Exploring how "Smart" the Basel II Framework is in the Australian Context of Banking Reform

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STATEMENT OF ORIGINALITY

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institute and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.

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PUBLICATION FROM THE RESEARCH

The following conference papers and proceedings have been produced from the research reported in this thesis.

- Li Siqiwen, (2009) 'Insights into the Financial Crisis: A Minskyian perspective drawing on interviews with Australian regulators and risk managers' *11th Path to Full Employment Conference/16th National Unemployment Conference*: *Proceedings,* Newcastle, NSW, Australia
- Li Siqiwen, Juniper Archibald James, (2008) 'Adjustments to the Basel-II framework for prudential control as suggested by the current financial crisis', *Labour Underutilisation, Skills Shortages and Social Inclusion: Incorporating the 10th Path to Full Employment Conference and 15th National Conference on Unemployment: Proceedings*, Newcastle, NSW, Australia
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Thesis Abstract

This thesis evaluates the effectiveness of Basel II as a regulatory framework in the Australian context of banking reform. More specifically, the thesis draws on a range of economic theories to establish a distinction between risk and uncertainty, explain both the causes and consequences of financial instability, and investigate the structure of, and policy responses to major financial crises.

In this context, the thesis investigates the congruence between Basel II framework and the attributes of Responsive and Smart Regulation. While the thesis argues that Basel II can be regarded as a good example of 'smart' regulation, it highlights areas of weakness and potential danger. In particular, it raises concerns about procedures of risk-management that are based on internal modelling using the Value-at-Risk (VaR) approach, as required under Basel II. It examines ways in which techniques of quantitative analysis can be enhanced to accommodate uncertainty through the use of robust techniques that account for time-varying uncertainty premia. However, within an environment characterised by increasing financial instability, the parameters that determine deep structures of self-similarity in the stochastic processes of different assets, will themselves be shifting so that the relevant asymptotic densities become more fat-tailed and negatively skewed.

This thesis applies the Universal Pragmatics methodology developed by Jurgen Habermas for interpreting both relevant documents and the responses of interviewees. The validity claims highlighted in Habermasian discourse analysis are adopted as benchmark for normative evaluations of interviewee responses. This methodology is applied to transcripts of semi-structured interviews that have been designed to extract relevant information from both risk managers in the banking sector and supervisors from the regulatory authorities in Australia.

The research findings arising from an analysis of interviews show the superiority of Basel II in contrast to Basel I, and also supports the determination of those aspects of Basel II that are more or less effective. This process highlights a range of problematic issues arising from Basel II, in regard to risk management and supervisory practices, which need to be addressed by policy-makers, supervisors, and bank practitioners in the future.

In particular, the thesis concludes that a more effective prudential control of the entire financial market and an improved system of corporate governance in the banking sector, are important complements to Basel II for the purpose of stabilising financial markets and obtaining sustainable economic growth in the Australian economy.

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Chapter One
Introduction

1.1 Introduction

The thesis provides a timely evaluation of Basel II, which has been implemented in Australia and certain other developed economies recently. The following sections consider the background to the research, research aim and scope, and the content and structure of the thesis.

1.2 Background of Research

On 26 June 2004, Central Bank Governors and the heads of their respective bank supervisory authorities within the Group of ten (G10) countries issued a publication based on an agreed text, the Revised Framework on International Convergence of Capital Measurement and Capital Standards. A comprehensive version of it was issued on 4 July 2006 after collecting responses from banks and relevant regulatory authorities from various regimes. This new capital adequacy framework is commonly known as Basel II. This framework serves as the basis for the national rulemaking and implementation process, and it takes account of new developments in the measurement and management of banking risks for those banks that move onto the “internal ratings-based” (IRB) approach.

In releasing the 1988 Capital Accord (Basel I), the Basel Committee on Banking Supervision (BCBS) sought to harmonise regulatory capital requirements for internationally active banks and to make regulatory capital sensitive to risk, by risk-weighting assets and converting off-balance sheet assets to on-balance sheet equivalents. Basel I has been implemented in many jurisdictions including Australia. In Australia, Basel I was first implemented for all Australian banks and, over time, for all authorised deposit-taking institutions. In 1996, a requirement to hold regulatory capital explicitly against market risk was added. There are two alternative approaches to the measurement of market risk: a standardised method and an internal model approach.

With subsequent advances in risk management practices, technology and banking markets, the insufficiencies and poor performance of Basel I and its 1996 amendment became apparent, and it has been criticised by academics, regulators

and bank practitioners widely especially after the occurrence of the 2008 financial crisis. As a step forward in the evolution of regulatory capital, Basel II aims to strengthen the soundness and stability of the international banking system while maintaining sufficient consistency.

Basel II is structured based on three pillars. Pillar One is the direct replacement for the prescriptive elements of Basel I. In addition to credit and market risks, Pillar One requires regulatory capital for operational risk and it provides a range of approaches through which banks are able to use their own risk estimates. Similar to credit risk, there are standardised and advanced approaches to operational risk[1]. The treatment of market risk is little changed under Basel II.

The second Pillar—supervisory process, and the third Pillar—market discipline, constitute the new content of Basel II, and are regarded as supplements to regulatory capital adequacy requirements to oversight the risk-taking activities of banks. In particular, the aim of the second Pillar is specified to be the extended and active bank supervision.

Pillar Two is a supervisory review process, which seeks to ensure that banks have adequate capital to support all the risks in their business and to encourage them to develop and use better risk management techniques in monitoring and managing their risks. This Pillar is regarded as providing formalised guidance for national supervision.

Pillar Three is market discipline, and it details certain disclosure requirements to allow market participants to assess key pieces of information such as risk exposures, risk assessment processes and capital adequacy. Under national supervision, banks are required to provide reports with such information to regulators, in the terms of Pillar Three of Basel II; however banks need to disclose information to the public as well as to regulators which is beyond the regulatory purpose of information disclosure.

[1] Under each of the available standardised approaches, income is used as a proxy for operational risk. In contrast, the capital requirement of the advanced measurement approaches (AMA) is the risk measure generated by a bank's internal operational risk measurement system using certain quantitative and qualitative criteria.

Until the late 1970s, financial regulation in Australia imposed heavy restrictions on how banks could structure and grow their balance sheets. The deregulation of the banking sector in Australia (simultaneously in other developed economies) in the early 1980s clearly placed the prime responsibility for a bank's prudential management on the bank itself. At the same time, in common with other banking systems around the world, an explicit bank supervision regime was put in place with the support of the Basel regulatory framework.

While Australia is not a member of the BCBS, the Australian Prudential Regulatory Authority (APRA), as prudential regulator of the Australian financial services industry, implemented all of the Basel II approaches through APRA's prudential standards on 1 January 2008, the earliest day that the BCBS made the advanced approaches available. Similar to the approach taken with Basel I, it is applied to all authorised deposit-taking institutions in Australia.

For several years prior to the release of the Basel II proposals, some of the larger Australian banks, such as Commonwealth, Westpac, and ANZ, had been developing 'economic capital' models as a way of better managing their risks. Based on their understanding of Basel II, that is argued to be primarily designed for large internationally operating banks, those banks expected to be able to retain their existing risk methodologies and assessment processes for Basel II purposes and, on that basis, also expected very large reductions in regulatory capital compared to their regulatory capital-holdings under Basel I. As regulator, APRA challenged the banks' internal processes and models according to its benchmarking which highlighted the differences in the balance sheet composition and risk profile of the larger Australian banks and the impact of those differences on regulatory capital. This was against a background of apparently large reductions in credit risk capital under the IRB approaches that, as argued by APRA, could not be fully explained by the structure of banks' balance sheets.

Under APRA's prudential standards, each bank is subject to a prudential capital ratio[2] (PCR) as determined by APRA. To support the determining of PCR, APRA's existing Probability and Impact Rating System (PAIRS) assist

[2] The PCR cannot be less than eight percent but it may be higher according to the result of banks' internal capital adequacy assessment process (ICAAP).

supervisors' judgement-making regarding inherent risks and the quality of a bank's risk management and controls. APRA takes into account a bank's internal capital adequacy assessment process (ICAAP) and other relevant factors when determining PCR. This supervisory process is implemented under the Basel II framework, the same as under the previous Basel accord.

The implementation of Basel II in Australia has required a new suite of prudential reporting forms. APRA has taken a two-tiered approach to Pillar Three and banks are required to make their first Pillar Three disclosure at end-September 2008. For those Australian-owned banks adopting the advanced approaches, the requirements closely align with those of the Basel II framework. The requirements for banks which have not adopted the advanced approaches are less onerous but are equally relevant.

According to the comments from advocators who are mainly the regulators, Basel II with three-Pillar structure is regarded as able to make regulatory capital much more risk-sensitive. Furthermore, it is considered that the opportunities for regulatory arbitrage have been significantly reduced, and that it leads to greater transparency in the financial market which is beneficial for the supervision of banks' risk-taking behaviours. APRA describes the overall benefits of Basel II as from: "*the greater risk-sensitivity of regulatory capital and improvements to risk management will manifest Banks themselves over time, and will be significant*" (APRA, 2008, P.6).

1.3 The Research Aim and Scope

The design and structure of Basel II reflects the intention of policy-makers to improve supervision of the banking system and risk management practices in the banking (and insurance) sectors, so that the stability of the financial system as whole can be enhanced.

The task of evaluating the effectiveness of Basel II is informed by an exploration of the diverse aspects of this regulatory framework. To this end, two research questions have been constructed to inform the analysis conducted in chapters Two, Three, Four, and Five of the thesis.

Based on the literature review of four pioneering theories of regulation (governmentality, reflexivity, responsive regulation and 'smart regulation), the first research question is whether the Basel II framework possesses certain attributes which enable it to be regarded as an example of 'smart' regulation? The second research question is how effective is the Value-at-Risk (VaR) approach, which forms the core aspects of the underlying risk methodology applied under the Basel II framework? In this regard, the thesis aims to evaluate the advantages and disadvantages of the VaR approach supplemented, where necessary, with a discussion about other prevalent risk assessment techniques. In particular, the thesis makes a number of suggestions about how techniques of risk assessment can be augmented. To this end, the literature review focuses on the Keynesian distinction between risk and uncertainty, non-expected utility theory, and other relevant concepts. The notion of decision-making under conditions of uncertainty is utilized to investigate options for the design of an 'optimal' regulatory strategy for the purpose of achieving financial stability. The issues raised by this interrogation of the second research question are deployed in guiding the response to the first research question.

In the evaluation of Basel II as a guiding framework for regulating risk-taking in banking, one crucial fact must be considered: Basel II is translated by national regulators into a set of regional prudential policies that reflect differences in regulatory interests, priorities, and concerns and, more importantly, differences in the structure of their banking systems.

Therefore, to assess the effectiveness and performance of Basel II in regard to risk management and supervision practices, the second step of this research is to explore and evaluate the responses from Australian practitioners who work in both Basel II-related risk management and supervision.

As discussed in the previous section, Australia, although not the member of BCBS, embraced Basel II at an early stage and encouraged banks to adopt more advanced aspects of this regulatory framework. Empirical analysis was based on interviews undertaken with supervisors from the regulatory authorities (i.e. APRA), risk analysts, risk managers, and directors of the Basel II program within

banks with responsibility for the implementation and oversight of the policy and risk-management framework.

In subsequent chapters of the thesis (Six, Seven, and Eight) research conducted for this thesis is motivated by the aim of ascertaining whether Basel II is superior to Basel I, and the extent to which Basel II has responded to the acknowledged deficiencies of Basel I. To this end the thesis addresses the following research questions: research question three — does Basel II perform effectively in regard to the purpose of maintaining financial stability? Research question four— are there issues or problems arising from the Basel II implementation, and if yes, will these issues or problems have an impact on the effectiveness of Basel II?

In an effort to penetrate beneath the surface of what is presented in interview responses interpretation is guided by the prospect that divergent strategic interests may be responsible for distorting communicative action in regard to risk management and supervision practices under Basel II framework. To this end, some of the more radical aspects of Habermas's Universal Pragmatics and Theory of Communicative Action have been drawn upon to provide the researcher with useful insights. The results of this Habermasian analysis of interview responses are then reviewed to determine the implications of the current financial crisis for future policy-making, supervision and corporate governance of the banking system.

1.4 Content and Structure of the Thesis

The thesis is structured by nine chapters including this introductory chapter. The second chapter, which follows, examines the nature of decision-making under conditions of both risk and uncertainty. Initially, the Chapter draws on the seminal work of Frank Knight and John Maynard Keynes, for whom uncertainty arises in a context where probabilities can neither be measured nor assigned, before examining recent developments in the behavioural economics of ambiguity and uncertainty aversion.

Based on a brief review of expected utility theory, this chapter explores inconsistencies that arise when there are departures from fundamental axioms, departures that seem to be justified by observed behaviour. The discussion

extends to a consideration of sub-additive and multiple-prior approaches that have developed to accommodate aversion to ambiguity or uncertainty.

Chapter Two explores the debate between various schools of thought (Keynesian, Post-Keynesian, Monetarist, New Classical and New Keynesian) that differ markedly in the explanations on offer about the causes and cures for financial instability. Included here are the Asymmetric Information approach of Mishkin, the Monetarist approach, and Minsky's Financial Instability Hypothesis. By linking the concepts of uncertainty to the explanation of the causes of financial instability a theoretical framework is constructed to inform the evaluation of broadly macroeconomic policy interventions, on one hand, and more specific forms of financial regulation, like Basel II, on the other hand.

The economic hypotheses and policy stances of each of the various schools of thought carry over to theories of regulation as shown in Chapter Three. There it is argued that approaches to regulation have typically oscillated between command-and-control and voluntary forms of self-regulation. Influenced by the Keynesian conviction that market failures associated with uncertainty and instability are unavoidable, a stringent "command-and-control" approach is usually embraced by policy-makers of this persuasion. For those working within the Responsive Regulation, Neoclassical, and Austrian economics traditions, as discussed in this chapter, the "command-and-control" approach to regulation has been criticised. While members of the aforementioned economic schools favour self-regulation the proponents of Responsive Regulation favour an approach based on the "regulation of regulation". Drawing on these various perspectives, the Chapter traces the transformation of financial regulations in the U.S, UK and Australia during and after the 1980s.

As a consequence of this regulatory change, the role of banks in the financial market has been transformed from a simple intermediary role based on the conversion of short term household deposits into long term loans to the corporate sector to one where banks operate as brokers in the structured finance market. The Chapter argues that this change in roles raises new regulatory challenges and imposes a requirement for the design of an appropriate new regime of prudential controls.

Under the process of financial deregulation scheme, banking systems in U.S., UK and Australia were exposed to a marked evolution in the nature of capital regulation (from pre-Basel; to Basel I; 1996 amendment; and then to Basel II). Chapter Three reviews this historical change. Moreover, the recent 2007-2008 global financial crisis is used as the context for a preliminary appraisal of the effectiveness of the Basel II implementation in Australia.

Based on the recognition that neither the command-and-control nor the self-regulation mode based regulation can accommodate the growing complexity of the financial market, it is argued that a new regulatory regime is needed. Chapter Four introduces four theoretical concepts—governmentality, reflexivity, responsive regulation and 'smart' regulation—which are deployed in characterising the nature of frame of this new regulatory regime category. The Chapter develops a benchmark derived by weaving together the conceptual frameworks of reflexivity and responsive regulation (with smart regulation viewed largely as an updated version of responsive regulation). In turn, this benchmark is seen to have two components: on one hand, the concept of responsive enforcement and, on the other hand, the notion of spreading the burden of regulation beyond the direct sphere of government. This benchmark is then applied to an exploration of the congruence between Basel II and those innovative regulatory approaches.

In Chapter Five, Basel II's underlying risk estimation approach—Value-at-Risk (VaR)—is evaluated. To uncover both its flaws and advantages, three methods of calculating VaR (variance-covariance; historical and Monte Carlo simulation) are discussed. Backtesting and stress testing—techniques that are regarded as necessary complement to VaR analysis—are also examined in this chapter. Given the failure of VaR to adequately capture tail risks and due to its lack of sub-additivity, the effectiveness of other prevalent approaches to the estimation of risk—Extreme Value Theory (EVT), Copula-based approaches, Expected Shortfall (ES)—are evaluated. In addition, distortion risk measures (which are shown to be closely related to coherent risk measures), are also discussed, thus, shedding further light on the limitations of VaR (and ES). The Chapter argues that not only risk premia, but also uncertainty premia, should be taken into account in the estimation techniques adopted for regulatory capital assessment

purposes. Accordingly, the capacity of the techniques drawn from the literature on risk-sensitive and robust control theory, to accommodate fundamental uncertainty is discussed.

Chapters Two, Three, Four, and Five serve the purpose of evaluating Basel II from a variety of theoretical perspectives. In contrast, based on the research methodology set out in Chapter Six, Chapters Seven and Eight evaluate the effectiveness of Basel II as implemented in Australia since 2008 by explicitly drawing on the interview responses of bank practitioners and supervisors from the regulatory authorities that work closely with banks to guide the process of implementation of Basel II in Australia.

The research methodology adopted for this research is qualitative research using semi-structured interviews as a tool to extract information. Chapter Six elucidates the design of the research methodology with a detailed explanation of the interview strategy (including sampling type, the strategy used for contacting potential interviewees, the rationale behind the design of interview questionnaires and their subsequent updating), and also the process of qualitative data analysis. This analysis was based on philosophical and methodological notions drawn from Habermas's Universal Pragmatics, the Theory of Communicative Action, and Habermasian Discourse Ethics. In Chapter Six it is argued that these components of a Habermasian approach provide the researcher with useful insights into whatever tendencies may exist for communicative distortion in relation to the Basel II related risk management and supervision process.

Chapters Seven and Eight interpret the research findings arising from interviews. Based on interviewee responses, the research findings interpreted in Chapter Seven focus on evaluating the superiority of Basel II relative to Basel I by highlighting the inadequacies of Basel I with respect to the risk categories employed, the underlying risk methodology, performance in stressed market conditions and the resulting distortions. While Basel II overcomes many of these limitations, the chapter argues that it also has a profound organisational impact both on banks and the supervision process itself, not least through the building of a reflexive culture of risk management.

Chapter Eight departs from Chapter Seven by engaging in a deeper interpretation of the specific issues and problems raised by interviewees. The problems emerging from Basel II implementation focus on seven aspects: first, implementation burdens including complexity of risk methodology, restricted data requirements, regulatory buffer imposed by national regulators, and the IRB accreditation debate; second, the possibility of competitive disadvantage specifically related to issues of the capital benefits to be derived from adopting IRB, and cross-border supervision; third, issues with external ratings, in which the profit-driven nature of rating agencies and its impact on the quality of ratings and consequently the effectiveness of Basel II are discussed; fourth, securitisation with discussion on regulatory arbitrage; fifth, cross-border supervision with issues of different risk approaches adopted in overseas branches and parent banks, dislocation in risk measurement, difficulties in Basel II implementation and the possibility of competitive disadvantage specifically in regard to cross-border supervision; sixth, problems with Pillar Three reporting which involves issues relating to information shortage, the excessive cost burden, the need for education, and the understanding, possible inconsistency with International Accounting Standards, and issues of confidentiality; seventh, Pillar Two risk assessment in regard to relevant quantification difficulties and aspects of liquidity risk management.

In this chapter, the underlying conflicts between regulators and bank practitioners, which, it is suggested, reflect their distinct strategic interests (bureaucratic and economic, respectively) that drive decision-making and action, are exposed and critically discussed.

Chapter Nine concludes the thesis by summarising the theoretical contributions and empirical research findings arising from the interview analysis. In the light of the theoretical discussion and empirical findings, this Chapter examines policy implications under three aspects: effective prudential control with enhanced supervision over the entire financial market, and improved corporate governance. The research findings are also exposed to a critical appraised which discusses limitations and suggests potential for improvement. To close off the Chapter, potential areas of future research are foreshadowed.

Chapter Two
Decision-Making under the Conditions of Risk and Uncertainty

2.1 Introduction

Financial markets play an important role in the intermediation between borrowers and lenders, thereby facilitating macroeconomic expenditures that impact on economic growth and the welfare of economies. However the same markets are also a source of economic instability that has the potential to generate systemic failure in the financial system. The intent of this thesis ultimately is to explore the role of the Basel – II accords in ameliorating that threat.

However the immediate purpose of this chapter is to examine the nature of the decisions faced by economic agents and finance markets as they grapple with determining a course of action that has repercussions for future outcomes but where those outcomes carry inherent risk and uncertainty.

The Chapter opens, in Section 2.2, with a discussion of the debate surrounding the concepts of risk and uncertainty. At the heart of the debate are two different views of the world. One holds that decision makers assign probabilities to likely outcomes and make decisions based on the maximization of their expected utility or benefit. The other view argues that decision makers face circumstances in which it is impossible to assign or even measure probabilities, and that expectations, weight of evidence and states of confidence will be critical to decision making. The first view is largely held by the classical school and their later adherents. The latter view has its roots in the work of Frank Knight and John Maynard Keynes. Since Knight and Keynes represent a departure from the traditional view, their work is discussed in some detail. Later writers, like Davidson and Hacking, distinguish between situations that are amenable to probabilities (as in ergodic or aleatory) and those which are not (as in non-ergodic or epistemic). Post Keynesians continue this dialogue with further theoretic refinement, including the notions of ambiguity and fundamental uncertainty. The Chapter then offers a brief review of Expected Utility Theory and its many critics. The review highlights problems with the fundamental axioms on which the theory is

expounded and the sub-additive and multiple-prior approaches developed to cope with decision making with an aversion to uncertainty.

Notwithstanding the criticisms levelled at expected utility theory, it has spawned an influential stream of thought that has given rise to the propositions that markets are capable of producing efficient outcomes and that decision makers can form and be guided behaviourally by rational expectations. These views are hotly contested and the flavour of that debate is outlined in Section 2.3. The discussion of the various schools of thought—Keynesian, Post-Keynesian, Monetarist, New Classical and New Keynesian – lays a foundation for the different perspectives on the causes of observed financial instability.

Section 2.4 begins with an outline that defines financial crises in terms of various "bubbles" but devotes most attention to reviewing and discussing the competing theories on financial instability, notably: Asymmetric Information approach to financial instability (Mishkin, 1991, 1997); Monetarist approach to financial instability (Friedman and Schwartz, 1963); and Minsky's (1982a. 1982b, 1986) Financial Instability Hypothesis (FIH). Furthermore, the different policy propositions based on their diverse views are critically discussed. This section brings together the links between the conceptions of uncertainty and the hypothesized causes of financial instability and the policy prescriptions foreshadow the potential role of financial regulations like those of the Basel accords.

2.2 Risk and Uncertainty

Surprisingly, risk and uncertainty have a rather short history in economics. The formal incorporation of risk and uncertainty into economic theory was only accomplished in 1944, when John von Neumann and Oskar Morgenstern published their *Theory of Games and Economic Behavior* - although the exceptional effort of Frank P. Ramsey (1926) must be mentioned as an antecedent. Indeed, the very idea that risk and uncertainty might be relevant for economic analysis was only really suggested in 1921, by Frank H. Knight in his formidable treatise, *Risk, Uncertainty and Profit*.

2.2.1 Frank Knight on Uncertainty and Risk

Prior to Frank H. Knight's 1921 treatise, only a handful of economists, notably Carl Menger (1871), Irving Fisher (1906) and Francis Y. Edgeworth (1908), had deigned to acknowledge the potential modifications risk and uncertainty might make to economic theory. It was in Knight's treatise that, for effectively the first time, the case was made for the economic importance of these concepts. Indeed, he linked profits, entrepreneurship and the very existence of the free enterprise system to risk and uncertainty.

Frank Knight's perspective on uncertainty exercised a significant influence over Keynes (1936) and the Post Keynesian monetary theorists. Frank Knight (1921) defines the distinction between risk and uncertainty in the following terms:

> The essential fact is that "risk" means in some cases a quantity susceptible of measurement, while at other times it is something distinctly not of this character; and there are far reaching and crucial differences in the bearings of the phenomenon depending on which of the two is really present and operating. […] It will appear that a measurable uncertainty, or "risk" proper, as we shall use the term, is so far different from an immeasurable one that it is not in effect an uncertainty at all (Knight, 1921, pp. 10-20).

In Knight's interpretation, "*risk*" refers to situations where the decision-maker can assign mathematical probabilities to the randomness which he faces, while "*uncertainty*" refers to situations when this randomness "cannot" be expressed in terms of specific mathematical probabilities. According to Knight, there are two ways of assessing "risk": *a priori* and *statistic* judgment that in economic practice relies on the estimate of the frequency and thus probability of an event[3].

[3] This implies that an event must have been experienced a sufficient number of times in the past.

After making the distinction between a-priori and statistical judgment, Knight defines a third type of judgment which he calls *estimates*, where objective probability cannot be determined[4]:

> The liability of opinion or estimate to error must be radically distinguished from probability or chance of either type, for there is no possibility of forming *in any way* groups of instances of sufficient homogeneity to make possible a quantitative determination of true probability. Business decisions, for example, deal with situations which are far too unique, generally speaking, for any sort of statistical tabulation to have any value for guidance. The conception of an objectively measurable probability or chance is simply inapplicable (Knight, 1921, p.231).

This type of *subjective* judgment is about the correctness of an estimate of the consequences of a certain action when a valid basis to determine numerically the potential error in this estimate is lacking. In such cases the difference between risk and uncertainty is visible.

Knight also introduces the notion of the confidence that agents feel about their estimates of risk and return:

> The businessman himself not merely forms the best estimate he can of the outcome of his actions, but he is likely also to estimate the probability that his estimate is correct. The "degree" of certainly or of confidence felt in the conclusion after it is reached cannot be ignored, for it is of the greatest practical significance. The action which follows upon opinion depends as much upon the amount of confidence in that opinion as it does upon the favourableness of the opinion itself. The ultimate logic, or psychology, of these deliberations is obscure, a part of the

[4] Because even in cases of risk there is always a subjective element in the establishment of a probability

> scientifically unfathomable mystery of life and mind (Knight, 1921, pp. 226-7).

Nonetheless, some economists dispute this distinction between risk and uncertainty and argue that in Knightian uncertainty the problem is that the agent does not assign probabilities (not that she/he actually cannot). They raise the issue that uncertainty is an epistemological and not an ontological problem[5]. Langlois and Cosgel (1993) convincingly argue that Knight has been misunderstood in his interpretation from the perspective of present-day theory—particularly asymmetric information and non-insurable risk. They contend that Knight's main concern was less with the difficulty in assigning probabilities to outcomes and more with the impossibility of classifying the relevant states of nature (Langlois and Cosgel, 1993, p.459)[6].

After Knight, economists finally began to take the concepts of risk and uncertainty into account: John Hicks (1931), John Maynard Keynes (1921, 1936, 1937), Michael Kalecki (1937), Helen Makower and Jacob Marschak (1938), George J. Stigler (1939), Gerhard Tintner (1941), A.G. Hart (1942) and Oskar Lange (1944) appealed to risk or uncertainty to explain things like profits, investment decisions, demand for liquid assets, the financing, size and structure of firms, production flexibility, inventory holdings, etc.

2.2.2 Keynes's Uncertainty

As is commonly known, uncertainty is the fundamental element of Keynes's theory. As Minsky (1975, p.57) writes, to comprehend Keynes "it is necessary to understand his sophisticated view about uncertainty, and the importance of uncertainty in his vision of the economic process."[7] To understand Keynes' treatment of uncertainty in *The General Theory* (1973a) one has to go back to his *Treatise on Probability* (1973b). Similar to Knightian uncertainty, Keynes links the concept of uncertainty to the problem of *measurability* as "there is no scientific basis on which to form any calculable probability whatever. We simply do not know." (Keynes, 1921, p.114)

[5] The problem centres on "knowledge" of the relevant probability, not of its "existence".
[6] A similar Knightian notion of uncertainty appears to underpin Fama's recent interpretation of the 'unnamed' state variables problem arising in Breeden's (1979) inter-temporal capital asset-pricing model (Fama, 1998).
[7] Minsky (1975, p.57) argues that "Keynes without uncertainty is something like Hamlet without Prince".

Keynes argues that social, economic and political conditions change radically (over a twenty-year period), making it impossible to extrapolate future events based on the events of today. In other words, Keynes defined as uncertain a phenomenon whose probability cannot be calculated, leaving people ignorant about the future. In view of the future being uncertain, individuals, more specifically entrepreneurs, follow their instincts, characterized by what Keynes described as *animal spirits*[8]. In contrast to Knight who mainly focuses on the distinction between risk and uncertainty discussed before, Keynes stresses the amount of knowledge on which probabilities often have to be based. The concept of probability developed in his *Treatise* shows that intuitive knowledge is important for the formation of a rational belief. The imperative to act rationally provides a justification for the determination of rational degrees of belief[9].

In the *Treatise* Keynes argues that three conditions: *measurability; the principle of indifference*; and *atomic uniformity*[10], must hold jointly for application of the conventional Benthamite form of the probability calculus. These conditions are unlikely to be simultaneously satisfied. For instance, in the absence of measurability, Keynes intimated that we might not even be able to *rank* probabilities on an ordinal scale of greater or smaller likelihood (Juniper, 2001b).

According to Keynes, *the principle of indifference*[11] can only be applied when evaluating indivisible alternatives (i.e. those which are not a disjunction of two or more mutually exclusive probabilities), and "equal probabilities must be assigned to each of several arguments, if there is an absence of positive ground for assigning unequal ones" (Keynes, 1973b, p.45). *Atomic uniformity* requires that causes work additively so that the net outcome of any complex of causes in combination can be determined as the vector sum of each of their separate, independent and invariable effects (Keynes, 1973b, pp. 276-7). The condition of *limited independent variety* applied when a finite number of ultimate axioms and laws of necessary connection

[8] In other words, the state of confidence of individuals depends on conventions. Therefore, the adoption of conventions by economic agents is a partial solution to the problems of uncertainty.
[9] In Keynes' view a probability reflects the degree of rational belief which is held about a proposition on the basis of given knowledge or evidence. The maximum degree of rational belief is called certainty and the minimum degree impossibility.
[10] These latter two supplementary conditions relate to the problem of induction, and consequently, the level of confidence we may have in our calculations of probability.
[11] In the General Theory, Keynes argues that the principle of indifference is not generally applicable to social and economic phenomena because the calculation of actuarial expectations on the "assumption of arithmetically equal probabilities based on a state of ignorance leads to absurdities" (Keynes, 1973a, p. 152).

govern the structural composition of the system under analysis such that the range of future realizations of the system can be identified and their relative likelihoods determined. In *The General Theory*, Keynes questions whether this condition could hold for future outcomes in unstable and volatile markets (Keynes, 1937, p. 214). Finally, Keynes contends the *weight* of *argument* as a measure of the sum of favorable and unfavorable evidence must be distinguished from probability, which instead measures the difference between two classes of evidence. The weight comprises both the amount of relevant evidence and the completeness of evidence[12]. Any assessment must include both the weight of argument and the associated risk, even in the case that probabilities and worth are measurable, and if only in an ordinal sense (Juniper, 2001b).

In his later economic writing—*The General Theory* - Keynes maintains the view that expectations depend not only on the most probable forecast but also on the state of confidence (Gerrard, 1994). Keynes consistently distinguishes between short-run and long-run expectations in *The General Theory* [13] . Short-term expectations are concerned with the day-to-day production and employment decisions of firms with the daily process of revising market anticipations in the light of actual market outcomes. In contrast, long-term expectations are concerned with decisions about real and financial investment. Keynes asserts that agents would generally expect the future to be like the recent past unless strong reasons exist for thinking otherwise in the case of short-term expectations. For long-term expectations, Keynes argues the *most probable forecast* and the state of *confidence*, which depends on both the size of any prospective change and uncertainty about the precise form that the change would take, are the influencing components (Keynes, 1936, p.148). Therefore, Keynes thought confidence is more related to the concept of *weight* than *probability*. He also asserts that the investment decision at any particular moment is a unique choice since there might be no relevant frequency distribution in existence, for example because of systematic changes in market condition[14] (Juniper, 2001b).

[12] Keynes contends that any assessment of evidence must account for risk in the sense of the mathematical expectation of the loss attached to a particular action.
[13] In other words, the distinction between risk and uncertainty takes a specific form in Keynes' *General Theory*—the distinction between short-term and long-term expectations.
[14] Gerrard (1994) argued that the Keynesian notion of "animal spirits", defined as the spontaneous urge to action rather than inaction, is most appropriately viewed as being determined

After Keynes, Davidson (1994) distinguishes between two different economic paradigms: predetermined, immutable and ergodically knowable reality; and unknowable, transmutable and non-ergodic reality (see also Skidelsky, 1992, p.xi). By ergodicity Davidson means the implicit or explicit assumptions made by most orthodox economists (e.g. Samuelson, 1969, pp.184-5) of the existence of a unique long-run equilibrium independent of initial conditions. In ergodic environments agents either know the future in the sense of actuarial certainty equivalents, or their knowledge is incomplete in the short-run due to bounded rationality and the path of the economy is largely deterministic, subject to random stochastic variation[15] as in the stationary random process. However, in a non-ergodic environment, knowledge is intrinsically incomplete[16].

Deprez (2001, p.282) also makes a distinction between ergodic and non-ergodic contexts which is more statistic-based:

> Some *stationary* random processes possess the property that almost every member of the ensemble exhibits the same statistical behavior that the whole ensemble has. Thus, it is possible to determine this statistical behavior by examining only one typical sample function. Such processes are said to be *ergodic*. […] A process that does not possess [this] property […] is *non-ergodic*.

Moreover, Davidson argues that non-ergodic reality is a feature associated with all long-term decisions about investment and wealth creation which:

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by the state of confidence rather than by some sort of non-rational motivation. In contrast, Davidson (1995) thought that "animal spirits" reflect a disposition on the part of an investor to act in the absence of any secure basis for determining the likely outcome of their actions.

[15] In this case, it follows by using time-series or cross-sectional data of past events, it is possible to derive a well-defined probability distribution for the full set of possible future outcomes (Solow, 1985).

[16] According to Juniper (2001, p. 68), this argument raises a series of issues which concern the relationship between cognition and reality. From a critical realist perspective the cognitive capabilities of agents come to operate as a part of the very mechanisms and structures which the human sciences are seeking to explain. Therefore, in addition to changes in sentiments or the breakdown of conventions and other institutional arrangements, fundamental uncertainty about events, in and of itself, can give rise to structural breaks and unpredictable changes in the relationships determining these same events. As such, variations in subjective cognition and attitudes can give rise to variations in objective processes and conditions, but causality also flows in the opposite direction. Accordingly, Keynes suggests that for both reasons, economic processes were too changeable for aleatory notions of probability to apply with any degree of confidence to the world of human conduct.

> Implies the probability that there is a permanent and positive role for government in designing policies and institutions to provide results referable to those that would be generated by competitive markets in a nonergodic environment (Davidson, 1994, p.XXX).

Hacking (1975) drew a further distinction, applied to probability theory, to clarify the crucial differences between the two generic types of choice situations: *aleatory dimension* and *epistemic dimension*. The aleatory dimension relates to the nature of the real causal structure whereas the epistemic dimension relates to the decision-makers knowledge and understanding of that causal structure. A risky choice situation is characterized by a causal structure with stable deterministic and stochastic components (the aleatory dimension) where decision-makers are essentially backward looking at past outcomes as a guide to future actions. Conversely, an uncertain choice situation is characterized by causal structures that are subject to fundamental change or limited understanding of decision-makers. In this type of situation, firms have to form long-term expectations for the purpose of investment decisions, and decision-makers have to be forward-looking and "scientific".

A reconciliation of the apparently divergent views of Gerrard and Davidson, regarding the concept of Keynesian uncertainty, is achieved with the synthesis in the following table (source from Juniper, 2001b):

Table 1 Knightian / Keynesian Uncertainty—A Synthesis

	Incomplete Knowledge	Compete Knowledge
Structurally Determinant	*Uncertainty* *(e.g. Chaos)*	*Perfect Certainty*
Structurally Indeterminant	*Fundamental Uncertainty* *(Type 2 or 3)*	*Risk* *(Type1)*

Immutable (Ergodic) Reality:

- Type 1— Agents know the future in the sense of actuarial certainty equivalents

- Type 2— Agents' knowledge of ergodic reality if incomplete in short-run due to bounded rationality.

(Subjective probabilities converge to objective probabilities through learning or Darwinian selection by market of more rational techniques=>become type 1)

Transmutable (Non-Ergodic) Reality:

- Type 3— Agents believe sufficient information does not exist to predict future by means of frequency distributions.

  (Relevant to decisions involving investment, accumulation of wealth and finance)

The case of *perfect certainty* represents an environment with the most straightforward and simple assumption that can be made in economic analysis, which generates perfect foresight. Most orthodox theories presume an environment of *risk* (bottom right-hand), in which economic agents can determine the optimal trade-off between variance and return for any transaction or group of transactions because agents are assumed to have complete knowledge of the future in the sense that outcomes can be described in terms of actuarially certain equivalents. In the case of *chaotic* (top left-hand) processes, the formation of expectations are with incomplete knowledge of the structurally determinant system due to the infinite sensitivity of the system to initial conditions. Grandmont has argued that the existence of non-linear chaotic macroeconomic systems justifies a permanent and positive role for government (Grandmont, 1985, 1987). In this context, the role of policy is to nudge the economy onto more preferable, but still attainable, trajectories or to manipulate key parameters to prevent any transition from systems with well-behaved and stable dynamics to one subject to complex, chaotic dynamics (Juniper, 2001b).

In the case of fundamental uncertainty in which agents have incomplete knowledge of a structurally indeterminant system, many orthodox models (particularly neoclassical)

allow for the existence of uncertainty in this sense but are predicated on the notion that knowledge which is initially incomplete can gradually become more complete. Accordingly, Keynes considered orthodox (i.e. Classical) economic theory as having reduced the analysis of behaviour under uncertainty to be a special case of risk. He advocated moving beyond the orthodox theory of economic behaviour by encompassing the theory of decision-making under conditions of risk within a more general theory that allowed for a broader conception of uncertainty to include fuzzy probability distributions and the possibility of future structural changes to which no relative frequencies could be attached[17] (Fontana & Gerrard, 2004).

2.2.3 Ambiguity and Fundamental Uncertainty

Dequech (2000, p.41) introduced Post Keynesian developments with the comment that "some lines of research close to mainstream economics have started to deal with 'Keynesian' or 'Knightian uncertainty"[18] […] particularly Post Keynesian." This discussion of Keynes' uncertainty[19], particularly through distinguishing ambiguity and fundamental uncertainty could help to assess the similarities and differences between the more mainstream and more heterodox works, which share a common foundation in Keynes's work on probability and uncertainty.

2.2.3.1 Distinction between Ambiguity and Fundamental Uncertainty

Dequech (2000, p.41) follows Camerer and Weber (1992, p.330) in contending that fundamental uncertainty and ambiguity, although distinct, (*ambiguity* refers to missing information that could be known, while *fundamental uncertainty*[20] implies that some information does not exist at the decision time because the future is *yet to be created)* both pertain to situations different from those that mainstream economics deals with under uncertainty or risk. Under this notion of fundamental uncertainty he subsumes both Paul Davidson's ontologically grounded concept of non-ergodicity in stochastic processes and also the philosophical approach adopted by such as

[17] This will be discussed later within the Chapter.
[18] For surveys of this kind of research refer to Camerer and Weber (1992) and Kelsey and Quiggin (1992).
[19] Some, especially Post Keynesians, interpret Keynesian uncertainty as synonymous with what is called here fundamental uncertainty.
[20] Dequech (2000, p.42) argued that fundamental uncertainty is not synonymous with complete ignorance and that its degree varies depending on the existence and range of institutions such as contracts, market-makers, and informal conventions.

O'Donnell (1991), Carabeli and De Vecchi (2001) and Lawson (1999a, b), who follow the position articulated by Keynes in his *Treatise on Probability*.

Winslow (1989)[21] actually demonstrates that Keynes had abandoned the atomistic ontology of the *Treatise on Probability* for Whitehead's (1928) notion of organic interdependence when he came to write the *General Theory*. To be able to support processes of inference within a world where everything was now seen to be dependent on everything else, Keynes was also obliged to adopt Whitehead's ontological conception of a nested hierarchy. Winslow[22] (1989, pp. 1175-1178) argues that this notion grounds the distinction Keynes makes between short run and long run expectations (also refer to pp.7-8 of thesis). The shorter the distance into the future of events to be forecast, the greater is the number of factors that can be treated as given. The further into the future are the event to be predicted the larger the reduction in what can be treated as given, and the smaller the amount of knowledge available for purpose of prediction (cited in Juniper, 2007, pp.4-5). Furthermore, Winslow (2005, pp. 13-15) argues that Keynes's antagonism towards utilitarianism was due to the fact that it was predicated on atomistic rather than organic foundations. In particular, the axiomatic foundations of utility theory gave rise to what Keynes, following Ramsey, called "scholasticism", which entailed "treating what is vague as if it were precise and trying to fit it into an exact logic category" (Keynes, 1937, p.197).

As briefly discussed earlier, the central organising principle of Paul Davidson's ontological grounded concept of non-ergodicity has a great deal in common with the critical realists' emphasis on mutability and the necessity for open-systems thinking, which believes this world does change due to emerging objects and structures. The social world is changing more rapidly than the natural world, because the social world incorporates the perception, reflection and action of human beings and social collectives engaged in social experience, learning and innovation. Thus in an open system it is not possible to obtain a closure, which is opposite to the closed-system thinking of mechanism.

[21] He draws heavily on the work of Keynesian scholars such as Rod O'Donnell and Anna Carabelli.

[22] According to Winslow (1989), Keynes argued further that "money-making" and "money-loving", as drives, would provide an effective motivational support for what Freud described as the phenomenon of "group psychology". In addition, Ernest Jones's notion of sublimination and regression played a key role (Juniper, 2007).

According to the characteristics (existence of information) of each of them (ambiguity and fundamental uncertainty), Dequech argued in his paper (2000, p.42), ambiguity, unlike fundamental uncertainty, may disappear *ex ante* with the passage of time[23]. Fundamental uncertainty, in contrast, would be the type of uncertainty supporting the claim, made by Keynes and his more heterodox followers (Post-Keynesian), that money is not neutral, either in the short or in the long run. This criticizes the mainstream models treatment of money by putting it in an intertemporal context that allows a Keynesian type of money demand to exist only in the short run, while keeping a standard notion of uncertainty (risk). Also, the impossibility of completely eliminating fundamental uncertainty before the time of making some important economic decisions opens the way for a permanent reason for liquidity preference, which may not exist under ambiguity and which is strictly precautionary. On the other hand, Dequech argued (p.43), if fundamental uncertainty can be reduced, then both under ambiguity and fundamental uncertainty, one reason that people prefer liquidity is that they want to wait until obtaining more information (to form more reliable estimates) for their decision-making. This (non-existence of information in the case of fundamental uncertainty and thus permanent reason for liquidity preference) again raises the criticism of the self-adjustment process of markets and neutral money in the long run, believed by mainstream theorists.

Two groups offer interpretation of Keynes' notion of uncertainty. One group argues that uncertainty corresponds to an absence of numerically determinate or even comparable probabilities (Lawson, 1988; Rotheim, 1988, p.88; Brown-Collier and Bausor, 1988, p.238-9; Hamouda and Smithin, 1988, p.160; and Dutt and Amadeo, 1990, p.105-6). Related to the notion of *weight* in the *Treatise*, the other group argues that probability is a relation that weight has to do with the evidence on which the probability relation is based (Hoogduin, 1987; Kregel, 1987; O'Donnell, 1991; Runde, 1991; Anand, 1991; Brady, 1993; and Gerrard, 1994).

Before engaging in further discussion of the Post-Keynesian distinction between ambiguity and fundamental uncertainty, it is useful to briefly review recent developments in utility theory which extend the expected utility framework of Von Neumann and Morgenstern (1944). In particular the sub-additive and multiple-prior

[23] Under ambiguity in a dynamic setting, more information may become available to the decision-makers, changing their probability distributions or their assessment of the reliability of these.

versions of uncertainty aversion help to expound the distinction between ambiguity and fundamental uncertainty.

2.2.3.2 Brief Review of Utility Theory

The growth of literature covering decision-making, game theory and finance, draws upon generalizations of expected utility theory (EUT). After the 1738 version of expected utility theory described by Daniel Bernouli, Von Neumann and Morgenstern (VNM) reinterpreted and presented an axiomatization of the theory in 1944 in terms of agents' preferences over different ventures with random prospects. Some authors have extended the VNM axiomatic framework including the axiom of continuity (see Bewley, 1986) and the independence axiom (see Chew and Epstein, 1989; Dekel, 1986; and Tversky and Wakker, 1995).

The independence axiom, first posited by Paul Samuelson, is related to the linearity of probabilities (Juniper, 2001b). Let A and B be two lotteries with $A > B$, and let tϵ (0,1] then $tA + (1 - t)C > tB + (1 - t)C$. Later the Allais Paradox (Allais, 1953) questioned the nature of EU-based choice under the independence axiom and showed an inconsistency of actual observed choices with the predictions of expected utility theory by devising the following questions.

Question 1: which prospect would you choose of x1= to receive 100 millions with probability 1, or y1= to receive 500 million with probability 0.10, 100 millions with probability 0.89, and nothing with probability 0.01?

Question 2: which prospect would you choose of x2= to receive 100 millions with probability 0.11, and nothing with probability 0.89, or y2=to receive 500 millions with probability 0.10, and nothing with probability 0.90?

Allais found that the majority answered x1 to question 1 and y2 to question 2, and argued that this pair of prospects could indeed be chosen for good reasons. But it violates EUT, since there is no function U that would both satisfy: U(100) > 10/100 U(500) + 89/100 U(100) + 1/100 U(0), and 11/100 U(100) + 89/100 U(0) < 10/100 U(500) + 90/100 U(0).

Under suitable conditions expected utility theory can be generalized to accommodate uncertainty or ambiguity aversion. In Subjective Expected Utility (SEU)[24], originally put forward by Savage (1954), the 'sure-thing" principle plays the same role as the 'independence axiom' in the VNM framework (Gilboa and Schmeidler, 1989). However the Ellsberg paradox (1961)[25] demonstrates that the 'sure-thing' principle that is satisfied under expected utility preferences is not satisfied under non-expected utility preference. Hence the Ellsberg paradox is not compatible with the expected utility hypothesis, while the non-expected utility preference function typically violates Marschak (1950) and Samuelson (1952)'s 'independence axiom' (Machina and Schmeidler, 1992). Within Savage's framework, uncertainty aversion is accommodated by weakening the *sure-thing principle*, and is formalised mathematically through the application of Choquet expected utility theory[26] (Choquet, 1955). For gaining an intuitive understanding of uncertainty aversion, Tversky and Wakker (1995) adopt an approach called *cumulative prospect theory* (CPT) to examine a version of non-expected utility that can easily be extended to accommodate uncertainty, and the paradoxes of Ellsberg (1961) and Allais (1953). This is discussed further in section 2.2.3.3.

Returning to the distinction between ambiguity and fundamental uncertainty, Dequech (2000) distinguished between weak and strong uncertainty. Weak uncertainty (risk), following the *Treatise*, refers to the presence of numerical less-than-unity probabilities and maximum weight. This is in opposition to the mainstream subjectivist conception, where uncertainty is characterized by the presence of a unique, additive and fully reliable probability distribution. Dequech (2000, p. 44) defined strong uncertainty as essentially characterized by the absence of such a distribution, due to the paucity of evidence. However, the case of ambiguity is defined as a less-

[24] It combines two distinct subjective concepts: a personal utility function and a personal probability analysis based on Bayesian probability theory.
[25] See also Chipman (1960, pp. 79-88), Raiffa (1961), Becker and Brownson (1964), Slovic and Tversky (1974), and MacCrimmon and Larsson (1079, chapters 7& 8) for similar observed violations.
[26] A generalization of probability theory grounded in the notion of capabilities (Juniper, 2001).

strong type of strong uncertainty in terms of the presence of interval probabilities and a predetermined list of possible events (p.45, p.52)[27].

In keeping with this notion, Dequech described the urn problem (denied by Ellsberg, 1961), as an example of ambiguity because in this case information about the contents of the urns exists and could potentially be revealed to decision-makers. Following Gilboa and Schmeidler (1989), Dequech (2000) also observed that decision making under aversion to uncertainty can be formalised in two mathematically equivalent ways, which are motivated by the Ellsberg Paradox (Ellsberg, 1961)[28]: either through the use of sub-additive probabilities (i.e. probabilities of events that "add up to less than one"); or through the adoption of a multiple-priors approach in which it is presumed that agents do not possess a unique probability distribution[29].

2.2.3.2.1 Multiple-Priors

The multiple-priors approach abandons the standard idea that decision-makers have a unique probability distribution; rather, it is asserted that they must choose a particular distribution within a range of feasible distributions given the problem at hand (Dequech, 2000)[30]. Ellsberg (1961, p.661) introduced a set of probability distributions and also referred to the confidence that the decision-maker has in estimates. Thus the idea of full reliability is also abandoned[31]. A similar approach, in the Bayesian framework, is pursued by Gärdenfors and Sahlin (1982). The axiomatization of the multiple-prior approach is provided by Gilboa and Schmeidler (1989). They construct their model of decision-making under a multiple-priors form of uncertainty aversion

[27] In this case, a person will conceive of a set of probability distributions rather than of only one, and will be able to unambiguously assign probabilities to each of these distributions (Camerer and Weber, 1992, p.331).
[28] Similar to the independence axiom in the VNM framework, which is criticized by the Allais Paradox, Savage's axiomatization has also induced a specific 'paradox' - Ellsberg (1954) - which is usually understood as contracting the existence of subjective probabilities and constitutes the starting point of another generalization trend.
[29] However, Juniper (2007, p.8) points out that Dequech ignores fuzzy measure of fuzzy set theory. The further mathematical equivalence between each of these formalisms—sub-additive capacities in association with Choquet integration; fuzzy-measure theory; or sub-optimal control using multiple-priors and minimax algorithms, has been rigorously demonstrated by Schmeidler (1989), Gilboa and Schmeilder (1989), and Mirofushi and Sugeno (1989).
[30] In this game-theoretic approach to decision making, nature is assumed to choose the worse case distribution, i.e. one that maximizes the agent's penalty function, from within the feasible set of distributions, in full knowledge of the agent's control law. In response, the agent must choose from amongst the available control settings a vector that minimizes the penalty function, given the worse case distribution selected by nature. This yields the "minimax" solution to the game (Juniper, 2007. p.8).
[31] This explains the paradox, in Ellsberg's experiments people prefer more reliable information.

because within a multiple-priors setting, ambiguity aversion arises when agent's relevant probabilistic beliefs are given by a set of probability measures rather than a singleton distribution. To characterize the optimal rules in this context the researcher must therefore apply an intertemporal max-min expected utility approach. These rules are assumed to have been designed to protect the agent against unfavourable probabilistic structures in the financial environment[32] (Juniper, 2001b).

2.2.3.2.2 Sub-Additive Probability

The non-additive prior approach is axiomatically developed again by Schmeidler (1989) and Gilboa (1987) to retain the commitment to point probabilities, which has been criticized by Runde (1995, p.349), and it replaces the Bayesian prior with a non-additive measure or capacity. Based on axiomatic derivations of non-additive probability, primarily of capacity provided by Schmeidler (1982, 1984 1989), these new axiomatizations can be viewed as modifications of Savage's sure thing principle in which the probability-related axioms (particularly, the independence axiom) are suitably weakened (Comonotonic independence) (Davis, Hands and Maki, 1998). The condition of comonotonic independence is posited between the independence axiom and Gilboa and Schmeidler's (1989) weaker "smoothing" condition of certainty independence. A non-additive measure may exhibit uncertainty (ambiguity) aversion (Schmeidler, 1989, p.574). In other words, relating the non-additive measures approach to the idea of working with convex sets of probability measures, Schmeidler (1982, 1986) states that the minimum expected utility may be represented by a Choquet integral of a convex, i.e. sub-additive capacity. The degree of sub-additivity may be taken to represent one's faith in the probability assessments (Karni and Schmeidler, 1991, p.1803; Camerer and Weber, 1992, p.348).

[32] Marinacci (1999) outlines a set of behavioural considerations that might motivate an approach to decision-making predicated on uncertainty aversion, while in Epstein and Schneider (2001) an axiomatic basis for uncertainty aversion has been constructed deploying a discrete-time, multiple-priori, recursive utility framework. The debate between Epstein and Schneider (2001) and Hansen (2001) is over the precise nature of the relationship holding between risk-sensitive penalty functions and multiple-priori forms of generalized utility. Grant and Quiggin (2002) showed how Epstein's (2001) definition of ambiguous events can be used to define ambiguity aversion over preference (Juniper, 2002).

Gilboa and Schmeidler (1989) have established the mathematical equivalence between these two capacity[33]-based representations of uncertainty aversion: the first of these entailing the use of sub-additive probabilities, and the second, involving minimax optimization within a *multiple-prior* setting (Basili, 2000, p.6).

In both cases—sub-additive probability and multiple-priors, first, the preference relation $\underline{\varphi}$ satisfies the Archimedean, comonotonic independence (in the case of multiple-priors, it is *certainty independence*—a weakening of the comonotonic independence condition), monotonicity, and non-degeneracy axioms; second, there exists a utility u: X→R, unique up to a positive linear transformation and a convex compact subset, say K, of additive probability measures on subsets of S, such that a→ $\int_S (\Sigma_{x\epsilon X}\, a(s)(x)u(x))d\pi(s)$ represents $\underline{\varphi}$ on A_f (in the case of multiple-priors, a→ $\min\{\int_S u(a(s))dp(s) | p \in K\}$ represents $\underline{\varphi}$ on A_f).

Moreover, under a multiple priors approach, there are two aspects of decision making under uncertainty: the sensitivity to ambiguity captured by the agent's penalty function; and the dimension of the stochastic uncertainty constraint which determines the magnitude of the set of feasible distributions. In the case of sub-additivity, these two aspects are subsumed by the parameters of the distortion function which is applied to the (de)cumulative distribution of events under a mathematical technique referred to as Choquet integration. Essentially, distortion functions place more weight on the tails of the cumulative distributive, giving increased emphasis to events which convert impossibility into possibility or likelihood into uncertainty rather than events which are more likely to occur (Juniper, 2007).

Schumpeterian creative destruction plays an important role in the defence of the more radical notion of uncertainty of Post Keynesians such as Davidson (1991), Dow (1995, p.55), and Lavoie (1992, p.44). The connection between innovations and a more radical type of uncertainty also appears in the Neo-Schumpeterian literature (Freeman, 1982, p.149-50; Dosi and Egidi, 1991, p.148), as well as in some strands of Austrian

[33] A "capacity" usually refers to a set function which satisfies $\varphi(\Delta)=0$, $\varphi(\Omega)=1$, and is monotonic with respect to set-theoretic inclusion. The other concepts satisfy this basic requirement as well as further (" super-additivity ") conditions, such as: $\varphi(A)+\varphi(B)\geq\varphi(A\cup B)+\varphi(A\cap B)$ (Davis, Hands and Maki, 1997).

and New Institutional economics (Langlois, 1994). Therefore, Kregel (1990, p.90) points out there is an endogenous pressure for something that causes uncertainty.

Motivated by the desire to explain the finding that decision-makers routinely violate the independence axiom, this variety of departures from the constraints of expected utility theory entails replacing the linear system of weighting expected utilities of each outcome in a lottery by their respective probabilities with a non-linear weighting system derived from a cumulative distribution (Juniper, 2001b).

2.2.3.3 Cumulative Prospect Theory

As previous discussed, Dequech contends that both the multiple-priors and sub-additive probability approaches adopted by those seeking to generalize expected utility theory conform to the notion of ambiguity, In contrast, for fundamental uncertainty, Dequech (2000, p.48) argued the key quality of situations of fundamental uncertainty is that some of the information relevant for decision-making purpose "… cannot be known, not even in principle" at the time of making the decision. In such cases, even through the agents might construct a subjective probability distribution for use in making decisions, they should openly acknowledge all possible events.

EU's very conceptual apparatus carries limitations, particularly regarding the notion of the state of the world, which is defined as independent of action. Dequech (2000, p.49) following Camerer and Weber (1992, p.339) argued that proponents of EU theory preclude any possible consideration of fundamental uncertainty because people's acts, whether intended or unintended, cannot create a new state of world. This implies that while EU theory under ambiguity can certainly accommodate cases such as the one constructed by Ellsberg, it cannot deal with situations of fundamental uncertainty. Dequech further stressed that situations of fundamental uncertainty do not necessarily imply complete ignorance, and "the ordinal degree of uncertainty regarding the result of a decision may vary over time" (2000, p. 49). Moreover, while informational asymmetry may apply to existing information it obviously cannot apply to information that can never come into existence (p.50).

Retuning to views expressed by Keynes in the *Treatise on Probability*, Dequech (2000, p.50) argues of *Keynesian Uncertainty* [34], which is interpreted as fundamental uncertainty, that it "may be sufficient to indicate that one is not referring to risk in an objectivist approach or to uncertainty in standard SEU theory".

Cumulative prospect theory (CPT) has nowadays become the most prominent alternative to expected utility (EU). It is widely used in empirical research and various axiomatic characterizations of CPT have been proposed (Luce 1991, Luce and Fishburn 1991, Tversky and Kahneman 1992, Wakker and Tversky 1993, Chateauneuf and Wakker 1999, Schmidt 2001, and Schmidt and Zank 2001). The paradoxes of Allais (1953) and Ellsberg (1961) are resolved under CPT, as well as the coexistence of gambling and insurance (Friedman and Savage 1948). The equity premium puzzle (Mehra and Prescott 1985), the overtime premium puzzle (Dunn 1996), the status quo bias (Samuelson and Zeckhauser 1988), and the endowment effect (Thaler, 1980) can all be accommodated under CPT[35].

It was argued that the approach under cumulative prospect theory (CPT) adopted by Tversky and Wakker (1995) is a way of gaining an intuitive understanding of uncertainty aversion through examining a version of non-expected utility that can easily be extended to accommodate uncertainty, although other axiomatic approaches are no doubt feasible, Tversky and Wakker's approach is convenient in so far as it highlights the attributes of CPT under both uncertainty and risk[36] (Juniper, 2001b).

In his 1987 paper, Machina shows that various forms of non-expected utility theory can be differentiated according to their respective value and weighting functions (pp. 132-3). Compared to the weighting functions in EUT which is simply the relevant probability associated with each state of nature, the weighting function under CPT is in a more complex form. Tversky and Wakker (1995) examine the properties of the weighting function used in CPT and argue that this particular function satisfies

[34] Indeed, Keynes (1973a, p.82) discussed in the *Treatise* a case very similar to the one of Ellsberg's (1961) urn problem.
[35] Another popular alternative to expected utility is the rank-dependent utility (RDU) model of Quiggin (1981). RDU generalizes EU by introducing a weighting function which transforms cumulative probabilities.
[36] Particularly, Tversky and Wakker (1995, p. 1269) show how the notion of sub-additivity can be used to compare two different weighting functions.

bounded subadditivity[37] (SA). Machina (1987, pp. 132-6) identified one of the variety of CPT weighting function as departing from linearity in probabilities, which implies two situations: first, individuals are risk-seeking for gains and risk averse for losses of low probability; second, they are risk averse for gains and risk seeking for losses of high probability. In the application of CPT under uncertainty, Tversky and Wakker (1995, p. 1264) propose a definition of subadditivity under uncertainty that they assume the existence of lower and upper boundary events which implies *lower* sub-additivity and *upper* sub-additivity respectively. They also show how the notion of sub-additivity can be used to compare two different weighting functions[38]. Tversky and Wakker (1995, p.1267) also introduce the notion of a sub-additive transformation[39] to establish a definition of *more sub-additive than*. They examine the sub-additivity of two or more weighting functions.

Although CPT is regarded as prominent alternatives to EU, and contributes to the understanding of uncertainty aversion and consequently accommodating uncertainty; in terms of fundamental uncertainty, Juniper (2001b, p.99) emphasises that certain characteristics that Dequech terms fundamental uncertainty as above can be accommodated through the use of techniques of robust and risk-sensitive control under stochastic uncertainty constraints[40]. Moreover, the imposition of a relative entropy constraint in risk-sensitive control theory implies that the actual conditional joint distribution function could depart fundamentally from the chosen reference model (i.e. Gaussian or Hidden-Markov): and in ways that to a large extent remain unknown, if not unknowable (at least for the duration of the modelling horizon). All that is required is that the spectral energies of these processes, in so far as they deviate from the reference model, fall within the pre-specified relative entropy bounds.

[37] According to Tversky and Wakker (1995, p. 1260): bounded subadditivity obtains if there exists boundary constants $\varepsilon \geq 0$, $\acute{\varepsilon} \geq 0$, so $w(q) \geq w9p+q)-w(p)$ whenever $p+q \leq 1-\varepsilon$, and $1-w(1-q) \geq w(p+q)-w(p)$ whenever $p \geq \acute{\varepsilon}$. The first of these conditions-upper sub-additivity-implies that a shift in probability has more impact when it makes an event certain than when it makes an event more probable. The second of these conditions—lower subadditivity implies that a shift is probability has more impact when it makes an event possible than when it merely increases the probability of an event.

[38] For such a comparison, one of the functions must be a strictly increasing transform of the other and must meet certain conditions relating to event unions and boundary events (Juniper, 2001).

[39] A transformation $\underline{\varphi}$: [0, 1] → [0, 1] is sub-assistivity (SA) if it has the same mathematical properties as a SA weighting function.

[40] This includes cases where the relevant stochastic processes are non-ergodic. For example, when the matrix of transition probabilities in a hidden-Markov model is irreducible, after departing from a given state of nature or regime, and once sufficient time has passed, there is no guarantee that a particular trajectory will ever return to that initial state of nature or regime.

Implicitly, the presumption is that these pre-imposed bounds do not diminish over time, either through the operation of some learning mechanism, the acquisition of new information, or some surreptitious, evolutionary process of market selection. Thus, at least in a narrowly conceived sense, the entropy constraint can be envisaged as representing our relative ignorance about the relevant states of nature that pertain to the control problem under consideration. Juniper (p.100) further argued, in a broad sense, the application of stochastic uncertainty constraints governed by model uncertainty, observation error and external perturbation could potentially be alleviated if more complete knowledge was available.

Minsky, as a representative Post-Keynesian economist, offers a different interpretation of Keynes's Uncertainty that contrasts sharply with the view of orthodox Keynesian economists. To further understand Keynesian Uncertainty from the Post-Keynesian point of view, Minsky's interpretation is examined.

2.2.3.4 Minsky's Interpretation of Keynes' Uncertainty

Keynes argues that fluctuations in investment are the primary influence over the trade cycle—acting through the multiplier[41] to influence aggregate expenditure. In turn, these fluctuations are seen to arise from difficulties associated with decision-making in an uncertain economic environment (Juniper, 2005). On this point, Minsky (1975) affirms the importance of uncertainty in Keynes' vision of economic process (refer to p. 5 and footnote). Also, Keynes emphasises the general role of *conventions* as a method for making decisions in the face of uncertainty; accordingly, Minsky especially focuses on conventions relating to the financial positions of banks, inventors and consumers:

> …in a capitalist economy the aspect which is least bound by technology or by fundamental psychological properties, which is most clearly a convention or even a fashion, subject to moods of optimism and pessimism and responsive to the visions of soothsayers, is the liability

[41] Chick (1983) and Vercelli (1999) have emphasized the dynamic rather than the static nature of the multiplier. This dynamic perspective interprets the multiplier as a disequilibrium propagation mechanism.

> structure of both operating and financial organizations (1975, p.128).

Minsky (1975) further suggested a formal way of unpacking Keynes's arguments about the influence of uncertainty over investment:

> Since investment fluctuates, and since one of the basic ingredients in the analysis of investment—the supply schedule of investment goods—is a stable function, the observed fluctuations must be due to variations in (1) some combination of the prospective yields, as determined by both the production of income and views about the future; (2) the interest rate as determined in financial markets, or (3) the linkage between capitalisation factor for prospective yields on real-capital assets and the interest rate in money loans. The linkage reflects the uncertainty felt by entrepreneurs, households and bankers. In fact, Keynes uses all three of these to explain the fluctuations of investment (p.95-6).

In Minsky's 1975 book, both Keynesian uncertainty and liquidity preference featured notably in relation to financial markets. Keynesian uncertainty is interpreted as explaining the sensitivity of fluctuations in borrowers' and lenders' risk[42] to changes in the degree of diversification of investment activity and the reliance on external, relative to internal, sources of finance. It explains why the demand price of capital curve [43] rotates in a clockwise direction reflecting a decline in the "certainty

[42] Generally speaking, borrower risk is the likelihood that a borrower will be unable to repay the loan on time which is based on the borrower's financial condition, industry segment and conditions within that industry, economic variables, and intangibles like company management. Conversely, lender's risk is normally the default risk in terms of decreasing collateral value and thus quality. Minsky (1986, p.xv) borrows from Keynes the "lender's and borrower's risk often attributed to Michael Kalecki (actually also derived from Keynes) to identify a "two price system" where one price is for current output and the other is for assets. He argues if external (borrowed) funds are involved, then the supply price of capital also includes explicit finance costs—most importantly the interest rate but also all other fees and costs—that is, supply price increases due to "lender's risk".

[43] It converts the capitalization ratio into the demand price per unit of capital. Capital ratio is also called the financial leverage ratio - it compares the debt to total capitalization - and thus reflects the extent to which a corporation is trading on its equity.

equivalent" of each unit of capital's cash inflows per period[44]. At the same time, this down-grading of the certainty equivalent would also change the point at which external finance had to be sought and, thus, the point where borrowers' risk begins to be imposed as a margin on the demand price of capital. The liquidity preference in Minsky's view explains why the capitalization ratio schedule shifts to some extent independently of, and more severely, than the rate of interest on fixed income securities[45] (Juniper, 2005).

In Minsky's later work on the *Financial Instability Hypothesis* (to be discussed in more detail in section 2.4.2.3 of this chapter) notions of uncertainty and liquidity preference remain ubiquitous[46]. However, this analysis merely elaborates on matters that, in his earlier publication, were primarily discussed in terms of increasing diversification risk for providers of finance to firms and the adverse consequences of an increased reliance by firms upon external finance rather than on retained earnings. Juniper (2005, p.4) argues that this concern about diversification risk is influenced more by fundamental uncertainty than by liquidity preference *per se*.

This summary of the financial literature pertaining to risk and uncertainty has traced the identification and separation of the concepts from Knight through Keynes to orthodox Keynesian economists and onto Post-Keynesian economists. In the course of the discussion, attention has focused on Keynes' criticism of "Classical" economists and the short comings of expected utility theory.

The next section opens with discussion of the Efficient Market Hypothesis and Rational Expectations and devotes attention to the perspectives of various schools of thought - Keynesian, Post-Keynesian, Monetarist, New Classical and New Keynesian – on these propositions.

2.3 Efficient Market Hypothesis

The hypothesis of efficient markets is another important strand of work in finance utilised in the empirical analysis of asset prices. One disturbing finding has emerged

[44] When multiplied by the capitalization ratio, determines the per unit demand price of capital.
[45] For example, capture the influence of increase in the required return to equity over the user cost of capital.
[46] He explained why interest rates may begin to raise independent of any interventions on the part of monetary authorities in response to increasing financial instability, as households, banks and firms move out of Hedge into more Speculative and even Ponzi financial positions.

from analysis and that is that asset prices tend to follow a random walk. Other work by Holbrook Working (1934), Alfred Cowles (1933, 1937) and Maurice Kendall (1953) suggested that there was no correlation between successive price changes on asset markets. Later, Clive Granger and Morgenstern (1963) and Fama (1965, 1970) using high-powered time series analysis came up with the same randomness result. According to these issues, the "Efficient Market Hypothesis" (EMH) posited by Samuelson (1965) and Mandelbrot (1966)[47] is a breakthrough. It assumes that if markets are working properly, then all public and, in some versions, private information regarding an asset will be channelled immediately into its price. If price changes seem random and are thus unable to be forecast, it is because investors are doing their jobs—all arbitrage opportunities have already been exploited to the extent to which they can be.

The Efficient Market Hypothesis was made famous by Fama (1970) [48] when he defined it as a market which 'adjusts rapidly to new information' (Fama, 1969, p.2), and later connected it to the *Rational Expectation Hypothesis*. Fama (1970) made a distinction between three forms of EMH: the weak form; the semi-strong form which has formed the basis for most empirical research[49]; and the strong form. This hypothesis, although being criticized later, motivated studies on looking at the possibility of forecasting based on variables such as dividend yield (Fama and French, 1988); P/E ratios (Campbell and Schiller, 1988); and term structure variables (Harvey, 1991)[50] . It soon became clear, however, that while rapid adjustment to new information is an important element of an efficient market, it is not the only one. A more modern definition is that asset prices in an efficient market 'fully reflect all available information' (Fama 1991).

[47] In 1965, Fama defined an "efficient" market for the first time, in his landmark empirical analysis of stock market prices that concluded that they follow a random walk. Samuelson provided the first formal economic argument for "efficient markets". He focussed on the concept of a martingale, rather than a random walk, as in Fama (1965). In 1966, Mandelbrot proved some of the first theorems showing how, in competitive markets with rational risk-neutral investors, returns are unpredictable—security values and prices follow a martingale.

[48] The efficient-market hypothesis (EMH) is attributed to Eugene Fama (1960) but in 1990 it was acknowledged that Bachelier first expressed it.

[49] Recent research has expanded the tests of market efficiency to include the weak form of EMH.

[50] EMH also stimulated a plethora of studies on such variables as *earnings* (Ball and Brown, 1968); *stock splits* (Fama, Fisher, Jensen, and Roll, 1969); *capital expenditure* (McConnell and Muscarella, 1985); divestitures (Klein, 1986); and *takeovers* (Jensen and Ruback, 1983).

However, “technical” traders or “chartists”, who believed they could forecast asset prices by examining the patterns of price movements, were confounded by the EMH assertion that told them that they could not beat the market because any available information would already be incorporated in the price. Furthermore, Robert Shiller (1981) criticized the EMH on the grounds that, not withstanding that it is probably one of the more resilient empirical propositions around, it lacked a clear sound theoretical standing. It implies that if investors are fully rational in terms of full information reflected in prices, then everyone can profit and thus the existence of trading should be doubted. Grossman and Stiglitz (1980) and Milgrom and Stokey (1982) discussed this peculiar and contradictory implication of rational expectations under the Efficient Market Hypothesis.

2.3.1 Rational Expectation

Rational Expectations Theory is the basis for the Efficient Market Hypothesis and is also a key assumption in many contemporary macroeconomic models (particularly mainstream), and is influential in other areas of contemporary economics and game theory. It assumes that agents’ expectations are correct on average and will not be systematically biased through using all relevant information, although the future is uncertain and not fully predictable. Rational Expectation was initially proposed by Muth (1961), and became influential under Lucas (1972) and Sargent (1973).

It supposes that P is the equilibrium price in a simple market, determined by supply and demand, and actual price will only deviate from the expectation if there is an 'information shock' caused by information unforeseeable at the time expectations were formed. In other words *ex ante* the actual price is equal to its rational expectation:

$$P = P^* + e$$

$$E(P) = P^*$$

Where P^* is the rational expectation and e is the random error term, which has an expected value of zero, and is independent of P^*.

Following on from Muth’s article, Lucas’ development of *rational expectation* (1972) contains two main components. First, he began with the old assumption that

recessions are self-correcting, which implies government should do nothing but wait the correction out. Second, he asserts that government intervention can only range from ineffectualness to harm. Sargent and Wallance (1975) developed the Policy Ineffectiveness Proposition. Mishkin (1983, p.157) contends that, on balance, the results justify using the assumption of rational expectations in empirical work, especially when financial markets are studied. The results for these specialized markets are very robust but there is much truth in the argument that just because the hypothesis holds true in these markets, it does not prove that it is the ideal way of forming expectations across the economy. No major favourable insights of rational expectations in other markets have abounded, which at least points to the hypothesis not being technically strong.

This hypothesis is often criticized as an unrealistic model of how expectations are formed. Particularly, the followers of the Austrian School and Keynes himself (1973a. b) pointed out that given fundamental uncertainty, the future cannot be predicted, so that no expectations can be truly "rational".

2.3.2 Different Perspectives on Efficient Market Hypothesis

As outlined earlier, Rational Expectations and the Efficient Market Hypothesis are foundational assumptions for most mainstream theorists and their macroeconomic models. Friedman, as pioneer of Monetarism, believes the financial market is efficient[51] and, contrary to the debate with Keynesians and Post Keynesians, that the demand for money function is stable. After Friedman's famous 1959 work, monetarists have tried to empirically establish the stability of the demand for money function or the income velocity of money. Interest inelasticity, exogenity of real rates of return on assets, and financial *rational expectations* have been employed to justify the stability of monetary velocity. Friedman argues that laissez-faire government policy is more desirable than government intervention in the economy. Governments should aim for a neutral monetary policy oriented toward long-run economic growth, by gradual expansion of the money supply. He advocates the quantity theory of money, in which general prices are determined by money. Therefore active monetary (e.g. easy credit) or fiscal (e.g. tax and spend) policy can have unintended negative effects.

[51] Friedman thinks the financial market is efficient, but not perfect.

Furthermore, the Chicago School rejected Keynesianism in favour of monetarism until the 1980s, when it turned to rational expectations and has since affected the field of finance by the development of the efficient market hypothesis. This school is associated with neoclassical price theory and libertarianism, and with the view that regulation and other government intervention is always inefficient compared to a free market[52].

New Classical macroeconomics engages with the imperfect information argument and takes as a basis the assumption of *Rational Expectation*. Stiglitz's (with J.K. Kindahl, 1970) contributions connect finance more closely with economic theory by explaining the demand for financial assets as a utility maximization problem (as discussed before) whose ultimate goal is the optimal choice of consumption. He paved the way to Lucas's (1978) *tree model* and Breeden's (1979) *consumption capital asset pricing model* (CCAPM)[53]. Lucas defined the very powerful concept of *rational expectations* as:

$p(\cdot) = p^s(\cdot)$ and $F(d_{t+1} | d_t) = F^s(d_{t+1} | d_t)$. [54]This model is the result of the combination of Arrow-Debreu-Radner general equilibrium theory [55] and von Neumann-Morgenstern expected utility theory. Expected utility theory gives much more structure to the behaviour of people with respect to risk taking, and thus allows for a theory with more concrete predictions about equilibrium asset prices.

Like the New Classical approach, New Keynesian macroeconomic analysis usually assumes that households and firms have *rational expectations*. But the two schools differ in that New Keynesian analysis usually assumes a variety of market failures. In particular, New Keynesians assume prices and wages are "sticky", which means they do not adjust instantaneously to changes in economic conditions. Wage and price stickiness, and the other market failures present in New Keynesian models, imply that the economy may fail to attain full employment. Therefore, New Keynesians argue that macroeconomic stabilization by the government (i.e. fiscal policy) or by the central bank (i.e. monetary policy) can lead to a more efficient macroeconomic

[52] In terms of methodology the stress is on "positive economics" – that is, empirically based studies using statistics to prove theory.
[53] It is a general equilibrium model that is simplified and specialized in exactly the way that financial economists have found useful.
[54] Lucas proves that this defines a *unique* and constant pricing function.
[55] The first welfare theorem of general equilibrium theory allows us to transform the general version of the model into a much simpler one-good, one-agent economy.

outcome than a laissez faire policy would. However, New Keynesian economics is less optimistic about the benefits of activist policies than traditional Keynesian economics was.

The Efficient Market Hypothesis which is built on the assumption of investor rationality represents the opposite view from Keynes. In contrast, Keynes pictures market as a "casino" guided by the "animal spirit" of entrepreneurs motivated by short-run speculative consideration[56]. Keynes (1964) wrote in The General Theory:

> For most of these persons are, in fact, largely concerned, not with making superior long-term forecast of the probable yield of an investment over its whole life, but with foreseeing changes in the conventional basis of valuation a short time ahead of the general public. They are concerned, not with what an investment is worth to a man who buy it "for keeps", but with what the market will value it at, under the influence of mass psychology, three months or a year hence" (pp. 154-5).

In the EMH, investors have a long-term perspective and return on investment is determined by a rational calculation based on changes in the long-run income flows. After comparing the views of Keynes, Tobin and Minsky, Crotty (1990) contends that shareholders are increasingly concerned with short-term gains and thus have very short-term planning horizons as Keynes believed, which slow the flows of EMH. Lawrance Lee Evans (2003, p.94) also argues that given fundamental uncertainty and adaptive expectations, the standard valuation model becomes the "conventional expectations" valuation model, and marrying the flow theory to Minsky's model of financial fragility becomes straightforward. These results conflict with the Rational Expectation Hypothesis (REH) and Efficient Market Hypothesis as well. In this sense, EMH fails to provide a realistic framework for the formation of (rational) expectations under uncertainty, particularly under fundamental uncertainty with non-

[56] It implies investors are not interested in assessing the present value of future dividends and holding an investment for a significant period, but rather in estimating the short-run price movements.

existent information for decision-making purpose, as discussed in the section on *Keynesian Uncertainty*.

Relative to Davidson's distinction between two economic paradigms—ergodic and non-ergodic reality, the efficient market hypothesis has its foundation in the ergodic axiom, which means that the expected value of an objective probability can be always estimated from observed data that provides reliable information about the conditional probability function that will govern future outcomes[57]. Therefore, Davidson (1998) argued market fundamentals are immutable in the sense that they cannot be changed by human actions and, according to the efficient market hypothesis, short-term speculation can interfere with the efficient capital allocation function of financial markets. Speculative volatility is explained by the existence of "noise traders". Otherwise, the observed secular trend of financial markets is determined by immutable real sector fundamentals, which means that in the long-run irrational traders are made extinct by an efficient market. Further, acknowledging the criticism of rational expectations, Davidson (1998) pointed out that economic agents in financial markets have heterogeneous expectations, one can never expect whatever data set exists today to provide a reliable guide to future outcomes. In this sense, expectations that drive spot financial market prices are not rational, because the conventional valuation based on psychological forecasting of the market cannot be statistically reliable. Therefore, financial markets cannot be presumed to be efficient in the sense stated by efficient market theory.

In a market consisting of human beings, the notion of the efficient market hypothesis is therefore criticized from a psychological perspective. Based on the assumption of human rationality, (see discussion in Section 2.2.3.2 on Briefly Review of Utility theory) and according to the works by Kahneman and Tversky (1986) (also Rabin and Thaler, 2001), cognitive heuristics has found that assigning probabilities to uncertain outcomes in decision-making causes individual decision biases. Even the proponents of EMH such as Fama and French (1995) maintain the correctness of this notion, and La Porta, Lakonishok, Shliefer and Vishny (1997) argue that the prediction of (i.e. stock) returns reflects psychological factors, social movements, noise trading, and

[57] In this system, the decision-makers believe that an immutable real objective probability distribution governs both current and future market outcomes.

fashions (or conventions) of irrational investors in a speculative market. All of this raises the question as to whether the predictability of returns represents rational variations in expected returns in terms of irrational speculative deviations from the theoretical values. Although the transition from micro behaviour to macro behaviour is considered still not well established, Pratt, Wise and Zeckhauser (1979) demonstrated the failure of the market to correct individual biases.

The above review of literature on the Efficient Market Hypothesis and Rational Expectations, particularly the criticism of these two hypotheses both from orthodox and heterodox perspectives, lays the ground, in the next section, for the literature review and discussion of Financial Instability and Financial Crises, the latter being the most destructive form of financial instability.

2.4 Financial Instability and Crisis

Uncertainty, employing Knight's (1921) definition, pertains to future events that are not susceptible to being reduced to objective probabilities, while uncertainty also provides opportunities for profits in a competitive market. Due to the inter-temporal nature of economic and financial decisions and existence of an unknown future, uncertainty threatens financial stability, when a shock exposes the "certain level of uncertainty" incorporated into pre-shock inter-temporal decisions as insufficient. The introduction of an unstable period depends on a number of factors: the differential between the incorporated level of uncertainty ex ante and ex post; the effect of the uncertainty differential on confidence and sentiment; the resilience of markets and institutions to the unwinding of previous positions and the adoption of new positions.

2.4.1 Financial Crisis

For Davis (1999: p.2) "financial crisis is seen […] as a major and contagious collapse of the financial system, entailing inability to provide payment services or to allocate funds for investment; realization of systematic risk". The above quote defines financial crisis as the most destructive form of financial instability.

2.4.1.1 Noise Traders

A widely used approach to explain financial crises has been to scrutinise the different views of agents, to accept that they are heterogeneous in many ways, including that some may have rational expectations while others do not. Baumol (1957) and Zeeman (1974) emphasize a conflict between "fundamentalists"[58] and "chartists"[59]. However, this view fell out of favour after Tirole (1982) rejected this approach and undertook a revolution of rational expectations. Then, Black (1986) posited the existence of "noise" traders[60], arguing that "noise' traders could at times destabilize markets and create bubbles depending on the strategies they used, much like the chartists of old models. Day and Huang (1990) followed this with a model that added market makers to this setup and showed the possibility of a wide variety of dynamic paths for asset prices, including dynamically chaotic ones.

2.4.1.2 Nonlinear Dynamic of Economic Bubbles

Impetus for a nonlinear approach to explaining economic bubbles increased after Delong (1991) demonstrated that such "noise" traders could not only survive but even thrive in markets that also contained traders with rational expectations[61]. In Day and Huang (1990), Chiarella (1992) and Farmer and Joshi (2002) heterogeneous traders rely on nonlinear trading rules to determine their orders. Frankel and Froot (1986), Calsamiglia and Kirman (1991), Brock and Hommes (1998) and Lux and Marchesi (1999) derive nonlinearities by the traders´ switching between technical and fundamental forecast rules. Recent empirical studies (Sarantis and Karamouzis, 1999; Taylor and Peel 2000; Taylor, 2001; and Chortareas, 2002) reveal evidence of nonlinear mean reversion in foreign exchange markets[62]. In particular, Sarantis and Karamouzis (1999), and Taylor (2001) presume that agent heterogeneity may be a cause for nonlinear mean reversion in the price process.

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[58] They stabilize the market by buying when the asset price is below the fundamental, and selling when the price is above the fundamental.
[59] They tend to chase trends in the price dynamic and thus destabilize the market, creating excess volatility, if not necessarily outright bubbles (Zeeman, 1974).
[60] "Noise" traders are argued to follow no particular strategy or rule, or to follow arbitrary ones, and they interact with a group having rational expectations (Black, 1986).
[61] This overturns an old argument that such traders would lose money and be driven from the markets.
[62] The statistical findings are obtained by applying relatively new nonlinear methods such as the smooth transition autoregressive (STAR) family of models.

2.4.1.3 Bubbles

The conventional theoretical approach to the phenomenon of economic bubbles, in the financial economics literature, has been to identify it as a price of an asset staying away from the *fundamental value* of the asset for some extended period of time. Tirole (1982) demonstrated that speculative bubbles are impossible in a world of infinitely-lived, homogeneous, rational agents, trading positively valued assets in discrete time periods. It is easier to theoretically hypothesize the existence of *stationary bubbles* that can easily arise in overlapping generations models, even with homogenous agents possessing rational expectations[63] (Tirole, 1985). However, in practice, asset returns in many financial markets exhibit kurtosis and some non-Gaussian properties.

On the other hand, there are schools of thought that deny that a fundamental may be knowable at all due to *fundamental uncertainty* (such as Davidson, 1994 in the Post Keynesian school); or argue that searching for fundamentals is irrelevant because all that matters are short-term dynamics at high frequencies, which is the view of some developers of the econophysics approach (Bouchaud and Potters, 2003).

Since Tirole's proof, the literature has divided into two categories—*rational bubbles* and *irrational bubbles*. Each category exams how and in what ways bubbles might arise as various conditions are relaxed.

One famous model that allows for *rational bubbles* is Blanchard and Watson's (1982), stochastically crashing rational bubble. In this situation there is a bubble with prices rising, but as they rise, the possibility of a crash back to the fundamental also rises. In this sense, there is requirement for traders to earn a risk premium to buy the asset to cover for the rising possibility of a crash. This in turn suggests a bubble that must arise at an accelerating rate. [64]Some have used this method to predict the peaks of bubbles, but efforts to forecast peaks following this methodology did not work out (Lux, 2009).

[63] For example, Tirole (1985) argued the case for fiat monies with positive values whose fundamental values are presumably zero - such bubbles are essentially impossible to identify in practice. It is the exploding bubbles, or at least the sharply increasing ones, that are relevant here.
[64] In practice not all bubble are observed like that.

Other theorists posit that bubbles are inherently totally *irrational*, with agents, including even professional traders, falling into overly optimistic moods during speculative booms, to be followed by emotions of more negative and panicky sorts after a bubble peaks. Among these discussions, the most famous discussions are from Kindleberger [65] and Minsky. Kindleberger (1973, 1978) proposed a general economic theory concentrating on five different, yet relatively contemporaneous stages: *displacement, boom, overtrading, revulsion,* and *tranquillity*[66], to deal with the idea of an economic bubble (or as he termed it "mania"). He believed an economic bubble (or "mania") occurred when speculation about a commodity would cause a price to increase, thus producing even more uncertainty. The price of a good would then reach an absurd level. Kindleberger's "bubble (or "mania") theory" became popular in the years when most economists were mesmerized by the efficient-markets theory, ruling out the possibility of economic bubbles. The theory acknowledged past bubbles, yet explained them as being caused by fraud-prone markets, arguing that they were unlikely to occur in well regulated modern settings.

Championed by Kindleberger (1973, 1978), Minsky (1975, 1982a, 1982b, 1986) has proposed a simplified explanation—the Financial Instability Hypothesis (FIH) that is most applicable to a closed economy. He theorized that financial fragility is a typical feature of any capitalist economy. To facilitate his analysis, Minsky defines three types of financing: hedge finance; speculative finance; and Ponzi finance, which finance firms choose according to their tolerance of risk. The detailed discussion of Minsky's FIH can be found in the following section but for now note the strong influence that the work of Kindleberger and Minsky has exerted on the literature. For example, Shiller (2005) strongly advocates this viewpoint and presents the data and arguments to support it in detail. Palma (1998) and Kregel (1998) also undertook the

[65] Kindleberger generalized this argument through his works: *The World in Depression* (1973) and *Mania, Panics, and Crashes: A History of Financial Crisis* (1978).

[66] *Displacement* occured when economic stability encouraged financial innovations that 'stretched liquidity', this plus competition urged financial institutions to increase leverage ratios, increasing credit availability. With easy credit, asset prices could be bid up, and rising prices encouraged yet more innovation and competition to further increase leverage. Then the modern capitalist economy goes towards an unconstrained speculative *boom*. The situation of *overtrading* occurs as markets provide a fresh supply of 'greater fools', euphoria develops and warnings of those crying 'bubble' are ridiculed. The situation is thus followed by the occurrence of *Revulsion* where all expectations are negative. After a long period of panic, Kindleberger says there is *tranquillity* which implies no significant change in market conditions.

analysis of the Asian crisis to present a compatible viewpoint on bubbles with that of the Kindleberger—Minsky model.

Undoubtedly, a financial crisis is destructive to the health of the financial system and the economy as a whole. There is a vast amount of both theoretical and technical literature on uncertainty, risk and financial crisis, that aims to explore the source and nature of financial instability in capitalism either from orthodox or heterodox, such as Post-Keynesian, perspectives. These competing financial instability theories mainly fall into three strands, being the Mishkin's Asymmetric Information Approach to Financial Instability; Friedman—Schwartz's Monetarist Approach to Financial Instability; and Minsky's *Financial Instability Hypothesis* (FIH). The following section reviews these three approaches from their distinct explanations on the source and nature of financial instability. Subsequently, the different policy propositions, based on their distinct views, are discussed from the researcher's point of view.

2.4.2 Financial Instability

The economic literature distinguishes between financial stability, instability and fragility. However, there are no universally accepted definitions of these terms.

According to Andrew Crockett (1997), financial stability generally refers to the "normal" functioning of the key institutions and markets in a financial system. In other words, this stability first requires that key industries within the financial system are stable, which means they can continue to meet their obligations with a high degree of confidence. Second, key markets are required to be stable without any change in fundamentals. Stability in financial institutions means the absence of stresses that have the potential to cause measurable economic loss beyond a strictly limited group of customers and counterparties. The financial distress of a small institution or the occurrence of substantial losses at a large institution, are generally not considered a threat to the stability of the financial system. Rather, a more appropriate label is idiosyncratic crisis. That is, the illiquidity or insolvency of a financial institution is due to the specific circumstances of the distressed institution. Such idiosyncratic instability of financial institutions is usually the result of inadequate risk management, fraud, or a "run" by depositors.

Crockett (1997) suggests that instability in the financial system occurs due to the absence of stability in these key industries or markets within the financial system. However, it is a controversial point as to whether the financial distress of a large institution, particularly, a bank, warrants the label idiosyncratic instability or financial instability. Banks are generally considered to be 'key institutions' as their intermediation role in the saving-investment process witnesses. Both households and companies rely on the provision of credit either for their purchases or investment purposes which is offered from the savings banks. In detail, there are two reasons usually given to explain why banks warrant special treatment in the preservation of financial stability:

1. Banks' liabilities are repayable at par on demand, while their assets are typically comparatively illiquid, that is not readily marketable and convertible into cash. This makes them more liable to runs that cause illiquidity and even insolvency. Illiquidity generally refers to the inability to transact in financial claims at full market value. For a borrower, illiquidity is the inability to obtain sufficient funds to service current obligations. Insolvency is a balance sheet state where liabilities exceed assets.

2. Banks remain responsible for the operation of the payments system. This means that difficulties at one institution are transmitted, semi-automatically, to the rest of the financial system, with the risk, at the extreme, that the payments system could seize up (systemic risk).

Thus, instability in the banking system has a greater capacity to generate systemic contagion than difficulties elsewhere in the financial sector. However, the distinctions are becoming more blurred, with problems at key non-bank institutions having growing potential for significant spillover consequences.

Similarly, stability in financial markets means the absence of price movements that cause widespread economic damage. Prices can and should move to reflect changes in economic fundamentals. And the prices of assets can often move quite abruptly when something happens to cause a reassessment of the future stream of income associated with the asset, or the price at which this income stream should be discounted. It is

only when processes in financial markets move by amounts that are much greater than can be accounted for by fundamentals and do so in a way that has damaging economic consequences, that one is justified in talking about instability or crisis in the financial system.

However, in the economic literature, there are competing theoretical explanations for financial instability, with each identifying a different root cause of financial instability. The next section turns to the discussion of the three representative views mentioned earlier.

2.4.2.1 Asymmetric Information Approach

One approach has the root cause of financial instability arising from a breakdown of information flows, which hinders the efficient functioning of financial markets and causes the market failure. This approach has its foundation in asymmetric information and agency cost theory, and is therefore called the asymmetric information approach.

The Asymmetric Information Approach as developed by Mishkin (1991, 1997) believes information asymmetry has the power to hinder the efficient functioning of financial systems in relation to their capacity to channel funds to those individuals or firms with productive investment opportunities. To be successful, participants in financial markets must be able to make accurate judgments about which investment opportunities are more or less creditworthy. Thus, a financial system must confront problems of asymmetric information, in which one party (normally the lenders) to a financial contract has much less accurate information than the other party (the borrowers).

Asymmetric information leads to two basic problems in the financial system: Adverse selection and Moral hazard. Adverse selection occurs before the financial transaction takes place, when agents who are potentially bad credit risks are the ones who are most actively seeking loans[67]. Thus, the lender must be concerned that the parties most likely to produce an undesirable or adverse outcome are also most likely to be selected as borrowers. Lenders will try to tackle the problem posed by asymmetric information by screening out bad from good credit risks, but this process is inevitably

[67] For example, risk lovers are likely to be the most eager to take out a loan, even at a high rate of interest, because they are less concerned with paying the loan back.

imperfect. Another problem—Moral hazard occurs after the transaction takes place, when a borrower has incentives to engage in risky activities that are undesirable from the lender's point of view because they decrease the likelihood that the loan will be paid back. Higher risk activities, if they pay off, produce high returns for the borrower, but if they fail, the lender bears most of the loss.

The asymmetric information problems described above provide a definition of what financial instability is by Mishkin (Mishkin and Herbertsson, 2006: 31):

> Financial instability occurs when there is a disruption to financial markets in which asymmetric information and hence adverse selection and moral hazard problems become much worse, so that financial markets are unable to channel funds efficiently to those with the most productive investment opportunities.

Adverse selection and the classic "lemons" problem, first described by Akerlof (1970), occurs in the debt market because lenders have trouble determining whether a borrower is a good risk[68] or , alternatively is a bad risk[69]. If the lender cannot distinguish between the borrowers of good quality and bad quality (the "lemons"), (s) he will only make the loan at an interest rate that reflects the average quality of the good and bad borrowers. It leads to higher-quality borrowers paying a higher interest rate than they should; while low-quality borrowers pay a lower interest rate than they should. One result of this "lemons" problem is that some high-quality borrowers may drop out of the market, with what would have been profitable investment projects not being undertaken. Consequently, there is hazard that the borrowers have incentives to engage in activities that are undesirable from the point of view of lenders—that is, activities that render loan repayment less likely. Moral hazard occurs in the performance phase of the financial contract, because a borrower has incentives to invest in projects with high risk in which the borrowers earn economic profit if the project succeeds, while the lender bears a disproportionate amount of the loss if projects fail. The conflict of interest between borrowers and lenders stemming from moral hazard (the agency problem) implies that many lender will decide that it is

[68] Good investment opportunities with low risk.
[69] Poorer investment projects with high risk.

more profitable to engage in credit rationing, so that lending and investment will be at suboptimal levels, as the demand for investment funds exceeds the supply of investment funds—a latent demand for investment funds exists (Mishkin, 1991).

The approach argues that the existence of asymmetric information and the adverse selection and moral hazard problems its presence generates, provides a framework for understanding how a disruption in financial markets can cause a contraction in aggregate economic activity.

2.4.2.1.1 Factors leading to Financial Instability

Given the primary role of asymmetric information, and the adverse selection and moral hazards symptomatic of asymmetric information, the approach postulates that there are four categories of factors that lead to financial instability: increase in the interest rate; increase in uncertainty; asset market effects on balance sheets; and problems in the banking sector. The four factors identified act to worsen adverse selection and moral hazard, enhancing the prospect for financial instability.

2.4.2.1.1.1 Increase in the Interest Rate

Increases in interest rates decrease the return on projects that succeed. Accordingly, the presence of higher interest rates induces firms to undertake projects with lower probabilities of success but higher payoffs when successful. Higher interest rates exacerbate the adverse selection problem as the average quality of borrowers declines. Dependent upon a lender's ability to discriminate between good and bad borrowers, the lender may decide to ration credit in the presence of excess demand for loanable funds, as a means to reduce the adverse selection effect. An increased incidence of credit rationing will lead to a significant decline in investment expenditure and aggregate economic activity (Mishkin, 1992).

In this context, the term credit rationing is reserved for circumstances in which either among loan applicants who appear to be identical some receive a loan and others do not, and the rejected applicants would not receive a loan even if they offered to pay a higher interest rate; or there are identifiable groups of individuals in the population who, with a given supply of credit, are unable to obtain loans at any interest rate, even though with a larger supply of credit, they would. This type of credit rationing is

called equilibrium quantity rationing (Akerlof 1970; Stiglitz and Weiss, 1988; Stiglitz, 1989).

2.4.2.1.1.2 Increase in Uncertainty

A dramatic increase in uncertainty, due perhaps to the failure of a prominent financial or non-financial institution, a recession, political instability, or a share market crash, may also cause financial instability, as it makes it more difficult for lenders to screen out good from bad credit risks. The increase in uncertainty makes information in financial markets even more asymmetric and may worsen the asymmetric information problem. The increased adverse selection effect acts to augment credit rationing leading to a significant decline in investment expenditure and aggregate economic activity (Mishkin, 1991, 2007a).

2.4.2.1.1.3 Asset Market Effects on Balance Sheets

Deterioration in the balance sheets of both non-financial and financial firms is argued to be the most critical factor for the severity of asymmetric information problems in the financial system. This factor is derived from the importance of collateral and net worth in limiting the degree of adverse selection and moral hazard (Mishkin, 1997).

The transfer of title over collateral and net worth acts to reduce the lender's loss and also agency costs if the borrower defaults on contractual payment commitments. In addition, non-financial firms with high net worth, who have existing borrowers, have less incentive to commit moral hazard, as the transfer of title over assets is substantial (Mishkin, 2007b). High net worth also reduces the likelihood of default because net assets can be liquidated to meet interest and principle payments. Hence, deterioration of balance sheets worsens both adverse selection and moral hazard problems in financial markets, increasing financial fragility and thus promoting financial instability. It is through the net worth channel that share market oscillation can amplify the adverse selection and moral hazard problems inherent in financial markets. With respect to the promotion of financial instability, a share market correction or crash, for example, can increase adverse selection and moral hazard problems in financial markets because it leads to a large decline in the market value of firms' net worth. Lender protection against adverse selection provided by high net worth evaporates (Mishkin, 2008). This scenario triggers costly monitoring by the lender, as

borrowers have increased incentives to engage in moral hazard as the transfer of title over assets in the event of liquidation is lessened.

In an economy that features debt contracts of long duration, an unanticipated decline in inflation leads to a decrease in the net worth of firms. This complementary element enhances the significance of the net worth channel. An unanticipated disinflation or deflation increases the value of firms' liabilities in real terms without an offsetting rise in the real value of firms' assets leading to an increase in adverse selection and moral hazard.

2.4.2.1.1.4 Problems in the Banking Sector

Problems in the banking sector constitute the fourth factor that leads to financial instability in the asymmetric information approach. The nature of commercial banking positions these financial intermediaries to engage in information-producing activities and capitalise on a comparative advantage in reducing moral hazard (Mishkin, 1997). The nature of commercial banking indicates why banks have such an important role in financial markets of channelling funds to entities with productive investment opportunities. Thus, a decline in the ability of banks to engage in financial intermediation and external loans for profitable investment projects, will lead to a contraction in investment expending and aggregate economic activity.

A decline in the ability of banks to engage in financial intermediation and extend loans for profitable investment projects occurs through deteriorating bank balance sheets (bank capital). This deterioration comes about through a number of avenues. First, the financial distress of a bank's borrowers due to the deterioration of non-financial firms' balance sheets through increases in interest rates, share market corrections, or unanticipated declines in inflation, may lead to an increase in the rate of debt delinquency and increasing impaired assets. Secondly, an increase in interest rates exacerbates the maturity mismatch between a bank's assets and liabilities. The degree of exacerbation is dependent upon the success of the bank's risk management strategy in predicting the change in interest rates, and reallocating assets between maturity buckets to maintain the desired degree of maturity mismatch. Thirdly, excessive risk taking on the part of banks, due to inadequate prudential supervision and regulatory structure, through "overlending" in aggregate or to specific sectors of

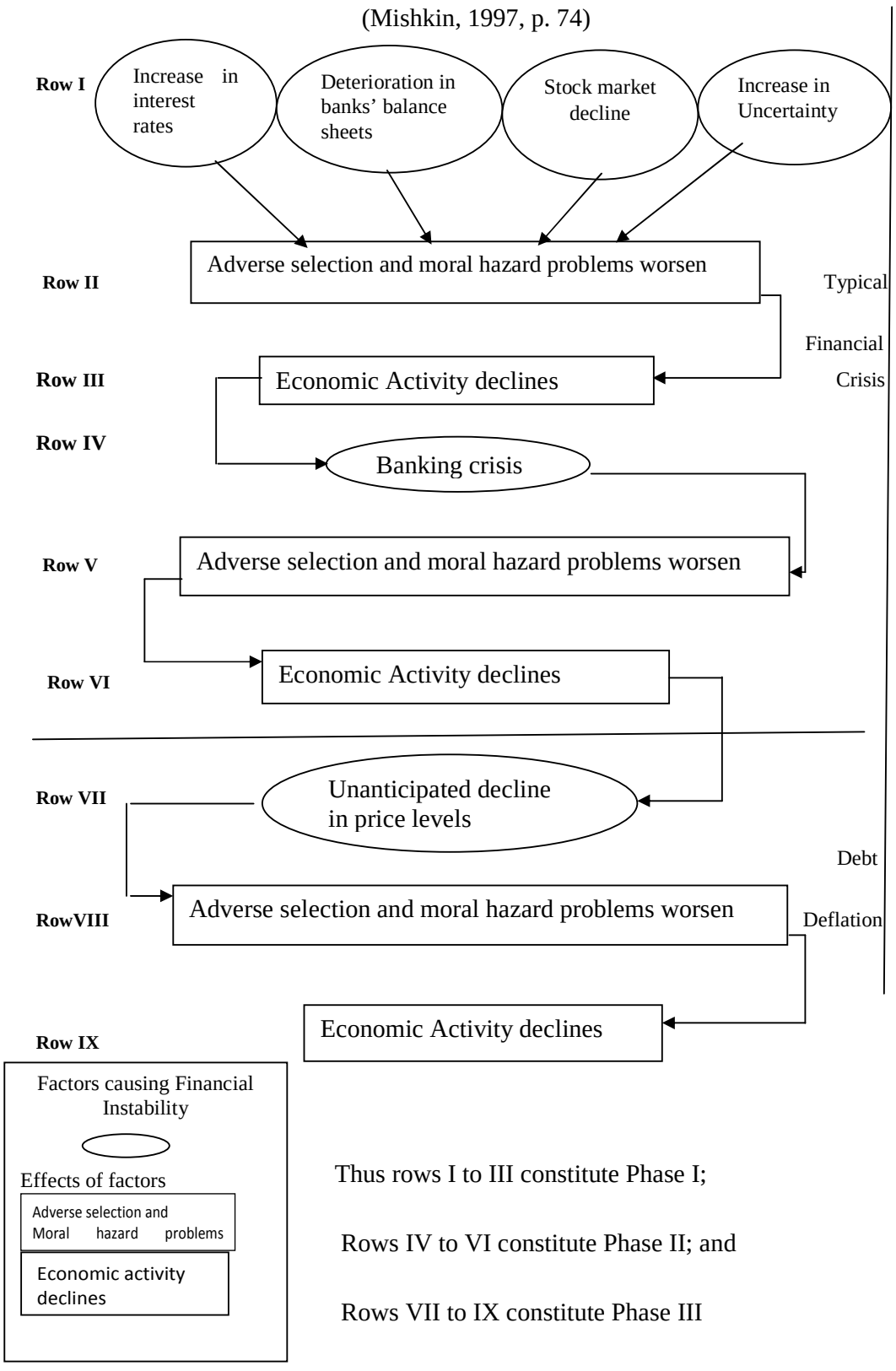
the economy, may weaken bank balance sheets. Fourthly, the occurrence of a bank panic, initiated by the insolvency of a single institution leading to multiple, simultaneous failures of banking institutions through a contagion effect, also weakens bank balance sheets (Mishkin, 2001; 2007a). These factors in isolation or combination lead to deteriorating bank balance sheets.

In response, banks have two options, first, restrict lending to equilibrate their current capital ratio with their target capital ratio; second, raise additional core and supplementary capital to meet the regulatory minimum capital ratio, and thus limit the contraction in lending (Mishkin, 1997). The feasibility of the second option is questionable, as balance sheet weakness is not conducive to an issue of equity capital and subordinated debt at a reasonable cost. Therefore, the typical response of banks with weakened balance sheets is a restriction in lending which contracts economic activity. Based on the explanation of how the above four factors increase the degree of adverse selection and moral hazard, and consequently promote financial instability, the discussion now turns to the propagation mechanism that promotes financial instability in the asymmetric information approach.

2.4.2.1.2 Propagation Mechanism of Financial Instability

The propagation mechanism of financial instability is represented by Figure 1. The factors causing financial instability are surrounded by ovals, with the effects of the factors surrounded by boxes. The broken lines show the propagation of financial instability.

Figure 1 Propagation of Financial Instability in Industrialized Countries



Thus rows I to III constitute Phase I;

Rows IV to VI constitute Phase II; and

Rows VII to IX constitute Phase III

The four factors appear in the top row of Figure 1. The occurrence of any of the four factors can trigger a worsening of adverse selection and moral hazard problems in financial markets, leading to contracting economic activity as depicted in the flow chart. Of the four factors that typically initiate financial instability, the approach asserts that increases in domestic interest rates, is the most prominent. Once interest rates have been "driven up sufficiently" (Mishkin, 1997. p.63), complemented with the unanticipated tightening of the interest rate cycle, there are negative spillover effects on the remaining three factors. These negative spillover effects include: worsening flow and stock position of non-financial firms leading to a deterioration in banks' balance sheets; share market reversal or correction further decreasing the market value of firms' net worth or collateral; shifting expectations with respect to macroeconomic variables increasing the uncertainty incorporated into inter-temporal decision making.

Despite the primacy of the increase in interest rates factor, it is posited that any of the four factors in the top row of Figure 1 can promote financial instability. Furthermore, the occurrence of all four factors, if significant enough, can mutate a minor period of financial instability as depicted in rows I-III into a full blown financial crisis represented as rows I-VI in Figure 1. The critical factor generating the more extreme form of financial instability is a banking crisis (row IV) leading to a second round of worsening asymmetric information and contraction in economic activity (rows V & VI) (Mishkin, 1997). If a minor period of financial instability is termed the first phase (Phase I), and the progression to a financial crisis constitutes the second phase (Phase II), the period of financial instability may enter a third phase (Phase III). In Figure 1, Phase III is represented by rows VII-IX. The nexus between Phase II & III is the occurrence of an unanticipated decline in price levels that further propagates financial instability by generating a third round of worsening adverse selection and moral hazard leading to a contraction in economic activity. Phase III constitutes a process of debt-deflation (Fisher, 1933) as described in the discussion of Minsky's FIH. The asymmetric information approach postulates that Phase III—the emergence of a debt-deflation process - arises from the economic downturn and contraction of the money supply resulting from a banking crisis, possibly leading to a sharp decline in prices. Accordingly, the unanticipated deflation would lead to a further deterioration in firms' net worth because of the increased burden of indebtedness, and consequently, a third

round of worsening adverse selection and moral hazard problems in financial markets and contraction in real economic activity.

2.4.2.1.3 Policy Implications of Asymmetric Information Approach

As the propagation mechanism essentially encompasses three phases of an increasing degree of financial instability, it is apparent there is a role for policy to mitigate the progression of financial instability from Phases I-III. The policy implications of the approach take two forms. First, there is a role of policy to ensure that the economic structure minimizes the degree of asymmetric information inherent in financial markets. Secondly, there is a necessity for policy intervention to mitigate the progression of financial instability from Phases I-III.

The first type of policy implication derives from the fundamental axioms of the approach, that is, the existence of an information asymmetry inherent in the nature of the financial contract. Specifically, it is assumed that borrowers have an information advantage over lenders because borrowers have more information about the risk and return characteristics of the investment projects they desire to undertake.

Previously it has been argued that the possible expropriation of collateral and net worth is a means by which lenders can reduce the incentives for moral hazard by borrowers. For the threat of expropriation to be realistic, certain structural characteristics, induced by regulation, need to be present. These structural characteristics include: clearly defined property rights; enforcement of the law of contract; compulsory and timely disclosure of relevant information between contractual parties; and bankruptcy procedures that ensure speedy resolution (Mishkin, 1997). If the presence of asymmetric information and the adverse selection and moral hazard problem its presence generates is not extinguished by the structural characteristics mentioned above, there exists a requirement for a bank regulatory or supervisory system to reduce the structural bias towards excessive risk taking lenders. The principal means by which the institution charged with prudential supervision (typically the central bank) seeks to reduce excessive risk taking by banks is the implementation and enforcement of capital requirements[70] (Mishkin, 1997, 2007a).

[70] While the three categories of risk principally covered by the capital adequacy guidelines (credit risk, market risk and operational risk) directly threaten bank balance sheets, the most significant in the asymmetric information approach is credit risk.

The Basel Accords are an example of such requirements and will be introduced in detail in the next chapter.

Essentially, if measures undertaken to enhance information flows in the financial system fail to significantly reduce the degree of adverse selection and moral hazard problems in financial markets, there will be an increasing propensity for counterparty default[71]. Where capital requirements are adequate any deterioration in banks' balance sheets is less likely to initiate a period of financial instability. This heightens the importance of the discussion of the effectiveness of the existing capital adequacy guidelines in the following chapters.

Another structural bias towards excessive risk taking is the existence of moral hazard between lenders (financial institutions) and regulators (central bank or supervisory agency). The implicit (explicit) bias is termed "too-big-to-fail" (TBTF) and derives from the perceived (known) reluctance on the part of the Government to permit the failure of a financial institution due to the potential systemic effect on the financial system, and the occurrence of macroeconomic losses in the real economy (Mishkin, 1997, p.89). Its presence negates incentives for creditors to monitor the institution's risk profile and trigger withdrawal of funds to signal when excessive risk is engaged. The existence of moral hazard between lenders and regulators significantly impairs the motive for lenders to combat adverse selection through costly screening and monitoring of borrowers, as the costs to the lender of excessive risk taking are substantially reduced, if not eliminated. In terms of systemic risk, the moral hazard between lender and regulator overwhelms the moral hazard between lender and borrower (Mishkin, 1997, 2007a).

The approach argues that vigilant prudential supervision and the use of market discipline can limit TBTF. Operating through a different channel, market discipline is argued to be an effective tool to ensure that a banking institution does not take on excessive risk. According to Lane (1993, p. 55), "market discipline means that financial markets provide signals that lead borrowers to behave in a manner consistent with their solvency". Lane (1993, pp. 61-72) argues that four conditions are needed for effective market discipline. First, financial markets must be open. Secondly, information bearing on a borrower's creditworthiness must be readily available to

[71] The Basel Accord seeks to limit the effects of default on the solvency position of banks.

lenders. Thirdly, markets must not anticipate that a delinquent borrower (financial institution) will be bailed out. This implies that the borrower (financial institution) does not have access to central bank financing that would enable it to maintain an otherwise unsustainable position. Fourthly, the borrower must respond to market signals.

The second type of policy implication arises via the necessity for intervention to mitigate the progression of financial instability through Phases I-III depicted in Figure 1[72]. The principal initiating factor of Phase I is an increase in interest rates that may arise from tightening monetary policy—that is an initiation from the operation of a direct policy instrument. However, the implementation of policy measures to ensure that the economic structure minimizes the degree of asymmetric information inherent in financial markets may act as a countervailing influence to any aggravation of adverse selection and moral hazard problems that result from the initiating factors in Phase I (Mishkin, 1997). However, there is a significant role for policy to mitigate the propagation of financial instability from Phase I-II. The nexus between Phase I and Phase II is the occurrence of a banking crisis (row IV in Figure 1).

The generation of a panic in the banking system is the result of another facet of asymmetric information in financial markets. That is, the asymmetric information between lenders to financial institutions (depositors and holders of certificates of deposit) and borrowers (financial institutions themselves) can precipitate a banking crisis through a widespread and simultaneous removal of funds from institutions (Mishkin, 1991). The panic, if unchecked, significantly increases the incidence of credit rationing through a separate channel—the money-multiplier (Mishkin, 1997, p. 79). Explicit deposit insurance is a policy instrument to overcome the likelihood of a panic. In its absence, a timely statement made by the central bank, with respect to ensuring liquidity, to depositors who seek it, serves as a comparable substitute to explicit deposit insurance. Ensuring the liquidity of the banking system through explicit or quasi deposit insurance is subsidiary to a central bank that stands ready to act as lender-of-last-resort (LOLR). Deposit insurance and LOLR are covered in the discussion of Minsky's FIH and the Monetarist approach (Schwartz, 1988, 1995; Mishkin, 1997).

[72] There probably is no role for policy to prevent a minor period of financial instability, termed Phase I.

The nexus between Phases II & III is the occurrence of an unanticipated decline in price levels as the banking crisis precipitates a contraction in the money supply and economic downturn. The unanticipated deflation would lead to a further deterioration in firms' net worth because of the increased burden of indebtedness, and consequently, a third round of worsening adverse selection and moral hazard problems in financial markets and contraction in real economic activity (Mishkin, 1997, pp. 88-9).

The asymmetric information approach argues that a credible commitment to price stability can prevent the development of a debt-deflation process if LOLR intervention is ineffective (Mishkin, 1997, p. 91). The policy instrument to prevent the development of a debt-deflation process is expansionary monetary policy. Action to lower nominal interest rates limits the upward pressure on real interest rates, reducing the increase in the real burden of debt (Mishkin, 2008).

The asymmetric information explanation of financial instability is not without its critics. Schwartz argued, that both lenders and borrowers live in the same state of uncertainty when they evaluate a project, so "asymmetric information is not the problem confronting lenders and borrowers" (Schwarz, 1998, p.XX). The problem is that monetary authorities vainly try to stimulate the economy above its natural path which generates inflation. However, a more profound criticism is made by Post Keynesians that this approach merely identifies the market imperfections, like asymmetric information (or price rigidities in the Monetarist approach that will be introduced later) rather than actually acknowledging that *uncertainty* fundamentally exists in capitalism. As discussed earlier, fundamental uncertainty implies that some information just does not exist and thus is immeasurable which causes the endogenous instability of the financial sector. Asymmetricians, like Mishkin, who focus on market imperfections, believe that all information is knowable but is just asymmetric with a skewed distribution. Even though this approach is argued theoretically, it is ambiguous politically (Stockhammer and Ramskogler, 2008). Therefore, the approach is comparably narrowly based and ill equipped to explain the unstable nature of the complex and dynamic financial system in capitalism.

2.4.2.2 The Monetarists Approach to Financial Instability

Starting with EMH as a basic assumption for their theories and models, the Monetarist approach to financial instability focuses on contagious banking panics, which may cause monetary contraction. This approach linked to Friedman and Schwartz (1963) and Cagan (1965) is two pronged. First, depositors' lack of confidence in banks' abilities to convert deposits into currency restricts the loan writing ability of banks through the traditional credit creation process, if banks remain solvent. Second, financial instability can result from the failure of the central bank to pursue a predictable monetary policy, generating sharp swings in the money supply.

2.4.2.2.1 Foundations of the Monetarist Approach

Friedman and Schwartz (1963) and Cagan (1965) notice that changes in the money supply are attributed to changes in its three proximate determinants:

1) High powered money consisting of currency held by the public +currency held in bank vaults + deposits of banks at the central bank;

2) Deposit-currency ratio: the ratio of the public's deposits to its currency holding;

3) Deposit-reserve ratio: the ratio of the deposit liabilities of the commercial banking system to its reserves.

Periods of contraction in the growth rate of the money supply that were produced or aggravated by banking crises or unanticipated tightening in monetary policy were induced or coincided with simultaneous severe economic contractions—"deep depression".

Bank panics are argued to lead to declines in the growth of the money supply through reductions in the money multiplier brought about by falls in the deposit-currency and deposit-reserve ratios. According to Friedman and Schwartz:

> "The deposit-currency ratio has been of major importance primarily during periods of financial difficulties. In each such period, the public's loss of confidence in banks led to an attempt to convert deposits into currency which

> produced a sharp decline in the ratio of deposits to currency and strong downward pressure on the stock of money…" (1963, pp. 684-5)

As the above quote articulates, banking panics arise out of a loss of confidence by the public in the ability of banks to convert deposits into currency. The loss of confidence is typically initiated by the failure of an important financial institution. In a fractional reserve banking system attempts by the public to increase its cash holdings can only be satisfied by a multiple contraction of deposits, unless there is suspension of convertibility of deposits into currency or intervention by the monetary authorities. If the deposits removed from "suspect" institutions are not re-deposited into "sound" financial institutions, there is a decline in the deposit-currency ratio. The deposit-reserve ratio, like the deposit-currency ratio, "has been of major importance at times of financial difficulties…whenever the public has shown distrust of banks by seeking to lower the deposit-currency ratio, banks have reacted by seeking to strengthen their reserves" (Friedman and Schwartz, 1963, p.685). The removal of deposits and increases in bank reserves leads to a decline in the deposit-reserve ratio.

The wholesale removal of deposits featured in a banking panic leads to widespread bank failures because even sound banks are forced into insolvency by declines in the value of their assets that they sell in a vain attempt to satisfy a mass scramble for liquidity. Thus, bank failures lead to a contraction in economic activity and lead to deflation via reductions in the money supply through the money multiplier as a consequence of falls in the deposit-currency and deposit-reserve ratios.

2.4.2.2.2 Schwartz's Extensions of Monetarist Approach

Schwartz (1986, 1988, 1995, and 1998) has made extensions to the theoretical underpinnings of the monetarist approach to financial instability. One of her extensions referred to the distinction between "real financial crises" and "pseudo-financial crises".

Real financial crises arise out of fears that means of payment will be unobtainable at any price and, in a fractional-reserve banking system, leads to a scramble for high-powered money. It is precipitated by actions of the public that suddenly squeeze the reserves of the banking system. In a futile attempt to restore reserves, the banks may

recall loans, refuse to roll over existing loans, or resort to selling assets. This sequence of events is commonly observed in banking panics and stock market crashes. Other instances of financial distress and instability do not pose a threat to the payments system and are labelled pseudo-financial crises (Schwartz, 1986). Thus Schwartz's extension is clearly consistent with the foundations of the monetarist approach, reviewed earlier, which identifies financial crises with banking panics or "policy-switching" that either produce or aggravate the effect of monetary contraction.

Another extension to the theoretical underpinnings of the monetarist approach to financial instability, made by Schwartz, concerns the possible macroeconomic cause of bank failures. According to this extension, banking panics have often been caused or amplified by fluctuations in the aggregate price level. That is, instability in the price level exacerbates financial instability. This extension is referred to as the Schwartz Hypothesis (Schwartz, 1998). The Schwartz Hypothesis considers both relative price instability and general price level instability as conducive to financial instability. Relative price shocks refer to sharp declines in commodity and real estate markets after several years of substantial price increases. Such declines can lead to financial distress in the real sector units in the affected economic sectors such as industries or regions. Financial sector units engaged in borrower-lender relationships with the distressed units may face increased debt delinquency (non-performing loans) as a consequence of that financial distress. Unless all financial institutions are heavily exposed to the collapsed markets, this relative price level instability leads to localized financial distress without threatening the stability of the overall financial structure or the aggregate economy. The Schwartz Hypothesis is more concerned with the widespread effects of general price level instability. Apart from contributing to interest rate instability, its presence distorts lenders' perceptions of credit and interest rate risk on both the upswings and downswings of price movements. It contributes, in the upswings, to euphoric decisions by banks and across low-risk asset types, as judged by the initial economic environment, particularly one that fostered inflation. An unexpected reversal of inflation in selected markets or in general could significantly increase the riskiness of the banks' assets and lead to insolvencies (Schwartz, 1995). In such scenarios, ex post, the evaluation of the quality of the assets would differ from the ex ante evaluation.

The Schwartz Hypothesis is consistent with the observation that more recent episodes of instability in banking systems have tended to be the result of unexpected losses on the banking and trading books, that is the asset-side of the balance sheet of the institutions involved, rather than the occurrence of bank runs which is the liability-side of balance sheets. If these losses are the result of a mispricing of credit and interest rate risk due to swings in inflation, the hypothesis may be an explanation of the losses incurred.

2.4.2.2.3 Policy Implication of Monetarist Approach

The monetarist approach identifies financial instability with the incidence of banking panics and unanticipated changes in monetary policy ("policy-switching"). Both these incidences produce or aggravate the effects of monetary contraction. Accordingly, the policy implication of the approach focuses on measures to prevent banking panics and "policy-switching".

The approach sees "real financial crises" as grounded in fears that the means of payment will be unobtainable at any price, leading to a scramble for high-powered money and the wholesale removal of deposits from the banking system. Accordingly, one policy proposal to prevent the development of a banking panic is the introduction of an explicit deposit insurance scheme[73]. Deposit insurance is argued to be an effective 'circuit-breaker' as it prevents bank panics by removing the reason for the 'runs', which cause the loss of confidence in the ability to convert deposits into currency (Schwartz, 1988, 1995).

In addition, a policy to prevent bank panics, operating as a substitute or a complement to deposit insurance, is the lender-of-last-resort (LOLR) function of the central bank. When LOLR is a complement to deposit insurance, the latter will come into effect in response to bank insolvency and not a "run". Thus, depositors will be paid out, in full, up to the pre-specified limit, even if the insolvency constitutes a pseudo-financial crisis. Furthermore, LOLR should only operate through open market operations (OMO) to provide liquidity to the market in general, in preference to discount window lending (Schwartz, 1988).

[73] A deposit insurance scheme implemented by a government authority, which is not necessarily the central bank, guarantees the conversion of deposits into currency up to a pre-specified limit.

From the discussion of the foundations of monetarist approach, "policy-switching" was seen as responsible for aggravating the contraction of the money supply in two of the deep depression cycles identified by Friedman and Schwartz (1963). Also, discussion of the Schwartz Hypothesis indicated that instability in the price level exacerbates financial instability. The policy option seen as simultaneously extinguishing the possibility of "policy-switching" and delivering price level stability is the pursuit of a "predictable monetary policy". Schwartz describes "predictable" monetary policy in her 1988 work:

> There is no well-understood prescription to achieve price stability other than limited growth of the monetary base that the authorities alone determine. A quantitative measure of price stability averaged over some medium-term period needs to be adopted by legislation or in some other binding requirement imposed on them (Schwartz, 1988, p.36).

In other words, the central bank should use its policy to keep money supply growth close to the long-run trend of the growth rate of real output and thereby maintain aggregate price stability[74].

The monetarist approach advocates the pursuit of predictable, transparent, and simple monetary policy rules to prevent "policy-switching" and to maintain price stability. While monetary policy regimes that target a growth rate of the money supply have fallen out of favour, inflation-targeting regimes have become increasingly popular. Arguably, inflation targeting is a more modern form of a "predictable" monetary policy as it is predictable (target range for inflation), transparent (known to market participants), and simple (maintain inflation within the target range).

Note that Schwartz's hypothesis focusing on price rigidities (and also Mishkin's focus on asymmetric information) accepts imperfection of markets[75]. In that sense, government should apply temporary, quick and targeted policies in order to compensate for those imperfections and to put the economy back on its "natural"

[74] This policy derives from the modern restatement of the Quantity Theory of Money.
[75] While Mishkin's approach to financial instability is based on the acknowledgement of market failure and inefficient markets, the Monetarists' approach is totally based on EMH assumption, model and theories. Therefore, the Monetarist approach puts much attention on policy failure.

course (Stockhammer and Ramskogler, 2008). Government intervention is thought to be intrinsically unstable for two reasons by Monetarists (Friedman and Schwartz 1963; Friedman 1968; Kydland and Prescott 1977; Barro and Gordon 1983). A first reason is the assumed incompetence of policymakers to deal with economic problems, as well as the lags involved in policymaking, which lead to economic mismanagement, instability, and suboptimal economic results. A second reason is due to the impact of political interests, which, even if policymakers are well-intentioned, lead to time inconsistency. On the contrary, Minsky viewed the government as a necessary complement to the profit-oriented sector and more generally the individual sphere of the economy. Minsky's research, which is discussed in the following section, led him to conclude that capitalism is a highly dynamic system permeated by dialectical forces and circularities (feedback loops) specific to this system. He argued that "stability is destabilizing," i.e. prolonged economic growth generates financial fragility, and that relevant business cycles are mainly "due to financial attributes that are essential to capitalism" (Minsky 1986: 173). He and others criticized Monetarists for being too restrictive in their definition of financial crises by reducing them to bank panics (Schwartz 1988, 1998), and for brushing aside events that would have been catastrophic if the government had not intervened (Sinai 1976; Minsky 1986; Mishkin 1991).

2.4.2.3 Financial Instability Hypothesis

The last of the three theoretic approaches to explaining financial instability centres on the concept of financial fragility. There is no universally accepted definition of financial fragility. Financial fragility is usually a term reserved for economic units (households, non-financial and financial companies) where the state of the unit's balance sheet offers a heightened vulnerability to default in a wide variety of circumstances. At the macro-level referring to the whole financial system, financial fragility means that 'the ability of the financial system to withstand economic shocks is weak' (Schwartz, 1995, p. 1).

From a Post-Keynesian perspective, the development of financial fragility under conditions of fundamental uncertainty is the root cause of financial instability. The market is seen as inherently inefficient and characterised by irrational bubbles. Following Keynes, Minsky (1982b, 1986) proposed his Financial Instability

Hypothesis (FIH) to illustrate how financial crises can occur as an endogenous outcome of decision-making within financial units. He focused on the relationship between the banking system and investors, highlighting the possibility of financial fragility developing during upturns in the business cycle (also see Kindeberger, 1978). This approach postulates a cyclical process, relating continuing economic expansion to declines in uncertainty and an increasing preference for externally financed investment expenditure. Over time, both the increasing reliance on external finance, and the increasing deferment of 'break-even' times, change a "sound" financial structure into a "fragile" one.

The financial instability hypothesis is composed of two fundamental propositions. The first is that the economy has financing regimes under which it is stable and financing regimes under which it is unstable. The second proposition is that over periods of prolonged prosperity, the economy transits from financial relations that make for a stable system to financial relations that make for an unstable system.

While this theory of financial instability is sometimes attributed to Kindleberger (1978), its theoretical structure was solely developed by Minsky (1977, 1982b)[76]. The economic theory underlying the FIH was developed, principally by John Maynard Keynes, in the *General Theory of Employment, Interest and Money*. The genesis of the FIH lies in what Minsky views as the neglected aspects of Keynes's *General Theory*:

> It is ironic that an economic theory [the neoclassical synthesis] that purports to be based on Keynes fails because it cannot explain instability. The essential aspect of Keynes's General Theory is a deep analysis of how financial forces—which we can characterise as Wall Street—interact with production and consumption to determine output, employment, and prices. One proposition that emerges from Keynes's theory is that, from time to time, a capitalist economy will be characterised by persistent unemployment. The neoclassical synthesis accepts this result, even though a deeper consequence of the

[76] Minsky's Financial Instability Hypothesis sometimes is called Financial Fragility Hypothesis (FFH).

> theory, which is that a capitalist economy with sophisticated financial practices is inherently unstable, is ignored. Keynes's analysis that leads to this deeper result provides the foundation for an alternative economic theory that leads us to an understanding of instability. (Minsky, 1986, p.100)

Contrary to the prevailing economic orthodoxy of the time, Keynes postulated that a capitalist economy is inherently unstable through his General Theory, which is:

> A theory of why output and employment are also liable to fluctuation. It does not offer a ready-made remedy as to how to avoid these fluctuations and to maintain output at a steady optimum level. But it is, properly speaking; a Theory of Employment because it explains why, in any given circumstances, employment is what it is (Keynes, 1937, p221)

According to Keynes, this inherent instability of the capitalist economy is generated by changes in investment expenditure. In other words, investment demand is the driving force causing the observed fluctuating of a capitalist economy. Thus, the theoretical crux of the FIH—revealed by Minsky's emphasis in the above quotation – is the theory of investment developed by Keynes. Minsky's interpretation of Keynes's theory of investment, related the impetus for investment expenditure not only to prospective yields but also to the way in which investment is financed. While investment expenditure may be initially financed internally, as it increases external funds in the form of debt and equity must be drawn on.

The debt financing of investment expenditure, results in a contractual commitment of the investing unit to make periodic payments of principal and interest to the lender. These contractual payment commitments are unwavering and are known. Presumably, the firm will obtain the cash for such payments, through the realization of quasi- rents earned by capital assets, which are unknown. The articulation between expected cash flows and contractual payment commitments are termed "financial regimes". Minsky classified financial regime into three financial postures: hedge, speculative and Ponzi finance. These financing regimes are characterized by different relations between cash

payment commitments on debt and expected cash flows due to the quasi-rents earned by capital assets.

Hedge positions are the most financially prudent positions, because they are able to clear outstanding debt, in full, out of the current receipts. Hedge units expect the cash flow from operating assets to be more than sufficient to meet contractual payment commitments now and in the future, which means expected cash flows always exceed the financing costs and operating expenses, including dividends for shareholders, by a pre-determined desired level. A profitable firm that has virtually no short-term debt and which has mainly equity liabilities is a hedge-financing unit, which is said to have sufficient margins of safety to withstand economic shocks.

Agents who adopt speculative positions, experience occasional cash shortfalls in the short run, but in the long run they are able to generate cash flows that more than cover their cash commitments. A speculative financing unit may experience a period, typically near term, when its cash payment commitment is greater than the expected quasi-rents for these periods. This characteristic differs from a hedge-financial unit, which expects its quasi-rents to exceed its contractual commitments in every time period. The speculative unit will continually require re-financing. Accordingly, speculative units have lower margins of safety as they are more exposed to economic shocks.

Ponzi positions are the most fragile in the system. The cash flows from operations are not sufficient to fulfil either the repayment of principal or the interest due on outstanding debts, thus Ponzi agents always increase their outstanding debt in order to meet their financial commitments, cover their existing debt and generate profit (Darity, 1992, p. 75). During an economic boom, expectations about the expected future returns become increasingly optimistic. Firms undertake riskier investment projects and therefore increase their debts. Banks also participate in this expectation by supplying the loans required to undertake such investments. In fact, banks as profit-seeking institutions are willing to provide loans to more risky customers at a higher price. At this point, most of the firms, as well as banks, move from hedge financial positions to more speculative and Ponzi ones, as they overestimate their expected returns. Since Ponzi units have no margins of safety, any non-normal functioning of the financial system will lead to their inability to meet their contractual payment

commitment, and the debt-equity ratio will start to increase at an increasing rate, consequently, the economy will slowly become unstable. The system is inherently unstable because of the overly optimistic behaviour of financial units.

Given the classification of hedge, speculative, and Ponzi-financial units, the FIH posits that if total liabilities are dominated by hedge-financing units, then the aggregate financial structure is “robust”, and the financial system is stable. Units that engage in hedge finance are vulnerable only to what happens in the market for their product, whereas units that engage in speculative and Ponzi finance are also vulnerable to shocks originating in financial markets. This is because of the margin of safety implicit in the hedge-financing regime.

According to Minsky, the fragility of the financial system depends upon the number of factors that can amplify initial disturbances. Hedge, speculative and Ponzi-financing units are all vulnerable to events that reduce the cash flows from assets. However, speculative and Ponzi units are vulnerable to shocks originating in financial markets such as an unanticipated rise in interest rates etc. Furthermore, as they must continually refinance their positions, they are also vulnerable to financial market disruptions such as market stress or market breaks.

Therefore, the greater the weight of speculative and Ponzi finance in the total financial structure, the greater the fragility of the financial structure. Ian Macfarlane (1999), then Governor of the Australian Reserve Bank observed that financial instability is the tendency for episodes to occur near the peak of the business cycle, amplifying that cycle.

Apart from the relative weight of financial regimes, there are two other determinants of the fragility of the financial system: the degree of liquidity in the system; and the reliance on debt to finance investment expenditure. Based on these determinants, the endogenous development of financial fragility can be made clear.

The analysis of the endogenous process usually begins in the aftermath of a recession of the business cycle. The recession following the period of financial instability has forced investing units—whether they correspond to hedge, speculative, or Ponzi financing units—to re-evaluate their margins of safety. If although avoiding bankruptcy, the units faced significant difficulty in meeting their contractual

commitments, they will conclude that margins of safety were too low. Accordingly, the units will endeavour to inflate margins of safety to adequately reflect the current economic climate. Such a period is usually referred to as one of “balance sheet restructuring”.

The stabilizing effect of the economic recovery, whilst not restoring receipts to pre-recession levels, restores confidence in the current levels of receipts. Cash flow is further enhanced by the return of consumer confidence, boosting gross national expenditure. Firms may begin to see retained profits rising, increasing the equity of the units. The cash flow characteristics of the firms, following the period of restructuring, will increasingly show few periods where cash payment commitments exceed quasi-rents. After some time, if this occurs in all time periods, the unit can properly be labelled as a hedge-financing unit.

If the sequence above is an accurate depiction of the financial structure of a majority of other units, the recovery phase has brought about liability structures conducive to a stable economic system. The economy is heavily weighted towards hedge-financing arrangements that feature sufficient margins of safety. However, the imprint of the recession on the collective psyche of borrowers and lenders has a dampening effect on their willingness to undertake profitable investment projects, especially if they have long gestation periods. If the economy does not dip back into recession, the recovery gives way to a period of economic tranquillity. If the business cycle consists of nine stages (Mitchell, 1951, p.14): trough; early, mid, and late expansion; peak; early, mid, and late contraction; trough, then a period of economic tranquillity encompasses the stages: early, mid, and the early part of the late expansion.

During this period of economic tranquillity, the cash flow, capital value, and balance sheet characteristics of borrowers and lenders, continue to improve. As this period of economic tranquillity lengthens, investing units observe that realized quasi-rents on capital assets begin to exceed expectations. In hindsight, it appears that margins of safety incorporated into liability structures were too pessimistic. Effective demand for the goods and services of business exceed ex ante aggregate supply. For a time, firms may be able to accommodate the excess through higher capacity utilization rates. However, in the continuing presence of a revival in effective demand, units will have to increase the level of their investment expenditures.

As the period of tranquillity continues, the expectation of future cash flows, formed by extrapolations of current economic conditions, require increasing levels of investment expenditure for expected demand to be fulfilled. Internal finance is no longer sufficient, external finance must be tapped. In the case of debt financing, the units must emit new liabilities. In order for units to emit liabilities, there must be willing lenders. The FIH asserts that bankers live in the same climate of expectation as the managers of capital assets. The extent to which layering, or leveraging of retained earnings, i.e. debt-financing, takes place in the financing of investment depends not only on the expectation of investing firms, but also on the willingness of bankers to go along with, if not to urge such layering.

Thus, not only are borrowers willing to assume liability structures that are less cautious, lenders are too. Once a change in expectations occurs, borrowers, with liability structures that previously, from the point of view of the lender, would have carried the possibility of bring them credit risk, now become quite acceptable. Financial intermediaries (particularly banks) also accept more risk in their own liability structures, that, in a more pessimistic expectation climate, they would have rejected. Therefore, as the period of economic tranquillity continues, investing units discover that their current liability structure is compatible with a previous state of confidence, which incorporated an unused margin of "borrowing power". Units are able to increase their debt levels as views about an "appropriate" liability structure have changed (Minsky, 1977).

What has been sketched out is a loop of positive feedback. The negative feedback of the recession period resulted in a reappraisal of borrowers and lenders positions in assets and liabilities. The revival of profits due to economic recovery operating through increased private sector confidence encourages more optimistic expectations about the future, manifesting in increased investment expenditure. The realization of cash flows, that equal or exceed expenditures, transforms expectations about future cash flows, again resulting in a reappraisal of position. In the presence of economic tranquillity, this loop of positive feedback reinforces itself creating an investment boom, i.e. new investment leads to increases in income that stimulate further investment and further income increases (Minsky, 1986).

As the dynamic described above becomes more advanced, expectations about the future begin to incorporate views consistent with the prospect that the existing tranquil economic conditions will continue indefinitely. Success breeds a disregard for the possibility of failure. Rather than an extended period of economic tranquillity being regarded as an aberration, it becomes the norm. Thus, expectation of a normal business cycle is replaced by the expectation of steady economic growth—a "new era" has arrived. The "economics of euphoria" is a phrase that has been coined to describe an economy infected with such a change of state (Kindleberger, 1978). In other words, the reluctance to hold liquid assets in a portfolio declines as a direct result of 'euphoria'; this is particularly the case for financial institutions. "Free reserves" and riskless assets, such as government bonds, become poor assets to hold with the decline in the risk premium on assets whose returns are dependent upon the performance of the economy. The shift to euphoria increases the willingness of financial institutions to acquire assets by engaging in liquidity-decreasing portfolio transformations. Thus, the increased incidence of positive feedback trading, and the emergence of 'bubbles' in the asset market, is a consequence of 'euphoria'.

Another feature of the euphoria economy is that the short-term financing of long positions becomes a way of life for many organizations. If the term structure of interest rates corresponds to a normal yield curve, the carrying costs of debt can be made less burdensome, by converting long-term debt into short-term debt. With the economy characterized by expensive long-lived capital assets, such a financing method seems irrational. In the realm of normal economic conditions, where the memory of past instability impinges on current behaviour, such a deduction would be correct (Kindleberger, 1978). However, the operation of euphoric economic conditions means that the distant memories of instability results in the short-term financing of long-lived capital assets being perceived as rational. Borrowers and lenders discount the likelihood that difficulty will be encountered in the rolling over of maturing short-term debt. The future promises perpetual expansion and the smooth functioning of factor, product, and financial markets. This is one route whereby an economy experiencing a period of prolonged prosperity, endogenously progresses from one characterized by robust financial structures, to one dominated by fragile financial structures. The pyramiding of liquidity together with the increased use of debt leads to increasing leverage in the financial structure (Minsky, 1982b). The three

determinants of systemic fragility are in operation, and the economy is exposed to shocks. Thus, the successful normal functioning of the economy has endogenously generated a fragile financial structure.

In general, the greater the extent of financial fragility, the less significant the shocks have to be to induce a period of financial instability. In contrast, for lower levels of systemic fragility, larger shocks are required to unleash an episode of financial instability. The period of financial instability will occur at close to the peak of the business cycle. The worst-case scenario in this approach is that the financial system is very fragile and a significant shock occurs, setting off a debt-deflation process, as theorized by Irving Fisher (1933). Fisher's debt-deflation theory encompasses a nine-step process:

> A state of over-indebtedness exists, […] lead to liquidation, through the alarm either of debtors or creditors or both. We may deduce the following chain of consequences on nine links: *(1) debt liquidation leads to distress selling* and to *(2) contraction of deposit currency* […] causes *(3) A fall in the level of prices* […] there must be *(4) A still greater fall in the net worth of business,* precipitating bankruptcies and *(5) A like fall in profits,* […] leads to the concerns which are running at a loss to make *(6) A reduction in output, in trade and in employment of labor,* which leads to *(8) Hoarding and slowing down still more the velocity of circulation.* The above eight changes cause (9) *Complicated disturbances in the rates of interest*… (Fisher, 1933, pp.341-42)

Fisher's emphasis is that the essence of the debt-deflation process is a decline in commodity prices that increases borrowers' real debt burden (Fisher, 1933). However, the modern restatement of Fisher's debt-deflation process places emphasis on the role of asset prices and profit flows rather than commodity prices and changes in the money supply. In the modern version, a financial crisis ushers in declines in confidence, reducing profit flows to business, including distress selling of assets that saturate secondary markets, reducing the prices received. The result is a fall in the net worth of business and an increase in bankruptcies. The divergent emphasis between

the modern version and the classical Fisher version has significant policy implications. The policy implication of the FIH is discussed below.

2.4.2.3.1 Policy Implication of Financial Instability Hypothesis

The policy implications of this approach is that intervention should be designed to limit the development of negative spillover and feedback effects between the real and financial sectors of the economy. This involves two distinct steps: Refinancing the markets or institutions whose perilous position defines the crisis; and Ensuring that the aggregate of business profits do not decline.

Thus, the twin "parameters" of financial crisis management are lender-of-last-resort intervention and government deficit spending when the economy is in or on the brink of recession.

2.4.2.3.1.1 Lender-of-Last-Resort (LOLR) Intervention

As far as LOLR intervention is concerned, the central bank must expeditiously determine the extent of financial instability taking place. The incidence of financial instability may be minor, with the central bank willing to provide ample liquidity at the discount window, preventing panic by financial institutions, and not resulting in a system wide "call in" of loans, thus avoiding the debt-deflation scenario. This provision of promise to supply cash as is needed should be the primary response of policy-makers to the instability. If LOLR intervention is not forthcoming, units will have to sell assets at "fire-sale" prices in an attempt to meet their contractual payment commitments. A process of debt-deflation is unleashed. If the diagnosis of the central bank is correct, and position-making activity is only occurring on a micro not macro scale, this LOLR intervention should be effective in stabilizing the payments and financial systems. However, if the financial instability occurring is taking place on a macro scale, the traditional LOLR intervention (i.e. the provision of promise to supply cash as is needed) may not be sufficient to offset the adverse effects of widespread position-making activity such as in the debt-deflation scenario (Minsky, 1982a).

In addition to the traditional LOLR intervention, the central bank must intervene in a direct way to facilitate the restructuring of debts, so that in the aftermath of the unstable period, the weight of hedge financing increases in the total financial structure.

In the absence of this direct measure, restrictive refinancing terms on short-term debt will not alleviate units of the need to hypothecate assets to make payment commitments, and an extended period of financial instability is not avoided. Another intervention by the central bank is to guide the evolution of the financial system, either by legislation or by its operations, so that the actual and potential weights of speculative and Ponzi finance is constrained. An important component of this third intervention is the early recognition of new products or institutions that would expedite the spread of an asset-liability mix biased towards fragile financial structures, and implement reforms to reduce their weight in the total liability structure (Minsky, 1992).

2.4.2.3.1.2 The Government Deficit

The second parameter to the management of financial instability is the response of the government deficit which differs from LOLR intervention. The first two LOLR interventions are an immediate and primary response to financial instability while the last LOLR intervention acts as a measure to prevent the onset of financial instability.

In contrast, the response of the government deficit acts as a preventative measure, and a secondary response to financial instability. The government deficit acts as a stabilizer of corporate profits prior to an unstable period (Minsky, 1986). Recall that a decline in cash receipts to business (expected quasi-rents exceed realized quasi-rents of capital assets) affects all types of financing arrangements: hedge, speculative, and Ponzi. If the decline in the export surplus and capitalists' consumption can be somewhat offset by a rise in the government deficit, a floor is placed under profits, allowing current profits to fulfil the financial commitments of investing units. This also implies that the economy must feature a potential budget deficit that is large relative to gross investment. The most effective form of government deficit is one that largely varies as a response to changes in private sector income levels.

The existence of "Big Government" is a prerequisite for the government deficit to be an effective secondary response to financial instability. The size of the government deficit will be significant enough to inflate gross national expenditure and therefore corporate profits, if the unstable period has lowered the private sector component of gross national expenditure. This is because expected quasi-rents determine the

willingness of borrowers and lenders to take on investment and financial commitments. Big government acts as a circuit breaker of the recursive process by which a decline in investment leads to a decline in profits, reducing the likelihood of a deep and prolonged recession (Minsky, 1986).

Although this approach identifies twin parameters for policy intervention, the policy mix of LOLR intervention and Government deficit has the greatest chance of fending off a debt-deflation. The economy's central bank acting as LOLR reduces the panic element omnipresent in financial crises. The LOLR function performed by the central bank gives pause in calling in loans from illiquid, but not necessarily insolvent, borrowers. The rescheduling of contractual payment commitments relieves borrowers of the need to sell assets for cash, averting financial instability. Even though LOLR intervention will prevent the development of negative feedback between the real and financial sectors of the economy, still borrowers and lenders become conservative. Consequently, declines in aggregate demand and corporate profits will follow. Activist fiscal policy establishes a floor under aggregate demand, stabilizing corporate profits, and increasing the likelihood that the economy experiences a "V-shaped" economic recovery.

In the end, for Minsky, individual economic freedom and big government are not incompatible. On the contrary, a big government is necessary to have an economy "where freedom to innovate and to finance is the rule" (Minsky 1993: 81). Entrepreneurs' creativity and imagination can thrive more fully and be more focused because of the higher stability of the system.

However, there is one drawback alluded to by Minsky, with respect to the effectiveness of policy intervention in avoiding financial instability on a macro scale. Minsky theorizes that there is a downside if policy is "too successful" in minimizing the scale of financial instability, and the depth of the recession that follows. That is insufficient purging of borrowers and lenders takes place, with the economy having the settings to relapse into another tranquil and then euphoric period relatively easily (Minsky, 1986).

In the historical past and more recently, major financial crises have resulted in significant economic dislocation flowing from the financial sector to other productive

sectors within affected economies. Thus policymakers are concerned about minimizing macroeconomic losses arising from financial system disturbances as one of the ultimate objectives of policy (Kent and Debelle, 1999). Banking regulation, that is designed to ameliorate financial crises, is adopted globally to maintain the health of the financial system and economies as a whole.

2.5 Conclusion

This chapter has discussed two types of decisions that economic agents confront – decisions involving risk to which probabilities of occurrence can be attached and decisions of uncertainties to which no probabilities can be attached. The separation of these decisions was first expounded by Knight and subsequently developed by Keynes. The distinction is important as it has a bearing on the behaviour of economic agents. Traditional theorists had argued that economic agents would find their behaviour being guided by the selection of the course of action that optimised outcomes for the agent once risk (in the sense of knowable probabilities) was factored into decision making. Thus a single course of action would be determined for that agent. But by asserting that the future was unknowable in a probabilistic sense, Keynes was arguing for behaviour that reflected agents' perceptions of the likely state that would prevail and a set of possible outcomes to behaviour.

The chapter has traced the increasing refinement and sophistication to the conception of uncertainty that has allowed that some decisions fall within ergodic parameters but some remain of the non-ergodic or fundamental uncertainty type. Along the way the chapter has explored the inherent inconsistencies between expected utility theory and its axioms as well as its weaknesses with respect to observed behaviour. The appeal to sub-additivity and multiple priors, in an attempt to accommodate expected utility theory to an aversion to uncertainty, has been shown to be consistent with the state of ambiguity but not of fundamental uncertainty.

The chapter has demonstrated that the view of uncertainty radically impacts on perceptions of financial instability and subsequently on policy prescriptions to address that instability. The traditional view, that ultimately all decisions are subject to a knowable probability decision, gives rise to the notion that economies will gravitate towards a long run stable equilibrium path. This notion is reflected in the efficient

market hypothesis and rational expectations theories. Adherents to this view, such as Monetarists and New Classicists, are apt to see financial instability as a self correcting aberration that calls for policy makers to follow simple rules. On the other hand, the behavioural responses to the presence of fundamental uncertainty may mean that there is no unique long run equilibrium growth path. Furthermore, this behaviour of economic agents may mean that there is an inbuilt bias towards financial instability within capitalism. Under this scenario, government policy is required to nudge the economy in the direction of sustainable financial behaviour and to mitigate or deter the worst excesses of such behaviours. Without mitigation through policy intervention, the "fragile" financial system is increasingly vulnerable to negative shocks.

To maintain financial, and thus, general economic stability, an "optimal" regulatory strategy is required. The next chapter first reviews the literature pertaining to the role of regulatory strategies in history within the financial sector. This reveals a pattern of oscillation between direct government intervention and self-regulation. The historical review of prudential controls in the financial sectors of Western countries (UK, USA and Australia) shows the transition from the pre-deregulation period to financial deregulation, and the changes that have occurred in banks' behaviour during this transition. The history of global banking regulation is also reviewed with particular emphasis to 1988 Basel Accord (Basel I), the later the amendment made to the Basel Accord (i.e. including the market risk category), and then the recent New Basel Accord, named Basel II.

However, designing an effective and efficient regulatory strategy is very challenging, especially when industries are experiencing a dramatic updating of organizational technologies (both within and outside the financial system). Therefore, based on the recognition that theoretical analysis must become more sophisticated in next chapter, Chapter Three shows and discusses the correspondent change reflected in policy—moving away from the oscillation (between direct government intervention and self-regulation) towards 'third-way" approaches to the "regulation of self-regulation" or the "conduct of conduct". The framework of current new banking regulation—Basel II is thus evaluated using "third-way" approaches a benchmark.

Chapter Three

Prudential Control and Banking Regulation

3.1 Introduction

Attempts to conceptualize and incorporate the notions of risk and uncertainty within theoretical economics spawned divergent schools of thought with their diverse policy prescriptions and this was detailed in the previous chapter. This thread is pursued in this chapter by examining the impact of the schools of thought on the practical issue of the appropriate policy stance for regulation of the finance sector. Depending on which school of thought was in the ascendancy, the dominant regulatory theory has oscillated between command-and-control and self-regulation to guide the design of financial regulation for the purpose of maintaining financial stability[77]. The first section of this chapter offers an outline of the debated pros and cons for both modes of regulation. Based on the Keynesian conviction that market failures associated with uncertainty and instability were unavoidable, Keynesian policy-makers normally embrace top-down forms of "command-and-control". However, this stringent and direct regulatory approach has been criticized according to the weaknesses identified by legal authors, and economists from the neoclassical and Austrian schools. These schools advocate the proposition of self-regulation as a guide to policy-making in financial systems.

Sections 3.3.1 and 3.3.2 of the chapter then trace the influence of these two modes of regulatory theory in the historic records of the U.S., UK and Australia from Post World War II through to the financial deregulation of the 1980s. A most important consequence of this historical change, has been the transit of banks' behaviour from acting as financial intermediaries to taking the role as brokers in the structured finance market. The combined effects of financial deregulation, rapid technological change, the evolution of the banking function, and the increasing complexity and diversity of finance activities has left regulatory bodies grappling with the problem of designing appropriate prudential standards.

[77] Apart from the debate between these two modes, a third way an approach has emerged which is beyond the current chapter but it is briefly introduced here. Further detailed discussion will be undertaken in Chapter Three.

So the chapter moves, in Section 3.3.3, to explore the evolution of capital regulation from the pre-Basel regulation, based on the U.S, UK and Australian experience; to the 1988 Basel Accord (Basel I); the 1996 Basel I amendment; and then to the new Basel Accord (Basel II) that the G-10 countries and other developed economies, such as Australia are implementing. Recall that the major thrust of this chapter is to discern the most appropriate and effective regulatory regime for the purposes of achieving financial stability of the system. Accordingly, the occurrence of the recent 2007-2008 financial crisis is raised to offer a preliminary appraisal of the effectiveness of Basel II.

Section 3.4 draws the chapter to a conclusion with the observations that effective prudential controls are essential in the current economic climate but that neither command-and-control nor self regulation hold the answers. In highly complex and competitive financial markets, a new approach to regulation, which melds elements of earlier approaches, needs to be developed. Despite the weaknesses identified in Basel II, it recognised this new approach to regulation and this forms the subject matter of the next chapter.

3.2 Theories of Regulation

Regulating the financial institutions, particularly the banking system which has played a key role in achieving financial stability, is a challenging task for policy-makers. For a long period, the design of regulatory strategies has been characterized by an oscillation between two approaches. On the one hand, direct and comprehensive forms of government intervention were advocated based on Keynesian theories. On the other hand, the conservative side of political economy, influenced mainly by neoclassical and Austrian economic theories, has advanced the idea of a self-regulating financial market.

3.2.1 Oscillation between Two Modes of Regulation

3.2.1.1 Command and Control

Command and control describes an approach that allows regulatory authorities to use enforcement machinery, such as standards, to regulate organizations. Under command-and-control regulation, the regulator dictates in great detail the actions the regulated firm must undertake. For example, using command-and-control regulation, the regulator can mandate the adoption of an operating system and techniques. It is

argued that command-and-control is authoritative in nature and normally uses a top-down approach. Safe and high-quality service can be promoted through command-and-control regulation if the regulator dictates operation and performance standards and enforces these standards (Sappington, 1994).

It was common for Keynesian policy makers to embrace top-down forms of "command-and-control", given their conviction that market failures associated with uncertainty and instability were unavoidable, even for well-developed markets. Activist forms of stabilization policy, which were intended to reduce the amplitude of the business cycle, were complemented by extensive interventions in the financial system.

The Keynesian approach advances a critique of claims for market self-regulation (discussed in the following section), which is a view commonly held among classical and neoclassical economists. This criticism helps lay a foundation for state intervention and thus helps to define the role of state in relation to the economy which is the core of political economy. Keynes and his followers question the claim that an unregulated market system will fully exploit society's productive potential, given the existence of fundamental uncertainty and the "animal spirit" of individuals. Therefore, Keynesian economists advocate active policy responses by the public sector, including monetary policy actions by the central bank (Minsky's so called 'big bank'), and fiscal policy actions by government (Minsky's so called 'big government'), to stabilize the financial sector and output over the business cycle. Keynes also argues that governments should solve problems in the short run rather than waiting for market forces to do it in the long run, because "in the long run, we are all dead" (Keynes, 1924, p.XXX)

In contrast to classical economists' recommendation of balanced government budgets, Keynes argues that balanced government budgets would exacerbate the underlying problems such as rising saving, and lower the demand for both products and labour. For him, and also his followers like Minsky, a government deficit is the one way to manage financial crises, particularly when the economy is in or on the brink of recession.

Influenced by Keynes, Franklin Roosevelt during his Presidency adopted some aspects of Keynesian economics, especially after 1937 in the depths of the depression. And Keynesian policy successfully helped the Post depression economies (particularly the U.S) struggling with recession to rebuild, so Keynesian ideas became dominant in Europe after World War II, and in the U.S. in the 1960s.

However, with the oil shock of 1973, and the economic problems of the 1970s, Keynesian economics began to fall out of favour. During that time, many economies experienced high and rising unemployment, coupled with high and rising inflation, so the simultaneous application of expansionary (anti-recession) policies based on Keynesian theories was criticized by Classical/Monetarist economists like Friedman and Austrian economists such as Hayek. The debate about the merits of direct government intervention with supposed negative aspects and what neo-classical economists describe as the "virtue of the market mechanism" mainly takes place in the U.S. Post 1970s, economic policies have tended to embrace the conservative side of political economy with the idea of a self-regulating market reflecting the influence of neoclassical and Austrian economic theories.

Legal authors, drawing on empirical research from fields such as environmental policy and tax regulation, have also commented on the impact of direct and stringent government invention. Cole and Grossman (1999) reanalysed the literature on the supposed failings of command law[78] and concluded that traditional command methods of regulation by nation states suffer obvious limitations. In business regulation, the main focus of Braithwaite's work on regulation itself has turned into a concern with the limits of command regulation in inducing regulatory cooperation (1993)[79].

The structure of industry, especially banking industry, involves a wide range of different interests (i.e. strategic interests of business) and business communities (investors, shareholders. etc.), as Furger (1997) claims, this complex structure is Durkheimian in nature. Durkheim's famous phrase: "everything in the contract is not contractual" (Durkheim, 1933, p.211) captures the view that in complex economic structures with actors pursuing strategic interests, a sense of command regulation and

[78] They coupled this research with a history of U.S. clean air legislation.
[79] But Braithwaite goes further than the command regulation/deregulation debate— to transcend the debate about the limits of command, which will be discussed as the "third way" approach in the next chapter.

willingness to comply with commonly agreed rules is limited. Furger (1997) further points out the solutions to this Durkheimian problem have increasingly converged on the idea of self-regulation. Gunther Teubner (1993, 1998) who influenced the European regulatory theories, identified the pathologies of command regulation as part of a crisis of growing juridification[80]. Teubner's account draws inspiration both from Habermas and from Luhmann's systems theory[81]. Command regulation cannot cope with conditions of high complexity. Moran (2002, p. 401) argues that attempts to extend modes of command law beyond the legal system to other social systems produces pathological consequences which manifest themselves as implementation failure. In terms of Habermas's idea of communicative action and Luhmann's system theory (to be discussed in Chapter Six), this failure itself typically leads to an intensification and elaboration of the modes of command, leading to further pathologies, and the *colonization*[82] of whole new social areas by command types of regulation or law[83].

On the other hand, command-and-control has strengths such as its dependability[84] which makes it straightforward to identify breaches of the legal standard and to enforce the law. Latin (1985) sets out several advantages to this approach over more particularized and flexible instruments:

> "[…]decreased information collection and evaluation costs, […], greater accessibility of decisions to public scrutiny and participation, increased likelihood that regulations will withstand judicial review, reduced opportunities for manipulative behavior by agencies […], reduced opportunities of obstructive behavior by regulated parties,

[80] Juridification is an ambiguous term, both descriptively and normatively. In descriptive terms, some see juridification as "the proliferation of law" or as "the tendency towards an increase in formal law"; others as "the monopolization of the legal field by legal professionals"; the "construction of judicial power", "the expansion of judicial power" and some quite generally link juridification to the spread of rule guided action or the expectation of lawful conduct. There are five dimensions of "juridification"—constitutive juridification; juridification as law's expansion and differentiation; as increased conflict solving with reference to law; as increased judicial power; and as legal framing (Blichner and Molander, 2005).
[81] Refer to the discussion of the concept of 'reflexivity' in chapter three.
[82] This is related to Habermas's discussion of lifeworld and system, refer to Chapter Five—Methodology.
[83] In the language of system theory, there develops a negative feedback loop, as Moran (2002, p.401) concludes, "Failure begets failure".
[84] Particularly when there is adequate monitoring and enforcement

> and decreased likelihood of social dislocation and "forum shopping" resulting from competitive disadvantages between geographical regions or between firms in regulated industries" (Latin, 1985, p. 1271)

Gunningham (1998, p.43) also argues that the clear, precise standards that command-and-control can embody, can best be enforced against firms which are readily identifiable and accessible, and he affirms the efficiency of command-and-control i.e. in reducing pollution from single media, point sources.

However, the number of weaknesses of command-and-control has contributed to its limited effectiveness. In the background paper provided for the World Bank's World Development Report, David Sappington argues, limited information about the regulated industry can influence the form, function, and scope of the regulator's operations. When the regulator's information is limited, command-and-control regulation may be inferior to regulation in which substantial decision-making authority is delegated to the (better-informed) regulated firm. He further points out that, in such cases, the regulator may achieve his goals more effectively if he allows market forces, rather than regulatory mandate, to govern some dimensions of the firm's operations. This particularly applies for an industry characterized by rapid technological change with frequent development of new products, i.e. telecommunications and finance industry, because command-and-control in such industries might result in lower performance than in an approach with complete information of the industry (Sappinton, 1994).

As Gunningham argues, *first*, an effective command-and-control approach requires regulators to have comprehensive and accurate knowledge of the workings and capacity of industry. *Second*, economists criticize the use of uniform standards as they prevent firms from tailoring their responses. This rigidity of command-and-control, particularly when embodied in uniform technology-based standards, has been criticized for being economically inefficient. *Third*, there is an absence of incentives for firms to go beyond minimum standards. Another criticism is related to the cost and difficulty of enforcement, since some regulatory regimes or agencies might have insufficient resources to monitor compliance with any degree of adequacy. Further, the increasing administrative complexity, a proliferation of law and the possibility of

vulnerability to political manipulation are the weakness aspects of command-and-control (Gunningham, Grabosky, and Sinclair, 1998).

The perceived limitations of command-and-control regulation crystallize a key issue in the study of political economy. Policy makers responded to the pathologies of command-and-control by adopting a self-regulatory mode of deregulation. Certainly recognition of the limits of direct intervention strengthened the deregulation movement in many developed economies, such as the U.S, UK and Australia. Discussion in section 3.3 will use the experience of these nations, as three typical instances, to illustrate the deregulation movement.

3.2.1.2 Self Regulation

Self-regulation is not a precise concept, but according to Gunningham (1998, p.50), it is defined as:

> "A process whereby an organized group regulates the behavior of its members, most commonly, it involves an industry level organization (as opposed to government or individual firms) setting rules and standards (codes of practice) relating to the conduct of firms in the industry"

Gunningham further suggests that industry self-regulation might take one of three forms. First, *voluntary, or total self-regulation*, involves an industry or profession establishing codes of practice, enforcement mechanisms, and other mechanisms for regulating itself, entirely independent of government. Second, *mandated self-regulation*, involves direct involvement by the state whereby it requires business to establish controls over its own behaviour, but leaves the details and enforcement to business itself, subject to state approval and oversight. Finally, *mandatory partial self-regulation* involves business itself being responsible for some of the rules and their enforcement but with the over-riding regulatory specification, though not the details, being mandated by the state (1998, p.51).

The previous chapter discussed Rational Expectations and the Efficient Market Hypothesis from the perspective of various schools of thought—Keynesian; Post Keynesian; Monetarist; New Classical and New Keynesian. Those who believe in the Efficient Market Hypothesis and adopt the Rational Expectation Hypothesis as a basic assumption of models or theories, normally embrace the self-regulation approach for a

free market economy[85]. The atavistic belief in Rational Expectations and the Efficient Market Hypothesis results in the so called "laissez-faire" policy conclusion that government intervention should be minimized or eliminated in an *unfettered market.*

The 'normative core' of classical liberalism is the idea that *laissez-faire* economics will bring about a spontaneous order or "invisible hand" that benefits the society (John Locke, 1689; Adam Smith[86], 1776; David Hume, 1984; David Ricardo, 1817, etc.) Laissez-faire activists such as the Austrian School economists (Hayek, 1979; Kresge, 1999) support little or no state intervention on economic issues, which implies free markets and minimal regulation. However, the Laissez-faire capitalism advocated by the Austrian School is against our current Neoliberal version of globalization, even though they both believe in the efficient market and rational expectations (Sally, 1998).

In contrast to Keynesians, on the conservative side of political economy, economists such as Ludwig von Mises, Friedrich Hayek (1999), and Pigou (1936) believed in market clearing. So governments and other monopolistic elements were the main sources of market "abnormality". Based on a deep belief in the *invisible hand*, Milton Friedman (1962, 1968, and1986) argued:

> "A governmentally established agency—the Federal Reserve System—had been assigned responsibility for monetary policy […] it exercised this responsibility so ineptly as to convert what otherwise would have been a moderate contraction into a major catastrophe" (Friedman, 1962, p.38)

Monetarists believe the market adjusts quickly to eliminate shortages & surpluses, thus business cycles may be efficient. They point out that direct government policy will destabilize the economy by interference with hard to control private behaviour. Therefore, monetarist economists, such as Milton Friedman (1962, 1968, and 1986),

[85] In political economy, one opposite extreme to the free market economy is the command economy, where decisions regarding production, distribution and pricing are a matter of the state. This has been partly discussed in the previous chapter under the section of Minsky's Financial Instability Hypothesis approach to financial instability.

[86] It is argued that stress of economic benefit of unfettered markets, in line with neoliberalism, first began to appear with Adam Smith's (1776) *Wealth of Nations* and David Hume's *A Treatise on Human Nature*

promoted the virtues of removing the 'dead hand' of government from the 'invisible hand' of the market. Friedman argued that the market would adjust quickly to eliminate shortages and surpluses, so that business cycles themselves were efficient cleansing mechanisms. He pointed to the fact that direct government interventions could further destabilize the economy by hindering rational decision-making on the part of private agents. Thus the main policy conclusion from them is that government intervention to regulate the economy was unnecessary and brought about distortions. Accordingly, they argued that there was a need to restrain arbitrary action on the part of government.

In response to this negative assessment of direct government intervention from neoclassical and Austrian theories of economics[87], neoliberal processes of self-regulation have been advocated. From an historical perspective, what is often championed as a new "paradigm" of economic theory and policy-making (Einar & Amund, 2005) reflects a return to type (Hayek, 1979). As Munck (2005) observes, the prospect of a self-regulating market is a core assumption of classical liberalism, and an important presumption amongst neoliberals as well, who promote various forms of deregulation, the increasing flexibility of markets, and forms of self-regulation.

Self-regulation is prevalent in many areas of social regulation in the U.S., Europe and other advanced economies like Australia. A significant body of literature argues that self-regulation could encourage the regulated entities to be more creative and innovative in promoting compliance with policy objectives, with an enlightened self-interest for industry playing a more dominant role. It offers greater speed, flexibility, sensitivity to market circumstances, efficiency and less government intervention than command-and-control. Thus an improved relationship between government and industry is being recognised by policy-makers—as a successful way of attaining policy goals and objectives (Moran, 2002; Aalders, 1993; Teubner, Farmer and Murphy, 1994; Gunningham, 1995). It is argued that the delegation involved in self-regulation could reduce government's burden in seeking to control the economic

[87] The neoclassical idea of political economy is subsidiary to the central focus of efficient exchange within markets. The main premise of neoclassic economics is that markets do work and that price signals will bring about the necessary adjustments in the economy in response to economic change (Caporaso & Levine, 1992).

system under a command-and-control type regulatory approach, which in modern complex societies is hardly feasible (Moran, 2002). Spitzer (1992, p.19) also writes "preference for a deterrence strategy has more to do with ensuring accountability to legislatures, the public and industry than with its ability to achieve compliance". Moreover, Gunningham (1998) concludes that, since self-regulation contemplates ethical standards of conduct which extend beyond the letter of the law, it may significantly raise standards of behaviour and lead to greater integration of issues into management process.

However, Gunningham points out that, in practice, self-regulation often fails to fulfil its theoretical promise and commonly serves the industry rather than the public interest. Braithwaite also comments:

> "Self-regulation is frequently an attempt to deceive the public into believing in the responsibility of an irresponsible industry. Sometimes it is a strategy to give the government an excuse for not doing its job" (1993, p. 91)

Consequently, self-regulatory standards are seen as usually weak, enforcement as ineffective, and punishment as secretive and mild. Webb & Morrison (1998, p.1) argue self-regulation commonly lacks many of the virtues of conventional state regulation, "in terms of visibility, credibility, accountability, compulsory application to all, greater likelihood of rigorous standards being developed, cost spreading, and availability of a range of sanctions". Some legal authors comment that self-regulation or market-based approaches are not invariably more efficient than command-and-control, although certain market-based approaches, in theory, can be more efficient[88] (Cole and Grossmand, 1999; Hahn and Noll, 1982). Cole and Grossman (1999) further conclude that when institutional and technological costs are considered, command-and-control regulations appear neither inherently inefficient nor invariably less efficient than the self-regulation approach. Based on some empirical case studies, they argue that in some cases, such as those involving very high monitoring costs,

[88] One must account for the legal and political (i.e. institutional) context in which they would operate (Cole and Grossman, 1999).

command-and-control can be more efficient than market mechanisms (similar arguments can be found in Allen & Harrington, 1999; and Steinzor, 1998).

As a result, policy-makers and academics have argued that neither spontaneous forms of self-regulation nor a command-control approach are satisfactory; they are searching for a "third way" approach which is beyond the oscillation between direct and stringent government regulation and self-regulation. They propose that the trend in regulatory policy could move towards more flexible, lenient, and accommodative control mechanisms such as 'responsive regulation' and 'smart' regulation. This has important consequences for the enforcement of corporate regulation, particularly in a complex and dynamic environment such as the financial system.

3.2.2 Third Way Approaches

In Braithwaite's early work (1989) on business regulation, he had already moved his focus away from the command-and-control regulation versus deregulation debate. His concern is to develop an effective regulatory system which is necessary both on grounds of economic efficiency and risk management. It aims to foster norms among the regulated such that they will voluntarily comply, and depends upon the creation of a constant dialogue between regulators and regulated in conditions of great complexity. Braithwaite believes in systems of business regulation that operate "in the shadow of the law", but his emphasis is on persuasion and dialogue in the regulatory process (1989, p. 57). In Ayres and Braithwaite's book *Responsive Regulation* (1992), the regulation is pictured as a pyramid of activities, beginning with persuasion at the bottom, and ending with a variety of draconian penalties at the top. In the more recent work by Gunningham and Grabosky (1998), there is a central theme that advocates that we be self-consciously 'smart' in regulatory design. Aalders and Withagen (1997) also produce an empirically rich comparative study of health, safety and environmental regulation which explores the familiar limits of command-and-control and argues for a model of reflexive, "conditioned" self –regulation. Both Gunningham and Braithwaite contributed to the design and redesign of self-regulation, which has transcended the command-and-control regulation versus deregulation debate discussed before. These proposed creative concepts, according to Moran (2002, p.399) "begin(s) to answer the critical question: when can one safely abandon command and control in favour of more subtle strategies?" Gunningham and Grabosky (1998, p.54)

figure out the core answer to this question for industrial regulation is, "when an industry perceives a 'community of shared fate'—when poor performance on the part of one damages the collectivity".

Teubner has a similar view on regulatory design to Braithwaite, which is inspired by Habermas and Luhmann. In Teubner's 1993 book *Law as an Autopoietic System,* he points out that Luhmann sees the condition of highly complex societies as constellations of self-steering systems and law itself is autopoietic in nature:

> Law produces internal models of the external world, against which it orients its operations, through information produced internally […] it is a closed autopoietic system operating in a world of closed autopoietic systems" (1993, p.97)

From this sense, Moran (2002) concludes that Teubner's solution of regulatory design looks strikingly like Braithwaite's, which emphasizes reflexivity, within which other sub-systems will operate.

There is also a literature on regulatory thinking with broader analytical ambitions, mostly inspired by the work of Foucault. All the main themes in Foucauldian analysis are compressed into Rose's book (1999)—the broadening of the conventional language of "government" into a wider conception of "govermentality", a notion designed to suggest that systems of control go beyond conventional instruments of the state (the emphasis is on the historical foundations of regulatory structures); and the emphasis on regulation as a project that involves the reconstruction of social understanding, such that effective systems of control are those that involve the internalization of control norms. Chapter Four, which follows, will further discuss the literature of "govermentality" and other regulatory theories which advocate exploring "third way" approaches that transcend the oscillation between command-and-control and self-regulation. The notions of 'reflexivity', 'responsive regulation' and 'smart' regulation among these "third way" approaches are discussed and woven together to develop a dichotomy as a benchmark to evaluate the Basel II three-Pillar framework.

However, returning to the main theme of this chapter, viz the implications of the oscillation between command-and-control and self-regulation approaches, the chapter

now will explore the implications for prudential control of the financial sector as it transited from the pre-deregulation period to the financial deregulation period.

3.3 History of Prudential Control Regulation

There is no universal conception of what constitutes prudential regulation. Government always controls the activities of financial markets and financial institutions. Banks, particularly, are highly regulated in contrast to other non-bank financial institutions (NBFIs). The regulations on these institutions are normally labelled 'prudential regulation', and the process directed primarily at monitoring and sometimes directing individual banks in order to ensure that they obey regulations and do not behave imprudently is termed *supervision* (Gardener, 1986)[89]. In the basic context, financial governance has two components: prudential supervision, bounding the financial risks of a set of financial firms or markets; and lender-of-last-resort intervention which has been discussed in Chapter Two (Dymski, 2008).

Broadly prudential control of the financial sector experienced certain changes as a result of the trend to "deregulation" that began in the 1970s in developed economies, such as the U.S., UK and Australia. This trend later spread to the rest of the world.

3.3.1 History of Changes in Financial Sector

Between the Second World War and the late 1970s, the financial systems of developed economies were heavily regulated, such as in Australia, U.S. and UK. There were controls over many aspects of finance, domestically via regulation of the quantity, type and pricing of banking services, and externally through a managed exchange rate system and the regulation of foreign exchange and foreign bank entry. After serious financial crises and with the arguments of the poorer performance of the banking sector (i.e. decreased market share compared to their NBFI competitors) raised by academics and industry itself, there was a major redirection of policy, from the early 1980s on, and the financial system was deregulated.

[89] Some authors have used the terms 'prudential regulation' and 'supervision' interchangeably. Gardener (1986, p.33) argues banking supervision is concerned fundamentally at the "micro-level" with the financial health or safety of individual banks where the primary aim of supervision is to help ensure that soundness is maintained in the banking system. Prudential regulations, in contrast, are broader with concerns like the risk of the system as a whole, its stability, and the depth and strength of the main markets dealt in by banks.

3.3.1.1 Pre-deregulation Period

During the pre-deregulation period, the interest rates that banks could charge on loans and pay on deposits was tightly controlled within narrow bounds. Banks were subject to directives on the overall quantity of loans and there was moral persuasion in relation to industries to which loans should or should not be made. Furthermore, financial institutions were highly specialized, with trading banks lending to business, saving banks to households, and with finance companies providing more risky property loans and consumer credit.

3.3.1.1.1 U.S before Deregulation

In the U.S, as in all the developed economies, in the Bretton Woods period, financial risks were bounded. Exchange rate risk was largely moot because exchange rates were fixed. Default risk rose largely during downturns. And in the 1950s and early 1960s, liquidity risk was virtually unknown: the savings that supported asset positions were largely held on the balance sheets of depository institutions; and these latter institutions' liability rates were capped by low regulatory rate maxima. Because borrowing markets were undeveloped at that stage, banks' lending was limited to the extent of the readily available deposit funds to which they could lay claim, which implied there were market-scope boundaries that both restrained liquidity risk and checked the extent of default risk.

In the 1970s, commercial banks in the U.S faced restrictions on interest rates, both on the deposit and lending sides of their business. They were restricted for the most part to classic financial intermediation—deposit-taking and lending[90], and banks were limited in the geographic scope of their operations[91]. However, the fixed exchange rate system was under increasing pressures[92], and systematic price inflation in the mid 1970s also put increasing pressure on banking systems. Financial markets grew more

[90] Also the areas like underwriting many corporate securities and insurance products.
[91] No state permitted banks headquartered in other states either to open branches or to buy their banks, and many states prohibited or restricted intrastate branching.
[92] The pressures were many. The UK tightened exchange controls in 1966, and then devaluated the pound sterling by 14% in 1967. The accelerating Vietnam War and inflationary pressure worsened the U.S. external balance and heightened the overvaluation of the dollar. Finally, the convertibility of the dollar into gold was suspended in 1971. The dollar was permitted to float against gold in 1973, and immediately tumbled in value. The transition from the Bretton Woods system was traumatic: a severe oil-price shock and recession in 1973-74, accompanied by continually accelerating price inflation (Dymski, 2008).

complex, and began to escape the purview of government regulators. Liquidity risk increased, both because of large banks' liability management and because of disintermediation. Funds leaked out of the system of regulated intermediaries. Furthermore, in the case of the U.S., while it was not recognised at the time, cross-border default risk was rising precipitously for banks [93](Dymski, 2008).

By the end of the 1970s, the U.S and global macro economies were in disarray, and they abandoned Keynesian theories which were dominant during the earlier depression period, to overcome the crisis of confidence in the U.S. financial and economic system by killing off inflation. Hobbled by consequent disintermediation and high interest rates, the U.S. banking system was substantially deregulated with the 1980 legislation (Dymski, 2008). The pressure of the 1980s that promoted efficient deregulation came largely from outside of the American banking system, and mandated efficiency-enhancing changes that would permit banks to survive. This competitive pressure from abroad was reflected in the significant loss of U.S banks' domestic and international market shares in the 1980s. The growth of securities markets, and increasing competition from mutual funds, pension funds, the commercial paper market, and NBFIs like finance companies and credit unions all added to the pressure to improve the efficiency of banks. The U.S. bank regulators were faced with a choice between regulating less and having less to regulate. The dismal prospect of overseeing a shrinking banking sector galvanized the Federal Bank to coax Congress into bank deregulation (Edwards and Mishkin, 1995; Calomiris, 2000).

3.3.1.1.2 UK before Deregulation

UK supervision has been grounded historically on the principles of flexibility and informality. It had always been a varying mix of self-regulatory arrangements, moral suasion and self-imposed constraints. There had never been a tradition of legislative regulation or a comprehensive legal framework governing the regulation of financial institutions in the UK and supervision of banking had always been quite flexible[94]. The traditional stance of the Bank of England, as central bank, had been not to seek substantial legal powers but to rely on informal surveillance and prudential oversight

[93] The reason is American banks competed to make Latin American loans.
[94] This is a feature that distinguishes the UK system from that of most other countries including the US, and also Australia.

based upon its substantial authority and central role in the financial system[95]. Formal regulation and supervision of banks in the UK was not developed until 1970s[96] in response to the UK financial system becoming more complex and more competitive with the numbers of institutions increasing substantially[97]. In this environment, the traditional approach became less viable, which was one reason why the UK regulatory and supervisory regime in finance became more formal and focused on achieving the goals of investor protection and curbing systemic risk (Abdelhamid, 2003).

3.3.1.1.3 Australia before Deregulation

Between the early 1940s and late 1970s, Australia had a two-tier financial system, consisting of regulated trading and savings banks, subject to the Banking Act, and non-bank financial institutions (NBFIs) that were relatively free of regulation. The rationale behind this system was that financial intermediation was largely synonymous with banking when the regulations were imposed at the beginning of the post-war period (Merrett, 1991, p. 8; Schedvin, 1992, ch.1)[98]. After the Second World War, the 1945 *Banking Act* gave the central bank, initially the Commonwealth Bank (CBA), then the Reserve Bank (RBA) from 1959, regulatory powers over the banks under the influence of Keynesian theory that emphasised the economic responsibility of government as discussed before. The primary purpose of the regulations at that time was not prudential but to deliver macroeconomic control (Fitzgibbons, 2006). In the 1970s, a combination of economic changes increased the burden of the regulations and further weakened the competitive position of the banks relative to the NBFIs (Harper, 1985, p.i). From the 1950s and 1960s, a number of NBFIs [99]emerged outside the regulated banking sector, including finance companies, merchant banks, building societies and credit unions, and began to challenge the dominance of the banks. The rise of the NBFIs was partly due to the bank regulation that reduced their capacity to adjust to changing conditions and imposed a cost disadvantage on them; and the

[95] The cultural tradition of regulation, historically important in the evolution of regulation and supervision of the British banking system, was for the Bank of England to rely on personal knowledge of the bankers themselves.
[96] This is a delay which can be compared to other countries such as U.S. and Australia.
[97] This is partly due to the entry of foreign institutions coming from countries where regulation is highly logistic and are concerned about benefiting from UK style of supervision.
[98] During the Second World War, the National Securities legislation gave the government regulatory powers over the banks in order to divert resources to the central bank.
[99] Some NBFIs were subject to some state government controls, but these were much less onerous than the control over banks (AFSI, 1980, P. 100).

increasing development of the economy and the consequent need for a more sophisticated financial system (Arndt & Stammer, 1965, p. 187; AFSI, 1980, pp. 97-9; Carew, 1991, p. 110; Goldsmith, 1969). The emergence of NBFIs and other institutions in financial markets, squeezed the market share of banks in Australia[100], the following table (Table 2) shows the changes of market shares among banks, NBFIs, superannuation, managed funds and others and the Figure 2 shows the shrinkage of bank assets over 1963 to 1988.

Table 2 : Assets of Financial Institutions (% of total)

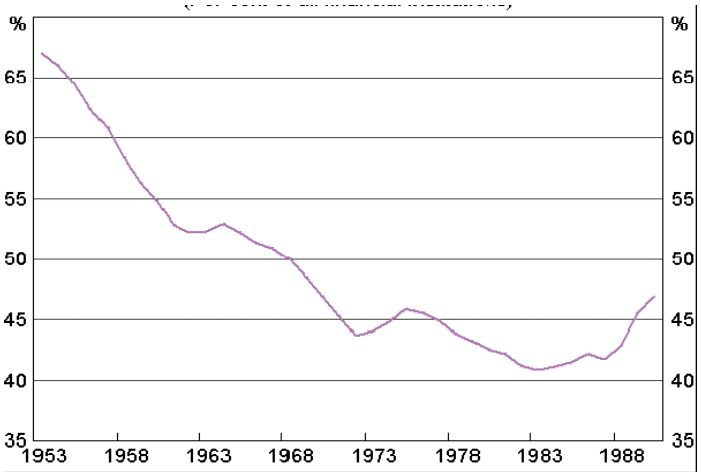
	1955	1960	1970	1980	1985	1990	1995	1998
Banks	64	54	46	42	41	44	46	43
NBFIs	10	17	20	30	28	19	14	12
Life and Superannuation	22	23	25	19	19	22	27	29
Other managed funds	1	2	1	1	4	6	6	8
Others	3	4	7	8	8	8	7	8

Notes: excludes assets of the Reserve Bank of Australia

Source: from Kent & Debelle, 1999.

[100] A similar situation occurred in the U.S before deregulation - there was also a dramatic shrinking of market share of banks in 1980s, due to NBFIs, mutual funds, pension funds and others. Refer to p. 14.

Figure 2: Bank Assets (% of all financial institutions)



Source: from RBA, 2001, p.2

From the end of the 1970s and into the early 1980s, the view that free and open financial markets would improve the effectiveness of policy, the operation of firms and the well-being of households became more widespread, particularly among policy-makers (Brouwer, 1999). Hence, Australia started liberalizing its financial markets[101]. Before that, interest rates in the Australian financial sector were still controlled by the authorities, strict limits were placed on bank lending, financial institutions were required to buy government securities at non-market prices, and movements of capital into and (especially) out of the country were tightly controlled.

Globally, due to the growth in non-bank financial institutions (NBFIs) and off-balance sheet activity, regulators came to the view that the banks were excessively controlled, as reflected in declines in their profitability relative to the new NBFIs. Some commentators argued that excessive control had hampered innovation, making it hard for creditworthy borrowers to get loans (Battellino, 2007). Harper (1985, p.5) commented that the financial regulations "had always disadvantaged banks to some extent relative to non-banks", as evidenced by loss of banks' market share over the 1960 and 1970s. He further concludes that these economic factors were the catalyst that led to deregulation because they greatly accelerated the decline of the banking sector relative to the NBFIs and led the banks to reassess their attitude towards

[101] The domestic financial system and the capital account were reformed more or less simultaneously. The deregulation of bank operations came notably with the removal of controls over interest rates on certificates of deposits in September 1973, other bank deposits in December 1980, and loan rates in April 1985.

regulation. In particular, Harper regarded the advent of inflation, technological advances[102], and the internationalization of markets as the most important causes of deregulation, because they "significantly altered" the impact of the regulation to the disadvantage of the banks (1985, p.i). These views led to the promotion of a neoliberal "free market" model based on financial deregulation by policy-makers that would supposedly enable the banks to compete more effectively with their non-bank counterparts.

3.3.1.2 Financial Deregulation

Friedrich Hayek and Milton Friedman argued against government intervention in fiscal policy. In empirical practice, their ideas were embraced by conservative political parties in the US and the United Kingdom beginning in the 1980s. The neoliberal era has been characterized in the financial area both by financial-market integration and banking deregulation.

Broadly speaking, there were two major aspects to this new era of financial deregulation: the first being macroeconomic in nature characterized by such policies as the floating of the exchange rate and the full implementation of the tender system for selling debt to the public. The second aspect impacted on financial intermediaries, primarily the banks. The major policy changes included the abolition of both interest rate controls and credit guidelines, and the entry of foreign banks, which was designed to increase competition in the domestic market. This aspect of financial deregulation received the most criticism, because it was argued that increased competition actually forced banks to change their activities and increase their appetite for risk, in an environment of heightened financial innovation. Further, there was a widespread belief that this contributed to a surge in credit that contributed to a subsequent boom and bust cycle in asset prices (Macfarlane, 1995). During the period of deregulation, a few large consolidated banks, nicknamed "supermarkets", were formed with activities spanning almost every form of investment in the financial market including the securitisation market, mortgage brokerage and electronic banking. Relaxed regulation enriched banks and triggered a willingness on the part of investors to consume credit products. In turn, governments were encouraged to fight

[102] The technological changes greatly increased the opportunities for, and lowered the cost of, financial innovations, enabling the NBFIs to develop services that were close substitutes for bank services.

inflation aggressively by adopting high interest rate. In response to periods of tight-money, financial institutions became willing adopters of financial innovations, which made the supply of credit ever more elastic. To give the reader a fuller picture of the impact of financial deregulation in developed economies, the following section outlines the experiences of the U.S, UK and Australia.

3.3.1.2.1 Financial Deregulation in UK

Financial deregulation in the UK mostly started during the second half of the 1980s (but the first action actually has been undertaken since 1970s) and followed the main cultural traditions of the UK, namely self-regulation, albeit within a statutory framework. Although investors and foreign institutions welcomed the regulation of the British market on a more formal basis implemented in early 1970s as elucidated before, the domestic institutions recognised the regulatory compliance burdens that were entailed in its implementation. The UK deregulated system of supervision converged to a large extent on the US regulatory mode due to the presence and operation of a large number of aggressive and competitive American institutions who were not fully acquainted with UK traditions. There are a few major *steps* in the UK financial deregulation including: (1) the phasing out of direct monetary controls[103] in 1971; (2) floating of sterling in 1972; (3) the abolition of exchange rate control in 1979; (4) reform—Big Bang in the London Stock Exchange in 1986; and (5) deregulation of building societies after the *Green Paper*[104] in 1984-1987 (Hall, 1987). Calls for the reform of supervisory arrangements governing the activities of both banks and NBFIs in UK were made after the collapse of Johnson Matthey Bankers in 1984 (in Australia's case, reform followed the 1981 Campbell Inquiry), while the supervision of building societies was to be amended in the light of the diversification opportunities offered under the Building Societies Bill of 1985[105]. The reform of

[103] Such as abolishing the clearing banks' interest-rate cartel, and replacing the 8% cash ratio and 28% minimum liquid assets ratio imposed upon the clearing banks alone, with a *minimum reserve asset* ratio applied to clearing banks, secondary banks and large finance houses.

[104] The response of the government to the call for an amendment to building society legislations came in the shape of this Green Paper (Building Societies: A New Framework) published in 1984. With respect to the provision of new financial services, and subject to the general principle of ensuring they continued primarily in their traditional roles, the legal restrains under which they had operated were loosened so they could develop in other fields (Hall, 1987, p.101)

[105] In 1985, according to the Banking Supervision White Paper, banks operating in UK would remain subject to authorization procedures, the assessment of capital and liquidity adequacy and the adequacy of internal control and inspection procedures, a compulsory deposit insurance

prudential control in the financial sector of the UK economy is argued by Hall (1987, p. 150) to have involved a degree of "reregulation" with deregulation in the monetary controls sector, in contrast to the traditional self-regulation type of prudential control undertaken before[106].

3.3.1.2.2 Financial Deregulation in U.S

The U.S's deregulation process eliminated the extensive government guidelines that segmented financial product markets, limited banks' geographic expansion, and governed many financial-market prices. The start of the deregulation process in the U.S was symbolised by the passage of legislation by the federal government during the 1980s, such as *Depository Institutions Deregulation* and *Monetary Control Act*, and also *Garn-St. Germaine Depository Institutions Act* (1982) which diminished distinctions between banks and NBFIs; and also the interest rate ceilings on deposits were phased out in the early 1980s (Calomiris, 2000).

National legislation in 1982 loosened thrifts' investment rules and expanded secondary markets for mortgage debt[107]. The thrift system's default and liquidity risk problems were solved through the combination of a massive federal bailout and an enhanced securitisation mechanism, for moving mortgage loans off banks' balance sheets. In the U.S, the restrictions on the entry and activities of overseas banking firms were gradually softened or eliminated (Abdelhamid, 2003). Beginning in 1987, the Federal Reserve Board used its authority to relax restrictions on bank underwriting activities. The Federal Reserve also pressed for the relaxation of the branching and consolidation limits[108].

After financial market deregulation, economic commentators championed the virtues of the increasingly deregulated U.S-style system of corporate governance (La Porta, 2007; 2008). Irrespective of whether corporate finance is sourced from banks or from equity markets, which unavoidably changes the risk-taking activities of banks in the

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scheme, lending limits, existing foreign exchange guideline, and NBFIs guidelines, in contrast to changes made in building societies.

[106] As above few steps of deregulation and the historical review in previous section 2.1.1.2 show, UK has experienced from flexible and informal regulation, to formal prudential control, then as influenced by deregulation trend worldwide, to implement a deregulation but with a degree of "reregulation" in certain sector of the financial system, i.e. Big Bang in Stock Exchange.

[107] Since some thrifts held state charters, not federal charters, numerous state regulators also loosened the rules on thrifts' permissible activities.

[108] It culminated in the passage of a federal interstate branching law in 1994.

more competitive deregulated market detailed in the following section, the crucial issue became whether the 'cushion' of regulations and legal structures within any given nation gave effective protection to those responsible for providing external investment finance to productive enterprises. In this context, economists identified a strong, if not inevitable pressure for convergence towards US "benchmarks" for systems of corporate governance around the world[109] (Froud; Haselm; Johal and Williams, 2000). Juniper (2006) argues that at the height of neoliberal enthusiasm for the unfettered market, the US financial system was praised for the support it gave to executive remuneration in the form of stock-options, which allied the interests of shareholders with those of management and allowed firms to compensate talent even before they received anticipated returns. At the same time, a fecund mix of savvy philanthropists or "business angels", second-boards, and risk-hungry venture capitalists is seen to support highly risky but highly rewarding corporate investment in the new "dot-com" technologies (Lazonick and O'Sullivan, 2000). With the demise of the dot-com boom in the early 2000s, the euphoria over the US system rapidly receded to be replaced by a new cycle of re-regulation. In the US, this included the formalised separation of auditing functions from those of consulting on the part of the big accounting firms. The observers recently began to raise increasing doubts about the convergence hypothesis. In particular, bank-based systems are seen to possess valuable attributes. While equity-based systems had to be policed through an increasingly complex and opaque system of market self-regulation, corporate legislation, and layered prudential controls, across overlapping jurisdictions, bank-based systems are susceptible to control through a single, and increasingly market-oriented system (Rhodes and Appledorn, 1998; Lannoo, 1999).

3.3.1.2.3 Financial Deregulation in Australia

In Australia, neoliberal policies have been embraced by governments of both the Labor Party and the Liberal Party since the 1980s. The governments of Bob Hawke and Paul Keating from 1983 to 1996 pursued economic liberalization and a programme of micro-economic reform. Stress was laid on national competition policy, privatization of government corporations (including the Commonwealth Bank),

[109] This includes the higher levels of venture capital activity, unprecedented growth in remuneration for CEOs and other senior-executives, and increasing resort to stock option-based systems of incentive.

reform of factor markets, floating of the currency, and reduction on trade protection. Later, when the Liberal Party returned to power in March 1996 under Prime Minister John Howard, the programme of economic liberalization was continued with the privatization of more government corporations, and a formal charter of independence of the Reserve Bank of Australia (RBA) (Clyde, 2003).

Following the Campbell Inquiry in 1981, whose intention was increasing monetary policy effectiveness and reducing the inefficiencies of the financial system created by the differing regulatory treatment of banks and NBFIs, the banking system was deregulated and arrangements for prudential supervision were introduced. From the introduction of the history of the RBA, on its website, comes the statement:

> "In the five years following the appointment of a major financial system inquiry (the Campbell Committee, 1979), the Australian financial landscape was transformed to a virtually *fully deregulated* system. At the same time, the RBA gradually built up *a specialized banking supervision function*"

The key reform on the international side was the floating of the exchange rate[110] and the removal of most capital controls in 1983[111]. Other important regulatory changes which affected the composition of banks' balance sheets and their cost structure were the replacement of the Liquid Government Securities (LGS) ratio with the Prime Assets Ratio (PAR) in 1985 and the removal of statutory reserve deposits in 1988. However, the liberation in Australia did not proceed along a straight path. In the 1980s, the banks engaged in an aggressive search for earning and asset growth, adopted high risk portfolios, dropped prudential standards, and did not offset this by any increase in liquidity or capital adequacy ratios. In the 1980s and 1990s, the central bank realized there was need for prudential oversight or controls because the banks had operated for decades as credit rationers to low risk clients. As a result, one of the

[110] Brouwer (1999) argues that floating the exchange rate improved the control of the Reserve Bank of Australia (RBA) over domestic liquidity.

[111] The prior history of deregulation of the capital account was not one of uniform movement towards a deregulated system: in the 1970s, controls on capital inflows were intensified or moderated a number of times in response to the strength of those flows and the authorities' intention to control them (Brouwer, 1999).

key tasks of the Wallis Inquiry in 1997 was to put in place a system of prudential oversight and controls (Brouwer, 1999).

The Wallis Inquiry Report in 1997 put in place a structure designed to improve the competitiveness and efficiency of the Australian financial system while preserving its integrity, security and fairness. The Wallis Inquiry recommended strengthening the surveillance of financial intermediaries by combining existing supervisory institutions into one, thus a single prudential regulatory agency—the Australian Prudential Regulatory Agency (APRA) was established in 1998 with the task of overseeing a wide range of deposit taking financial institutions, insurance companies, life offices and superannuation funds. This shifted the responsibility for supervising banks and protecting depositors away from the RBA[112] to APRA. APRA has been provided with comprehensive powers, including over licensing of deposit-taking institutions, particularly banks[113]. Simultaneously, intervention powers to manage failure have also been improved. Amendments to the *Banking Act 1959* both clarify the mechanisms by which the prudential regulator may take control of a troubled deposit-taking institution, and allow the prudential regulator to appoint an administrator for that purpose[114] (RBA, 1998). During deregulation, the barriers to competition were broken down until further financial innovation, such as development of securitisation markets, mortgage brokers and electronic banking, took place (Battellino, 2007). Particularly the emergence and boom of securitisation markets triggered the change in bank behaviours from intermediaries to brokers. The subsequent section will explore this aspect. Following financial market deregulation, domestic financial institutions had to compete with foreign financial firms[115] both in the domestic marketplace and in the world marketplace for financial services[116]. Table 3 shows the increased presence of foreign banks in the Australian financial markets.

[112] Reserve Bank maintains the responsibility for ensuring that shocks to any part of the financial system do not ultimately threaten the stability of the Australian economy.
[113] APRA has power to make standards on prudential matters in relation to authorized deposit-taking institutions.
[114] While these statutory management powers provide the means for control in a crisis, APRA also has the option of using less direct strategies, such as facilitating the takeover of a troubled institution or its business by other sound institutions.
[115] Some bankers were worried of losing protect from regulations and face the competition brought by foreign banks, in contrast the younger bankers are normally positive about deregulation.
[116] Further liberalization and entry occurred from the early 1990s, to now, there are no limits on the number of foreign bank branches or subsidiaries opening in Australia. Nevertheless,

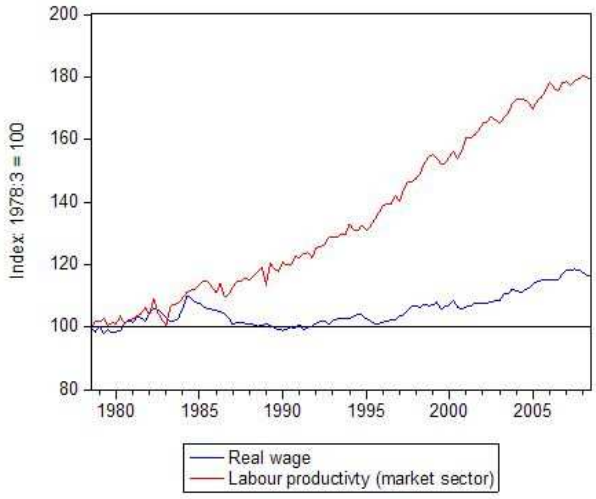
Table 3: Authorized Foreign Banks in Australia (Numbers of firms)								
	1984	1986	1988	1990	1992	1994	1996	1998
Branches	2	3	3	3	3	8	17	24
Subsidiaries	0	15	15	15	14	13	13	12
Total	2	18	18	18	17	21	30	36
Share of total bank assets (%)	1	6	9	12	11	12	15	17

Source: from Kent & Debelle, 1999

Deregulation of banking operations gave banks responsibility, allowing them to shift from simple credit allocation to liabilities management in the face of market-determined demand for credit. Edey and Hviding (1995) argue that liberation with deregulation has improved internal efficiency in banking firms, as shown by declining operating costs and some fall in interest margins. It has improved allocative efficiency by removing distortions in relative funding costs and providing greater opportunities for international portfolio diversification. Finally, it has reduced liquidity constraints and so enabled households to better smooth consumption over time. That is evident in Australia's case from, for instance, the substantially increased housing finance (refer to Figures 5 and 6), improved risk diversification, and increased reliance on external finance for investment and consumption, and the boom in the credit market. However, within these developments were sown the seeds of financial instability and the signals that the market was moving towards the dangerous fringe (source from Mitchell, 2009). This is reflected in the following figures: the simultaneous decrease in real wages and dramatic increase in productivity (as shown in Figure 3); the decrease in the total wage share of GDP (as shown in Figure 4); and the decreasing household saving ratio (as shown in Figure 7).

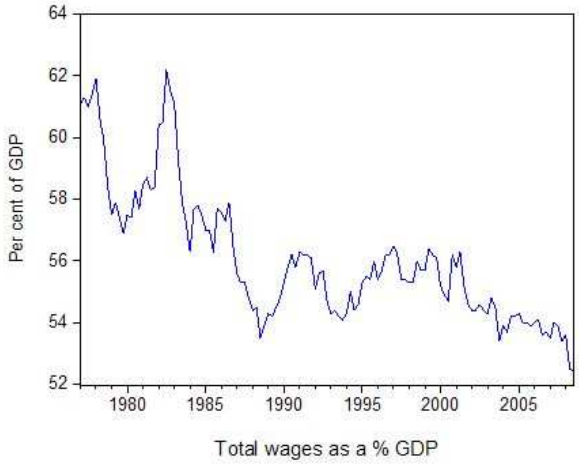
applicants for a banking authority have to satisfy the criteria set down in the APRA's Prudential Statements J1 and J2.

Figure 3: Decrease in real wage and increase in productivity



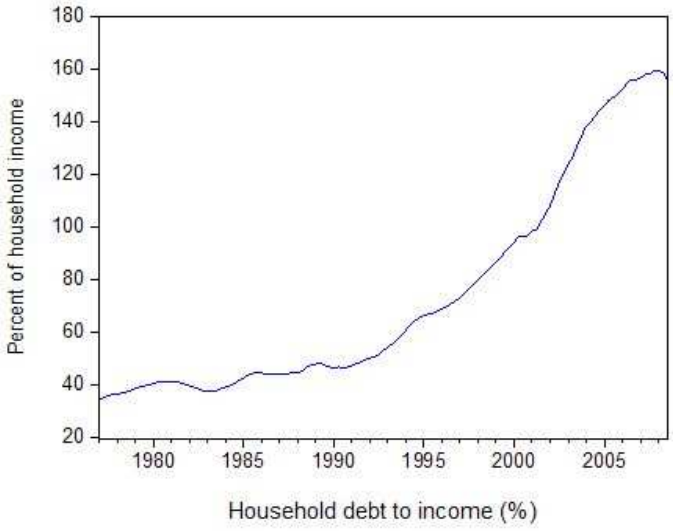
(Source from Mitchell, 2009)

Figure 4: Decrease in total wage share of GDP



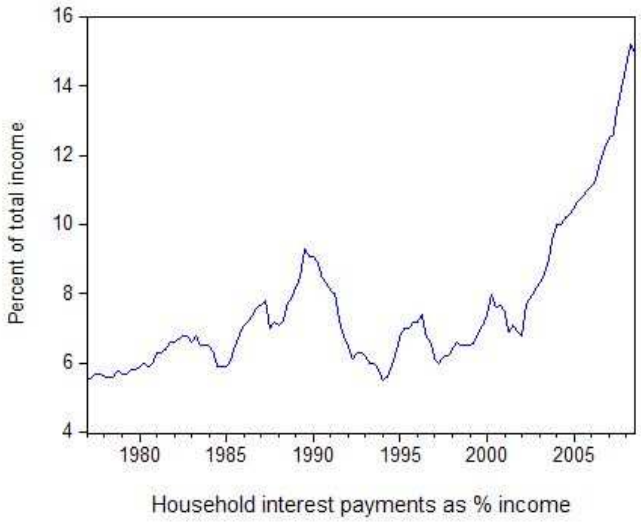
(Source from Mitchell, 2009)

Figure 5: Increase in household debt to income ratio



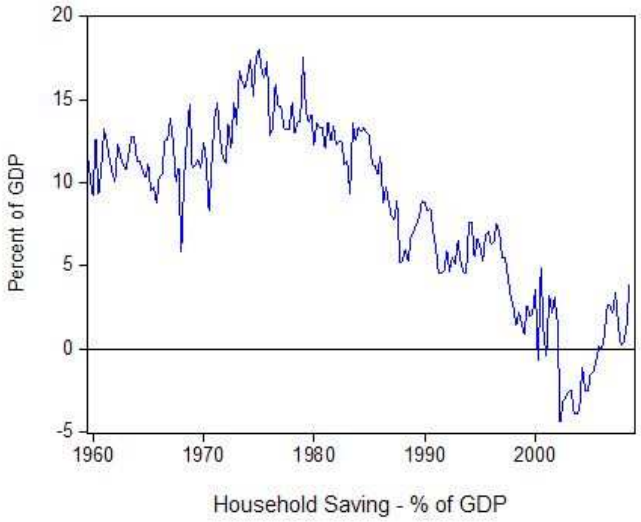
(Source from Mitchell, 2009)

Figure 6: Household interest payments as percentage of income



(Source from Mitchell, 2009)

Figure 7: Decrease in household saving ratio



(Source from Mitchell, 2009)

Australia and other OECD countries, such as the UK, experienced, in the late 1980s and early 1990s asset price bubbles and deterioration in the quality of bank assets. In Australia's case, easier access to funds, and intense competition between the banks for new business, generated an expansion of credit for investment, particularly in commercial property. The financial position changed from hedge, to speculative, and towards ponzi. Brouwer (1999) argues credit standards, on the whole, were loosened. When the economy slowed down and the bubble burst, non-performing loans severely eroded the profitability of the banking system, and left many firms over-leveraged which moved the financial position further towards ponzi (Lowe, 1994; RBA, 1996; Mills, Morling and Tease, 1994).

Prudential controls implemented during the deregulation era both responded to, and helped to transform financial institutions. The changes in corporate and financial regulation both reflected and promoted a fundamental global transformation in the nature of bank lending. Banks themselves moved away from their traditional roles of mediating between household depositors and firm borrowers, to become brokers negotiating complex deals between investors, corporate borrowers, and providers of collateral in the form of securitized assets. The following section discusses and

reveals how this change occurred in banks' risk-taking activities after the financial market was deregulated.

3.3.2 Change of Bank Activities

The deregulation of the financial market, increased flexibility, lax oversight and unprecedented competition lead to dramatic changes in the role of banks within the broader financial market. The most obvious sign of this shift was a change in the role of banks, which moved away from being simple financial intermediaries to being brokers.

3.3.2.1 The Shift from Financial Intermediation to Brokerage

In past decades, banks have mainly acted as financial intermediaries between households and firms, a role which made them a central institution of post-war economic growth. As the 'middle man', banks organized the overall savings-and-investment process by transforming short-term and volatile deposits primarily sourced from households into long-term loans to companies requiring financial resources for investment purposes.

In moving from intermediation to brokerage, banks now operate by bringing together investors, borrowers, providers of securitized assets, those offering hedging services, providers of insurance on mortgages and other securitized assets (Gorton & Winton, 2003). After the opening of the commercial paper market to the banks' NBFI rivals after deregulation, banks started to lose their advantage. Therefore, banks became increasingly active as players in the structured finance market. The fee income for originating loans now accounts for a large proportion of bank profits. In functioning as collateral in contracts with borrowers, securitized assets help to dramatically reduce capital adequacy requirements. However, each form of securitisation has the potential to become a source of financial fragility.

3.3.2.2 Structured Finance Products

In general, securitisation is a form of financing in which the cash flows associated with the existing financial assets are used to service funding raised through the issue of asset-backed securities (ABSs). It consists of transferring illiquid assets (i.e. loans) to an independent company named the *Special Purpose Vehicle* (SPV) controlled by a

trustee. The SPV buys the loans to the bank and funds itself by issuing securities that are backed by them. To improve the marketability, usually, banks provide some form of credit enhancement to the structure, by, for instance, granting a subordinated loan to the SPV. These SPV issued debts are structured in various degrees of seniority and the banks buy the lowest one. So the repayment of the SPV's debt is made with the cash flows generated by the securitized loans[117]. The securities bought by investors have a better quality than the underlying loans because the first losses of the pool are absorbed by the equity tranche. This creates attractive investment opportunities for investors, but it implies that the main part of the risk is still in the bank's balance sheet, because banks treat the sale of assets to SPVs as true sales even though they retain the underlying risk through credit enhancement to the ABS (Balthazar, 2006, P. 34-5).

As a "market-oriented" financial practice, securitisation activity is highly sensitive to changes in the market and depends heavily on liquidity (Wray, 2008). By converting non-marketable credit instruments into publicly traded securities, securitisation can allow the financial institutions to continue to initiate mortgages even when their funding capacities are low, which implies the absence of limits to credit creation on the part of banks. Moreover, the active involvement of banks in the securitisation market has partly been driven by the need to supplement fund income with fee income (Wray, 2008:3). It is argued that securitisation spreads risk across several financial sub-sectors, only a fraction of which - banks- were under a prudential-oversight umbrella. Other NBFIs are comparably less oversighted and SPVs are generally not included in the balance sheet for regulatory purpose (Dymski, 2008).

Securitisation increases the dependence of banks on the originate-to-distribute (OTD) model, which separates the banks' initiating activities in the securitisation process from their capital holding activities. This is a kind of 'remote origination' where credit enhancements are treated as direct credit substitutes in the securitisation process, and they are then treated as any other credit guarantee for capital requirements purposes. This implies SPVs rather than the bank itself originates the securitized assets. Banks never own the underlying assets. They simply are liable through the credit enhancement offered to gain fee income, which also implies banks have turned

[117] The more senior loans are paid first, and so on, until the 'equity tranche' is exhausted—the more junior loans are often kept by banks.

to fee-based activities instead of traditional interest income-based financial intermediation.

Undoubtedly, securitisation has operated to spread bank risk more broadly to whoever can handle it on the market and it also helps to optimise capital management of banks. This leads to a growth in securitisation, for instance, in one of the most "popular" securitisation products—Collateralised Debt Obligations (CDOs). CDOs are created by carving the cash flow from the underlying asset into various categories or tranches, each possessing different risk characteristics and distributions.

However, this OTD business model on which banks relied, raises the issue of disconnection between banks acting as brokers, those offering securitised assets, the actual originators of the assets that are going to be securitized, and those providing hedging and insurance services in relation to the assets. Accordingly, Juniper (2006) argues those generating the IOUs are lending in the knowledge that many sub-prime borrowers would be unable to honour their repayment commitments, while ratings agencies ignored the incipient danger because the associated insurance-risk was supposedly on-sold at an appropriate price to those who could manage it effectively.

Similarly, Dymski (2008, p.18) states that the neoliberal age has been accompanied by rapid advances in technological and market capacity, which have permitted financial intermediaries that originate risky assets to sell them to other entities. This disconnection between the "locus of risk-creation and that of risk-bearing" has encouraged financial intermediaries to adopt what he terms "liquidity-intensive strategies", which generate net income from fees more than from interest margins. This disconnection actually complicates the prudential oversight.

While bankers, investors and even credit rating agencies enjoyed new prosperity from the securitisation market, the seeds of instability were being sown as discussed in the previous section of the chapter. Juniper (2006) further argues that in the wake of the global financial crisis, which still threatens accumulation in both the developed and the developing world, neoliberal policies are under sustained attack in the name of a return to high levels of government intervention. Dymski (2008) says that the neoliberal era has seen an increase in the occurrences and depth of financial risk.

3.3.3 Implications for Regulation of Banking System

The changes to prudential regulation, following the adoption of deregulation policies in most economies of the world, liberalized the economic environment in which banks operated, and thus caused the transit of banks' behaviour from acting as financial intermediaries in the saving-investment process to being brokers in the structured finance market. Consequently, banks are tending to rely more on fee income instead of interest income, and their risk appetite is changing as is evidenced by their broader risk-taking activities including increased off-balance sheet activities. The boundaries between various kinds of risks are blurred so that the interaction between different risks is deepened. All this challenges and impacts on the prudential control of banking systems, particularly the risk-based capital standard, and the risk evaluation and management at industry level. These developments directly trigger the evolution of the International Capital Adequacy Requirement from a mere framework to inner content.

3.3.3.1 Pre-Basel Prudential Control

Prior to the implementation of the 1988 Basel Accord—Basel I, bank capital was regulated by imposing uniform minimum capital standards regardless of banks' individual risk profiles, and their off-balance sheet positions. The increased international competition among banks during the 1980s, particularly after loosening entry for foreign banks, emphasized how inconsistently banks were regulated with regard to capital[118]. The major increase in off-balance sheet activity by banks that took place in the 1980s altered the risk profile of banks, while the regulatory requirements concerning equity ratios remained the same.

In the mid-1980s, the Bank of England and the Federal Reserve Board became concerned about the growing exposure of banks to off-balance sheet claims. In response; first of all, they strengthened the equity base of commercial banks by requiring that they set aside more capital against risky assets[119]. In addition, the regulators in U.S and UK proposed translating each off-balance sheet claim into an

[118] For example, banks in U.S and UK were required to finance more than 5% of their risky assets by means of equity, while Japanese bank regulations contained no formal capital adequacy requirements, which disadvantage American and British banks (Crouhy, Galai and Mark, 2001).
[119] They demand more capital than before, at least 8% against risk-weighted assets.

equivalent on-balance sheet item, so that capital could be assessed against derivative positions.

After deregulation, financial instability increased accompanied by certain bank failures such as in U.S[120]. Regulatory agencies were forced to focus their attention on risk-based capital standards instead of tighter capital requirements given the higher competition their domestic banks were facing after loosening entry for foreign banks. Further, banks were struggling to adapt to the new systems such as floating exchange rates after many years of relative currency stability. The risk of financial loss to banks due to currency trading, higher competition, complex financial innovation[121] and increasing reliance on external finance was clear while their market share and risk return were climbing up. These issues raised the need for international coordination and harmonization of prudential control measures, particularly in the banking sector to safeguard against global financial instability in the dynamic period.

In Australia, during most of the post-war period, the Reserve Bank of Australia (RBA) had adopted the Statutory Reserve Deposit (SRD) system, whereby a percentage of trading bank deposits was held at the Reserve Bank at below market interest rates; and also the Liquid Assets and Government Securities (LGS) Convention, under which a percentage of trading bank deposits was invested in cash or Commonwealth Government securities. Asset restrictions on saving banks required them to invest a relatively high proportion of their deposits in prescribed assets, mainly government securities issued by the Commonwealth and State Governments. In 1988, the SRD arrangement was replaced with the much less-onerous system of non-callable deposits (NCDs).The successor to the LGS ratio—renamed the Prime Assets Ratio (PAR)—was also substantially reduced due to the trend of moving towards a more market-oriented direction (RBA, 1991).

Prior to the 1980s, bank supervisors in the U.S. did not impose specific numerical capital adequacy standards. Instead, supervisors applied an informal and subjective case-by-case review tailored to the circumstances of individual institutions. In

[120] U.S regulators allowed commercial banks to expand by buying failed saving banks when facing higher competition.

[121] At the initial stage when financial derivatives developed, many of the banks exposed to the mismatch between short-term and long-term funds failed to hedge this exposure. This is partly due to the fact that some of them were not familiar with the risk-shifting mechanism provided by derivatives, particularly for the complex mechanisms such as securitisation.

assessing capital adequacy, regulators stressed factors such as managerial capability and loan portfolio quality, and largely downplayed capital ratios[122]. It was widely held that rigid adherence to fixed capital ratios would preclude the more comprehensive analysis thought necessary to weigh the myriad of factors affecting a bank's ability to sustain losses[123]. During the post World War II period through to the early 1970s, dollar-weighted average capital ratios for the banking industry ranged between 5% and 8%. In response to the later series of bank failures, for the first time, the federal banking agencies introduced explicit numerical regulatory capital requirements. The standards adopted employed a leveraged ratio of primary capital (which consisted mainly of equity and loan loss reserves) to average total assets[124]. Over the next decade, regulators worked to converge upon a uniform measure. By 1986, regulators were concerned that the primary capital ratio failed to differentiate among risks and did not provide an accurate measure of the risk exposures associated with innovative and expanding banking activities, most notably off-balance-sheet activities at larger institutions. Regulators began studying the risk-based capital frameworks of other countries; France, the UK and West Germany had implemented risk-based capital standards in 1979, 1980 and 1985, respectively (FDIC, 2003).

In late 1987 central bankers from the Group of Ten (G-10) countries announced the creation of an international risk-based capital adequacy standard for commercial banks, known as the first Basel Accord—Basel I, which contrasted sharply with the uniform capital adequacy requirements imposed regardless of an individual bank's risk portfolio that had been implemented by regulators for a long time prior to deregulation.

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[122] Supervisors did try to make use of a variety of capital adequacy requirements as early as 1864, when the National Banking Act set static minimum capital requirements based on the population of each bank's service area, but most early attempts at quantifying the notion of capital adequacy were controversial and unsuccessful. In the 1930s and 1940s, state and federal regulators began to look at the ratios of capital-to-total deposits and capital-to-total assets, but both were dismissed as ineffective tests of true capital adequacy. Various studies of ways to adjust assets for risk and create capital-to-risk-assets ratios were undertaken in the 1950s, but none were universally accepted at that time.

[123] For example, the American Bankers Association's 1954 Statement of Principles explicitly rejected the use of numerical formulas for determining capital adequacy in favour of supervisory judgment.

[124] The Federal Reserve Board and the Office of the Comptroller of the Currency announced a minimum primary capital adequacy ratio of 6 percent for community banks and 5 percent for larger regional institutions. The FDIC established a threshold capital-to-assets ratio of 6 percent and a minimum ratio of 5 percent.

3.3.3.2 1988 Basel Accord: Basel I

The 1988 Basel Accord (Basel I) defined two minimum standards for meeting acceptable capital adequacy requirements: an *asset-to-capital multiple*[125] and a *risk-based capital ratio*. The first standard is an overall measure of the bank's capital adequacy. The second measure focuses on the credit risk associated with specific on- and off-balance sheet asset categories (refer to Thesis Annex 2 & 3 as attached) and takes the form of a solvency ratio, known as the Cooke ratio: the ratio of capital to risk-weighted on-balance sheet assets plus off-balance sheet exposures[126] (BCBS, 1988). Under such risk-based capital standards, the size of the required capital cushion would be determined by the risk level of a bank's lending activity, both on and off the balance sheet. Regulators would assign each asset or lending activity a "risk weight" based on the probability of default or financial loss. The goal was to encourage banks to hold lower-risk assets, such as government bonds or loans to established corporations, and to discourage the use of riskier off-balance sheet activities (Reinicke, 1995, p.151). This original accord provided a risk-weighting scheme whereby different classes of assets—such as cash, sovereign debt, mortgages, and corporate loans—were assigned a risk score between zero and 100%. These "risk buckets" [127]ultimately formed the denominator of a bank's capital-to-asset ratio, with the stipulation that the numerator must equal or exceed 8%[128]. The Cook ratio under Basel I has two components[129] (table 4): Tier 1, consisting primarily of shareholder's equity, and Tier 2, consisting of subordinated debt, loan-loss reserves, and other forms of capital. Of the Basel Accord's 8% regulatory capital, a minimum of 4% came from Tier 1 capital, with the remainder coming from Tier 2 (BCBS, 1988).

[125] It is conceivable that a bank with large off-balance sheet activities might trigger this multiple as the minimum capital requirement, but in general the assets-to-capital multiple is not the binding constraint on a bank's activities.
[126] The weights are assigned on the basis of counterparty credit risk.
[127] For the details of risk weights by category of on-balance-sheet asset and also credit conversion factors for off-balance-sheet items refer to Annex 2, and Annex 3 attached.
[128] A bank's investment in a sovereign bond from an OECD country was assigned a risk weighting of zero and thus did not enter the denominator. On the other hand, a loan to a private corporation was assigned to the 100% risk bucket and therefore entered the denominator in full.
[129] Under 1996 Amendment, the Cooke ratio has another component, named Tier 3 capital.

Table 4: Regulatory Capital Elements

Tier 1	Tier 2
a) Paid-up share capital/common stock	a) Undisclosed reserves
b) Disclosed reserves	b) Asset revaluation reserves
	c) General provisions/general loan-loss reserves
	d) Hybrid (debt/equity) capital instruments
	e) Subordinated debt

(More detail refer to Annex 1 attached)

After the promulgation of the accord, two developments occurred: first, the accord quickly became a truly global standard embraced by developed and developing countries around the world; and second, regulators in the Basel Committee—and through the developed world—faced pressure from their domestic banking sectors to address some of the shortcomings of this original agreement.

At that time, the accord's risk-weighting scheme seemed innovative, and it was no doubt an improvement over the pre-Basel type capital requirements in the banking sector that it created a worldwide benchmark for banking regulations[130]. And compliance with the accord soon became a signal to international investors of the creditworthiness and stability of a country's banking sector. However, as the accord became a global standard, regulators and bankers themselves realized that the risk-weighting system was arbitrary, inefficient, and potentially harmful to the broader economy (U.S Shadow Financial Regulatory Committee, 2000). It was argued that the scope of Basel I was limited since it did not address various complex issues related to capital adequacy, such as *portfolio effects*[131] and *netting*[132]. The Accord also

[130] The introduction of a risk-based framework with different risk-weights for different assets' classes, although not reflecting completely the true risk of banks' credit portfolios, is clearly an improvement on the previous regulatory ratios that were used, particularly in the U.S, such as equity, asset, and deposit ratios.

[131] Portfolio effect is the term used to describe various benefits that arise when a portfolio is well diversified across financial instruments, issues, industries, and geographical locations; naturally, a well-diversified portfolio is much less likely to suffer from massive credit losses than is a

completely ignored the problem of setting aside capital adequacy for tradable securities [133] in the trading book (Crouhy, Galai and Mark, 2001, p.53-62). In recognition of these drawbacks, the Basel Committee amended the Accord in 1996. Actually, the Basel Committee addressed one obvious shortcoming of the accord soon after its implementation: its exclusive focus on credit risk at the expense of other types of risks. Therefore, the 1996 amendment incorporated market risk that banks incur in their trading accounts into banks' capital requirements (BCBS, 1996). However other types of risks such as liquidity risks, and operational risks that mainly arose from related technology growth[134] were still disregarded.

3.3.3.3 1996 Basel I Amendment

The 1996 Amendment required financial institutions to measure and hold capital to cover their exposure to the market risk[135] associated with debt and equity positions in their trading books[136], and foreign exchange and commodity positions in both the trading and banking books[137]. Basel I treated all instruments equivalently, whether they resided in the trading or banking book[138], however with deregulation and freer entry for foreign banks to domestic financial markets, there was an increasing cross-border default risk among multinational banks. Thus the 1996 Amendment introduced the requirement of measuring market risk, in addition to credit risk, in the trading book.

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portfolio of deals concentrated with a single instrument, one party, one industry, and one geographical area (Crouhy, Galai and Mark, 2001, p.53).

[132] Netting is a legally enforceable agreement by means of which counterparties can offset their claims against each other on a replacement cost basis, recognizing only the net amount, when there are netting agreements in place, the net exposure of the portfolio to a particular counterparty may be quite small Crouhy, Galai and Mark, 2001, p.54).

[133] For example, government holdings were excluded from the capital calculations.

[134] For example, the growth of information technology, the use of computer science in daily trading, and the growth in electronic-banking services

[135] Market risk arises when there are price changes in debt instruments, equity, commodities and foreign exchange exposures. A bank's market risk exposure is determined both by the volatility of the underlying risk factors and the sensitivity of the bank's portfolio to movements in those risk factors.

[136] A trading book consists of positions in financial instruments and commodities held either with trading intent or in order to hedge other elements of the trading book. To be eligible for trading book capital treatment, financial instruments must either be free of any restrictive covenants on their tradability or able to be hedged completely. In addition, positions should be frequently and accurately valued, and the portfolio should be actively managed (BCBS, 1996, p.5).

[137] These positions include all financial instruments that are marked-to-market, whether they are plain vanilla products such as bonds or stocks, or complex derivative instruments such as options, swaps, or credit derivatives (Crouhy, Galai, and Mark, 2001, p.63).

[138] The most significant risk arising from the non-trading activities of financial institutions is the credit risk associated with default.

In addition to incorporating market risk, one of the important innovations of the 1996 Amendment to the Basel Accord and banking industry risk management was that it officially condoned the use of a self-regulatory approach. This amendment acknowledged internal models based on the value-at-risk (VaR) methodology to assess market risk exposure, since Basel Committee of Banking Supervision (BCBS) and regulators recognised the complexity of correctly assessing market risk exposure, especially for derivative products which appeared in more and more complex forms following the boom in financial innovation triggered by deregulation. Further, regulators accepted that banks were active as brokers in complicated structured finance markets which implied that banks were (knowledgably and technically) familiar with these financial products and could better estimate risks using an "in-house" approach.

The advantage for the banks in adopting an internal model-based approach should be a substantial reduction in regulatory capital, and a more accurate allocation of capital that reflected the actual risk embedded in their positions, compared to the capital charge arising from the standardized approach (Crouhy, Galai and Mark, 2001). To benefit from this capital relief, the 1996 Amendment made it clear that banks must implement a risk management infrastructure that is fully integrated with their daily risk management—in particular, with their setting of trading limits and their risk monitoring of operations (BCBS, 1996). This more qualitative concern with the infrastructure and application of risk management techniques[139] is what is argued to help promote 'sound' risk management systems within banks (Crouhy, Galai and Mark, 2001).

Under Basel I and its Amendment, banks were required to satisfy three capital adequacy standards[140]: first, a maximum assets-to-capital multiple; second, an 8% minimum ratio of eligible capital to risk-weighted assets; and third, a minimum capital charge to compensate for market risk of traded instruments on and off the balance sheet (Crouhy, Galai and Mark, 2001). Under the 1996 Amendment, the Cook

[139] This more qualitative concern with the infrastructure and application of risk management techniques can be traced back to recommendations of a seminal report published by the Group of Thirty (G-30) in 1993 (Crouhy, Galai and Mark, p. 48-53).

[140] In addition to these capital adequacy requirements, the BIS has set limits on concentration risks. Risks that exceed 10% of the bank's capital must be reported, and banks are forbidden to take positions that are greater than 25% of the bank's capital without explicit approval by supervisors.

ratio had an additional component—Tier 3, or supplementary capital, consisted of short-term subordinated debt with an original maturity of at least two years[141] (BCBS, 1996, P.5). In addition, the regulators required that systematic back testing and stress testing be conducted on a regular basis, in order to test the robustness of the internal model to various extreme market conditions and crises[142]. Implementing a VaR calculation is a significant step forward in the history of risk management and banking regulation. Therefore, Chapter Five will discuss the VaR approach thoroughly along with other related notions, such as extreme value theory, to identify when this technique is accurately efficient to support risk management and in what situations, it is not desirable even under the current Basel II framework.

Nevertheless, Basel I, even with the 1996 Amendment, is generally acknowledged to be flawed. *First*, as noted earlier, according to Crouhy's argument (with Galai and Mark, 2001) the Accord does not address complex issues such as portfolio effects, even though credit risk in large portfolios is normally bounded to be partially offset by diversification. *Second*, the lack of risk-sensitivity, since Basel I excluded risks such as liquidity risk, operational risk and other risk types (i.e. reputational risk and legal risk). This shortcoming has been criticized a lot, because it produced a distorted assessment of actual risks and led to a misallocation of capital, which triggered strong incentives for banks to play the game of 'regulatory capital arbitrage'[143]. Banks are tempted to incur lower capital charges while still incurring the same amount of risk by using financial engineering techniques, such as securitisation, with the function of spreading risks from banks' banking books to their trading books, or broadly to other sectors of the financial system. As discussed before, with more and more dependence on the "originate-to-distribute (OTD) model" and the consequent disconnection between risk-creation and risk-bearing, the quality of the assets remaining on the

[141] Tier 3 capital will be limited to 250% of a bank's tier 1 capital that is required to support market risks. This means that a minimum of about 28½% of market risks needs to be supported by tier 1 capital that is not required to support risks in the remainder of the book (BCBS, 1996, P.5)

[142] The improvements are required to be implemented by supervisors if the model fails to pass the test, i.e. when back testing reveals that trading losses are happening more frequently than the VAR Model calculation would suggest.

[143] Regulatory capital arbitrage is the process whereby a financial institution reduces its regulatory capital requirement with little or no corresponding reduction in its overall levels of risk. For example, if a bank, operating under the Basel I accord, has to hold 8% capital against default risk, but the real risk of default is lower, it is profitable to securitize the loan, removing the low risk loan from its portfolio. On the other hand, if the real risk is higher than the regulatory risk then it is profitable to make that loan and hold on to it, provided it is priced appropriately.

books of a bank deteriorates, defeating the purpose of the Basel Accord[144]. *Third*, banks face market risk from the full range of positions held in their portfolios but the capital standards focus on the market risks arising from the bank's trading activities. These problems have led the banking industry to suggest that banks should be allowed to develop their own internal credit VAR model, not just for market risk. *Finally*, the regulators realized that there was an urgent need to update the Accord to eliminate issues coming out through a better alignment of regulatory and economic capital. In June 1999, the Basel Committee issued a proposal for a new capital adequacy framework that rests on three pillars to replace the 1988 Accord.

3.3.3.4 New Basel II Accord: Basel II

The new Basel Accord, named Basel II, is structured on three pillars: Pillar One—Minimum Capital Requirements; Pillar Two—Supervisory Review Process; and Pillar Three—Market Discipline, to support the global objectives of financial stability and better risk management practices.

3.3.3.4.1 The Three Pillars of Basel II

Pillar One: Minimum Capital Requirements

The first Pillar—*Minimum Capital Requirements* is the updated version of the 1988 Accord modified with the 1996 Amendment, which expands risk coverage to incorporate other major source of risks, such as interest risk in the banking book and operation risk. It also adds a capital charge for other risk types such as liquidity risk, legal risk, settlement risk and reputational risk (BCBS, 2006). Table 5 shows the structure of Pillar One.

[144] There is a strong incentive for arbitrage that might damage the bank's risk profile by retaining low-quality loans on the balance sheet as a result of using techniques like securitisation. For example, when the regulators correctly adapted the rules of Basel I for securitisation (the subordinated debt is risk-weighted at 1250%), this imposed a capital requirement of 100% (subordinated loan is highly risky as it absorbs the losses of all the pool). But if the risk linked to the structure of the operation is correctly captured, if nevertheless creates negative incentives, as to keep a good reputation on the marketplace banks tend to securitize good-quality loans, the loans remaining on the balance sheet are low-quality ones, which damage the bank's profile (Balthazar, 2006, p.35).

Table 5: Minimum Capital Requirements

Total Eligible Capital ≥ 8 %		
Credit Risk	Market Risk	Operational Risk
Standardized Approach	Standardized Approach	Basic Indicator Approach
Internal rating-based foundation Approach	Internal Model Approach	Standardized Approach
Internal rating-based advanced Approach		Advanced Measurement Approach

(Source from Crouhy, Galai and Mark, 2001, p.75)

Internal models adopted by banks to capture both credit and market risks are supposed to be able to enhance the incentives for banks to develop and strengthen their risk management systems, which overcome the weak incentives under Basel I. The Internal models generally can be designed to capture diversification effects by realistically modelling the correlations between positions. Comparably, the standardized model whether designed under the 1996 Amendment or the Basel II framework, does not attempt to model correlations accurately in this way, because the main issue of an effective capital regulation is not whether to lower the amount of capital that is required, but how to allocate the right amount of capital which can balance the different concerns between regulatory authorities, whose purpose is to maintain financial stability, and bankers, whose concern is risk return while satisfying regulator's requirements. Therefore, it is argued that the use of an internal rating-based approach would pave the way to the adoption of full credit risk modelling for the banking book. It is a promising signal of the regulator's willingness to bring regulatory capital closer to economic capital. As of late 1999, the proposals for an internal rating –based (IRB) approach are still very sketchy, and banks' internal rating systems will need to be examined more thoroughly. Under Basel II implementation, the adoption of the IRB approach will be authorized by regulatory authorities based on the examination of the soundness of banks' internal rating systems and data availability. This implies that just those internal models which satisfy regulatory

purposes will be eligible to be used under the IRB approach. This is a very challenging task for banks, even for multinational banks with more mature internal systems, because data availability is a fatal factor banks are facing (BCBS, 2006).

Pillar Two: Supervisory Review Process

The supervisory review process is designed to ensure that a bank's capital position and strategy are consistent with its overall risk profile, and ensure it follows rigorous process, measuring its risk exposures correctly, and having enough capital to cover its risks. Regulatory arbitrage is also supposed to be scrutinized. Supervisors will review the treatment of the trading account to ensure consistency with the methodologies developed for the banking book in order to reduce the incentive for regulatory arbitrage. Early supervisory intervention will be encouraged if the capital is thought not to provide a sufficient buffer against risk. And supervisors should have the ability to require banks to hold capital in excess of minimum regulatory ratios depending on a variety of factors such as the experience and quality of its management and control process[145], its track record in managing risks, the nature of markets in which the bank operates, and the volatility of its earnings. This second Pillar is intended to impose a close partnership between banks and their supervisors. Supervisors are expected to become familiar with the increasingly sophisticated techniques developed by the banks to assess and control their risks [146](BCBS, 2006).

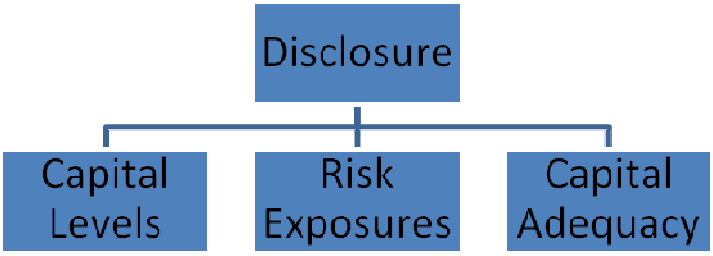
Pillar Three: Market Discipline

Market discipline under the Basel II framework acts as a lever to strengthen the safety and soundness of the banking system through better disclosure of capital levels and risk exposures, and also help market participants to better assess the bank's ability to remain solvent. No doubt, its concern is with information disclosure. The Basel Committee intends to foster market transparency so that market participants can better assess bank capital adequacy based on the disclosed information on banks' capital levels, including details of capital structure and reserves for credit and other potential losses, risk exposures, and capital adequacy (refer to Figure 8) (BCBS, 2006).

[145] In Australia, banks' internal risk management and control process is named the Internal Capital Adequacy Assessment Process (ICAAP).

[146] The supervisors are also supposed to be involved in the development of those techniques. It is clear the position of supervisors will become more challenging under Basel II framework with higher request on their skills. Regulatory authorities also therefore should engage in an active program of educating supervisors.

Figure 8: Information Disclosures under Market Discipline



Source: Crouhy, Galai and Mark, 2001, p.88)

The reports required by the Pillar Three rules of Basel II have to be publicly disclosed at least twice a year. The intention of establishing this Pillar is to let the market place be an additional pressure on banks to improve their risk management practices, i.e. through higher funding cost if the information disclosed shows the poor risk management performance or increased risk appetite of banks. However, the information disclosure report under the Basel II framework is designed for the benefit of general investors, which is different to the accounting report which is targeted at shareholders' interests. This might raise the issue of the alignment of accounting disclosure standards with Pillar Three information disclosure rules[147]. In general, bank credit and equity analysts and bond investors will find the disclosed information very useful in evaluating bank's soundness both for their investment decision-making and indirect supervision[148] purpose.

Basel II marks another big step forward in the history of both banking regulation and risk management. It is more risk-sensitive with broader risk categories and redefined definition of capital. For each risk type, financial intermediaries can choose among different methodologies, ranging from simple methods to more complex and accurate tools. In contrast to the Basel I framework, risk measurement under the current Basel II framework is no longer ensured by a one-size-fits-all type of regulation, but by several rules that depend on the activity, size and risk-profile of the bank. And Basel II dramatically enhances the transparency of a bank's risk profile and risk-taking activities. It is supposed that banks with a sound risk management system and advanced internal rating system will have a lower regulatory capital holding as a

[147] This issue is discussed further as one of the problems arising from the 2008 financial crisis in section 2.3.5.1.2 –Criticism of external ratings.
[148] Comparably, supervision by regulatory authorities is a more direct form of supervision.

‘reward’, and thus will enhance their competitive advantages in domestic financial markets.

The Basel II framework is primarily designed for large internationally operating banks. In Australia, similar to the approach taken with Basel I, it is applied to all authorised deposit-taking institutions (ADIs) as guided by APRA. As provided for in Basel II, APRA has exercised a number of discretions to make the Framework more relevant in the Australian market such as setting up a 20% “Loss-given-default (LGD) floor”. In addition, compared to the Basel II Framework, according to the structure of Australian financial market, APRA has made the risk-weights for residential more granular, reflecting different loan-to-valuation ratios (LVRs), whether loans are standard or non-standard (including ‘low-doc’ loans) and whether loans are covered by lenders mortgage insurance.

The accreditation of adopting advanced IRB approach under Basel II is required to be approved by APRA. APRA advocates ADIs to use risk management processes, in particular the risk modelling approaches that are best practice for their size and risk profile. Finally, 3 out of 4 major Australian banks (ANZ, Westpac and Commonwealth Bank of Australia) have been granted approval of adopting advanced approaches for both credit and operational risk measurements. National Australia Bank is the only one not in “advanced approach club”, which it only adopt advanced measurement approach (AMA) for operational risk measurement while foundational IRB is adopted for credit risk measurement. The other two comparably large Australian banks—Macquarie and BankWest adopt AMA for operational risk and foundational IRB for credit risk measurement. Market risk measurement for all banks is conducted based on VaR approach.

However, the 2008 Subprime crisis, on the one hand, exposes certain problems including the previously discussed flaws of dependence on OTD model and the focus on market risk solely for trading activities. On the other hand, the occurrence of this financial crisis raises arguments about the efficiency of Basel II in preventing the occurrence of similar market catastrophes and maintaining financial stability in the future.

3.3.3.5 2007-2008 Financial Crisis

In the middle of 2007, the "bubble" in the housing market finally burst, due primarily to excessive and reckless lending in the subprime mortgage market. Unfortunately, this was not the end of the story; it was just the beginning of a "storm" in the financial markets. By early 2008, the credit crunch descended and companies and individual investors desperately faced the difficulties of refinancing their investments. Bankruptcy became their last call. Then recently, bad news about the performance of the four largest investment banks in the U.S shocked the world. Contemporaneously with these developments, the new global capital regime for banks, known as the Basel II framework, came into force both within the G10 and in signatory countries such as Australia. This raises the argument about the effectiveness of Basel II in regulating financial institutions (particularly banks), and preventing similar crises from happening for the purpose of maintaining financial stability. Of course, this is the main question that this research thesis endeavours to address from the Post-Keynesian point of view.

The 2008 financial crisis, which erupted in the US subprime mortgage sectors and then led to a worldwide collapse in the financial system, has deeply-rooted causes. From the previous discussion of the functioning of financial markets, changes of regulatory environment, and changes of banks' behaviour, it is possible to identify two inherent issues that need to be addressed.

3.3.3.5.1 Disconnection within Securitisation Process

Securitisation has been a central element in the dynamics of the recent financial turmoil. One of the reasons is that the OTD (originate-to-distribute) model that banks relied on as a means of funding and risk dispersal actually encouraged the erosion of margins of safety, encouraged irrational risk-taking activities, and encouraged an optimistic belief that the economy would continue to grow without let up or hindrance (Knight, 2008). As we have seen, under the OTD model, originators do not hold the loans on their balance sheet nor do they hold regulatory capital to guard against these risks. This reduces the incentive for them to be concerned about borrowers' ability to

pay and, at the same time, increases their exposure to market downturns[149]. The easing of limits to the issue of mortgages has coincided with a loosening of creditworthiness checks over the holders of securitised assets. The seeds for growth in underlying default risk have thus been sown. In the housing market, borrowers are often reluctant to reject offers of loans that may become unaffordable for them (Wray, 2008). When interest rates rise, the holders of the assets that have been securitised may be forced to sell; a process which directly leads to a dramatic fall in the prices of the resulting securities. That is what happened when the quality of subprime mortgages started to deteriorate in 2005 in U.S, the securities backed by these loans started to lose value, causing losses in investors' portfolios.

Another aspect that has exposes the securitisation process to criticism is its long chain character. Modern securitisation involves quite long chains of production. There is considerable distance between ultimate investors in collateral and holders of the originating liability. This longevity is responsible for adverse incentives along the securitisation chain, which contributes to lax monitoring of risky activities, and ultimately to a deterioration in credit underwriting. The multiple-tranche characteristics of securitisation allow pools of various liabilities to be engineered in diverging ways, particularly through credit enhancement. The investors in the higher rated tranches (i.e. AAA rating) thus have few incentives to undertake serious due diligence because they primarily rely on the rating for their investment decision. The lower rated tranches are normally re-securitised, with the burden of borrower scrutiny passed along the chain to investors who might have a problem analysing the credit quality of what they are buying. Here, the analytical difficulty resides in the complexity of the instruments employed in the securitisation process (Knight, 2008). And most important, there is disconnection between banks acting as brokers, investors, firms and household borrowers, those offering securitized assets, the actual originators of the assets that are going to be securitised, and those providing hedging and insurance services in relation to the assets, the credit rating agencies assessing levels of risk in relation to these assets (include credit default swaps). Any rating or

[149] According to a common practice, originators of subprime loans have subsequently sold their mortgages to other intermediaries—often unregulated vehicles—and used the revenues for granting new loans. Securitized loans have been then transformed into securities, and tranched according to their creditworthiness. The high ratings are assigned by rating agencies to the senior tranches (higher quality loans) of such securities and thus enhance the rating of the entire pool.

risk management system will fail when this kind of disconnectedness becomes commonplace.

The Basel Committee is responding to the issues exposed by the 2008 financial crisis by: adjustments to the treatment of credit lines to off-balance vehicles; the strengthened prudential framework for trading book assets; and a stricter regulatory regime for rating agencies under Pillar One of Basel II. However, the problems of disconnection within the securitisation process seem not to have been eliminated by the amendments to Basel II. And under the Basel II framework, the capital standard still focuses on the market risks arising from the bank's trading activities, thus market risk is still considered to be a component of trading activity. This is an issue that has persisted from Basel I and its 1996 Amendment.

3.3.3.5.2 Criticism of External Ratings

Notwithstanding the above, questions also have been asked about the reliability of risk management procedures and techniques for risk rating, especially in regard to the need for "checking the natural tendency for declining credit standards in a boom". (Wray, 2008:2) There are two aspects to this criticism. The first pertains to the profit-driven nature of external rating agencies and accounting firms, which rely on fee-based income for services provided to financial and non-financial institutions. It is argued that, to keep onside with customers, rating agencies will be pressured to issue ratings that make assets more marketable and enable customers to reduce their holdings of regulatory capital.

The second is directed at the statistical techniques used by rating agencies. The statistical models employed to evaluate risk have been criticized for their backward-looking nature, especially when the market is at the peak of its prosperity phase. In fact, this is not just the flaw of models used by credit rating agencies as the statistical models used by banks and their supervisors are also based on data generated from previous periods. In the aftermath of the subprime crisis, significant downgrades were made on a variety of externally rated CDOs, even those belonging to AAA tranches.

Under Basel II, the assessment of borrowers' creditworthiness provided by credit rating agencies (CRAs) still plays a significant role, particularly under the standardized approach for credit risk. Therefore, all the criticisms of the reliability of

external ratings as a basis of risk measurement, embedded in both the Basel I and Basel II frameworks, necessitate further discussion of internal rating systems of banks themselves[150] and this is pursued in Chapter Five of this thesis. One of the superior aspects of Basel II, compared to previous iterations, is the Value-at-Risk (VAR) technique for internal rating systems.

Another issue which has been argued after the 2007-2008 financial crisis is the problematic alignment of Basel II rules with current international accounting principles. The introduction of fair-value accounting for trading book assets[151] has meant that the fair-value assessment has certainly played a major role during the financial crisis, pushing banks to raise new capital to cover losses and avoid possible defaults. Thus, the concern is that the simultaneous implementation of Basel II and the new accounting standards would make banks' balance sheets more vulnerable to assets' value fluctuations. Actually, as a matter of fact, this happens to any regulation requiring banks to meet minimum capital levels. Basel II, by its nature, cannot be excluded.

3.3.3.5.3 Regulatory Environmental Changes as underlying driver

Quite apart from the above two examples of regulatory failure revealed by the subprime crisis, the twofold underlying drivers of this crisis have to be explored. *First*, the financial deregulation of the 1980s has been associated with real wage repression within the advanced industrial economies. In Australia, for example, this is seen in the ever widening gap between productivity growth and real wages growth from 1985 onwards (refer to Figure 3) and the dramatic decline of total wages as a share of GDP post 1987 (see Figure 4). Furthermore, the household savings ratio has been steadily and spectacularly shrinking (refer to Figure 7), a symptom of a broader chronic problem. *Second*, the 'vital role' that governments play in wealth creation must be acknowledged. Governments are the sole creators of net financial assets in the economy. Transactions between banks, households and firms net out to zero. If governments run deficits they provide opportunities for the private sector to add to

[150] Under Basel II framework adopted by the Australian government, most small and medium sized banks only have accreditation for the standardised approach, which relies heavily on external rating agencies. Even some of the big banks which have accreditation for an IRB approach still combine internal and external ratings in ways that depend on the consideration of cost and benefits.

[151] Those assets are to be mark-to-market, if there is an active market, or marked-to-model otherwise.

their net wealth positions. Conversely, when governments run continual surpluses they are destroying the wealth of the non-government sector. So as national governments have embraced fiscal conservatism, the resulting policy of fiscal withdrawal has sucked real wealth out of national economies. However at the same time, the private sector's desire to accumulate wealth creates a ready market for ever more risky financial instruments. These two outcomes are the product of the neoliberal regimes implemented as a direct result of an unprecedented shift in power from labour to capital. With the absence of a developmental state that can intervene sufficiently in capital markets to promote high levels of investment, the accumulation process has accordingly been fuelled by credit-driven consumption (i.e. effective demand). Consequently, financial institutions have increasingly attempted to lend to households under conditions where borrowers are increasingly less likely to repay the loans as discussed in the section regarding the OTD model. This is a weak link that has been aggravated by the increasing precariousness of work. Further, to lower their borrowing costs[152], corporations have drawn upon securitized assets which have relied on the bundling together of IOUs[153] derived from the household sector. But these assets have been rated incorrectly by rating agencies. As a result, the insurance risk, in the form of Credit Default Swaps (CDS), has been on-sold, at too high a price after credit enhancement to mortgage insurers (i.e. AIG) which are mostly located in the region of the deregulated financial sector.

In that manner, the subprime crisis and the resulting credit crunch can be regarded as an 'epiphenomenon' arising from the transition of the regulatory regime as discussed in the first half of this chapter. Hence, by its nature, capital regulation is prescriptive; Basel II cannot contribute much to change the outcome of events that are deeply-rooted outside regulatory causes.

However, with its improvement over the previous Basel Accord, and as an unquestionably important component of the *supervisory toolkit*, an understanding of Basel II itself and its ability to stabilize financial market needs to be more thoroughly explored. Accordingly, the following chapter of this thesis will closely look at the Basel II framework, its content and technical aspects.

[152] This has happened under both Basel I and Basel II frameworks.
[153] Nevertheless, it is the dodgy IOUs at the origin of the whole process that have served to undermine the entire chain of activity.

3.4 Conclusion

Through the broad sweep of this chapter, we have seen how the policy influence of Keynes, with its emphasis on command-and-control regulation, withered against the onslaught of stagflation and technological challenges. Advocates of a free market approach took advantage of these events to push for a policy shift in favour of self regulation. Thus in the process of financial deregulation, systems shifted away from a command-and-control philosophy towards a self-regulation mode of prudential control. However the more liberal mechanisms of governance, the repositioning of banks as financial agents, the emergence of new financial products, the neoliberal obsession with 'small governments' and budget surpluses and the disguising of financial risk have all combined to foster the 2008 financial crisis and present challenges to the designers of prudential control measures.

In the current financial climate, it is clear that prudential control can no longer rely on autocratic systems of command-and-control nor on voluntary systems of collective self-regulation. Instead, there is growing interest in shifting to what has been described as "smart regulation" (Aalders and Wilthagen, 1997) or "responsive regulation" (Ayres and Braithwaite, 1992). This stance is notably reflected in the adjustments made in moving from Basel I to Basel II. So the next chapter firstly introduces the concepts (*governmentality*, *reflexivity*, *responsive regulation*, and *'smart' regulation*) which fall within the new regulatory paradigm and then explores the congruence between the Basel II framework and these concepts.

Chapter Four

Is Basel II a "Smart" Regulation

4.1 Introduction

The philosophical underpinnings of macroeconomic management have been the subject of heated debate and contention, as witnessed in the controversy surrounding the different schools of thought and their advocacy of the superiority of command-and-control versus self-regulation as the preferred mode of directing macroeconomic events. Dissatisfaction with the performance of these economic tools has provoked the search for new economic paradigms to guide policy makers and, in particular for the purposes of this thesis, to structure and guide policy decisions aimed at securing and protecting the viability of the financial system.

Arguably the beginning for such a new paradigm starts with a reappraisal of the notion of government and its relationship to individuals and therefore its legitimacy to wield power, regulatory or otherwise. Thus this chapter will open with an extended discussion of the concept of governmentality. This philosophically based discourse sees government as a continuum that moves from individual self control to societal control and explores the manner in which individuals cede control and power to the state and its institutions. Out of this discussion flows a critique of the role that neo-liberalism assigns to the state.

However, the discussion of governmentality *per se* does not generate guidelines for a new regulatory stance but it does offer two insights. First and foremost it typifies governmentality as a complex interaction of individuals, institutions and authorities and it introduces the reflective manner which ultimately results in the rationalisation of the exercise of power. These two threads are implicit in the concepts of reflexivity and responsive and smart regulation.

Therefore, the chapter will proceed by first familiarising the reader with the notion of governmentality, while the third and fourth sections will outline reflexivity and responsive regulation and smart regulation, respectively. The fifth section waves the concept of reflexivity, responsive and also smart regulation together and develops a

benchmark against which the Basel II framework can be evaluated. Accordingly, the last section of this chapter investigates whether Basel II can be deemed to be 'smart' regulation.

4.2 Governmentality

The discussion of this new regulatory paradigm begins with the notion of *Governmentality* (Foucault 1978, 1980, 1983, 1991; Dean, 1999). This approach details the manner in which notions of state and society emerge through a reflective process and this analysis of and reflection upon government practice delivers a rationalisation of the exercise of power. Further, as old notions of equitable equilibrium or justice give way to new notions of political economy, questions of governing "too much" or "too little" come to the fore. This section then flows into an exploration of the implications of governmentality for the role neo-liberalism assigns to the state.

4.2.1 Foucault's Concept of "Governmentality"

While many forms of contemporary critique still rely on the dualism of freedom and constraint, from the perspective of "governmentality", the polarity of subjectivity and power ceases to be plausible: government refers to a continuum and is based on a broad sense.

Foucault coined the concept of governmentality[154], from his lectures given at the Collège de France from 1977-1979[155], to study the "autonomous" individual's capacity for self-control and how this is linked to forms of political rule and economic exploitation[156] (Lemke, 2000, p.4). In his lectures, Foucault uses the notion of government in a comprehensive sense geared strongly to the older meaning of the term and adumbrating the close link between forms of power and processes of subjectification. So, the "art of government" describes government as not limited to state policies alone, instead it includes a wide range of control techniques that apply to a wide variety of objects, from self-control to 'biopolitical' control. As described

[154] This concept of governmentality coined by Foucault also has been defined as the "art of government" in a wide sense (1978) in his lectures.
[155] In his lectures, Foucault offers an analysis by way of historical reconstruction embracing a period starting from Ancient Greece through to modern neo-liberalism.
[156] He shows how the modern sovereign state and modern autonomous individual co-determine each others' emergence.

by Foucault, "government also signified problems of self-control…government is conduct of conduct" which ranges from 'governing the self' to 'governing others' (Foucault in Burchell, 1991a, p. 48, Foucault, 1978, p. 16-7).

His concept of "governmentality" develops a new understanding of power, which is not only in the form of hierarchical, top-down power of the state, but also includes the forms of social control in disciplinary institutions as well as the forms of knowledge. Foucault's lectures reveal that some of the features of governmentality are:

> "The ensemble formed by the institutions, procedures, analyses and *reflections*, the calculations and *tactics* that allow the exercise of this very specific albeit complex form of power, which has as its target *population*, as its principal form of knowledge political economy, and as its essential technical means apparatuses of *security*" (Foucault in Burchell, 1991a, p. 101-3)

Authors such as Thomas Lemke (2000) point out that Foucault's definition of governmentality identifies the reciprocal constitution of power techniques and forms of knowledge. And also provides a semantic link of governing ("gouverner") and modes of thought ("mentalité')[157] which indicates that it is impossible to study the technologies of power without an analysis of the political rationality underpinning them[158].

Juniper also argues that the conceptual apparatus of the assemblage—*power-knowledge*, is applied to a new theme: the analysis of governmental practice as it reflects upon itself and is rationalized (Juniper, 2008, p. 1, citing Foucault, 2008). In detail, it is where the way individuals are driven by others is tied to the way they conduct themselves, along with complementarity and conflicts between techniques

[157] Similarly, Mitchell Dean's (1999) definition of governmentality is based on breaking it into 'govern' and 'mentality'. 'Govern' incorporates other forms of governance, and 'mentality' focuses on the idea of mentalities of government, which combines Hunt and Wickham's (1994) description of governmentality and idea of government rationalities.

[158] In other words, there are two sides of governmentality, on the one hand, the term pinpoints a specific form of *representation* where government defines a discursive field in which exercising power is 'rationalized'[158]. On the other hand, it structures specific forms of *intervention*[158] (Lemke, 2001).

which assure coercion and processes through which the self is constructed or modified by self.

According to the concept of governmentality, through this reflective process, notions of state and society, and of sovereignty and subjection are formed[159]. Foucault identifies the emergence of a particular type of rationality—political rationalities that enable ways of governing to be modelled on the basis of a state that is both pre-existent and continually reconstituted as its objectives and rules are transformed (Juniper, 2008). In other words, as Lemke comments (2000, p. 7), by coupling forms of knowledge, strategies of power and technologies of self, it allows for a more comprehensive account of the current political and social transformations (i.e. financial deregulation as discussed in Chapter Three), since it makes visible the depth and breadth of processes of domination and exploitation. In Foucault's perspective, a political rationality is not pure, neutral knowledge which simply "represents" the governed reality. It is not an exterior instance; instead it is an element of government itself which helps to create a discursive field in which exercising power is "rational". As Lemke (2000, p. 5) argues power, in the sense Foucault gives to the terms, could result in an "empowerment" or "responsibilization" of subject, forcing them to "free" decision-making in fields of action.

Foucault finds that with political economy, the principle of governing too much or too little replaced the notion of an equitable equilibrium or justice. This flows from his observation of the government practices that emerged from the 16th and 17th centuries. Foucault describes a certain type of discourse that establishes an "intelligent connection" between a set of practices[160] bringing unity to a field that was previously inscribed by diverse notions of feudal rights, sovereignty, procedures for the enrichment of the state's treasury, and techniques for preventing urban revolt. This newfound coherence enabled such practices to be judged as good or bad in accordance with propositions subject to the division between true and false (Juniper, 2008, p. 2):

[159] Foucault's works initially focus on two projects: his interest in political rationalities and the "genealogy of the state" on one hand; and "genealogy of the subject" on the other. His work on "governmentality" links these two aspects, through the connections between what he called technologies of the self and technologies of domination, the constitution of the subject and the formation of the state (Lemke, 2000, p. 2).

[160] This includes tax levies, customs charges, regulations pertaining to grain prices and manufacturing.

> It was a matter of showing by what conjunctions a whole set of practices—from the moment they become coordinated with a regime of truth—was able to make what does not exist (madness, disease, delinquency, sexuality, etc.), nonetheless become something, something however that continues not to exist. That is to say, what I would like to show is not how an error—when I say that which does not exist becomes something, this does not mean showing how it is possible for an error to be constructed—or how an illusion could be born, but how a particular regime of truth, and therefore not an error, makes something that does not exist become soothing. It is not an illusion since it is precisely a set of practices, real practices, which established it and thus imperiously marks it out in reality (Foucault, 2008, p. 19)

This coupling of a set of practices and a regime of truth forms an apparatus of knowledge-power marking out what does not exist, legitimately submitting it to the division between true and false. Foucault (2008, pp. 13-7; p. 29; pp. 32-3) observes that the new discourse of political economy increasingly assumed responsibility for establishing "a reasoned, reflected coherence" between various practices, which could therefore be judged in accordance with a comprehensive regime for truth. Now the necessary self-limitation of government could be determined in relation to the intrinsic nature of things, as revealed by this new apparatus of knowledge-power insofar as it determined, internally as it were, the very border between too little and too much government (Juniper, 2008, p. 3, citing Foucault, 2008, p. 13)

This new conception of internal limitation, Foucault (2008, pp. 10-3) continues, was predicated on de facto principles rather than legal principles. Nevertheless, he emphasizes the fact that this was a general rather than specific or contingent conception[161]. Accordingly, Juniper (2008, p. 3) argues that rather than establishing a division between freedom and submission, it was more a question of establishing a division between what should or should not be done. Rather than being a question of

[161] This has being neither dependent on the doctrine of natural rights assigned to man by God, nor on some notion of the will of subjects.

distinguishing between the governors and the governed, it was more a question of determining the excessive or insufficient nature of certain government practices in relation to transactions taking place between the governors and the governed. Political economy, in that sense, was called upon in determining the reasons for such excessiveness or insufficiency.

When explored further, underpinning this political economy was the *homo oeconomicus* (Foucault, 2008, p. 268). This conception of rational choice enabled the neoclassical economists to confront any issues involving the choice of means, ways, and instruments. Even non-rational conduct could be drawn within the compass of *homo oeconomicus*, provided that the individuals concerned were construed to act in a non-random or systematic way to modifications in the environment[162] (Juniper, 2008, p. 3).

Foucault (2008, pp. 276-80) discerns in the subject of interest a definitive barrier to the exercise of sovereignty. In constituting the political conception of a common interest—each individual must know how to interpret their interest and must be able to pursue it without obstruction. Given the deemed idea of some political economists that it is impossible for the sovereign to attain a comprehensive view of the economic mechanism[163] (Juniper, 2008, p. 4), the subject of interest becomes the embodiment of ignorance on the part of the sovereign (Foucault, 2008, p. 283).

Foucault saw his concept of governmentality as completing a cycle begun when he extended his work on "the slow formation of a knowledge and power of normalization based on traditional juridical procedures of punishment", to account for broader mechanisms of social defence, the role of metaphors of war in historical discourse, and the internal war waged against dangers arising from within the social body itself (Juniper, 2008, p. 5; citing Foucault, 2003b, p. 329; 2003a, p. 216). And under this concept, the anatomo-politics of the human body, and reformatories is now displaced by a bio-politics of the human species, while vested regulatory apparatuses subsume the application of particular techniques of discipline. It was argued that Foucault's

[162] For American neo-liberals, this conception would ally economics with behaviourism in psychology for, beyond a clearly defined role as the one who must be 'let alone', *homo oeconomicus* is also someone who is "eminently governable" (Juniper, 2008, p. 3, citing Foucault, 2008, p. 270).

[163] One would totalize each element thus enabling each of them to be integrated into a unified whole over which the monarch can exercise a transparent and carefully crafted sovereignty.

new technology of power, focusing on the security of populations, represents a clear move away from the concerns of the state during the classical age which were focused on the safety of territory, towards the application of a new technology of power that is now concerned with security, equilibrium and "a sort of homeostasis" (Juniper, 2008, p. 5).

Therefore, it is concluded that Foucault's "governmentality" describes a new regime of power with population as its target, political economy as its major form of knowledge, and apparatuses of security as its essential technical instrument (Juniper, 2008, p. 6). This concept is extended beyond the domain of the state itself, to encompass "the conduct of conduct", thus coming to serve as a theoretical framework for describing all relations of power in their generality. Nevertheless, when applied specially to the problem of the state, the concerns of governmentality become those of government proper (Juniper, 2008, p. 6; citing Foucault, 2008, p. 305).

4.2.2 Rethinking the Role of State in Neo-liberalism under "Governmentality"

The governmentality literature offers a modest conception of the role of law in the ordering of society. This theoretical stance allows for a more complex analysis of neo-liberal forms of government that feature not only direct intervention by means of empowered and specialized state apparatuses (as in command-and-control regulation), but also characteristically develop indirect techniques for leading and controlling individuals (as in self-regulation). Governmentality displaces the state from the centre of our thinking about ordering and thus opens up the possibility of generating a new framework and makes us rethink the role of state in neo-liberalism.

Neo-liberalism is criticised for its extension of economy into the domain of politics, the triumph of capitalism over the state, the globalization that escapes the political regulations of the nation-state. And another line of criticism is levelled against the destructive effect of neo-liberalism on individuals, in terms of one key feature of the neo-liberal rationality that is the congruence it endeavours to achieve between a responsible and moral individual and an economic-rational individual[164] (Lemke,

[164] It is argued that in this manner, a forever precarious harmony has to be forged between the political goals and the state and a personal "state of esteem" (Cruikshank, 1999; Greco, 1993; Nettleton, 1997).

2000, p. 12). As Lemke (2000, p. 6) argues, the criticism could cite the devaluation of traditional experiences neo-liberalism promotes, the process of individualization endangering collective bonds, the imperatives of flexibility, mobility and risk-taking that threaten family values and personal affiliations: neo-liberalism as "practical anti-humanism".

Foucault's governmentality is often used in reference to 'neoliberal governmentality' [165] that is characterised by decentred power and industry self-regulation in neoliberalism. Neoliberal theorists (particularly based on the Chicago School) maintain that market is tending to a *natural* economic reality, and government intervention should be limited to avoid "uncontrolled growth of bureaucratic apparatuses" (Lemke, 2001, p. 197)[166].

Thus the concept of governmentality suggests that it is not only important to see if neo-liberal rationality is an adequate representation of society, but also how it functions as a "politics of truth"[167] (Lekme, 2000, p. 8). According to Foucault, from the perspective of governmentality, government refers to a continuum, which extends from political government right through the forms of self-regulation which neoliberals advocate, namely 'technologies of the self' as Foucault calls them (quoted in Lemke, 2001, p. 201). Thus, Foucault and his followers (Lemke, 2001, Dean, 1999, Foucault, 1978, 1980, 1983, 1991) reason that neo-liberal forms of government do not simply lead to a shift in the capacity to act away from the state and onto the level of society, but to a reduction in state or its limitation to some basic functions. The strategy of rendering individual subjects 'responsible' entails shifting the responsibility for social skills and for life in society into the domain for which the individual is responsible and transforming it into a problem of 'self-care'[168] (Lemke, 2001, p. 201; Rose and

[165] In his 1978 lecture, Foucault gave an outline of the classic liberal art of government by discussing the works of Adam Smith, David Hume and Adam Ferguson. And his analysis of neoliberalism is concentrated in German post-war liberalism and the liberalism of the Chicago School.

[166] Lemke (2001, p 200) comments that, for neo-liberalism, "it is more the case of the state being controlled by the market than of the market being supervised by the state", since "neo-liberals are convinced that the state does not define and monitor market freedom, for the market is itself the organizing and regulative principle underlying the state".

[167] For instance, producing new forms of knowledge, inventing new notions and concepts that contribute to the "government" of new domains of regulation and intervention

[168] They further comment that the key feature of the neo-liberal rationality is the congruence it endeavours to achieve between a responsible and moral individual and an economic-rational actor

Miller, 1992; Garland, 1996, p. 452-5; Rose, 1996, p. 50-62; O' Malley, 1996, p. 199-204). The concept of governmentality from theoretical perspectives coincides with neo-liberalism's political rationality that endeavours to link a *reduction* of "state" to "bureaucracy" to "network" and security systems to the increasing call for 'personal responsibility' and 'self-care' (Lemke, 2001, p. 203)[169].

The concept of governmentality also proves to be useful in correcting the diagnosis of neo-liberalism as an expansion of economy into politics, that takes for granted the separation of state and market (Lemke, 2000, p. 11). According to Foucault (2008, p. 116), there exists a state under the supervision of the market rather than a market supervised by the state. Therefore, he suggests, under the influence of Husserl's "eidetic reduction, by abandoning a naïve interpretation of completion as an expression of innate appetites and instincts, replacing it by one based on a formalisation and recognition of an underlying economic logic: one must govern for the market rather than because of the existing market" (Juniper, 2008, p. 7).

Foucault (2008, p. 252) characterizes the neo-liberal discourse of the Chicago School [170] as an attempt to remain within the confines of *homo oeconomicus.* Moreover, moral judgements or anthropological inquiries are abandoned in the name of an analysis of economic behaviour, which is henceforth considered in terms of risk management rather than profit seeking. Foucault's discussion of neo-liberal governmentality shows that the so-called "retreat of the state" is in fact a prolongation of government[171]; neo-liberalism is the transformation of politics that restructures the power relations in society. Lemke (2000, p. 12) argues what we observe today is not a diminishment or a reduction of state sovereignty and planning capacities but a displacement from formal to informal techniques of government and the appearance of new actors on the scene of government such as non-government organizations (NGOs) (trade unions like Australian Banker Association are the examples in the financial sector), that indicate fundamental transformations in statehood and a new relation between state and civil society actors.

[169] Apart from the individual 'itself', advocators such as Dean, Lemke also emphasize the 'collective bodies' and institutions have to be 'autonomous' (Lemke, 2001, p. 203).
[170] Such as the researches are from Gary Becker.
[171] Juniper (2008, p.1) describes as "continually reconstituted as its objectives and rules are transformed", as noted before.

Foucault's concept of "governmentality" identifies the importance of the reflective process in the transformation and rationalisation of the exercise of power, and hence the concept of "governmentality" is at its most effective in reformulating our understanding of *state* through the analysis of the micro-detail of particular institutional practices such as banking risk management, rather than suggesting how this re-conception of power might be deployed in future regulatory policy (Scott, 2003). It is argued that, on the basis of the governmentality analysis, regulation, if not always law, is a key constitutive element of contemporary societies (Hut 1993: Chapter 13; Shearing 1993). So the argument in the next three sections pursues what the conception and character of regulation that endeavours to map into this reflective shaping of government and institutions might look like. Each of the next three sections will explore a particular regulatory construct though, by the conclusion of Section 5, the common ground between them will be evident.

4.3 The Concept of Reflexivity

Governmentality rests on transformations via a reflective process and the tenor of this is captured in the notion of reflexivity. The idea is that legal process might react or respond to business undertakings in a way that both takes into account the vested interest and position of business but also seeks to manipulate that towards the achievement of a common social goal. Thus the core idea of this new regulatory state is regulated self-regulation, an idea it shares with the notion of "reflexive law" by Teubner (1983, 1986) and enforced self-regulation as a form of responsive regulation (Ayres and Braithwaite, 1992: Chapter 4)[172].

4.3.1 The Concept of "Responsive Law"

By the 1970s, as part of the trend away from direct and stringent government regulation towards more flexible, lenient control mechanisms characterized by 'conditioned self-regulation", or "cooperative regulation" regarding potentially harmful business activities, various pioneer concepts were proposed, such as "responsive law", a phrase coined by Nonet and Selznick (1978). They posit three

[172] However, in this regard this conception of responsiveness differs from Teubner's (1986) Reflexiveness and Luhmann's Autopoiesis (Luhmann, 1986).

modes of legal order: *repressive law*; *autonomous law*; and *responsive law*[173]. Repressive law appeals to the primitive need for order which is also its object, and social defence and relies heavily on coercion[174]. Nonet and Selznick characterize it as a tool of political authority and device by which those in political power seek to consolidate authority, command obedience, and legitimize their presence (Feeley, 1979). Autonomous law emphasizes procedural regularity and predictability with the object of taming repression. The distinguishing characteristics of autonomous law are the separation of law and politics, the accountability of officials to the rule of law, and the emphasis on procedures[175]. Responsive law[176], according to Nonet and Selznick, focuses on the substantive goals of the community and views law as an instrument for achieving them. Responsive law pursues accountability not solely in terms of compliance to rigid rules, but through fidelity to the substantive aims of the law. Unlike autonomous law, responsive law focuses on principles within the law with open texture, allowing for debate, change, and adjustment[177]. Moreover, according to Nonet and Selznick, the legal order begins with repressive law—a response to the primitive need for order and security—which then gives birth to the desire to "tame" force through autonomous law and procedure. In turn, the rigidities of autonomous law give rise to impatience with formality, and the impulse for a more socially *responsive* legal order (Feeley, 1979, p. 901).

4.3.2 The concept of Reflexivity: 'Autopoietic' Regulation

From responsive law, after comparing the views of Nonet and Selznick (1978) on the one hand, and Luhmann (1986)[178] and Habermas (1979, 1987) on the other, Teubner developed the concept of "reflexivity" in the study of law and regulation, which is classified as 'autopoietic' regulation with four attributes: systems monitoring;

[173] Each mode is distinguished from the other by purpose, method, and source of legitimacy.
[174] It focuses on the most basic need of society, and law is subordinated to politics and dependent on brute force.
[175] Disobedience is tolerated only to the extent that its object is to challenge the validity of statutes.

[176] Responsive law is joined to the tradition of the sociological jurisprudence and the philosophical perspectives of John Dewey.
[177] These principles point to goals and suggest directions, but do not necessarily supply the detailed guides to decide concrete cases.

[178] According to Luhmann (1986), the binary code of a system is complemented by an internal 'programme' that structures the process of coding, amongst other things, by bringing in external information.

intermediary structures; corporate social responsibility; and market-oriented regulatory tools (1983, 1986, 1992). This concept is one of the key concepts in postmodern images of human culture and society, as well as in second-order cybernetics and system theory (Aalders & Wilthagen, 1997, p. 428).

Autopoiesis is a term developed initially in the biological sciences, derived from Greek words meaning self-producing, and refers to the idea that law reproduces itself according to its own norms (Scott, 2003, p. 7). Luhmann's introduction of the concept of autopoiesis into social science has found wide resonance, including with Teubner's concept of 'reflexivity'. Luhmann perceives the world as consisting of differentiated and autonomous social sub-systems [179], and these sub-systems are said to be cognitively *open* but normatively and operatively *closed*, which means the sub-system is susceptible to "facts, situations and events of its environment" (Luhmann, 1992, p. 145). So the theory of autopoiesis displaces a linear governance pattern in which policy is translated into legislation, then regulatory action and regulatory effects with an image of "a multitude of autonomous but interfering fields of action in each of which, in a causal and simultaneous manner, recursive processes of differences take place (Paterson and Tuebner, 1998, p. 457). Put another way, the successful implementation of regulatory law is dependent on achieving some measure of "structural coupling" of sub-systems (Teubner, 1987, p. 415). This approach recognises the 'inner logic' of social systems and sets law the challenge of seeking to steer those social systems into more socially compatible channels (Tuebner, 1987, p. 428). Luhmann conceives autopoiesis in three interdependent moments: self-reference; reflexivity; and reflection[180], while Teubner describes his hypothesis, regarding the inherent problems of communications between sub-systems, as the problem of "regulatory trilemma" — that is, avoiding incongruence of law and society; over-legalization of society; and over-socialization of law. Aalders and Wilthagen (1997, p.436) also saw this concept of "reflexivity" based on a mixture of legal and non-legal, of public and private, as a possible solution to the problem of 'regulatory trilemma'

[179] The political, the legal, the social and the economic are the sub-systems central to regulation according to Luhmann's theory of Autopoiesis.
[180] Reflection is its relationship with itself. And reflexivity as a mechanism within an autopoietic system implies that the referring process and the referred process are structured by the same binary coding; it is the're-entry' into the system of the difference between system and environment.

which requires a 'negotiating regulatory framework' to be effective[181]. Koppen (1994 p. 201) also calls this "the explicit recognition of new forms of legal formality that emerge as the outcome of the informal negotiation process".

Under this concept, society is characterized by the 'horizontal' emergence of social subsystems, and each of these communication systems is of a self-referential nature so that the subsystem is tied to its own specific binary code which governs and structures all its operations and communications. Self-referential or autopoietic systems are considered operationally closed for intervention from the outside (i.e. by means of legal regulation), however, informational openness exists at the same time, as subsystems create "internal order" from "external noise" (Aalders & Wilthagen, 1997). Thus this concept realizes the importance of communicative aspects of decision-making and action to effectuate reflexive rationality (which absorbs the Habermas' philosophical ideal of communicative rationality to be discussed in Chapter Six), while it confirms the necessity to 'regulate' self-regulation at industry level[182]. Teubner argues that societal integration has to take place at the level of the social subsystem by building restrictions into the "reflexion" of the social subsystem. Law and regulation can only be successful as far as they facilitate and reinforce internal reflexive process. External control only makes sense in an indirect way and as the regulation of self-regulation, Thus, Reflexive law:

> "Will neither authoritatively determine the social functions of other subsystems nor regulate their input and output performances, but will foster mechanisms that systematically further the development of reflexion structures within other social subsystems" (Teubner, 1983, p. 275)

According to Teubner's concept of 'reflexivity", Aalders and Wilthagen (1997) classify four types of strategies as attributes of this type of 'autopoietic' regulation—*systems monitoring*; *intermediary structures and net works*; *corporate social*

[181] Aalders and Wilthagen (1997) emphasize the need for 'negotiating government' to cope with issues like third-party interests, access to information, and enforcement.
[182] Aalders and Wilthagen (1997) state that this strategy of regulating the self-regulation should aim at incorporating preventive conditions, regarding targeted regulatory issues, into corporate behaviour and decision making.

responsibility; and other *market-oriented regulatory tools*, which are derived from legal, non-legal, public, and private aspects, to solve the problems of democratic decision making.

4.3.2.1 Systems Monitoring

It is argued that the thought of regulating self-regulation is rather explicit in this approach that may be labelled *systems monitoring* or *systems enforcement*. In this approach, the inspectorate takes into account its limited capacity and resources, and tries to promote, facilitate, and monitor internal control systems in companies. This approach recognises that in-company management systems show sufficient dynamics to warrant ongoing and profound activity[183] on the one hand, while on the other, regulatory agencies are capable of judging the actual performance of management systems and, in cases of a negative judgement, these agencies are capable of making or promoting adjustments. Based on these presuppositions, a strategy of regulating in-company management systems, in general, seems promising, because its focus is strategic intervention into certain characteristics of an organization's decision making process (Aalders and Wilthagen, 1997). Teubner (1983) also suggests that under this approach, inspectorates have the responsibility to take great pains to promote democratic structures and procedures in companies in order to strengthen business' learning capacity and reflexive processes. At the same time, the prominent and critical danger threatening the development of the systems control approach is being recognised. Aalders and Wilthagen (1997, p. 432) identify the insufficiency of a systems control that is only directed to "good appeal" and to leading companies; while leaving the more serious problems in small companies untouched. Actually, in regard to this issue, in the earlier work by Rees (1988), he mentions:

> "If a firm has a strong indigenous regulatory system, a regulatory task environment that readily lends itself to consensual problem solving and workers who would directly benefit from a strong self-regulation programme, then that firm may well be a good candidate for *mandated* self-regulation." (1988, p. 238)

[183] This implies the attention of corporations should not be incidental or limited to minor matters.

Therefore, the efficiency and advisability of system control in the absence of substantial involvement of the state and its agencies should be argued (Gunningham, 1995); its sustainment must be backed by legislative enforcement, public disclosure, and countervailing powers such as the networks and unions noted below.

4.3.2.2 Intermediary Structures and Networks

Intermediary structures are an important element in using reflexive strategies. Trade associations, employer associations, district safety and health committees, or other networks of business may function as channels of indirect regulation, when contacted and adequately informed and influenced by regulatory agencies[184]. These industry associations have been instrumental in conveying the government message to industry; changing the mind of decision-makers in industry; and gently directing them to more prudential behaviour. This approach, as Teubner (1983, p. 273) comments, "resolves conflicts between function and performance by imposing internal restrictions on given subsystems".

4.3.2.3 Corporate Social Responsibility

The concept of corporate social responsibility explicitly refers to the necessity of the internalization of "external" goals and values. This moral or ethical concept is in opposition to the classical view that the mere aim of business is wealth maximization for its shareholders or owners. Instead, this approach sees that corporations should sit in a wider social context. By its nature, such moral concepts are not likely to be smoothly transformed into clear policies and strategies. However, to be meaningful, moral competence has to be built into the social structure of the corporation (Gunningham, 1995). Thus, methods have to be developed to increase corporate social responsiveness. Selznick points to institutionalization as the main strategy, having faith in "the benign face of bureaucracy" because it generates specialized units and internal interest groups in the company that are capable of determining policy, monitoring practices and establishing appropriate procedures (Selznick, 1992, p. 352). Corporations are stimulated to add some form of social reporting and auditing to their balance sheets, and to include moral and social issues in leading business training

[184] Small firms in particular rely on such organizations for information, advice, and support. And normally they are easier to grasp by this indirect route than by means of direct regulation.

programmes and courses (Sigler and Murphy, 1988, p.53). And most importantly, this strategy should be supported with co-regulation, and the following market-oriented regulatory tools.

4.3.2.4 Market-Oriented Strategies

Under Teubner's concept of "reflexivity", market-oriented regulation is recognised as an efficient regulatory instrument, based on its advantages such as: independence from outside agencies that are not familiar with actual risks; independence from the firm's size; and last but not least, a supposedly much greater effect than the expected penalty for violating a regulatory standard. However, adequate market regulation depends heavily on, or even has been determined by, sufficient market transparency, since as Felstiner and Siegelman (1989) note, the market participants usually do not have sufficient information on the risk they are facing, thus they cannot make rational choices regarding the situation. Therefore, the core of this strategy is that it should be backed by market transparency and full information disclosure.

4.4 Responsive Regulation

The theory of responsive regulation is centrally concerned with designing regulatory institutions and processes which stimulate and respond to the regulatory capacities which already exist within regulated firms, attempting to keep regulatory intervention to the minimum level necessary to secure the desired outcomes, but while retaining the capacity to intervene more (in terms of more stringent enforcement or the introduction of a more interventionist regime) if the need arises. In a sense, responsive regulation is allied to and a logical extension of reflexivity. There are two broad components to responsive regulation – the design of the regulatory pyramid and the inclusion of other parties in the process to spread the burden of regulation.

The basic idea of the concept of responsive regulation is that governments should be *responsive* to the conduct of those they seek to regulate in deciding whether a more or less interventionist response is needed, while decisions to escalate should *respond* to assessments about the effectiveness of self-regulation. Where formalist approaches define problems and responses in advance, on the basis that agents are both rational

and consistent, responsive regulation is not prescriptive but acts on the basis that agents can generally be persuaded towards compliance.

4.4.1 Responsiveness

The notion of regulatory responsiveness was first applied by Nonet and Selznick (1978), who talked about the need for "responsive law" during regulatory transition periods as discussed before. Their notion of "responsiveness" was characterized by certain elements including flexibility, a purposive focus on competence, participatory citizenship, and negotiation. These were advocated as guides to the design of regulatory strategies. This notion of "responsiveness" was taken over by Ian Ayres and John Braithwaite to investigate "responsive regulation".

Ayres and Braithwaite's concept of responsive regulation is encapsulated in the *regulatory pyramid model* they proposed. It was argued by Gunningham (1998, p. 396) that two features of this pyramid made it efficient: first, the gradual escalation up the face of the pyramid which reflects the notion of "responsiveness"; and second, the existence of a credible peak which, if activated, will be sufficiently powerful to deter even the most egregious offender. The former feature—*gradual escalation*, is desirable because it facilitates the 'tit for tat' response on the part of regulators which demonstrates that under responsive regulation enforcement has the virtue of being highly selective in a principled way, in contrast to an abrupt shift from low to high intervention. The latter feature ensures a level playing field in that the virtuous are not disadvantaged because "cowboys" will be punished. The structure of the pyramid itself channels the rational actor down to the base of the pyramid.

The escalation of government intervention reflects the core of this concept, that is *responsiveness* requires regulation to be responsive to industry structure and conduct[185], since different structures will be conducive to different degrees and forms of regulation. Government should also be attuned to the differing motivations of regulated actors. Then, according to Ayres and Braithwaite (1992, p. 4), "regulations

[185] Conduct, here, means how effectively industry is making private regulation work. In this manner, the very behavior of an industry or the firms therein should channel the regulatory strategy to greater or lesser degrees of government intervention.

themselves can affect structure[186] and can affect motivations of the regulated" for the regulatory purpose of government.

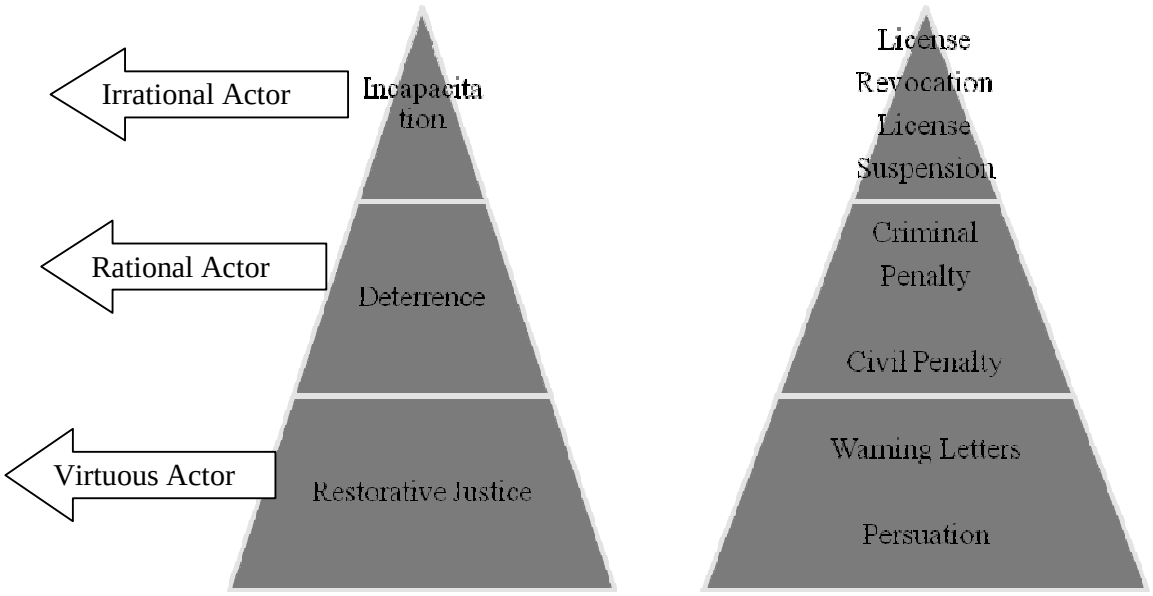
4.4.1.1 Tit-for-Tat Strategy

Under the concept of responsive regulation, a distinction is drawn between virtuous, rational, and irrational actors, so that appropriate interventions can be applied ranging from persuasion, through deterrence, to ultimate incapacitation. Therefore, the most distinctive part of responsive regulation is the regulatory pyramid (Figure 9 & Figure 11) with its intention to solve the puzzle of when to punish and when to persuade.

At the base of the pyramid is the most deliberative approach that can be crafted for securing compliance with a just law. Moving up the pyramid is associated with more and more demanding interventions. The idea of the pyramid is that "presumption should always be to start at the base of the pyramid first", and it is a "dynamic model" (Braithwaite, 2006, p. 886), which implies that the pyramid conceives of responsive regulation essentially in terms of a dialogic regulatory culture in which regulators signal to industry their commitment to escalate their enforcement response whenever lower levels of intervention fail.

[186] For example, the number of firms in the industry

Figure 9: The Enforcement Pyramid representing the Sanctions pitched at Single Regulated Firms and an Example



Source from Ayres & Braithwaite, 1992, p. 35; Braithwaite, 2006, p. 887

Under this model, regulators begin by assuming virtue (adopt persuasion or warning letters as their approach) but when their expectations are disappointed[187], they respond with progressively punitive and deterrent oriented strategies (i.e. civil penalty and criminal penalty) until the regulated firm conforms. And when deterrence fails, the idea of the pyramid is that incapacitation is the next port of call, which means responsive regulation does require a big stick at the peak of an enforcement pyramid[188]. Thus regulatory strategy normally incorporates the notion of a "Benign Big Gun" that is a big stick in hand but a predisposition to start with soft persuasion[189].

[187] Braithwaite thought that when persuasion does fail, the most common reason is that a business actor is being a rational calculator about the likely cost of law enforcement compared with the gains from breaking the law (2006, p. 887).
[188] Braithwaite also points out that this big stick is expensive, as well as demanding upon state capacities in other ways.
[189] A banking regulator empowered with only one effective sanction - the drastic power to withdraw or suspend licenses – may find it is often politically impossible and morally unacceptable to use it, because withdrawal of a licence involuntarily would result in that bank losing the implicit or explicit guarantee of the central bank, with a likely bank run or cessation of activities, resulting in possible contagion effects. Hence, an extremely stringent regulatory

The responsiveness achieved by the tit-for-tat strategy along the regulatory pyramid also helps industry and individual firms to build business cultures of social responsibility[190]. This acknowledges that compliance is optimised by regulation that is contingently cooperative, tough and forgiving[191] .

4.4.2 Spreading the "Regulatory" Burden

According to Selznick (1992, p. 465-70), "responsiveness begins with outreach and empowerment…", so responsiveness means having respect for the integrity of practices and the autonomy of groups; or responsiveness to "the complex texture of social life"[192]. Under responsive regulation, autonomy of regulated firms (in the form of system monitoring[193]), and empowerment of third parties (the idea of Tripartism[194]) in this 'regulatory' game are two aspects showing the theme of spreading the regulatory 'burden' from the shoulders of government to industries and individual firms.

4.4.2.1 Transforming from Command-and-Control to Self-regulation

Based on the early research by Peter Grabosky and John Braithwaite (1986, chap. 16), responsive regulation is positioned at the mid-point between each of the two major dimensions underlying the *typology*[195] of regulatory agencies they developed (Figure

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approach at times might result in a failure to regulate, so the benign big gun approach is the enforcement attitude normally adopted in business regulation (Ayres & Braithwaite, 1992, p. 36).

[190] Corporate social responsibility, first introduced on p.16, is one feature of reflexivity or 'autopoietic' regulation. Here, under the notion of 'responsiveness', it also reflects this 'internalization' of 'external' goals. So as discussed later, both notions can be accommodated under the category of responsive enforcement—one aspect of the benchmark used to evaluate Basel II.

[191] As outlined earlier under the Benign Big Gun approach that combines a tough big stick, with forgiving persuasion that always takes precedence.

[192] So Selznick points out the challenge of responsiveness is "to maintain institutional integrity while taking into account new problems, new forces in the environment, new demands, and expectations" (1992, p. 336).

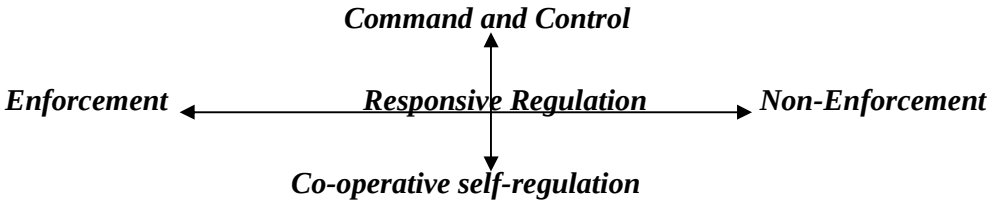
[193] This aspect coincides with the first feature of the concept of reflexivity discussed as 'autopoietic' regulation in p14.

[194] The tripartism structure under responsive regulation is the same as the intermediary structure under the concept of reflexivity.

[195] In this 1986 research, they identified seven different types of regulatory intervention: *conciliations; benign big guns; diagnostic inspection; token enforcement; detached token enforcement; detached modest enforcement; strong enforcement*, which they called *enforcement modes*, ranging from weak to strong (non-enforcement to enforcement). These enforcement modes focus on either particularistic solutions or rule book solutions. The first three enforcement modes—the conciliation, benign big gun, and diagnostic inspection mode tend to lead to cooperative fostering of self-regulation with particularized solutions. The other four modes—detached token enforcement, detached modest enforcement, token enforcement modes, and strong

10): the *regulatory dimension* with detached command-and-control regulation and cooperative self-regulation on one hand; and the *enforcement dimension* with non-enforcers and enforcers on the other.

Figure 10: Major Dimensions underlying the Typology of Regulatory Agencies



Source: Grabosky & Braithwaite, 1986, chap. 16, p. 228

Accordingly, responsive regulation is seen as seeking out a 'middle-path' between the excesses and extremes of rigid or tokenistic enforcement on one side, and top-down command-and-control or neo-liberal self-regulation on the other.

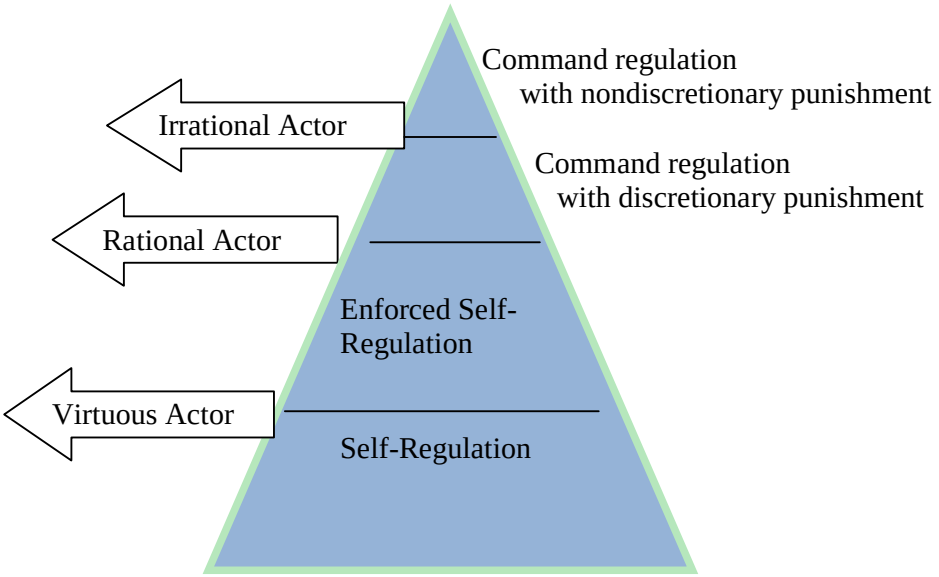
In the pyramid representing the sanctions pitched at an entire industry (Figure 11), enforced self-regulation is positioned in the middle of the pyramid and is discussed as one of the optimal regulatory approaches for *rational actors*, reflecting the 'middle path' feature of responsive regulation.

This second type of pyramid (Figure 11) represents the regulatory sanctions pitched at the entire industry. Self-regulation constitutes the broad base of the pyramid, with enforced self regulation the next layer up, followed by command regulation with discretionary punishment. The top layer is command regulation with nondiscretionary punishment such as the imposition of codes of conduct, or interest ceilings on loans, or prudential ratios across the entire banking industry. Similar to Figure 3.1, this pyramid also illustrates an escalation format of regulation, as moving up the pyramid, more and more demanding interventions are involved in terms of the behaviours of

enforcement modes use all forms of enforcement. They are rule-book oriented, and tend to use command, control or arms length regulatory relationships (Currie, 2006, p. 55). According to these findings, they develop a typology, and the location of these seven enforcement modes, within this typology, reflects their different enforcement level and regulatory strategies, i.e. command-and-control or cooperation.

regulatees, while it also can channel the rational actors down the pyramid[196] to reflect "responsiveness".

Figure 11: The Enforcement Pyramid representing the Sanctions pitched at the Entire Industry



Source from Ayres & Braithwaite, 1992, p. 39

Enforced self-regulation as "one of the creative option(s)" in this pyramid (Ayres & Braithwaite, p. 6), is designed to respond to the dilemma of choosing between either imposition of detailed government regulation on business or naïvely trusting firms to regulate themselves. Under this model, government would "compel each company to write a set of rules tailored to the unique set of contingencies facing that firm, and regulatory agencies would either approve these rules or send them back for revision if they were insufficiently stringent" (Ayres & Braithwaite, 1992, p. 106). This means firms are still required to regulate but according to their internal models in order to avoid harder and less tailored standards imposed by state, and negotiation occurs between state and individual firms to establish regulations that are particularized to each firm. Here, the 'responsiveness" also has been reflected through this process of particularizing regulatory standards in terms of their business structures, and firms 'internalize" their regulatory gaols instead of them being imposed by 'external'

[196] In this pyramid, when self-regulation works well, it is the least burdensome approach from the point of view of both taxpayers and the regulated industry.

regulatory agencies. Certain aspects of the regulatory 'burden' have been transformed from the state to industry and individual firms under this model.

In addition to this diffusion of the regulatory burden by encouraging firms and industries to behave as virtuous and/or rational actors, responsive regulation also empowers public interest groups (PIGs) to monitor and scrutinise the behaviour of regulated firms. This tripartite structure of regulator, regulatee and PIGs is another aspect of responsive regulation that shows its ability to spread the 'regulatory' burden.

4.4.2.2 Tripartism

According to Braithwaite, the design of responsive regulation recognises that restorative justice, deterrence, and incapacitation are "all limited and flawed theories of compliance, (and) what the pyramid does is to cover the weaknesses of one theory with the strengths of another"[197] (2006, p. 887). Therefore, Ayres and Braithwaite argue the central importance of third parties, particularly Non-government Organizations (NGOs), being directly involved in regulatory enforcement oversight[198] (Ayres & Braithwaite, 1992, chap. 3). This Tripartite structure—empowering PIGs—is an advanced way to both secure the advantages of the evolution towards cooperation between regulatory agencies and industry while minimising the risk of agency capture and corruption (1992, p.7).

Responsive regulation comes to conceive of NGOs as fundamentally important regulators in their own right, just as business is important as regulators as well as regulatees (Ayres & Braithwaite, 1992; Gunningham & Grabosky, 1998). Tripartism fosters the participation of PIGs in the regulatory process in two ways. *First*, it grants the PIGs and all its members access to all the information that is available to the regulator; and *second*, it gives the PIGs a seat at the negotiating table with the firm

[197] Braithwaite further explains that the ordering of the strategies in the pyramid is based on the consideration that by only resorting to more dominating, less respectful forms of social control after more dialogic forms have been tried first, puts the less costly, less coercive, more respectful options lower down in order to save money. In this manner, coercive control comes to be seen as more legitimate. "When regulation is seen as more legitimate, more procedurally fair, compliance with the law is more likely (Braithwaite, 2006, p. 887).

[198] Ayres and Braithwaite argue that states are at great risk of capture and corruption by business, even greater risk where regulatory bureaucrats are poor. They further explain that NGOs do more than just check capture of state regulators, they also directly regulate business themselves, through, for example, naming and shaming, restorative justice, consumer boycotts, strikes, and litigation they run themselves (Braithwaite, 2006, p. 888).

and the agency when deals are done, and it should maximize the prospects of genuine dialogue around the table leading to a discovery of win-win solutions, instead of the babble of many conflicting voices talking past each other. This empowerment of PIGs engenders incentives for regulatory players to develop trust and to reap rewards by "learning to be concerned about the interests of the other" (Ayres & Braithwaite, 1992, 98; see also Fisher & Ury, 1981).

The idea of tripartism can be applied to enforcement at any level of the enforcement pyramids. Ayres and Braithwaite argue PIGs indeed can strengthen the acceptability of deregulatory shifts by injecting public accountability and resistance to supine enforcement under the softer options. Furthermore, PIGs involvement can also provide the 'data' on noncompliance that justifies escalations of state regulatory intervention. In that sense, the ideas of tripartism and enforcement pyramids (as reflected by above pyramids) are complementary ways of transcending the regulation versus deregulation debate (1992, p. 97).

In general, responsive regulation is not a clearly defined program or a set of prescriptions concerning the best way to regulate. It is a dynamic or smart combination of both 'responsiveness' and the ability to 'spread the regulatory burden' by embracing a *tit-for-tat* strategy along the regulatory *pyramid*; locating the strategy at the '*middle-path*" of the typology; building incentives for firms to *internalize* their 'social responsibility'; and adopting the idea of tripartism at every level of enforcement.

4.5 Smart Regulation

Based on the concept of "Responsive Regulation", particularly the *regulatory/enforcement pyramid at entire industry level (Figure 3.3)* proposed by Ayres and Braithwaite (1992), Gunninghan, and Grabosky and Sinclair expanded this enforcement pyramid to a three-sided regulatory pyramid model, which "encapsulates not only the Ayres and Braithwaite's concept of a graduation to higher levels of intervention in response to regulatory resistance, but more important, (hopes to achieve) this through interactions between different, but complementary instruments and practices" (1998, p. 452).

Gunningham, Grabosky and Sinclair (1998) propose five principles for the design of 'smart' regulation" which reveals a similar core structure for this type of regulation to that of "responsive regulation".

Principle 1—*prefer policy mixes incorporating a broader range of instruments and institutions* - this is similar to the *Tripartism structure* of "responsive Regulation", Gunningham etc. see the combination of regulatory instruments involving a wide range of institutional actors as the best means of overcoming the deficiencies of individual instruments exposed by the command-control versus self-regulation debate. Furthermore, they highlight that this regulatory combination should be *systematically* put together in terms of the benefits of their mutual application instead of just going beyond a "single strategy" without integrated consideration. Thus, this complementary mix of instruments is required to be *tailored* to specific policy goals. Similar to Tripartism, certain expectations, under this principle, are put on the participation of third parties. Gunningham etc. confirm the role of third parties as assisting in "taking the weight off government intervention" (1998, p. 389), and recognise that additional benefits of broadening the regulatory net to include third parties are that a multiplicity of regulatory signals have the potential to be mutually reinforcing, and in many cases, "surrogate" regulators are far more exacting than direct government intervention.

Gunningham etc. return to discussion of this participation in principle 4—*empower participants who are in the position to act as surrogate regulators* - both second parties (industry) and third parties play valuable roles in the regulatory process, acting as quasi-regulators. They conclude, in many cases, harnessing the power of markets will, necessarily, be achieved through the vehicles of second and third parties rather than by direct government regulation since they are more potent than direct intervention (1998, p. 408). This conclusion is coincident with and also supports the argument of *Tripartism* in Ayres and Braithwaite's "responsive regulation". There are varieties of mechanisms through which government may seek to engage third parties more fully in the regulatory process. The authors of both notions—"responsive regulation" and 'smart' regulation realize the necessity of providing adequate information for such purposes. Gunningham etc. argue that reliable data on the performance of industrial firms, enables third parties, which could be in a position to

"exert influence to make objective judgements about government in such a *tripartite* regulatory structure should also take the role of creating necessary preconditions for second or third parties to "assume a great share of the regulatory burden"[199] (p. 411).

Principle 2 —prefer *less interventionist*[200] *measures* - suggests that the less interventionist approaches are preferred to more interventionist ones based on three criteria: efficiency; effectiveness, and political acceptability. However, the presupposition of this preference depends on the performance of individual firms in the previous period[201]. And then, Gunningham etc. like Ayres and Braithwaite, locate the policy instruments on a continuum from the least to the most interventionist in a pyramid.

But Gunningham etc. introduce an expanded version of the regulatory pyramid in principle 3—*ascend a dynamic instrument pyramid to the extent necessary to achieve policy goals*, based on the *enforcement pyramid* developed by Ayres and Braithwaite. As discussed before, this pyramid shows the different levels of intervention from low to high, which can be assumed by regulators. Accordingly, Gunningham etc. raise a issue that the pyramid of "responsive regulation" is concerned with the behaviour of, and interaction between, only two parties: government and industry, with only the former acting as regulator and enforcer, and the latter solely in the role of regulated ones. As discussed before, third parties play an important role as quasi-regulators in the regulatory process. Similarly, second parties, who are normally the regulated ones, under 'smart' regulation", become quasi-regulators with third parties. Therefore, Gunningham etc. consider the regulatory enforcement pyramid under 'smart' regulation can usefully include three faces: government and agencies as first parties; industry as second parties; and PIGs as third parties. In such an expanded model, escalation (i.e. increasing coercion) would be possible up any face of the pyramid, instead of merely from government as under the pyramid of "responsive regulation".

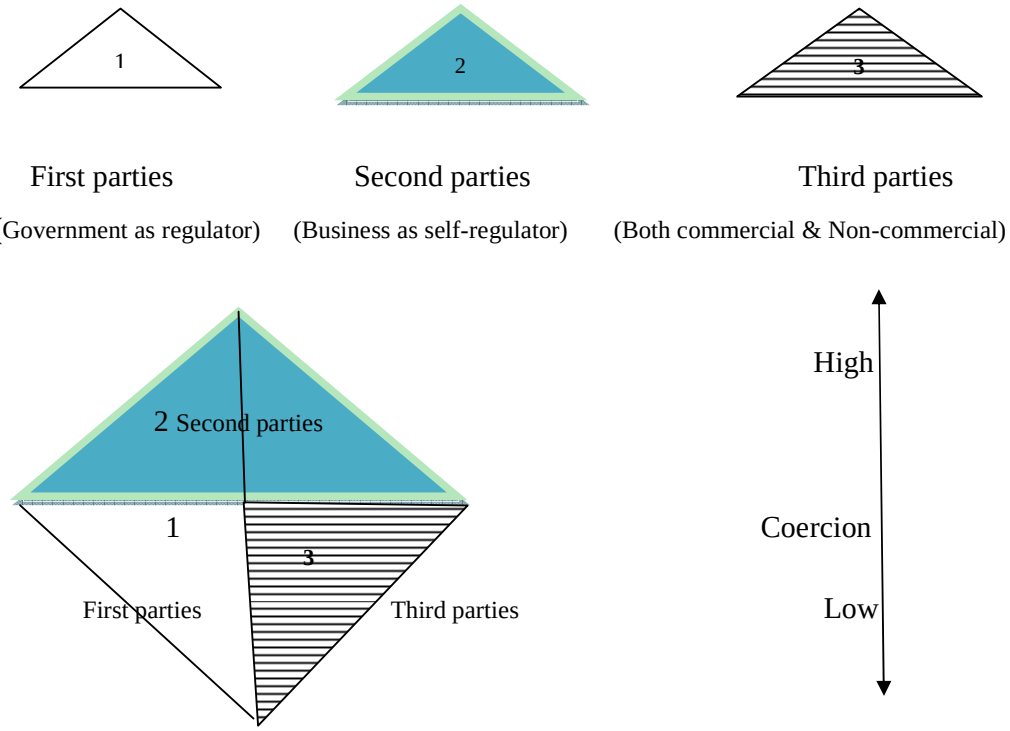
[199] Gunningham etc. argue that this will reduce the drain on scarce regulatory resources and provide wider community input.

[200] Gunningham etc. mean by "intervention", under this principle, prescription and coercion. Prescription refers to the extent to which external parties determine the level, type and method of eg. risk management. Coercion, in contrast, refers to the extent to which external parties or instruments place negative pressure on a firm to manage their risk-taking activities or improve their risk management system.

[201] Gunningham etc. discuss in their principle 3 that the preference of less interventionist measures can be undertaken when this less interventionist measure "will work" (1998, p. 395), which implies the performance of individual firms in the previous period should be considered as presupposition.

That means, escalation would be possible up the second face through self-regulation at industry level, or up the third face through a variety of actions by associations, unions, and other market participants with disclosed information (See Figure 12).

Figure 12: The Three-faceted Pyramid developed by Gunningham etc



Source from Gunnignham, et.al, 1998, p. 398

Gunningham etc. discuss the value of a "two track" regulatory system in principle 5—*maximize opportunities for win-win outcomes*, which emphasises the need to design different regulatory strategies for different types of firms to overcome the limitation of one-size-fits-all regulation and thus achieve win-win outcomes. Under this system, one 'track" is designed for best practice performers who should be encouraged and facilitated in going "beyond compliance" with the existing regulation; another "track" is designed for laggards, who need to be brought up to the existing legal standards by a variety of other strategies.

This expanded pyramid under 'smart' regulation" can be seen as an updated version of the pyramid under "responsive regulation", particularly the Tripartism structure advocated by both notions, is better embedded in the regulatory pyramid under

'smart' regulation". But, by their nature, they share the same idea and follow a similar route to achieve the new regulatory regime.

Furthermore, Braithwaite concludes that the two concepts—*responsive regulation* and *reflexivity* are "mostly on the same wavelength"[202] when it comes to solving the regulatory trilemma, and the authors of both concepts see the necessity to regulate by working with the grain of naturally occurring subsystems in business through the 'structural coupling'[203] of reflexivity related subsystems (2006, p. 885).

Therefore, these three notions of "*reflexivity*"; *responsive regulation*" and "*smart regulation*" can be woven together once it is recognised that a more foundational dichotomy can be established between mechanisms that *spread the burden* of regulation beyond the direct sphere of government (i.e. via systems monitoring and the use of tripartism and intermediary structures); and mechanisms that *achieve responsive enforcement* (i.e. by implementing a credible and invincible regulatory response initially induced through the enforced internalisation of external goals). This dichotomy will now be applied to an evaluation of the Basel II regulatory framework.

4.6 Is Basel II 'Smart' Regulation?

As soon as the new international capital adequacy requirements framework was released, it attracted the attentions of regulators, bankers and market participations as they explored its effectiveness in stabilizing financial markets, enhancing the competitive advantage of banks, and protecting shareholders and stakeholders. Particularly after the 2007-2008 financial crisis, as discussed in the previous chapter, certain issues were exposed that raise questions about the effectiveness of Basel II in preventing any future happening of a similar disaster, and about its ability to stabilize economies as the BIS expects.

[202] While Braithwaite confirmed the coincidence of these two concepts by their nature, he also argued that the concept of responsive regulation differed in one important point from Teubner's (1986) concept of reflexivity and also Autopoiesis (Teubner, 1988). As Braithwaite said, "I do not see law and business (sub) systems are normatively closed and cognitively open. In a society with a complex division of labor the most fundamental reason as to why social systems are not normatively closed is that people occupy multiple roles in multiple systems" (2006, p. 885).

[203] The required structural coupling among a rich plurality of separated powers is not only about checking abuse, it is also about enhancing the semi-autonomous power of nodes of governance to be responsive to human needs (Teubner, 1986, pp. 316-8).

To evaluate Basel II, which is the core intention of this research, the first step should go towards closely understanding and evaluating the framework of this new Basel Accord. So in this section, drawing on the history of regulatory strategies (command-and-control and self-regulation debate); and utilizing the new regulatory paradigm represented by the three concepts—*reflexivity; responsive regulation* and *smart regulation*, a foundational dichotomy[204] is developed and used as a benchmark to evaluate Basel II's framework. This provides the first part of the answer to the research question—how 'smart' is Basel II in the context of the Australian banking system.

4.6.1 Dichotomous Framework as evaluation Benchmark

Responsive regulation can be split into two constituent parts—'responsiveness' and ability to 'spread regulatory burden'. These two parts are broad and deploy different approaches to achieve them. However the earlier discussion has exposed functional similarities between these two broad parts and the four features of the concept of 'reflexivity'—being system monitoring; intermediary structures; corporate social responsibility; and market-oriented strategies. This implies that these four features can be accommodated under the two broad aspects of responsive regulation. As a result, this dichotomy will be built on two themes: first, the mechanisms that *spread the burden* of regulation beyond the direct sphere of government; and mechanisms that *achieve responsive enforcement*. Under the *first* theme, approaches such as system monitoring, tripartism and intermediary structures are classified as mechanisms to spread regulatory burden. Under the *second* theme, approaches such as building corporate social responsibility and market-oriented strategies are seen as mechanisms to achieve responsive enforcement.

4.6.1.1 Spreading the Regulatory Burden

This branch of the dichotomous framework will bring together systems monitoring and the presence of intermediary structures from the concept of 'reflexivity'; plus the

[204] In this thesis, the concept of governmentality is not used to develop the dichotomy, because it is anti-juridical in contrast to the concept of 'reflexivity' and 'responsive regulation'. The concept of governmentality in this chapter has provided a philosophic framework to rethink the role of state in neo-liberalism (refer to p. 8). Smart regulation is seen as a modification of the theory of responsive regulation (as discussed on p. 28), and shares the same features. So the dichotomy will be derived mainly from weaving the concept of 'reflexivity' and responsive regulation together.

notion of enforced self-regulation with its positioning in the middle of the enforcement pyramid between command regulation and self-regulation, and the idea of Tripartism from the concept of responsive regulation.

4.6.1.1.1 System Monitoring and Enforced Self-Regulation

The first factor contributing to a spreading of the regulatory burden is system monitoring [205], which compensates for a limited inspectorate capacity through promoting the internalization of goals and objectives. Inspectors are supposed to monitor and regulate the operation of self-control systems and, subsequently, intervene at the system level. Similarly, the model of enforced self-regulation, under responsive regulation, also has such a function. Reflecting its positioning in the middle of the pyramid, the enforcement and rule-writing is undertaken by firms at a system level, but regulatory agencies are responsible for authorizing these rules and making sure their implementation is aligned with regulatory prudential standards. In that manner, these two approaches although under different concepts are actually coincident on "spreading the regulatory burden" from government to industry.

4.6.1.1.2 Intermediary Structures and Tripartism

The second manner in which the regulatory burden is spread is via enlisting the assistance of third parties such as trade unions, industry networks and OH&S committee. Whether under the guise of intermediary structures or Tripartism, both approaches are concerned with empowering PIGs and making them function as channels of indirect regulation, when contacted and adequately informed and influenced by regulatory agencies. On one hand, they could communicate agreement with government enforcement to the enterprise, or on the other hand, they could change manager's minds and gently direct them towards "rational" behaviour. Generally, intermediary structures could play a role as "guardians of the public interest", as they draw together cooperation between industry and market participants (Aalders & Withagen, 1997). Similarly, "responsive Regulation" advocates a "tripartite" approach under which government, industry and public interest groups

[205] It is further argued that the most prominent and critical danger threatening the development of a system control approach is represented by politics turning to deregulation and privatization. For success the system monitoring should be backed by legislative enforcement, public disclosure, and countervailing power.

(PIGs) are conceived to act as a three legged stool in supporting a responsive agenda. The three-fold process of cooperation that ensues is deemed to make regulatory strategy more "stable". Thus, under "responsive regulation", industries are encouraged to consider not just private interest but also the public interest. PIGs thus become an acknowledged third player in the regulatory game, acting as "eyes" watching over the whole process from a distance[206] (Ayres & Braithwaite, 1992).

4.6.1.2 Achieving Responsive Enforcement

4.6.1.2.1 Corporate Social Responsibility and Responsiveness

A principal thrust of responsive regulation is to achieve responsive enforcement. Enforcement pyramids are predicated on the notion that a gradual escalation of enforcement interventions and a credible peak sanction can induce changes in the attitude and behaviour of industry (individual firm) that channels participants down the pyramid from irrational to rational, and then to virtuous actors.

This process of internalizing external objectives is what is hoped to be achieved with corporate social responsibility under reflexivity. Particularly, when regulators adopt a "Benign Big Gun" strategy [207] or promote the belief in "the benign face of bureaucracy" (Aalders & Wilthagen, 1997, p. 434) by firms, the culture embedded in internal systems changes and nurtures the growing tendency of internalizing of 'external' goals and values of individual firms and industries, because "guns are not fired at the virtuous, and because the threat of the gun is kept so far in the background that people are not forced to think just in terms of it. Virtue is saved from being undermined; indeed virtue is nurtured" (Ayres & Braithwaite, 1992, p. 50).

4.6.1.2.2 Market-Oriented strategies and Tripartism

The market-oriented regulatory tool could be considered as a compensation for one-sized market interference by government regulation. It should be backed by market transparency and requirements for disclosure of full information (Aalders & Withagen,

[206] At the same time, market incentives—to be discussed below—are brought into the regulatory process within an environment of public disclosure to ensure a more sensitive and effective form of surveillance and control.

[207] The benign big gun institution economizes on motivation, not just virtuous motivation. It does not depend on citizens being virtuous. If they are not virtuous, guns are ready to be fired (Ayres & Braithwaite, 1992, p. 50).

1997), where information disclosure relates specifically to the degree of conformity with the requirements of regulation i.e. capital adequacy as set by banking supervisors.

Under the tripartite structure of responsive regulation, the market participants are empowered, along with PIGs such as NGOs and unregulated industry panels to work with regulators. The outcome promotes a win-win result for all: for regulators, whose focus is on prudential standards; for industry or individual firms, who are more concerned with the benefit the regulation brings to them; and for market participants and public interest groups, who pursue either their own private investment interest, or the interest of the public domain.

Using the above foundational dichotomy as a benchmark, the three-Pillarframework of Basel II and also its related content can be evaluated. Thus the degree of congruence found between the Basel II framework and the mechanisms listed under the dichotomy goes some way toward answering the first research question this thesis is investigating — is Basel II 'smart' regulation?

4.6.2 Is Basel II Framework an example of these new Regulatory Approaches?

4.6.2.1 Spreading the Regulatory Burden

4.6.2.1.1 Internal-Rating based Approach and System Monitoring

Taking account of new developments in the measurement and management of banking risks for those banks that have built 'mature' internal systems, BIS (Bank for International Settlement) proposes an 'internal-rating based' (IRB) approach under pillar-1 of the Basel II framework to allow such banks to move onto the IRB approach. In this approach, institutions are allowed to use their own internal measures for key drivers of credit risk as primary inputs to the capital calculation, subject to meeting certain conditions and to explicit supervisory approval[208] (BIS, 2006). In contrast to the total reliance on external ratings from rating agencies to evaluate all risk types under the 1988 Basel Accord and later for credit risk measurement under the 1996

[208] All institutions using the IRB approach will be allowed to determine the borrowers' probabilities of default while those using the advanced IRB approach will also be permitted to rely on own estimates of loss given default (LGD) and exposure at default (EAD) on an exposure-by-exposure basis. These risk measures are converted into risk weights and regulatory capital requirements by means of risk weight formulas specified by the Basel Committee.

Basel Amendment[209], the design of the IRB approach under Basel II comprehensively promotes system level monitoring within banking risk management practice. The in-house experts and the internal systems, and models that banks have developed over past years, are performing an important role in regulatory 'games'. For banks themselves, the regulatory capital holding calculated by the internal system and in-house experts, using internal data, definitely offer better 'fit', while removing the extra 'weight' of the regulatory capital burden means that more capital is available for running the business. This also implies that the incentive for banks to further develop their internal system and enhance their risk management performance can be built into the IRB approach, because they are getting a 'reward' from investing in their internal systems and behaving well. For regulators, the IRB approach spreads certain burdens of regulating banks from regulators (in Australia's case, Australian Prudential Regulatory Authority, APRA) to industry itself, which solves the problem of insufficient regulatory resource. Accordingly, the regulatory resource can be more efficiently allocated to particular area needs, like strengthening support and oversight.

In general, the IRB approach under Basel II could be regarded as an instance of intervention at system level, which should be backed by regulatory supervision, the disclosure of full information and market discipline acting simultaneously as the countervailing power.

4.6.2.1.2 Intermediary Structures and Tripartism under Basel II

The integration of intermediary structures or tripartism reflected in Basel II's framework does not deviate much from earlier approaches. The participation of PIGs under Basel II is mostly based on the platform built between various trade unions, industry networks, OH&S Committees, banks and regulatory authorities prior to Basel II.

In the Australian region, NGOs, such as the Australian Bankers' Association, are active in bridging between banks and regulators, particularly around issues arising from released policies, cooperating with government to ensure implementation of policies (e.g. Wallis Inquiry), and thus creating a stable financial system on the one

[209] As discussed on p. 39 CHECK page number still OK of previous chapter, under the 1966 Basel Amendment, although certain banks were allowed to use their internal VaR models, this was just for market risk, not credit risks. So under Basel II, the internal rating system is being allowed to be used for evaluating main risk types in banks.

hand; and negotiating for banks with regulators to eliminate conflicts, and also look at ways of preventing criminal behaviour to protect consumers on the other[210]. Another example of such structures in the Australian banking system would be networks formed to benchmark progress and to implement proprietary versions of Value at Risk (VaR) software. In this regard, banking industry associations may also play a limited intermediary role.

Nevertheless, although limited, the BIS still takes account of the power of PIGs under Basel II. They have been empowered under Pillart-2 of Basel II—*Supervisory Review*, to closely work with supervisors as a countervailing power in banking supervision. According to Pillartwo requirements, supervisors must take care to carry out their obligations in a transparent and accountable manner, thus they should make *publicly* available the criteria to be used in the review of banks' internal capital assessments[211] (BIS, 2006, P. 219). Via this means, third parties such as NGOs can obtain valuable information, for example, information about the result of banks' internal capital assessment, and the explanation of correspondent regulatory actions from supervisors, and they can act in response to cooperate with regulators. The concern for disclosing supervisory information to the public domain, which can be seen as the empowerment of PIGs, runs throughout the whole of Pillar Two documentation and is coupled with the call for cooperation everywhere.

Accordingly, in Australia, slightly before the implementation of the Basel II agenda, APRA established two new risk assessment and supervisory response tools—Probability and Impact Rating System (PAIRS) [212] and Supervisory Oversight

[210] In these cases, the Australian Banker's Association brings together banks, government and private sector representatives, and police and card schemes to solve the problem, or take certain intervention such as persuasion.

[211] For instance, if the supervisor chooses to set targets or trigger ratios or to set categories of capital in excess of the regulatory minimum, factors that may be considered in doing so should be publicly available, which means the supervisor explains to the banks and also the public domain by disclosing certain information.

[212] PAIRS is APRA's risk assessment model, it incorporates two dimensions: the Probability and Impact of the failure of an APRA-regulated entity i.e. banks. PAIRS is the supervisory risk evaluation of regulated entities for regulatory purpose using supervisory prudential standards as benchmarks, by which supervisors could review the net risk position for each of the key risk types including strategy and planning, liquidity, operational, market and investment, credit and insurance risks. It also better reflects the manner in which APRA conducts its supervision activities under APRA Supervision Framework (ASF).

Response System (SOARS)[213]. PAIRS is based on the Internal Capital Adequacy Assessment Process (ICAAP), but uses supervisory prudential standards as benchmarks, to assess the banks' risk position and risk management performance for the regulatory purpose. All this information is released publicly to let all interested parties, particularly PIGs, have knowledge about banks' risks (APRA, 2008a). To ensure supervisory interventions are targeted and timely, the SOARS reports which are aligned with PAIRS results, are also released to the public domain (APRA, 2008b). In this sense, PIGs can be informed, and cooperate with regulators to indirectly regulate banks, and also can oversight the supervision process.

4.6.2.2 Achieving Responsive Enforcement

4.6.2.2.1 "Responsiveness" in Basel II Framework

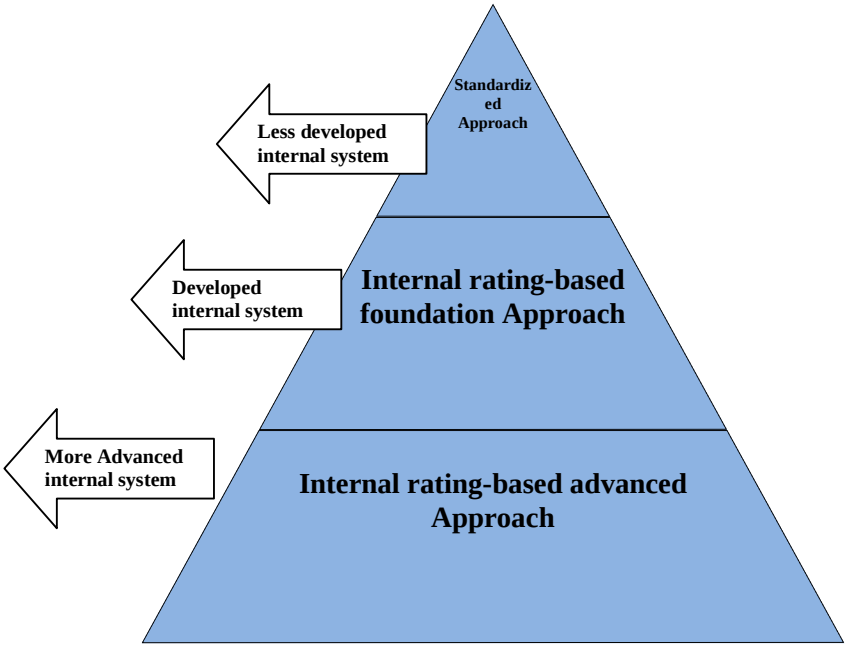
The main theme of the Basel II design is to achieve flexibility, regulatory prudence and to truly reflect the risk profile of banks. To overcome the flaws of a one-size fits all framework, BIS sets different levels of risk evaluation approaches to adjust for the differences in internal systems, availability of data pool, and the ability and performance of risk management in various banks under Basel II (as listed in Table 5 of Chapter Three). This consideration is intended to 'free' the advanced banks (i.e. multinational banks) from being disadvantaged by the backward looking one-size fits all regulatory framework in contrast to their well developed internal system and in-house technologies; while still keeping the regulatory capital commitment of the other banks aligned with their less-developed internal systems, and inhibiting them from moving forward to a higher but 'unfit' stage. This design with different levels of 'flexibility' can be reflected by a pyramid as seen in Figure 13, which is developed by researcher based on Ayres & Braithwaite's pyramid (Figure 11). Firms are ranked in terms of the differences in their internal systems, in-house technology and ability to manage risk, which ranges from less-developed, to developed, then to more advanced internal systems. The choice of which risk evaluation approach to adopt de-escalates 'responsively' along the pyramid from the standardised approach[214], to internal-rating

[213] The combination of the PAIRS report with SOARS is used to determine how supervisory concerns based on the PAIRS risk assessments should be acted upon. All regulated entities by APRA subject to PAIRS assessment are assigned a SOARS stance.

[214] The banks with less-developed internal systems, insufficient data pool, and less desirable in-house technology (which might be caused either by short history, small size and insufficient funding for system update, or just unwilling to invest heavily on internal systems in terms of

based foundational approach[215], and down to the bottom—the most advanced approach—internal rating-based advanced approach[216].

Figure 13: The Pyramid of Risk Evaluation Approaches for Credit Risks



Another aspect under the Basel II framework that also reflects the promotion of 'responsive' enforcement is that supervisors are encouraged to apply prudential floors on banks that adopt the IRB approach for credit risk and/ or the Advanced Measurement Approach (AMA) for operational risk particularly during the interim. And the further implementation of such prudential floors is required to be responsive to the performance of individual banks or industry (BIS, 2006).

cost-return consideration) are just allowed to adopt the standardized approach (on top of the pyramid). This practice is very close to that done under the 1988 Basel I and 1996 Amendment.

[215] Under the foundation approach, as a general rule, banks provide their own estimates of possibility of default (PD) and rely on supervisory estimates for other risk components.

[216] Under the advanced approach, banks provide more of their own estimates of PD, loss given default (LGD) and Exposure at default (EAD), and their own calculation of maturity (M), subject to meeting minimum standards.

4.6.2.2.2 Risk Culture, Board Education and Corporate Social Responsibility

Under Basel II, the regulatory response will initially be induced through the enforced internalisation of external goals, as embodied in the internal modelling capacity of individual banks. On one hand, through the application of the internal rating-based (IRB) approach (the de-escalation along the pyramid when their internal systems are updated towards 'mature' and more advanced levels) banks can reduce their capital adequacy requirements. On the other hand, they can tailor their modelling approaches to the particular constellation of market, operational, and credit risks to which they are exposed. Within this de-escalation process, the growing incentives of banks to invest in system updating are built-in, particularly when they see or have benefit from IRB (or even more advanced approaches) such as lower regulatory capital holding, or more flexibility on comprehensive strategy planning related to internal-based risk evaluation. Simultaneously, the culture of risk management could be gradually nurtured among the banks and spread to the whole banking industry.

Another factor contributed to enhancing corporate social responsibility which is more clearly defined in Basel II documents, is the 'education' of the banks' board and senior management on risk management and capital planning to achieve desired strategic objectives. Under Pillar Three of Basel II (BIS, 1996, p. 205-6), senior management and the board should "view capital planning as a crucial element in being able to achieve its desired strategic objectives", because the analysis of a bank's current and future capital requirements in relation to its strategic objectives is a vital element of the strategic planning process. It also mentions that "it is likewise important" that the board of directors understands and supports strong internal controls and written policies and procedures to ensure that management effectively "communicates these throughout the organization".

Therefore, with the exception of the quantitative criteria used for calculating regulatory capital holdings, Basel II, compared to the previous Basel Accord, is concerned more with the qualitative side or strategy aspect of risk management. Its efforts in promoting risk culture nurturance and educating bank boards and senior management are the instances of such a tendency.

4.6.2.2.3 Market Discipline

Under the previous Basel Accord, direct regulatory supervision alone was deemed to be an effective instrument for inducing banks to hold sufficient capital, but under the framework of Basel II, BIS confirms the role of market discipline as a necessary supplement (of Pillar1—minimum capital requirements and Pillar2—supervisory review process) to ensure adequate provision of capital, particularly in the cases where banks rely on internal methodologies, as this can assess capital requirements with more discretion through disclosing relevant information to market participants.

As the third Pillar of Basel II, this market-oriented approach, intends to encourage market discipline by developing a set of disclosure requirements which will allow market participants to assess key pieces of information on the scope of application, capital, risk exposures, risk assessment processes, and hence the capital adequacy of the institution. This way is seen as effective within the common framework of Basel II through informing the market about a bank's exposure to those risks and providing a consistent and understandable disclosure framework that enhances comparability.

As the core of market discipline, information disclosure under Pillar3 follows a principle that supervisors should require banks to disclose information under safety and soundness grounds for their supervisory purpose[217], while the mechanisms adopted by supervisors may vary from country to country and range from "moral suasion" through dialogue with the bank's management, to reprimands or financial penalties[218].

Especially it is argued, that with a series of evolutionary developments in financial markets, banks have acquired more sophisticated tools for managing and transferring risk, including through securitisation and the use of credit derivatives. In the light of these changes, regulators have argued that levels of subordinated debt would act both as a primary information signal under market discipline and as a technological mechanism affording greater flexibility in meeting capital adequacy requirements, (Federal Reserve Board, 1999). The sensitivity of information derived from

[217] Supervisors have the authority to require banks to provide information in regulatory reports. Some supervisors could make some or all of the information in these reports publicly available. In Australia, APRA puts these reports submitted by banks on its website.
[218] The nature of the exact measures used will "responsively" depend on the legal powers of the supervisor and the seriousness of the disclosure deficiency.

subordinated debt levels will, it is claimed, provide a warning signal even when a bank is "healthy".

The congruence found between Basel II's framework (also related content) and these creative regulatory concepts ('reflexivity', responsive regulation and 'smart' regulation) draws a picture that Basel II shares certain characteristics with these innovative notions. Precisely speaking, Basel II is an example of such 'smart' regulation in the field of banking regulation. However, although Basel II's framework has 'smart' features, it is still too early to conclude that Basel II can also work effectively in the real world, because the real financial market is far more complicated, and capitalism, as argued in Chapter Two, has an 'endogenous' tendency to instability within the business cycle. To explore the exposure to this tendency, this research is going to examine the technical aspects of Basel II (Value-at-Risk approach) and talk with experienced practitioners who work closely with the Basel Accords and risk management in the Australian banking system.

4.7 Conclusion

The regulatory concepts—govermentality, reflexivity, responsive regulation, and 'smart' regulation provide a new and innovative paradigm for the design of regulatory strategy with an ability to transcend the command-and-control versus self-regulation debate. These concepts offer this research a theoretical foundation from which is developed a dichotomous framework against which to evaluate Basel II framework. Consequently, the congruence explored between Basel II framework and these concepts evidences that Basel II can be regarded as an example of 'smart' regulation. However, this is an inadequate basis on which to conclude the effectiveness of Basel II in preventing similar financial crises happening and hence stabilizing financial markets. Therefore, the next chapter will examine the technical aspects of Basel II, paying particular attention to the Value-at-Risk (VaR) approach and the issues arising from the related risk measurement practice.

Chapter Five

Is the Value-at-Risk Approach adequate for Risk Management under the Basel II Framework?

5.1 Introduction

In this chapter of the thesis the researcher examine the risk estimate approach—Value-at-Risk (VaR) which has been extensively embraced by regulators, and practitioners in financial markets under the current Basel II framework as the basis of risk measurement both for the purpose of ensuring regulatory capital adequacy, and risk management and strategic planning at industry level, to uncover its advantages and flaws. The researcher starts by discussing three different methodologies of the VaR approach—variance-covariance; historical and Monte Carlo simulation in section 5.2.1. As required by regulators under the Basel II framework, backtesting and stress testing are adopted as complementary to VaR, which the researcher discusses in sections 5.2.2 and 5.2.3. But in section 5.2.4 and 5.2.5, the researcher intends to argue that Extreme Value Theory (EVT) is able to capture tail risks better, and Copula methods can assist VaR for accurate risk aggregation by combining the specific marginal distributions with a dependence function to create a joint distribution of the portfolio. In section 5.3, based on further discussion of the weakness of VaR associated with sub-additivity, the researcher introduces and explores the effectiveness of an alternative approach to VaR—Expected Shortfall (ES) that is advocated by certain academics. Another risk measure—distortion risk measure, which is closely related to coherent measure, sheds further light on limitations of VaR and ES (in section 5.4). Based on the belief that both ontological and epistemic factors interact to determine a model outcome, decision-making in the financial world becomes complicated with the inclusion of not only risk premia, but also uncertainty premia. This latter is closely related to uncertainty aversion and liquidity preference in *Keynes uncertainty* and Minsky's notion of *Financial Instability Hypothesis*, and should be taken into account technically, which the mathematical equivalence between two capacity-based representations of uncertainty aversion (multiple-prior setting and sub-additive probabilities) established by Gilboa and Schmeidler (1989), and Tversky and Wakker's Cumulative Prospect Theory (1995), provide a platform

for this discussion. Section 5.5 intends to suggest a new entry-point for the purpose of formalising and modelling uncertainty in financial markets—robust and risk-sensitive control theory, with the application of Tsallis entropy in assisting understanding of decision-making.

5.2 Value-at-Risk Estimate Approach

5.2.1 Traditional Value-at-Risk Approach

Risk is simply the potential for deviation from expected results, particularly adverse deviation. Behind every future cash flow, earnings result, or change in value there lays a probability distribution of potential results. The relative magnitude of risk could be defined by a measure of spread or dispersion in that distribution such as the standard deviation or variance. However, variance is not necessarily sufficient for capturing risk—two distributions with dramatically different shapes and differing amounts of downside risk can have the same variance (Rosenberg & Schuermann, 2004).

Measures such as skewness and kurtosis can be used to quantify the risk that is not adequately described by variance alone. Another approach is to examine the percentiles of the distribution such as Value-at-Risk (VaR) approach. Jorion (2001, p. 107) argues that the greatest advantage of VaR is that it summarizes in a single, easy way to understand a number that captures the downside risk of any institution due to financial market variables.

Apart from the above, the other characteristics of the VaR approach, which give it an edge over the more traditional risk assessment methods used in capital markets context are: (1) it provides a common measure of risk across different positions and risk factors, while traditional methods are more limited[219]; (2) VaR enables us to aggregate the risks of positions taking into account the ways in which risk factors correlate with each other, most traditional risk measures do not allow for the "sensible" aggregation of component risks; (3) VaR is holistic in that it takes full account of all driving risk factors, whereas traditional measures only look at risk factors one at a time (i.e. Greek).

[219] For example, duration measures apply only to fixed-income positions, Greek measures apply only to derivatives positions, portfolio-theory measures apply only to equity and similar (e.g. commodity) positions, and so forth.

Therefore, value-at-risk (VaR) is widely used to measure the risk of loss on a specific portfolio of financial assets. Banks, brokerage firms, investment funds, and regulators have widely endorsed statistical-based risk-management systems such as VaR.

The New Basel Accord (Basel II) acknowledges the important role of value-at-risk (VaR) [220] as a basis of risk measurement and regulatory capital calculation. Particularly, for the regulatory purpose, a risk measure approach, such as VaR, needs to have the ability to adequately capture all the risks facing an institution, encompassing market risk, credit risk, operational risk, and other risks.

VaR integrates market risk across all assets, derivatives, stocks, bonds or commodities, and it also can be adapted to account for credit risk, liquidity risk, and operational risk. Accordingly, under the Basel II framework, the VaR approach is adopted extensively for capturing various risks instead of only focusing on market risk as under the 1996 Basel I Amendment.

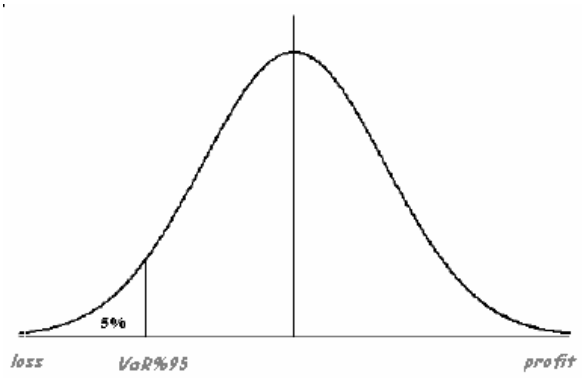
For a given portfolio, probability and time horizon, VaR is defined as a threshold value[221] such that if the probability that the mark-to-market loss on the portfolio over the given time horizon exceeds this value is the given probability level assuming normal markets and no trading in the portfolio[222] (Jorion, 2001). The following figure 14 shows a one day VaR at 95% confidence level.

[220] VaR's heritage can be traced to Markowitz's (1952) seminal work on portfolio choice. He noted that "you should be interested in risk as well as return" and advocated the use of the standard deviation as an intuitive measure of dispersion. Much of Markowitz's work was devoted to studying the tradeoff between expected return and risk in the mean-variance framework, which is appropriate when either returns are normally distributed or investors have quadratic utility functions.

[221] A loss which exceeds the VaR threshold is termed a "VaR break" (Holton, 2003). So the VaR probability level is specified as one minus the probability of a VaR break, i.e. the VaR with 5% VaR break would be called a one-day 95% VaR.

[222] The reason for assuming normal markets and no trading, and to restricting loss to things measured in daily accounts, is to make the loss observable. In some extreme financial events, it can be impossible to determine loss, either because market prices are unavailable or because the loss-bearing institution beaks up.

Figure 14: One day VaR at 95% Confidence Level



If we let Y_t be the portfolio value at time t, and define the k-period ahead portfolio return as $r_{t+k} = \ln(Y_{t+k}) - \ln(Y_t)$. We can denote the (1-$\alpha$) % VaR estimate at time t for a k-period ahead return as $\text{VaR}_{t+k}(\alpha)$, so that

$$\Pr\left(r_{t+k} < \text{VaR}_{t+k}(\alpha)\right) = \alpha$$

In the case of market risk using internal models under the Basel II framework[223], a bank is required to produce a 10 day[224] forward Value-at-Risk (VaR) measure each day using its own models on all trading book positions and banking book commodity and foreign exchange positions. The parameters for this measure are a 99% confidence level[225] using at least a year of historical data. Each day's general market risk capital number is determined by multiplying the average of the last 60 days' worth of 10 day VaR measures with a safety factor of 3[226] to provide the minimum

[223] Initially under the 1996 Market Risk Amendment, there were two forms of market risk measured, general market risk and specific market risk. General market risk is composed of interest rate, equity, commodity or foreign exchange risk. Meantime, specific market risk is intended to cover variation both from day-to-day price fluctuations and from unexpected events (i.e. unexpected bond default).

[224] BIS chose a 10-day period because it reflects the tradeoff between the costs of frequent mornitoring and the benefits of early detection of potential problems.

[225] Jorion (2001, p, 118) argues that the choice of the confidence level should reflect the degree of risk aversion of the company and the cost of a loss exceeding VaR. Higher risk aversion or greater cost implies that a greater amount of capital should cover possible losses, thus leading to a higher confidence level. This is the reason why BIS set 99% confidence level, instead of 95% level, under Basel II—being based on prudential control considerations, and also reflects the tradeoff between the desire of regulators to ensure a safe and sound financial system and the adverse effect of capital requirements on bank returns.

[226] A loss worth more than the VaR estimate will occur about 1% of the time, on average, or once every 4 years. It would be unthinkable for regulators to allow major banks to fail so often. This explains the multiplicative factor K=3, which should provide near absolute insurance against bankruptcy. Presumably, the multiplicative factor also accounts for a host of additional risks not

capital requirement for regulatory purposes. This multiplier is determined from back-testing the validity of each day's one day VaR estimate against the actual trading results of the following day. And the stress testing is performed once each quarter looking back over the prior year of trading days. However, different VaR models differ in terms of the horizon periods and confidence levels used, particularly, in terms of their estimation methodologies.

Generally, VaR methods can be categorized into two groups in terms of analytic techniques for measuring a distribution's VaR[227]: first, nonparametric—directly reading the quantile from the distribution, historical simulation based on the empirical distribution and sample quantile fall in this category; second, parametric—calculating the standard deviation and then scaling by the appropriate factor such as variance-covariance approach and Monte Carlo simulation. This kind of parametric approach, in contrast to the first category, attempts to fit a parametric distribution such as a normal distribution to data. VaR is then measured directly from the standard deviation.

5.2.1.1 Variance-Covariance Approach

The variance-covariance approach was formulated and broadly used after JP Morgan released its RiskMetrics methodology in 1994. It is based on the assumption of joint normality between various market measures (i.e. prices, interest rates, etc).

One of the original approaches for portfolio risk measurement is Markowitz's (1959) mean-variance analysis. Consider a simple case of three assets (or more broadly, three cash flow generating processes) with returns r_x, r_y and r_z and weights w_x, w_y and w_z such that these weights sum to one. The portfolio return is simply $r_p = w_x r_x + w_y r_y + w_z r_z$ and the variance is

$$\sigma_p^2 = w_x^2 \sigma_x^2 + w_y^2 \sigma_y^2 + w_z^2 \sigma_z^2 + 2w_x w_y \sigma_{x,z} + 2w_x w_z \sigma_{x,z} + 2w_y w_z \sigma_{y,z}$$

Where σ_i^2 is the variance of the i^{th} return and $\sigma_{i,j}$ is the covariance between return i and j.

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modelled by the usual application of VaR that fall under the category of model risk (Jorion, 2001, p. 120).

[227] The choice of VaR method is a function of the nature of the portfolio. For fixed income and equity, variance-covariance approach is probably adequate. For plain vanilla options, a simple enhancement of variance-covariance such as the delta-gamma approach is often claimed to be suitable, but if there are more exotic options, a more advanced full revaluation method such as historical or Monte Carlo simulation is required.

Then, assuming for simplicity that the portfolio expected return is zero, the portfolio VaR can be written based on the Gaussian approach[228] as (see, for instance, Bradley and Taqqu, 2002),

$$\mathrm{VaR}_{p}(\alpha) = \boldsymbol{\sigma}_{p} F_{p}^{-1}(\alpha)$$

Where $F_{p}^{-1}(\alpha)$ is the α^{th} quantile of the standardized portfolio return ($r_p/\ \boldsymbol{\sigma}_p$), and $F_{p}^{-1}(\alpha)$ is the standardized quantile function, which measures risk in terms of the number of standard deviations from zero.

5.2.1.1.1 Delta-Normal Method

The most common and simplistic variance-covariance method is the *delta-normal* method. It is a parametric, analytic technique where the distributional assumption made is that the daily geometric returns of the market variables are multivariate normally distributed with mean return zero[229]. So it is an appropriate method to compute VaR for portfolios with linear positions and whose distributions are close to the normal probability density function[230].

If the portfolio consisted of only securities with joint normal distributions, its return is

$$R_{p,\,t+1} = \sum_{i=1}^{N} W_{i,t} R_{i,\,t+1}$$

Where $W_{i,t}$ is weight and the portfolio variance is given by

$$\sigma^{2}(R_{p,\,t+1}) = W_{t} \sum W_{t}$$

[228] This is the basic and simplest way among various models to calculate VaR and also Expected Shortfall (ES). It assumes the independent identical distribution (i.i.d.) of standardized residual terms. The variance-covariance VaR is based on this assumption.

[229] This is the fundamental Geometric Brownian Motion model, and the historical data under this method is used to measure the major parameters, the distribution of the profit is normal as well.

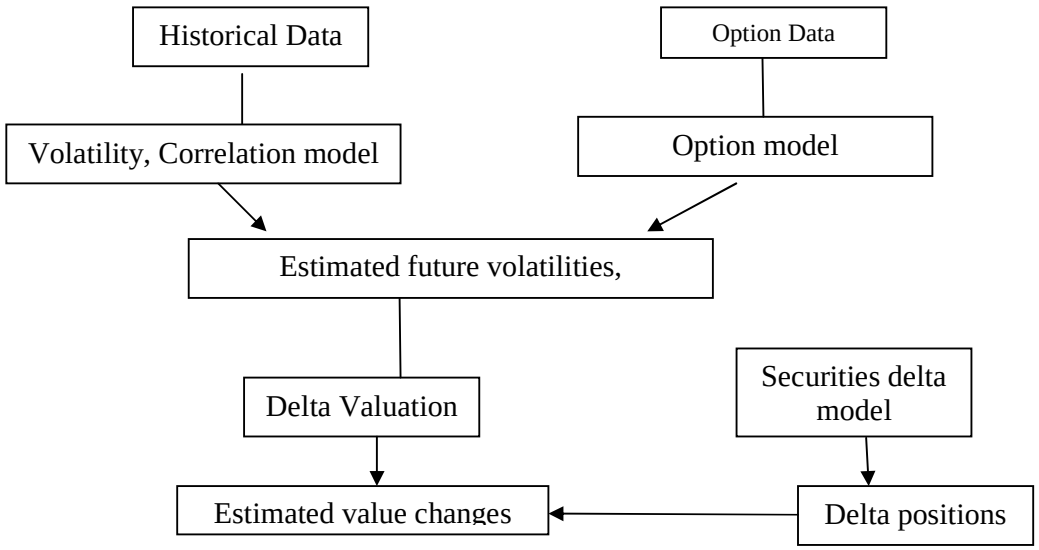
[230] Using the Delta-Normal method, Value-at-Risk would be relatively easy to compute, fast, and accurate. In addition, it is not too prone to model risk (due to faulty assumptions or computations). Because the method is analytical, it allows easy analysis of the VaR results using marginal and component VaR measures.

Where $\sum_{t+1}$ is the forecast of the covariance matrix over the VaR horizon. After certain processes, including mapping, which produce a set of exposures $X_{i,t}$ these are aggregated across all instruments for each risk factor. The portfolio VaR is then

$$VaR = \alpha \sqrt{X_t \sum_{t+1} X_t}$$

The steps involved in this approach are shown by Figure 15.

Figure 15: Delta-Normal Method[231]



5.2.1.1.2 Delta-Gamma Method

When we extend the analytical tractability of the delta-normal method with higher-order terms, it becomes the delta-gamma method such as the RiskMetrics analytical method and approximates the nonlinear relationship via a Taylor series expansion. This approach assumes that the change in value of the instrument is approximated by its delta and its gamma[232]. The delta-gamma method gives

$$VaR\ (V) = (S\text{-}S^{-}) - \frac{1}{2}\Gamma(S\text{-}S^{-})^2, \text{ if the long equity option, and}$$

$$VaR\ (V) = (S^{+}\text{-}S) + \frac{1}{2}\Gamma(S^{+}\text{-}S)^{2,} \text{ if the short equity option.}$$

[231] This figure is sourced from Jorion (2001, p. 220) Figure 9-8.
[232] It is the second derivative of the instrument's value with respect to the underlying price.

where S^- is that down value of the stock which corresponds to the confidence level required, and S^+ is that up value of the stock which corresponds to the confidence level required.

The variance-covariance approach, particularly the delta-normal method, is easy to implement because it involves a simple matrix multiplication. It is also computationally fast, even with a large number of assets, because it replaces each position by its linear exposure. Also, in many situations, this approach provides adequate measurement of market risks[233]. As a parametric approach, it is easily amenable to analysis, since measures of marginal and incremental risk are a by-product of the VaR computation[234].

However, the above approach, particularly the delta-normal method, can be subject to a number of criticisms. The first is the existence of *fat tails* in the distribution of returns on most financial assets. These fat tails[235] are particularly worrisome precisely because VaR attempts to capture the behaviour of the portfolio return in the left tail. In this situation, a model based on a normal distribution would underestimate the proportion of outliers and hence the true value at risk. Another problem is that the method inadequately measures the risk of *nonlinear instruments*, such as options or mortgages[236] (Jorion, 2001, p. 220-1). Therefore, for complicated portfolios, full valuation based approaches—*historical simulation* and *Monte Carlo simulation* are more plausible for VaR computation.

5.2.1.2 Historical Simulation

The historical simulation method provides a straightforward implementation of full valuation. It uses the empirical quantile of the historical distribution of return series in a very direct way as a guide to what might happen in the future.

To calculate VaR using historical simulation, first, the current portfolio weights are applied to a time-series of historical asset returns[237],

[233] Under the delta-normal method, the distribution of returns need not be assumed to be stationary through time, since volatility updating is incorporated into the parameter estimation.
[234] The delta-normal method has the advantage of illustrating the "mapping" principle in risk management.
[235] Some of these tails can be explained in terms of time variation in risk. However, even after adjustment, there are still too many observations in the tails (Jorion, 2001, p. 221).
[236] Under the delta-normal method, options positions are represented by their "deltas" relative to the underlying asset. Thus, the asymmetries in the distribution of options are not captured by the delta-normal VaR, Jorion (2001, chap 9) demonstrated such a conclusion.
[237] The weights W_t are kept at their current values. This return does not represent an actual portfolio but rather reconstructs the history of a hypothetical portfolio using the current position.

$$R_{p,k} = \sum_{i=1}^{N} W_{i,t} R_{i,t} \qquad K=1, \ldots, t$$

Then, the hypothetical future prices for scenarios *k* are obtained from applying historical changes in prices to the current level of prices[238]:

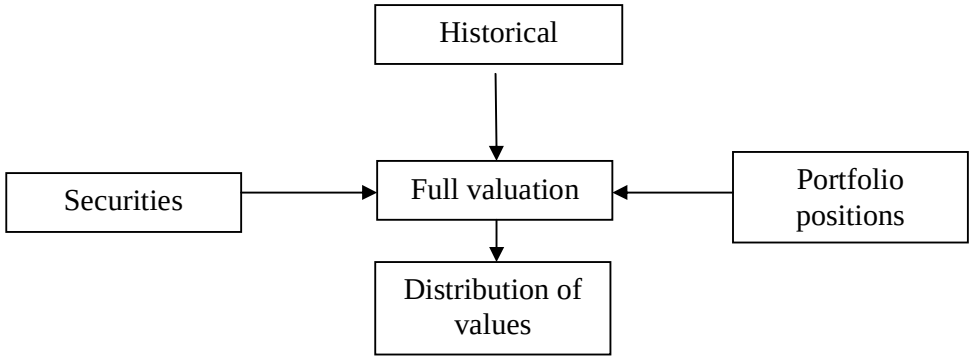
$$S_{i,t}^{*} = S_{i,o} + \Delta S_{i,k} \qquad i=1, \ldots, N$$

This can create the hypothetical return corresponding to simulation *K*:

$$R_{p,k} = \frac{V_k - V0}{V0}$$

VaR is then obtained from the entire distribution of hypothetical returns, where each historical scenario is assigned the same weight of (1/t). The steps to operate historical simulation are shown in following Figure 16.

Figure 16: Historical Simulation Method[239]



The main advantage of historical simulation is that it makes no assumptions about risk factor changes being from a particular distribution. This methodology is consistent with risk factor changes being from any distribution. By relying on actual prices, the method allows nonlinearities and non-normal distributions. The method captures gamma, Vega risk, and correlations. It does not rely on specific assumptions about valuation models or the underlying stochastic structure of the market. As Jorion (2001, p. 223) pointed out, the most important feature is this approach can account for a *fat*

This approach sometimes is called *bootstrapping* because it involves using the actual distribution of recent historical data without replacement.

[238] The instruments in the portfolio are then repeatedly re-valued against each of the scenarios.

[239] This figure is sourced from Jorion (2001, p. 222) Figure 9-9.

tail, because, as it does not rely on valuation models, it is not prone to model risk. Thus, it is widely used.

Historical data, however, may not provide the best available forecast of future risks. It always assumes that we have a sufficient history of price changes, and only one sample path is used. Situations involving changes in regimes, for instance, are simply not reflected in recent historical data. In cases where risk contains significant time variation, the simple historical simulation method will miss situations with temporarily elevated volatility[240]. This method also has the drawback that it quickly becomes "*cumbersome"* for larger portfolios with complicated structures[241] (Jorion, 2001, p. 224).

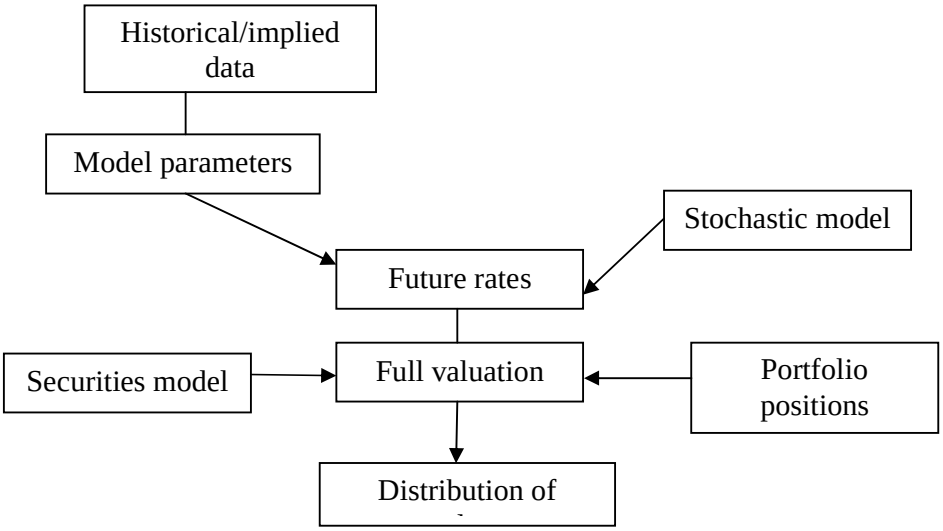
5.2.1.3 Monte Carlo Simulation

The Monte Carlo method is a combination of parametric methods and historical simulation. It begins where variance-covariance left off, with the standard deviation and correlations of the market risk variables. Like the variance-covariance method, this method also assumes a normal distribution in returns and the variance-covariance matrix is being used[242].

The Monte Carlo simulation method can be briefly summarized in two steps (Figure 17). In the first step, a stochastic process is specified for the financial variables. In the second step, fictitious price paths are simulated for all financial variables of interest. Each of these "pseudo" realizations is then used to compile a distribution of returns from which a Value-at-Risk (VaR) figure can be measured**.**

[240] The worse case event can be that historical simulation will be very slow to incorporate structural breaks, which are handled more easily with an analytical method such as RiskMetrics.
[241] In practice, users adopt simplifications such as grouping interest rate payoffs into bands, which considerably increases the spread of computation. Regulators also have adopted such a "bucketing" approach. But if too many simplifications are carried out, such as replacing assets by their delta equivalents, the benefits of full evaluation can be lost (Jorion, 2001).
[242] Monte Carlo is a spreadsheet simulation, to simulate a model, values for certain variables are generated randomly, consequently, Monte Carlo simulation creates a historical data according to variance-covariance matrix.

Figure 17: Monte Carlo Method[243]



Monte Carlo simulation techniques are more flexible and powerful compared to the other two approaches (variance-covariance; and historical simulation). It can account for a wide range of exposures and risks, including nonlinear price risks, volatility risk, and even model risk. Jorion (2001, p. 225) argues that it is also flexible enough to incorporate time variation into volatility, fat tails, and extreme scenarios. Simulation generates the entire *pdf*, not just one quantile, and can be used to examine the expected loss beyond a particular VaR.

However, its computational time is a big drawback of this method, particularly, if the valuation of assets on the target data involves a simulation, for then the method requires a "simulation within a simulation", which is too onerous and consequently expensive to implement on a frequent basis. VaR estimates from MC simulation are subject to *sampling variation*, which is due to the limited number of replications. Also, the potential of model risk cannot be ignored, because MC relies on specific stochastic processes for the underlying risk factors as well as the pricing model for securities such as options or mortgages. Therefore, it "is subject to the risk that the models are wrong"[244] (Jorion, 2001, p. 226).

We should see that VaR can assess exposure to different markets in terms of a common base. The dollar value that it provides can be directly compared to actual

[243] This figure is source from Jorion (2001, p. 225) Figure 9-10.
[244] To check if the results of MC are robust to changes in the model, simulation results should be complemented by some sensitivity analysis.

trading profit and loss results. These calculations provide a basis for the bank to develop sophisticated models.

All the VaR models are based, in one way or another, on historical data. As such they may over or underestimate risk when the past is not a good predictor of the future. But the use of historical data does eliminate subjectivity. Also, it is argued that a VaR figure provides no indication of the magnitude of losses when a confidence interval is breached.

In general, VAR does not give a consistent method for measuring risk, as different VaR models will come up with different VaR results. The historical simulation method based on historical data takes into account the actual shape of the observed distribution of the profits and losses. Comparably, the Monte Carlo approach depends on simulating future happening and is computationally demanding. The most widely used approach—variance-covariance method assumes symmetry around a zero mean, which gives weight to both profits and losses.

However, even the supporters of VaR such as Philippe Jorion (2001, p. 29) mention that VaR is no panacea. VaR measures are only useful insofar as users grasp their limitations including lack of sub-additivity and ability to capture tail risks. Thus, the application of VaR models always should be accompanied by validation. Model validation is the general process of checking whether a model is adequate. This can be done with a set of tools, including backtesting, stress testing, and independent review and oversight.

5.2.2 VaR Backtesting

Backtesting is a formal statistical framework that consists of verifying that actual losses are in line with projected losses. Model backtesting involves systematic comparisons of VaR with the subsequently realized P & L with the goal of setting up the test so as to maximize the likelihood of catching biases in the VaR forecast[245] (Jorion, 2001). Especially given that the above weaknesses have been recognised both

[245] These procedures or reality checks, are essential for VaR users and risk managers who need to check that their VaR forecasts are well calibrated. If not, the models should be re-examined for faulty assumptions, wrong parameters, or inaccurate modelling. This process provides ideas for improvement.

by academics and practitioners, adopting backtesting becomes crucial for a VaR-based risk measurement process.

So Basel II requires backtesting in the adoption of internal VaR models for capital requirements. The intention is to eliminate the incentive of banks to understate their reported risk. At the same time, the backtesting system also can avoid unduly penalizing banks whose VaR is exceeded simply due to bad luck. The requirement includes a shorter horizon to increase the power of the tests that is backtesting is performed over a 1-day horizon under Basel II, even though the horizon of the VaR measure is 10 business days for capital adequacy purposes. With backtesting, when the model is perfectly calibrated, the number of observations falling outside VaR should be in line with the confidence level. When the number of exceptions is large, the model underestimates risk. The simplest method to verify the accuracy of the model is to record the failure rate, which gives the proportion of times VaR is exceeded in a given sample (Jrion, 2001). Backtesting involves balancing two types of errors: rejecting a correct model versus accepting an incorrect model.

This system is appropriate for some users, such as bank regulators, who set the capital adequacy charge from this quantile. But it is insufficient when institutions are implicitly forecasting the entire probability distribution function (pdf); it should assess the quality of the forecast based on the whole pdf instead of one point only. As an integral component of a systematic risk management process, backtesting VaR numbers provides valuable feedback to users about the accuracy of their models and also enforces essential improvement.

5.2.3 Stress Testing

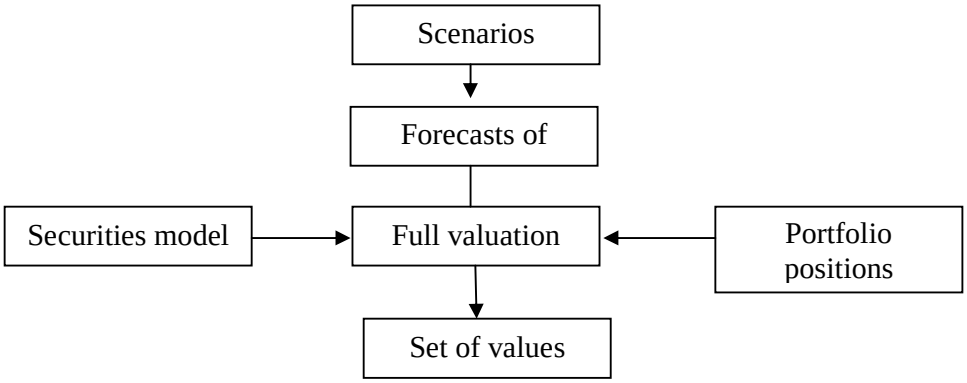
Stress tests can provide useful information about a firm's risk exposure that VaR methods can easily miss, particularly if VaR models focus on 'normal" market risks rather than the risks associated with rare or extreme events[246]. Stress testing is essential to examine the vulnerability of the institution to unusual events that

[246] In financial markets, extreme price movements correspond to market collapse or foreign exchange crisis during extraordinary periods. By their very nature, extreme movements are related to the tails of the distribution of the underlying data generating process. Normally, an exponential decay or a finite endpoint at the tail—the density reaching zero before a finite quantile, is also treated as thin-tailed (Gencay and Selcuk, 2003).

plausibly could happen or happen so rarely that VaR 'ignores" them because they are in the tails.

Jorion (2001, p. 28) points out that it seems obvious that VaR measures are not meant to identify the worse potential loss. When based on historical data, it will fail to identify extreme unusual situations that could cause severe losses. Besides VaR only measures quantifiable risks which exclude risks such as liquidity risk, political risk, or regulatory risk. But, the behaviour in the tail can be analysed through stress testing techniques, which must be viewed as an indispensable complement to VaR. Stress testing is indeed required by BIS as one of seven conditions to be satisfied to use internal models from the 1996 Basel Amendment to current Basel II[247]. The main method of stress testing is scenario analysis, which consists of evaluating the portfolio under various states of the world[248]. The process of undertaking a scenario analysis approach is shown as Figure 18.

Figure 18: Scenario Analysis Approach[249]



Low correlations help to reduce portfolio risk. However, it is often argued that correlations increase in periods of global turbulence. This increasing correlation occurring at a time of increasing volatility would defeat the diversification properties of portfolios, particularly the measures of VaR based on historical data would then

[247] To calculate exposure to risk under extreme conditions, the BIS requires banks to undertake stress tests for their dealing portfolios. These simulate possible losses from a share market crash similar to October 1987, sharp movements in long term bond rates such as in 1994, or from extreme foreign exchange market turbulence. Under Basel II, a bank must "ensure that it has sufficient capital to …cover the results of its stress testing" (BIS, 2006, p. 218), which establish a direct link between stress tests and risk capital.

[248] Typically, these involve large movements in key variables, which require the application of full-valuation methods.

[249] This figure is sourced from Jorion (2001, p. 236) Figure 10-2.

seriously underestimate the actual risk of failure because not only would risk be understated, but so would correlations. This double blow could well lead to returns that are way outside the range of forecasts (Jorion, 2001, p. 199). This also points to the need for stress simulations to assess the robustness of VaR measures to changes in correlations. In that sense, stress testing is a necessary safeguard against possible failures in the VaR methodology, and provides a useful reminder that VaR is no guarantee of a worst-case loss. As Jorion (2001) comments while VaR focuses on the dispersion of revenues, stress testing instead examines the tails.

5.2.4 Extreme Value Theory (EVT)

As discussed before, VaR methods tend to ignore extreme events at the tails of the distribution. One response to this problem is to use stress tests and scenario analysis. These can simulate the changes in the value of our portfolio under hypothesized extreme market conditions, which are certainly very helpful. However, they are inevitably limited, since we cannot explore all possible scenarios, and by definition give us no indication of the likelihoods of the scenarios considered. Researchers and practitioners handle this issue by using Extreme Value Theory (EVT)—a specialist branch of statistics that attempts to make the best possible use of what little information we have about the extremes of the distributions in which we are interested.

Extreme value theory (EVT)[250] models extreme values rather than modelling whole observations. As with VaR, its goal is to choose the height of the dike so as to balance the cost of construction against the expected cost of a catastrophic situation. EVT extends the central limit theorem[251], which deals with the distribution of the *average* of i.i.d. variables drawn from an unknown distribution to the distribution of their tails.

[250] There are generally two methods to work with extreme events under EVT: Fisher-Tippett Theorem (Block Maxima) and Number of Exceedances over a Threshold (peak over threshold) method. The first one directly models the minimums and maximums. The second one deals with the ones that exceed the threshold.

[251] Central limit theorem actually tells us what the distribution of extreme values should look like in the limit, as our sample size increases. When modelling the maxima of a random variable, extreme value theory plays the same fundamental role as the Central Limit theorem plays when modelling the sum of random variables (Kellezi and Gilli, 2000).

Fisher and Tippett (1928) proved the *EVT theorem*, which specifies the shape of the cumulative distribution function (cdf) for the value *x* beyond a cutoff point *u*. Under general conditions, the cdf belongs to:

$F(y) = 1- (1- \xi y)^{-1/\xi} \quad \xi \neq 0$

$F(y) = 1- \exp(-y) \quad \xi = 0$

Where $y=(x-u)/\beta$, with $\beta > 0$ a *scale* parameter[252]. The parameter, ξ gives an indication of the heaviness of the tails: the bigger ξ, the heavier the tail. This parameter is known as the tail index, and the case of most interest in finance is where $\xi > 0$, which corresponds to the fat tails commonly found in financial return data[253]. This theorem assumes the limiting distribution of extreme returns always has the same form (whatever the distribution of the parent returns from which extreme returns are drawn). It allows estimating extreme probabilities and extreme quantile, including VaR, without having to make strong assumptions about an unknown parent distribution.

This distribution is defined as the *generalized Pareto distribution*[254] because it subsumes other known distributions, including the Pareto and normal distributions as special cases. The normal distribution corresponds to $\xi=0$, in which case the tails disappear at an exponential speed[255]. And heavy-tailed distributions do not necessarily have a complete set of moments, unlike the normal distribution. Indeed, $E(X^k)$ is infinite to $k \geq 1/\xi$[256]. Longin (1996) presents various methods to do so, we can then estimate the tail cdf as

$$\hat{F}(y) = 1- (N_u/N) \left[1+ \xi \frac{(x-u)}{\beta}\right]^{-1/\xi}$$

The VaR at the *c*th level of confidence is obtained by setting $\hat{F}(y) = c$, which yields

[252] For simplicity, assume that $y>0$, which means that we take the absolute value of losses beyond a cutoff point. Here, ξ is the all-important shape parameter that determines the speed at which the tail disappears. We can verify that as ξ tends to zero, the first function will tend to the second, which is exponential. It is also important to note that this function is only valid for x beyond u.
[253] In this case, the asymptotic distribution takes the form of a Fréchet distribution.
[254] Reesor and McLeish (2002) say the generalized Pareto distribution (GPD) is an integral tool in extreme value theory, because it appears as the limit distribution of scaled excesses over high thresholds (also see Embrechets, Kluppelberg, and Mikosch, 1997).
[255] For typical financial data, $\xi>0$ implies a *heavy tail* or a tail that disappears more slowly than the normal. The coefficient of estimate of ξ can be related to student *t*, with degree of freedom approximately $n=1/\xi$.
[256] For $\xi = 0.5$, in particular, the distribution has infinite variance, like the student *t* with n=2.

$$VaR = u + \frac{\hat{\beta}}{\hat{\xi}} \{[(N/N_u)(1-c)]^{-\hat{\xi}} - 1\}$$

This provides a quantile estimator of VaR based not only on the data but also on our knowledge of the parametric distribution of the tails[257]. More generally, the approach can be extended to time variation in the scale parameter, in effect augmenting a GARCH process by an EVT distribution[258]. McNeil and Frey (1998) show that this approach provides better tail coverage than the static EVT or the GARCH-normal models.

Another advantage of EVT is the issue of *time aggregation*. Intuitively, extreme values are rarer; they aggregate at a slower rate than the normal distribution as the horizon increases. So EVT distributions are stable under addition, i.e., retain the same tail parameter for long-period returns.

To summarize, the EVT approach is a useful complement to VaR computation on fat-tailed distributions in terms of its ability to fit extreme quantile better than the conventional approaches for heavy-tail data. For routine confidence levels such as 90, 95, and perhaps even 99%, conventional methods may be sufficient. At higher confidence levels, however, the normal distribution underestimates potential losses. The EVT is also a convenient framework for the separate treatment of the tails of a distribution which allows for asymmetry. In that sense, and also considering the fact that most financial return series are asymmetric, the EVT approach is advantageous over models which assume symmetric distributions such as t-distributions, normal distributions, ARCH, and GARCH-like distributions[259] (Nelson, 1991).

EVT can draw smooth curves through the extreme tails of the distribution based on powerful statistical theory[260]. Also, the EVT approach need not be difficult to implement, i.e. the student t distribution with 4 to 6 degrees of freedom is a simple

[257] Jorion (2001, p. 250) shows that normal cdf drops much faster than the empirical distribution and assigns very low probability to extreme values. In contrast, the empirical (or historical simulation) method follows the data more faithfully. Its drawback, however, is that the quantile is very imprecisely estimated. Instead, the EVT tails provide a smoother, parametric fit to the data without imposing unnecessary assumptions.

[258] The estimation proceeds in two steps: (1) fitting a GARCH model to the historical data using a (pseudo) maximum likelihood method and (2) fitting the EVT distribution to the scaled residuals.

[259] This does not include the E-GARCH, because it allows the asymmetry.

[260] Jorion (2001, p. 253), further points out that fitting EVT functions to recent historical data is still fraught with pitfalls. The most powerful statistical techniques cannot make short histories reveal once-in-a-lifetime events. That's why for all the new techniques behind EVT, stress testing still "remains a delicate art form".

distribution that adequately describes the tails of most financial data. So far, EVT can be seen as a powerful and yet fairly robust framework in which to study the tail behaviour of a distribution. The approach based on extreme values to compute VaR thus covers market conditions ranging from the usual environment considered by the existing VaR methods to the financial crises which are the focus of stress testing.

VaR as a risk measurement approach has been controversial. The supporters of VaR-based risk management claim its benefit on improving systems and helping to set up a proper risk management function, while some authors such as David Einhorn (2008) recently criticised VaR for contributing to the occurrence of financial disaster. Graeme West (2004) indicates that the risk of the combined portfolio is greater than the risks associated with the individual portfolios, i.e. negative diversification benefit, if VaR is used to measure the diversification benefit[261]. Its lack of sub-additivity means that this can give rise to regulatory arbitrage or to the break-down of global risk management within one single firm, which triggers excessive risk-taking.

Yamai and Yoshiba (2005) also show that investors can manipulate the profit-loss distribution using assets whose loss is infrequent but large (i.e. concentrated credit portfolios), so that VaR could become small as the tail becomes fat which means the problem of tail risk can be serious. This potential risk from the model used could cause systemic risk, when investors choose such assets that have smaller VaR estimates but with more serious tail risk (refer to the discussion made in Chapter Two), the liquidity preference is gradually reduced. According to Minsky's Financial Instability Hypothesis (FIH), this triggers the transformation of financial positions from *hedge*, to *speculative*, and then to the most dangerous, *Ponzi*. The attitude of market participants to risk is also transformed from *uncertainty aversion* to *money lover* where participants largely rely on external finance for their investment and consumption purposes (while real income is simultaneous dropping as shown in Chapter Three). As a consequence, the economy is gradually gliding towards the 'black hole' of crisis.

[261] If 'f' is a risk measure, the diversification benefit of aggregating portfolio's A and B is defined to be:
$f(A) + f(B) – f(A+B)$

Similarly, Einhorn argues that VaR led to excessive risk-taking and leverage at financial institutions, and focused on manageable risks near the centre of the distribution and ignored the tails, so it created an incentive to take 'excessive but remote risks' among senior executives and risk managers. This is also a serious concern for regulators. If regulation allows the capital requirement of a firm to be calculated as the sum of the requirements of its subsidiaries and if the requirements are based on VaR, the firm could create subsidiaries in order to save regulatory capital.

Furthermore, Joe Nocera (2009) also discusses the role VaR played in the 2007-2008 financial crisis and suggests that VaR was very useful to risk experts, but nevertheless exacerbated the crisis by giving false security to bank executives and regulators. Thus, he concludes that VaR is a powerful tool for professional risk managers, but is both easy to misunderstand, and dangerous when misunderstood. Concerning the financial market crisis of fall 1998, BIS Committee on Global Financial System (1999, p.43) also notes that "a large majority of interviewees admitted that last autumn's events were in the 'tails' of distributions and that VaR models were useless for measuring and monitoring market risk". So, Christoffersen and Diebold (2000) and Berkowitz (2001) argue that rather than focus on just one number such as VaR, risk managers and, implicitly, regulators should focus on the whole density function of returns by using other techniques such as ES simultaneously.

5.2.5 Copula Methodology

As the issue of risk aggregation has recently become an area of study, based on some research results[262], it has been suggested that incorporation of the diversification effect can be crucial for accurate risk aggregation, particularly in the tails[263]. Using copulas to this end seems like a natural application, particularly for VaR users. To obtain the correct portfolio VaR, we need to obtain the joint return distribution of the

[262] Ward and Lee (2002), approach the problem of risk aggregation by considering risks pair-wise. They use pair-wise roll-up with a Gaussian copula, while Dimakos and Aas (2004) decompose the joint risk distribution into a set of conditional probabilities and impose sufficient conditional independence so that only pair-wise dependence remains. Their simulations indicate that total risk measured using near tail (95% to 99%) is about 10-12% less than the sum of the individual risks. Using the far tail (99.97%), they find that the total risk is often overestimated by more than 20% using the additive method.

[263] In that sense, the Basel II framework that extensively embraces the VaR approach fails to recognise diversification effect as discussed before, and seems not encourage diversification.

portfolio; copulas allow us to solve this problem by combining the specified marginal distributions with a dependence function to create this joint distribution[264].

Embrechts, McNeil, and Straumann (1999, 2002) were among the first to introduce this toolkit to the finance literature. Frey and McNeil (2001) emphasize the importance of tail dependence and, by introducing copulas, generalize dependence beyond correlation[265]. Copulas provide important theoretical insights and practical applications in multivariate modelling, the essential idea of the copula approach is that a joint distribution can be factored into the marginals and a dependence function called a copula. The term copula is based on the notion of "coupling"—the copula couples the marginal distributions together to form a joint distribution. The dependence relationship is entirely determined by the copula, while scaling and shape (e.g. mean, standard deviation, skewness, and kurtosis) are entirely determined by the marginals (Rosenberg & Schuermann 2004). In general, it separates the dependence structures between random variables and their marginal distributions and characterizes the non-linear relationship between different random variables.

This technique allows us to incorporate realistic marginal distributions, both conditional and unconditional, that capture some of the essential empirical features of these risks such as skewness and fat-tails while allowing for a rich dependence structure. It is argued that the risk dynamics will naturally carry through to the joint or total risk distribution via the copula.

Using a copula, marginal risks that are initially estimated separately can then be combined in a joint risk distribution that preserves the original characteristics of the marginals. This is sometimes referred to as obtaining a joint density with pre-determined marginals[266]. The copula approach may then be naturally applied to

[264] Joint distributions can then be used to calculate the quantiles of the portfolio return distribution, since the portfolio returns are weighted averages of the individual returns.
[265] Poon, Rockinger and Tawn (2004) use multivariate extreme value theory instead of copulas to model tail dependence. Their technique is data-intensive and requires empirical observations of joint tail events. Other applications of copulas include Rosenberg (2003), who uses a copula related methodology for multivariate contingent claims pricing. Patton (2002) uses copulas to model exchange rate dependence while Fermanian and Scaillet (2003) analyse copula estimation and testing methods.
[266] For example, when individual risk distributions are estimated using heterogeneously dynamic models that cannot be easily combined into a single dynamic model (e.g. different explanatory variables, different variables frequencies, or different model type), the marginals may be thought of as pre-determined.

combine these time-varying marginal risk distributions to obtain a time-varying joint risk distribution. In addition, there are cases where marginal risks are not estimated using time-series data[267]. There is then no direct way to create a multivariate dynamic model that incorporates all of the risk types. Once again, the copula method can incorporate these marginal risks into a joint risk distribution.

The copula approach[268] is also useful when "off-the-shelf" multivariate densities inadequately characterize the joint risk distribution. In the risk management context, the multivariate normal distribution is known to poorly fit the skewed, fat tailed properties of market, credit, and operational risk. Using copula, parametric or non-parametric marginals with quite different tail shapes can be combined into a joint risk distribution, which thus can span a range of dependence types beyond correlation such as tail dependence (Rosenberg & Schuermann, 2004).

The theorem proposed by Sklar (1959) underlies most applications of the copula[269]. For the bivariate case, Sklar's theorem can be stated as follows. For any bivariate distribution function $H(x, y)$, let $F(x) = H(x, \infty)$ and $G(y) = H(\infty, y)$ be the univariate marginal probability distribution functions. Then there exists a copula C such that[270]:

$$H(x, y) = C(F(X), G(Y))$$

The copula relates the quantiles of the two distributions rather than the original variables, so that the copula for two random variables is unaffected by a monotonically increasing transformation of the variables[271].

The copula for any multivariate distribution function can be obtained using *the method of inversion*[272] which is constructed from the bivariate normal distribution via

[267] The examples are implied density estimation, survey data, or combination of frequency and severity data.
[268] The normal copula is commonly seen in the literature (Ward and Lee, 2002), more recently, the Student-t copula has become prominent (Frey and McNeil, 2001) because it can capture "tail dependence", which is controlled by the degrees of freedom parameter. In contrast, a normal copula has tail dependence.
[269] Sklar's theorem states that given a joint distribution function H for p variables, and respective marginal distribution functions, there exists a copula C such that the copula binds the margins to give the joint distribution.
[270] We have identified the distribution C with its cumulative distribution function. Moreover, if marginal distributions $F(x)$ and $G(y)$ are continuous, the copula function C is unique. Otherwise, the copula C is unique on the range of values of the marginal distributions.
[271] For example, the copula of the joint distribution of X and Y is the same as the copula of the joint distribution of *ln* (X) and *exp* (Y).

Sklar's theorem. Using this method called *Gaussian Copula*[273], the copula C (*u*,*v*) of the joint distribution $F_{x,y}$ is:

$$C(u,v) = F_{x,y}F_X^{-1}(u), F_Y^{-1}(v)$$

Where F_X^{-1} and F_Y^{-1} are the marginal quantile functions, and *u* as well as *v* are probabilities. A joint distribution with given marginals and a given copula can be created by plugging in the marginal distributions into the copula function, to obtain the joint distribution $F_{a,b}$ using the copula C (*u*,*v*) and the marginals F_a, and F_b (Rosenberg & Schuermann, 2004):

$F_{a,b}(a,b)=C(F_a(a), F_b(b))$

Rosenberg and Schuermann (2004) in their paper, compare three VaR approximations to the copula method, and conclude that both additive-VaR and Normal-VaR are significantly biased relative to Copula-VaR. While add-VaR overestimates risk, since it fixes the correlation matrix at unity, when in fact the empirical correlations are much lower; N-VaR underestimates risk since it uses the lowest standardized quantiles for the marginals (refer to discussion of VaR section). The hybrid approach (H-VaR) tracks Copula-VaR well, but it is also upwardly biased and thus conservative. In general, copulas provide a complete description of the association or the co-dependence properties of random variables at each point of a distribution. This representation takes into account the problems connected with dependent extreme events that cannot be characterized via linear correlation or VaR (Szego, 2002).

However, copula is criticized for: *first*, no processes are defined for copula functions; *second*, there is no clear way to simulate paths; third, the section of copula functions is arbitrary; and the last, is that when it comes to pricing Credit Default Swaps (CDS), the approach of copula functions depends on the statistical inference on the default time distribution, which creates the distortion result. This last drawback of copula has been argued to contribute to the 2008 financial crisis, as CDS are criticized as the

[272] This technique factors out the effects of the original joint distribution with the marginal quantile functions.
[273] Li (2000) develops this Gaussian Copula method, which is widely used in pricing complicated financial instruments such as CDOs, and definitely for risk estimation both by bankers and regulators.

centre of the storm, due to copula-based VaR methodology, adopted internally by banks, underestimating risks.

In their research, Rosenberg and Schuermann (2004) had an interesting finding that regardless of whether measured by VaR or ES, given a risk type, total risk is more sensitive to differences in business mix or risk weights than to differences in inter-risk correlation. They further figured out there is a complex relationship between volatility and fat-tails in determining total risk: depending on the setting, they either *offset* or *reinforce* each other. For example, as operational exposure is increased relative to market and credit exposure, total risk, whether measured using value-at-risk (VaR) or expected shortfall (ES), first declines significantly[274] but then flattens as the impact of fatter tails offsets the effect of lower volatility. As correlation of market and credit risk with operational risk is increased, both volatility and fat-tail increase. They concluded, that the choice of copula (normal versus Student-t[275]), which determines the level of tail dependence, has a *more modest* effect on total risk. Furthermore, their results demonstrate that while expected shortfall (ES) is always greater than VaR, as guaranteed by the definition, their sensitivities to change in business mix and correlation are very similar. When the VaR approach is based on Copula method, it supposes that Copula-VaR can generate similar result with ES, although it is argued that VaR is not being performed as a "coherent" risk measure as ES.

5.3 "Coherent" Risk Measures

The fundamental problem that risk managers and regulators, who extensively embrace the VaR approach for their risk measurement, are facing is how to aggregate risks of various positions (market, credit, and operational risks) in the banking, securities and insurance sectors. They cannot be simply just added up, because of possible interactions /correlations between different risks types. Therefore, lack of sub-additivity is criticised as one of the obvious weaknesses of the VaR approach for not being qualified as a "*coherent"* risk measure.

[274] This is because operational risk normally has lower volatility than the other two.

[275] In a multi-dimensional setting, Archimedean copulas based on one parameter may lack flexibility to effectively capture the dependence structure. The normal and Student-t copulas are more flexible in this sense since they allow working with more parameters based on a correlation matrix. The normal copula has the drawback that it does not allow modelling tail dependence. The tail dependence for the Student-t copula drives the results for the normal and Student-t copula further apart for higher probability levels.

5.3.1 Lacking of Sub-Additivity as weakness of VaR Approach

Artzner, Delbaen, Eber, and Heath (1997, 1999) list four desirable properties – monotonicity[276]; translation invariance[277]; homogeneity[278]; and sub-additivity[279] for risk measures for capital adequacy purposes (A risk measures can be viewed as a function of the distribution of portfolio value W, which is summarized into a single number ρ (W)).

For a sub-additive measure, portfolio diversification always leads to risk reduction, while for measures which violate this axiom; diversification may produce an increase in their value even when partial risks are triggered by mutually exclusive events (Acerbi, Nordio and Sirtori, 2001). Thus sub-additivity is necessary for capital adequacy requirements in banking supervision. For instance, given a bank made of several branches, if the capital requirement of each bank is dimensioned on its own risk, the risk of the whole bank could turn out to be much bigger than the sum of the branches' risks when the adopted risk measure violates sub-additivity.

More light was shed on the limits of VaR by some important theoretical work by Artzner et al.[280] (1997, 1999). They show that the quintile-based VaR measure fails to satisfy the last property—sub-additivity unless the underlying risk factors come from an elliptical distribution[281] (normal distribution belongs to this category). However, this is of limited consolation because most real-world loss distributions are not elliptical ones. So this is labelled as the fundamental problem of the VaR approach, particularly by academics, because it means, in essence, that VaR has no claim to be regarded as a "true" risk measure. One of these instances comes up with pathologic examples of short option positions that can create large losses with a low probability

[276] Monotonicity: if W1≤W2, ρ (W1)≥ ρ (W2), or if a portfolio has systematically lower returns than another for all states of the world, its risk must be greater.
[277] Translation invariance: ρ (W+K) = ρ (W) – K, or adding cash K to a portfolio should reduce its risk by K. This is also called risk-free condition, which indicates that as the proportion of the portfolio invested in the risk-free asset increases, portfolio risk should decline.
[278] Homogeneity: ρ (bW) = bρ (W), or increasing the size of a portfolio by *b* should simply scale its risk by the same factor (this rules out liquidity effects for large portfolios. This indicates larger positions bring greater risk.
[279] Sub-additivity: ρ (W1+W2) ≤ ρ (W1)+ ρ (W2), or merging portfolios cannot increase risk. This indicates the risk of the sum cannot be greater than the sum of the risk.
[280] Their starting point is that although we all have an intuitive sense of what financial risk entails, it is difficult to give a good assessment of financial risk unless we specify what a measure of financial risk actually means (Dowd and Blake, 2006).
[281] Artzner et al. (1997) points out that to guarantee sub-additivity of VaR, the value of the portfolio has to be a linear function of risk factors and that those risk factors must be elliptically[281] distributed which implies VaR is subadditive only in a Gausssian world.

and hence have low VaR combined to create portfolios with larger VaR. Thus, a firm could concentrate all of its tail risks in one exposure in such a way that the risk borne by that exposure appears just beyond the overall portfolio VaR threshold (Embrechts, McNeil and Straumann, 1999, 2002). So, it is not surprising that VaR significantly overestimates total risk or economic capital by adding up the risks of the marginal distribution as it assumes perfect inter-risk correlation.

Much as the concept of a sufficient statistic provides a compact representation of the characteristics of the data, so VaR is hoped to give us a similarly compact sufficient risk measure. However, given the above weaknesses, VaR is obviously inadequate for sensitive risk measurement purposes. Expected Shortfall (ES) appears as a natural choice to resort to when VaR is unable to distinguish between portfolios with different riskiness.

5.3.2 Expected Shortfall (ES)

Regulators make extensive use of VaR and its importance as a risk measure is therefore unlikely to diminish[282]. However, as another informative measure of risk, *expected shortfall*[283] (ES) has a number of advantages over VaR[284]. This has led many financial institutions to use it as a risk measure internally. As noted before, VaR has limits to only provide the information about the cut-off loss that will happen in a particular percentage (i.e. 95%, 99%) of the time, the information of average size of the loss when it exceeds the cut-off value that emerge at the tail of the distribution, which is called conditional loss or tail loss, needs a complementary approach—expected shortfall (ES) to capture such losses beyond VaR. Artzner et al. (1999) shows that the shortfall measure, which is the expected loss conditional on exceeding

[282] VaR which has a compact representation of risk level, and measures downside risk, has met the favour of regulatory agencies.
[283] Expected shortfall is also known as the tail conditional expectation which estimates the potential size of the loss exceeding VaR. So it is also called "conditional VaR", "mean excess loss", "beyond VaR", or "tail VaR".
[284] The literature that compares the two measures—VaR and ES, is not rich yet, especially under the fat-tails assumption. McNeil and Frey (2000) verify that the General Pareto Distribution (GPD) of EVT results in better estimates for ES than the Gaussian model. They compute discrepancies between returns and ES measures on the violation days, make a hypothesis that the mean of the discrepancies equals zero, and depend on a bootstrap test to decide whether to reject the hypothesis or not. They found that normality is more likely to reject the hypothesis than the GPD. Yamai and Yoshiba (2001, 2002a, 2002b) have done extensive works in comparing ES and VaR in terms of: consistency with expected utility maximization and elimination of the tail risk; estimation error, risk factor decomposition, and optimization; validation under market risk stress testing. Baska and Shapiro (2001) compare VaR and ES as constraints in an optimal portfolio construction setting, advocating ES to remedy the shortcomings of VaR.

VaR, satisfies the above four noted "coherent" properties—monotonicity; translation invariance, homogeneity; and sub-additivity that VaR is critised as being short of.

Expected shortfall (ES) which is closely related to VaR, is also sometimes referred to as conditional expectation of loss given that the loss is beyond the VaR level[285]. It is promoted as a "coherent" risk measure that estimates the mean of the beyond-VaR tail region by Artzner et.al (1997, 1999).

As an alternative risk measure to VaR, it focuses on the left tail of the distribution of returns. Specifically, ES at time *t* over horizon *k* at confidence level α, is defined as:

$$ES_{t+k}(\alpha) = E\left[r_{t+k} \mid r_{t+k} \geq VaR_{t+k}(\alpha)\right]$$

Similar to VaR, three approaches can be adopted to calculate ES—Gaussian approach; historical simulation; and extreme value theory (EVT) approach.

Under the Gaussian approach, let ø be the density of the standard normal distribution, the corresponding ES_α (X) is,

$$ES_\alpha(X) = \sigma \frac{\phi[\Phi^{-1}(\alpha)]}{1-\alpha}$$

Under historical simulation approach, where $X_{n(1)} \leq X_{n(2)} \leq \ldots \leq X_{n(n)}$ are the order statistics. Historical ES is as;

$$ES_\alpha(X) = E[X|X > VaR_\alpha(X)] = \left(\sum_{i=[n\alpha]}^{n} X_{n(i)}\right)/(n - [n\alpha])$$

Based on EVT, an additional parameter $\beta>0$ has been introduced as scale parameter and ξ is the shape parameter or tail index[286]. And *n* is total number of observations and *u* is threshold, then

$$\widehat{ES}_\alpha(X) = \frac{\widehat{VaR}_\alpha(X)}{1-\xi} + \frac{\beta - \xi u}{1-\xi}$$

Yamai and Yoshiba (2001, 2002a, 2002b, 2005) observe that when the profit-loss (P/L) distribution is normal, VaR and expected shortfall give essentially the same

[285] An intuitive expression can be derived to show that ES can be interpreted as the expected loss that is incurred when VaR is exceeded. McNeil et al. (2005) provide mathematical proof.
[286] Parameters β and ξ are defined as same as in EVT equation, refer to p182.

information[287]. Both VaR and expected shortfall are scalar multiples of the standard deviation. In that case, VaR provides the same information on tail loss as does ES[288]. They also show that VaR and ES are free from tail risk[289] only when the underlying profit-loss distribution is normal. In general, they conclude that ES is more consistent with expected utility (EU) maximization under less stringent conditions than VaR. In their (2001) paper, they indicate in detail that VaR is consistent with EU maximization when portfolios are ranked by first-order stochastic dominance, while ES is consistent with EU maximization when portfolios are ranked by second-order stochastic dominance[290]. Thus, VaR is more likely to have unanticipated effects on utility maximization than ES.

ES has better properties than VaR with respect to tail risk and sub-additivity (Acerbi, 2004). Dowd and Blake (2006) demonstrate that since ES is a coherent risk measure, the outcomes of scenario analyses are also coherent risk measures. The theory of coherent risk measures therefore provides a risk-theoretical justification for the practice of stress testing[291].

However, its advantages do not come without certain disadvantages. ES does not always yield better results than VaR. Yamai and Yoshiba demonstrate that ES is likely to result in worse estimates than VaR if adopting simulation methods for estimation. Estimates of VaR and ES are affected by estimation error, such as limited sample size, resulting in sampling fluctuation; particularly the estimation error of ES is larger than for VaR when the underlying loss distribution is fat-tailed[292], because ES considers the right tail of the loss distribution. ES are thus affected by whether large and infrequent losses are realized in the obtained sample. In contrast, VaR is less

[287] More precisely, if the profit-loss distribution belongs to the elliptical distribution family (normal distribution belongs to this family), either VaR or expected shortfall (ES) suffice for information about loss distribution, as both would be redundant (Yamain and Yoshiba, 2005).
[288] For example, VaR at the 99% confidence level is 2.33 times the standard deviation, while expected shortfall at the same confidence level is 2.67 times the standard deviation.
[289] VaR has tail risk when VaR fails to summarize the relative risk of available portfolios due to its underestimation of the risk of portfolios with fat-tailed properties and high potential for large losses, as discussed before.
[290] They also pointed out that when portfolios are not ranked by second-order stochastic dominance; ES is no longer consistent with EU maximization or free of tail risk.
[291] They also argue that this is useful, since it means that it can always estimate coherent risk measures by specifying the relevant scenarios and then taking (as relevant) their (perhaps probability-weighted) averages or maxima.
[292] As ξ approaches one, i.e. as the underlying loss distribution becomes fat-tailed, the relative standard deviation of the ES estimate becomes much larger than that of the VaR estimate.

affected, since it does not take into regard losses beyond the VaR level. Therefore, to reduce estimation error, the sample size of simulation needs to be increased, which makes ES is much more costly to operate. This implies that the use of a single risk measure should not dominate financial risk management. Another weakness of ES is that it is claimed to have poor performance in the case of risk-aversion, notwithstanding its coherence; Dowd and Blake (2006) demonstrate that ES is appropriate if the user is risk-neutral at the margin, if a particular user is risk-averse, the weighting function rises as parameters in the risk-aversion function gets bigger, and ES performs unsatisfactorily. In this case, they also demonstrate that VaR performs worse, particularly, when the users under VaR are actually risk-loving (i.e. with negative risk-aversion) and in the tail loss region. Both VaR and ES generate "uncomfortable" results (p. 204). In general, each risk measure offers its own advantages and disadvantages.

5.4 Distortion Risk Measures and Choquet Integral

5.4.1 Distortion Risk Measure

Distortion risk measures[293] are closely related to coherent measures[294]. A distortion risk measure is the expected loss under a transformation of the cumulative density function (cdf) known as a distortion function, and the choice of distortion function determines the risk measure.

If F(x) is cdf, the transformation F*(x) =g (F(x)) is a distortion function, if g:[0,1]→ [0,1] is an increasing function with g(0) =0 and g(1) =1. The distortion risk measure is then the expectation of the random loss X using probabilities obtained from F*(x) rather than F(x). Like coherent risk measures, distortion risk measures have the properties of monotonicity, positive homogeneity, and translation invariance; they also share with spectral risk measures the property of Comonotonic additivity. Thus the properties we might look for in a "good" distortion function include continuity,

[293] The root of distortion theory can be traced further back to Yaari's dual theory of risk (Yaari, 1987), and in particular the notion that risk measures could be constructed by transforming the probabilities of specified events. Going further back, it also has antecedents in the risk neutral density functions used since the 1970s to price derivatives in complete market settings.

[294] They were introduced by Denneberg (1990) and Wang (1996), and have been applied to a wide variety of financial risk and insurance problems, most particularly to the determination of insurance premiums, in Wang's paper; it includes Value-at-Risk and Tail-VaR as special examples.

concavity, and differentiability (Wang, Young, and Panjer, 1997; Darkiewicz, Dhaene, and Goovaerts, 2003).

The theory of distortion risk measures sheds further light on the limitations of VaR and ES. The VaR and ES can be shown to be a distortion risk measure once it has a Choquet integral representation (Wirch and Hardy, 1999). When VaR is obtained using the binary distortion function:

$$\begin{cases} g(u) = 1 \\ g(u) = 0 \end{cases} \text{ for } \begin{cases} u \gg \alpha \\ u < \alpha \end{cases}$$

However, it is a poor function because it is not continuous, due to the jump at u =α; and since it is not continuous, it is not coherent. Thus, from the perspective of distortion theory, VaR is a poor risk measure that is based on a "badly behaved" distortion function (Dowd and Blake, 2006, p. 205).

ES is a distortion risk measure based on the distortion function:

$$\begin{cases} g(u) \gg (u-\alpha)/(1-\alpha) \\ g(u) = 0 \end{cases} \text{ for } \begin{cases} u \gg \alpha \\ u < \alpha \end{cases}$$

In contrast, this distortion function is continuous, which implies that ES is coherent (this is similar to the discussion made before in section 5.3.2). However, this distortion function (ES) is still flawed, as Dowd and Blake (2006) argued that it throws away potentially valuable information, because it maps all percentiles α to a single point u; it does not take fall account of the severity of extremes, because it focuses on the mean shortfall. Therefore, ES fails to allow for the mitigation of losses below VaR, it gives an implausible ranking of relative riskiness, it fails to take full account of the impact of extreme losses, and it is not consistent with risk-aversion as discussed before (Wirch and Hardy, 1999; Wang, 2002).

According to that, various distortion functions have been proposed to remedy these sorts of problems, of which the best known is the Wang Transform (Wang, 2000):

$$g(u) = \Phi[\Phi^{-1}(u) - \lambda]$$

Where Φ is standard normal distribution function and λ is a market price risk term that might be proxied by for example, the Sharpe ratio. Wang transform is argued to

recover CAPM and Black-Sholes under normal asset returns, and this distortion function is everywhere continuous and differentiable (Dowd and Blake, 2006). According to Wang (2002), it is coherent and superior to ES in terms that it takes account of the losses below VaR, and also extreme losses.

Wang (2002) suggest a generalization of Wang Transform as:

$g(u) = \Phi[b\Phi^{-1}(u) - \lambda]$

Where $0<b\leq 1$. This second transform provides for the volatility to be distorted, and it deals with tail risks. Another possible transformation appears below:

$g(u) = Q[\Phi^{-1}(G(u)) - \lambda]$

Where Q is a Student t-distribution with degrees of freedom, and G(u) is estimate of the distortion function of *u*. This transform is suggested by Wang (2002) to deal with the impact of parameter uncertainty on risk measures[295].

5.4.2 Choquet Expected Utility

Choquet capacities are argued as a subjective way to represent uncertainty (Schmeidler, 1989).Choquet capacities can be axiomatized in case of pessimism or optimism under uncertainty (Zhang, 2002).

For any random variable X with ddf S(x), the Choquet integral with respect to distortion function g is defined by (Denneberg, 1994):

$$H_g(x) = \int_0^{\infty} g(S(x))dx + \int_{-\infty}^{0} [g(S(x)) - 1]\,dx$$

$$= \int_{-0}^{\infty} [1 - \bar{g}(F(x)]\,dx - \int_{-\infty}^{0} \bar{g}(F(x)dx$$

If X is a random variable, then the Choquet integral is equivalent to the expected value of X under the deformed probability distribution with ddf S*[296]. For any distortion function, g, and real-valued random variables (X, Y), Reesor and McLeish

[295] Many other distortion functions have also been proposed, and a useful summary of these is provided by Denuit et.al (2005, pp. 84-95).

[296] That is for any distortion, g, $H_g(x) = E_{p^*[}X]$.

(2002) proved that H_g has properties of monotonicity, positive homogeneneity, translation invariance, comonotonic additivity, sub-additivity, superadditivity, and asymmetry[297]. For any distortion function, Choquet integral satisfies the axioms of monotonicity, positive homogeneity, and translation invariance. As such, Reesor and McLeish (2002) commend the Choquet integral as a natural tool for constructing coherent risk measures by specifying an appropriate distortion function.

Verlaine (2003) points out individuals do not accord with expected utility. Kahneman and Tversky's (1979 and 1992) studies show that individuals first rank outcomes and then apply a non-linear PWF. However, their model is just a subcase of the general Rank Dependent Expected Utility (RDEU) model[298]. The decision weight associated with an outcome can be interpreted as the marginal contribution of the respective event, defined in terms of capacities. The measure of an event thus depends on its rank and it is a generalization of expected utility called RDEU. An individual maximizing is called a Choquet Expected Utility (CEU) maximizer[299]. Recently, Choquet integral has been identified as an important tool in the measuring and pricing of financial and insurance risks. Chateauneuf, Kast and Lapied (1996) use it to explain apparent discrepancies in observed market prices. The Choquet integral with the normal distortion function has been proposed to price both financial and insurance risks (Wang 2000)[300].Artzner et. al (1999) show that the Choquet integral is useful not only in constructing good risk measures but also in testing the properties of a given risk measure (see also Wirch, 1999). Furthermore, as discussed in the following section, Reesor and McLeish (2002) suggest that the link between relative entropy

[297] H_g satisfies the properties of Sub-additivity for concave g, $H_g(X+Y) \leq H_g(X) + H_g(Y)$; superadditivity for convex g, then $H_g(X+Y) \geq H_g(X) + H_g(Y)$; and asymmetry, $H_g(-X) = -H_{\bar{g}}$, where $\bar{g}$ is the dual distortion function of g.

[298] Let Ω be a finite set of states of nature. Let X be a set of monetary outcomes that includes the neutral outcome 0, all other elements are interpreted as gains or losses. An uncertain prospect fact is a function from Ω into X. To define the cumulative functional distribution, outcomes of each prospect are arranged in increasing order. The utility that is expected by the individual depends on the ranking of the outcomes and the function is thus called RDEU.

[299] Under risk, where an objective cumulative distribution function is assumed given, it may be interpreted as maximizing expected utility with respect to the transformed cumulative distribution function F where F is the objective cumulative distribution function. As we argue below, such an objective distribution never exists. v is the PWF and it's shape seems to be rather robust across experiments (see Tversky and Wakker (1995) and Prelec (1998)). Moreover, Prelec (1998) derives the functional from a set of intuitive axioms.

[300] Many recent papers in the insurance literature illustrate the use of Choquet integral as a premium principle. Wang, Young, and Panjer (1997) show that any market premium functional that satisfies the prescribed axioms has a choquet integral representation.

and distortion gives further insight into risk measures that have a Choquet integral representation. As such, they also show that conditional tail expectation (CTE) or ES is coherent, as its defining distortion function is concave, in contrast to VaR that is not coherent and which does not satisfy the sub-additivity property as discussed before.

There are various risk measures[301] available for risk management and prudential control purposes, but agreement on the weakness of the VaR approach is reflected in the adoption of EVT, and copula as complementary methodologies, and the promotion of ES and distortion risk measures as alternative approaches.

Risk measures such as VaR and Expected Shortfall (even ES is argued to be a coherent risk measure by Artzner et.al), are actually based on risk premia, rather than uncertainty premia, particularly *Keynesian uncertainty*. As Keynes and Minsky have pointed out, the pattern changes if "belief about beliefs" (Juniper, 2004) do not vary at random, but through the workings of a dialectical process of mutual conditioning and interaction between the uncertainty aversion of the majority of economic agents and actual conditions in the institutional world of banking and credit provision, household borrowing, and corporate investment. It is wage-price instability (decreasing real wage with productivity growth which implies the reliance on external finance as noted in Chapter Three) and an increasing vulnerability of financial positions on the part of banks, households and firms to adverse movements in interest rates and resultant aggregate demand conditions, which actually determine fluctuations in the preference for money or near-money assets. Thus, considerable work must be done to develop a risk measure framework under uncertainty rather than risk, particularly for capital adequacy requirement purpose under the current Basel Accord framework.

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[301] Apart from the risk measures I discussed, there are other quantile-based risk measure proposed, for example, Convex risk measures (Heath, 2001; Fritelli and Gianin, 2002), which are based on an alternative set of axioms to the coherent risk measures, in which the axioms of sub-additivity and linear homogeneity are replaced by the weaker requirement of convexity; Dynamic risk measure (Wang, 1999; Pflug and Ruszcyynski, 2004), which are multi-period axiomatic risk measures and are able to take account of interim cash flows - the most coherent risk measures are not this type. They are argued as potentially more useful for longer-term applications where interim income issues might be more important; Comonotonicity approaches (Darkiewicz et al, 2003), which apply to situations when we are interested in the sums of random variables and cannot plausibly assume that these variables are independent; Markov bounded approaches (Darkiewicz et. al, 2003), which derive risk measures based on the minimization of the Markov bound for a tail probability. This leads to a risk measure π that satisfies $E[\varphi(S, \pi)=\alpha E[\upsilon(s)]$, where S is a random variable, $\varphi(S)$ and $\upsilon(s)$ are functions of that random variable, and $\alpha \leq 1$ is an exogenous parameter.

As propounded in Juniper (2005), both ontological (i.e. levels of financial instability determining the magnitude of the stochastic uncertainty constraint) and epistemic factors (i.e. behavioural parameters governing risk-sensitivity) interact to determine model outcomes.

No doubt, it is crucial for practitioners in risk management areas and regulators who are focussed on prudential controls, to measure and account for the preferences of investors as manifested in the trade-off between risk and return. In addition to risk premia, asset-prices also incorporate *uncertainty* premia. In that sense, this thesis adopts a philosophic position as discussed in Chapter Two that uncertainty is both epistemic and ontologically based, and while uncertainty aversion (the concept can be traced back to the Keynesian notions of fundamental uncertainty from Frank Knight's related concept of untraded risk which was discussed in Chapter Two), as such, is subjective in nature, it has real effects in markets for financial assets, which can therefore be detected with an appropriate constellation of theoretical (i.e. the discussion made on relevant financial theories in Chapter Two) and empirical techniques that are explored in the following section.

Nevertheless, one new entry-point for formalising and modelling uncertainty in financial markets, and the calculation of uncertainty premia rather than the more familiar category of risk premia that are embodied in the returns on financial assets, is through robust and risk-sensitive control theory. The author believes this can inform policy interventions in financial markets, under the current Basel II framework, from the technical perspective with the aim of regulating and managing financial instability.

5.5 The approaches to measure Uncertainty and Ambiguity

While an increasing number of quantitative finance theorists are now willing to distinguish between risk and uncertainty, amongst heterodox theorists a commonly held position is that sufficient information does not exist that would enable economic agents to predict the future by means of frequency distributions[302] (related arguments

[302] As the philosophic discussion on uncertainty and risk in Chapter One noted, for Post-Keynesian, the cause of this insufficiency is often attributed to the unpredictable creativity of human beings, who can transform institutions (i.e. the behaviour of banks as they transformed from acting as intermediaries to taking the role of broker in financial markets post- deregulation), introduction of new products and services (i.e. financial innovations, particularly the structured finance products (CDOs)), and development of new ways of doing things that, over varying time

have been explored in Knightian uncertainty and risk, and Keynes's notion of uncertainty in Chapter Two). In contrast to heterodox opinions, this thesis sees virtue in the development of formal models of uncertainty aversion that could inform prudential control (i.e. under Basel II) and macroeconomic policies designed to offset the damaging consequences of the business cycle, to maintain the stability of financial markets.

One important example of fundamental uncertainty at work is the phenomenon whereby 'out-of-the-money' put options increase dramatically in value after major financial crises (Rubinstein, 1994). An alternative interpretation of this phenomenon would be to claim that this is merely an example of 'implied volatility'. The prevalent nature of this phenomenon demands a more detailed investigation into possible determinants of implied volatility, which is evidenced by the volatility 'smile' or 'smirk' observed in option markets[303].

Essentially, implied volatility is[304] effectively an expression of our ignorance about the root causes of fluctuations in option prices. In terms of its calculation, implied volatility can reflect a variety of departures from the Black and Scholes assumptions, namely those due to: *first*, non-normality of the stochastic process for the log-price relative to the underlying asset; *second*, incomplete markets due in turn to stochastic volatility or missing markets for certain risk factors[305]; *and last*, uncertainty aversion[306] (Juniper, 2005b).

The prospect of incorporating uncertainty aversion into the pricing of real options opens the door for different kinds of investment behaviour to be modelled

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horizons, and in various combinations (i.e. the various tranches character of CDOs as explained before), serve to revolutionize the stochastic characteristics of dynamic economic processes.

[303] Typically seen when implied volatility is graphed as a function of a range of strike prices of a chosen option: both in-the-money and out-of-the-money.

[304] It is calculated by comparing the market price of a chosen option with the Black and Scholes price calculated using an estimate of the actual volatility of the underlying asset. Taking actual market prices for an option at each strike price, the Black and Scholes equation is inverted to calculate the volatility that would have to obtain for that market price to issue from the option price formula and this is compared with the empirical volatility.

[305] In incomplete markets it is necessary to estimate the market price of risk to calculate asset prices (i.e. in more formal terms, an equivalent martingale measure must be derived using either a utility function or, alternatively, a dual operator such as a minimum variance hedge or minimum relative entropy).

[306] Juniper (2005) argues that it also can be granted a utility-theoretic foundation, and that can be interpreted as equivalent to liquidity preference, insofar as it is reflected in the presence of uncertainty premia in asset markets, in addition to more conventional risk premia.

mathematically as a form of decision-making under uncertainty[307]. This approach would effectively accommodate some of Minsky's concerns about the formal modelling of investor uncertainty about the quasi-rents derived from corporate investment activity (Juniper, 2005b). As argued in Chapter Two the concept of uncertainty aversion closely corresponds to the Keynesian notion of liquidity preference. Knight believed that uncertainty aversion arises due to an inability on the part of certain individuals to specify the state space governing risk. And agents who do not possess it themselves will not recognise this ability. In contrast, Keynes adopted a more ontologically grounded view of uncertainty as something that pertains to long-term decision-making. The main ontological basis for this uncertainty is the phenomenological reality of human freedom and the creative ability to intervene in history, so transforming the nature of economic institutions and processes (the change in the regulatory environment post- implementation of deregulation policies and the consequent transformation of banks' behaviour was reviewed in Chapter Three).

Like his predecessors, Minsky embraced the *instability principle*, which is predicated on the notion that economic instability is an *endogenous* phenomenon[308]. Juniper argues that economy-wide variations in uncertainty aversion are precipitated by changes in the level of financial instability. In effect, increases in financial instability reflect a heightened sensitivity on the part of the financial system to adverse movements in liquidity preference[309]. This heightened vulnerability is responsible for initiating adverse movements in the sentiment of investors: the whole economy thus becoming exposed to a form of self-fulfilling prophecy, though one that would operate through increases in both fundamental uncertainty and uncertainty aversion.

[307] Van der Hoek and Sherris (2001), found a workable approach to options pricing under uncertainty aversion based on the use of distortion functions, which conform to the axioms of non-expected utility theory.

[308] In Minsky's version of events, periods of optimism are seen to give rise to behaviour that, in more conservative times, might appear reckless: banks, households, and firms embrace more fragile financial positions, in the sense, that (present value) break-even times for investment and points for turn around in debt-redemption are increasingly deferred. Initially, this recklessness occurs at a time when existing rates of interest are relatively small, primarily due to low levels of liquidity preference. For example, expanding firms rely more on external sources of finance rather than on retained earnings. In general, each class of agent becomes more exposed to less diversified sources of income and to financial obligations that are more rigid and inflexible. As the whole economy becomes more and more vulnerable to adverse changes in interest rates or downturns in effective demand, liquidity preference begins to rise, perversely feeding into the very process that determines the structure of short term interest rates.

[309] This is due to detrimental changes in the balance sheet exposure of banks, households and firms.

Investment decisions would then be affected across the entire liquidity spectrum from financial assets to non-financial and commodity-specific assets (Juniper, 2005b).

According to Minsky, the variations in financial instability—reflecting movements along the investment continuum that ranges from hedge, through speculative to Ponzi financial positions—should be accommodated (in a control sense) through the use of adaptive techniques that trace the path-dependent trajectories of critical parameters. In that sense, from an epistemic perspective uncertainty aversion reflects a greater sensitivity on the part of agents to the heightened consequences of any adverse movement in the spectrum of liquidity premia. These consequences, in turn, are (ontologically) determined by real changes in balance-sheet structures of economic agents. In a risk-sensitive, stochastic optimal control setting, each of these interwoven factors has a clear interpretation: uncertainty aversion is represented by the parameter in the penalty function determining where agents are situated along the spectrum between H_2 and H-infinity control; while financial instability would be accommodated by an expansion in the stochastic uncertainty constraint representing the model uncertainty, external perturbation and observation error.

5.5.1 Robust and Risk-Sensitive Control

Risk-sensitive control obtains when the conventional linear quadratic objective function is replaced by one that is non-linear. For example, Caravani (1987) considers two risk-sensitive (H_2 Norm) functions:

$$f(x) = x + \mu|x|$$

$$f(x) = \frac{1}{2}x[1 \mid \exp(\mu x)]$$

that he incorporates into a criterion function that preserves some of the mathematical convenience of the linear quadratic case:

$$\min \sum_{t=0}^{T} \{f'(x(t))Qf(x(t)) + u'(t)Ru(t)\}$$

Immediately below, the exponential function (for a scalar state variable) is graphed for two different values of the μ parameter (the solid line) and compared with its

linear quadratic counterpart (the dashed line) to show how this particular function can assign asymmetrical weight to positive and negative values of the state variable:

Figure 19: Caravani's (1987) Risk-Sensitive Weighting Function

Source from Caravani, 1987, figure 2

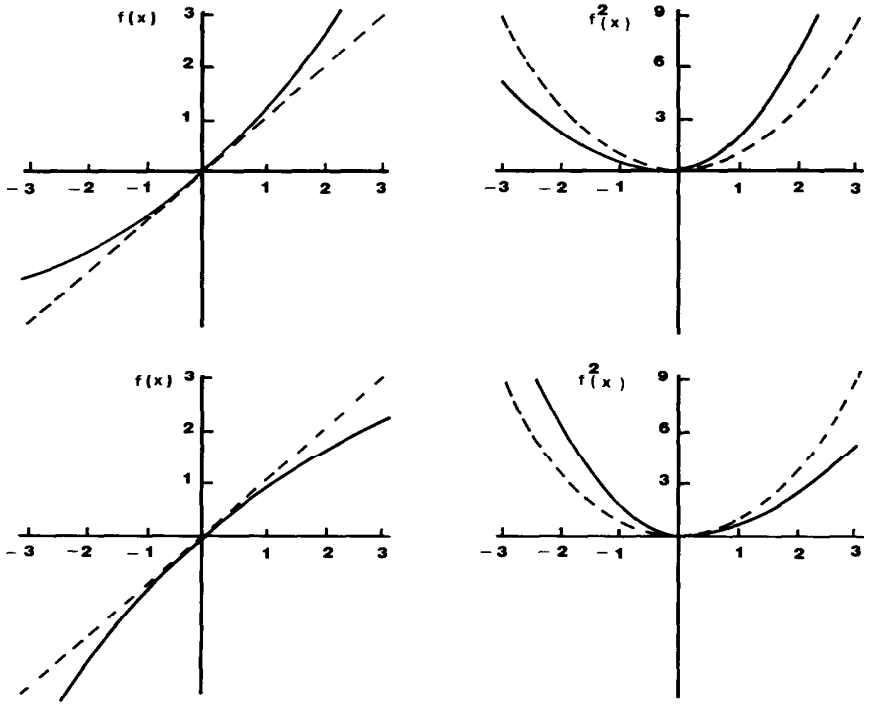

Fig. 2. Function $f(x)=(1/2)x(1+\exp(\mu x))$. Dashed graphs $\mu=0$. Solid graphs: above $\mu=0.2$, below $\mu=-0.2$.

Applications of risk-sensitive and robust control and filtering principles to finance theory are less common than applications to optimal stabilization policy. Nevertheless, notable exceptions include Lefebvre and Montulet's (1994) utilization of risk-sensitive, calculus-of-variations techniques to investigate a firm's optimal choice of the mix between liquid and illiquid assets, Fleming's (1995) risk-sensitive approach to portfolio management, and McEneaney's (1997) work on robust pricing of financial options under stochastic volatility. When continuous trading is impossible (e.g. during stock market crashes that are frequently modelled as Poisson jump processes), or when interest rates and stock volatility are stochastic the law of one price breaks down. A replicating portfolio of securities cannot be constructed to perfectly hedge against the corresponding shocks. McEneaney shows how robust control techniques can be

employed when the stock volatility is stochastic, using the well known Black and Scholes formulas to derive upper bounds on the relevant option price.

Juniper (2005b) argues that one obvious reason for the recent proliferation of these techniques is that typical time-series for the return sequences of most financial assets exhibit significant kurtosis and skewness. Risk-neutral control techniques based on the Gaussian process (i.e. VaR and ES) only tend to the mean and variance of the relevant series rather than to higher-order moments and moments about the mean. It is easy to confirm that exponential objective functions are sensitive to all relevant moments within the joint-probability distribution. For example, Caravani (1987, p. 456) demonstrates that in the scalar case:

$$Ef'(x)Qf(x) = g(x_0) + \left.\frac{\partial g}{\partial x}\right|_{x_0} E(x - x_0) + \frac{1}{2!}\left.\frac{\partial^2 g}{\partial x^2}\right|_{x_0} E(x - x_0)^2 K$$

Moreover, the shape of the f(x) and f^2(x) functions illustrated above shows that the application of risk-sensitive control techniques can yield a maximal asymptotic ratio of "up-side chance" to "down-side risk", in contrast to VaR and ES with focus on "down-side risk".

This asymmetry between up-side and down-side risk is a notable feature of Bielecki and Pliska's (1999) derivation of a continuous-time portfolio optimization model under risk-sensitive control. Their chosen objective function is (Bielecki and Plisa, 1999, p. 339):

$$J_\theta = \lim_{t\to\infty} \inf\left(\frac{-2}{\theta}\right) t^{-1} \ln E e^{-\left(\frac{\theta}{2}\right)\ln V(t)}, \theta > -2, \theta \neq 0$$

Maximizing $J\theta$[310] protects an investor interested in maximizing the expected growth of their capital against large deviation of the actually realized from their expectations, where θ plays the role of the risk-aversion parameter and R(t) = $\ln V(t)$ is the cumulative reward. Kenneth Kasa (1999) examines a scalar robust control problem with a simple quadratic objective function capturing the trade-off between variations

[310] By taking a second-order Taylor's series expansion about θ=0, Bielecki and Plisa (1999, p. 339) confirm that "$J\theta$ can be interpreted as the long-run expected growth rate minus a penalty term, with an error that is proportional to θ2. Furthermore, the penalty term is proportional to the asymptotic variance…."

in the state variable and variations in the control. Kasa presumes that agents are uncertain about both the stochastic properties of the disturbance and the underlying model, where the latter form of uncertainty is parameterized by a bound on the H_∞ norm of the loss function[311].

To accommodate uncertainty, Hansen and Sargent (2000) exploit the mathematical parallel existing between the risk-sensitive stochastic control theory, risk-neutral stochastic control theory, and the deterministic, differential game interpretations of robust control theory[312]. In engineering applications of stochastic control theory, uncertainty is represented variously by a norm bound, a sum integral constraint or a relative entropy constraint. Through this stochastic uncertainty constraint, root mean squared bounds are imposed over three types of uncertainty: observation error, additive or multiplicative model uncertainty, and external perturbation. In contrast, a relative entropy constraint imposes a bound over the divergence of candidate probability distributions from a reference distribution[313].

Elliott et al., (1995) introduce methods that have been developed and adopted by engineering control theorists and signal processing theorists for both the estimation and control of Hidden Markov models. These techniques have a two-fold advantage. First, a familiarity with these techniques afford access to an extensive body of literature spanning the fields of mathematical statistics, electrical engineering and signal processing that is broader than can be found within the standard econometrics literature. Second, the techniques introduced are similar to, though more basic than, those adopted for the robust and risk-sensitive control and filtering[314] of more

[311] Kasas (1999, p. 175) shows that for a given feedback policy, there is a strictly convex function relating values of the H_∞ norm to values of the parameter summarizing the relative cost of the state versus control variability: Thus, if one wants to produce a less activist policy, one can either make changes in the control variable more costly or increase the degree of model uncertainty.

[312] As argued in Juniper (2005), the insights gained from a critical analysis of Hansen and Sargent's (1999) adoption of risk-sensitive and robust control theory for modelling economic decision-making under uncertainty or ambiguity aversion, once the underlying principles have been extracted from their neoclassical integument, provide a behavioural justification for the Kaldorian versions of asset-price theoretic macro-models proposed by Carlo Panico (1993) or Godley and Lavioie (2000). This affords the opportunity for developing a more robust (in both senses of the term) and defensible understanding of Keynesian approaches to asset markets than can be afforded by Tobin's conventional risk-based approach.

[313] The latter is usually of a predefined Gaussian form.

[314] The complex dynamic outcomes would be fairly common when there is non-linear relationship. In such cases, a resort to control and filtering techniques that have been designed for

complex linear and non-linear diffusion processes (Elliott et al, 1995; James and Baras, 1995). For instance, techniques of dynamic programming, which employ operators derived from applications of Girsanov's theorem, underpin the estimation and control of non-Gaussian stochastic processes, including Lévy processes and those characterized by multi-fractional Brownian motion (Helge et al., 1996).

Elliott et al., (1995) draw on Dupuis and Ellis's (1997) characterization of the duality between free energy and relative entropy to construct error bounds for risk-sensitive filters. They assume that the true probability model is fixed but unknown, and that the estimation procedure makes use of a fixed nominal model. They show that the resulting error bound for the risk-sensitive filter is the sum of two terms, the first of which coincides with an upper bound on the error one would obtain if one knew exactly the underlying probability model, while the second term is a measure of the distance between the true and design probability models. Under Hansen et al's (1999) interpretation these two components, comprising the stochastic uncertainty constraint, reflect the inability of the controller to discriminate between a range of feasible probability models using the usual, entropy-based information criteria.

In the mathematical finance literature (e.g. Stutzer, 1995; Chan and van der Hoek, 2001) it is well known that the use of relative entropy (MinxEnt) to estimate risk-neutral probabilities, Gibbs state price probability densities, or equivalent martingale measures yields the same set of results as those obtained under the assumption that a representative investor determining the composition of their optimal portfolio has preferences associated with a constant absolute risk aversion utility function with a constant of proportionality equal to $-1/a$ (where a is the coefficient of absolute risk aversion). It is hardly surprising; therefore, that the applications of the MinxEnt principle to problems of discrete choice yield results that can be related to underlying utility theory. Stutzer (1995, pp. 376-378) provides three additional interpretations of the state price density function based on: a quasi-maximum likelihood, a minimum information bound, and a Bayesian interpretation that is similar to that embodied in Laplace's principle.

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linear dynamics would be sure to fail. The slightest hint of observation error, model uncertainty or non-Gaussian perturbation would result in devastating control failure.

However, in financial applications of risk-sensitive control theory the object of study is uncertainty aversion rather than incompleteness in markets as noted before. The property of *bounded sub-additivity,* which characterizes Cumulative Prospect Theory (CPT), one of the better known models of non-expected utility theory, has recently been extended by Tversky and Wakker (1995), to account for decision-making under uncertainty. This theory can help to identify the relationship between two forms of uncertainty aversion are portrayed in the asset-pricing literature: sub-additive probabilities and multiple-prior representations of robust control. The authors interpret this condition as implying that an event has a greater impact when it turns impossibility into possibility or possibility into certainty, than when it merely makes a possibility more likely (Tversky and Wakker, 1995, p. 1264).

As discussed also in Chapter Two - Section 2.2.3, Gilboa and Schmeidler (1989) have established the mathematical equivalence between two capacity-based representations of uncertainty aversion[315]. In a multiple-priors context, ambiguity aversion arises when the agent's relevant probabilistic beliefs are given by a *set* of probability measures rather than a singleton distribution. In characterizing the optimal rules in this context, researchers assume that economic agents adopt an intertemporal max-min expected utility approach: in a game – theoretic context, nature is presumed to be malicious in maximizing a penalty function through the choice of a particular probability density from within the range of permissible distributions. The agent is then presumed to minimize the same penalty function through the choice of a (sub-optimal) control law and filter. These rules are designed to protect the agent against unfavourable probabilistic structures in the financial environment. In this control theoretic context, the duality between free energy and relative entropy applies to the stochastic uncertainty constraint , which accounts for (multiplicative) model uncertainty, observation error, and (typically non-Gaussian) perturbation.

Marinacci (1999) outlines a set of behavioural considerations that might motivate an approach to decision-making predicated on uncertainty aversion, while in Epstein and Schneider (2001), an axiomatic basis for uncertainty aversion has been constructed deploying a discrete-time, multiple-priors, and recursive utility framework. A continuous-time variant is discussed in Chen and Epstein (2000). Also, see the debate

[315] The first is these entailing the use of *sub-additive probabilities*, and the second is involving max-min optimization within a *multiple-priors* setting.

between Epstein and Schneider (2001), and Hansen et al. (2001) over the precise nature of the relationship holding between risk-sensitive penalty functions and multiple-priors forms of generalized utility. Significantly, Grant and Quiggin have shown how Epstein and Zhang's (2001) definition of 'ambiguous events' can be used to define ambiguity aversion over preference relations in "a solely preference-based and model-free manner" (Grant and Quiggin, 2002, p. 2).

In many application of risk-sensitive control, where penalty functions belong to the exponential family (reflecting constant absolute risk aversion), the stochastic uncertainty constraint represents the difference between free and bounded entropy. Presumably, in application of Tsallis entropy the penalty function would conform to the power law family and the stochastic uncertainty constraint would be determined by the difference between free and bound Tsallis entropy[316].

These new techniques of risk-sensitive control could apply penalty functions drawn from the generalized entropy family, with stochastic uncertainty constraints correspondingly expressed in the form of Tsallis rather than BSG entropy. Simultaneously, Juniper (2005a) argues that analysis predicted on generalized entropy based-techniques—which has the advantage of encompassing an increasingly general class of stochastic process—is at present unable to engage comprehensively with a range of issues of crucial importance for policy debates, especially those relating to macroeconomic stabilization and the prudential control of financial institutions under the current Basel II framework[317].

[316] Juniper (2005b) points out that the focus of the discussion of adoption of Tsallis entropy would be the construction of a clear behavioral foundation for financial applications of Tsallis entropy, he further argues that Choquet Expected Utility Theory could provide a foundation of this kind. Moreover, he comments that in the absence of such a foundation, at present, applications of Tsallis entropy are unable to extend beyond the 'curve-fitting' exercises commonly found in option pricing, to inform debates over financial instability and in broad, macroeconomic policy. To conclude, the Tsallis entropy is uniquely placed to assist in understanding decision-making of this nature.

[317] One of the reasons for this posited inadequacy is the current models of asset pricing are entirely separated from decisions about production and investment, i.e. the lucas tree mode treats the dividend process as exogenously determined. Stochastic growth models, with some financial components, are usually predicated on neoclassical growth where the real forces of (marginal) productivity and thrift are ultimately responsible for driving the dividend process (Brock, 1982).

In a Minskian or Keynesian world, therefore, interactions between financial institutions, firms and households are seen to be crucial[318]. In particular, uncertainty aversion or changes in liquidity preference would directly influence the decisions that firms make about *real* (physical) investment, not just the decisions that investors make about financial investment (Juniper, 2005a). Therefore, robust and risk-sensitive control is necessary for decision-making by practitioners in the banking industry for risk management and strategic purposes and for regulators with attention on prudential control, who face not just the risk, but also uncertainty.

When the step to incorporate uncertainty premia in risk modelling for decision-making has been made, the implication is that variations in uncertainty aversion will influence the dividend process itself, via the multiplier effect spreading from investment to overall levels of effective demand and aggregate activity. This makes financial decision far more complex than those predicted either on exogenous dividend streams (the Lucas tree model) or those associated with stochastic growth models (Brock, 1982). Accordingly, Keynesian insights into the nature of financial markets can no longer be precluded from investigation or policy intervention on spurious ontological grounds.

5.6 Conclusion

In this chapter the researcher has provided an examination of the VaR approach that plays a fundamental role in risk measurement for regulatory capital adequacy purposes under the Basel II framework. This is an essential part of the evaluation of the current Basel II Accord that this thesis aims to make. The uncovered weaknesses of VaR in capturing tail risks and incorporating diversification effects, which flow from the lack of sub-additivity, are criticized as contributing to the occurrence of financial crises in terms of the underestimation of risks and thus excessive risk-taking triggered under this approach. Although Extreme Value Theory (EVT) and Copula methods show their ability to perform better under VaR analysis, in contrast to the other two complementary methods of backtesting and stress testing as currently adopted by regulators under the Basel II framework, the fact that sub-additivity is lacking is the proof that VaR is not qualified as a coherent risk measure like Expected

[318] Minsky's work has spawned a variety of attempts to model financial instability using tools of non-linear dynamic simulation and analysis (Taylor and O'Connell, 1985; Foley, 1997; Keen, 1995, 1999, 2000).

Shortfall (ES). From the researcher's perspective, it further argues that distortion risk measure, as another closely related quantile-based risk measure, sheds further light on the limitations of VaR and also ES which are argued to be not consistent with risk-aversion (but once they have a Choquet integral representation, VaR and ES can be shown to be a distortion risk measure). However, from the Post-Keynesian point of view, if risk modelling is just focused on risk premia, and ignores time-varying uncertainty premia, then this seems insufficient for more and more complicated decision-making in the financial world particularly with a dynamic regulatory environment, which triggers changes in banks' behaviour and investors' risk appetite. In this sense, this chapter suggests robust and risk-sensitive control theory, as a new entry-point for such intentions to formalise and model uncertainty, could be implemented under the current Basel II implementation, with Tsallis entropy, to help correct the instability partly sourced from flawed VaR approaches.

So far, all the discussion and examination of Basel II, from its framework to risk measure approaches, including both theoretical evaluation[319] and technical discussion (in this chapter), has been mostly based on academic perspectives. However a balanced appraisal of Basel II requires input from practitioners who work closely with the Basel Accord in the risk management area within the Australian banking system, and regulators with prudential control responsibility. The following chapters will provide the reader with a critique and assessment of operational issues and the performance of Basel II from the viewpoint of these practitioners.

[319] Chapter Three theoretically evaluated Basel II's framework using the dichotomy derived through weaving the notion of "reflexivity", responsive regulation and smart regulation together as a benchmark, which was based on the background review of prudential regulation.

Chapter Six

Research Methods: the Philosophy and Research Design

6.1 Introduction

The purpose of this chapter is to discuss the research methods that are used for the evaluation and investigation of the effectiveness of the implementation of Basel II in Australia. Because of the paucity of published information on the responses from banking industry practitioners and supervisory authorities to the implementation of Basel II beginning from January of 2008 within Australia region, it is necessary to develop methods to collect information directly from the relevant organizations. As such the methodological approach to data collection in this thesis will be comprised of semi-structured interviews that act as tools designed to extract the information required to answer the research questions. The information directly collected from practitioners (who either work closely with Basel II-related risk management practices within the Australian banking system or act as supervisors from supervisory authorities) will be analysed and interpreted (in following two chapters) to serve the investigation of empirical research.

The chapter begins with a discussion of philosophical ideas that underpin the research (section 6.2). As Yeung (1997:55) states: "Methods are surely important, but their importance cannot be exercised unless they are supported by strong philosophical claims at the ontological and epistemological levels". As such, the first section of this chapter will advance Habermas' Universal Pragmatics and related Theory of Communicative Action as the most suitable philosophical framework through which to view the question. At this stage it is important to note that the first section is not intended as a detailed exposition of the philosophy but rather serves to sketch how Habermas' Universal Pragmatics with Communicative Action Theory provides useful insights for this research. The second section (6.3) describes how the research has developed and it further explains choices about the efficacy of semi-structure interviews and Qualitative Data Analysis (QDA) to extract information. In this section I also outline interview strategy which includes—sampling type, strategy of accessing potential participants, rationale of interview questionnaire and also its updating is introduced. This chapter is concluded with a discussion of QDA processes based on

Habermasian Discourse Ethics and further detail the coding strategy employed in the interview formation.

6.2 Philosophical Underpinnings

All research whether quantitative or qualitative, is based on some underlying assumptions about what constitutes "valid" research and which research methods are appropriate. In order to conduct or evaluate research, it is therefore important to know what are these assumptions are.

Guba and Lincoln (1994) suggest four underlying "paradigms" for research: Positivism, post-positivism, critical theory and constructivism.

For critical researchers, social reality is historically constituted and is produced and reproduced by all people. Critical researchers further maintain that although people can consciously act to change their social and economic circumstances, their ability to do so is constrained by various forms of social, cultural and political domination. Thus the main task of critical research is seen as being one of social critique, whereby the restrictive and alienating conditions of the status are brought to light. As such, critical research focuses on the oppositions, conflicts and contradictions in contemporary society, and seeks to be *emancipatory*. One of the best-known exponents of contemporary critical social theory is Jürgen Habermas.

Habermas traces his philosophical discourse on modernity back to the *Young Hegelians* and is particularly interested in the various ways in which they dealt with antinomies of reason arising within the philosophy of the subject. This project extends from Descartes through to Kant and Husserl and finds critical expression in the diremptive conception of a self-inflated subject, alienated from both its internal and external nature. To identify the problematic of rationalization with reification and to free it from the aporias of the philosophy of consciousness, Habermas passes through Marx into Praxis Philosophy that is moderated by Husserl and Weber (associated with Lucas, Horkheimer and Adorno), and also into the works of the Frankfurt School (Juniper, 2001. p. 8). This innovation represented a clear paradigm shift away from purposive activity to communicative action, which was also inspired by the likes of

Mead (Symbolic Interactionist School[320]) and Durkheim. In addition to this he also takes into account and integrates into his own work the contributions of language theorists Wittgenstein, and Chomsky; assorted phenomenologists; ethnomethodologists, functionalists, structuralists, etc. In the Marxist reception of Weber's theory of rationalization, from Lukacs to Adorno, the rationalization of society is always thought of as a reification of consciousness. In addition, Habermas argues that the role of communicative action in Praxis Philosophy is just as a force of production. This position implies that there is a separation of emancipator practice from critical consciousness, and thus the instrumental rationalization of lifeworld becomes unsusceptible to ideology critique, due in large part to its lack of critique content. Thus, rationalization cannot be dealt with adequately within the conceptual frame of the philosophy of consciousness, which an objectifying operation practiced by a Reason could be mutilated by the drive for self-maintenance of both bureaucratic administration and the market place. Therefore, Habermas applied the basic concepts developed by Mead (*communication-theoretic foundation of sociology)* and Durkheim *(a theory of social solidarity connecting social integration to system integration*) (refer to p8-p9). Through this application he developed the Theory of Communicative Action to reconstruct an undamaged intersubjectivity that allows both for unconstrained mutual understanding among individuals and for the identities of individuals who come to an unconstrained understanding with themselves (Habermas, 1987).

The philosophical underpinning of Habermas' project offers two important contextual inferences when it comes to elucidating the research methodology of this thesis. First, Habermas identifies a clear distinction between technical, practical and emancipator knowledge-constituting interest, which is evident at a methodological level in the distinction between the empirical-analysis, historical hermeneutic and critical science[321]. This distinction provides the basis for a critical methodology based on communicative and emancipator interest, which Habermas labelled *universal pragmatics* (or theory of communication). As a consequence, the research design of this thesis will be based on Habermas' universal pragmatics of intersubjective

[320] George Herbert Mead's Symbolic Interactionist School had a profound influence over Ethnomethodology and Sociology.
[321] Habermas' critical theory method grounded in his theory of communicative action, incorporating the notion of critical theory method.

communication[322]. Second, from a more theoretical perspective at the sociological level, Habermas argues that Economic and Bureaucratic-administrative subsystems have contaminated the lifeworld (which provide the resource and context for communicative action) through forms of purposive-rational action[323] that are aimed at meeting the imperatives of system-maintenance. Based on this notion and in contrast to the more technocratic, procedural and autocratic aspects of government regulation and prudential control, the researcher is able to stand at a critical point to evaluate Basel II as implemented in the Australian banking system. In addition, Habermas' Universal Pragmatics of intersubjective communication serves to explore the communicative distortion tendencies arising from Basel II-related risk management and supervision practices that have potential impact on the effectiveness of Basel II.

6.2.1 Universal Pragmatics

There is one approach that offers a promising forward as received little mention in the methodology literature. Here, Habermas' work on human knowledge interest is particularly illustrative (Habermas, 1972).

Habermas gave a new direction to both hermeneutic theory and Praxis as he claims the necessity of hermeneutics through a critical and self-reflective methodology. As a second-generation member of the Frankfurt School, a centre that has built its reputation for its strategic conjoining of Marxist inspired philosophical reflection with the emerging methodologies of the social sciences, Habermas shares the foundational idea that knowledge is a product of the society which is mystified and reified, and that through critical reflection such mystifications and reifications can be overcome. Furthermore he argues that different kinds of knowledge have different criteria for truth claims, which are represented in different communities with different political, economic and ideological interests (Habermas, 1979).

[322] It is reflected by choosing qualitative instead of quantitative as research method and analysing research data.

[323] Strategic action is second level of purposive–rational action which is distinct with communicative action. Purposive-rational action, according to Habermas (1968, 1970), is action, aims at the controlling reality. The second type of purposive-rational action is strategic action, which aims at "influencing the decisions" of an entity seen as an "opponent". It is argued that purposive-rational actions are "egocentric" because they focus on advancing their own interests rather than on "harmonizing" the interests of all concerned. With purposive-rational action, both the natural world and other people are seen as entities to be dominated—as the objectives of possible technical control.

In his 1972 work *knowledge and Interest,* he advances a pathway of his critical theory methodology to explore knowledge-constitutive interests[324] and offers a threefold typology for the interests that shape human knowledge which together "…*establish the specific viewpoints from which we can apprehend reality in any way whatsoever*" (Habermas, 1978, p.311).

These three generic domains of human interest are: the technical, the practical (or communicative) and the emancipator interest. According to these three types of human interest, he also distinguishes correspondent research methods adopted to yield different kinds of knowledge. Consequently, exploring the linkages between knowledge, experience and human purpose can serve to reduce the failures in our own perceptions, speech and action.

In regards to technical human interest, empirical-analytic research methods[325], which aim to exploit knowledge for the purposes of prediction, control and domination over nature and social relations, are adopted to yield the instrumental knowledge of the natural sciences. Similarly, interpretive historic-hermeneutic methods, which must take meaning and consciousness into account and aim to understand communication within and between social groups, is used to generate practical (communicative) knowledge[326] for practical (communicative) human interest[327]. Here, Habermas found that modern society has fostered an unbalanced expansion of the technical interest in control. The drive to dominate nature becomes a drive to dominate other human beings. Thus, Habermas' speculation about how to alleviate this distortion revolved around reasserting the rationality inherent in "communicative" and "emancipatory" interests (Stephen, 1995, p.6). Both forms of knowledge are geared to mastery of external phenomena (natural or social). Although each practice is epistemologically

[324] Habermas introduces the concept of 'interest', 'cognitive interests' or 'knowledge-constitutive interests'. 'Interests' guide people in how they constitute reality and organise their experience. These interests determine what can count as an object of knowledge, as well as the methods that can be used to produce and justify what counts as knowledge.
[325] Empirical- analytical knowledge is a product of the belief that it is possible to acquire "objective" knowledge of a pre-existing external world. It is derived, in its present form, from positivism and dedicated to purposive control.
[326] Practical knowledge only barely masks the human purpose of control in social contexts where empirical events are constantly shifting.
[327] Empirical-analytical and historical-hermeneutic approaches are contemporarily associated and historically derived from various species of positivism, and both of them are likewise subject to direct and indirect observation and analysis in regard to limited in space and time.

legitimate, they are intimately and inevitably associated with power and purpose that Habermas seeks to redress.

To achieve emancipator human interest, Habermas places critical theory method one step deeper than the historic-hermeneutics in the sense that it belongs to the emancipator domain of human interest that makes use of critical theory. This kind of emancipatory knowledge encourages self-reflection, that is emancipatory in intent and in effect, and within which self-reflection, knowledge and interest are one. This is illustrated in the following table:

Table 6: Habermas' Three Domains of Knowledge

Type of Human Interest	*Kind of Knowledge*	*Research Methods*
Technical *(prediction)*	**Instrumental** *(causal explanation)*	**Positivistic Sciences** *(empirical-analytic methods)*
Practical *(interpretation and understanding)*	**Practical** *(communicative)*	**Historical Sciences** *(hermeneutic methods)*
Emancipatory *(criticism and liberation)*	**Emancipation** *(reflection)*	**Critical Social Sciences** *(critical theory methods)*

Source from: MacIsaac, 1996

Like the general trend among the Frankfurt School style of investigation, the critical theory method that Habermas proposes is a potent mixture of theory, praxis and a program of action all designed to counteract the oppressive effects of the social construction of knowledge (Habermas, 1979). Habermas' engagement with the theory and praxis of hermeneutics commenced after shifting from a critique of knowledge to

critique of language in regard to his debate with Gadamer[328]. Although Habermas agrees with Gadamer that a dialogue has to be a free interaction between two agents, Habermas contends that hermeneutics can overcome the defects argued in their debate, through a critical and self-reflective methodology. Here Haberman maintains that if hermeneutics is geared towards truth, the interpreter can take a non-participative stand and thus be able to accurately diagnose the interactive processes of ideology and language since both ideology and language pervades the life-world. To further elucidate his position Habermas makes use of a model provided by Freud for treating the pathologies arising from ideology and language's systematic warping of the life-world. Simultaneously, with a Marxist style critique of ideology which was designed with a view to unmask the ideological deceptions of the dominant consciousness and expression, and also towards liberating the emancipator interest, Habermas constructs a *Universal Pragmatics* approach with task of searching for authentic consensus and meaning. In this sense his universal pragmatic approach makes fine-tuning that suit the discipline into his critical needs not just adapt to pragmatics.

The ideological roots of Habermas' Universal pragmatics are multi-varied and complex. In addition to being attributed to the tradition of critical theory in a general sense (which can originally be traced back to the work of Max Horkheimer) it also draws upon material from a large number of fields including: pragmatics, semantics, semiotics, informal logic, the philosophy of language, social philosophy, sociology, symbolic interactionism, ethics (especially discourse ethics), epistemology and the philosophy of mind. The term "universal pragmatics" includes two different traditions. On the one hand, ideas are drawn from the tradition of Plato, Aristotle, and Kant, wherein words and concepts are regarded as universally valid idealizations of shared meanings. And, on the other hand, inspired by American Pragmatic tradition from Charles Sanders Peirce, George Herbert Mead and Charles Morris, who all argued that words are arbitrary signs devoid of intrinsic meaning, and whose function is to denote the things and processes in the objective world that surrounds the speakers.

[328] Habermas claims that the radical problem with historical (Gadamerian) hermeneutics is that it assumes that every dialogue between a subject and an object, or between two subjects, is a genuine and authentic dialogue. He was unaware that the free flowing of understanding and interpretation can be possibly warped by the dominating and distorting forces of ideology that can be rarefied and subtle to be unseen and unfelt by the actors themselves.

Here Habermas ameliorates the tension between these two philosophical positions by locating his universal pragmatics between linguistics on one hand and empirical pragmatics on the other. Its two most important theoretical components deal with the cognitive and the communicative use of language. The first involves competently ordered expressions that can be employed in speech situations. The second concerns the nature of those situations in the lifeworld.

The basic concern in universal pragmatics is utterances or speech acts in general. This is in contrast to most other fields of linguistics, which tend to be more specialized, focusing exclusively on very specific sorts of utterances such as sentences. For Habermas, the most significant difference between a sentence and an utterance is that sentences are judged according to how well they make sense grammatically, while utterances are judged according to their communicative validity (Habermas, 1979, p. 31). According to universal pragmatics there are three ways in which we can evaluate utterances,: theories of elementary propositions; theories of first-person sentences; and theories of speech acts. Here, the last method of evaluation—theory of speech acts which draws on Austen's theory of speech acts, is the element that Habermas is most interested in developing as a theory of communicative action. Habermas also notices the qualitative characteristics of language rather than its quantitative significance to social life in his universal pragmatic analysis of communication. This last position is crucial and it has inspired this thesis to adopt a qualitative research methodology rather than quantitative research method.

6.2.2 Theory of Communicative Action

Habermas developed his universal pragmatic analysis of communication—Theory of Communicative Action as the normative and philosophical foundation for his critical social theory. In his theory, communicative action serves to transmit and renew cultural knowledge, in a process of achieving mutual understanding, and it coordinates action towards social integration and solidarity. After Habermas read Weber's description of rationality, he argued that Weber's basic theoretical assumptions with regard to social action prejudiced his analysis in the direction of purposive rationality. Here, Habermas finds the work of Mead and Durkheim particularly useful in freeing Weber's theory of rationalisation from the aporias of the philosophy of consciousness.

For Habermas (1989, p.5), Mead's theory of action "clears the way for a communication concept of rationality". He writes:

> "Following the thread of Mead's theory of action, we have traced the paradigm shift from purposive rationality to communicative action to a point at which the theme of intersubjectivity and self-preservation again comes to the fore" (Habermas, 1989, p.113)

Habermas (1989, pp.58-112) combines Mead's ontogenetic analysis of the "social self" emerging from a communicative process of symbolic interaction between the "I" and the "Me" with Emile Durkheim's phylogenetic analysis of a "collective consciousness" which arises from the sacred foundations of morality in the ritually preserved fund of social solidarity connecting social integration to system integration [329]. Habermas (1989. p58) states: "Mead conceives personal identity exactly as Durkheim does—as a structure that results from taking over social generalized expectations". Hence, while Mead prepares the basis for a theory of communicative interaction, Durkheim establishes the foundation for a theory of norm-regulated ethical conduct. By combining the work of Mead and Durkheim with the emancipatory aims of an ideological critique, the ultimate goal of Habermas' social scientific research program becomes that of a progressive liberation from all power relations, thus to arrive at a norm-governed ideal communication community wherein the social self achieves mutual understanding with others through open communication and unconstrained public dialogue free of all internal repressive (Feud) and external oppressive (Marx) forces of coercion, dominance, and authority(Odin, 1996).

6.2.2.1 Lifeworld and System

In his Theory of Communicative Action, Habermas makes a series of distinctions. The first major differentiation he makes is between two social realms, the *system* and

[329] The social integration is accomplished in system through the functional integration of the consequences of actions. It bypasses the consciousness of individuals and does not depend upon their being oriented towards acting collectively. Economic and industrial systems are great examples, often producing complex forms of social integration and interdependence despite the openly competitive orientations of individuals; the social integration accomplished in the lifeworld, by contrast, depends upon the coordination of action plans and the conscious action-orientations of individuals.

the *lifeworld*[330] (Habermas and Nicholsen, 1990). For Habermas, the *lifeworld* is more or less the "background" environment of competences, practices, and attitudes representable in terms of one's cognitive horizon. Except providing the context, he also sees lifeworld acting as a resource for intersubjectivity in culture, society and personality aspects [331] . Thus it can be argued that the rationalization [332] and colonization of the lifeworld by the instrumental rationality of bureaucracies and market-forces is a primary concern of Habermas' Theory of Communicative Action.

Habermas argues that the action-oriented approach[333] of the lifeworld cannot account for all the complexities of modern societies. The process of rationalization should be understood not only as a differentiation of the lifeworld as a symbolically reproduced communicative order, but also in terms of the 'material substratum' of society (Habermas, 1987, pp. 238-82). This twofold perspective indicates that societies have to secure the transmission of cultural values, legitimate norms and socialization processes, and, in addition, they also have to efficiently manipulate and control their environment in terms of successful interventions (e.g. effective prudential control in financial market). Particularly, once the structural differentiation of the lifeworld is acknowledged—alongside a similarly differentiated development of rationalization

[330] The social integration is accomplished in system through the functional integration of the consequences of actions. It bypasses the consciousness of individuals and does not depend upon their being oriented towards acting collectively. Economic and Industrial systems are great examples, often producing complex forms of social integration and interdependence despite the openly competitive orientations of individuals; the social integration accomplished in the lifeworld, by contrast, depends upon the coordination of action plans and the conscious action-oriented of individuals.

[331] Culture is conceived as a store of knowledge ensuring cultural reproduction by connecting newly arising situations with tradition and everyday practice. Society is seen as the set of legitimate orders achieving social integration by supporting processes of group identity and solidarity. Personality is seen as a product of socialization ensuring that future generations of individuals acquire the communicative competencies that are congruent with existing forms of collective life (Habermas, 1978, pp. 343-344).

[332] In sociology, rationalization is the process whereby an increasing number of social actions and interactions become based on considerations of efficiency or calculation rather than on motivations derived from custom, tradition, or emotion. It is conceived of as a core part of modernization and as manifested especially in behavior in the capitalist market; rational administration of the state and bureaucracy; the extension of modern science; and the expansion of modern technology.

[333] There is a distinction between two concepts of rationality that shape knowledge to guide action (Habermas, 1984, pp. 8-22, 168-85). First, cognitive-instrumental rationality conducts action that aims at the successful realization of privately defined goals. These action types are either instrumental, when they are directed at efficient interventions in a state of affairs in the world (e.g. through labor), or strategic, when they guide attempts to successfully influence the decisions of other actors. Second, communicative rationality underlies action that is aimed at mutual understanding, conceived as a process of reaching consensus between speaking subjects to harmonize their interpretations of the world.

and social pathology—both diagnosis and treatment must disintegrated into a diverse and contingent set of interventions (Juniper, 2001, p.16).

To further develop his position, Habermas also integrated a systems theory approach to his work on lifeworld, paying particular attention to the economic and the political subsystems (Habermas, 1987, pp.338-43). In this context he maintains that as a result of the growing universality and abstraction of lifeworld, structures such as custom and tradition give way to less concrete ethico-legel and communicative structures. As a result Habermas maintains that these systems have through the course of history split off, or 'uncoupled', from the lifeworld to function independently, no longer on the basis of communicative action aimed at mutual understanding, but in terms of the functionality of the steering media—money and power. Habermas refers to this process as the colonization of the lifeworld: the communicative potentials aimed at understanding in the lifeworld are contaminated in terms of the systemic imperatives of monetary and bureaucratic interventions. Thus it is axiomatic that the imperatives of both the economic subsystem associated with monetary exchange and wage labour, and state administrative system associated with bureaucratic, fiscal apparatus of government as steering-media have contaminated the everyday lifeworld with an impoverished and standardized language (e.g. law) and set of instrumental practices (e.g. regulation and supervision within banking industry) based on action-oriented[334] feedback control. In this context we are not just referring to economic instrumentalism but also to various procedural forms of rationality in legal, organizational and management practices (Juniper, 2001, p.5). In other worlds, a systemic functionalism holds sway over these reified life forms and domains of action that a system effectively operating in the interest of capital accumulation (Habermas, 1978, pp. 342-343). In the third chapter of this thesis researcher discuss at the length the history and design of regulatory strategies characterized by oscillation between command-and-control and self-regulation, and the consequent transition from pre-deregulation policy to financial deregulation policy in financial market, precisely reflect this philosophic elucidation by Habermas.

According to Habermas, lifeworld becomes colonized by steering media (money and power) when the following four things happen (Habermas, 1987, p.356):

[334] Action-oriented control includes not only strategic action, but also communicative action. He also argued strategic action is parasitic on communicative action.

1. Traditional forms of life are dismantled. (e.g. transition of people's role from as producer, consumer to investor)
2. Social roles are sufficiently differentiated. (e.g. transition of banks' role from acting as financial intermediaries to financial brokers)
3. There are adequate rewards of leisure and money for the alienated labour.
4. Hopes and dreams become individuated by state canalization of welfare and culture.

However, with the accumulation of knowledge, the formation of new social identities, and the construction of new forms of socialization, Habermas contends that other institutional developments can occur, which may serve to offset and even overcome this contamination of the lifeworld (Juniper, 2001). Hence, Habermas does not conceive of the 'uncoupling' of system and lifeworld as problematic in itself. Thus he maintains that the coordination of action in systems can best be secured by steering the media because they manage to relieve communicative actions from the possibility of dissent, and because they can do so with a high level of productivity and efficiency. Actions coordinated through these steering media relieve communicative action from difficulties in reaching consensus[335] in complex societies characterized by a range of action alternatives and, therefore, a constant threat of dissent. It is important to note that actions coordinated by the steering media of money and power differ from communicative action. This is the case because the steering media aim at the successful (cognitive-instrumental) organization of the production and exchange of goods on the basis of monetary profit (economy) and the formation of government to reach binding decisions in terms of bureaucratic efficiency (politics) (Deflem, 1996).

However, systems also have the capacity to penetrate back into the lifeworld. Coordination mechanisms oriented to success thereby enter into the domains of the lifeworld (culture, society and personality) that should be secured through communicative action oriented to mutual understanding if they are to remain free from disturbances and crisis manifestations (Habermas, 1987, pp. 318-31).

Furthermore, Habermas contrasts purposive-rational action and the technocratic consciousness[336] with approach based on communicative action. Purposive-rational

[335] Consensus emerges from the inter-subjective recognition of criticisable validity claims.
[336] According to Habermas, technocratic consciousness suppresses person's desire for a different type of action; a way relating to people and nature that does not involve domination. During

action, according to Habermas (1970), is action, aims at the controlling reality. The second type of purposive-rational action is strategic action, which aims at "influencing the decisions" of an entity seen as an "opponent". It is argued that purposive-rational actions are "egocentric" because they focus on advancing their own interests rather than on "harmonizing" the interests of all concerned. Thus with purposive-rational action, both the natural world and other people are seen as entities to be dominated—as the objectives of possible technical control.

He argues that the power of technocratic consciousness is fundamental when societies are in their developmental phase within which the technology, science and economic growth are intertwined, and he conceives that the socialization as in process of technocratic reform can violate integrity of lifeworld.

Thus, instead of purposive-rational action and technocratic consciousness, Habermas maintains that society needs not to be reoriented in a very different way and as an anecdote advances the idea of the communicative action, which is linked ultimately to emancipation. According to Habermas (1968), emancipation is a state of awareness where we understand the differences between purposive-rational and communicative action and we can therefore achieve mutual understanding. He suggests that our current orientation toward purposive-rational action and technocratic consciousness have made us to forget emancipatory interest.

6.2.2.2 Communicative Action

According to Habermas, language does not merely serve as a vehicle for the constitution and communication of symbolic meaning but it also serves as a vehicle for political domination and the legitimation of social power exercised through organized force. Compared to Husserl with his focus on consciousness, however, Habermas, whose social theory is grounded in *communication*, focuses on the lifeworld as consisting of socially and culturally sedimented linguistic meanings.

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technocratic process, technology, science and economic growth have become intertwined, and emerge finally as driving force in social life. However, the links among technology, science and economic growth is necessary if society is to develop.

Therefore his Theory of Communicative Action is based on an assumption that language is implicitly social and inherently rational[337].

In the Habermasian notion, truth is a "warranted assertability", and is thus a fundamentally pragmatic and regulative concept providing a particularly effective basis for the evaluation of speech act in terms of their validity, according to mutual recognition of four distinct validity claims. First, that a given utterance is understandable. Second, its propositional content is true. Third, that the speaker is sincere in making the utterance. And fourth, it is right or appropriate for the speaker to be performing the speech act. Furthermore, for Habermas, all validity claims—epistemic, normative and aesthetic—are intersubjective in nature, thus individuals can critically deploy the linguistic resource of the lifeworld to question and transform the economy and the state (Juniper, 2001, p.7). The continuing efforts to come to an agreement based on *communicative rationality* implies a kind of quasi-transcendental presupposition that systematic constrains or distortions of communication can be removed, and in turn, such removal implies the possibility of selecting and employing specific speech act; initiating and perpetuating certain kinds of dialogue; assuming particular dialogue roles; openly expressing certain attitudes, and even to command, oppose, forbid, or permit certain actions on the part of others. Thus, his conception of the *ideal speech situation* as a asymptotic norm implies that participants are able to totally free from both constrains of domination[338] and conscious modes of strategic (i.e. interested) behaviour (Juniper, 2001, p.12).

Habermas also argues that the achievement of mutual understanding is dependent on the performance of individual participants and communicative competence in communicative practice, which requires a linguistically based intersubjectivity operating in the discontinuous form of critique, and cooperative pursuit of truth with equal respect of each individual's interest. In general, a broader, collective practice or way of thinking, or precisely, according to Habermas, an intersubjective communicative practice oriented to mutual understanding may well have an important role to play in fending off the adverse consequences of the various contesting fundamentalisms that exert an irreconcilable influence over geopolitics in

[337] According to Habermas, argument is central to the process of achieving a rational result. Thus, argumentative speech can produce valid result.
[338] This constrains of domination includes those derived from unconscious repression.

the current epoch. As seen by Habermas, other theories just grasp a partial aspect of the communication process, which solely either built on the intentions of the speaker, or the representation of state. Thus in the interest of consistency this thesis will adopt the Habermasian Universal Pragmatics associated with communicative action theory as its philosophical underpinning, and intends to adopt a critical view to look at Basel II as regulatory strategy and related prudential control undertaken in banking system. More generally, this thesis also intends to apply Habermas' communicative action theory to gain a more realistic insight into the bounded and profoundly limited nature of decision-making involved in Basel II-related risk management and supervision process.

6.3 Research Design

This section describes how the research was designed and developed with aim to answer research questions. It begins by explaining why a qualitative research method has been chosen as basis of thesis' research design and why a semi-structured interview has been adopted as a suitable main discourse source. This section also describes the strategy adopted to undertake research interviews including how the sample was identified and the rationale behind the interview questions. The principles of updating interviews questions are outlined as well. Then, a Qualitative Data Analysis (QDA) process based on Habermasian Discourse Ethics with detailed coding strategy will be introduced to readers.

6.3.1 Research Questions

The design and methodology adopted for this research aims to answer the following main research questions:

1. Does the Basel II framework conform to the principles of 'smart' or responsive regulation in regard to banking risk management?

2. What is the nature and extent of the congruence between Basel II and the principles of responsive/smart regulation?

3. Is the underlying risk methodology of Basel II that is based on the Value-at-Risk (VaR) risk approach sufficient for the purposes of banking risk management and supervision?

4. How effective Basel II's implementation in Australia is in its empirical practices, according to bank risk managers and supervisors' comments?

5. What are the potential issues or problems arising from the implementation of Basel II in Australia?

6.3.2 Qualitative Research Method

Qualitative research methods are developed in the social sciences to enable researchers to study social and cultural phenomena. In particular it is designed to help researchers understand people and the social and cultural contexts within which they live. Generally speaking, Qualitative Data Analysis (QDA) denotes a processes and procedures whereby we move from the qualitative data that have been collected into some form of explanation, understanding or interpretation of the people and situations we are investigating.

Kaplan and Maxwell (1994) argue that the goal of understanding a phenomenon from the point of view of the participants and its particular social and institutional context is largely lost when textual data are quantified.

Brannen (1992) advances a particularly simplistic level of analysis in the assertion that qualitative approaches view the world through a wide lens and quantitative approaches through a narrow lens. This view is echoed by many empiricists who maintain that qualitative research is soft and subjective, and thus does not offer a valid methodological alternative to real science.

Creswell (1998) identifies five major methodologies in the field of qualitative research: Ethnography, Phenomenology, Case Study, Grounded Theory and Biography. However, other traditions such as Hermeneutics, Post-Structuralist and Habermasian Discourse Ethics should not be excluded and have become increasingly popular in social science research.

QDA is usually based on an interpretative philosophy with a view to examine the meaningful and symbolic content of qualitative data. As stated earlier this thesis will adopt Habermas' Universal Pragmatics associated with Theory of Communicative Action as its methodological underpinning. As result, the particular methodology

derived from using Habermas' allows for the exploration of ideal speech situations and validity claims as the prima facie framework to assess the communicative rationality through analysing discourses from qualitative data collected by semi-structured interviews. For Habermas (1979), each utterance has to abide by the criteria of comprehensibility; truth, sincerity and appropriateness or rightness[339]. For the purposes of this research project, in order to achieve emancipatory rationality in risk management practice it is necessary to diagnose distorting tendencies in communication of decision-making. Here, the critical discourse analysis based on Habermas' criteria helps to uncover such distortions. As a result this approach assists the researcher in identifying the distinctions between strategic interest of and consensual approach adopted by financial industry practitioners and regulators, and also the different strategic interests of them[340] in regard to interpretation of interview material.

In general terms this thesis mixes theoretical approaches with empirical approaches to generate knowledge production. In particular this thesis will focus on the evaluation of the effectiveness of Basel II from an empirical perspective with a particular emphasis on collecting responses from either bank practitioners or supervisors who work closely in Basel II-related risk management and regulatory supervision areas in Australia. The evaluation of Basel II will combine the research findings arising from interviewees' comments on the issues arising from the implementation of Basel II based on the critical discourse analysis of interview material with the discussions made in Chapter Three and Four about the 'smart' features of Basel II's framework.

To achieve this target, the data collection method for this research are designed to be able to help the researcher explore the participants' responses comparably deeper, also implying the method being chosen should be soft to flow with participants' responses into deep layer to sufficiently achieve research target. In view of that, the researcher will use semi-structured interviews to collect data.

[339] The terminology of Habermas' four validity claims varies because of translation, i.e. another version is: clarity, truth, sincerity and comprehensibility.

[340] The strategic interest of bank risk managers relates to their own careers and power within the organization, while the strategic interest of regulators is in promoting their own regulatory empires. Consensual approaches to regulation are more collaborative and egalitarian rather than dominating and autocratic, although more autocratic means can be deployed by regulators when a more cooperative approach fails.

6.3.3 Semi-Structured Interviews

Qualitative data sources include: observation, interviews, surveys, documents, texts as well as other elements that shed light on the research questions (Glaser and Strauss, 1967, PP.161-84). Certainly participant observation has merit, and is very prominent across both the social and behavioural sciences (Silverman, 1985). However, in the context of this research project it is impractical for several reasons. In particular this method poses a problem because as the researcher, I am an "outsider," thus without high level contacts within banking and regulatory authorities it would be difficult for me to be to embed myself in area that is arguably one of the most sensitive within these types of organizations.

Questionnaire surveys are more practical in contrast to observation, particularly mail surveys. But it has disadvantages as data gathering strategy for this thesis, for instance: insufficient depth with fully structured questions compared to interviews, resulting in potential problems in sufficiently satisfying the criteria of this research—deep and flexible; also this technique has problems with potential low response rates. Thus mail surveys are particularly problematic because they are completely dependent on voluntary compliance.

Hence, semi-structured interviews based on open-ended questions (e.g. "What is your opinion about …?") have been chosen as suitable data gathering strategy for the empirical evaluation of the implementation of Basel II, which is part of the assessment of the effectiveness of Basel II (this thesis also explores the 'smart' features of Basel II's framework and evaluates its underlying VaR-based risk methodology in previous chapters). As Yeung (1997) stresses that it is necessary to compare and contrast different sources of findings when they are explaining the same phenomenon.

6.3.4 Interview Strategy

6.3.4.1 Sampling

A fundamental assumption about methods in social science is that if enough individual experiences are aggregated to the point where the information is becoming repetitive, then an understanding of how a process or event unfolds should emerge (Sayer, 1992; Robson, 2002). This is based on the premise that the most accurate

knowledge individuals possess is that of their own personal experience. For this research, in order to diagnose communicative distortion in decision-making occurred in which a particular group of people in a shared socially, discursively, and historically structured specific communicative space are deliberating together (Habermas, 1979), *theoretical sampling* is adopted to guide researcher to choose potential participants. According to theoretical sampling, participants are selected on the basis of their potential contributions to research, and it involves iteration between sample selections, fieldwork (i.e. interview) and analysis. The goal of theoretical sampling is not the representative capture of all possible variations, but to gain a deeper understanding of analysed cases and facilitate the development of analytical frameworks and concepts. Therefore, the eligible respondents for this research who share a socially, discursively and historically structured specific communicative space in banking risk management and regulatory supervision areas where communicative distortion emerges, are those whose daily work, for example, is directly involved in risk management practice within banks, or supervising risk management practice of banks.

In order to triangulate these issues, *multiple viewpoints* will be collected from the responses of experienced experts who are: from risk measurement related data analysis and reporting areas which both from banks (e.g. manager of risk analysis division) and supervisory authority (e.g. senior analyst in banking supervision division and supervisors); and risk management related policy area which includes Basel II scheme compliance within banks (e.g. director of Basel II programme) and design of Basel II related Australian scheme in supervisory authority (e.g. senior specialist of Basel II development programme). Above all, the bank participants from risk related data analysis area are required to have experience in dealing with all three main risk types— credit, market and operational risks (e.g. manager or senior analysts in different risk type areas), which can fully cover various issues arising from different aspects under Basel II framework. Also, in order to engage effective comparisons with the responses collected from various types of banks interviewed, the supervisors in supervisory authority will be chosen from two groups: those that oversee diversified institutions (e.g. major banks with diversified business line interviewed), and those that oversee single business-line institutions (e.g. regional banks).

Table 7 shows types of organizations involved and individual participants from various organizations in research interviews.

<table>
<tr><th></th><th colspan="2">Organizations involved</th><th>Individual Participants from:</th></tr>
<tr><td rowspan="3">Banks</td><td rowspan="2">Major Banks</td><td>Domestic Australian major banks</td><td>Risk Reporting</td></tr>
<tr><td>Overseas major banks</td><td>Risk Analysis
(including credit, market and operational risk analysis)</td></tr>
<tr><td colspan="2">Regional Banks</td><td>Risk management related policies</td></tr>
<tr><td rowspan="3">Australian Supervisory Authority</td><td colspan="2">Diversified institutions oversight group</td><td>Risk Analysis</td></tr>
<tr><td colspan="2">Single business-line oversight group</td><td>Supervision
(both from two groups)</td></tr>
<tr><td colspan="2"></td><td>Basel II scheme related policies</td></tr>
</table>

The main sources used for identifying potential participating organizations are: APRA's (Australian Prudential Regulatory Authority) website; ABA (Australian Bankers' Association) and various banks' website. The first round of potential participating banks is chosen by referring to comprehensive listing of banks on APRA and ABA's websites. Then, a brief background of these banks will be checked according to the information provided on their organization official websites. Obviously, just the qualified banks that have committed to the Australian Basel II scheme[341]will be kept in second round list. Because of the small size of the industry,

[341] According to APRA's Basel II scheme, all local banks will involve the Basel II implementation at different approach level. However, few banks which normally just have representative office or simple branch don't have proper risk management division and staff in Australia. Their risk management function including risk analysis and management are undertaken in overseas head office.

the strategy is to target as many qualified banks as possible with an emphasis on both local and overseas major banks with comparably more mature risk management system and experience. Here, specific contact detail is important in ensuring a good response to interview requests, however, such information as key persons' contact information cannot be directly got from sources like banks' website. Therefore, the researcher will adopt a sampling type—"snowball or chain" to gradually access potential interviewees (Creswell, 1998, p 119).

6.3.4.2 Strategy of Accessing Potential Interviewees

A thoughtfully written *research project information statement*, briefly but sufficiently introducing information and stating the purpose of the research can have a positive influence on response rates because it can persuade the potential respondent that partaking in a request of interview is worth his or her time (Robson, 2002). The project information statement used for this research has several points to convey: a description of what the research was about; what research method is used to collect data (semi-structured interview); who can be the qualified potential participants; and particularly what is the arrangement of undertaking an interview (e.g. place and time needed). To guarantee confidentiality, a consent form with well-designed conditions for participants to "tick" will be very helpful in increasing response rates. Also, the legitimacy of the research will be demonstrated by including a copy of this thesis's ethics approval documentation issued by the University. In addition, to make this process more convenient for respondents a reply-paid envelope with researcher's address will be attached along with the information statement and consent form. The examples of research project information statement and consent form are found in Appendix B (B.1 and B.2).

The access to potential participants will be made through "snowballing" process as follows: the telephone and email will be used to initially approach potential participants and confirms interview arrangements. Since the contact information of potential participants are hard to access directly, through either phone call or email inquiry to some more public divisions in targeting banks, the researcher will make contact with managers or directors of potential participating divisions. Thus information statements and consent forms for organization participation will go to relevant manager before going to direct participants. When a call was made—ideally

a fortnight later—another round of phone calls or emails are made to confirm their willingness of participation. After confirming their (or their nominated employees') participation by returning a signed version of the consent forms, the project information statements and consent forms for individual participation will then be directly sent to individuals. To establish a professional reputation, thank you emails for interview granted are important.

6.3.4.3 Rationale of Interview Questions

Within the design of the initial interview questions and later in the question updating stage, there is a prominent theme also the target running through whole data collection procedure—exploring communicative distortion in risk management practice at bank level and also in decision-making process at supervision level. Here, the exposed distortion tendencies arising from information collected by semi-structured interviews are diagnosed via Habermas' four validity claims. Furthermore the benchmark of the ideal speech situation is the basis to distinguish between strategic interest (of banks and regulators) and consensus approach to regulation. In view of such recognition as guidance, the emancipatory rationality in risk management practice can be achieved by the critique of self awareness in concrete and practical decision-making through argumentation, in which "emancipatory" or "communicative" interest could alleviate the communicative distortion in risk management related practices (Habermas, 1968).

In order to explore distortion tendencies existing in risk management and supervision practice, the questions for interviews are normally open-ended questions (e.g. "what is your opinion on..?"), which means it is not tightly categorised and thus the interview process remains semi-structured. Under these open-ended mainstream questions, some sub-questions sorted by categories are provided for the researcher's use. In this case, to answers open-ended questions from respondents, researcher could pick relevant sub-questions to ask, but this exclude the situation that the issues arising from respondents' answers are new, which means there are no relevant sub-questions, thus updating of questionnaires needs to be made. Using this strategy, research can guide the flow of interviews towards a good argument. Here, it arise an issue that the researcher should be aware of his or her hermeneutic position—that is, the recognition of the role of the researcher in interpreting an enquiry and that this will influence the type of knowledge received and interpreted. Schoenberger (1991) notes that the

corporate interview is susceptible to problems of control since the likely respondents are people accustomed to being in control. The resolution offered is to establish a 'collaborative dialogue' that engages respondents, allowing him or her to shape the content of the discussion but without controlling it, thus the researcher is able to control flow of communication without dominating it. This is also the fundamental ideal of semi-structured interview with open-ended questions. Being well informed about a firm before an interview is also an essential strategy in corporate interview methods (Schoenberger, 1991). So, the information about bank's risk management history, their current Basel II implementation process (e.g. Basel II accreditation application progress), and also the particular specialty of potential interviewees are necessary as background information for interviews.

It is axiomatic the tenor of interview questions depend greatly on the entity being investigated; with different questionnaires for supervisory authority and banks; and also the banks having various structures (Reasons can refer to the explanation of types of participants in section 6.3.4.1 Sampling and also table 7). Examples of interview questionnaires are found in Appendix 6. Due to comparably smaller size of the Australian Banking industry, especially given that are only four major banks in Australia, the number of suitable Australian practitioners who are available to participate in this research is not much. After almost 8 months of "snowballing" contacting process, researcher successfully conducted 15 interviews with 16 senior risk-managers who are mainly from major Australian banks, and prudential supervisors who work with APRA on Basel II project, lasting on average 1.5 hours or more (normally, 8 to 24 interviews with such length can be seen as sufficient). They were semi-structured with the flexibility to be more structured if the interviewee was pressed for time, or certain issues are more concentrated that just occurred in last few interviews. In some cases two interviewees are present[342]. Amongst 15 interviews, 6

[342] Researcher has conducted a joint interview among 15 interviews mentioned above. Two interviewees who work in different areas of Basel II project within same bank suggested participating in interview together to suit their time schedule. One of the interviewees, who work as a senior risk manager, is responsible for risk measurement, management and also the reporting to Basel II program director and senior executives. The other interviewee acts as the director of Basel II program who majorly deals with relevant policy issues instead of quantitative aspects. Due to their different responsibilities, expertise and experience with Basel II, there are some interesting arguments between two interviewees on Basel II implementation that have been explored. These arguments reveal the differences in understanding and practicing Basel II Accord between quantitative and qualitative professionals, which contributes to the critical discussions of Basel II implementation in Chapters Seven and Eight.

interviews have been conducted before the occurrence of US sub-prime crisis and the rest of 9 interviews have been conducted just after the crisis occurred[343]. Compared to the interviews conducted before crisis, interviewees who participate in this research after crisis are keen to offer their opinions on the issues exposed by GFC which are closely related to Basel II as well. This offers researcher ability and sufficient information to critically evaluate Basel II implementation in the volatile period.

Interviewees are recorded normally by being taped with grant and later transcribed, but in the case of interviewing with participants from regulatory authority, because of their confidentiality consideration, interviews are only recorded by taking written notes.

According to Riley (1996, pp.36-7):

> "When establishing the credibility of analysis, the tradition of investigator-as-expert is reversed. This process is called 'member checking' and is an invited assessment of the investigator's meaning. Informants can be invited to assess whether the early analyses are an accurate reflection of their conversations."

To ensure the accuracy of the information gathered and to maintain the creditability of later analysis, all interview transcripts will be sent to interviewees within one month after interviews via email. This will be done to confirm the usage of information, e.g. some of information that interviewees want to be off-record, or some extra information has been added). In addition to this a research diary containing the researcher's thoughts related to either previous interview information or further questionnaire updating will be taken while interviews are being taped. These research diaries will be used in parallel with memos (explained shortly) to provide source for data analysis and the updating of interview questionnaires.

[343] Researcher has already built the contacts with interviewees who participated in interviews after the occurrence of US sub-prime crisis. All of these interviewees have granted consent for participation before crisis, otherwise there will be absolute difficulties of having opportunities to interview them. The timing of conducting these interviews offers this research valuable information.

6.3.4.4 Updating of Interview Questionnaires

Qualitative research has a built-in mandate to strive towards verification through the process of category "saturation" which is achieved by staying in the field until no further evidence emerges. Verification is done throughout the course of the research project which implies data collection and analysis are interrelated processes (Glaser and Strauss, 1967). This process normally calls for simultaneous data collection and analysis whose results could direct the next stage data collection (Glaser, 1978).

Interview questionnaires need to be updated in terms of new relevant issues arising from reviewing and analysing interview transcripts combined with written notes and also memos being taken, while sometimes repetitive issues from interviews being done are removed from questionnaires. By doing so the research process is able to capture all potentially relevant aspects of the topic as soon as they are perceived. Only when no new findings arise from freshly collected data, data collection process can be viewed as being done and verified through "saturation".

6.3.5 Discourse Analysis

The term "discourse analysis" is used to describe the process of identification of meaning from verbal and/or written discourse. It refers to attempts to study the organization of language 'above the sentence', and therefore to study larger linguistic units, such as conversational exchanges or written texts (Slembrouck, 2001, p.34). The term discourse analysis covers a range of different methodologies. This research adopts Habermasian Discourse Ethics as discourse analysis approach to understand and thus interpret in Chapters Seven and Eight the communicative distortion tendencies in risk management and relevant supervision practices. Habermas' Universal Pragmatics associated with communicative rationality enables us to apply normative standards to expose the distortions in discursive practice, and as consequent, to guide us to improve risk management practice and relevant supervision decision-making process. In this research, Habermas' ideal speech situation[344] and validity claims—comprehensibility; truth; sincerity; appropriateness or rightness, are

[344] Habermas sets out these four validity claims that must exist in order for the ideal speech situation to be realized. According to Habermas, rational action is the result of communicative action when actors do not violate any of the validity claims in their speech acts. This ideal speech situation results in undistorted communication and builds comprehension, trust, knowledge, and consent. In contrast, distorted communication results in misrepresentation, confusion, false assurances, and illegitimacy.

used as the framework to assess the discourse. Specifically, each validity claim is applied as an analytical lens, through which to analyse the texts describing responses from banks and supervisory authorities on Basel II framework and its implementation related issues.

Identification of *truth* claims within the discourse was guided by a search for objective facts such as argumentation and evidence, i.e. the argumentation or evidence shows the distortion (or common-sense) between regulators or banks, we could depend upon this information to identify whether this is based on their strategic interest, bureaucratic interest or consensus. *Sincerity* claims are identified through examining the choice of metaphors and connotative worlds used in the texts, which may reveal nuances not apparent on cursory reading (Cukier & Bauer, 2004, p.241). *Comprehensibility* is assessed in the usage of jargon, unfamiliar terminology, or incomprehensible language. When these obfuscations are absent, comprehensibility validity claim is achieved. *Rightness* (or legitimacy) is assessed by identifying texts that indicate experts in discourse (Michalos, 1986). For instance, who (which party/institute) was considered an expert, and on what basis of interest (strategic, bureaucratic interest or consensus)?

In terms of above discourse analysis using Habermas' validity claims as benchmark, the communicative distortions are exposed and interpreted, and consequently, the distinction between strategic, bureaucratic interest and consensus approach can be made for the assessment of communicative rationality in risk management and related supervision practice under Basel II framework within Australian context after undertaking other analysis process—coding; Memoing and sorting.

6.3.6 Coding Strategy

In critical discourse analysis, as in qualitative data analysis (QDA) generally, the discourse analysed forms the basis for the coding scheme. And as a result, the research can use coding at an early stage of analysis, assigning codes to the textual material (i.e. interview transcripts) being studied (Miles and Huberman, 1984). Therefore, the discourse analysis of this research begins at early stage of data collection (in order to guide next data collection as discussed before).

Coding is the process of identifying the components of analytical results. It is a function of the data. Creswell (1998) notes that the coding process in qualitative research projects generally falls into one of four formats: First, there is open coding**,** where categories are formed, and their defining characteristics are detailed. Second, there is axial coding**,** where data is assembled in new ways after open coding, and the researcher highlights a central phenomenon and explores causal conditions, specifies strategies, identifies the context and intervening conditions, and consequences are detailed. Third, there is selective coding wherein all categories are unified around a "core" category, and categories that need further explication are filled-in with descriptive detail. And fourth there is conditional coding, which visually portrays the social, historical and economic conditions influencing the central phenomenon. For this research, open coding and selective coding will be the most appropriate data analysis techniques.

6.3.6.1 Open Coding

Open coding is the interpretive process by which data sets are broken down analytically. Its purpose is to give the researcher new insights by breaking through standard ways of thinking about or interpreting phenomena reflected in the data, a series of techniques have been adopted to undertake this process (Corbin and Strauss, 1990, p. 14).

6.3.6.1.1 Breaking down Data into Units

Researcher breaks down "raw data" into various units of meaning through conceptualizing them. The repeatedly present concepts in interviews and documents are picked out and given label. In that sense, these concepts act as basic units of analysis. For example, when interviewees compare the Basel II with Basel I framework generally, comments like "more comprehensive", "not one-size fits all"…could be given the conceptual label as "superior structure". As the researcher encounters other comments comparing to the previous, if they appear to resemble the same phenomena, then these too, can be labelled as "supervisor structure". In this way, the concepts that pertain to the same phenomenon may be grouped to form categories. In addition, data must be examined for regularity and for an understanding of where that regularity is not apparent.

6.3.6.1.2 Descriptive Categories

Categories are higher in level and more abstract than the concepts they represent. They are generated through the same analytical process of making comparison to highlight similarities and differences that is used to produce lower level concepts. Moreover, categories are the "cornerstones" of generating analysis results, and they provide the means by which analytic results can be integrated and reported (Corbin and Strauss, 1990). Using the above example, while coding, the researcher notes that, although the concepts are different in form (i.e. concept of "superior structure" is different with concept of "practicability"), they seem to represent responses directed toward similar issue— the design of the Basel II framework. Thus, they can be grouped under a more abstract heading, for example, the category: "empirical effectiveness of Basel II". However, to build descriptive categories, certain specification of categories, their properties and their dimensions needs to be made, and through this specification, "categories can be defined and given explanatory power" (Corbin and Strauss, 1990, p.8). As result, these categories can then be broken down into specific properties and dimensions (i.e. "that the empirical effectiveness of Basel II" has the property of practicability, which can be dimensionalized as ranging from impractical, costly, practical and effective). Based on that, categories can become related to one another and they could enable researcher to notice empirical implication.

6.3.6.1.3 Constant Comparisons

Making comparison assists the researcher in guarding against bias, as he or she is then able to challenge concepts with fresh data. Moreover, such comparisons also help to achieve greater precision and consistency. Once aware of distinctions among categories, the researcher can spell out specific properties and dimensions of each. Here, ambiguities can be resolved through additional field-work or specification (Corbin and Strauss, 1990, p.13). Furthermore if the researcher inadvertently places data in a category where it does not analytically belong, by engaging in systematic comparisons, the errors can be located and as a result the data and concepts can be arranged in the appropriate classifications.

After descriptive categories have been formed, the researcher re-evaluates interrelationship between these descriptive categories through comprehensively comparison (i.e. category—"simplified risk category of Basel I" is compared with category—"broader risk category under Basel II" to evaluate the superiority of Basel II in contrast to Basel I in empirical practices).

6.3.6.2 Selective Coding

As a result of the above process, descriptive categories can be subsumed into higher order categories—core category, which represent the central phenomenon of the study. And other categories not being subsumed into core categories will stand in relationship to the core category as conditions, action/interactional strategies, or consequences. In this process of selective coding, the categories that need further explication are filled-in with descriptive detail. In this way, poorly developed categories, in which few properties have been uncovered in the data, are most likely to be identified during selective coding. So, the researcher can return to the interviews or documents to obtain data that will allow gaps to be filled.

6.3.7 Memoing, Sorting and Writing

Since the researcher cannot readily keep track of all the categories, properties, hypotheses, and generative questions that evolve from the analytical process, it is necessary to devise a system to do so. Here, the use of memos constitutes the most effective system to manage frequent correspondence gathered in the data collection process. Memos are not simply about "ideas," they are involved in the formulation and revision of theory during the research process (Corbin and Strauss, 1990). For this research, writing memos begins with first coding sessions and continues to the end of the research. It incorporates and elaborates on the coding sessions themselves as well as on the "coded notes".

Once the researcher has achieved saturation of categories with constant comparison, he or she proceeds to review, sort and integrate the numerous memos related to the core category. It is important to note that in Qualitative Data Analysis (QDA), literature is treated as data, with the same status as other data. Combined with the theoretical evaluation of the 'smart' features of Basel II framework in chapters Three and Four, the assessment of underlying VaR-based risk methodology in Chapter Five;

the interpretation of the research findings arising from interviews will be started after sorting the memos and will contribute to structure a comprehensive "story" of Basel II.

6.3.8 Validity

As discussed in the first section of this chapter (on the philosophical underpinning of the research methodology), which applied Habermas' universal pragmatics associated with his theory of communicative action and predicts that "language games" are based on the mutual recognition of four distinct types of validity claims—comprehensibility; truth; sincerity and appropriateness or rightness (refer to p.236). As such, the central concern of validity in this research project is on the politics of representation, which ostensibly implies that there is process that actively promotes the critical reading and rereading of any given research representation in terms of the aforementioned 'four validity claims.' Here, the researcher adopts a process of continually revisiting the sense-making processes of the research participants through updating questionnaire (see pp.19-20); writing research diary (see p.19); and also simultaneous memo taking (see p.22). These processes are necessary to appreciate how meaning is grounded in, and constructed through discourse practice that is contextually, culturally, and individually related (Mishler, 1986, Ryan, 1999). Thus, when an interview is based on a process wherein the interviewers and respondents strive to achieve symbiotic meaning, the relevance and appropriateness of questions and responses emerge through, and are realized in the discourse itself.

In this sense, the process of validation is arguably "democratized" by the proliferation of readings emerging from researchers, participants, and readers. The goal of validation is not to determine, once and for all, if a representation serves a particular function, but rather to discover and anticipate how it "does," "can," or "might," function to incite and foreclose, emancipate and oppress, and so forth when applied to different times and contexts and evaluated from different social locations.

In addition, the validity of this research is also addressed through the following strategies which are common in qualitative research and fall into two main sets. The first is concerned with *internal validation* and the second is concerned with verifying findings *externally* (Ritchie & Lewis, 2003).

For internal validity, *constant comparative method* (Galser & Strauss, 1967; Silverman, 2000) and *deviant case analysis* will be undertaken. First, *constant comparison* involves constant checking and comparison across different sites, cases, times, individuals, etc. This can assist the researcher in guarding against bias and to achieve greater precision and consistency. The details of constant comparative method adopted by this research can refer to section 6.3.6.1.3 Constant Comparison in page 250. Second, the researcher uses a *deviant case analysis* to ensure that deviant cases or "outliers" are not forced into classes or ignored but instead is used as an important resource in aiding understanding under varying contexts. After constant comparison, the researcher deals with the "outliers" in the selective coding stage. These poorly developed categories, in which few properties have been uncovered after the stages of open coding and constant comparison, are also identified during selective coding with other categories (researcher returns to the interviews or documentations to obtain data). This will allow gaps to be filled and thus lead to a more complex, dense and thick analysis.

For External validity, *triangulation and member or respondent validation* are adopted in this research. Denzin (1978) suggests that there are different forms of triangulation. In this research, two forms of triangulation are adopted. First, Semi-structured interview, documented accounts and literature review (Chapter Two-Five) together form the source of research data. Second, in order to triangulate issues, multiple viewpoints are collected from responses of participants in various areas in different types of organizations (refer to p. 239 and Table 7 with detail). Therefore, the analysis based on multiple viewpoints representing the diversity of perspectives among the research participants—bank managers, analysts and supervisors.

Member or respondent validation is also achieved through a process of "member checking" wherein respondents are invited to assess and check the accuracy of information they provided. Through this process confidentiality issues related to usage of information are confirmed or further discussed with the respondents (refer to p. 242 with detail).

Furthermore, credibility also can be achieved through a process of theoretical sampling (p.239), Here, the use sampling as a type of purposive sampling implies that the involvement of iteration between sample selection, fieldwork and analysis, in

which the use of a research journal and memos provides some help. Thus it is argued that this iteration stops at the point of "saturation", which has a built-in mandate to strive towards verification (Glaser and Strauss, 1967).

6.3.9 Limitation

Because of the small size of the banking industry in the Australian region, as mentioned before (see p.18), the strategy is to target as many qualified banks as possible with an emphasis on both local and overseas major banks with comparably more mature risk management system and experience. However, there are three issues arising from research process that restricts the number of participants the researcher can approach.

First, difficulties in accessing potential interviewees, such as lack of contact information and confidentiality or legal considerations from banks and supervisory authorities (see p. 240). Thus there could be an inherent restriction on the number of organizations or participants that researcher can approach on one hand, and that can extend the scheduled time for research data collection on the other hand, (research project will be more costly and time consuming for researcher).

Second, the individual participants are required to have a high level of experience in risk management related areas (in the case of banks), or banking supervision areas (in the case of supervisory authorities). Unfortunately, the fact is that not many individuals in the selected organization are qualified interviewees for this research. Normally eligible interviewees would consist of: senior analysts, managers and directors of the Basel II program within banks, or senior specialists or supervisors within supervisory authorities. Therefore to obtain participation consent from them or arrange suitable interview time with them are always difficult and thus require researcher to deal with more flexibly. Particularly, due to the confidentiality consideration of the interviewees from supervisory authorities, interviews with them are not allowed to be recorded. Only written notes can be taken during interviews, which increase the difficulty for the researcher to sort information accurately, however, the later member checking through sending sorted notes to them for assessment and checking ensures the accuracy of information.

The last area of limitation is related to the recent financial crisis. Because of the stress and pressure on financial institutions during and after the 2007-2008 financial crisis, some potential participants whom researcher has already built contact with, discussed about interview participation, even received participation consent from them before financial crisis occurred, have cancelled interviews or have elected not to respond to the researcher. In these cases, the researcher understands their position, and fully respects their decision not to participate.

6.4 Conclusion

This chapter has discussed the philosophical foundations for the research, and the research design including empirical data collection (semi-structured interview) and Qualitative Data Analysis (QDA) process including Habermasian Discourse analysis and coding strategy.

The philosophy of Habermas' Universal Pragmatics of intersubjective communication provides the thesis the critical methodology based on communicative and emancipatory interest on one hand, which could contribute to investigative the tendencies of communicative distortion arising from Basel II-related risk management and supervisory practices as interpreted in the following two chapters (Chapter Seven, and Eight). On another hand, his more theoretical perspective that both the economic and the bureaucratic-administrative subsystems have contaminated the lifeworld through forms of purposive-rational action that are aimed at meeting the imperatives of system-maintenance, in contrast to the more technocratic, procedural and autocratic aspects of government regulation and prudential control, allows the researcher to stand at a critical position to evaluate the effectiveness of Basel II implementation in Australia for prudential control purposes. Chapters Seven and Eight of this thesis highlight the debates taking place between regulators and banking practitioners and reveal the trajectory of the conflicts in terms of their distinct interests, that the banks are driven by profit mechanisms and strategic interests while the regulators' have a set of bureaucratic interests aimed at maintaining financial stability, which might have an impact on the effectiveness of Basel II implementation.

Furthermore, the discussion of research methods including a detailed interview strategy (sampling, rationale of interview questionnaire and its updating) and

Qualitative Data Analysis process (Habermasian Discourse analysis and detailed coding strategy), provides readers a picture of how these empirical works have been done and also help readers to understand the analytic result interpreted in chapters Seven and Eight.

Chapter Seven

Research Interview Analysis and Findings

7.1 Introduction

Thus far this research has assessed the efficacy of Basel II in terms of its claims to be an example of 'smart' regulation in regard to its technical attributes. Now we come to the significant and distinctive contribution of this thesis – namely the qualitative research which allows us to hear the 'voices' of practitioners from the banking industry and from supervisory regulators. This chapter is the first of two chapters that explore the presumed superiority of Basel II over Basel I, and assess the effectiveness of Basel II in empirical risk management and prudential supervision practices, as reflected in a series of interviews undertaken with bank risk managers, senior analysts, and supervisors from regulatory authorities in Australia. These chapters represent the unique contribution of this thesis to the research literature, as these experts and professionals are charged with the implementation of Basel II and are well situated to identify both its strengths and its weaknesses. In addition to providing an insider's insight into the operation of the system, the interviews also permit an investigation of the degree of congruency in the approach and views of bank practitioners on one hand, and regulators on the other. In terms of Habermasian methodology, this will permit an understanding of whatever tendencies may be at play distorting communicative practices in risk management and supervision.

The first section of this chapter is split into two segments. Section 7.2.1 focuses on the issue of the superiority of Basel II relative to Basel I. Interviewees offer their appraisals of Basel II in terms of its purported broader risk categorization, strengthened underlying risk methodology, and better performance in stressed market conditions. Section 7.2.2 then seeks to evaluate the operational effectiveness of Basel II itself. Thus interviewees comment on the effectiveness of underlying risk methodologies; the practicability of Basel II; the organizational impact on banks and supervisions; and, the risk culture built into Basel II implementation. Section 7.3 will summarize conclusions.

Chapter Eight will focus on the issues and problems arising from Basel II implementation.

7.2 Research Findings

Based on the analysis of the in-depth semi-structured research interviews undertaken with the interviewees outlined in Chapter Six (see table 5.1 for an overview of interview structure and participating organizations), the research findings are categorized into three streams: two of the streams are the subject of this chapter (the evaluation of the purported superiority and effectiveness of Basel II); while the last stream is analysed in the following chapter (issues and problems arising from the Basel II implementation).

7.2.1 Views on the Inadequacies of Basel I

The design of Basel II "seek(s) to *improve* on the existing rules by aligning regulatory capital requirements *more closely* to the underlying risks that banks face. In addition, the Basel II framework is intended to promote *a more forward-looking* approach to capital supervision; one that encourages banks to identify the risks they may face, today and in the future, and to develop or improve their ability to manage those risks. As a result, it is intended to be *more flexible* and *better able to evolve with advances in markets and risk management practices.*" (BIS, n.d.).

This brief description of Basel II, from the BIS website, reveals the core intention of Basel II's design. In particular, the italicized words highlight the crucial importance of *sensitivity*, which in detail can be argued to be reflected by: a broader categorization of risk; an underlying stronger methodological design; an improved ability to respond to the economic environment; and a correction of the weakness of the previous Basel Accord. Therefore, this section will analyse the comments garnered from the interviewees to evaluate the extent to which each of these attributes of sensitivity under Basel II are actually achieved in operational terms.

7.2.1.1 Simplified Risk Categories under Basel I

As discussed in Chapter Three, Basel I, even with the 1996 Amendment, was widely acknowledged to be flawed, particularly after certain weaknesses were exposed by the

sub-prime crisis. In particular, its simplified risk categories and consequent lack of risk-sensitivity, is alleged to have produced a distorted risk assessment that has resulted in a misallocation of capital.

Most of the interviewees criticize Basel I over its simplified risk categories in a straight forward way, by using words such as 'blunt', for instance:

> Basel I was …, as a requirement … a *blunt* measure at the time it was introduced. It was apparently a blunt instrument, (and) it was all credit risk. There was nothing else at all. (Interview No.12)

When interviewees portray the stance of Basel I, they use such phrases as 'one-size fits all' and a 'proscription approach' to describe the features which are regarded as the most obvious drawback of Basel I:

> This kind of very rules-based *proscription approach* you would have to do … under Basel I was a kind of *one size fits all*, across the broad, almost back at ledger change if you like… (Interview No.7)

> Basel I is typically a *one-size fits* all framework, and poor at *risk quantifying*, so it is obviously *less-risk sensitive* compared to Basel II. (Interview No. 4)

> Basel I was in particular, is *one-size fits all*, simplistic, probably irrelevant[345]… (Interview No. 14)

The above comments directly produce the conclusion that, from those practitioners' perspectives, Basel I was obviously inadequate for risk assessment purposes, and unavoidably insensitive to risk. Furthermore, its inability to adapt to a volatile market environment and to the increasingly complex internal systems of banks due to the growth of financial innovations is criticized by interviewees. Basel I approaches were seen as 'outdated' in contrast to the development of quantitative risk management techniques:

[345] Here the Interviewee uses the word "irrelevant" in a broad way. It means Basel I's framework is not well aligned with the internal system of the banks, and it also indicates the lack of ability to adapt to the broad market environment.

> Basel I was never going to last long against the volatility of the product environment, the sophistication of the market generally. I think, you know, 20 years ago, Basel I (was) fine from a mathematical formula point of view, but now…. (Interview No. 6).

One of the interviewees—a credit risk expert in the banking sector—commented that the over-simplified risk category of Basel I failed to capture the correlations among credit risks. As a consequence, the outputs from risk estimates were criticized as being distant from the banks' real risk profiles, thus implying a distortion in risk assessment:

> It (Basel I), certainly from my credit risk perspective, was not focused on true credit risk. It was an across the board approach to the risk weighting of certain types of assets, that didn't really have any correlation on default risk or loss risk, for credit risk. It doesn't make sense to continue under the old Basel I which had a flat structure for similar types of lending irrespective of things like LVRs[346] or risks specific to each transaction (Interview No. 11)

As the successor to Basel I and the 1996 Amendment, the first question that will be posed regarding Basel II is: whether this new Basel accord responds to the above recognised flaws of Basel I? The following two sections will draw on interviewees' points of view to provide the answer.

7.2.1.2 Broader Risk Categories under Basel II

As outlined in Chapter Three, Basel II's framework is structured around three "inter-locked" (Interview No.8) pillars—*Minimum Capital Requirements*; *Supervisory Review Process*; and *Market Discipline*. Under the first pillar, operational risk has officially been brought into the regulatory risk category for the first time together with credit risk and market risk, which had themselves been recognised previously under Basel I and the 1996 Amendment. At the same time, some other particular risk types are also embraced under Basel II, and are now included in Pillar Two—the supervisory review process. It is this richer risk categorization, together with the

[346] LVR means Loan to Value Ratio. It is an amount lent in relation to the value of a property.

underlying risk methodology, that is now deemed to be more effective given the activist embrace of the VaR approach and deployment of internal models:

> Basel II is absolutely more sensitive in contrast to Basel I, it covers the risks between various exposures which fall in different risk categories, between counterparties. (Interview No. 3)

> Whereas now under Basel II, the specific risk for each transaction is incorporated into an end capital number, it makes a lot more sense (compared to Basel I). (Interview No.11)

Alongside this positive evaluation of the increased sensitivity of Basel II, interviewees also mention the adoption of internal models, which, as shown later, are used by bank risk managers as the main benchmark against which to assess the sensitivity of Basel II:

> Basel II is much more risk sensitive, which we can see, (as) it better quantifies risks and the risk category is broader. It did take into account the individual institutions by allowing them to use their *internal models* in a *broad way*. (Interview No.4)

Similarly Interviewee No. 7, who previously described Basel I as a "very rules based proscription approach", affirms the efforts that the designers of Basel II made to address Basel I's flaws and enhance sensitivity in risk management practices:

> …but now its pretty much expected (under Basel II), in response to whatever the latest data tells you, that banks can review their real models and incorporate that. (Interview No.7)

7.2.1.3 Stronger Underlying Methodology under Basel II

Not surprisingly, almost all the interviewees, whether from the banking sector or regulatory authorities, comment on the IRB based risk methodology fairly positively. Based on their own strategic interest and risk management purpose, banks keep investing in their in-house experts and internal systems, and they firmly believe that those internal systems and models with up-to-date information are much more sensitive to the real risk profile of the banks. In that sense, incorporating the banks'

internal models[347] into the regulatory modelling approach is regarded, especially by bank risk managers, as not only generating more reasonable numbers for the regulatory capital they are required to hold, but also incorporating more sensitive components into the prudential control process, in contrast to the situation under Basel I. The following comment represents such opinions:

> Yeah I think it's extremely positive on that front, the previous methodology[348] didn't reflect the risk banks undertake. So I think the market expects a regulator to have knowledge of the different risks different banks undertake - they didn't really see that under Basel I. So as a consequence a lot of things that drove the sub-prime and things like lending to some structured vehicle in the middle of nowhere, versus a reputable corporate or bank, happened… (Interview No. 1)

To summarize, the above comment reveals the opinions of bank risk managers that the regulators' knowledge of banks' risk profiles can be enhanced through adopting the IRB approach which is regarded as more sensitively reflecting the underlying risks in various banks with different business structures. Furthermore, they suggest that the distorted risk assessment that contributed to the recent financial crisis, was related to the lack of sensitive internal modelling for the purposes of calculating regulatory capital requirements under Basel I. This view, however, may well reflect a degree of over confidence in the ability of their internal modeling to predict and avert such crises in the future.

According to No. 2 interviewee, the IRB-based methodology of Basel II, which contributes to proper risk assessment and sensitive regulatory capital allocation, has potential to help regulators establish a "fairer" set of rules for the "game": while conservative banks gain rewards in the form of capital reduction, the "cowboys"—those who 'previously focused on riskier clients'—are now penalized.

[347] According to Basel II rules, the banks using internal models are permitted to adopt for regulatory capital calculation purposes only those that are explicitly authorised by regulatory authorities, which imply that not all internal models of banks have been authorised for this purpose. There is on-going negotiation between banks and regulatory authorities, as to the extent of authorisation that is appropriate.

[348] "Previous methodology" here means the methodology adopted by Basel I framework.

> I think the underlying methodology of Basel II is very strong, much stronger than Basel I, in terms of appropriately identifying risks in the business side…competitors had *previously been more focused on riskier clients*…(but) used to *hold similar levels of reserve and shareholder funds as we did*...now we (are) seeing *a steep change* in that...we start seeing a benefit for us...(There is a) steering toward more high grade corporate counter party and larger multinational organisation which is sort of our requirement. In comparison to some of our more aggressive investment banking peers, we see a reduction in the level of capital holding. There was a 7% reduction in the capital we had to hold. (Interview No. 2)

This potentially reflects the "responsive regulation" philosophy of Ayres and Braithwaite's (as reflected in their 'Regulatory Pyramid Model' as discussed in Chapter Four, p.149). This example also explains why banks are such activist advocators of the IRB approach. The underlying capital reduction that could benefit banks' capital management is a major incentive and exposes banks' strategic interest as motivator of their opinions and also decision-making.

As directly revealed in the comments made by the following interviewees, the IRB-based methodology brings the output of the banks' internal capital adequacy assessment process (ICAAP) closer to the real risk profile banks possess:

> Now I think that what we are seeing in the market place, right now, is a sort (of) a testament to (the) fact that Basel II is something very similar to what we really are. (Interview No.6)

> But now that's pretty much expected, in response to whatever the latest data tell you, that banks can review their real models and incorporate that. (Interview No.7)

Other than bank practitioners, an experienced supervisor from the regulatory authorities suggests that one of the criteria of sound regulation is to comply with the changes arising from the industry. This ability to respond to the dynamics of the regulated industry can be viewed as a "reflexivity" attribute of the Basel II regulatory framework. In the following comment, the interviewee affirms the efforts made by the

designers of Basel II to better adapt to the consequences of changes in banking industry practice:

> The innovation in the banking industry always go(es) ahead, the policies should come up after that. For the banks, they are also working on improving risk management always, especially for banks with diversified business lines; their internal risk management system and the models are complex. This is just the issue that (explains why) policies are getting more risk sensitive and better quantified to adapt to the needs or changes of industry. (Interview No.5)

Although the above comment did not mention the IRB approach directly, as bank risk managers had, it clearly conveys the impression that prudential control practices under the Basel II framework are 'getting more risk sensitive…' and are thus able to benefit from the increased sophistication of banks' internal modelling systems.

Another interviewee, who acts as a regulatory supervisor, indicated that "Basel II brings more focus about the capital definition" (Interview No. 3), which could also contribute to building a sound methodology basis for regulatory risk assessment purposes.

In general, Basel II attracts more positive comments, as with the following, which highlights Basel II's relative superiority over Basel I, in regard to the objective of protecting deposit holders in the banking system:

> Basel II is definitely an improvement on Basel I. I think most of the banks will agree with that. (It is) the process of allocating regulatory capital, which is, I guess, at the end of the day designed to protect deposit holders of the banks. (Interview No. 11)

Basel I was widely criticized both by bank practitioners and regulatory supervisors, for its failure to prevent the financial crisis from happening, and for its poor performance in stressed market conditions, as discussed in the subsequent section.

7.2.1.4 Performance of Basel I and Basel II in a Stressed Economic Environment

The occurrence of the 2007-2008 financial crisis, weakened investors' confidence in the market and raised questions about both risk management within financial institutions and the effectiveness of scrutiny by relevant regulatory agencies. As discussed in Chapter Three, securitisation serves a risk dispersion purpose, which is clearly an innovative function when compared to more traditional financial products. However while it benefits those financial institutions that are pursuing profit-making opportunities, securitisation introduces challenges for the 'one size fits all' approach of Basel I. The following interviewee reveals the inadequacies of Basel I in dealing with off-balance sheet financial products such as securitized assets:

> I agree with the regulator in … that Basel I was rendered obsolete as soon as people started securitizing, it is not a set of standards that makes meaningful sense when credit risk becomes something that you can buy and sell. (Interview No. 9)

The recent crisis also raises the issue of whether the new Basel Accord (Basel II) is better able to deal with more volatile market conditions. The problems with external ratings agencies were clearly exposed by the sub-prime crisis (refer to discussion in section 3.3.3.5.2, p.123, Chapter Three). The subsequent downgrade action undertaken by these same external rating agencies contributed to the downturn in the market and triggered widespread criticism of the lack of reliability of the risk assessment process.

Under the Basel II framework, the banks with comparatively mature and developed internal systems are officially allowed to adopt an internal-ratings based (IRB) approach. This risk approach offers banks an alternative way to efficiently allocate their capital for profit-driven business purposes, while satisfying the regulatory requirement to hold sufficient capital as a buffer against the risks that banks own. This approach puts considerable weight on the likely performance of the IRB approach as a mechanism that renders Basel II more sensitive to actual constellations of risk. The comments from interviewees in regard to the IRB approach can be split into two main groups: positive and negative.

A representative comment from those who express positive opinions about IRB suggests that it is better able to adapt to "material changes" in the market, in ways that are more sensitive to conditions within stressed markets (italics used to highlight relevant comments):

> I think in the down turn for a credit risk portfolio, the combination of having banks' own risk estimates in place, as well as (external ratings)… within Basel (is important). So it is not just the theoretical reaching of the credit risk exposure, you actually (have) got to show that, if there is a material change in the credit risk you reached; if you need to downgrade it; versus the appropriate credit approvals… all that sort of stuff. So it *makes … the theoretical requirements more practical*, and I think when in a down turn, yes it is better compared to Basel 1, that you can have capital reliant on credit risk estimates. (Interview No.11)

However, policy-makers face different priorities to banks. The regulatory focus centers on the need to maintain financial stability and to moderate the growth of financial markets. As we have seen, the reliability of external ratings has been questioned after the recent financial crisis, yet these external ratings[349] are necessary for less sophisticated banks and, as such, will continue to play an essential role in risk assessment and regulation under Basel II.

Ethical principles of prudential control require external rating agencies to be "independent" from both regulators and industry customers. But as indicated in Chapter Three, their "profit-driven" nature has been exposed by the financial crisis and, accordingly, their reliability has been called into question by both academics and banking practitioners. In this regard, one of the bank risk managers questions this reliance on external ratings, commenting, in particular, on its consequences for the adequacy of capital provisions (also see the discussion about external ratings in Chapter Three, and subsequent discussion about external ratings in Chapter Eight, section 8.4):

[349] In Chapter Eight, section 8.3, other reasons why external ratings will remain active in the Basel-based regulatory framework particularly for less advanced banks, are revealed by interviewees. For instance, the comparably lower cost, ability of external rating agencies to reach certain areas which smaller financial institution are unable to achieve etc.

> I think what falls down a little bit is the reliance on external ratings, and I think that we've seen external rating agencies potentially being slow to recognise credit risk's future direction. At (the bank's name) we've always had very limited reliance on external rating agencies. Certainly they factor into our internal rating, but they are just one actor. (Interview No.11)

Yet another interviewee, who works with an investment bank, pointed out that there was a difference between the anticipated performance of Basel II and its actual performance in volatile post-crisis circumstances:

> Under Basel II, it is more risk sensitive. It *should* have handled the sub-prime crisis better, but *in fact* it probably didn't, because it (is) fairly reliant on (well at least on the securitisation part of things, which is where the sub-prime losses come from, through mortgage backed securities, sub-prime backed securities) … external ratings, and they have been proven to be flawed, so in that sense, it hasn't done much at all. (Interview No.10)

From the regulators' perspective, one interviewee clearly indicated Basel II is incapable of adapting to a stressed market environment, although he didn't clarify the exact reasons:

> In contrast to Basel I, it's definitely more positive. But I won't say Basel II will very much adapt to current situation[350] (that's why BIS is working on some issues exposed by the crisis). Basel II has potential or big potential to assist the market correction in terms of its ability to better capture risks, from my point of view as supervisor. (Interview No.5)

To sum up, even amongst those who were positive in their assessment of Basel II, primarily because the adoption of the IRB approach has the potential to improve the performance of Basel II in volatile periods due to its heightened 'sensitivity' to risk, concerns were still expressed about the problems that emerged in the aftermath of the

[350] This interview was undertaken shortly after the occurrence of the sub-prime crisis, so the "current situation" means the stressed market situation.

global financial crisis. Most of the blame for these problems has been sheeted home to the unreliability of external ratings.

In the main, those interviewees who were more negative about Basel II, considered it to be merely "another extension" of Basel I in the sense that it allowed risk management practices to be more closely aligned with the banks' own profit-driven strategic interests and commercial purposes rather than with the satisfaction of regulatory requirements. In that sense, the resulting policy adjustments had a limited influence over the way that banks managed their risks in regard to their own strategic purposes:

> Basel II is another *extension* of trying to make the regulation (do) what the bank would do … as a commercial process as well. (Interview No.11)

Similarly, by defining Basel II as "a refinement" of Basel I, another interviewee argues that the development of internal systems within banks and rapid financial innovation has rendered the methodological basis of Basel II obsolete, despite its alleged superiority:

> Now banks had more time, got more sophisticated, and Basel II is just a refinement. It's not much of an improvement on credit risk side, but once again it still got to re-value a lot of products (new products). (Interview No. 12)

> Well obviously Basel II is much better, it is much grander. It just happened to be better than what we had prior[351] to it. (Interview No. 12)

In general, interview comments show that the superiority of Basel II relative to Basel I is undeniable, but its comparative performance in stressed market conditions is questionable due to the reliance on external ratings, even if the adoption of the IRB approach has the potential to improve its performance.

[351] 'What we had prior to it" here means the previous Basel I Accord.

7.2.1.5 Capital Relief and Information Disclosure as Two Ways to Correct the Distortion under Basel I

Apart from the *one size fits all framework*, and over-simplified risk categorization, Basel I is accused of introducing distortions to the financial market. First, the argument focuses on the lack of transparency under Basel I, particularly for certain new financial instruments, i.e. securitized assets, which are said to provide new opportunities for regulatory arbitrage (refer to the discussion on structured finance products in Chapter Three). In this regard, the information disclosure rules under Pillar Three of the Basel II Accord are cited as a means for reducing the occurrence of regulatory arbitrage:

> Well the big part of Basel II was it is responding to arbitrage of simple rules (Basel I). Those rules are simple, and they overestimate the required capital for mortgage books by a lot. So it was a tremendous incentive to get rid of your mortgages. But there will always be (arbitrage opportunities) in any regulation, Basel II is no different. Just as it will take banks a little while to work out where all of those places are, it will take regulators a little while to work out where all of those places are. The big, big, big difference is that any bank that elects to go down that route will be required to disclose this activity through Pillar Three. Let's imagine some kind of arbitrage available under Basel rules, so banks all around the world decide they are going to sell one segment out of their business, the same way securitisation used to do for home loans. Well the next reporting period they are going to see that, and they (regulator) are going to say to banks "Hang on!",, that will change the nature of the conversation[352]. (Interview No. 9)

Seemingly, information disclosure, in conjunction with other regulatory components—supervision and regulatory capital-holdings—offsets much of the distortion arising in financial markets under the previous Basel Accord.

[352] In this regard, the researcher feels the interviewee has indicated that regulators will take action to stop arbitrage once they detect warning signal in the banks' reports.

Second, risk managers who work with more sophisticated multinational banks, complain that their banks had been disadvantaged under Basel I due to the requirement for comparatively higher regulatory capital-holdings given their mature internal systems and business structures. Therefore, they were looking forward to subsequent adjustments being made to their regulatory capital-holdings in the form of capital relief[353]:

> We absolutely think that (there is capital relief), because we thought there was a *distortion* in the Basel I rules. Now there are two ways of responding to that distortion. One of them is you can sell your mortgage business, which is what the Americans did - invented a securitisation market. The Australian banks by and large have not sold their mortgage business, but were receiving a higher regulatory capita charge than any of their internal models justified. Did we all believe that meant that the minimum required to be held for regulatory capital was only for Basel credit? Yes, absolutely we all did. Did that in fact happen? Yes, absolutely it did. (Interview No. 8)

Accordingly, this interviewee further clarifies how regulatory capital reduction could correct the distortion under Basel I in a *plausible manner* and that the potentially reduced regulatory "burden" could leave more discretionary capital available—described as a form of 'flexibility—that banks could exploit for profit-making purposes. At the same time, he insists that banks will always hold sufficient capital against risks based on their own risk management consideration[354]:

> It didn't really mean that banks will now look to reduce the capital they will automatically hold against risks. It just meant that you would have additional *flexibility* to manage as the sort of external circumstances

[353] A bank risk expert argues that banks see capital relief as a "reward" for being conservative in risk-taking activities: "that obviously makes sense, but again depending on which bank and what their own internal policies are, and what they put into the models, which determines what comes out. From our perspective, we would be along the conservative side of things, so we would expect some benefit from IRB's approach." (Interview No.14)

[354] The conflict or distinct interest between regulators and bank practitioners has been revealed throughout the discussions mainly related to IRB approach, capital relief etc. Section 1.4 in next chapter discusses this issue thoroughly.

> changed. So (there is a) need to *separate Basel from risk management*[355]. (Interview No. 8)

It is clear that bank risk managers draw a boundary between the functions of the Basel regulatory framework and their own risk management obligations: while the Basel Accord serves the regulatory purpose of maintaining the stability and safety of the entire financial market and economy; at the banking industry level, risk management is a strategic interest-oriented action, which is aimed at meeting the system-maintenance imperatives of the banking corporations. In this regard, they suggest that their own strategic interest and risk management objectives are the main source of the rules that they follow, although regulatory capital-holdings under the Basel Accord are also a concern:

> Banks are going to reduce capital? No, not right now, maybe not ever, there are a whole lot of other factors that (come into) play in the final step that have appropriately very little to do with how it (the bank) regulates. (Interview 8)

The same interviewee highlighted the importance of the relationship between regulatory capital reduction and the new 'flexibility" delivered to banks:

> Basel changes the minimum (regulatory capital) for Australian banks, *tick*; Basel provides flexibility in the capital management, because it reduces the minimum, *tick*. (Interview No. 8)

In particular, this explains why many banks hold capital above the minimum regulatory level required:

> Even with capital reduction from Basel, banks still will hold more capital against risks, because of other factors in their risk management consideration. (Interview No.9)

Once again, it would seem that the main source of these reductions in regulatory capital-holding is the adoption of the IRB approach[356]:

[355] This means banks normally hold more capital than Basel required in terms of their own risk management consideration.

> If you are under the IRB approach, you are more likely to use less capital than if you are under the standardised (approach). (Interview No. 15)

In turn, this is also the main reason why Pillar One is widely regarded as the Pillar that generates most benefits for the banks under Basel II. This aspect of the new Accord will be explored in further detail in section 7.2.2.3. In particular, many bank practitioners have argued that national regulators failed to translate this key objective of Basel II—delivering 'flexibility'—into their supervisory negotiations. Almost all banking interviewees complained about the difference between their expectations about forthcoming capital relief in accordance with the new Basel II rules and the exact numbers imposed by the national supervisors. This matter will also be discussed in more detail in the next chapter.

7.2.2 Assessment of the Effectiveness of Basel II in Empirical Risk Management and Prudential Supervision Practices

In addressing the effectiveness of Basel II from an empirical perspective, practitioners with responsibility for risk management and regulatory supervision, must adopt workable empirical benchmarks that apply to real financial cases. Therefore, the following sub-sections evaluate the effectiveness of Basel II on the basis of such benchmarks, which in turn have been derived from the information provided by interviewees. These benchmarks are respectively classified as: *effectiveness of* the *underlying methodology*; the *practicality of Basel II; the organizational impact on banks and regulatory authorities; and the building of a risk culture*.

7.2.2.1 The Effectiveness of the Underlying Methodology

In the first section of this Chapter, most interviewees affirmed the superiority of the underlying methodology of Basel II, when compared with the previous Basel Accord. However, the interviewee responses drew a very general picture about the methodology of Basel II. To subject that methodology to more serious scrutiny,

[356] Consequently, some interviewees argue that the incentives for banks to advance their internal systems are based on cost-benefit evaluation, where the benefit in this sense is directly translated into capital reduction. Simultaneously, other interviewees, as discussed in section 7.2.2, claim accreditation from supervisors to use their own internal models is the motivation for them to update internal systems.

judgments should be made on the core risk modelling techniques, and any associated issues of relevance. Therefore, the following sub-sections specifically evaluate the effectiveness of the VaR risk approach and its supplementary risk modelling techniques—stress testing and backtesting—which are discussed by interviewees based on their experience of VaR-related risk estimation and reporting.

7.2.2.1.1 The Impact on Banks from Adopting IRB Approach

The Internal–Rating based (IRB) approach, based on VaR, which plays a vital role in Pillar One, is generally regarded as an improvement on the methodological approach of the old Basel Accord; for instance, one interviewee claims:

> It is certainly an improvement on what we had previously. (Interview No. 2)

Nevertheless, most of the commentators on IRB-based methodology in general can be divided into two groups: One group is broadly supportive while members of the other group hold reservations. Members of the former group argue that IRB provides the methodological basis for making the output of risk assessment more congruent with the real risk profile of banks, while affording incentive for the banks to update their internal systems as financial innovation arise:

> It is getting closer now. There will be a process for the economic capital (to develop). There will be some types of risks within the current risk categories (that) still need to be recognised and updated from time to time. Over time, it will be very close, but definitely not the same. Now is just kind of the beginning of the journey. Later maybe we need to talk about Basel III. (Interview No. 4)

Similar to the above comment from one of the regulatory supervisors, banking practitioners affirm that IRB brings risk assessment closer to the banks' actual risk profiles[357]:

[357] No.2 interviewee also mentions: "I think there will still be points of difference between different banks in terms that not all banks will get the same answer for the same corporate counter parties. But there is no perfect system."

> Yes definitely, very close, that's where all the modelling and things have been based on. As I said, a lot of this information we have been doing internally anyway. Perhaps not as frequently as we have to do it now[358], but it has been the basis of what we have done previously. (Interview No. 13)

And,

> IRB is a more sophisticated way of capturing risk, and I think it is probably a more accurate measure of risk - credit risk - because it looks beyond some of the initial exposed risk. It goes a bit deeper than the standardised (approach) would, so you would expect the IRB measure to be more closely aligned with the real risk than the standardised is. (Interview No. 14)

However, the following comment reveals a problematic issue. Statistically-based risk techniques, adopted widely by banks and other financial institutions for risk management purposes, cannot accommodate *time-varying uncertainty premia* (refer to relevant discussion in Chapters Two and Five). This creates an obvious obstacle for these risk techniques to overcome in their efforts to produce 'sensitive' risk estimates.

Apart from this aspect, which will be discussed in more detail below, another obstacle is associated with the difference in risk definition and assessment between regulators (who are often criticized as being too conservative) and the banks themselves, possibly reflecting the presence of some communicative distortion between them:

> I think probably (we'll) get closer to whatever optimal or true measures are, (although it is) *pretty hard to be able to get real*. One of the benefits of Basel II is this risk sensitivity…actually we have our own views what the true risk is, which APRA are not yet convinced about. That is, the regulatory authorities have looked at how close the

[358] This implies that regulatory enforcement forces banks to increase the frequency of risk assessment even if based on same internal system, which shows the impact on banks' daily risk assessment arising from Basel II implementation.

> regulatory value is and *they haven't come as far as we think* (they should)[359]. (Interview No. 7)

In addition to bringing risk measures closer to the banks' real risk profile, as described by some interviewees, the IRB approach potentially provides incentives for the banks to more comprehensively manage their own risks due to a better understanding of risk drivers and, importantly, to improve their internal systems.

As witnessed by one of the supervisors, during the early stage of preparation for IRB accreditation, the quality of their risk assessment for regulatory purposes had already been markedly improved:

> I can see the improvements from the documents they submitted for accreditation. (Interview No. 2)

The comment from another supervisor directly points out that the IRB approach broadly promotes concern for a "more comprehensive risk management" approach within the banking industry through the enhanced risk education of bank practitioners:

> From my opinion, I think IRB might be the factor that encourages banks to focus more on comprehensive risk management. Banks adopting IRB definitely have better understanding of their risk profiles, and accordingly, they will measure risks better and thus could better manage them based on in-house resources and processes. *I think better understanding is the main reason*. (Interview No.3)

However, my argument is that even though there is improvement in the quality of banks' risk assessment outcomes, as reflected by regulatory documents, and the adoption of the IRB approach, a notable difference between the perceptions of bank risk managers and their regulatory enforcers remains under the Basel Accords. Banks (especially the major banks) have their own ways of managing risks and risk philosophies. As we have seen, they measure and manage risks not only for regulatory purposes, but also in support of their business strategies. In that sense, the impetus for banks when adopting foundational IRB is to update their internal systems and, for

[359] In this response, the expression: "they haven't come as far as we think" implies that APRA as the regulatory authority, has not allowed the relevant bank to extend IRB modelling as far as they wanted, thus depriving them of some of the expected capital relief.

major banks, to better formalise their Internal Capital Adequacy Assessment Process (ICAAP) and reporting. Hence the references to "better understanding" and a "focus more on comprehensive risk management" from the above respondent could possibly be explained by the incentives provided to banks to continuously update their internal systems under the IRB approach. Moreover, discussed in the previous section, the responses of bank risk managers suggest that these system enhancing incentives are triggered by the potential capital reduction benefits, as reflected in the following response[360]:

> Yes, definitely, both major and smaller banks improved their internal systems significantly. The advanced ones may be improved much more than the smaller ones, as said, for the accreditation purpose. (Interview No. 4)

Apart from the capital benefit, yet another motivation for enhancing internal systems—as further pointed out by one of the supervisors—is the need to preserve IRB accreditation:

> There are definitely other incentives for banks to continue updating their internal system. First, accreditation is not forever, they need to continue updating to keep their accreditation at least. Except for this, using all of IRB models they developed is another factor of keeping them investing. (Interview No.3)

Similarly, for those standardised banks that do not yet have accreditation, the incentive to adopt IRB could reside in the potential capital benefit[361] from adopting a more advanced risk approach. As indicated by one bank manager, "possibly, for some

[360] This interviewee then pointed to the reason, namely, that: "…all these benefits (accrue) in terms of capital."

[361] A risk expert in the banking sector has highlighted the difference in capital "reward" arising from Basel II implementation: "I think the major four banks would be the most to benefit, just because they have the ability to apply advanced methods, (and) would see the industry reward in terms of reduction in capital levels. But I guess less sophisticated banks that apply standard available tools will probably see less benefit, especially given that the way that APRA has started to bring Basel II into practical application is fairly conservative in what risked weighted standard players have been allowed to use for certain products. Like a risk weighted vanilla home loan for example, to be capped at 35% for a standard bank, whereas, if putting that through our system for example, we might get 20%. The change in capital that can be held for one of the smaller bank versus the majors is fairly significant, which might benefit long term...might encourage less sophisticated banks to try to improve their risk management system to get themselves to be in a position to be able to use the advanced approach." (Interview No. 1)

of the standardised banks, it creates a motivation to want a transition to the more advanced approaches" (Interview No, 11)[362].

However, even if the potential "reward"—*capital reduction*—from adopting an advanced risk approach is tempting, the fact is, that there is also a cost associated with investing in system updating, particularly for less sophisticated banks or standardised banks. This cost is comparatively heavy and, as such, plays a key role in their decision-making; so that a full cost-benefit evaluation[363] must be undertaken of the whole process (section 8.3 of Chapter Eight further discusses this cost-benefit aspect of business decisions):

> Certainly for us, the regulatory capital number was not the prime motivator for us to be seeking more advanced approaches. The cost, particularly for the retail banks (is such that) I think, the smaller retail banks ... would assume that it is not worth the expense that a large Basel project would require to get them across the line. (Interview No. 11)

According to Basel II rules, banks with mortgage-based business structures are supposed to achieve bigger capital relief through adopting an advanced IRB approach, which implies that most of the Australian smaller banks possessing such a structure [364] have the possibility to obtain significant capital relief:

> From a Pillar One perspective, it depends on your product portfolio. So if you are a bank that holds a lot of residential mortgages, you are going to get the real capital benefit or capital saving, over those that sort of fall within the proven brackets, mortgage insurer etc. (Interview No. 14)

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[362]Similarly, No.1 interviewee also points out: "it might encourage less sophisticated banks to try to improve their risk management systems to get themselves into a position to be able to use the advanced approach."

[363] "So we are seeing benefits in terms of retail benefits, we see benefits for highly rated corporate exposures, which is a big component of what we do; we are seeing benefits in securitisation exposures, so these are all benefits, meaning lower capital." (Interview No. 13)

[364] As he explains: "start from an Australian banking point of view. If I was one of the other major banks, they would be thinking the sort of big benefit for them is quite a large reduction of capital for their retail banking portfolios, mortgages in particular. For the major banks, all the IRB banks in Australia would have very big capital relief because they are commercial banks, retail banks, trading banks. But from our point of view, that's not material, because mortgages are a minor component of what we do or used to do." (Interview No.11)

But actually because they are smaller banks, they are far from being qualified to adopt an advanced approach, even if the incentives to be derived from updating their systems are notable. In other words, the decision is entirely determined by the likely costs of achieving IRB accreditation. For them the overall incentives are not that credible.

Under the Basel II framework, as introduced in Chapter Three, a bank's IRB system is based on the VaR approach as the core method of risk assessment. After exploring the impact of adopting IRB on the banks themselves, this chapter's efforts at evaluation shift to an exploration of the effectiveness of the underlying risk methodology of Basel II, that is, to an evaluation of the effectiveness of the VaR approach.

7.2.2.1.2 The effectiveness of VaR Risk Approach

In Chapter Five the strengths and weaknesses of Value at Risk (VaR) as the core risk estimate approach, which has been actively promoted under the Basel II framework, were assessed in technical terms. The flaws described there included the lack sub-additivity and a failure to account for fat tails in the distribution of loss making events. The interviewees in this study work with the VaR technique on a daily basis and their views on this risk measurement approach afford similar perspectives.

As discussed in Chapter Five, fat tails are particularly irritating because VaR attempts to capture the behavior of the portfolio return in the left tail. In this situation, a model based on a normal distribution i.e. VaR, would clearly underestimate the proportion of outliers and, hence, the true value-at-risk. It comes as no surprise that both risk experts in the banking sector and regulators admit that the fat-tailed distribution issue is one of the distinct flaws of the VaR approach.

> Fat-tails is definitely one of the weaknesses of VaR as a risk measure from regulatory supervision point of view (Interview No. 3)

The interviewees, with a strong background in risk analysis in the banking sector also argue that the VaR approach based on the normal distribution assumption fails to capture tail risks. These comments coincide with the discussion in Chapter Five (pp.172-87) that multivariate normal distribution is known to poorly fit the skewed, fat-tailed properties of market, credit and operational risks:

> I would say VAR has many limitations, well publicized … not being able to account for the *fat tails*. Serves *normality*… (Interview No. 10)

This insufficiency is particularly evident when dealing with complex portfolios:

> From the quantitative aspect, it (VaR) is not adequate to measure complex portfolios; fat tails are *one* of the obvious weaknesses. (Interview No.4)

Furthermore, as noted by the following interviewee, these limitations of the VaR approach curtail its usefulness in empirical practice, specifically, that VaR is unable to accommodate uncertainty irrespective of whether it is being applied to historical data or through the use of the Monte Carlo simulation method:

> I think most probably (this would) be true in the market risk area. Yeah, because the credit risk loss distribution is you know (*we don't have well-behaved normal distribution based on historical data*), we got limited data. There's not a lot you can do with historically observed data, in particular to assign to individual loss events..., *it's hard to turn that actual loss data into simulation models*. (Interview No.6)

From an overall analysis of interview responses, it would appear that interviewees have not explicitly recognised problems associated with time-varying uncertainty premia, which all prevalent statistically-based risk-techniques ignore. To this extent, the often robust confidence elicited about the success of the banks' internal modelling may well be misplaced, in part reflecting, as shown by their comments, a bias towards 'instrumental' rather than 'communicative' forms of rationality.

After the occurrence of the recent financial crisis, BIS and various national supervisory authorities have honed in on the incremental default risk assessment[365] under the current Basel II framework, as it operates in volatile market circumstances (the BIS issued an adjustment document on incremental risks under the current Basel

[365] The decision to make adjustment on the basis of incremental risk assessment was taken in light of the recent credit market turmoil when a number of major banking organisations experienced large losses, most of which were sustained on their trading books. Most of those losses were not captured in the 99%/10-day VaR. However, since they did not arise from actual defaults but rather from credit migrations, combined with a widening of credit spreads and a loss of liquidity, applying an incremental risk charge covering default risk would not be adequate or appropriate.

II Accord[366]). This inability of VaR to capture incremental risks, particularly those attached to a trading book, was specifically discussed by one interviewee:

> Well one thing the Basel committee is trying to address is treatment of incremental default risk, and that's up to the banks in the world that currently want to build incremental default risk into VAR. That's never going to catch a VAR normal distribution like that. Finally sort of moving from having value to no value can't be caught by a normal distribution and that's something that banks around the world are now building into their VAR models - that additional risk. (Interview No. 10)

It would seem that another source of risk underestimation—*correlation*[367] has been neglected under the Basel II framework. As discussed in Chapter Five (p.181), correlations increase in periods of global turbulence, thus serving to undermine the diversification properties of a given portfolio. Accordingly, any VaR approach based on historical data fails to make forecasts that lie "outside the range" due to the presence of such correlations.

Another interviewee observed that the VaR approach, currently adopted by banks, evaluated by external rating agencies, and relied on by regulators, is inadequate when tit comes to dealing with the case of structured finance products such as CDOs. And here too, the problem of correlations arises:

> I think the problem with CDOs is that all the models you use, not just VAR, but (other) models, you know the models used by ratings

[366] The BIS issued a *guideline for computing capital for incremental risk in the trading book* in January 2009, which provides regulatory instruction, with more detail for banks to deal with incremental default risks in terms of the market exposure to the volatility. Then in July 2009, due to the occurrence of the recent financial crisis, BIS issued «Guidelines for computing capital for incremental risk in the trading book—final version», which contains several improvements to the capital regime for trading book positions. Among these revisions was a new requirement for banks that model specific risk, to measure and hold capital against default risk that is incremental to any default risk charge that was incorporated into the trading book capital regime in response to the increasing amount of exposure in banks' trading books to credit risk related and often illiquid products whose risk is not reflected in VaR.

[367] As discussed in Chapter Five, correlation among various risks can be minor under stable market conditions, but becomes significant during volatile periods. Secondly, as discussed, current prevalent risk techniques are flawed in regard to their ability to capture such correlation risk. Therefore, for less-sophisticated banks, given that correlation is not significantly visible in contrast to major risk types (i.e. credit risks, market risks) during normal market condition, risk managers decide not to take it seriously. There is also a technical difficulty for their less-advanced internal systems to measure correlation.

> agencies to determine required credit enhancements for ratings, they are all proven to be flawed, the correlation assumptions are not robust overtime. We see when markets move, under stress, correlations can increase dramatically. And I think that's one flaw within those models. I think VAR is just one type of model that probably doesn't capture the risks of CDOs all that well. (Interview No.14)

Banks are not compulsorily required to assess risk correlation in their ICAAP. Instead it is optional and the decisions about whether to include or exclude correlation estimates are made by risk managers when they make judgments about the level of their exposure. One interviewee frankly confessed that:

> We don't really do any correlation (assessment). (Interview No. 15)

Even those who admit to incorporating correlation estimates concede that such assessments are made on a case-by-case basis by the supervisors in response to the banks' ICAAP reports.

> They don't necessarily need to measure correlations in their ICAAP. If the correlation issue comes out and reaches a certain level, they will be required to put their assessment in the ICAAP. We will review and decide whether there is need to adjust the capital ratio and set … a higher PCR[368] to cover the correlation exposure[369]. (Interview No.4)

Although some of the major banks with more advanced internal systems, have recently begun to move into this area, post the financial crisis, respondents confess that that correlation assessment, for them, is a "relatively new science":

> That is one of the things we are looking to do at the moment, is trying to work out all of that, but, I guess APRA doesn't necessarily allow it under the current structure. But from an economic point of view, yes we

[368] PCR is prudential capital ratio, which is set by supervisors after they review the output of banks' ICAAP. PCR is a crucial part of the supervision process, and is usually adopted by supervisors for the purpose of adjusting the regulatory capital holding of the banks.

[369] Another similar comment from supervisors: "Depends on banks, for APRA, we will look at their ICAAP output. If they have correlation exposure, we will adjust…work out whether to ask them to hold capital for that. So we will definitely take into account the correlation by setting a proper PCR (Interview No.5).

> think it is allowed, but it is still a relatively new science I guess, so working out all those things is difficult. (Interview No.12)

For those major banks that routinely conduct correlation assessment it would seem that this advance often brings with it competitive advantages in risk management[370]:

> We have a team of quantitative analysts who conduct research into the behaviors of different markets for market risk, and we have a dynamic correlation model that we use. In the case of credit, like practically everyone else in the world, we started our credit correlation journey with the K&B portfolio manager model, and subsequently built our own estimates of correlation factors. We then extended last year to investigate more robustly the correlations between default probabilities and loss estimates, where we avail ourselves of the most up-to-date literature in the market. (Interview No. 8)

In general, however, correlation is regarded by both regulators and most bank practitioners, especially those from less sophisticated banks, as having only a minor impact on banks' risk profiles under normal market conditions. Further, there is a lack of clear guidance on the appropriate kind of correlation assessment that should be conducted either within Basel II rules or in guidelines provided by national supervisory authorities.

This optional nature of this procedure belies the danger associated with the so called 'peaceful volcano' of risk correlation as conceded by the following interviewee: (on this see p.181 in Chapter Five):

> If you write more different risk types in your (raw) market risk model, (then) the more you have to worry about changes in correlation. The more potential surprise you could get. (Interview No.7)

Overall, there is no interviewee support for the proposition that VaR is a sufficient risk assessment approach, particularly for complex financial products. As already

[370] Advances in the risk management literature can contribute to the building or development of a risk culture within a bank. As discussed in section 7.2.2.4, from the qualitative perspective, a culture of this kind can play a significant role in improving techniques of risk management while enhancing competitive advantage.

noted by interviewee No. 14 (p.18), all models can be "proven to be flawed". In response to the question: Is the VaR approach sufficient for capturing risks, particularly for complex products such as CDOs?, one interviewee responded abruptly:

> Our answer for that would probably be no. (Interview No. 11)

Nevertheless, as another interviewee observed, this risk approach will still play a dominant role on the stage of risk management and supervision under the Basel II framework, due to its wide acceptance by the banking industry, and particularly because it is currently favoured by regulators:

> Yes, well it is a well accepted and tried measure. Again I don't think honestly if there is something better, I don't see it disappearing overnight. It is going to be continued to be used, VaR as a measure. (Interview No. 14)

As discussed at the beginning of Chapter Five, in contrast to other previously prevalent risk measures, such as deviation or variance measures focusing on the relative magnitude of risks, VaR based on the examination of percentiles of the distribution does possess superior features. This is echoed in the following observations from regulators as to why VaR is adopted as the major risk approach under Basel II:

> VaR is one of the sound risk measure approaches, but definitely not sufficient, the truth is you cannot have the perfect statistic tool. (Interview No.3)

> I don't think there is any other better measure than that, and it's been used by banks for many years. (Interview 4)

Practitioners attempt to circumvent the problems associated with the adoption of the flawed VaR approach by coupling it with complementary risk approaches so that they do not have to rely just on "one number":

> It very much depends on what you use it for. So if you are after one number that you can use to compare the risks of different books in different ways, then it is better than many others. But risk management

> is never about *one number*, so if all you are doing is looking at VaR, then you are doing it wrong. (Interview No. 8)

One interviewee responded to this issue by asking a rhetorical question:

> Does it (VaR) give me *a complete picture* of the risks this company faces? Not at all… (Interview No. 9)

For this reason, many practitioners resort to stress testing as a complementary approach: "I think probably the 'why question' has more to do with *stress testing*…" (Interview No. 7)[371]. Other risk approaches such as EVT[372] and FTV[373] (see the detailed technical discussion of these approaches in Chapter Five) are also regarded by practitioners as essential supplements to the VaR approach:

> There are some approaches (that) might (act as a) supplement to a certain level, like EVT or FTV. But as statistic approaches, they cannot be perfect. VaR is a good tool working on simple portfolios, but for complex portfolios, it seems not so sufficient. From supervision perspectives, (that is) when we look at the assessment of complex portfolio like CDOs. (Interview No. 4)

7.2.2.1.3 Stress Test

One of the seven conditions that banks must satisfy when using internal models is that stress testing should be embraced as the key complementary risk assessment approach to that of VaR:

> Not only regulatory bodies (but in the) accounting (field) related sensitivity analysis is adopting stress testing. And stress testing has different disclosure in both corporates and banks which will provide investment communities with a *better* understanding of where the company may go... (Interview No. 2)

[371] In his comment, this interviewee first concludes that VaR is insufficient for risk management purposes. Then he comments "why question doing more with stress testing?" which highlights the need to adopt stress test as a complement to the VaR approach. A subsequent comment confirms the importance of stress testing in banks' risk management practices: "If I wrap it with some stress testing, then I can get a better picture and I am better able to manage the risks". (Interview No. 9)
[372] EVT is Extreme Value Theory.
[373] FTV is the Fat-tailed Value-at-Risk Approach.

As discussed in Chapter Five (section 5.2.3), stress tests offer users information about the risks associated with rare or extreme events that VaR ignores. According to one of the risk managers, such information is useful to assist bank boards with their business strategic decisions:

> I think from a commercial perspective, stress testing is very useful. That's for us, internally as a bank, to make sure that in worst case scenarios we have enough capital. It is also very interesting for our board to know that as well. So that's very important. (Interview No. 11)

In regard to overcoming the drawbacks of VaR as described above (i.e. correlation risk), some practitioners emphasize the contribution that stress tests can make:

> They do stress tests on top of this kind of their best test of the VaR. An instrument like that is fairly sensitive to correlations to default (Interview No.7)

> There are various good approaches to assess correlations. (It) depends on the bank's internal system and model structure. Basically, running some statistical methods, but should be supplemented by stress test… (Interview No. 4)

In particular, scenario-based stress testing could assist banks to make adjustments to their internal systems by comparing the test outputs with future ICAAP results. In this regard, one bank risk expert highlighted the importance of setting a proper scenario pool. The challenge, from his perspective, was to define the scenario realistically:

> Fundamentally, stress tests are good if they are done in a reasonable manner, and I think to do a macro test … was pretty good practice. So 2 years later when we got our ICAAP process together (that had a macro test in as well), it allowed us to design one (that) sort of fitted (the system better)...and that will be realistic for us. (Interview No. 7)

The setting of a proper scenario pool is not a one-off task: it requires constant updating and refinement of scenarios so that stress testing can adapt to dynamic market conditions:

> I think definitely (we need to refine scenarios for stress testing). I think once something stops being theoretical and has actually happened; I think that's the most important input into a stress testing model. (Interview No. 11)

> Yeah, certainly that's what we do (refine scenarios) from a commercial perspective. And I think that most banks would do that as well, because otherwise it is just all theoretical, and it might be you don't really know whether it is a worst case scenario unless you have got the most up to date data. (Interview No. 15)

Both regulatory supervisors and bank risk experts admit there is a dilemma confronting those involved in setting general scenarios, for instance:

> Stress testing is a good approach used for regulatory purposes to set the prudential capital ratio, but there is a difficulty to set appropriate scenarios, which is well known even for bank users. (Interview No.5)

In particular, the scenario pool must be adjusted during "sensitive periods" to produce an accurate benchmark for worst case scenarios, both to guide decision making and the design of future business strategies.

Nevertheless, this is also an area where conflict arises between regulators and bank risk managers, which may reflect distortion of communication between these two groups. Due to their distinct bureaucratic interests - regulators tend to focus on the objective of maintaining financial stability while banks tend to focus on their business strategic interest – this comes to the fore in relation to regulators' "downturn considerations" and the banks' strategic "sensitivity" to volatile conditions. From the following comment, we see that banks closely adhere to such principles of "*sensitive forecasting*":

> If you exclusively got a scenario where you're linking economic variables to loss in a (certain) way, it might be a little bit tricky there for (some) kind of a really extreme event that you might calculate capital on…(as a bank, we prefer) to turn our stress testing model into a kind of *sensitive* forecasting. (Interview No. 7)

In terms of the philosophy of choosing scenarios, certain voices from the banking industry side would prefer to exercise their own discretion rather than have downturn considerations imposed by regulators:

> In some senses, the scenarios you get from regulators can sometimes be a bit odd as well. As banks, we should have the best view of what scenarios are relevant for us as well. It is hard as a regulator, in a sense, to think of a stress test which isn't going to necessarily give you stressed outcomes, because they are not necessarily across all of our divisional models, certainly P&L[374] effects. So (it's) tricky for them to come up with... sensible stress tests for a particular bank... (It's) one size fits all stress test.... (Interview No. 8)

> You know banks have been a little resistant to some of the (regular) risks. I think APRA probably says more now (during the crisis) in light of the idea of stress testing, on top of other conservatism. (Interview No. 6)

> They have those sorts of stress tests for the market and commodity, so I wouldn't be surprised if they had very conservative stresses for credit spreads for a long time as well. If they didn't have them before, they would definitely have them now, that's for sure, so would every other bank around the world. (Interview No.10)

The following supervisor's comment reveals that the regulatory philosophy is biased towards downturn considerations. Regulatory responsibilities, they admit, force them to be "more conservative than banks":

> APRA's choice of scenarios is a bit down-turn consideration biased, which means it should be more conservative than banks. (Interview No. 5)

One reason why regulators are more conservative than banks in scenario refinement is that their baseline may be closely aligned to idiosyncratic forms of environmental "reflexivity" (refer to Aalders and Wilthagen's notion of 'reflexivity' discussed in

[374] P & L effect is profit and loss effect.

Chapter Four) and "plausibility" as is reflected by the words in italics in the following quote:

> We have done a lot of scenario review recently (after the sub-prime crisis). We refined certain scenarios *in terms of what happened recently*, but we won't include the *very severe ones* like market disruption. We are more conservative according to what happened in the market. (Interview No.4)

> We always consider the downturn possibility in policy setting and supervisory review, and definitely need to refine scenarios from time to time. But for the current situation, there is no need to include scenarios like market disruption, that's *overstated*. Banks do stress testing as well, but they don't consider much of the downturn possibilities. Most of their stress test scenarios are still based on good time ones. (Interview No.5)

This scenario-related debate will go on for a long time, unless the two groups of participants can put their own distinct forms of purposive-action in abeyance (for banks, this amounts to strategic interest-oriented action, and for regulators, it amounts to bureaucratic interest–oriented action) to finally achieve *mutual understanding*[375].

In cases of empirical implementation, risk experts report that a lack of valid scenarios is a major hurdle to refinement and, thus, to the validation process using backtesting (this issue will be further discussed below):

> It's going to take a lot of debating about what the appropriate level of stress is and things like that. Yeah (the necessity of refining scenarios after market dislocation), if you didn't have them before, I think it's fair to say quite a few banks would have had these scenarios. (Interview No.12)

[375] Refer to the discussion in Chapter Six. Habermas' Communicative Action is adopted as a philosophical guide in the interpretation of interview results. Mutual understanding can be regarded as resulting from a reconciliation of conflict between regulators whose regulatory decisions are based on bureaucratic interest to maintain financial stability, and bank practitioners whose comments represent the profit-driven business strategic interest of the banks.

This problem is also highlighted by supervisors (the issue of data limitations will be explored further in section 8.2.2 of Chapter Eight):

> But for stress testing based on regulatory purposes, data is the problem, and sort of lack of data and strong scenarios. (Interview No. 4)

For banks in general, beyond the scenario-setting debate, irrespective of whether they have adopted foundational IRB or advanced IRB, stress testing is recognised as a relatively new area characterized by notable difficulties:

> Stress testing and scenario analysis require a lot of data, it is a difficult process. (Interview 8)

> Stress testing is something that is relatively new, so we (are) still building a process around it at the moment, but stress testing is got to be something you do on a ongoing basis, looking at a couple of times a year, it is not a one off thing. (Interview No. 13)

7.2.2.1.4 Backtesting

Backtesting is another complementary risk measurement approach to VaR, which is also required under the Basel II framework for purposes of validation, especially during periods of turbulence. As one risk expert in the banking sector put it:

> In a normal market, there would have been no issues in terms of suiting stress testing for unusual events or shocks. But when you've got a turbulent market like now, it is hard to put a validation on the stress testing, and say, well, we've been doing this and that's the outcome we had, under normal market conditions, but now we are under stress or even the market is going through those, it is still in turbulence. So can it actually be validated through stress test? I wouldn't be surprised if banks are actually looking at the stress tests, and saying what we've been doing is *meaningless*, as we know now the outcome is different. So I think under normal circumstances, no one would question the outcome of the stress test, because it's not hard to validate. But under a turbulent situation, you cannot actually validate it at all. Now, there is

> nothing to do for the justification. It will be going through real life stress, so, yeah, surely people are putting question marks into those models in the stress test. (Interview No.15)

Nevertheless, during such periods of turbulence, both stress testing and backtesting face notable technical difficulties. As the above quote reveals, the changing market environment undermines backtesting scenarios that have been constructed on the basis of historical trends, rendering their results "meaningless".

Even when market conditions are stable, validation efforts can be hindered by model complexity:

> Particularly, a fairly good economic environment has been very hard to validate with these types of models[376]. It's very sophisticated compared to the old Basel approach, no matter whatever banks have been using internally. (Interview No. 7)

Where another risk expert confirms that proper scenario setting is the critical aspect of stress testing, he indicates that achieving a workable 'trade-off' between regulators and banks may help to overcome the scenario debate:

> It's being critical of stress testing… (But) there is a trade-off (for choosing scenarios). In some cases, it's more conservative than anything you have seen. If you go over the top, people probably are more likely to use an extreme number than others, then (the issue) is you are never going to be able to validate them[377]...For example, in a sense, you want to keep it severe and plausible as well...a kind of backward looking approach, but the worst we've seen. If you have seen something bad, in a forward looking sense…, the thing hasn't happened. (So) it is a trade-off between whatever you think is large enough to give you a stressed output, but without everybody telling you to go away, because you are ridiculous. (Interview No. 7)

[376] By "These types of models" the interviewee is referring to the sophisticated models used for assessing credit risk and operational risk under Basel II (see quotes from interview No. 7 in section 7.2.2.2 on *The practicability of Basel II in real financial markets*).
[377] Because certain scenarios have not or might not happen, or may occur at levels that are more or less severe, risk managers may not have real numbers at hand for validation purposes.

By 'trade-off,' this researcher means more negotiation and communication between regulators, and banks so that their distinct interests can be 'harmonized' (other debates between regulators and bank practitioners in relation to IRB approval, which also reflect processes of communicative distortion, are explored in Chapter Eight).

In his discussion of stress testing scenarios, yet experienced risk expert from the banking sector recommends the adoption of "coherent" risk approaches (on this see the Chapter Five discussion about "coherent" risk measures)[378]:

> For those areas, it makes sense to have some *coherent* economic models (Interview No.15)

As revealed by the following interviewee, correlation will be the issue demanding more concern from regulators and bank risk experts:

> Currently there is no best way to handle it; actually there never has been a solution to fix the difficulties of assessing correlation. (Interview No.3)

This comment points to the fundamental complexity of the quantitative aspects of risk management and regulatory supervision that is prevalent in the current statistics-based quantitative risk models that just focus on risk premia, but ignore time-varying uncertainty premia (refer to Chapter Two). These inadequate risk approaches, which are intensively embraced under the Basel II framework, conceal a possible threat to the stability of financial markets via the amplified complexity of decision-making triggered by the growth of verified financial innovations.

7.2.2.2 The practicability of Basel II

As a regulatory framework, good intentions of the policy-making process and sound design are just the first step to achieve goals. Given the dynamic market environment and growing complexity of the banks' internal systems and financial products the

[378] As discussed in Chapter Five, section 5.3, coherent risk measure such as ES, perform poorly in the case of risk-aversion, notwithstanding their coherence; while VaR attracts risk-loving users in the tail loss region. Both of them generate "uncomfortable" results (p.194, Chapter Five). In short, each affords certain advantages and disadvantages, in terms of comprehensive risk management and regulatory supervision. While stress testing can contribute to assessing correlation as a complement to any chosen risk measurement technique, both VaR and ES suffer from similar inadequacies when it comes to accounting for forms of correlation that are a potential threat to financial stability.

question of the practicability of Basel II in empirical risk management and supervision practices comes to the fore.

It has already been posited that the IRB approach, as the core of Basel II's Pillar One, has helped to translate theory into practice, especially through the deployment of in-house expertise so that internal models can be more closely aligned to a given banks' risk profiles[379]. This perception is confirmed by the following interviewee's response:

> I think it is a framework (that) …has been developed with (a view to practicality in) application in mind. I think that's very important to be able to bring something in that could be linked to the individual bank's underlying system. So it is not just a theoretical methodology but it sounds like it could work in practice, so that's a positive. (Interview No. 1)

Similarly, a risk manager, who works in the credit risk area, commented on the enhanced practicability of Basel II due to its promotion of the IRB approach:

> I think in the down turn for a credit risk portfolio, the combination of having banks' own risk estimates in place, as well as the requirements, … within Basel (is important). So it is not just the theoretical reaching of the credit risk exposure, you actually (have) got to show that, if there is a material change in the credit risk you reached; if you need to downgrade it; versus the appropriate credit approvals… all that sort of stuff. So it makes … the theoretical requirements more practical, and I think when in a down turn, yes it is better compared to Basel 1, that you can have capital reliant on credit risk estimates. (Interview No.11)

While this researcher has argued previously that the greater practicability of Basel II rests on the practitioners' confidence in the power of their internal systems, relative to the more rigid requirements of regulatory modeling, the above discussion of VaR limitations has indicated that this confidence may be misplaced.

[379] In section 7.2.2.1.1(p.272), the comment from No.3 interviewee also signals enhanced practicability of Basel II from adopting the IRB approach—"IRB approach broadly promotes the concern on "more comprehensive risk management" among the banking industry through enhanced risk education of bank practitioners".

The next interviewee draws attention to the recent revision that has brought incremental risks under the framework of Basel II, suggesting that this creates greater consistency between risk estimates in accordance with Basel II rules and the actual exposure as reflected in the banking books during periods of increased volatility:

> Obviously that make sense, I mean in regards to what actually happened. They are now putting some quantification in regards to the additional capital that needs to be set aside, and it's going to be consistent with what's in the banking book. So the Australian banking book risks are going to be aligned, it's going to be consistent across them. But from what I recall, it's still in discussion stage until later this year, but I think it's the right track to go on, especially in this environment of what's happened. And now that it's all out in the open, people can have another look at it. First of all, I guess determine that they understand what the products are, and what the actual risks are behind them, and provide some sensible risk weightings across the book. (Interview No. 15)

However, some risk experts, including those from both major banks and less-sophisticated banks, have argued that inconsistencies may still arise due to the deployment of over-sophisticated risk methodologies along with their associated data requirements[380] when compared with their simpler counterparts:

> I think it's true that probably banks' … (Basel II) sophistication has gotten a fair way ahead of Basel I, but as (for) all the historical data (being) there, and the system in place to really justify using a Basel II model? No! (Interview No. 6)

This ambiguous nature of these responses in regard to the issue of consistency will be further examined in the next chapter. The following comments address qualitative aspects of management philosophy, as written into Basel II rules, rather than the

[380] The issue of over-complexity of Basel II and its strict data requirements are explored in detail in section 1 of Chapter 7—the burden of Basel II implementation.

specifically quantitative aspects of risk assessment. The next interviewee raises doubts about the success of these design objectives[381]:

> What Basel II was said to have imposed on management, in practice hasn't worked. Conceptually I think it makes sense. I mean conceptually, from our perspective, I mean we are conservative by nature, so potentially Basel II should be very beneficial for us. In practice it hasn't really translated into that. (Interview No. 14)

Another risk expert offers some explanation as to why these objectives have not succeeded. His opinion echoes the earlier theme of a dichotomy of purpose between banks and regulators:

> Personally I don't see Basel II as a "stick" better fitted for management. Let's say if we never had Basel II, banks won't fail. I say Basel II is more of a reporting tool than anything else; it's not a management tool. Even though regulators would like to mention the Basel II framework, whether Basel II is there or not, banks still have to prudently manage the bank's risk. They are just trying to articulate that risk, in a way that management doesn't really care about. (Interview No.15)

> I mean I don't see Basel II as a "stick". I mean if you cannot do it you get penalized. And the regulator sector doesn't change; the owners are still on the board, to manage the risk. It's not the regulators' role to manage the bank, it's up to the board, and that hasn't changed from Basel 1 to Basel II. All it has done is given some tools and gotten the management to focus on different risk aspects that the bank faces, and force them to measure it, and owners to manage it. (Interview No.15)

In conclusion, Basel II may have fallen short in achieving practicable outcomes because it attempts to be 'a bit of everything". Based on some practitioner opinions,

[381] However, there is a disagreement in such aspects, another risk expert describes the guidance on management under Basel II as "extremely vital, important" information: "about 200 of those paragraphs are about securitisation, only some of them are about measurement. A lot of them are about management, that's extremely valid information, relevant to the current crisis, and yet others are about having board oversight, good process, independent thinking in your risk management function. All of that is vitally important if you are going to manage banking in volatile times." (Interview No. 9)

the IRB approach under Pillar One more closely aligns risk assessment output with the real risk profiles of banks while the revision on incremental risk assessment offers banks more practical forms of guidance. At the same time, others caution that the over-sophisticated methodology and strict data requirements have undermined these efforts at consistency while the qualitative management components of the Basel II rules have not achieved what policy-makers expected.

7.2.2.3 The Organizational Impact on the Banks and Regulatory Supervision Process

This section of the chapter raises the question: "*What are the organizational impacts on banks and the regulatory supervision process*?" in relation to the experience of Basel II implementation in Australia,

7.2.2.3.1 The Organizational Impact on Banks

In contrast to the previous Basel Accord, the current new Basel framework is structured by three pillars instead of one. This raises the question as to which pillar generates the most benefit or has the most significant impact on banks' risk management and supervisory processes.

7.2.2.3.1.1 The Impact on Banks arising from Pillar One

Based on the analysis of all relevant comments, the majority of interviewees have nominated Pillar One—*Minimum Capital Requirement*, as being responsible for generating the most benefit to the banking sector, the reason most cited being that the adoption of the IRB approach has delivered real capital benefit to the banks.

For bank risk experts, the impact on banks can most obviously be seen in the enhancement of internal risk assessment systems:

> I would say a lot of work had to be done on enhancing systems, implementing new systems. I mean OK, we'll have to go and gets a whole system around the Basel II reporting for the credit risk. (Interview No. 14)

As with the conclusion reached in section 7.2.2.1.1, here, the potential for capital relief and the competitive advantage of being in a position to opt for the advanced IRB approach are regarded as the two main motivations for banks to update their systems.

> (The potential benefits are more from) Pillar One and credit risk, just because (its) so much about income, we got compensated for taking on credit risk, the largest risk to the bank. The others are probably…market risk is pretty small for us, largely the same as Basel I anyway. You wouldn't implement Basel II if you were stuck using 100% risk weight and 50% risk weight, for a few credit risks, then you know, (its) probably not worth the effort. Pillar One credit risk, the benefit is there, unless you are an organization like Citi Group or something very varied, with the contribution of different risk types, maybe there is more then in the renewed Pillar Two for them. (Interview No. 7)

Although certain banking practitioners acknowledge that banks will benefit in the long term from enhanced internal systems under Basel II implementation, regulatory enforcement still plays an important role in forcing banks to "grow up" quickly:

> […] as I said there is nothing in Basel II that isn't just good banking practice. So while the regulator is being on top of things that means they are forcing you to do good banking practice. Any downside is short-term, because in the short term you've got to keep doing the things you know you should do. Whereas often you attempt not to do things because of the cost constraint, it just forces you to do what you know you should do anyway, so I see no downsides. (Interview No. 12)

This banker clearly understands that the intention of policy-makers is to maintain the "health" of financial institutions and achieve financial stability. To this extent, his opinion mirrors the conventional bureaucratic understanding about the objectives of regulatory authorities. When mutual understanding of this kind about the desirability of regulatory enforcement grows it undoubtedly has the power to contribute to achieving both regulatory and business strategic goals in a more collaborative manner

with less communicative distortion and a greater capacity to overcome potential conflict between these two groups.

Another interviewee from the banking side also affirmed there has been improvement in internal systems under Basel II, but unlike others who have cited capital relief as motivation, he insists the motivation for banks to invest in this "project" is based on attainable benefit from the 'risk management' perspective:

> We would never undertake a big project, or a small project for that matter, based on regulation alone. It should make sense to us from a commercial perspective, and risk management perspective, and I think that's why our Basel project was a success. It was because a lot of our improvement to our internal rating system for credit risk, for example … suited us commercially and also meant that we could comply with the advanced requirement for Basel II. (Interview No. 11)

As noted previously (section 7.2.2.1), bank practitioners believe that a strengthened underlying risk methodology, together with "integrity risk management" would help banks to better survive volatile market conditions:

> I think that the measurement tools that are advocated by Basel II and the focus on high integrity risk management, [382] with clearly documented processes, are vital for surviving in a period of market volatility. So it has worked to support the banks that have performed well during crisis. (Interview No. 8)

In particular, one bank risk manager indicates that the inclusion of operational risk in the Pillar One risk category forces banks to actively work on this area, which potentially could improve both their systems and experiential learning about operational risk management:

> Pillar One is the revised risk estimate; capital for operational risk is now being introduced, so that's where the majority of any bank's project work would be done. (Interview No. 13)

[382] This notion of "high integrity risk management" would seem to be congruent with the previously discussed concern for "comprehensive risk management" i.e. to be promoted through education of Bank boards and risk management practitioners.

As mentioned before, for banks, the major benefit from Pillar One has been directly interpreted in a “tangible” form—capital reduction mainly achieved by adopting the IRB approach:

> What are the benefits? (The) benefit is the reduction in capital. (Interview No. 13)

> For the banks, Pillar One generates benefit for them because of obvious capital relief, and I think some of the benefit is also from adopting IRB. But these IRBs are the accredited IRBs, for APRA, we set the regulatory floor for their ICAAP process, so the accredited IRB and regulatory floor together determine how much benefit they can get. (Interview No.3)

However, the extent of the benefit finally delivered to banks, is arguable as the above supervisor and following bank risk manager indicate. In addition to the ‘tangible’ benefit, some interviewees think the adoption of IRB under Pillar One, also brings banks long term and ‘intangible’ benefits such as the better understanding of risks:

> Does it pay off? Well you can say it pays off already in terms of better understanding of our risks and the cost of our risks. Has it actually delivered any reduction in capital? Probably arguable at the moment (Interview No.13)

Similarly, one of the supervisors affirms that potential capital reduction from risk diversification could also build incentive for banks to diversify risks which assists banks to optimise their risk profiles:

> Yes, definitely, when they see there is potential of capital reduction from risk diversification, they will keep doing it (diversifying risks). (Interview No. 4)

Against the tide of banker support for Pillar One, we get the following observation from a supervisor:

> From the supervisor's point of view, I think definitely it is Pillar Two. For the banks' case, it might be Pillar One, if they have sufficient

> internal resources, especially for some advanced banks. Their internal system is already very complex, they can definitely benefit from IRB. (Interview No.4)

While the majority of interviewees admit there is an impact on banks' risk management practices, and internal system structures from Basel II implementation, a few interviewees insist that Basel II merely codifies their own routine for the banks' risk management process, for instance:

> Just during the initial stages, I mean, we are still sorting out things as we are going along. But once we get that done, it is not too much different from what it was previously. (Interview No. 13)

> We invested in policy, we increased staff, we put some money into IT systems. All of the banks have done that, but that hasn't changed the way the banks managed themselves. The bank manages itself according to its internal views with reference to the external perspective. (Interview No. 9)

This might be the case for major banks and smaller banks adopting the standardised risk approach. As discussed above, major banks have internal models that are more advanced than the authorized models under IRB, so the impost under Basel II is more focused on the cost of reporting, adopting standardizing formats, and adding extra data, and does not lead to fundamental changes; for standardised banks, the risk approach they adopt under Basel II is the same as under Basel I, so there is no fundamental change for them either. The above two cases represent two such situations.

But the most obvious finding from the second comment is that the interviewee, like others discussed above, draws a clear boundary between the bank's own way to manage risks and the work required to satisfy regulatory requirements. For this reason, bank risk managers insist that this new regulatory framework does not change the way they behave based on their business strategy, and risk philosophy.

From another perspective—that of a supervisor—the regulatory floor imposed in Basel II risk management practices serves the purpose of making sure that there will not be fundamental changes, as clarified in the following comment:

> There won't be fundamental changes in Australia (due to the regulatory floor). As I said earlier[383] advanced Australian banks will benefit as same as less sophisticated banks here. (Interview No. 4)

In summary, the impact on banks from implementing Pillar One is mainly viewed as reducible to the capital reduction obtained by adopting the IRB approach, while a few interviewees mention longer term, 'intangible' benefits. Both supervisors and bank practitioners acknowledge the absence of fundamental change associated with the Pillar One implementation.

7.2.2.3.1.2 The Impact of Market Awareness on Banks

Pillar Three probably represents the most significant departure from the Basel I approach. In particular, it imposes new forms of accountability over the banks: "*I say Basel II is more a reporting tool than anything else*" (Interview No.15). Pillar Three is designed to operate as a complement to the other two pillars. It's objective is to build awareness among the market participants by disclosing to the public essential information about the risk assessment and management process of the banks. Through this disclosure, market participants are supposed to obtain information about the banks' risk profiles and capital holdings, which could assist them in making investment decisions.

After summarizing comments about information disclosure from interviewees, we see that Pillar Three is clearly expected to bring the greater transparency to the market:

> (The market) will be more transparent from banks' point of view, that's possibly the main change from disclosing information. The most transparency possible will flow to the higher reporting. (Interview No. 14)

[383] This interviewee argued that there was no competitive disadvantage incurred by the less sophisticated banks due to the adoption of the IRB approach by the major banks. In regard to the existence of the fundamental changes, his opinion was to deny the existence of fundamental changes based on the argument that all banks benefit equally under Basel II.

Furthermore, other bank risk experts affirm that information disclosure will increase public concern about banks' risk-taking activities:

> I think there will just be an increased emphasis by the public wanting to understand why banks enter risky markets, and others (will) probably (be) looking for more valid justification. Now as for doing business in riskier areas, we are going to have to disclose significant information about riskier business. (Interview No. 1)

> The whole idea of it is to make the market more aware of what the different risk profiles of different banks are. It is just a way of trying to get the market a better view of what the different risk profile of different banks is. (Interview No. 12)

One bank practitioner indicates that Pillar Three reports are obliged to combine quantitative information with qualitative information about banks' risk management processes, which creates a "major differential" in contrast to the regulatory reports provided to APRA by banks before Basel II implementation:

> Pillar Three asks us for some qualitative view of risk models as well as this process. Most banks write out a page about their risk management in their annual report, so that is the *major differential*[384]. (Interview No. 7)

Similarly, another interviewee provides a detailed explanation as to how these information guidelines on risk management under Basel II have had a significant impact on banks' regulatory reporting:

> The Basel II standard is whatever, 850 paragraphs long. One hundred of those paragraphs are about disclosure, and the additional transparencies have been seen by all the regulatory bodies commenting on the financial crisis as a must do. About 200 of those paragraphs are about securitisation; only some of them are about measurement; a lot of them

[384] Another comment also directly points out that pillar three reporting requirements impact on banks' reporting processes significantly, due to the increased relevant work and cost: "but that is a big change, a lot of new reporting has to be generated. This takes time, and building the systems to generate those, so big upfront cost." (Interview No. 13)

> are about management - that's extremely valid information, relevant to the current crisis; and yet others are about having board oversight, good process, independent thinking in your risk management function. All of that is vitally important if you are going to manage banking in volatile times. (Interview No. 9)

Furthermore, one of the interviewees from a major bank argues that it is Pillar Three—described as "real new stuff"—that is responsible for most of the impetus to change:

> For a bank to have received accreditation, it must have had a sophisticated management for its own benefits anyway, which means that the real new stuff is Pillar Three. But at this early stage without studying and understanding enough of report (requirements), it's premature to comment on it[385]. (Interview No. 8)

There are a variety of arguments as to how information disclosed under Pillar Three will assist regulatory supervisors to discipline banks' risk-taking activities. One way is that market participants or general communities will be able to ask questions about the differences in the risk profiles of various banks:

> Well they should get a much better view. But also once they start seeing this, they would start asking questions of all the banks. Why does your profile look different than somebody else's profile? (Interview No. 13)

While market participants or the community in general, can direct questions to banks through the media or market analysts, but the most direct way for market participants to discipline banks' risk-taking activities is through influencing share prices and funding costs.

One bank risk expert points out that information disclosed about banks' risk profiles will have a direct impact on such costs, albeit, after a certain period of adjustment:

[385] This interview was undertaken before the advanced banks submitted their Pillar Three reports to APRA. At that time, as one interviewee mentioned, just the Bank of Japan and a few other banks had released their Basel II reports. So most of the bank risk experts, regulatory supervisors and market analysts from overseas or within the Australian region were still watching each other, trying to extract information and building the benchmark for their reporting purpose. The relevant issues arising from Basel II reporting can be referred to the discussion in *section 8.7-The Issues with Information Disclosure*.

> I guess the fact that discipline of Basel II has a direct impact on price. … If they all start to build awareness (that) if they can offer certain assets as security or collateral against loans, their price will improve significantly. So I guess what's happening in the improvement (but also I mean in the interim period while all banks trying to move to Basel II), there will be mismatch in market. (Interview No. 2)

Interviewees see market transparency as the "mirror" that provides market participants and the general community with a chance to detect the risk-taking activities banks have undertaken. A number of interviewees reveal how the information disclosed to the market participants in the commercial business process will influence funding costs:

> Well it is a fact that they impose regulatory disclosures onto the banks, so you have to disclose, but the effect is that it forces the banks to better management of the risks. Otherwise investors would say to directors "I won't lend them money", and then cost of funds goes up. I think to an extent. But, for us, traditionally we are quite conservative anyway, and I suppose a lot of banks would have their own internal risk management policies etc, that are in place. But it would drive the front line practices, so I think it would drive the funding practices, it might breakthrough, and there will be a degree of pressure. Because already I understand that a lot of staff already starts to think about Basel II - how are our deals affected profitability wise, if we introduce a Basel II environment? So the investors would suddenly realize, that this deal under Basel I would have made this much profit, but under Basel II it doesn't make that much profit, so therefore they would try to put that into line. So I mean there is that thing about disclosure, but there is also I think the benefit when it comes to risk-weighted assets under the Basel II environment, if you structure the facilities properly, would mean that drives behavior as well. (Interview No.15)

Similarly,

> It will assist banks to get the point, if the market is more transparent, the banks could have lower funding cost when they behave well. (Interview No.4)

> Pillar Three market discipline normally …would be sensitive thinking about funding cost, how banks (are) penalized for taking on risks…but shareholders might benefit from increased risk taking…potential returns are there, for them, they are benefited in the upside (the asset portfolio of banks), so it gives a kind of scope to have more of the New Zealand approach to regulation in the past 10 years. (Interview No. 7)

On the other hand, some argue that external ratings play a more crucial role and have more influence on banks' funding costs and future business strategy:

> Funding cost would very much go to affect your S&P (Standard& Poor) rating, and that's what most people refer to. It's only a question of to what extent does Pillar Three carry additional disclosures. I think it's probably a fairly indirect link between the numbers you put on the Pillar Three disclosure and whatever your actual funding costs are. It really depends on the rating agencies' view of this information. (Interview No. 8)

Arguably, the pressure exerted from the public domain in response to disclosure under Pillar Three is likely to encourage banks to build a benchmark on reporting under Basel II:

> I think eventually you would see them compete, eventually some bank would actually give more information than what they are required to provide on the standard, because it would probably send a message that they are prudent etc. So it can be a competitive advantage, if you use it properly. (Interview No. 15)

> The banks will look at each other's risk levels, and will *benchmark* each other. And possibly say well, why are we offering more amendment and vice-versa, and so you will get all kinds of benchmarking exercises going on. The reporting I think for Pillar Three will be interesting in the

> inter-bank benchmarking sense - having more sensible conversations with bank equity analysts about where we will see the largest risks and having a bit more confirmable information across banks. (Interview No.6)

> Reporting similar information out of the new level of management information. Certainly there's going to be all kinds of benchmarking and performance cross checking. (Interview No. 7)

Regulators also acknowledge the importance of the benchmarking function in promoting awareness amongst market participants as shown in the following response:

> Our reporting is normally 3 months ahead of theirs; APRA has told the banks they want them all to report around the same time for the first time. We've got to hold our numbers back for 3 months, because that way people can compare them. (Interview No. 12)

Similarly, another interviewee highlights the importance of market awareness for informed decision-making by investors:

> I think the main benefit is probably on market disclosure, the comparison across banks, and having sensitive kinds of more informed shareholders who appreciate what the risk is that the banks have, and in some sense, a large depth of investor either directly or through rating agencies, but certainly not APRA. (Interview No. 7)

The impact on banks from Pillar Three raises the question as to whether or not the market awareness built up under Basel II could change banks' risk appetite. The last section of this chapter is devoted to assessing this conjecture.

The following comment from an experienced supervisor shows that although market awareness has potential to influence banks' risk-taking activities, regulatory capital adjustment has the capability to impact on banks' risk appetite directly. This pertains to the "Benign Big Gun" type of regulatory approach, as discussed in Chapter Five, which was posited to be more straight forward and efficient than other approaches:

> I don’t think banks will be pushed to change their risk appetite. They may change their risk profile at some level (I mean, still same risk appetite, just manage risk better), but not directly from market awareness. If banks are over risk-taking, their ICAAP will reflect the capital assessment aligned with their risk exposure which will directly impact on raising regulatory capital which will change their risk profile. The market awareness might relate to banks' funding costs from the market and possibly indirectly impact on banks' risk profile. (Interview No.3)

In summary, it would appear that information disclosure under Pillar Three brings transparency to the market as anticipated. Particularly after the occurrence of the recent financial crisis, there is a necessity to build market awareness among market participants and general communities. In that sense, comments from interviewees confirm the ability of Pillar Three reporting to influence public concern about banks’ risk profiles, and risk-taking activities, with feedback effects driven by changes in both share prices and funding costs. However, external ratings and regulatory capital-holdings are argued to have more direct influences on banks’ risk-taking behavior and risk appetites.

7.2.2.3.1.3 The Impact on Regulatory Supervision

From a supervisory perspective, Basel II makes the banking sector’s ICAAP (Internal Capital Adequacy Assessment Process) output more formalised. This is required under the IRB approach, since accreditation of the risk assessment platform implies that a bank’s ICAAP must be reviewed as well. These more formalised ICAAPs have the potential to substantially reduce the time and effort supervisors spend on reviewing, by spreading the supervisory burden in relation to the Prudential Capital Rate (PCR)-related supervisory assessment processes:

> Banks' ICAAP should be qualified as one factor of accreditation. From my point of view, the qualified ICAAP will perform a little bit better under Basel II, from what I see, it's because ICAAP will be more formalised. For APRA , it will be easier to work with more formalised ICAAP output to set a proper PCR. (Interview No. 5)

Yet another supervisor affirms that under Basel II the ICAAP output is "more individual(ized)" and better able to assist supervisors in setting a more appropriate PCR:

> So far, I can see there is a need to refine the understanding of risks according to the information and guidance provided in the Basel II framework, especially for advanced banks. The analysis in their ICAAP is more individual[386]. Based on that, we can set a more proper PCR, which can be a more efficient number, but ICAAP itself doesn't play a significant role in accreditation. (Interview No. 3)

One supervisor acknowledges that specific adjustments have occurred in relation to APRA's *Probability and Impact Rating* (PAIRS) and *Supervisory Oversight and Response* (SOARS) systems under Basel II, which were initially introduced under the old Basel Accord as essential components of APRA's supervisory process:

> There are changes to those two systems - more focus on exploring how to make them align with the ICAAP output and process - which will make the systems more efficient. Especially for the PAIRS system, there are more breakouts for risks…more separation of risks from control. This is also the break for the board. (Interview No. 4)

As an emerging risk approach, stress testing has been adopted for regulatory supervision purposes and been given more emphasis under Basel II mainly due to the desire of banks to embrace the IRB approach:

> The focus is a little bit different; we are more interested in stress testing with the advanced banks' case. Because they are adopting IRB, their internal models and system should satisfy APRA always. Accreditation is not forever. (Interview No. 3)

In addition, certain types of risk (i.e. concentration risk), now included in the Pillar Two risk categories, have attracted attention of supervisors. This has broadened the

[386] Here, interviewee means that the ICAAP risk analysis is based on banks' internal system, the IRB approach.

approach of supervisors towards risk assessment, enhancing their understanding and increasing their experience of dealing with these risk types:

> But for the Pillar Two things, concentration risk has been an interesting exercise to look at as well. (Interview No. 7)

In particular, one interviewee from the banking sector spoke of the changes that have occurred in the form of regulatory supervision practice and the consequent impact on banks after Basel II implementation:

> Yeah, I think what they have done now is APRA has turned their Basel project team into a BAU (Behavioral Analysis Unit) team. So they would regard that as a BAU. So probably the banks have been dealing with accreditation issues, getting a headache, but in a year or two, gonna be more rational kind of a quarterly, or specific visit, kind of a show and tell. (Interview No. 7)

One of the supervisors confirms that there has been a "functional change" to the supervisory approaches and processes, specifically to the enhancement of the knowledge of the regulators about quantitative risk management and the efficiency of their supervisory work:

> There will be functional change to our supervisory approaches and process. It will change the quantitative aspects of supervisory approaches - the work with modeling - and it will improve the output of modeling, which is more granular than in the past. The supervisors will have comparably better understanding of the risk quantification and the process of data collection. There will be more work for supervisors as well, like more review work. (Interview No. 3)

Notably, as revealed in the following responses, this "functional change" is specifically reflected in the adjustments made to the risk buckets established under the supervisory process:

> There are risk buckets set according to that assumption (the concept/philosophy of *Proportionality* of APRA's supervision process).

> The number of risk buckets has been changed, and this reflects the more accurate risk categorization of Basel II, and also coincides with the risk assessment of Australian banks. The major banks have sophisticated internal assessment systems. If the size of risk buckets is too small in contrast to the banks' internal risk categories, the PAIRS rating won't be that accurate, that will impact on our judgment and the adjustment of banks' capital adequacy.[387] (Interview No. 5)

> For example, for the standardized approach under Basel II, the number of risk buckets is significantly increased. The risks can be classified more accurately and put in the risk bucket which suits them more, and consequently the quantification output will come out better. Thereby providing greater risk sensitivity. (Interview No. 4)

In summary, as revealed in the responses of one of the supervisors and in also a bank risk expert, in contrast to the old Basel Accord, this new Basel II Pillar "adds an extra layer of vigour", and provides more information and guidance for supervisors:

> My answer is Pillar Two[388], because we have this additional pillar of supervision, which provides more information and guidance for the supervisory works. We could benefit from that, which is quite pleasant for our work; we would have better understanding as well. There will be more for us to draw out the difference of risk diversification (in terms of Pillar Two risks), this is one step further. (Interview 4)

> I think it probably adds an extra layer of vigour, on top of...again, feedback from the regulators, from what they are doing. It is a second bird's eye look at our models. (Interview No. 7)

[387] This interviewee also mentioned: "apart from risk buckets, APRA has more streams to risk assessment." (Interview No. 5)
[388] When this interviewee answers the question: which pillar generates most benefit? His answer is pillar two.

7.2.2.4 The Building of a Risk Culture

As the following interview responses reveal, the new system is encouraging a change in the very culture of risk management. One interviewee from the banking sector notes the influence of Basel II in educating members of bank boards:

> Basel II identifies the need to educate boards. In the past, the executives of risk management reported to risk managers, and they then reported to the CFO or other members of boards. Now the attention has been shifted more from reporting and assessment to comprehensive risk governance. The risk management decision or adjustment could be made more directly when the board is more directly involved and is familiar with risk management. (Interview No. 5)

These sentiments are confirmed by another bank risk manager:

> I think on the other hand it also does bring the thinking about risk management into focus. It forces management to focus on certain things because they have to do it for the regulator. I think that's a good thing. It does bring those risks to the forefront. The executives do need to understand what risks are facing the bank, especially in this environment. It's probably very tiny things that executives are thinking up the option of what really their positions are when it comes to those risks. (Interview No. 15)

In particular, Basel II's emphasis under Pillar Two on practices that go beyond quantitative risk assessment, to encompass risk management is seen as a complement to regulatory supervision and is said to "open management's eyes":

> For Pillar Two, I would say it probably opens management eyes to, or forces them to look at, the various risks that the bank is exposed to, and forces them to measure it, correlate it, and look at capital in probably more educated ways than they had in the past. (Interview No. 14)

Based on the previous comments about how Basel II rules influence bank board education, interviewee No. 5 goes on to confirm how risk management has moved

away from an entirely quantitative based approach to one based on more qualitative assessments[389]:

> I think if boards of banks are educated in terms of Basel II's intention of that, there won't be just the quantitative aspects in focus for risk management. (Interview No. 5)

A similar confirmation of risk culture building under Basel II is also indicated in the following response:

> I think a better understanding of risks and risk management will be built among Australian banks. (Interview No. 4)

The following interviewee observes an extension of this changed risk culture into the public domain outside the banking industry, driven by the Pillar Three information disclosures:

> The risk culture in Australia has been good. I think this new framework will make more people understand the risks, widening understanding, sharing the information with banks. (Interview No. 3)

Interviewees from the banking sector state that actual adjustments have occurred in the role of risk managers within their bank, due to a growing sense about the importance of risk governance:

> On a global perspective we are looking at changing the risk function roles so that there is actually a person who is heading up the risk management, not just credit risk management, but risk management in general. So that is something that we as a group are looking at.[390] (Interview No.14)

[389] In Chapter Three, the researcher argues Basel I is more pertinent to risk measurement guidance, while Basel II is identified as a regulatory framework for risk management which includes qualitative management information and guidance. In that sense, this comment from No.5 interviewee demonstrates this discussion.

[390] Another risk manager also reveals similar changes in the underlying risk management function although via a different path: "The structure we have at the moment is that, last year it was more of a centralised structure, whereas now it is de-centralised. So that you got a smaller head office, credit function, risk function, and then you got risk offices throughout all the different businesses like PBS is our business, basically, but (bank's name) which is a retail banking system, they used

One risk expert in the banking sector, observes that not only board members but the entire staff of the bank need to be educated to enhance the organization's risk culture:

> I think we are seeing already the move to more sensitive risk weighted asset positions in the bank which indicates … the individual profitability is now assessed against quality of the asset they bring into the bank...just continue to educate the whole bank. Overall I would expect the knowledge and understanding will come back to them. (Interview No.1)

Finally, as disclosed by a bank risk manager, another aspect of risk culture building has been the growth of an internal consulting and training industry which relies on the provision of risk management services[391]:

> There has been an industry in financial consulting and acting inside the banks themselves, to build useful quantitative models that provide reasonable estimates of a whole swag of risks. (Interview No. 8)

In summary, the majority of comments demonstrate risk culture building within the banking industry under the current Basel II framework. Basel II contributes to introducing a more qualitative management component onto the previous quantitative risk measurement framework encouraging, in turn, greater attention on the part of bank managers to questions of corporate governance. However, this effort has not been 'appreciated' by everyone; the following comments from two risk managers expose their negative opinion of these guidelines on management, addressed in Pillar Two, as they are regarded as being 'naive' by these bankers:

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to have risk people in them, but those risk people used to report through to the heads of the different business units, whereas now the risk people whilst they are still embedded in those businesses, actually report through to the group chief risk officer. Well we used to report to the CFO, but just last week, we had a new group chief risk officer and he reports directly to the managing director, so he reports directly to the CEO, whereas previously we used to report to the CFO." (Interview No. 10)

[391] However, there is another reason behind the "heightened focus on risk management". According to a comment from one supervisor, the recent financial crisis rather than Basel II has most probably been the major influence in focusing attention on risk management:
"Heightened focus on the risk management side, but from a regulatory perspective they are not… dislocation of capital markets around the world, sub-prime, has meant certainly increased focus on the compliance angles and credit policy…risk management has become a much more significant role since last year..." (Interview No.1)

> If you talk to management, the CEO, CFO, the feedback I get is, "this (building a risk culture) is crap". It doesn't help management to manage risk, and the whole purpose of Basel II, especially Pillar Two, is in prudential management application of your risk, and how you go about managing it. What Basel II was said to have imposed on management, in practice hasn't worked. (Interview No. 12)

> Conceptually I think it (building a risk culture) makes sense, but in practice it hasn't really translated into that. (Interview No. 15)

7.3 Conclusion

This chapter has highlighted evidence for the superiority of Basel II relative to Basel I. Both risk managers and supervisors welcome Basel II's broader risk categories, and strengthened risk methodology, with the inclusion of the IRB approach and the incorporation of banks' internal systems, where appropriate. There is some equivocation regarding Basel II's performance in volatile market conditions. Some bank experts attribute the stronger performance under Basel II to the inclusion of the IRB approach, although reservations about the role of external rating agencies remain. Nevertheless, some argue that the entire performance is being determined by banks acting in their own best interests with the improved performance being incorrectly attributed to Basel II. Furthermore, the information disclosure provisions under Pillar Three and the capital relief opportunities derived from the adoption of the IRB approach are regarded by bank risk managers as two ways to correct for the distortions introduced under Basel I (i.e. insufficient transparency in the market being related, in particular, to structured finance products as discussed in Chapter Three; and the regulatory capital "burden" on major banks under Basel I in regard to their internal systems status).

Turning to the effectiveness of Basel II in its own right, the interview analysis was organized under four discrete headings: *effectiveness of underlying methodology*; *practicability of Basel II*; *organizational impact on banks and regulatory authorities*; and *risk culture building*.

The assessment of Basel II's underlying risk methodology acknowledged the gains made from the usage of the IRB approach. Practitioners observe that this has enabled the production of risk assessment outcomes that are closer to the real risk profile banks possess. However, the flaws of VaR approach, which has been embraced as the core risk approach under the IRB methodology, have been criticized by interviewees with evidence sourced from their experience of working with VaR-based daily risk analysis. These criticisms from practitioners coincide with the arguments explored in Chapter Five (highlighting the flaws of VaR such as incapacity to account for fat-tailed risk, sub-additivity etc, which come to the fore in relation to correlation risk, risks associated with complex structured finance products, and extreme events).

Under the IRB approach, Basel II requires the adoption of stress tests and backtests as compulsory components yet, in practice, users—including banks and regulators—report operational difficulties with stress testing and backtesting that centre on the strict data requirements, scenario-setting dilemmas, and validation issues, which emerge, especially during market downturns. Furthermore, regulators and banks have distinctly different scenario-setting benchmarks, which clearly expose differences in the character of their purposive-oriented actions and strategic interests. The decision-making of banks is driven by their business strategic interest (so their scenario-setting follows their principle of 'sensitivity'), while regulators are more conservative by nature due to their bureaucratic interest of maintaining financial stability (so their scenario-setting is downturn biased).

The assessment of the practicability of Basel II reveals a divide amongst respondents. One stream of comments support Basel II, with the argument that it jumps the theoretical hurdle and is empirically more workable in regard to internal modeling and use of in-house experts, while the other stream identifies potential problems relating to an over-sophisticated methodology and restrictive data requirements (for certain banks). Furthermore, under Pillar Two rules, Basel II advocates that a qualitative component be added to the banks' quantitative risk analysis, but this conception is not aligned with banks' understanding of managing risks, thus exposing potential for communicative distortion.

The organizational impacts of Basel II on banks mainly arise from the implementation of Pillars One and Three, while the impact on the regulatory supervision process is

more obviously associated with Pillar Two. Based on comments from bank practitioners, the expected capital relief from the adoption of the IRB approach is the major reason for banks to favor Pillar One over other pillars. Information disclosure under Pillar Three contributes to bringing transparency to the market and thus builds market awareness. Particularly, bank risk managers cite the influence from market participants on prices and funding costs that would discipline banks' risk-taking activities. However, they point out that external ratings and regulatory enforcement have more direct power on disciplining banks' risk-taking behavior.

Supervisors note that the guidelines and information about supervision under Pillar Two has had an effect of formalising the supervisory process, and they admit the existence of "functional change" as evidenced by an adjustment to risk buckets and increased emphasis on adopting stress tests for regulatory purpose etc.

Overwhelmingly, there are numerous comments affirming the efforts of Basel II to build risk culture between the banking industry and the broad market. The education of bank boards, adjustment of risk function role, and change of risk knowledge and ethics of front-line staff have been witnessed by interviewees and provided as evidence.

Overall, the superiority and strength of Basel II in contrast to Basel I is apparent. However, certain issues or aspects are still points of contention between regulators and banks, or even between bank risk managers who are from different bank types. As a result, the assessment report on the effectiveness of Basel II cannot provide a clear black or white answer.

Therefore, the next chapter is going to focus on these more contentious issues emerging from the interviews, going beneath the 'headline' conflicts, to hopefully draw a more comprehensive picture of the effectiveness of Basel II. The relevant issues include such matters as the extent of capital relief, the role of external rating agencies, and the divergence between the banks' sensitivity forecasting versus the regulators conservative downturn bias.

Chapter Eight

Concerns about the Problems arising from Basel II Implementation

8.1 Introduction

The distinctive contribution of qualitative research lies in its ability to move behind a comparative static analysis of outcomes to reveal underlying processes of implementation and adjustment. In the previous chapter, the effectiveness and superiority of Basel II compared to Basel I was evaluated by interrogating practitioners, bankers and regulators working at the 'coal face' of risk-management and prudential control. This evaluation foreshadowed a series of problems that had arisen during Basel II implementation, which could loom larger in the future and these are going to be explored in detail in this chapter.

The first section will discuss the alleged burdens of Basel II implementation that relate to the complex nature of its underlying risk-assessment methodology and strict data requirements. The second section investigates the possibility of competitive disadvantage deriving from the adoption of the IRB approach. The discussion in this section ranges over the scale specific nature of capital benefits, the expectations gap in regard to the prospective magnitude of any capital relief, and the impact of imposed regulatory buffers. The third section weighs up the pros and cons of retaining a system of external ratings within Basel II. The fourth section addresses the problematic nature of securitisation, especially in relation to its connection with practices of regulatory arbitrage. The fifth section investigates the issues arising from cross-border supervision in detail, while the sixth section focuses on issues or potential problems coming out from Pillar Three information disclosure requirements. The seventh section of the Chapter hones in on issues pertaining to Pillar Two risk requirements. Finally, the Chapter finishes with concluding observations.

8.2 The Burdens of Basel II Implementation

Information gleaned from interviews undertaken both before and after the sub-prime crisis reveals that problems arising from Basel II implementation could go well

beyond those issues primarily exposed by the crisis. In particular, certain of these issues have emerged from interview commentary that has revealed a potential for conflict between regulators and bank risk managers. Encounters with problems of this nature would be expected from the Habermasian perspective adopted in this thesis, because bureaucrats and banking personnel pursue different strategic interests. Conflicts of this kind have the potential to undermine the effectiveness of the Basel II framework in relation to its objective of stabilizing financial markets.

The following first section is going to expose the burdens confronted by banks in Basel II implementation, as reported by interviewees. The first two subsections (8.2.1; 8.2.2) are related to the methodology and relevant data issues.

8.2.1 Excessive Complexity of Underlying Methodology

As discussed in Chapter Seven, the broader risk categorization and strengthened risk methodology of Basel II are seen as important corrections to the simplistic approach adopted under Basel I. Nevertheless, some interviewees argue that Basel II's risk methodology has erred too far in the opposite direction:

> Well, I think it's the old simplicity versus sophistication argument com(ing from) both sides really. (Interview No. 6)

> I think it's true that probably banks' … (Basel II) sophistication has gone a *fair way ahead* of Basel I, but as (for) all the historical data (being) there, and the system (being) in place to really justify using a Basel II model? No! (Interview No.6)

The interviewees who are worried about the sophistication of the Basel II methodology are mostly from the smaller banks. There are a few banks that have more advanced internal systems than most of the regional banks, but less mature internal systems than the major banks. This type of middle-sized bank may be trapped in a dilemma: on one hand, the benefit from adopting advanced risk approaches triggers a willingness to obtain IRB accreditation from regulators; on the other hand, the status of their internal systems and relevant data storage means that they are comparably less able to adapt to and exploit the flexibility afforded by the Basel II IRB rules.

> But similarly, moving to Basel II is probably over-complicat(ing) things; (we) got ahead of ourselves, we cannot see the light (through) the trees; I think it's just *too much*, it is just over sophisticated, over-complicated. So you know, it was both ways, is it too simplistic on the Basel I? Yes. Is Basel II Pillar One or Pillar Two better suited? If you talk to management, the CEO, CFO, the feedback I get is, "this is crap. (Interview No.14)

The above quotation reflects the straight forward, yet critical attitude evinced by staff from the smaller banks towards the burdens associated with the complicated methodology arising, not only from Pillar One, but also from the consequent higher regulatory requirements in regard to the banks' risk assessment processes under Pillar Two.

However, complaints about the excessive complexity of Basel II also come from some representatives of the major banks that have mature internal systems and can draw upon sufficient experience. The comments of the following interviewee are typical of this group:

> It's all the problems you would expect from any major implementation project. It is just the sheer complexity of the regulation as well. It maybe that ('s) how big (the) exercise (is) compared to Basel I. How to explain that, how many pages or paragraphs? The question is covering so many risk types, so many different modelling approaches in there. It's quite a chunky regulation now as well (Interview No.8).

8.2.2 Strict Data Requirements under Basel II Framework

Amongst the interview responses addressing methodology-related issues under Basel II, the most discussed implementation burden concerns the strict data requirements, which represent a large component of the implementation cost that banks must meet[392]. This aspect of the implementation cost applies both to majors with an

[392] The interviewees advised that qualified data is less affordable for the smaller banks. For instance, Interviewee No. 1 stated that: "probably less at the regional bank, we were hoping the cost would end up at a standard approach, because I guess as an example (bank's name) will struggle (more) to cover the cost of data. Instead (bank's name) and other major banks write a billion dollars of home loan(s) every week, so it's not much really to cover those significant

advanced IRB and to their smaller counterparts with a Foundational IRB. As pointed out by one of the interviewees:

> It's certainly a (case of) credit and operational modelling almost being caught up in sophistication to where market risk model being out in about 10 years, now in terms of being in a very model driven approaches, obvious less data there (Interview No. 7)

Under Basel II, the data focus has been on the quality aspects such as the length of time and downturn data, rather than on size of the data pool. This actually constitutes a barrier either for banks with only a short commercial history, especially when data was mainly collected during the past upturn in market conditions preceding their Basel II implementation, as revealed by the following interviewee responses:

> I think that's the reason why only the major banks will be able to get accreditation (for) adopting (the) more advanced approach, because most (of) the others don't have sufficient history or data to build their bases. It would also mean that (for) all banks entering into emerging market(s), both APRA and FSA (would) check the models using their benchmark, which is at a much more conservative level...so, I think, yes, definitely there's sufficient data in the system in the major banks, but the ones (who have) been around for less time, that have less sophisticated system(s), are going to struggle, and that's probably why NAB hasn't achieved their advanced status. (Interview No. 2)

> (It's) Not (a problem) for any of the banks that have been accredited[393] so far. Having worked in small financial institutions, high quality data storage, high quality data (re)tention of customer application(s), subsequent customer behaviour, was not historically common practice. (Interview No. 9)

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costs." Similarly, Interviewee No.6 complained: "definitely, it's expensive. It requires a lot of system changes, and people maintaining that data". Interviewee No. 7 continued along a similar vein: "I got a rough idea of what they (regional banks) spend, so that sounds not pretty good, but nonetheless this (idea) of proportionality should be in play sustainably. Also if you aspire to be an advanced bank then you (have) to have an advanced system. It's kind of (a) theme we are getting. So that cost is a real cost for smaller bank(s). There would be a break even point."

[393] In this comment, "the banks have been accredited" mainly means the major banks which have been accredited by APRA to adopt advanced IRB approaches.

As a regulatory framework which centers on entire financial market stability, Basel II, by its nature, should include downturn data as an essential component of its data requirements to ensure 'prudent' control over the banking system. From the bank practitioners' point of view, their short but unrepresentative historical record becomes a hurdle in satisfying regulators' 'strict' requirements:

> We actually haven't suffered enough internal losses to be able to model our own LGDs, and their requirements are quite strict on how you use external data. To do that, until we start losing more money, we are not going to have the right data for us to get to that point. We have literally lost not very much money over the last 10 years or so at all. There are various reasons for that, but I think that the main differences are, in the ability to model your own losses, in terms of capital differences. (Interview No. 11)

Even for the major banks with a long history, data requirements are still a regulatory burden, as explained by the following interviewee:

> When they get (to) the modelling, (it) has to go back to the *full economic cycle*, which was going back to the 90's. A lot of information that was needed wasn't electronically held anymore … so some exercise(s), like go to warehouses, get lots of dusty boxes, go through information to get the information for the models. So getting the data was a big issue. (Interview No.13)

Likewise, all supervisors emphasized their concern about data quality and acknowledged the difficulties for banks to achieve convincing outcomes when incorporating their currently stored internal data into their Internal Capital Adequacy Assessment Process (ICAAP)[394]:

[394] One of the bank practitioners who is responsible for Basel II reporting also confirmed that whether the data which banks obtain could fit in the ICAAP and produce convincing output to satisfy regulatory requirements is challenging: "From reporting point of view, because that is the way I see it, it is hard to apply the rules with the data we have, a lot of it is judgement. So ok here are the rules, here are the haircuts you have to take, and here is the....., you translate that into the data, it is not easy, with what we have, in terms of the data, it's difficult to put in practice." (Interview No. 14)

> I think collecting sufficient data is always the problematic part, especially sufficient quality data, which means, the point is they need to make sure they fit data in (to) ICAAP proper. (Interview No. 3)

> We have to be quite sure (of) the quality of that, and how well it can fit in their internal system. The data should be as good as we require, not just as much as they can collect. (Interview No.4)

> Their focus should be put on having "meaningful" data. (Interview No.2)

While the complaints about data requirements emanating from the banking sector reflect the divide between policy-makers and bank practitioners regarding their respective practices and different philosophies on risk control (as reflected by Basel II data requirements, policy-makers are more focused on downturn considerations in contrast to banks), the banking practitioners nevertheless appreciate the reasons for supervisory anxiety.

As discussed in Chapters Five and Seven, the statistics-based risk approaches banks adopted, particularly with historical data, tend to be backward looking, which becomes problematic when market have prospered over a long boom period. This weakness is highlighted in the following response:

> I think it's[395] not really a problem. (In) one sense, it's (a) technical and systems issue…the main problem is just that Capital and Basel calculation(s) are supposed to be based on *downturn values* - kind of long run average value for defaults. What's a long run? You have to go back 20 years to get a good set of downturn data and banks just weren't collecting it. And lack of level of detail, it's more of a(n) issue I guess, even now the systems are in place to monitor collect(ion of) it. Particularly, we (have been) in a favourable macro-economic environment (for) more than 15 years, making it hard to guess what the next downturn (will) look like." (Interview No. 14)

Even backward looking risk assessment approaches can be supplemented, for regulatory capital calculation purposes, by scenario-based approaches such as stress

[395] The amount of the data, according to the interviewee, is not a problem.

testing. Of course, how the proper macro-economic scenarios should be constructed is arguable, and differences may arise between regulators and banks in relation to benchmarks chosen for scenario analysis (as discussed in Chapter Seven, section 7.2.2.1.3—Stress Test). Adopting the regulator's bureaucratic interest is said to generate a *non-sensitive* risk estimate output, while adopting the bank practitioners' point of view is said to generate a *sensitive* risk estimate output. The following comment highlights the practical difficulties for almost all the banks in implementing the relevant Basel II rules, in a more general sense:

> I think in our case, and many other cases, a lot of the regulations are difficult to translate into data terms, and that creates issues for us and for 99% of the banks out there. […]
>
> Because some of the rules are not black and white, it's not something you can translate into data terms. (Interview No. 13)

The interviewee continues in this vein:

> And on the collateral side for instance, *certain things are subjective as well, mak(ing) it hard to actually collect in hard data*. (Interview No. 13)

As previously discussed in Chapter Two, the decision-making that economic agents face is not only conducted under the condition of risk, but also that of uncertainty. In relation to the prevalent risk techniques (i.e. VaR) explored in Chapter Five, banks currently focus on risk premia, ignoring time-varying uncertainty premia. Some intimation of this comes through in interviews with bank risk managers:

> In terms of the data, what is going to come out of your risk engineering is if your data is not clear, transparent, complete, what's going to come out is going to be a lot of issues. And that's going to be an over-riding concept throughout this whole thing. (Interview No. 13)

This aspect of decision-making under uncertainty applies with notable force in the case of entirely new financial products, as revealed in the following interviewee response:

> Sometimes it's just impossible. So for example, if we've got a new business in a new jurisdiction, obviously we are not going to have any internal data. *In some parts of the world there just isn't any internal data*. So it's often quite difficult to find relevant external data, for some investment products that are brand new. There's nothing compatible to those data, in a lot of cases, it is just not possible. (Interview No. 11)

> The main reason is because it's new businesses and things like that, and we don't have the data, which is standardised, but then there are quite a few products which are the reverse. (Interview No. 9)

Since banks that adopt the standardised risk approach still rely on external ratings, complaints about strict data requirements of Basel II are sourced mainly from those banks that are preparing for IRB accreditation. In summary, although there are implementation cost burdens, difficulties with advancing internal systems, and collecting qualified data for IRB accreditation purposes, the potential capital relief from adopting the IRB approach motivates these banks.

8.3 The Possibility of Competitive Disadvantage relating to IRB Approach

8.3.1 IRB Approach introduces the Possibility of Competitive Advantage

As discussed in the previous Chapter (section 7.2.1.5, p.268), capital relief, derived from the adoption of IRB risk approaches under Basel II, is regarded as the major motivation for banks to invest in their internal systems because this benefit could help banks to achieve *competitive advantage* in the market, whilst offsetting certain investment costs:

> You know if you got good process in place, you('d) be allowed to have (expected capital benefit). If you('ve) got good process and could handle your risks, that would translate into (benefit) at some point in time. (Interview No. 6)

In general, because banking is a typical "scale" business, such "tangible" benefits delivered to banks in the form of reductions in regulatory capital-holding, could provide them with extra flexibility in capital management. This would directly bring

IRB users to a more advanced position in the market compared to other banks. Banks that still rely on external ratings under Basel II, that is, those adopting the standardised approach, are in a comparatively "detrimental" position:

> The ones (that) cannot use their internal rates end up in a more detrimental or conservative position than the (major) ones do, but then the offset to that is we are finding a lot of anomalies in ours because we rely on our internal systems… (Interview No. 1)

In addition, for those banks that adopt more advanced IRB approaches, there are potentially significant longer-run benefits associated with the reduced cost of system updating, as revealed in the following response:

> Look you got majors spending hundreds of millions on this. It's not gonna hurt them much in (the) LR (long-run). If they get capital benefits, they get good decision making capabilities, the pay back on this is pretty good, (because there is) the large potential benefit out (of) it as well. (Interview No.7)

8.3.2 Debate on IRB Accreditation between Regulators and Banks

The direct target for banks to invest in system updating is to obtain IRB accreditation. This triggers a debate, between regulators and banks, as to the appropriate extent of IRB accreditation. Once banks have made these investments, failure to gain accreditation has an on-going negative impact, as revealed by the following responses:

> Although it has the negative impact of meaning that our models aren't going to be improved, we do get benefits internally out of improving our models, and that's a good thing to be doing. But it doesn't encourage us if we are not getting recognition from the regulator on improving our risk modelling, improving our processes, improving our data, that's very important. (Interview No. 10)

> It's frustrating I think, we are in the same boat, a lot of the Australian banks have experienced that. The one example that comes to mind now

> is our loss-default model for mortgages, where as I understand (it) … none of the Australian banks have had approval from APRA. (Interview No. 11)

In addition, for those major banks that have been accredited to adopt the most advanced IRB risk approaches, there is still a problem. As explained by the following interviewee, their newly developed internal models designed for new products are normally excluded from the pool of internal models accredited for regulatory risk estimation purposes. This creates potential problems in determining sufficient regulatory capital to hold against the risks from trading new financial products[396]:

> Many … businesses and portfolios, many products can't fit into the Basel II framework, but we can model … what we think is correct as to get the right measure of risk. For example, Margin lending is effectively standardised (at) this 20% risk weight, because it doesn't get into the IRB framework. We used to model the risk on margin lending internally with our economic modelling, and we just can't use it for regulatory capital. Mortgages is another example, it is like that. Many of our investment products, capital protected investment products, and some of the more complex structured products, they don't fit into B2. We can model them as best we can with our internal models. Therefore, I would say in a lot of cases yes (IRB under Basel II with just those approved internal models can make risk estimation closer to real risk), but then there is quite a few cases where it can't. (Interview No. 10)

From these comments we can glean that bank practitioners are confident about their internal models and systems but they recognise that accreditation of internal models for regulatory capital calculation purposes should be 'prudent' given the regulatory interest in maintaining financial stability. For banks adopting the advanced IRB approach, the quality of their internal models and their experience in using them are determining factors in obtaining updated approval, as revealed in the following response:

[396] Similarly, another interviewee points to the same issue: "well obviously Base II is much better, it is much more grander…it's not much improvement on the credit risk side, but once again it still (has) got to re-value a lot of products (new products)." (Interview No. 12)

> Banks that get accreditation to use the IRB approaches can already do those themselves, using their own internal models. The difference between internal model(s) and the regulatory model is really a judgment call about a procedural robustness. So for instance, we had internal models that are analogues to IRB models in 1997, but we were accredited for Basel II in January 2008—11 years after we introduce (d the) model for our purpose. And we would not have got accreditation if we hadn't had the history of using these internal models. (Interview No. 8)

The majority of interviewees from the banking sector complain about the shortage of resources allocated to them by regulators for purposes of obtaining accreditation:

> I think the main area being problematic in both Australia and UK, is how it is implemented versus resources allocated to us by the regulators. Most of the frustrations from implementation, ha(ve) been like APRA is still confirming policy decisions of the Australian banks, and UK likewise. There are a lot of things banks would like to implement such as methodology but (this is) not approved. We put our proposal (in) 12 months ago, their lack of resource(s) meant they are still approving. (Interview No. 1)

As argued in Chapter Seven, the advantages of IRB accreditation relate to the capital benefit derived by banks. The larger the number and variety of internal models that banks gain accreditation for, the greater the size of the potential capital reduction they could conceivably achieve. As such, the position of respondents from the banking sector is largely driven by their profit-chasing orientation and related strategic interests. The perspective of regulators towards IRB accreditation, however, with their concern for the maintenance of financial stability, is one based on scrutiny and, as such, attracts criticism from bank practitioners for its *conservative* and *non-sensitive* or “bureaucratic” character.

For many bank risk managers, this conservatism is expressed in the inconsistency between their expectations about the likelihood of IRB accreditation given the cost or effort spent in seeking regulatory approval:

> Especially when they put in a lot of time and effort, and resources, into develop these…and don't get them approved. (Interview No. 10)

> I can see it's *a painful exercise* to go through—to have the regulator come in and stress test internal models, because they (are) always going to start from a conservative bias. (Interview No. 10)

In particular, as one interviewee points out, to satisfy regulatory requirements banks are forced to invest more than they would for commercial purposes, due to the excessive technical complexity of systems that are required by regulators:

> I think the more they have to invest, for regulatory reasons, the more sophisticated credit risks (applying) there. For business decisions, you can actually have your level below this (regulatory level). (Interview No. 7)

However some interviewees from the banking sector are more sympathetic to the regulator's stance:

> But you know, APRA have their reasons for not approving them, I think some of the banks have been fairly aggressive, in terms of the models they have taken to APRA, and that's probably not appropriate… (Interview No. 10)

The decision about how much to invest in internal systems needs to balance the investment costs against the capital benefit on offer, especially the long-term 'intangible' benefits derived from an enhanced ability to compete with others:

> Again it's a cost-benefit exercise, because there will be substantial cost involved moving to an advanced approach. There is more system enhance(ment) cost, project costs, and those issues. There is significant cost, but then again, they benefit more from the front line, to be competitive against other banks on advanced approach and so on. So we do have to do the cost-benefit analysis, and determine where we want to go. (Interview No.15)

Supervisors also recognise the incentives for banks to update their internal systems. They emphasize that the calculation of costs and benefits are judgment calls for the banks[397]. The incentive is there, but only for those that can pass scrutiny by the regulators:

> We won't push them to invest in adopting (the) advanced approach especially when they are not ready. For banks themselves, they won't choose to invest heavily if they are not that close to getting accreditation from us. They definitely will consider the cost and benefit. That depends on their judgment, whether or not there is an incentive. (Interview No. 5)

As concluded by a bank risk manager—"*accreditation results directly impact on (a) banks' incentive" (*Interview No.10). Further, supervisors emphasize that the risk approaches adopted or expected to be adopted by the banks should suit both their internal systems and their business structure:

> Those banks (who) are accredited (as) using more advanced approach(es), have complex business structure(s) and their products are more risky in contrast to those less sophisticated banks which adopt (the) standardized approach. For the case of less sophisticated banks, they won't get benefit from adopting (an) advanced approach, because there will be higher cost and even burden for them. (Interview No.5)

To conclude, in this debate over IRB accreditation, supervisors make it clear that banks need to rationally understand the intention of Basel II in adopting the IRB approach, and look closely at their internal models and systems. The flexibility intended to be delivered by Basel II doesn't mean aggressive model-driven competition. To maintain the stability of the entire financial market, responsible regulators will impose prudential controls that extend beyond the banks' own risk

[397] The vital role of cost-benefit analysis in banks' decision-making is not only reflected in this IRB accreditation debate, it obviously applies to almost all decision-making, including investment to obtain higher credit ratings, as the following interviewee suggests: "Well that's a business case study for them, I mean, would gains (from) the cost give them that higher credit rating? Could be that, they could have the most dynamic system in the world, but you are still a small bank, but (its still) hard to get a high credit rating; it is up to them to decide if it is worth it or not." (Interview No.12)

management practices. The implications of this regulatory aspect must also be carefully considered by banks in relation to their decision-making activities.

This debate, revolving around IRB accreditation, is characterized by the different respective responsibilities and interests of the two protagonists; and basically boils down to how many of the internal models that banks have developed can be approved for the calculation of regulatory capital holdings. Associated with this discrepancy is an argument as to who stands to benefit the most, and who is likely to be disadvantaged comparably under Basel II. This issue is explored in the following sub-section.

8.3.3 Major Banks Benefit More and in More Advanced Market Position

The debate surrounding the purported competitive disadvantage from Basel II arises from the assertion of the banking industry that the targeted beneficiaries of Basel II are mainly the major banks:

> Basel II with certain changes … target(s) more … the large banks, because those large and complex banks are disadvantaged more under Basel I, in terms of the development of their internal systems… (Interview No.1)

> *Basel II is more target(ed) on the large, and complex banks.* From Australia's case, I don't think even the large Australian banks could exactly fit very much in that framework - not like Citi Bank and Deutsche Bank…they have certain scope to fit in Basel II. (Interview No.2)

Even when smaller banks are successful in gaining IRB accreditation, they can still operate at a disadvantage in regard to larger banks:

> Well in IRB they (less-sophisticated banks) would be hogging more capital, mak(ing it) …harder (for them) to compete, which is what happened with (bank's name). So when you are not advanced, it is one of the factors (that) influences their overall rating, which made them susceptible to be(ing) taken over. Banking is a scale business; if you don't have the scale it is harder to be competitive. (Interview No. 12)

As explained in the following comment from a banking sector representative major banks will always possess have the capability to apply more advanced and effective modelling techniques:

> I think the major four banks would be the most to benefit, just because they have the ability to apply advanced method, (and) would see the industry reward in terms of reduction in capital levels. But I guess less sophisticated banks that apply standard available tools will probably see less benefit, especially given that the way that APRA has started to bring Basel II in practical application is fairly conservative in what risk weight(s) standard players have been allowed (to) use for certain products. Like a risk weighted vanilla home loan for example, (to) be capped at 35% for a standard bank, where as if putting that through our system for example, we might get 20%. The change in capital (that) can be held for one of the smaller bank(s) versus the majors is fair(ly) significant, which might benefit long term...might encourage less sophisticated banks to try to improve their risk management system to get themselves to be in a position to be able to use the advanced approach. (Interview No. 1)

As one experienced risk expert from the banking area observes, smaller Australian financial institutions may well receive favourable capital benefits under the Basel II rules due to nature of their business structure (i.e. because they are mortgage based businesses):

> It isn't true that major banks get more capital relief. The way in which Basel rules work, are geared to provide the biggest production on a margin basis for banks with a high percentage of mortgage(s). In Australia, small financial institutions are mortgage institutions. Home loan is where … the action is for Basel, so their relief as a proportion of their capital may well end up being greater than (bank name). Because (a) large international bank, has market risk, complex operations, has a corporate lending business, (it) receive(s) less generous relative treatment. They are more risky business(es) than a mortgage business. Does that mean that a small bank will think that there is a fair payout?

> Possibly not, why not? Well, mortgage business(es) by their very nature have not historically (been) attractive investments, so there is (a) bigger hurdle to get over to the advanced stage you've got to have 7 years of historical data, that's hard. For mortgages that are lots and lots of counting thing(s), lots and lots of years of history, monthly records etc. (Interview No. 9)

Nevertheless, as the second part of the above quote suggests, in practice outcomes can still diverge from theoretical presumption because various obstacles (including the burden of strict data requirements) prevent smaller banks from adopting the more advanced IRB approaches

Australian regulators must attend to the possibility that the competitive advantage flowing to the major banks under Basel II, could amplify the unequal relationship among banks of differing scales, which might well threaten the survival of small financial institutions. To ensure balanced competition within the financial market, particular during the interim period of Basel II implementation, APRA has imposed a regulatory buffer—20% Loss-Given-Default[398] (LGD) floor on residential mortgages for IRB users. This buffer serves to offset some of the capital reduction advantages that might otherwise flow from the additional flexibility associated with internal modelling.

8.3.4 The Non-Sensitive Nature of the Regulatory Buffer imposed in Australia

In opposition to the previous argument that Basel II differentially advantages the major banks, supervisors insist that Basel II is designed to deliver proper benefit to *all* banks so there should be no significant inequality:

> Basel II is designed for all ADIs' implementation. And there should be *equality* there. No matter major or small ADIs, all of them will benefit from Basel II. (Interview No. 5)

[398] Loss Given Default or LGD is a common parameter in Risk Models and also a parameter used in the calculation of Economic Capital or Regulatory Capital under Basel II for a banking institution. This is an attribute of any exposure to bank's clients.

Australian regulators ensure that the regulatory treatment delivered to banks is based on criteria for what is *proper* and *equal*, which means all banks should receive what they deserve in respect to their business structure and system status:

> From APRA's point of view, different type(s) of banks will get *proper treatment* under Basel II. No one will benefit more than others, because the approaches they can adopt under Basel II are accredited according to the nature and structure of their systems. So, under Basel II, all of them benefit from their suitable approaches, and those benefits are *equal* for them. (Interview No. 5)

Furthermore, as noted above, beyond the supervisory process, APRA takes action through imposing a regulatory floor (20% LGD floor) to diminish the competitive disadvantage that smaller financial institutions might face:

> There is certain capital relief for banks, particularly for advanced banks, but there is regulatory floor as well, based on prudential control consideration(s). We don't want any of them (to) have much significant capital reduction, much more than others.[399] (Interview No.3)

Accordingly, supervisors are confident that no fundamental change should be introduced in response to differences in scale or competitive capability under the Basel II implementation:

> There won't be fundamental changes in Australia. As I said earlier[400] … advanced Australian banks will benefit (the) same as less sophisticated banks here. (Interview No. 4)

Although the imposition of a regulatory floor by Australian regulators is designed to diminish the potential benefits derived by larger Australian banks that have adopted the IRB approach, almost all bank practitioners uniformly criticize this regulatory

[399] Similarly, another comment from a supervisor also expresses such opinion: "No, there is no(t) much difference between banks adopting the advanced approach and standardized approaches, so no matter for major banks or less sophisticated banks, they all get the proper treatment according to their internal systems and result coming out from their ICAAP". (Interview No.5)

[400] This interviewee states that no competitive disadvantage occurred in the less sophisticated banks due to the adoption of IRB approach by the major banks. In his opinion he denies the existence of the fundamental changes based on the argument that all banks benefit equally under Basel II.

floor, complaining that it is 'non-sensitive'401. As such, they complain that it can only have a negative impact on the incentive for updating internal systems. As revealed in the following response:

> APRA is grilling. As you sort of, got to use down-turn loss-given-default (LGD) to calculate your capital. So it forces the whole model beyond the normal model. (Interview No. 8)

Bank practitioners complain that this buffer is entirely based on the bureaucratic interest of national regulators and is inconsistent with banks' risk profiles and model status. It is in this precise sense that the banks describe the 20% LGD buffer as non-sensitive[402]:

> I think it is *cherry-picking* a lot of these things, because it is concerned with the current environment, and doesn't want to see banks reduce their capital. Similarly with 20% floor on LGD for home loans, we never lose 20% on a home loan. (Interview No. 9)

In particular, some interviewees provide examples to demonstrate how large this inconsistency between 20% LGD floor and the banks' risk profiles has been in practice:

> They (APRA) (are) always conservative. Margin lending (has) been a big business for us as well. When that 20% came out, we said ok, that's high, higher than we think it is, higher than the bank's expectation. I would say *at least double*[403]. (Interview No. 11)

> 20% LGD floor is not sensitive, but (APRA) they call it proper. I think 10% LGD floor fits in our model better. Comments-our own kind of in a sense, removed sort of our risk sensitivity. (Interview No. 7)

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[401] It should be noted that although the Basel II rules only mandate a 10% charge for residential mortgages for banks choosing to adopt the IRB approach, APRA has chosen to impose a 20% LGD[401] floor.

[402] Similarly, another respondent complains that, "The rules that they sought to introduce for margin lending, in particular, aren't consistent with our experience, for the matter of risk portfolio(s). So those rules are a good starting point, but they aren't quantitative, they don't reflect the risks in the customer, how much the value (of) the share you lent against, customer behaviour, anything like that, they are just simple rules, so that will need to be revised" (Interview No. 8)

[403] Another interviewee (No.9) also indicated 20% is double the number estimated by the banks: "now all our modelling, says 10% is a more likely number" (Interview No.9).

> The 20% or higher LGD is fairly non-sensitive. Especially for low LVR[404] loans, so that's frustrating for banks. (Interview No.10)

As a consequence, bank risk managers point out that this regulatory adjustment of Basel II rules impairs the banks' incentives to invest in system advancement under Basel II:

> My problem with Pillar Two is, we go to all the trouble of having our own risk estimates and having the regulator approve risk estimate(s), but then they also have the option of adding on buffers, if they are not happy with things like risk estimates. (Interview No. 13)

> Potentially, a bank isn't going to put in the time and effort to improve their models if they don't think they (are) going to get any benefit, and that probably (has) already happened. I mean since they implemented the 20% clause, which APRA has said, (is) until banks can produce something that's acceptable. I believe APRA have overlaid some rules around how much capital can be reduced by. I think they (are) only allowing it to be reduced by a certain amount, regardless what the model say(s). There is some overlaying sense … that they are applying. And I don't think that's going to last forever. (Interview No. 8)

Interviewees from the banking sector stress that Basel II is supposed to promote a so called 'sensitive' risk measurement output. Accordingly, they argue that the non-sensitive nature of the regulatory adjustment stands opposed to Basel II's intention of delivering certain flexibility to the banks in regard to their risk management practices:

> I think it was actually more of a problem and it does have a bit of a Basel I feeling about it as well, because it is just mandated - a mandate(d) risk weight. (Interview No. 15)

> I think that's their (regulators) intention, but I think that goes against the intention of Basel II as a whole, which I think is to have risk estimates and capital more correct , more sensitive. So we have that in place now, all the advanced banks have that in place now. But really at

[404] LVR is loan-to-value ratio.

> the end of the day, the regulator can just defer to the way they used to do it, and then just give us an arbitrary number, but I think it still gives us a lack of control over our own estimates. When we follow all the requirements, APRA are happy with risk estimates but at the end of the day they can still have the ability to add on.[405] (Interview No. 14)

The comments from supervisors acknowledge that the 20% LGD floor is not based on the risk profile of banks, conceding that it is being imposed to dampen processes of adjustment during the Basel II implementation period. However, in part, they blame the absence of reliable data:

> I think it is not risk sensitive enough. (The) 20% LGD floor is an example of that case. We set this number because the data that banks possess cannot generate very sensitive numbers, as they (are) expected or being required (to do). (Interview No. 4)

> I know there is a lot of discussion of this LGD floor. Actually APRA consulted certain experts about setting this floor, and when the report came out, they suggest this number[406]. May be it is not sensitive enough according to banks' exposure, but that is proper as (a) regulatory floor during (the) interim. (Interview No.5)

Moreover, the regulators go on to observe that this regulatory floor can be further adjusted, but the pre-condition is that the banks' data and models must first satisfy their strict prudential requirements:

> From APRA's point of view, we need to set a little bit higher regulatory rate. Once they have sufficient quality data and their capital holding can

[405] There is another comment reflecting a similar opinion from the bank risk experts: "I can see why the regulators are doing it, because they still want (the) opportunity to say, actually from a bank wise perspective we still have general concern about your risk management process…And then I think at the end of the day they would just have a buffer." (Interview No.14)

[406] An interviewee in the banking sector also provided similar information, but he thought this bureaucratic behaviour of regulators hampers the incentives of banks for advancing their risk estimate systems: "They had some external advice, and 20% was that number. Possibly recently we've seen that number is a bit more realistic than we thought, but I think, basically what they said is, that is the number, until we think of a better way to do it. So I think it is deliberately conservative." (Interview No. 9)

> satisfy APRA, we will lower the rate according to their ICAAP output. (Interview No. 4)

> But when banks' models and data, are ready for (a) lower LGD, we will give them what (is) suitable for them. (Interview No. 5)

Despite the complaints about the regulatory floor, a few bank practitioners have obviously learned some lessons from the recent financial crisis, as the following comment indicates:

> I think 20% is ..., I mean there are cycles in the markets, so in good times, yes, it looks high, but in bad times, who knows? Look at the UK markets, I mean mortgage values have come down. They are in recession; put this in the UK's housing context today that model looks too high. (Interview No. 1)

8.4 The Issues with External Ratings

Under Pillar One of Basel II, banks without IRB accreditation are required to adopt the *Standardised* approach that uses external ratings from rating agencies for regulatory capital-holding calculation purposes. Alternatively, banks that are "qualified" to use internal systems can calculate their own regulatory capital-holdings. Those banks that use *Foundational* IRB are allowed to develop their own empirical models to estimate the PD (Probability of Default) for individual clients or groups of clients, but are required to adopt the regulator's prescribed LGD and other parameters for calculating their RWA (Risk Weighted Assets). In contrast, *Advanced* IRB users are allowed to use their own quantitative models to estimate PD, EAD (exposure at Default), LGD and other parameters for regulatory capital calculation. In Australia, only a small proportion of banks received IRB accreditation[407] under Basel II, while most of the smaller, and especially regional, banks still rely on external ratings[408].

[407] The previous discussions on the IRB accreditation debate, and strict data requirements revealed that regulators' requirements for IRB approval are very restrictive. Therefore, only the banks with mature internal systems and comprehensive datasets (mainly the major banks), can attain authorisation to apply the advanced IRB approach.

[408] The following answers from banking interviewees highlight this difference with Interviewee No. 12 suggesting that, "[…] with large exposure you can map to external data. You know S & P and stuff like that. We use some external data for some modelling, but we assign our own credit

However, in conformity with arguments made in Chapter Three, as revealed by the sub-prime crisis, approaches relying on external ratings have been tainted by the "profit-driven" orientation of the credit rating agencies, which has triggered wide-spread doubt about the reliability of these ratings (also refer to technical discussion of the weakness of prevalent risk approaches adopted both by banks and rating agencies in Chapter Five)[409].

The alleged problems with external ratings create a headache for banks adopting the standardised risk approach under Basel II, as is evidenced in the following response:

> The problem was it went against one of the key principles of Basel II—IRB. So different to the rest of the Basel II … those banks adopting (the) standardised approach, rely very heavily on external ratings rather than internal risk assessments. And those external ratings from the ratings agencies have been shown to be fundamentally flawed, which means our measurement of the risk is fundamentally flawed, and our capital requirement is fundamentally flawed[410]. (Interview No. 13)

The proceeding evaluation of the role of external credit agencies and external ratings generally will be organised under three sub-headings: first, there will be an appraisal of the profit-driven nature of credit ratings; second, the impact of adopting external ratings on the effectiveness of Basel II will be explored; and finally, arguments for retaining external ratings in banks' risk management processes will be addressed.

8.4.1 Profit-Driven Nature of Credit Rating Agencies

The profit-driven nature of rating agencies has been exposed heavily by the sub-prime crisis. Those bank risk managers who have an intimate experience with these agencies

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rates to companies." In contrast, Iterviewee No. 14 observes that, "[…]or mortgages, we rely on external ratings" (Interview No.14).

[409] A risk manager points out that the principle of reliable rating should be "more to do with your risk appetite and your risk profile in general, and should drive that…I mean all these things get back to what (your) risk appetite is and what business do you do, and what level of risk you want to take, and how good your systems are therefore." (Interview No.7)

[410] As quoted in Chapter Six (p.248), another similar comment also reveals the flaws of VaR as the main risk approach used by credit agencies and also banks, particularly when dealing with structured finance products i.e. CDOs: "I think the problem with CDOs is that all the models you use, not just VAR, but (other) models, you know the models used by ratings agencies to determine required credit enhancements for ratings, they (are) all proven to be flawed." (Interview No.14)

and their 'products' i.e. external ratings, provide critical evidence to this effect. One respondent complains that the profit received by external rating agencies has encouraged them to offer "favourable" ratings to their customers allowing them to provide low cost credit:

> *I think most of the benefit(s) are in the investment grade cooperates,* where previously an Australian bank or ourselves lending to BHP Petroleum, or one of the BHP entities, we had to hold 100% risk weighted asset (of course now we are with a lot of the underlying collateral). They can apply to any loans they get, as well a strong credit rating with a risk weighted asset for BHP is now likely to be under 10%. (Interview No. 2)

Similar evidence is afforded by another respondent:

> Where we have had experiences with certain counter parties you would otherwise think to be highly reputable, and (we) would end up in a worse position. An example of that is dealing with US broker dealers (Morgan Stanley), you would think (they) would (be) the most reliable people to lend to, but our risk weight assets against those guys are doubled under Basel II. The history sit(ting) within our credit system suggest banks in that type of environment are less likely to pay than some of the corporate counterparties, which was a surprise...(In that sense) traditional teams (banks adopting the standard approach) (who have been) willing to take on a lot more risk, they are certainly getting much more heavily hit from the regulatory capital perspective. Now the people who (are) dealing with leveraged finance to private equity firms, they've go(ne) from risk weighted assets (of) 100% to often 300 or 400%. (Interview No.1)

The following comment from another bank risk manager reveals how his or her bank was obliged to substitute internally constructed ratings for those provided by the credit rating agencies:

> We use some external data for some modelling, but we assign our own credit rates to companies. So companies that might be with high credit

> ratings we might not necessarily want to lend money to. (Interview No. 12)

8.4.2 Impact of Unreliable External Ratings on the Effectiveness of Basel II

Typically, the occurrence of the sub-prime crisis exposed pre-existing problems with the quality of ratings provided by the agencies, as emphasized in the following response:

> Well it's more volatile. Now with the sub-prime crisis, there are actually a lot of *question* marks about the rating agencies. *How effective* they are; *how far back with prices* they were...; *how lagging* they were in re-rating things they should have (been) re-rated much earlier. (Interview No. 15)

As discussed in Chapter Seven, another risk manager focuses on the inability of external ratings agencies to adapt to volatile market conditions, especially in regard to securitized assets:

> Under Basel II, it is more risk sensitive. It *should* (have) handled the sub-prime crisis better, but *in fact* it probably didn't, because it (is) fairly reliant on (well at least on (the) securitisation part of things, which is where the sub-prime losses come from, through mortgage backed securities, sub-prime backed securities) … external ratings, and they have been proven to be flawed, so in that sense, it hasn't done much at all. (Interview No.10)

Obviously, those banks that are obliged to use external ratings, under the standardized approach, are going to be more exposed to the consequences of any major errors:

> Is there any problem from external ratings? Well depends on if you have sub-prime exposure or not. You are in trouble if you do have exposure, regardless of APRA, or anyone. (Interview No. 14)

Given that unreliable external ratings have frequently yielded risk assessments with 'fundamental flaws', one might have supposed that banks and regulators would be eager to get rid of them. However, in practice there are a number of commercial

reasons why financial institutions would continue to deploy external ratings in both risk management practices and regulation. This is the theme of the following sub-section.

8.4.3 Why Unreliable External Ratings still play a Role in Banks' Risk Management Processes

Recent history has provided an incentive for banks to re-think their use of external ratings, as one supervisor states:

> The problem (is that) external rating agencies are exposed very heavily. I think there will be incentive(s) coming out. Banks might think the risk assessment process differently. (Interview No.3)

As noted in the previous sub-section, skepticism abounds about the reliability of these ratings:

> So in terms of the question: is (the) standardised approach as a methodology, using ratings agencies (like), Moody's and S&P, instead of reliable measures? Given what the experience (has been), it is a funny question. (Interview No. 13)

Banks must still arrive at a positive cost-benefit outcome to warrant a shift away from external ratings to more reliable internal measures. For many of these banks the anticipated difficulties and higher costs required in updating their internal system weigh more heavily than any worries about the unreliability of external ratings, as shown in the following two responses:

> Yeah (there are well recognised problems with external ratings), but what's the alternative for those *regional simple banks*, who won't get any benefit from moving to other banks' approaches? (Interview No. 15)

> Depending on the type of exposure, if a bank has 80% of their exposure on residential mortgages, there is no point, or very little. Or depends on the incentive, is there an incentive for them to move? An incentive

> would be a certain capital, and what's the cost of doing it? It's a cost-benefit exercise. (Interview No.14)

According to the information provided by risk managers from major banks, even amongst those banks that are allowed to adopt advanced IRB, many still continue to use both external and internal ratings: "So (we adopt) the combination of internal loss experience, external loss events…". (Interview No. 9)

As disclosed by one of the risk managers, credit rating agencies have the ability to access certain types of data more easily, due to their longer history of data storage and more comprehensive data sources. This makes particular external ratings more accessible and affordable relative to obtaining them internally, even for major banks. For instance:

> Part of our scope … operational risk we do have a Fitch…they do have tens of thousands of data (of) relevance. (Interview No.9)

Supervisors also acknowledge these advantages:

> It did affect banks' risk management, especially those banks (who) rely heavily on external data. But they won't give it up quickly. Cost is the factor they always consider, if developing or adopting internal data is beyond their ability and budget. That's why Basel II allows the banks, including advanced ones, to choose using maybe both. (Interview No. 5)

Accordingly, this same supervisor concludes that external rating agencies will continue to play a role in risk management processes, even though the quality of their "products" is questionable:

> But, external rating agencies will still be there. Banks still need external data, based on cost consideration, and also these agencies have source(s) to reach certain data, which banks cannot (reach) or (it) is costly to do, particularly for smaller ones. (Interview No. 5)

Despite the critical report card, rating agencies remain outside the prudential control umbrella of regulators due to the so-called "independence principle", which is supposed to guarantee the trustworthiness of the 'products' provided to customers:

> Rating agencies have to be very independent and give what they think is an appropriate rating, otherwise they go out of business very quickly. (Interview No.13)

While the collapse in the reputation of credit agencies has stimulated calls for them to be bought under the umbrella of the regulatory framework this is somewhat problematic:

> The ratings agency just runs without the regulators at the moment. (Interview No. 10)

> In general, against those same risks, it is a bit tricky, because no framework (exists) which extends to cover the banks, the insurers, and everybody under (the) same methodology. (Interview No. 7)

Bank risk managers assert that the failure to regulate rating agencies represents a clear weakness in the regulatory framework especially because many market participants are obliged to use external ratings. As such, these rating-related problems will not disappear and will surely come to affect the stability of the financial market at some future date:

> I think that's (regulating external rating agencies) the only solution. As long as the issue of regulating ratings agencies (isn't) solved, there's always this problem. (Interview No.10)

> There is a lot of pressure especially in Europe, to bring in regulation (of) the ratings agencies. (Interview No.11)

Finally, some bank risk managers advocate more regulatory attention to prudential supervision of the banks, with particular scrutiny of the modelling aspect. One respondent suggested that, of necessity, this should extend to the entire process of securitisation and include all major players under regulations:

> I think maybe the review and scrutiny of the models by APRA needs to be a lot heavier, because there are so many more inputs that go into them. You cannot just move the exposure around, and play regulatory capital games. (Interview No. 7)

On balance, it might be argued that credit agencies and external ratings are like necessary evils. There are incentives for banks to keep using external ratings due to cost and technical considerations. Nevertheless the dubious quality of recent ratings has the potential to undermine the effectiveness of Basel II in regard to financial stability. Moreover, the "independence" principle applying to these agencies has helped them to escape regulation compared with other players in the financial market, and hence rendered them unaccountable for the damage their unreliable ratings inflict during financial crises. This raises the desirability of bringing them under a consistent regulatory framework with both the banks and other Non-Bank Financial Institutions (NBFIs).

8.5 The Issues with Regulatory Arbitrage

Regulatory arbitrage arises when a regulated institution takes advantage of the difference between its real or economic risk and its calculated position for regulatory purposes. Throughout the interview process, the process of regulatory arbitrage was seen to be correlated with one phenomenon—securitisation. Securitisation is the most prevalent form of 'off-balance sheet' financial innovation due to its ability to disperse risk throughout the financial market. Simultaneously it affords an arbitrage opportunity for banks that can reduce their capital holdings against underlying risk.

In what follows, analysis will first focus on the nature of securitisation, then examining the efforts made under Basel II to address the issue. The section will conclude with an appraisal of existing arbitrage possibilities under Basel II.

8.5.1 The "Seeds" of Regulatory Arbitrage sown by Problematic Nature of Securitisation

By serving the purpose of optimizing capital management, securitisation directly delivers 'tangible' benefit to banks in the form of *less regulatory capital-holding*. To some extent this is achieved by evading regulatory capital burdens through a process of regulatory arbitrage. The following comments from bank risk managers directly confirm such a function of securitisation, which had already been discovered and applied by banks under the previous Basel framework:

> It happened all the time. That's what securitisation was, so it was pure regulatory arbitrage. (Interview No. 13)

> Previously the arbitrage opportunities arose by the banks taking their assets off their balance sheet. So an example of those, were the ones securitized and (you) don't have to hold capital for them. (Interview No. 12)

For some aggressive market practitioners, the reduction of regulatory capital-holdings through securitisation during the upturn period was of obvious benefit for capital management:

> You know, you securitize loans so that, obviously, you don't pay as much in capital by passing the risk off to someone else. (Interview No. 7)

As noted by one of the risk managers, securitisation satisfies the banks' objectives of "moving" risks off their balance sheets through risk dispersion, but also exposes investors to new forms of risks when they lack sufficient understanding and knowledge about the resulting complex financial instruments:

> I mean securitisation serves a purpose, if a bank wants to move its risk, and there are people out there who want to take the risk for a price. There'll be a market for it. (Interview No. 15)

For a business like banking, which, no less than other firms, is driven by 'animal spirits', securitisation serves a multiplicity of "desirable" functions as shown by the following response:

> If they find it *easy to sell the loan,* they *get the better spreads* and *easier approval*, so that's the impetus for banks to want to do that. (Interview No. 7)

Due to a variety of positive feedbacks, and arcane forms of complexity, the securitisation market, while stimulating the growth of other markets, such as commercial paper and property, has helped to cover up the underlying fragility of the system until conditions for the subsequent crisis had been firmly entrenched.

Thus, securitisation is actually a double-edged sword, when used effectively during an upturn, it can assist investors by enhancing the liquidity of underlying assets. However, the problematic nature of the securitisation process, especially its complexity, along with the increased reliance on external ratings agencies, has put banks and other players in great danger, not least through the prospect of rapidly eroding balance sheets.

In many cases, the complexity of underlying financial instruments and their derivatives made the whole securitisation process hard to understand both for top management within the banks and their regulators. Furthermore, specialized risk experts in banks created and priced these new financial instruments using highly complex models, in part, kept secret to prevent competitors from copying the innovations in banking practice. As one interviewee observed—"*It gets more complicated, due to the sophistication of the models and so on*" (Interview No. 6).

As revealed by the following comment, the increasing complexity of securitisation arises not only from the adopted techniques of risk-management, but also from associated securitisation clauses:

> Some of the clauses under securitisation are not clear…especially under a stress environment…it is an issue, because it is deceptive. (Interview No. 14)

Securitisation promotes a disconnection between banks acting as brokers, those offering securitized assets, the actual originators of the assets that are going to be securitized, and those providing hedging and insurance services in relation to the assets. Therefore, it is not only the final buyers of securities that can be mislead by the underlying risks, either because they have been concealed by complicated quantitative risk techniques or by hidden unclear clauses which will only be uncovered during downturns, but the banks themselves, when they act as brokers in the whole process:

> Securitisation is a *deceptive* thing...and it's a *dynamic* thing as well, because you know, it could (be) normal in the market, assuming nothing comes up. But when you are in the stress environment, it can *come back to bite you.* So everything is fine when you have low

> securitisation happening, but if things go bad, the banks, for reputation reasons, have to take the risks back. (Interview No.14)

The occurrence of the 2008 crisis has provided a lesson to all market participants, especially banks, and they are now more alert to the quality of underlying collateral, as reflected in the following comment:

> So, yeah, most of the market was expecting the securitisation of low quality assets to potentially dry up, even to die, but it significantly increased when it came to high quality assets. (Interview No. 1)

Although risk-managers are aware of the potential problems associated with over-valued collateral, there is still ignorance of a more profound issue relating to the disconnection between various players within the securitisation process, as pointed out by a regulatory supervisor:

> The independence principle in APS 120[411], will work (to solve some of the problems related to securitisation), but the point is that it will create *problems* as well. For example, the problems derived from management of operational process of ADIs are independent with (the) securitisation vehicle. (Interview No. 4)

Despite the problems of securitisation, it still 'serves a purpose' and when it functions well, it is beneficial for market players. As such, there will still be a role for it to play, which raises the question of how Basel II attempts to address securitisation issues in its framework.

8.5.2 The Efforts Basel II made to address Securitisation Issues

Basel II's efforts to deal with securitisation are evidenced by the greatly increased number of pages devoted to the issue in comparison with previous frameworks. The rules about securitisation are much more specific; as a direct consequence, banks need

[411] On November 13 2006, APRA released a discussion paper and accompanying draft prudential practice standard on securitisation in the form of a new draft (new APS 120) of the existing Prudential Standard APS 120 "Funds Management and Securitisation" (current APS 120).

to hold more regulatory capital against risks from securitisation[412] and disclose more relevant information:

> Whereas now … the regulators (are) looking at (us) saying, "well really, you have to hold capital for them whether your keep them on your balance sheet or not". So, whilst previously (there was) capital arbitrage; securitisation going forward is much more likely just to be a *liquidity function*, because the banks would probably have to hold (capital); the new rules are we have to hold more capital than we used, but not as much as we held on balance sheet. (Interview No. 12)

Although the capital-holdings for (off balance sheet) securitisation cannot be as much as those allocated to cover balance-sheet risk, they have been increased, which potentially reduces the incentive for securitisation to achieve regulatory arbitrage, as described above. This effect is reflected in the following response, which treats securitisation as, "much more likely just…liquidity function", in other words, "you can't get the same…as you used to be able to" (Interview No. 7). The same Interviewee goes on to observe that:

> The capital you are holding in the first Tiers comes down for the low risk assets. You can't get the same regulatory capital improvement from securitizing them as you used to be able to, because your internal model is already saying that is lower risk. You know, you securities loans, obviously you don't pay as much in capital by passing (them) off to someone else.

In particular, the following comment from a risk manager points out that Basel II contributes to reducing the proliferation of poor quality securitized assets, due to the enhancement of ratings[413] and increased capital requirements over securitized assets under the new framework:

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[412] The following comment directly affirms the intention and efforts of Basel II in addressing the securitisation issues: "I think their intention is correct. Their intention is to make sure that if you have an off balance sheet exposure (that it really is an increasing type exposure), so really your deposit holders aren't on the hook for something that's been securitized; I think that's been the intention. So I think that's worked." (Interview No. 11)

[413] The enhancement of ratings mentioned in this comment is related to the adoption of IRB approaches, which generates more reliable ratings, as previously discussed.

> I think (Basel II) certainly puts a lot more emphasis on requiring *quality ratings* and securitisation. You are a lot less likely to see poor quality assets being (put) out into some sort of structure to get a better capital treatment, because banks would end up holding the lowest level of näive type of securitisation, risk weighted heavily for that. (Interview No. 1)

In general, the majority of comments both from supervisors and bank practitioners confirm the efforts of Basel II in reducing arbitrage possibilities, for instance:

> So I think (in) Basel II rules, they got the things closer to the true view. They reduce the opportunities (to) just move risks around, and they probably get capital savings as (a) result of that. So that many (opportunities to gain) internal(ly) … by moving exposure, I think it's definitely reduced. (Interview No. 8)

Bank risk managers admit that Basel II adjustments in the form of heavier regulatory capital charges significantly reduce the incentives for banks to securitize:

> But the BIS has recently come out saying that they are going to propose some change that would require banks to hold more capital. It may come down to the fact that, regardless of whether you are securitized or not, there is likely not going to be much difference in the capital. If that is the case, the only reason that you would securitize would be (for) the presence of (the) funding source. (Interview No. 13)

In addition to Basel II rules placing some restraints on securitisation, national regulatory authorities and both internal and external auditors of banks have made positive contributions towards informing markets about the complicated and otherwise obscure securitizing process:

> In the framework, there is governance around the models and assumptions, and there is independent review by the internal audits. There is external independent review by banks auditors, and you've got APRA itself. (Interview No. 6)

Banks also need to be more active in informing themselves of the potentially damaging consequences brought by securitisation. The recent financial crisis has made them more thoughtful and alert:

> Now they know from what they know, and what's happening at the moment. Before this credit crunch in this episode, no one would've thought that events like this could happen. But now that we are aware that under these stress type conditions, that these types of things can happen, it needs to be looked at again. (Interview No.15)

In that sense, as argued by one of the bank risk managers, a sufficient understanding of the implications of this complicated financial innovation is essential to keep them safe:

> There are certain circumstances where securitisation could be the right tool, but again you need to understand how it all works. And if you can understand the risks behind it, and … still also present what those risks are, and you are happy with it, then do it. But if you are not, you don't understand it, and you don't know fully the risks behind it, that is (a) different issue. (Interview No. 15)

It seems that since the financial crisis, Basel II's enhanced supervision might have curtailed securitisation for regulatory arbitrage purpose. But the discrepancy between economic risk and regulatory position is hard to eliminate for many reasons, such as technical insufficiency. Apart from securitisation, though, arbitrage possibilities may arise from other sources, as investigated below.

8.5.3 Existing Arbitrage Possibility under Basel II Framework

According to bank practitioners, even if Basel II rules impose more onerous regulatory capital requirements over securitisation, alternative arbitrage possibilities will still exist under the Basel II framework:

> This (Basel II) is not going to stop regulatory arbitrage; it will just be going to change the format of it. Anytime *there is always a difference between regulatory capital and economic capital*, you always get the

> opportunity for regulatory arbitrage. So it is not going to go away. (Interview No. 13)

As discussed in Chapter Five and the previous Chapter, the divergence between regulatory capital and economic capital is partly due to technical difficulties in measuring risk:

> I think that you would be saying that Basel II rules became more risk sensitive[414]… it certainly *reduced* the potential to shift risks somewhere else and have less capital held. (Interview No. 7)

> The opportunity will probably reduce, but it won't go away. That's why under Basel I most of the highly rated corporate (work) wasn't done through banks, because they were risk weighted 100%.[415] So there are regulatory arbitrages in the industry as well. So it could well be if this is more regular now, you know some of that lending might come back to banks and insurance. (Interview No. 13)

Supervisors also convey similar opinions about the inevitability of arbitrage opportunities arising under the existing risk management and regulatory supervision processes:

> No, it cannot get rid of regulatory arbitrage, especially the existence of securitisation. Securitisation is becoming complicated and diversified. Basel II just has the ability to possibly reduce it, not resolve it. (Interview No. 4)

The potential benefits derived from regulatory arbitrage will motivate banks to keep on doing it, though maybe in more innovative ways than those previously adopted:

> I wouldn't be surprised (if) the other bank have (practiced arbitrage) in the past and will in the future. We actually structure deals for the other

[414] After his comment on the sensitivity of Basel II, he also argued about the bureaucratic behaviour of regulatory authorities who impose excessive regulations that are beyond the Basel II rules: "I think…Basel II rules became more risk sensitive, (to an) extent that hasn't been diminished by any national digressions that APRA would apply".

[415] He gives an example: "so if General Electric wanted to borrow $1 million, we have to hold $80 million in capital. Now because they are a triple A rated entity, they can just go and raise bonds on the market without paying any capital charge." (Interview No. 13)

> banks, so they can take advantage of those opportunities.[416] (Interview No. 10)

In particular, some bank risk managers point out that differentials in capital charges continue to provide incentives for banks to maintain off-balance sheet activity of this nature:

> We are operating under the rules (Basel II), (so) is (there) incentive to share low risk counting loans? … You (are) going to have a low risk weight, but probably not as low as it should be. You can get capital relief from securitizing them.[417] (Interview No. 15)[418]

As the following interviewee indicates, strict regulatory capital rules are only effective temporarily during especially volatile market periods; and when these periods, market practitioners will raise criticism of Basel II's sensitivity.

> But I just think that the nature of the securitisation market will probably (be) more critical, say, the lack of securitisation markets now, globally, means that someone within the regulatory space needs to *revisit* all the securitisation requirements. I think the securitisation risk is changing now anyway, and I would expect that there needs to be a rehash of APS 120, and all the other regulations. (Interview No. 10)

As argued before, regulators or supervisors play an important role by operaing at a national level to oversee and prevent the occurrence of regulatory arbitrage, in accordance with the rules of Basel II. One risk expert from the banking sector

[416] After this interviewee comments on his peer's arbitrage behaviours, he uses his bank's case to explain that particular investment banks have less incentives to arbitrage due to business structures: "I am sure it has happened, but it's not something (bank's name) would do, we are far less focused on regulatory capital than other banks would be. We don't generate all of our profit from putting our balance sheet at risk, using capital. The other banks do, they put their balance sheet at risk, and they use capital to generate profit from lending, things like that. We don't, a lot of our income comes from things that don't use capital. Like fee income, advisory, investment, M&A (Merger & Acquisition) advisory type activities, you know. Regulatory capital has a lower importance for us at a strategic level, so I don't think (bank's name) would ever make decisions based on possible regulatory arbitrage, under Basel I or Basel II." (Interview No.10)

[417] Similarly, the following comment from another risk manager also reveals such incentives: "From (bank's name) point of view, that's not material, because mortgage is a minor component of what we do or used to do. So we are seeing … retail benefits, we see benefits for highly rated corporate exposures, which is a big component of what we do; we are seeing benefits in securitisation exposures. So these are all benefits, meaning lower capital." (Interview No. 10)

[418] Another supervisor also makes similar comment on the ability of Basel II to reduce the extent of regulatory arbitrages, but has insufficient capability to eliminate arbitrage possibilities.

indicates that certain regulatory rules (APS 120) have functioned perversely to "open up" arbitrage opportunities:

> The funny thing is since APRA's 120 came out; there's been a whole heap more capital arbitrage than ever before. APRA's 120 has opened up all sorts of (within the securitisation world) … arbitrage opportunities that people are working on, they are only taking advantage of external ratings. There is all sorts of peculiarity that comes out of APRA's 120, such as, if you originate Mortgage-Backed-Securities (in Australia these are 100% mortgage insured) and you retain subordinated debt, it gets double A rated, because of the mortgage insurance. As I was explaining, the Basel II synchronization framework gives a very good capital treatment to that sub-debt, even though it's a first-loss-exposure. And (it) doesn't matter whether you (have) a first-loss-exposure or fourth-loss-exposure because - obviously (there is an) incredibly, (big) difference in risk - you still get the same capital outcome. And that's just one example; there are many, I guess, opportunities for arbitrage as a result of the securitisation framework. (Interview No. 10)

In summary, the contributions of Basel II to reducing arbitrage opportunities are apparent. However, even the adjustments made under Basel II in response to securitisation, have not been sufficient to prevent regulatory arbitrage from occurring. Opportunities of this kind are unavoidable under any prudential framework. In response, effective prudential control by national regulators would seem to offer more than increasing regulatory capital-holdings as a buffer against potential abuse.

8.6 The Issues arising from Cross-Border Supervision under Basel II

During the discussion with interviewees on arbitrage opportunities, one of the risk experts suggested that cross-border supervision might provide a loophole for multinational financial institutions:

But I think the problem is the different rules and different jurisdictions. (Interview No. 11)

Accordingly, the following sections will explore the difficulties and potential problems that large banks face in terms of cross-border business activities, including difficulties arising from the AMA (Advanced Measurement Approach) to operational risk, the possibility of risk measurement dislocations, and the competitive disadvantage that overseas branches of those multinational banks could be exposed to. This elaborates on themes that were briefly mentioned in section 8.3.

8.6.1 Different Risk Approaches adopted between Overseas Branches and Parent Banks

Multinational banks with overseas branches extending to almost every corner of the world are exposed to regulatory burdens associated with cross-border supervision under different national regulatory frameworks[419].

According to Basel II rules, "the home country supervisor is responsible for the oversight of the implementation of the Framework for a banking group on a *consolidated basis*; host country supervisors are responsible for supervision of those entities operating in their countries" (BIS, 2006, p. 219). Therefore, the parent banks in home countries normally set the risk methodology basis to guide the daily risk measurement for their overseas branches. Moreover, they are usually regulated by home country regulators alone. Meanwhile, the regulatory situation that their overseas branches face is far more complicated. Although they are regulated by home country regulators as part of their respective domestic, parent bank, they are also supervised by host country supervisors. To this extent, the risk approaches they are expected to adopt in the host country should be authorized by the relevant regulatory authorities within that nation. In this sense, duplicated supervision pertaining to cross-border activities is unavoidable for most multinational banks.

[419] Nevertheless, as APRA Chairman John Laker (2006, p. 2), observes in a conference paper, "[c]ompared to other countries of comparable size, cross-border issues — New Zealand aside — are not particularly significant for us. Although the Australian banking system includes strong foreign competitors, around 82 per cent of its domestic asset base is Australian-owned."
.

Certain BIS provisions under the Basel II rules attempt to ameliorate the burden, as revealed in the following quote: "wherever possible, supervisors should avoid performing redundant and uncoordinated approval and validation work in order to reduce the implementation burden on banks, and conserve supervisory resources". Further, in order to avoid regulatory arbitrage, BIS emphasizes that "the methods and approval processes used by a bank at the group level may be accepted by the host country supervisor at the local level, provided that they *adequately* meet the local supervisor's requirements" (BIS, 2006, p.219). In fact, in many instances of cross—border supervision, it is normal for overseas branches to adopt less advanced (i.e. standardised risk) approaches while their parent banks adopt more advanced approaches, as argued in the following interviewee response:

> I think it is an issue for a lot of the banks. For us, for example, we are a *standardised bank* in the UK, and we are an *advanced bank* in Australia … so (it) is not so much that competing priorities between requirements of FSA[420] versus APRA, because the FSA requirements are quite basic compared to our requirements here in Australia. But yes I think that's a material issue for a lot of the banks, to process the relationship. (Interview No. 11)

A similar instance was cited by a risk manager from another multinational bank:

> There are some things we do differently in Australia to what we do in New Zealand; purely because that's what the regulators want. It doesn't make us operate differently. We operate according to what we think is best for our Australian business[421]. (Interview No. 14)

Although the commercial strategic interests of banks have priority in guiding their business decision-making, as indicated by the comment in practice they "operate

[420] The Financial Services Authority (FSA) is an independent non-governmental body in UK, given statutory powers by the Financial Services and Markets Act 2000. It plays a similar role to that of APRA as a regulatory body for financial institutions in UK.

[421] This comment also reveals that related risk aspects of risk management processes such as risk techniques adopted are part of the banks' business decisions although they need to satisfy regulatory accountability. This foreshadows the discussion at the end of this section among supervisors that based on the unavoidable existence of duplicated supervision, banks' strategy on business is impacted.

according to…what … is best" for them. The crucial issue is that there are different views as between home and host country regulators:

> When they started out, the Australian and New Zealand regulators were looking to work very closely together. But they still have said there are different views on things. (Interview No. 14)

This discrepancy triggers potential problems and difficulties for banks under Basel II implementation, as expressed by interviewee responses in the following section.

8.6.2 Difficulties in Implementation and Dislocation in Risk Measurement

Apart from the differences in fundamental risk approaches adopted between overseas branches and parent banks revealed above, there are some specific aspects of risk measurement that cause problems for cross-border business when banks attempt to comply with host country regulators. For instance, different risk definitions may be adopted on overseas business in contrast to home country business, i.e. differences in the definition of default, as disclosed by the following interviewee;

> There are some differences. For example we got a mortgage business in Italy, and they have to comply with … Bank of Italy regulation, and APRA regulation. And there are some differences within Italy, such that they have a different definition of default from the rest of the world. Most of the world has the 90-day definition of default, whereas Italy has the 180-day definition of default, but we've actually adopted the 180-day definition default. (Interview No. 10)

One new risk type officially included in the risk category of Basel II under Pillar One—operational risk measurement and supervision—has attracted the attention of BIS both in relation to local and cross-border business activity. The introduction to Basel II rules emphasizes that the "Basel Committee has issued general principles for the cross-border implementation of the revised Framework and *more focused principles for the recognition of operational risk capital charges under advanced measurement approaches for home and host supervisors* (BIS, 2006, P.3). This focused attention also implies recognition by regulators of a range of possible issues that might arise in regard to operational risk management in cross-border businesses.

As revealed by one of the risk managers, who works with a bank which is authorized by APRA to adopt AMA (Advanced Measurement Approach) for operational risk, AMA rules cause obvious difficulties in practice:

> Where the AMA method runs into difficulty, and has run into difficulty globally, it's for, let's caught 3 multi-national banks, and I don't mean banks like (bank's name) with branches in a bunch of different countries. I mean banks like Barclays, with … 30% of their business outside their home country. The AMA rules make it very, very *difficult to accommodate diversification between legal entities*. And if you add up a high confidence limit-loss for a bunch of different subsidiaries, and you can't accommodate diversification, then your AMA capital number is *absurdly large*. (Interview No. 9)

Other bank risk managers raise complaints about the potential for "dislocation" when different risk approaches are adopted between overseas branches and parent banks:

> There are I would say *substantial differences*. And because locally, the local subsidiary is on *standardised* (risk approach), and the parent on the *advanced* (risk approach), that *dislocation* itself in the credit risk measurement causes a bit of *grievous returns*, in terms of *pricing*. And so the way we gauge or measure the capital requirements are totally different. It creates issues on the pricing, which makes us *less competitive* than others locally, plus many other issues. (Interview No. 15)

The above interviewee's contention that overseas branches of multinational banks could be placed in a "less competitive" position in comparison to local banks, will be further investigated in the next sub-section.

8.6.3 The Possibility of Competitive Disadvantages

Duplicated supervision is a fact of life for multinational banks. Obviously, these duplicated interventions could be the cause of increased regulatory cost, as suggested in the following response:

> You have to do it twice - twice the work - yeah definitely in terms of time and staff costs.[422] (Interview No. 11)

But the issues from duplicated supervision are far more than just the cost burden, as the following example shows, different regulations applying across borders may result in different treatments, especially in regard to securitisation related capital issues. This might hinder bank efforts to adopt enterprise-wide commercial strategies:

> It creates a lot of issues in terms of, if the subsidiary plans to issue capital for instance, we would have to go on and get confirmation across all regulators[423]. So then we have the securitisation deal. Cross border regulations are different, so we have to go through the approval process, across all three regulators, the local, the regional head office, the ultimate head office. (Interview No.14)

> There are a lot of common things that won't be any issues, but there are certain things that are different, such as securitisations, insurance. *The treatments are different, the approaches, the frameworks could be totally different*. We have (seen considerable) differences between HKMA approaches for securitisation and those from APRA, so we got approvals here to consolidate the securitisation, *but we didn't get it from Hong Kong*. (Interview No.14)

From the perspective of bank risk managers, the emerging issues that could result in a competitive disadvantage are those concerning pricing (i.e. the price of lending) and regulatory capital-holding, as revealed in the following quotes:

> And so the way we gauge or measure the capital requirements are totally different. It creates issues on the pricing, which makes us less competitive than others locally, plus many other issues. (Interview No. 14)

[422] But for the case of major banks, cost is not that burdensome from duplicated work: "I mean it would be an additional cost, but not huge because all the underlying work they have to do is basically very similar. It is how you use it at the end that is different." (Interview No. 13)

[423] He then gives an example of how burdensome this application process across all regulators is for a multinational bank: "starting local, then Hong Kong, HKMA (the Hong Kong regulator), UK (FSA). So we have to get approval from all three on consolidation. It's HK consolidation, and ultimately the parent in the UK." (Interview No. 14)

> I think it would (be) because first, being on standardised, it *chews up more capital* than if you are on advanced, that's one; and second, in terms of *pricing*, the price of lending, if the local bank is on the advanced, being on the *advanced* uses less capital, as we are on standardised, we are definitely at a price *disadvantage* there. (Interview No. 14)

Conversations with both bank practitioners and supervisors, have indicated that another troublesome issue arising from cross-border supervision is the potential for inconsistency between various countries over the timing of Basel II implementation. As the following examples show, the US (and also some Asia countries i.e. China) has not yet implemented Basel II, while Australia has. Thus, the overseas branches of Australian banks are disadvantaged in the form of a "potentially higher capital charge":

> For the US case, it's not that easy to cope with them about many issues. Most of their banks haven't started adopting Basel II yet, so the subsidiaries of our banks in the US are facing the potential of a higher capital charge.[424] (Interview No. 4)

This inconsistency between regulatory platforms, imposes real challenges for banks that have overseas business, as revealed by the following risk manager's response:

> I think it's a very difficult task when foreign regulatory bodies are *not under consistent platforms.* The fact that not everyone adopted Basel II at the same time, such as the US is not adopting Basel II at the same time as most of the world, and also China. The level of information we need to provide to say Japanese regulators and Chinese regulators continues to be slightly different from FAS - that *creates a lot of challenges*. (Interview No. 1)

[424] Another supervisor also confirmed that this disadvantage possibly exists due to the inconsistency of the Basel II implementation progress across various regulators: "For those cases, yes, they've got some disadvantage, and regulatory capital charge will be higher." (Interview No. 5)

In response to these cross-border sources of competitive disadvantage some bank risk managers propose their own solutions:

> Probably the best way is you categorize different types of banks. You've got the global banks, (bank's name) and you've got the major locals, the (bank's name) … and you have the regional banks. So very niche markets, and different risk would apply to those categories. So you have to split the different categories, and apply different frameworks and rules to those. (Interview No.14)

> There has to be some overall cover each bank, individuals. You cannot apply the same framework to a regional bank as (to) … us, a global bank. (Interview No.15)

Unfortunately, while these suggestions sound plausible, due to the different concerns and regulatory philosophies of regulators in various jurisdictions, and the different structure of local financial markets, effective solutions are unlikely to be that simple. At the local level actual practices of supervision cannot be "one-size-fits all", given the different nature of each class of bank, as revealed by the following responses:

> The whole of the Basel II accord was to have one global standard, and I think what happened is each regulator, for reasons that sometimes make sense and sometimes don't, (have adapted their own permutation on the rules). (Interview No. 11)

> But certainly for market specific issues within geographies, their requirements obviously differ, and I think that their regulators will always feel that that's justified depending on what is happening within their jurisdiction. For the banks like that, it is actually not one global regime because individually you have to fill out for each individual regulator. (Interview No. 11)

Hence, the key to harmonizing the different interests of various regulators and, thus, solving the problems derived from cross-border supervision, is efficient communication and cooperation between home and host country regulators, as discussed below.

8.6.4 The Necessity of Efficient Negotiation between Home and Host Countries' Regulators

Enhanced cross-border communication and cooperation is regarded as one of the key aspects of an effective supervisory review process under Pillar Two of Basel II (BIS, 2006, p. 219). Effective supervision of large banking organizations necessarily entails a close and continuous dialogue between industry participants and supervisors. In addition, the Framework requires enhanced cooperation between supervisors, on a practical basis, especially in relation to the cross-border supervision of complex international banking groups, otherwise, as revealed in the following interviewee response, home and host country regulators would be unable to achieve a consensus outcome:

> I mean every regulator in every country would stick … to their own rules and they won't bend down to suit cross-border, (or) offshore regulator. (Interview No. 15)

To this end the BIS Committee supports a pragmatic approach of mutual recognition for internationally active banks as a key basis for international supervisory co-operation. This approach implies recognizing common capital adequacy approaches when considering the entities of internationally active banks in host jurisdictions, as well as the desirability of minimizing differences in the national capital adequacy regulations between home and host jurisdictions so that subsidiary banks are not subjected to excessive burden[425]. In this regard, comments from bank practitioners about the efforts of APRA, as the regulatory authority with responsibility to negotiate and build consensus with regulators in other jurisdictions, are generally positive[426]:

[425] The Basel Committee on Banking Supervision issued a paper on *Home-host information sharing for effective Basel II implementation*, which sets forth general principles for sharing of information between home country and host country supervisors in the implementation of the Basel II Framework. The paper highlights the need for home and host supervisors of internationally active banking organizations to develop and enhance pragmatic communication and cooperation with regard to banks' Basel II implementation plans, and also sets out practical examples of information that could be provided by banks, home supervisors and host supervisors.

[426] Supervisors themselves also express the efforts they made for their regulatory responsibilities: "we are always trying to avoid duplicated supervision; we check what the differences between supervisory requirements and approaches are. If those approaches and requirements can be accepted by APRA, and they fit in APRA's system, we will consider accepting some of them. We tried to make agreements with them on certain issues rising from home and host supervision." (Interview No. 4)

> Where you see co-operation in the Australian environment, APRA has been willing to accept the number calculated on the FSA basis. If we end up getting into a global position (with) different regulatory bodies (having a common) understanding, trying to perform the same function relying on each others' methodology, I think we will be in a lot stronger environment. (Interview No. 2)

One supervisor proffers an example of efforts made by the regulator to eliminate excessive regulatory burdens on the overseas branches of Australian banks through negotiating with host country regulators:

> Different *reporting require*ments which cause duplicated supervision and potential higher regulatory capital are always the issues faced by multinational ADIs for their cross- board activities. APRA always works on reducing those issues imposed on our ADIs. We let the host supervisors know our prudential standards, and try to make them accept them. In our new APS110, the definition of level of capital for adequacy purpose has been extended to also include certain APRA approved subsidiaries of ADIs which should be accredited. The ADIs and those subsidiaries together are ELE (extended licensed entity) under APS110 and Basel II. In level 2, in addition to the consolidated banking group, any immediate locally incorporated non-operating holding company of ADIs will be included as well. *So they should follow our rules*. (Interview No.5)

Despite the efforts of Australian regulators to ease compliance burdens, their primary responsibility remains prudential control and maintaining financial stability. So, from their point of view, the cost associated with cross-supervision needs to be factored into banks' business decision-making process whenever overseas expansions are planned:

> There is always duplicated supervision. Whether they will be disadvantaged by duplication depends on their choice. If they apply to

> operate or be authorized locally in other jurisdictions, APRA won't feel guilty about them. (Interview No. 3)

> That is what the banks should consider before deciding on doing that. That's the cost of business. Especially for some Asian countries, the legislation is very strict. The cost of opening business there is high, and that's what they should take into account in their business decision. For those cases, yes, they've got some disadvantage, and regulatory capital charge will be higher. (Interview No. 5)

Banks also concede that they weigh up the possible costs associated with duplicated supervision and information disclosure when assessing the potential benefits of business expansion:

> I would say it is significant for (bank's name). If the reporting and the regulation were going to be a problem we wouldn't have set up in those markets. Obviously the benefits of being in those markets far outweigh the regulatory burden of being in those markets. (Interview No. 11)

In general, cross-border issues under the Basel II framework cannot be diminished, but effective communication and cooperation between home and host country regulators can help to spread certain regulatory burdens. However, there is still a competitive disadvantage that must be faced by overseas branches wishing to engage in cross-border business activity.

8.7 The Issues with Information Disclosure

As previously discussed in Chapter Seven, Pillar Three is the major source of new content under Basel II. Information disclosure required under this Pillar is regarded by bank risk managers as one way to correct for distortions previously arising under Basel I. More than this, however, it contributes to a reduction in the incidence of regulatory arbitrage. The disciplinary effects of heightened awareness of market participants through information disclosure are acknowledged by bank practitioners (also see section 7.2.2.3.1.2 of the thesis):

> I think what APRA has requested is whatever information … would give a snapshot of your risk and investor insight into how you are managing that risk. I mean the whole reason of disclosure is one to make the market more informed, and to gauge one bank against another. (Interview No. 14)

However, throughout the interviews, the potential problems associated with information disclosure also come to the fore. These fall into five categories and are considered in the next five sub-sections of this Chapter:

8.7.1 Lack of Information and Cost Burden

Prior to Basel II implementation, national regulators required banks to report a certain amount of risk management information as part of the regulatory review process for supervision purposes. At the same time, banks also needed to disclose sufficient information to rating agencies for external rating purposes. To this extent, information disclosure was always an essential component of banks' responsibilities.

However, under Basel II, the requirements in regard to disclosure of risk management-related information are far more onerous. Less-advanced banks that hold insufficient amounts of historical information need to invest to extract more information than what was previously possessed. For major banks that have sufficient information, there is still the need to process and interpret this information to fulfil Basel II reporting requirements.

As argued by the following interviewees, some of the information required by regulators was not previously held by banks because it was not deemed useful for their internal management processes. This has triggered complaints about the associated cost burden, as revealed in the following quotes:

> One area we did get pushed back, was that APRA did want us to do a couple of things. You see most of the information that we report is stuff we have for internal management anyway. Yeah we have to change the format around, but it is information we have. *APRA was actually asking for some information originally which we didn't have, and it would cost us a lot of money for us to get that information, and we don't*

> *use it for managing the bank*, so we pushed back, and I think all other banks pushed back. Basically if it is stuff we produce for internal purposes, there is no huge issue if they want it later on. (Interview No. 12)

> With Pillar Three it is true *the biggest issue is the upfront cost* associated with figuring, getting all the reporting. Once you got it under control, once you got it all sorted out, it should be more of a routine process, but certainly setting it up in the first place takes a lot of time and effort…the cost has been phenomenal, high investment in people and systems, so it has been a huge cost. (Interview No. 13)

In addition, complaints have been made that information requirements are excessive, as discussed in the following subsection.

8.7.2 Excessive Information Disclosure

Judgments made by bank risk managers about whether Pillar Three information disclosure requirements are excessive or inadequate vary widely[427]. Some risk managers who work with advanced banks agree with supervisors that the extent of reporting is appropriate for the purpose of prudential control:

> Given the fairly targeted audience, they are trying to paint the picture; it is enough for that purpose. If for a strong appetite of a wider investment community to get their hands on it, more detail may be wanted.[428] (Interview No. 13)

[427] The following comment from a risk manager, who works in a bank that has adopted the standardised risk approach, suggests that insufficient information disclosure could lead to misinterpretation: "Could it not be studied? It could, because there is not enough information in there to read too much into the numbers. So you look at those, there are 2 tables, and (they) give you nothing else to compare to unless you compare to annual report or something else. But in isolation it could be not enough information, and therefore there could be misinterpretation." (Interview No. 15)

[428] Similarly, the following comment also shows this interviewee thinks Pillar three requirements are appropriate and unlikely to result in fundamental changes: "I don't think there will be changes coming out with Pillar Three, at least not the significant change or fundamental change, no. In the past, they also needed to provide us (with) reports. This time, the Pillar Three reports actually are partly based on the information they needed to report to us under Basel I, the reports are just extended to include some information for public use purposes. Whether the quality of reports will be improved? Yes, their reports should satisfy us, otherwise they won't get approval

For these advanced banks, the extra reformatting or interpretative work is not viewed as creating a significant new cost burden:

> I don't think they are excessive. It is information the banks have for their own internal purposes anyway. Sometimes (it) has to be reformatted, certainly big costs involved in getting to the format, but we have to follow full regulatory reporting. I don't think there is any other huge burden going forward. (Interview No.15)

Furthermore, the occurrence of the recent financial crisis has attracted the attention of market participants to the status of the risk profile and risk appetites of banks. In response to weaknesses revealed by the global financial crisis, this same interviewee acknowledges that the presence of more informed market participants is beneficial for prudential control of the banks (particularly, in regard to securitisation, which was heavily criticized in Chapter Three of the thesis):

> From a market point of view, if what the regulators are trying to do is to keep the market participants more informed, that would be good. I mean because obviously with the US sub-prime crisis and all the write-downs that have occurred, people just didn't understand what the risk profile of the banks they (had) invested (in) was. So, maybe it wouldn't have made any difference, but I think there is a good chance it would have." (Interview No. 15)

However, the majority of comments from risk managers on information disclosure err on the side of complaining about the excessive burden of reporting requirements under Basel II, as reflected in the following quotes:

> I think the intention at a high level is good, and I think that public disclosure is the right thing to do; I think it's *too much detail* though that needs to be disclosed. (Interview No. 11)

> When the accord came out, APRA put a standard out; though essentially the same, … they asked for *quite a bit of extra information,*

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from us to make it public. The case of advanced banks, they will have more professional staff working on reports, so I think I possibly will see some better reports." (Interview No. 5)

> and the banks pushed back on a lot of that, and said a lot of advanced stuff they *didn't have*… (Interview No. 7)

The words in italic above highlight the increased burden imposed on banks due to the prudential control. In this context, one interviewee referred to an industry forum that was held to promote greater consensus between banks and regulators:

> There was an industry forum that was formed on disclosure requirements, to try to get a consensus between the banks and APRA, about the best way to disclosure some of the more complicated and detailed requirements. And really what we found was, particularly with credit risk … some banks have 25 different credit risk ratings, we have 13. They don't map together, our PDs are different by rating grade. Does an investor really understand what a PD is? (Interview No. 11)

Although cost burdens are less of an issue for advanced banks, extra work and effort is still required to report on risk practices:

> The reporting requirements under Pillar Three are definitely *higher* for advanced banks. Because of their complex system and diversified business line, there should be more explanation and description in reports provided to the public. (Interview No.5)

In particular, a risk expert from the banking sector confirms that for his bank, it is difficult to disclose information which is hard to 'view apart from risk modelling':

> We don' t disclose things like our risk attributes, PD details, our impaired asset details, all these things are hard to view (from) risk modelling. (Interview No. 6)

These observations raise the issue of whether market participants and public users of bank reports; can understand the information disclosed by highly trained professional and specialized risk analysts. The following section will explore the education implications for market participants and the general community.

8.7.3 Education and Understanding Issue

The education issue is of less relevance for banks applying the standardised approach, as revealed in the following response by a risk manager:

> Under *the standardised (approach)*, it's fairly straight forward; we look at the exposure of risk, on the gross basis, or pre-collateralization, and at a post-collateral level. *I think it's nothing different to our annual report*. It's just the way the information is presented… (Interview No. 14)

Nevertheless, it remains a matter of particularly pertinence for advanced banks due to their complex systems. A number of bank risk managers raise the issue of educating report users, as revealed in the following responses:

> I think yeah, in general across the investor population, it would have to be more at the very high (end) of the understanding (the information disclosed through reporting) … the numbers spanned, and (it) takes a while for the general investor community to digest that kind of information as well. (Interview No. 14)

> Again I think the intention was right, but I think it is too complicated. And I think it will be very hard for investors to follow, given the amount of details that the requirements currently stipulate you need to disclose, and also on the credit risks. An example on the credit risk side for disclosures, because you are able to use your own risk estimates, for credit risk, it means that you can't compare across banks because they are all different. (Interview No.11)

Of course, for the general investor community, despite the acknowledged desirability of higher levels of education, market analysts play the traditional role of translating technically complex information into readable form:

> In terms of (the) understanding issue, I mean they need education definitely. Disclosure is always the first step, and there is no guarantee for them to understand the information. But for professional market

> analysts, this won't be the problem, and they will sort out the information from Basel II documents, and provide (it) to the market in a simpler way. In the short term, this (understanding problem for a large percentage of the population) might reduce its efficiency, but it's just the time issue, they (market participants) will be educated. (Interview No.1)

> They definitely need more time to be educated to understand information disclosed in reports. But getting the picture of banks' risk profile, market analysts possibly will do that for them (market participants), not that the shareholders and stakeholders will directly generate the picture. So they will get the picture, (but) maybe not directly. (Interview No. 3)

In particular, a risk expert emphasizes that the reports produced by various banks with different business structures and risk methodology bases, are distinct. So he points out that market analysts and investors should pay attention to the differences in banks' reports, and identify whether these differences are caused by risk model variety or actually mirror the differences in banks' real risk profiles:

> The way will probably be different across banks, but that will be one of the tricks. Analysts, and investors as well, try to look through their public disclosures to work out how many differences are really modelled and how much reflect real differences in the portfolio.[429] (Interview No. 7)

Even if the intention of Pillar Three is to build market awareness amongst market participants and public groups, a few risk experts also claim that the main users of "this very detailed management information" are professionals; the "rest of the market" would rely on the "translation" by market analysts:

[429] Moreover, he indicates that APRA as regulator also works on the differences shown by banks' ICAAP output, to identify whether these differences are caused by different risk approaches, or they reflect the differences of banks' real risk profile: "APRA has the same task recently. They know banks (have) got slightly different approaches to every risk area. They work out an average aspect, the right type of results, and whether it is reflecting just the modelling approach difference or an actual risk profile of the bank." (Interview No. 7)

> At the end of the day, *the main users of this very detailed management information would be probably professionals*. So by and large, the shareholders, the broad and dedicated investors, obviously, are just some to extent knowingly unsecured investors. But difficult to see how it's relevant to depositors, who in a sense, mostly rely on that layer … from APRA, more than use their own risk funding to go on and make their own assessment. I suppose the rest of the market would probably rely on these, those analysts somewhere …, the press reporters (and) the version among them. (Interview No.6)

> You don't need a lot of people to understand them, you only need *the key players* to understand them, and that's how it gets disseminated through the market. Just need to make sure major brokers understand it. (Interview No. 15)

8.7.4 Inconsistency with International Accounting Standards

As another information disclosure path, accounting standards always play a vital role in providing information on individual business' balance sheets to shareholders, as observed by the following respondent from the banking sector: "*Accounting standards could be a potential way of improving disclosure in those businesses*[430]...." (Interview No. 2). However, there are certain inconsistencies arising from the New International Accounting Standards (IAS) that are attracting attention, in particular, IAS 39 because it deals specifically with financial instruments[431], for instance:

[430] 'Those businesses' mean the companies with heavy leverage being exposed by the sub-prime crisis: "(when we look at news at the moment), the directors of companies leveraged heavily against their own shares, end up in mismatch of invested interest in share price movements". And he continues to claim that "the industry that is probably less regulated than banks had to report these things to one body'. (Interview No. 2)

[431] Under IAS 39, there is an important change in accounting for derivative transactions. In accordance wit these standards, banks need to mark-to-market and record all derivative holdings on their balance sheets, as well as classify them either as held for trading, or as hedging instruments. Previously, all derivative transactions were kept off the balance sheet, and hence removed from recognition by external stakeholders or even bank management. IAS 39, therefore, moves off-balance sheet items into the spotlight. Apart from IAS 39, commercial banks also need to comply with the accounting standards concerning financial instrument presentation (IAS 32) and disclosure (IFRS 7), which require banks to present their financial statements in an appropriate format, and to disclose sufficient information in regard to financial instruments and associated risk.

> Most of the banks that are on an international accounting regime have been implementing a new financial instruments disclosure alongside the new regulatory disclosures, so most of those projects see the two teams trying to sit together as much as they can (to) build one solution to meet those objectives. I guess the users of the financial data are a bit different to the users of the regulatory report. (Interview No. 1)

The majority of interviewees from the banking sector confirmed the inconsistency between Basel II and IAS, for example:

> Pillar Three reporting requirements cannot be consistent completely with new accounting standards, but BIS is working on it. (Interview No. 3)

> They won't coincide in the first year, but they will converge over time. (Interview No. 8)

Further, the Australian Accounting Standards on financial instruments (AASB7) have been criticized as being inconsistent with the Basel II framework:

> Oh yeah AASB7 and some of those things, there's been some issue around that. The accounting standards aren't necessarily designed for banks, some of them, like the one now - the accounting standards on provisioning - *bring us more back to a cash accounting basis*, but banks don't really operate that way. (Interview No. 13)

In this context, one interviewee discussed the potential for conflict between AASB-7 and APS-330:

> No, not completely, I think there are some elements of AASB-7 that don't agree with APS-330, and I think that there is still a bit of what to do to make them reconcile. I mean that's the difficult thing because it requires the regulators to talk to accounting bodies. (Interview No. 11)

Another issue reported by one supervisor[432], that of fair value measurement, especially for cross-border activities, is emerging from Basel II implementation:

> From my point of view, not from APRA's point of view, the prudential standards and new accounting standards have (a) bit of (a) problem to align together. Like the banks having certain *cross-board activities*, developing consistent *fair value measurement* guidance is needed between AASB and prudential standards. Also the additional audit guidance for fair value estimates is needed, particularly those derived through the use of models. (Interview No. 3)

However, the opinions from the banking side about fair value measurement are based on the concern that different market conditions influence whether or not this measure can act as a sound or a "deceptive" measure. The following bank interviewee confirms the position of the supervisor cited above, in placing emphasis on the need for creating consistency between banks by providing guidance on fair valuation[433]:

> The definition is a hot topic, as we (re)call for many years. How it's applied and is it a good measure, is it a deceptive measure? It depends on the times, if you asked this last year when the market conditions were different; you would actually receive different answers. As an APRA regulator would tell you, you only have fair valuation if you can be referring your fair valuation to something that you can validate. I mean how (do) you come with a fair value for something that doesn't have a market out there, which is the liquidity… when you look at the accounts, you think, is that valuation a true reflection of the value at this

[432] In contrast, another risk expert from the regulatory authority denies the existence of such inconsistency between accounting standards and Basel II regulatory guidance: "I think they do (align), there are difficulties to make them (perfectly) coincide, so we did a lot of work, the consulting…and we will work on improving it. BIS is currently working on an updated guidance for supervisory authorities on certain issues (after the crisis) which (are) intended to eliminate the inharmonious (content) with accounting requirements." (Interview No. 4)

[433] In the light of the recent financial crisis the BIS, itself, has realized the danger of any inconsistencies between regulatory reporting for the capital adequacy purpose and for accounting purposes. By the end of 2007, the BIS had initiated a project designed to gain a deeper understanding of various approaches used to value complex financial instruments. The Committee's work focused on the use of valuation methodologies for both risk management and financial reporting purposes. It also assessed the related control, audit and governance practices surrounding fair value measurement.

> point in time, or is it a deceptive? (For) many cases, the answer will be to hold it. I think the main thing is probably consistency. It is you know, an industry like banking has to be consistent across different banks. The regulator can have a role there, and impose consistency, and give guidelines or even prescribe voice (to) valuation. (Interview No. 14)

It can be seen that interviewees from both the banking sector and regulatory authority highlight the need for regulators to communicate efficiently with accounting bodies to ease inconsistencies that could otherwise become burdensome and confusing for information users. Under Basel II, reports are meant to provide sufficient information on banks' risk profiles to the broad market and public users.

For banks, any inconsistency between regulatory reporting rules and accounting standards create additional inconvenience because reports must be prepared to fulfil the requirements of both the regulatory and accounting bodies. Banks themselves are attempting to achieve alignment between each of these two systems:

> We are going to create alternative sets of risk measures to make them align. They are separated risk returns, but we are making sure that they line up. (Interview No.7)

8.7.5 Confidentiality Issue

One of the problems emerging in relation to Pillar Three, as described by interviewees from the banking sector, is that of confidentiality. One of the risk managers, argues that APRA's Basel II guideline SS-330 has the potential to trigger confidentiality issues for banks during the Pillar Three reporting preparation process:

> I think there is a statement within APRA's *standard SS-330* that does allow you to exclude commercially sensitive information. We are yet to get to the bottom of how to do that though, because I think from memory, the requirement is to say why you are excluding it. But then if you (are) saying why, then you are probably giving away what's confidential. So I think the way that it would work is we would need to get APRA approval to exclude certain things if necessary, but I think the majority of things do need to be disclosed. I don't think APRA will

> allow banks to exclude material (in the) portfolio on the basis of commercial confidentiality. (Interview No. 10)

Information released to regulators under the Basel II framework, as argued by the following bank risk expert, raises timing issues:

> Tier 1 is at a detailed level, and reading the number of retained earnings can give an indication as to your profits before it's actually released to the markets. This (is) *pre-empting the annual results* … and because we are part of a group, it is a *sensitive* thing. It is usually (why) you wait until the group results are released. The subsidiaries and branches cannot divulge any profit numbers before (the) group releases their results. So yeah the disclosure is sensitive, because the time model precedes the group results. (Interview No. 14)

When supervisors were asked about the question of commercial confidentiality, their answers tended to be much more conservative than those of bank managers. Yet one of the supervisors openly concedes the existence of confidentiality issues; going on to discuss the potential inappropriateness of including certain information which might be sensitive from a bank's perspective:

> Yes, there's a bit of (a) problem there, the commercial confidentiality issues are always there. Especially some sensitive information related to regulatory capital requirements possibly should not be under Pillar Three disclosure. (Interview No. 3)

To sum up, the contribution of Pillar Three to building market awareness and promoting market based discipline, are actively debated. In addition, certain issues or potential problems have emerged during the implementation period, including the excessive burden of information disclosure, the possibility of inconsistency with International Accounting Standards, and matters of commercial confidentiality. In general, supervisors respond more conservatively, often denying the existence of many of these problems. Bank risk managers also discuss the need for education, recognizing the difficulties that the general community could face in understanding Basel II reporting. While market analysts could help to overcome some of these problems by acting as translators, it will obviously take a notable period of time

before report users can adequately digest the information without the assistance of market analysts.

8.8 Issues relating to Pillar Two Risks

8.8.1 The Quantification of Pillar Two Risks

Pillar Two of Basel II provides regulators with a framework to deal with all those risks falling outside the Pillar One risk category that are still derived from a bank's risk-taking activities, including *systemic risk, pension risk, concentration risk, strategic risk, reputation risk, liquidity risk* and *legal risk.* The Basel Accord combines all these other risks together under the title of residual risk.

These Pillar Two risk types are mostly defined in qualitative terms (especially strategic risk, reputation risk, and legal risk) in contrast to credit risk and market risk. In particular, reputation is regarded by business managers as a prized though highly vulnerable corporate asset and managers may be more inclined to consider reputational damage as simply a failure to manage the relevant risks properly. Significantly, there is no universally accepted definition of strategic risk. It is identified as a potentially significant risk under Pillar Two, even though no precise definition is provided[434].

Therefore, the Pillar Two risk quantification problems are obviously associated with evaluating the qualitative features of these risk types in the absence of clear definitional guidance, as reflected in the following two responses from risk-managers:

> I think these areas (Pillar Two risks) are (a) little bit more *airy-fairy*, a little bit more *difficult to quantify*. (Interview No. 1)

> It's something that's hard to translate into numbers. You know, like contagion risk or reputational risk, a lot of it is judgment. We get a lot of different KPIs and indices. We can set our concentration risks being prudent at level X, (but) how (do) you determine whether level X is

[434] In the Pillar Two guidelines, the Committee of European Banking Supervisors (CEBS) suggests the following: strategic risk is "the current or prospective risk to earnings and capital arising from changes in the business environment and from adverse business decisions, improper implementation of decisions or lack of responsiveness to changes in the business environment". (BIS, 2006)

> adequate or not? A lot of it is judgment, I mean some of the reputational risk is something which … you know, you put something inside but you just don't measure, it is very hard to quantify. (Interview No. 14)

One risk expert from the banking sector indicates that the fundamental issue for him is the subjective nature of these risk types, which introduces enormous scope for error:

> It is hard to quantify future events that may or may not happen, and that's I guess the whole Basel issue. But I think, for reputational risk, you can make an assumption, but it is not really based on any quantifiable justification. And for (bank's name) we actually find there is not a high correlation between public bad news and our share price, so that would then mean, how much capital do you really need to hold for it? And our view would be, you don't need to hold capital at all, because that's what your earnings take (care of). (It) just means you don't make profit; it (does) not look good, but... (bank's name) or another bank would probably have a completely different way of estimating it. And the way that Pillar Two is written, obviously there are no guidelines. (Interview No. 13)

Quantification difficulties arise even for risk managers within advanced banks, due to the novelty and idiosyncratic nature of these categories of risk:

> Well as a whole, the problem of measuring those things is that they are overly new, in terms of how you calculate them. We can quantify them. We've been developing models to do that, but credit risk is something that's been measured for a long time, so you can get some comfort. Some of the others haven't been around, so it is a bit hard to quantify. (Interview No. 12)

The proliferation of methods used by banks to estimate Pillar Two risks also creates a hurdle for regulators:

> My understanding is that each bank does it differently. (Take) the estimation of reputational risk for example, our view on reputational risk is that we have a future earnings capacity, so any loss we might

> suffer because of reputational risk doesn't have anything to do with capital or minimum capital that we hold. It means you don't make as much profit going forward, but that doesn't mean that your deposit holders have to lose their homes. And I don't know how other banks feel about that, they probably do it (in) different ways. Again, so I think it is a challenge for the regulator to then go around to different banks and say which one is right and which one is wrong. Possibly they (will) all correct in their own way, and possibly that's the process that APRA will follow. There are no guidelines as to how (to) do it, because there aren't. But if you put your own case to APRA, they will consider it, and hopefully accept it. I think as a regulator it is a hard thing to do properly. (Interview No. 11)

In that sense, there needs more consensus on how to go about quantifying Pillar Two risks, which requires more effective communication between regulators and bank risk managers:

> I think Pillar Two risks are probably the ones where are still an emerging consensus between banks. That is (a) difficult exercise, kind of quantifying them, some of those other ones, nobody has yet discovered the (kind of) best approach. The regulators and banks were working on the best way to model them. (Interview No. 6)

The drive to quantify banks' Pillar Two risks has triggered the emergence of an industry within the banking system to provide necessary technical services:

> Yes, however, there has been an industry in financial consulting and acting inside the banks themselves, to build useful quantitative models that provide reasonable estimates of a whole swag of risks. (Interview No. 8)

Despite the subjective nature of these risks, there is a view that they can be effectively managed without resorting to quantification:

> You can't quantify them; I mean reputation risk isn't something that you would want to put a number on. It's just something you want to

> eliminate, (get) right or minimize. We don't try to, there's no need to quantify them. All you want to do is trying to make the right decisions strategically, and inform those decisions as effectively as possible. And operational risk (is)...making sure that processes and information is good enough to enable decision makers to make the right decisions. So that's how you limit reputation risk, you never try to quantify it. You just try to avoid reputation risk, so you (are) making judgment calls on whether there is reputation risk, yes or no, in a transaction, and whether you are willing to accept that reputation risk. (Interview No. 10)

Another bank risk manager points out that the conservative approach to capital holding against operational risk under Pillar One is actually intended to cover much of the exposure to Pillar Two risk:

> I think the conservative approach on capital holding against operation risk is designed to cover some of those (risks far removed) from (a) quantitative point of view. I think the main thing (that) will come out of that is ensuring that banks adequately understand what are the risks associated with them, ensuring they can adequately explain how they manage them, ensuring their system (is) in (a) safe place rather than being able to actually quantify what that risk is. (Interview No. 2)

From his perspective, the value of the Pillar Two residual risk category is largely educative. Nevertheless, as argued in Chapters Two and Five of this thesis, much of this, so-called, subjective risk should actually be classified as uncertainty- rather than risk-related. Even the prevalent quantitative models—including those constructed by the industry specialists mentioned above—are unable to account for uncertainty. In such cases, according to the relevant discussion in the cited Chapters, it may be more helpful to invoke notions of sub-additivity and robustness theory.

8.8.2 Liquidity Risk

Liquidity always plays a significant role for banks. As described by one bank risk manager, liquidity is like "insurance' for a bank. The BIS (BCBS, 2008, p. 1) also

indicates that "liquidity is a key determinant of the soundness of the banking sector[435]".

As with other Pillar Two risk categories, the measurement of liquidity risk is not mandatory, unless stipulated by a supervisor on the basis of a case-by-case review of a specific bank's ICAAP result, which has to identify significant liquidity risk exposure. The following comments from regulatory supervisors explain their supervisory process of liquidity risk and Pillar Two risk in general terms:

> We will review their ICAAP and make decision once banks have exposure. (Interview No. 4)

> They don't exactly have to (hold regulatory capital), except (when) we find they (are) exposed (heavily) to liquidity risks, we then will require them to put it into their ICAAP. But actually they should take liquidity risk into account, because it can be significant in certain times. Banks just don't need to hold much capital for that if we don't ask them to hold (it). (Interview No. 3)

Nevertheless, the regulatory requirements on liquidity risk measurement are both optional and flexible in comparison with Pillar One risks—market, credit and operational risks. Some bank practitioners claim that liquidity risk is "something that you don't measure, you just manage", with other interviewees going so far as to assert that there is no need to include liquidity risk under the Pillar Two risk categories:

> There are (the) same arguments for liquidity risk as well. Many people say that liquidity risk shouldn't be in Pillar Two as well, because *it's something that you don't measure, you just manage*. Liquidity risk didn't cause the sub-prime (crisis), poor liquidity risk practices within banks have contributed to many of the problems; have contributed to the spectacular collapse like Bear Sterns and Northern Rocks and so

[435] BIS 2008 paper further points out that "The market turmoil that began in mid-2007 has highlighted the crucial importance of market liquidity to the banking sector. The contraction of liquidity in certain structured product and interbank markets, as well as an increased probability of off-balance sheet commitments coming onto banks' balance sheets, led to severe funding liquidity strains for some banks and central bank intervention in some cases. These events emphasised the links between funding and market liquidity risk, the interrelationship of funding liquidity risk and credit risk" (BIS, 2008, P.1)

> forth. Many of those things are liquidity related, *but I don't think including it in Basel II is going to do too much*, it's about management ... just because they (are) not in Basel II doesn't mean banks aren't thinking about them. *Liquidity risk is supremely important*[436]… it's been the focus of every bank in the banking world for the last six months. There's absolutely nothing to do with regulation in Basel II and capital. Cash management is equally, if not more, important than capital management, they are both important, but they are different things. (Interview No. 10)

Another risk expert from the banking sector insists that although liquidity is a vital component of banks' risk management even without regulatory enforcement in the form of capital-holdings, there is no consistency in how it should be measured:

> Because I mean liquidity is like insurance for a bank, certain banks like to be secure and insured, and would sacrifice profit for prudent capability. Other banks are less prudent, like to take more risks, they would reduce, forgo their liquidity management for higher profit, let's put it this way. (Interview No. 14)

> Basel I or Basel II makes no different. Let's say Basel II never happened, banks would still measure liquidity risk? Yeah! Talking about Basel II and liquidity risk is probably *irrelevant*, there is no consistency out there. Every bank measures liquidity risk the way they see it. (Interview No. 14)

The problems with dealing with liquidity risk are compounded by differences business structures and internal systems, and a general lack of information sharing among banks. Some bank managers complain that even after information is disclosed, regulators still do not have the capacity to adequately understand relevant liquidity risk management processes:

[436] He then gives an example of how his bank takes liquidity risk seriously particularly after recent financial crisis: "Since the middle of last year we've had an enormous (number) of people and resources focused on liquidity risk. We started up (a) new committee at the board level to manage liquidity." (Interview No. 10)

> Every bank does it *different* out there, and there is no disclosure, or very little, *no one knows what others are doing*. And the regulator stands in the *middle*, not prescribing anything, and the *framework is actually very weak*. If you know what's happening out there, all regulators are running around trying to enhance the liquidity standard, so they want to put in new regulations, but they don't seem to get a grasp as to how to do it. (Interview No. 14)

> We had a seminar from APRA, and (they) called all the banks together, and (they) say tell us, how you do it. One of the banks says "Ok this is how we do it" … that was a year and half ago, and still nothing. APRA still can't come up with something they can impose or sell to the banks. But the bottom line is, liquidity risk, again every individual banks would be different, depending on their risk, on their market, on their exposures and how complicated or simple their business is. In our case, we put (in) a lot of efforts, and energy, and big cost, actually, as well, for the bank. (Interview No. 15)

From the researcher's point of view, even though most of the banks might take liquidity risk seriously in their risk management process, as a regulatory framework to guide the risk management practices of all banks, Basel II has a responsibility to incorporate all influential risk types into its framework and thus provide banks (and regulators) with explicit guidance.

Therefore, the arguments for the omission of liquidity and other risks under the Basel II framework reflect a degree of misplaced confidence on the part of practitioners in this regard, which has the potential to drive a wedge between regulators and bank practitioners, making it difficult to build mutual understanding and obtain consensus on certain emerging issues.

8.9 Conclusion

This Chapter explores the problematic aspects of Basel II by outlining the debates arising between regulators and bank practitioners regarding its implementation. Taken together—Chapters Seven and Eight, provide a comprehensive picture of Basel II

seen through practitioners' eyes. Giving 'voice' to the opinions and experiences of those charged with ensuring that Basel II is a practical reality, is the unique contribution made by this thesis. In the analysis of the relevant interview responses, the diversity of banking institutions, and their vested interests have been teased out. Further, recognition of differences in the strategic positions of business representatives and regulators has influenced interpretation of the data..

In the first implementation issue investigated—the burden of compliance with the complex methodology of Basel II—the heterogeneity of banks has come to the fore. Small- to medium -sized banks using standardised risk assessment and seeking IRB accreditation are the most vocal about this complexity , especially the attendant strict data requirements. Although these banks are motivated by potential capital relief to achieve IRB accreditation, they face formidable hurdles in the process. Banks that have only recently entered the market and 'less sophisticated' banks are disadvantaged by gaps in data accumulation and/or incomplete data that does not span a total economic cycle. Even advanced banks must contend with compliance costs, since data must be retrieved and transformed into a usable form to satisfy accreditation criteria.

This issue also brings to the fore, the fundamentally different perspectives of regulators and bankers. Regulators determine their data requirements with the financial stability of the financial system in mind. Their focus on prudential control favours the use of downturn calculations, which influences data requirements. On one hand, supervisors acknowledge that these requirements create difficulties for some banks trying to achieve IRB accreditation but they insist that these moves should be assessed to be considered over a long time frame. Bankers, on the other hand, are profit motivated and tend to be critical of the costs associated with attempting to satisfy the demand of regulators.

The second implementation issue revolves around the exploitation of competitive advantage from implementation. The banking industry asserts that Basel II delivers competitive advantage to advanced banks, primarily via the capital relief from successful IRB accreditation. Further, it is argued that this 'tangible' benefit is complemented by intangible benefits attached to the enhanced capabilities of

successful banks. However, regulators dispute this, arguing that outcomes are equal when adjusted through the imposition of a regulatory buffer.

The analysis of interview material also reveals other points on which the opinions of bankers and regulators diverge in regard to the question of competitive advantage. Generally, there is a chasm between the expectations of bankers on the degree of regulatory capital relief available from accreditation and the reality acknowledged by regulators. While advanced banks are often frustrated by the slow rate of regulatory approval for adoption of their internal models, standardised banks are frequently disappointed by conservative attitudes in response to efforts to achieve accreditation. However, at time both acknowledge that regulators are somewhat hamstrung by a lack of resources. For their part, regulators acknowledge that IRB accreditation is not for everyone and that banks need to make rational decisions about pursuing this approach in the light of their business structure and the relative costs and benefits from the process.

Connected to the issue of disputed differential advantage is the imposition of the regulatory buffer. All bank risk managers criticize this step which takes APRA beyond the Basel II rules. They argue that the buffer (LGD floor) is in fact a flat 'tax' that runs counter to the whole tenor of Basel II as it dilutes incentives for banks to invest in and upgrade their internal systems and be rewarded for the effort. Supervisors argue that it is a cautious, even prudent, measure introduced to ensure that an excessive disparity does not emerge between banks of different scales over the interim period. The regulators stand ready to lower the impost as internal systems improve.

The third implementation issue concerns the nature and usage of external ratings agencies under Basel II. The recent financial crisis exposed the weaknesses in the reliability of external ratings. In particular, the profit-driven nature of rating agencies and the potentially flawed techniques of risk measurement, and thus, potentially erroneous estimates of capital requirements was highlighted. Nevertheless, standardised banks continue to rely on external ratings, since access to IRB techniques is not available to them. Conceivably, this could undermine efforts to secure stability for financial markets under Basel II. Indeed, even advanced banks

retain external ratings for some purposes, because ratings agencies can draw on large or more affordable pools of data.

Given the continuing use of external ratings and the perception that relevant agencies are not held accountable for their 'product', there have been calls to bring agencies into the regulatory framework. Agency claims to offer impartial and independent advice has been seriously eroded by the crisis but it is not easy to see how they could be drawn into regulatory supervision.

It is a fact of human nature that wherever there is a difference between economic risk and that calculated for regulatory purposes, individuals will have the incentive to exploit those differences. This broaches the fourth implementation issue: the control of regulatory arbitrage. One response was for banks to adopt the practice of securitisation. Basel II has made efforts to address securitisation issues through higher regulatory capital charges and these developments have significantly altered recent practices. Nevertheless, to completely eliminate regulatory arbitrage, the supervisory system would need to be aligned exactly with the real risk profile of the banks and this is unlikely to occur. There are both technical and philosophical differences that act as barriers – the latter embodied in the fact that supervisory capital charges are determined by concerns for stability of the system while banks tailor their capital needs to their business interests.

The fifth implementation issue refers to supervisory costs associated with cross-border activity of banks. There are three aspects to such activity that have elicited complaints from banks. Since cross-border activity necessarily encounters different regulatory jurisdictions, there is duplicated reporting. Second, different jurisdictions impose different risk techniques, especially for operational risk, which often results in large capital charges, especially where extant techniques fail to account for the diversified nature of the entity. Third, different jurisdictions are operating in accordance with different timetables for the implementation of Basel II. The upshot of these problems is that the banks regulatory capital holding will be higher, impacting the pricing of loans for affected banks, thus placing them at a competitive disadvantage in comparison with local banks.

Regulators respond with the view that some additional cost from cross-border activity is a commercial reality and must be factored into banks' decision making. Nevertheless, regulators recognise the need for dialogue between national supervisors to minimize distortions introduced by variations in national approaches.

Issues of information disclosure feature in the sixth area of implementation concerns. The intent of the new content, under Basel II, is to raise public awareness of bank practices so that the public can exert more effective market discipline on banks. However, advanced banks generate more complex reports that require specialist knowledge so that they can be properly understood. This casts doubt over the usefulness of disclosure in the absence of either market analysts to interpret reports, or public education programs to raise financial literacy generally. Second, there are concerns about the cost and level of detail of information to be disclosed. For standardised banks that do not possess the information, disclosure adds a significant cost, even for advanced banks that have the information to hand, there are costs associated with interpretation and formatting. Banks seem to be divided as to whether the information requirements are excessive. The final concerns are business oriented and deal with inconsistencies between accounting standards and prudential standards and the potential for a compromise of confidentiality. National regulators are working to harmonize these standards.

Finally, the last implementation issue focuses on accommodating Pillar Two risks within the regulatory framework. This issue reveals a fundamental breach between bankers and regulators. Banks argue that the residual risks should not be subject to quantification and regulation. Putting to one side liquidity risk for the moment, their argument is fourfold. They cite the subjective nature of the risks and claim that they are intrinsically not quantifiable; they claim that such risks are more an issue for earnings outcomes and are not a capital matter at all; some assert that provision for such risks has been built into Pillar One, so there is no need for a double count; and the advanced banks argue that the formal identification of these risks is new and the techniques required to quantify them are still being developed. On liquidity risk, the banks acknowledge its importance but again argue that it is a cash matter and should be outside a regulatory framework centred on capital adequacy. Their contention is that the matter is managed within the businesses and does not need to be measured.

For supervisors, the variety of approaches adopted by banks to address these risks makes it extremely difficult to extract a standard approach. Indeed, with respect to liquidity risk, the regulator's approach to assessing a given bank's exposure is *ad hoc* and reliant on supervisor judgment. There is clearly a need for banks and regulators to develop a consensus as to the best way forward on these matters.

A common thread to all these issues is the divergence between the motivations of the two parties. Regulators design policies with conservative (i.e. downturn) considerations in mind and follow the principle of scrutiny in prudential control processes. While banks are profit-driven and concerned more with the benefit delivered to them as the regulatory burden is eased under Basel II. This conflict mirrors the existence of communicative distortion arising from risk management and relevant supervision practices. Habermas' theory of communicative rationality suggests that only practices that allow truly undistorted and uncoerced communication are capable of generating legitimate controls over conduct. In that sense, the solution to these debates between regulators and bank risk managers is in effective communication and interaction between the parties during Basel II implementation. Moreover, as regulators, their policy and actions should be more "responsive" to the nature and status of banks, to form the basis of an empirically effective "responsive regulation" in the financial world.

Therefore, Basel II does make certain contributions to improve and promote sound risk management practices within the banking industry, and guide and formalise supervisory practices. However, the failure of the framework to come to grips with uncertainty and its acceptance of a flawed underlying risk methodology means that Basel II has insufficient capability to stabilize financial markets. Due to the flaws of capitalism arising from uncertainty, as distinct from other market risks associated with the business cycle, prudential supervisors need to consider the inclusion of robust control theory to improve the regulatory framework.

Chapter Nine

Contributions of the Research and Policy Implications for Reforming Banking Risk Management Systems under Basel II Framework

9.1 Introduction

This concluding Chapter breaks the thesis into two sections. The first section of the thesis (Chapters Two, Three, Four, and Five) provides the theoretical context for an evaluation of the Basel II implementation in Australia. The second section (Chapter Six, Seven and Eight) interprets the responses of interviewees in the banking sector and within regulatory agencies in Australia to bring empirical evidence to bear on the research questions broached in Chapter Six. In response to the research findings, this concluding chapter proposes policy recommendations focusing on prudential controls, and corporate governance. Moreover, the limitation of this research and future research area are also addressed in the chapter.

9.2 Theoretical Contributions

The background Chapters in this thesis (Chapters Two, Three, Four, and Five) have the aim of providing a theoretical platform to assist readers in obtaining a comprehensive, though critical, understanding of structure and *raison d'etre* of Basel II. The essential thrust of this theoretical framework is that within capitalism the necessity for making decisions under the condition of uncertainty threatens the on-going stability of the financial sector. In general, four major theoretical strands emerge from this research. First, it is argued that the behavioural economics literature on decision making under conditions of uncertainty has the potential to operate as a basis for reforming current systems of risk management that are promoted under the Basel II framework. Second, the nature of the 2008 financial crisis is analysed to focus on the pivotal role played by securitisation and external ratings procedures in aggravating the downturn. Third, it is argued that Basel II, as a regulatory framework, possesses certain attributes of Responsive or Smart Regulation, which provides the answer to first research question addressed in Chapter Six. Finally, it is argued that flaws in the VaR risk approach, due to its inability to account for time-varying uncertainty premia and fluctuating tail-risk, are responsible for weaknesses in the

system of risk-management within the banking sector. This discussion on VaR answers the second research question which shed light on the technical issues arising from Basel II implementation. Insights from the literature on risk-sensitive and robust control are drawn upon as a vehicle for addressing the identified inadequacies of the VaR approach.

9.2.1 The Behavioural Economics Literature and Reform of the Risk Management System

The review of the literature on risk and uncertainty in Chapter Two separates the decisions that economic agents face into two types. One type involves risky decisions for which the probabilities of an event's occurrence can be obtained (as conceived by adherents to the neoclassical tradition of economic thought); while the other type involves decisions made under conditions of uncertainty where relevant probabilities cannot be obtained due to the fact that the future is unknowable (a conception with roots in the work of Frank Knight (1921) and John Maynard Keynes (1921, 1936 and 1937), with further refinements from Paul Davidson (1991, 1994, 1995 and 1998) and Ian Hacking (1975) who distinguish between amenable situations termed "ergodic" or aleatory and non-amenable situations termed "non-ergodic" or epistemic situations). Understandably, this distinction has an important bearing on the behaviour of economic agents. Chapter Two observes that some Post Keynesian economists have suggested that the closest formal representation of Keynes's notion of uncertainty is embodied in notions of decision making under ambiguity or uncertainty aversion.

The thesis has explored the inconsistencies between the axioms of expected utility theory and behavioral characteristics revealed in empirical studies of decision-making. It argues that these characteristics can be better explained by drawing on notions of ambiguity or uncertainty aversion. Chapter Two goes on to argue that there is a mathematical equivalence between sub-additive, multiple-prior, and fuzzy-measure theoretic approaches to formalising decision-making under uncertainty or ambiguity aversion. Nevertheless, the precise way in which the respective stochastic uncertainty constraints, distortion measures, or degrees of fuzziness are interpreted, will determine, in each case, whether the researcher is applying the notion of ambiguity or fundamental uncertainty. The thesis advocates the adoption of these techniques, in a

risk-sensitive and robust control theory setting, to accommodate fundamental uncertainty (as explained in section 9.2.4).

The orthodox economic view holds that economic agents are able to inform decision-making through the formation of rational expectations on the grounds that these decisions are based on ultimately knowable or measurable probabilities. As a result, it is presumed that markets produce efficient outcomes, as reflected in the efficient market hypothesis. However, following Keynes, this thesis argues that, in the presence of fundamental uncertainty, individual decisions are based on convention rather than caprice. Nevertheless, in the face of growing financial fragility these decision-making conventions can break down entirely, due to the impossibility of assigning probabilities to uncertain outcomes. Failure to adequately recognise and deal with uncertainty in decision making threatens financial stability.

In acknowledging the importance of fundamental uncertainty, the thesis then draws on Minsky's Financial Instability Hypothesis (FIH) to better explain the sources and nature of financial instability (1975, 1977, 1986, 1992 and 1993). It argues that there is an inbuilt bias towards financial fragility and instability within capitalism reflected in the often slow transformation processes occurring within financial markets as holders of financial assets move from hedge, through speculative to Ponzi positions. More generally, financial fragility increases because levels of diversification are reduced over time, the present value breakeven time of investments is increasingly deferred, and agents rely more and more upon external rather than internal sources of finance. On this line of argument, the process of causal entailment runs from the initial conception of fundamental uncertainty, to the conventional behavioural responses of economic agents, to fluctuations in the level of financial instability, through to variations in financial instability as conventions break down. This view is then utilized to suggest alternative approaches to the reform of systems of risk management in the banking sector. The Chapter provides a comprehensive theoretical background for understanding the nature and consequences of decision making under conditions of uncertainty on the part of economic agents that include financial institutions, regulators, and investors. As such, in providing more insight into the nature and source of financial instability, the Chapter assists policy-makers to design a more "optimal" regulatory strategy.

9.2.2 The Analysis of 2008 Financial Crisis drawing on Securitisation Issue

In Chapter Three it is argued that, over the past two decades, institutional trends in financial markets have seen banks moving away from acting as intermediaries between household depositors and corporate borrowers to a position where they take on the role of brokers in structured finance markets (i.e. securitisation) relying increasingly on fee income rather than on interest earnings. This behavioural change in the banks' risk-taking activities, it is argued, has both triggered off and, in part, occurred in response to a shift in the regulatory environment away from a "command and control" approach towards one influenced more by the notion of voluntary self-regulation. This shift, it is suggested, is one influenced by the advent of a strident neoliberalism, and is associated with a strong belief in the rationality of expectations formation in financial markets. However, in the presence of fundamental uncertainty, markets cannot function rationally. On the basis of this Keynesian and Minskyian insight the thesis analyses the recent financial crisis, drawing on the significant growth of securitisation as a typical example of an "off-balance sheet" innovation.

In the Chapter it is argued that the risk dispersion function of securitisation increases the dependence of banks on the originate-to-distribute (OTD) model, which separates banks' initiating activities around the securitisation process from their capital–holding activities. Under the previous Basel I framework this kind of 'remote origination' had the potential to trigger off regulatory arbitrage behaviour on the part of banks and other financial institutions. Such behaviour takes advantage of the difference between banks' economic risk and regulatory capital-holdings. The capital benefit gained from this securitisation related arbitrage behaviour helps banks to optimise their capital management and the risks are spread off banks' balance sheets. All this stimulates the prosperity of securitisation markets, while simultaneously sowing the seeds of instability.

As discussed in Chapter Three of the thesis, the OTD model supplemented by an unreliable external ratings system resulted in a disastrous disconnection, which also influenced vital information flows. For instance, the securitisation process brings together banks acting as brokers, with investors, firms and household borrowers but information does not flow freely between those offering securitized assets to be used as collateral, the actual originators of the assets that are going to be securitized, those

providing hedging and insurance services in relation to the assets, and the credit rating agencies charged with the responsibility for assessing levels of risk in relation to these assets (include credit default swaps). These information gaps contributed to the occurrence and the severity of the 2008 financial crisis and continue to generate challenges for policy-makers hoping to stabilize financial markets now and in the future.

9.2.3 Basel II possesses certain attributes of Responsive and Smart Regulation

With the recognition of the presence of uncertainty and the inherent instability in capitalism, government policy is acknowledged as essential to mitigate the tendency of the financial system to veer towards "fragility" and an ever-increasing vulnerability to negative shocks.

Chapter Three of the thesis reviews the literature on regulatory strategies and the history of prudential controls applied in the financial sectors of the UK, U.S and Australia in outlining the transition from the pre-deregulation to financial deregulation era. In the early stages this movement marked something of a paradigm shift away from the direct government intervention favoured by post-war followers of Keynes, to self-regulation as favoured by free market liberalists. The Chapter argues that the failure of this neoliberal regulatory environment is clearly evidenced by the 2008 financial crisis. It argues that the seeds of this crisis were apparent to those policy makers, which has produced a challenge to policy-makers charged with the responsibility for designing a new and more "optimal" prudential control system to replace the Basel I framework.

Accordingly, Chapter Four of the thesis reviews the literature on theories of Regulation, extracting from this overview the key concepts of *governmentality*, *reflexivity*, *responsive regulation*, and *'smart' regulation*. It argues that these notions are germane to the constitution of a new regulatory paradigm with the ability to transcend the command-and-control versus self-regulation debate by constructing a workable "third-way" notion of how to *regulate self-regulation*. To this end, the Chapter sets out a foundational evaluation benchmark against which to explore the congruence between the Basel II framework and the key regulatory concepts.

Chapter Four demonstrates that Basel II possesses each of the benchmark attributes of this "third-way" approach to regulation. As described in the Chapter, the first of the two components of the benchmark is spreading the regulatory burden. Two attributes—system monitoring and intermediary structures—fall under this component. The other component of this benchmark is responsive enforcement, which includes the attributes of responsiveness, corporate social responsibility and market-oriented strategies. System monitoring is achieved through the adoption of the IRB risk approach, whereas the involvement of intermediary structures such as trade unions, employer agencies, and industry networks can be seen in the support provided by regulators for industry networks and employer representatives like the Australian Bankers Association during the implementation process. Responsiveness is achieved under the pyramid of risk evaluation approaches proposed by Basel II (including foundational, IRB and advanced IRB approaches) that adjust the stance of regulation to the status of banks' internal systems and reflects "responsiveness". Corporate social responsibility is promoted under Basel II through its privileging of qualitative rather than solely quantitative aspects of risk management. This is also reflected in the Accord's emphasis on building a risk culture, and the education of banking boards, so that board members and top managers gain more knowledge and understanding of the risk management function. Market-oriented strategies include the market discipline provisions imposed under Pillar Three of the Basel Accord. Owing to the demonstrated congruence between Basel II and these benchmark attributes, Chapter Four of the thesis concludes that Basel II can clearly be viewed as an example of 'smart' regulation in the field of banking prudential control.

9.2.4 Adopt Risk-Sensitive and Robust Control Theory in Basel II

In Chapter Five, the thesis examines the VaR risk approach and other prevalent risk measures that are adopted for banking risk management and prudential control purposes. VaR approach plays a fundamental role in the process of assessing risk and calculating regulatory capital-holdings under Basel II. However, as argued in the chapter, it fails to capture fluctuating tail risk and incorporate diversification effects arising from the lack of sub-additivity. This Chapter evaluates Extreme Value Theory (EVT) and the copula method, and argues that they have ability to perform better in VaR-based risk analysis, in comparison to backtesting and stress testing (the two

existing components that are mandatory complements to the VaR-based IRB approach promoted under Basel II).

This Chapter of the thesis reveals that, unlike Expected Shortfall (ES), the VaR approach does not qualify as a coherent risk measure essentially due to its lack of sub-additivity. At the same time, the thesis argues that once VaR and ES are given a Choquet integral representation, they can be interpreted as distortion risk measures which are closely related to quantile-based, coherent risk measures. Nevertheless, VaR and ES remain subject to limitations because they are not wholly consistent with risk aversion. In that sense, the thesis argues that these flaws of VaR contribute to the underestimation of risks; flaws which can trigger excessive risk-taking, in turn, exposing financial institutions to market turbulence.

In this Chapter, the thesis further argues that these risk modelling methods, in particular, the VaR approach, in focusing solely on risk premia, ignores time-varying uncertainty premia, thus rendering them inadequate for complex decision-making and risk management in bank-based financial institutions. Hence, Chapter Five argues for the adoption under the Basel Accord of techniques derived from risk-sensitive and robust control theory.

9.3 Empirical Research Findings

9.3.1 Research Methodology for Empirical Investigation

To investigate of the effectiveness of the Basel II implementation in Australia, Chapters Seven and Eight apply qualitative research techniques, to gather responses from a series of semi-structured interviews with practitioners, who are closely involved in Basel II-related regulation and risk-management practices. To this end, as explained in Chapter Six, Habermas's Universal Pragmatics, and his related Theory of Communicative Action, have been chosen as the philosophic foundation to guide this critical methodological analysis.

Habermas' Theory of Communicative Action argues that both economic and bureaucratic subsystems have contaminated the lifeworld through forms of purposive-oriented action, which aim at achieving system-maintenance. The technocratic and autocratic aspects of prudential control are both a product and an expression of this

purposive and procedural rationality. The related distinction between the strategic interests of bureaucrats and of commercial practioners, as discussed in Chapter Six, affords critical purchase in understanding and exploring the nature of the conflicts exposed by the interviews, between regulators with their bureaucratic interest of maintaining financial stability, and bank risk managers focused on sustained profit making.

In Chapters Seven and Eight, this methodology is deployed in a comprehensive evaluation of Basel II, to reveal its superiority over Basel I; but also to highlight a series of potential problems arising from its implementation in Australia. In the process, the thesis uncovers tendencies for communicative distortion in regard to Basel II-related risk management and supervision practices that might have an impact on Basel II implementation. Reasons for these detrimental impacts include the increasingly multinational character of banking business, marked by growing cross-border activity. In turn, this gives rise to a number of complex issues revolving around working across different cultures, regulatory concerns, and approaches adopted towards risk estimation and management.

9.3.2 Superiority and Effective aspects of Basel II

Basel I, together with its amendment issued in 1996, was widely criticized as unable to meet its responsibilities in regulating the international banking system. Criticism of the capital adequacy-based approach centred on the inadequacy of the banks' internal risk-management systems, the lack of risk-management skills, and the growth of financial innovations, particularly those that contributed to the recent financial crisis.

In Chapter Seven, based on comments from interviewees, it is revealed that the insufficiencies of Basel I include an over-simplified (one-size-fits-all) set of risk categories and a weak underlying risk methodology. As a result, the regulatory system elicits poor performance under stressed market conditions. In regard to those aspects, interviewees affirm the efforts made to respond to such insufficiencies in drafting the Basel II framework, which include a broadening of the risk categories (i.e. including operational risk and Pillar Two risks) and a strengthening of the underlying risk methodology (as reflected by the proposed IRB approach). This has the potential to improve regulatory performance in volatile market conditions.

Nevertheless, as Chapter Seven goes on to reveal, certain bank practitioners point out that the reliance on external ratings could limit Basel II's performance in such situations. In addition, they suggest that information disclosure under Pillar Three of the new Accord and the potential capital relief derived from using the IRB approach, could help to correct prevalent distortions in capital markets by enhancing market transparency and spreading the regulatory capital burden carried by specific (i.e. major) banks once they are free to adopt the more advanced internal systems as permitted under the new framework. These findings would seem to confirm the superiority of Basel II relative to Basel I.

According to the interview material, bank risk managers, in particular, view Basel II as more practicable due to its adoption of an internal modeling approach, which relies on in-house expertise. Consequently, they rank Pillar One as the Pillar that generates most benefits for themselves, mainly because of the 'tangible' benefit delivered to them in the form of capital relief under the IRB approach. Amongst these bank practitioners, only a few pay attention to the longer term 'intangible' benefits such as incentives for advancing risk management systems as an on-going source of competitive advantage.

In contrast to bank risk managers, supervisors regard Pillar Two as the most beneficial Pillar. In this regard, it can be seen that their interests and responsibilities as regulators are clearly distinct from those of the banks. They find that the guidelines applied and information extracted under Pillar Two are helpful in achieving effective supervision (as reflected in the determination of more appropriate Prudential Capital Ratios (PCRs) the adjustment of risk buckets, and the increased emphasis on the use of stress tests for regulatory purposes).

Apart from the observations above regarding Pillar One and Pillar Two, respondents from both groups indicate that information disclosure under Pillar Three makes an important contribution. In addition to bringing transparency to the market, Pillar Three contributes to building greater market awareness amongst market participants and within the general community through its provisions for public information disclosure in regard to risk assessment and management. In particular, market

participants can monitor prices, funding costs, and risk-taking behaviour on the part of the banks. This monitoring activity assists supervisors by spreading the burden of regulation. Furthermore, numerous comments confirm the contribution that Basel II has made in building a risk culture amongst banking industry representatives and also more broadly amongst market players. The evidence afforded by interviewee responses in this regard focus on the positive impacts derived from the education of bank Board members, the enhancement of knowledge about issues of risk management, and an increase in the ethical behavior of front-line staff. Nevertheless, this Chapter also canvasses a range of problems and insufficiencies associated with Basel II.

9.3.3 Insufficient Underlying Risk Methodology of Basel II

Although bank risk managers uniformly praise the IRB approach for enhancing the banks' Internal Capital Adequacy Assessment Process (ICAAP); in particular, by allowing the modeled risk structures to more closely mirror the real risk profile that banks possess, they nevertheless concede that the VaR approach, which acts as core to the entire underlying risk methodology of Basel II framework, has major flaws. In the main, these criticisms from interviewees on the VaR, correspond closely to the theoretical discussion of the drawbacks of VaR set out in Chapter Five. The reported flaws include an inability to account for fat-tailed distributions and sub-additivity, and the failure of VaR, when dealing with risk correlation (for complex structured finance products such as CDOs, and Credit Default Swaps, as discussed in Chapter Five) and extreme events (which emerged after the occurrence of the recent financial crisis). However, throughout the interviews, the risk experts failed to recognise the most fundamental flaw of VaR and other prevalent risk techniques as described in Chapter Five and Two of the thesis, namely: the neglect of time-varying uncertainty premia.

In Chapter Seven, complements of VaR—backtesting and stress testing, are regarded as useful by all interviewees and are seen as a necessary part of the risk management and supervisory process. But interviewees acknowledge that technical difficulties or even barriers arise in relation to the empirical application of these tests. These arise from the restrictive data requirements, the requirement for down-side based scenario-setting, and validation issues in stress testing. As further discussed in Chapter Eight (see the next section below), the scenario-setting dilemma brings to the fore the

conflict between regulators and banks due to the divergence in their strategic interests—banks adopt what they named the 'sensitivity' principle as a scenario-setting benchmark because of their business strategic interest, while regulators are more conservative in wanting to base scenario-setting on downturn considerations due to their bureaucratic interest in maintaining financial stability. Similar debates between these two groups are discussed at greater length in Chapter Eight together with certain other problems arising from Basel II implementation.

9.3.4 Issues and Problems arising from Basel II implementation

Chapter Eight begins with an account of the fact that those interviewees working mainly for the less-sophisticated banks raise concerns about the over-complicated nature of the IRB methodology and the restrictive data requirements that, together, operate as barriers to implementation. According to the respondents, this is especially the case for those middle-sized banks that have adopted the Foundational IRB (FIRB) approach, largely due to the lack of advanced internal systems and high level risk management skills. Their desire to adopt the IRB approach, despite these failings, so that they can exploit the potential for capital relief could easily 'trap' them into a situation where they face heavy cost burdens and technical hurdles in their efforts to attain IRB accreditation.

Chapter Eight argues that the respective difficulties associated with the attainment of higher levels of IRB accreditation has a significant bearing on the banks' willingness to be active participants in both refining and improving on existing systems of capital management. Some bank risk managers further complain that national supervisors have not translated Basel II's intentions in regard to IRB rules properly denying them anticipated capital relief. The regulatory buffer or floor imposed by regulators over IRB users is criticized for being non-sensitive and overly bureaucratic. This, it is claimed, damages banks' incentives to work on advancing their systems. On the other side of the debate, regulators defend themselves by pointing out that, in the absence of a buffer, implementation of IRB provisions could have deleterious effects on the market share of the smaller banks, thus altering concentration ratios in the industry. Accordingly, they suggest that it is best of these effects are quarantined over the interim period of the implementation, through the imposition of a regulatory floor.

Another emerging issue from interview responses considered in this Chapter, one which has also been exposed by the recent financial crisis, is both the quality and trustworthiness of external ratings. These ratings play a pivotal role in building confidence within financial markets and doubts over their credibility threaten the effectiveness of Basel II implementation, helping to undermine the stability of financial markets.

Throughout the interview process bank risk managers provided examples of practices that have yielded potential profits to rating agencies. Unfortunately, the independence of those ratings is been seen to have been compromised by the profit-driven nature of rating agencies. Despite the fact that clear doubts have been raised about the quality of external ratings, the Chapter argues that there are many reasons why they are likely to be retained. First, for all banks, including large banks, there is a demonstrable advantage in retaining external ratings in cases where the rating agencies have access to some forms of data that are difficult or costly for banks to access. Second, for smaller banks who adopt the standardized risk approach, external ratings are required for determining their risk profile.

Another issue associated with the role of external ratings and credit enhancement that is explored in this Chapter concerns regulatory arbitrage. A typical example of such arbitrage processes is afforded by asset securitisation, which began to grow under the previous Accord, and is acknowledged to have contributed significantly to the current global financial crisis. Although Basel II makes efforts to address the securitisation issue and requires banks to hold more regulatory capital against it; arbitrage possibilities will not disappear under Basel II, because the recommended risk management techniques do not eliminate the discrepancy between economic capital and regulatory capital holdings. Moreover, the dynamic generation of financial innovations raises continuing challenges for regulators in terms of detection and estimation.

However, interviewees' discussions of securitisation largely focus on the 'deceptive' appearance of book entries and the tendency for over-valuation of poor quality collateral (primarily due to compromised external ratings). In this manner, they ignore the most important impact of financial deregulation: namely, the transformation that has occurred as banks have moved away from their traditional roles and

responsibilities in acting as intermediaries between household depositors and corporate borrowers to become active brokers between those offering securitized assets, the actual originators of the assets that are going to be securitized, investors, borrowers, and those providing ratings, hedging and insurance services in relation to the assets. In such an environment, it becomes increasingly difficult to adequately account for the risk associated with securitized assets. The Chapter warns that what is needed to address circumstances of this kind into the future are an effective and consistent set of prudential controls over all participating agencies in the securitisation process.

Chapter Eight also argues that driven by the trend towards increasing globalization of activity, multinational banks face additional problems in relation to cross-border supervision both. Due to the differences in national regulatory frameworks (i.e. countries have different Basel II implementation time schedules, and adopt Basel II at different levels), and also the diverging concerns of regulators in home and host countries, interviewees complain that overseas branches and their parent banks are forced to adopt different risk management approaches. This technical inconsistency creates further difficulties, particularly for overseas branches, in regard to regulatory capital assessment and reporting. Bank risk managers from such multinational banks argue that they are in a competitive disadvantage position in contrast to local banks; a view which is confirmed by supervisors. While acknowledging the necessity for effective communication with regulators from other jurisdictions, supervisors emphasize that banks must make their own judgment calls as to whether the consequences and responsibilities associated with cross-border activity are in their commercial interests or not. The Chapter warns that this source of communicative distortion has the potential to trigger off further conflict between banks and regulators.

Chapter Eight also discusses another emerging issue arising from Basel II implementation—information disclosure. New content provisions under Basel II impose notable data requirements. It is argued that even for the major banks, the necessary information is either not readily available or totally unavailable imposing major cost burdens. This shortage of information has triggered a discussion among banks and supervisors as to whether or not Pillar Three information disclosure requirements are excessive. The answers to that question are largely split between

bank risk managers and regulators. The former group argues that these reporting requirements are excessive and burdensome, and there are confidentiality issues; while the latter group insists on the appropriateness of these requirements and deny the existence of confidentiality issues. However, based on detailed examination of the exact clauses that deal with disclosure (i.e. SS-330), together with the acknowledgement by one of the risk supervisors, it would seem that the position of bank risk managers' is justifiable, while the interests for self-preservation of regulators have been exposed.

As discussed before, information disclosure also helps to build market awareness. Chapter Eight raises interviewee concerns that potential users of the information, including investors and the general community, might have problems understanding the complicated technical information. Apart from acknowledging the need for an education process for information users, some risk managers argue that, in practice, market analysts have to play an increasingly important information-mediation role, to reduce ignorance and misunderstanding.

However, Chapter Eight argues that one problem arising from the information disclosure process requires the immediate attention of regulators: namely, the inconsistency with International Accounting Standards. Both bank risk managers and certain supervisors, point to the fact that key Australian Accounting Standards (i.e. AASB 7) are not aligned with Australian Prudential Standards (i.e. APS-330). In addition, as already recognised by BIS, the field of fair value measurement requires effective and on-going communication between bank regulatory authorities and accounting bodies to achieve harmonization.

Another issue discussed in Chapter Eight, concerns difficulties in quantifying Pillar Two risks, particularly for some risk types that are regarded as qualitative and subjective in nature, such as reputation risk. For certain risks identified under Pillar Two, banks have constructed a variety of definitions in recent years that are now reflected in divergent risk assessment techniques. Therefore, bank practitioners argue that regulators must standardise these definitions to ultimately transform qualitative judgments into uniform quantitative assessment process.

Pillar Two risks carry optional regulatory risk assessments for banks in contrast to the assessment of Pillar One risks, which are each mandatory. Partially due to the acknowledged quantification difficulties, banks normally choose to hold extra capital to guard against those risks. However, the interviewee responses revealed that many practitioners believe that it is better to directly avoid risk through effective corporate governance and good business strategies, instead of through measurement and capital provision.

In this sense it can be seen that bank risk managers think that categorization of Pillar Two risks is less meaningful. This is especially the case for liquidity risk, with bank risk managers arguing that liquidity is regarded as 'insurance'. As such, it does not have to be brought under the provenance of regulatory risk assessment because it will already be taken into account within the banks' strategic management and corporate governance provisions.

9.4 Policy Implications of the Research

The regular occurrences of asset price inflation and deflation and financial crises are evidence that capitalism is inherently flawed. In recognizing uncertainty, this thesis is obliged to recognise that economic fundamentals, as such, do not exist, and can only be ascertained clearly in the event of a downturn or correction. In this context, it must be admitted that prudential controls will always be constrained in their efforts to stabilize the financial market. Nevertheless, viewed from a broader perspective government interventions can dramatically reduce financial instability over the cycle. While longer term solutions require more effective regulation and oversight of risk-taking activities across the entire financial market, regulators should acknowledge the importance of stable economic growth. To this end, the thesis makes two major policy recommendations.

9.4.1 Effective Prudential Controls over the Financial Market

Although the regulatory framework of Basel II has certain attributes of responsive and smart regulation, as shown Chapter Four, there are nevertheless deficiencies, issues and problems arising from its implementation as shown in Chapters Five, Seven and Eight. For the banking sector, it is apparent that bank risk managers feel reasonably

confident about their internal modeling and risk management skills, but the flaws in their risk techniques, revealed from a theoretical perspective in Chapter Five, and confirmed by interview findings in Chapter Six and Seven, and the frequent occurrence of financial crises, would suggest that regulators should put more effort efforts to overcome these technical insufficiencies. Over and above this, the evidence for communicative distortion due to conflict of interest between regulators and bankers suggest the need for more frequent and effective forms of communication to achieve greater congruence of interest. This is especially the case in regard to issues of cross-border supervision and IRB accreditation.

The interviews also exposed an inconsistency in the regulatory framework. While Non-Bank Financial Institutions (NBFIs) are clearly exposed to less regulation than other market players, this renders them more vulnerable to the shocks relating to the securitisation process. Nevertheless, due to a growing interdependence between institutions, the failure of these players will have impacts on the entire financial market. This unevenness of regulation also comes to the fore in regard to the external rating agencies with regulators continuing to apply the so-called "independence principle" to their activities. The thesis has argued that rating agencies will continue to be comparably less regulated and play an important role, despite their contribution to the recent crisis. For all the reasons cited, this arms-length approach will remain an obstacle to achieving financial stability.

From the evidence adduced and discussed in Chapters Seven and Eight it seems clear that, regulators need to strengthen prudential control over the entire financial market to achieve their goals of maintaining the stability of the financial market and sustaining growth in the economy.

9.4.3 Improvement of Corporate Governance in the Banking sector

As the central financial organization of a capitalist economy, banks' own corporate governance impacts on the soundness of the entire financial market. As revealed in the analysis of evidence in Chapters Seven and Eight, in contrast to regulators, bank risk managers expressed a strong belief in the importance and probity of their corporate governance systems. It would seem that risk management should not be the sole provenance of risk managers but should extend to Bank board members. To this

end, board members will need to acquire an adequate understanding of risk management principles so that they can implement sound business strategies. Increasingly, both bank boards and management must assess, continually monitor, and control the full panoply of risks associated with the activities undertaken by the respective bank. Furthermore, banks need to set and enforce clear lines of responsibility and accountability for such risks throughout the organization. This will enable both internal and external auditors to effectively conduct their work with a full recognition of the important control function that they are providing.

Finally, as part of corporate governance, banks need to build an ethical culture in regard to risk management that permeates from the top (i.e. bank Board, and senior managers) of the organization down to the very bottom (front-line staff).

9.5 Limitations and Future Research

While this research has made contributions to the investigation of the effectiveness of Basel II, both from theoretical and empirical perspectives, and has tendered policy implications, the research contributions and findings must be interpreted against the backdrop of the limitations of the research.

9.5.1 Limitations of the Research

The first limitation of this research is the interview sample size. As addressed in Chapter Six, the research method confronted three problems in recruiting participants for the interviews. First, the small size of the banking industry in Australia set tight absolute limits to the potential bank and regulatory respondents. Second, within this finite pool of finance experts, the field was further narrowed by the need to identify interviewees who met the requirements of the specialty and had experience in Basel-related risk analysis, management and policy areas. Third, qualified potential interviewees were often very senior in the organizations and unable to devote the time needed for the interviews. The researcher finally completed 15 semi-structured interviews lasting over one hour each with the risk managers, directors, and specialists from banks, and regulatory authorities. Although these interviewees provided beneficial and useful information to evaluate Basel II implementation, as exposited in Chapters Seven and Eight, the researcher realizes that the participation of more

experts would add greater depth to the research and strengthen confidence in the research findings.

In addition to risk managers and regulatory supervisors whose daily responsibilities are tightly related to Basel Accords, internal auditors within the banking sector and external auditors are also key personnel in bank risk management and prudential control. In particular, external auditors (i.e. some from big accounting firms have responsibilities for over sighting banks) are able to help regulators prevent or control regulatory arbitrage. However, due to the limited time schedule for this research and difficulties of approaching these potential interviewees (i.e. confidentiality considerations mean that they are less willing to participate and such senior staff are normally very busy and reluctant to participate in interviews), information from the perspectives of auditors is lacking in this research. This has limited the scope of the investigation into the emerging issues around Basel II implementation.

9.5.2 Future Research Area

This research investigating the effectiveness of the Basel II framework has confined itself to the Australian case. Australia is a developed economy with a banking system characterized by comparatively more mature internal and external regulatory systems than many developing economies, particularly countries like China.

The China Banking Regulatory Commission (CBRC) has announced that China is gong to ‘test the water’ with the implementation of Basel II from the end of 2010 for domestic banks. This is one year ahead of its original proposal. This event definitely will be a challenge given China’s volatile banking history.

The investigations and research findings arising from this research with Australia as case study, yields a research template for exploring the effectiveness of the Basel II framework in countries such as China. In the future, international comparative research could contribute to resolving issues of cross-border supervision that would benefit regulatory authorities within each regime, as well as multinational banks that have branches in both countries.

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Appendix 1

1988 Basle Capital Accord

Definition of Capital included in the Capital Base

A. Capital Elements

Tier 1:

c) Paid-up share capital/common stock

d) Disclosed reserves

Tier 2:

f) Undisclosed reserves

g) Asset revaluation reserves

h) General provisions/general loan-loss reserves

i) Hybrid (debt/equity) capital instruments

j) Subordinated debt

The sum of tier 1 and tier 2 elements will be eligible for inclusion in the capital base, subject to the following limits.

B. Limits and Restrictions

i. The total of tier 2 (supplementary) elements will be limited to a maximum of 100% of the total of tier 1 elements;

ii. Subordinated term debt will be limited to a maximum of 50% of tier 1 elements;

iii. Where general provisions/general loan-loss reserves include amounts reflecting lower valuations of asset or latent but unidentified losses present in the balance sheet, the amount of such provisions or reserves will be limited to a maximum of 1.25 percentage points;

iv. ***A***sset revaluation reserves which take the form of latent gains on unrealised securities (see below) will be subject to a discount of 55%.

(Source from Basel Committee on Banking Supervision, (1988), "International Convergence of Capital Measurement and Capital Standards", Bank for International Settlements)

Appendix 2

Risk Weights by Category of On-Balance Sheet Asset

0%:

(a) Cash[437]

(b) Claims on central governments and central banks denominated in national currency and funded in that currency

(c) Other claims on OECD[438] central governments[439] and central banks

(d) Claims collateralised by cash of OECD central-government securities3 or guaranteed by OECD central governments[440]

0, 10, 20 or 50%:

(a) Claims on domestic public-sector entities, excluding central government, and loans guaranteed by or collateralised by securities issued by such entities

20 %(at national discretion):

(a) Claims on multilateral development banks (IBRD, IADB, AsDB, AfDB, EIB, EBRD)[441] and claims guaranteed by, or collateralised by securities issued by such banks4

(b) Claims on banks incorporated in the OECD and claims guaranteed by OECD incorporated banks

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[437] Includes (at national discretion) gold bullion held in own vaults or on an allocated basis to the extent backed by bullion liabilities.

[438] For the purpose of this exercise, the OECD group comprises countries which are full members of the
OECD (or which have concluded special lending arrangements with the IMF associated with the Fund's
General Arrangements to Borrow), but excludes any country within this group which has rescheduled its external sovereign debt in the previous five years.

[439] Some member countries intend to apply weights to securities issued by OECD central governments to take account of investment risk. These weights would, for example, be 10% for all securities or 10% for those maturing in up to one year and 20% for those maturing in over one year.

[440] Commercial claims partially guaranteed by these bodies will attract equivalent low weights on that part of the loan which is fully covered. Similarly, claims partially collateralised by cash, or by securities issued by OECD central governments, OECD non-central government public-sector entities, or multilateral development banks will attract low weights on that part of the loan which is fully covered.

[441] Claims on other multilateral development banks in which G-10 countries are shareholding members may, at national discretion, also attract a 20% weight.

(c) Claims on securities firms incorporated in the OECD subject to comparable supervisory and regulatory arrangements, including in particular risk-based capital requirements[442], and claims guaranteed by these securities firms

(d) Claims on banks incorporated in countries outside the OECD with a residual maturity of up to one year and claims with a residual maturity of up to one year guaranteed by banks incorporated in countries outside the OECD

(e) Claims on non-domestic OECD public-sector entities, excluding central government, and claims guaranteed by or collateralised by securities issued by such entities

(f) Cash items in process of collection

50%:

(a) Loans fully secured by mortgage on residential property that is or will be occupied by the borrower or that is rented

100%:

(a) Claims on the private sector

(b) Claims on banks incorporated outside the OECD with a residual maturity of over one year

(c) Claims on central governments outside the OECD (unless denominated in national currency - and funded in that currency – see above)

(d) Claims on commercial companies owned by the public sector

(e) Premises, plant and equipment and other fixed assets

(f) Real estate and other investments (including non-consolidated investment participations in other companies)

(g) Capital instruments issued by other banks (unless deducted from capital)

(h) All other assets

(Source from Basel Committee on Banking Supervision, (1988), "International Convergence of Capital Measurement and Capital Standards", Bank for International Settlements)

[442] I.e. capital requirements that are comparable to those applied to banks in this Accord and its Amendment to incorporate market risks. Implicit in the meaning of the word "comparable" is that the securities firm (but not necessarily its parent) is subject to consolidated regulation and supervision with respect to any downstream affiliates.

Appendix 3

Credit Conversion Factors for Off-Balance Sheet Items

The framework takes account of the credit risk on off-balance-sheet exposures by applying credit conversion factors to the different types of off-balance-sheet instrument or transaction. With the exception of foreign exchange and interest rate-related contingencies, the credit conversion factors are set out in the table below. They are derived from the estimated size and likely occurrence of the credit exposure, as well as the relative degree of credit risk as identified in the Committee's paper "*The management of banks' off-balance sheet exposures: a supervisory perspective*" issued in March 1986. The credit conversion factors would be multiplied by the weights applicable to the category of the counterparty for an on-balance-sheet transaction (see Annex 2).

Instruments

1. Direct credit substitutes, e.g. general guarantees of indebtedness (including standby letters of credit serving as financial guarantees for loans and securities) and acceptances (including endorsements with the character of acceptances)

Credit Conversion Factors 100%

2. Certain transaction-related contingent items (e.g. performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions)

Credit Conversion Factors 50%

3. Short-term self-liquidating trade-related contingencies (such as documentary credits collateralised by the underlying shipments)

Credit Conversion Factors 20%

4. Sale and repurchase agreements and asset sales with recourse,1 where the credit risk remains with the bank

Credit Conversion Factors 100%

5. Forward asset purchases, forward deposits and partly-paid shares and securities, which represent commitments with certain drawdown [443]

Credit Conversion Factors **100%**

6. Note issuance facilities and revolving underwriting facilities

Credit Conversion Factors **50%**

7. Other commitments (e.g. formal standby facilities and credit lines) with an original maturity of over one year

Credit Conversion Factors **50%**

8. Similar commitments with an original maturity of up to one year, or which can be unconditionally cancelled at any time

Credit Conversion Factors **0%**

(N.B. Member countries will have some limited discretion to allocate particular instruments into items 1 to 8 above according to the characteristics of the instrument in the national market.)

(Source from Basel Committee on Banking Supervision, (1988), "International Convergence of Capital Measurement and Capital Standards", Bank for International Settlements)

[443] These items are to be weighted according to the type of asset and not according to the type of counterparty with whom the transaction has been entered into. Reverse repos (i.e. purchase and resale agreement - where the bank is the receiver of the asset) are to be treated as collateralised loans, reflecting the economic reality of the transaction. The risk is therefore to be measured as an exposure on the counterparty. Where the asset temporarily acquired is a security which attracts a preferential risk weighting, this would be recognised as collateral and the risk weighting would be reduced accordingly.

Appendix 4

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Information Statement for Organisations Participating in the Research Project:
Exploring how "Smart" the Basel II Framework is in the Australian Context of Banking Reform

Dear _ :

Your organisation is invited to take part in the research project identified above which is being conducted by Siqiwen Li from the School of Economics, Politics and Tourism at the University of Newcastle. Siqiwen Li is conducting this research as part of her Doctorate of Philosophy under the supervision of Dr James Juniper from the School of Economics, Politics and Tourism at the University of Newcastle.

Why is the research being done?

The purposes of the project are: first, to analyse the characteristics of Basel II compared with the provisions of Basel I. Second, based on literature review of responsive and smart regulation, the research explores the congruence between Basel II and the principles of responsive/smart regulation, and evaluates the nature and extent of this congruence. Third, the research evaluates the responses of the Australian banking system and its supervisory authorities to Basel II.

Project introduction:

This research project concerns the assessment of "smart" features of Basel II based on interviews with respondents from the Australian banking system and its supervisory authorities. The BIS (Bank for International Settlement) has issued the «New International Convergence of Capital Measurement and Capital Standards» (Basel II) which responds to deficiencies of the 1988 Capital Accord (Basel I). Its three pillars framework represents a far more sophisticated view of risk management and a far more comprehensive approach to supervising bank capital than that provided under Basel I.

To evaluate how effective the Basel II framework is, this project will draw on the concepts of "responsive regulation" and "smart regulation". Smart regulation or responsive regulation is an innovative form of regulation which goes beyond the

dichotomy between command and control, on the one hand, and self-regulation on the other.

After releasing Basel II, the responses from member countries were actively solicited. Although Australia was not a committee member, it was involved in discussions over Basel II and its implementation even while the Accord was still "work in process". APRA (Australia Prudential Regulation Authority) as the relevant supervisory Authority has indicated a willingness to implement Basel II. However, the attitude of some Australian bankers seems to reflect high levels of anxiety. Therefore, the assessment undertaken for this project needs to be based on a variety of "voices" both from the Australian Banking System and its supervisory authorities.

Research activities planned for the project include:

- A discussion of the characteristics of responsive/ smart regulation.
- Face-to-face interviews with both prudential supervisors, bank staff from risk management positions and economists / researcher who is responsible for Basel II or risk management related researches within selected banking institutions.
- Analysis of the data provided by participants concerning their assessment of the efficiency and effectiveness of Basel II in regard to the objectives of risk management, especially during the implementation stage.

Who can participate in the research?

We are seeking the participants from positions in risk management, and relative research within selected banks, and participants from APRA who are directly involved in supervising members of the Australian Banking System. Employees within your organisation who satisfy conditions are eligible to participate. If the participants are not currently in a position in risk management and auditing within banks, or the participants from APRA are not those directly involved in supervising members of Australia Banking System, they are not eligible to participate.

What choice do you have?

Participation in this research is entirely your organisation's and your employees' choice. Only those organisations and people who give their informed consent will be included in the project. Whether or not your organisation or your employees decide to participate will not disadvantage your organisation or them in any way. If your organisation or your employees decide not to participate, they may withdraw from the project at any time without giving a reason.

What would you be asked to do?

If your organisation agrees to participate, you will be requested to recruit eligible people from your employees to participate, and they will be asked to give following information:

- The interviewee's assessment of the efficiency and effectiveness of Basel II in risk management.
- Interviewee opinions about whether Basel II meets the definition of "smart regulation" in regard to risk management.

- Advice on those aspects of implementation, which should be given particular attention.
- An assessment of Basel II's performance during the crucial implementation stages.

Participants should only provide the researcher with information that they are authorised to release by their respective organisations. In addition, where a participant is an employee of an organisation, it is the views of the particular organisation, which are being sought. Participants have been selected across a variety of positions both from APRA, and from a variety of banking institutions.

Please note that, unless participants prefer alternative arrangements, the proposed interviews will be conducted in the interviewee's place of employment during normal business hours.

How much time will it take?

The questions to be asked in the interview are shown in the attached interview schedule. It is expected that the interview will take around one hour to complete.

What are the risks and benefits of participating?

The research thesis will be available in the public domain through the University of Newcastle library. The research findings resulting from the project will be made available to participants through a report which may be beneficial for their own risk management practices.

How will your privacy be protected?

Recording: with your employees' agreement the interview will be recorded by voice recorder. Only the researcher and supervisor involved in the project will have access to the recordings and to transcripts of the recordings. The participants will have the opportunity to view a transcript of the interview, which they may edit to remove any comment(s) they do not want recorded. The participants' name will not be cited either as a direct or indirect quotation in the Doctoral thesis arising from the research.

Data will be stored in the School's Security Room. Only the researcher and supervisor involved in the project will have access to the records and transcripts. Once the research thesis is accepted, the records and transcripts will be destroyed after 1 year for non-anonymous data, and after 5 years for anonymous data.

How will the information collected be used?

The collected interview information will be used in a research thesis to be submitted for a Doctoral Research Degree, the Doctoral thesis will be available to the public through the University of Newcastle's library. In addition, it is possible that sections of the thesis may be presented as conference papers or published in journals and that the completed thesis may also be published.

Individual participants will not be identified in any reports arising from the project. Participants may withdraw both themselves and their record of interview transcripts from the process at any time. Furthermore, participants will be allowed to review how their comments have been quoted before giving final consent to their use. Complete personal anonymity will be assured, although a broad description of the types of organisations and interviewee duties may be included in the published thesis.

The interview participants will be offered a report with research findings resulting from this research project.

What do you need to do to participate?

Please read this information statement and be sure you understand its contents before your organisation agrees to participate. If there is anything you do not understand, or you have questions, please contact Siqiwen Li on siqiwen.li@newcastle.edu.au, 0249216750 or Dr James Juniper on james.juniper@newcastle.edu.au 02 49217491.

If your organisation would like to participate, please complete and return the attached consent forms in the reply-paid envelope provided. This will be taken as your organisation's informed consent to participate. Your organisation also will be requested to suggest eligible potential interviewees from your employees to participate. I will contact you to confirm the potential participants, and then the project information statements and consent forms for participants will be posted to their office directly.

Further information

If you would like further information, please contact project supervisor Dr James Juniper, on and researcher Siqiwen Li on

Thank you for considering this invitation.

Dr James Juniper

Project Supervisor

Siqiwen Li
Researcher

Complaints about this research

This project has been approved by the University's Human Research Ethics Committee, Approval No. H-546-0807. Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02 49216333, email Human-Ethics@newcastle.edu.au).

Appendix 5

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Organisation Consent Form for the Research Project:

Exploring how "Smart" the Basel II Framework is in the Australian Context of Banking Reform

On behalf of my organisation I agree to participate in the above research project and give my consent freely.

On behalf of my organisation I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.

On behalf of my organisation I understand the participants can withdraw from the project at any time and do not have to give any reason for withdrawing.

On behalf of my organisation I consent to the recruitment of eligible people to participate in interviews for the above project. The purpose of the research has been explained me.

On behalf of my organisation I understand that the participants' personal information will remain confidential to the researchers.

On behalf of my organisation I acknowledge that I have had the opportunity to have questions answered to my satisfaction.

On behalf of my organisation I understand that my organisation can choose not to be identified in this project, that the participants can choose not to be recorded, that the participants can edit transcripts of the interview to remove any comment they do not want quoted, and that they are not obliged to answer any questions if they choose not to.

Organisation's Name: _____
Print Name: _____ Position/ Title: _____

Signature**:** Date:

If there is anything you do not understand, or you have questions, please contact Dr James Juniper, on or Siqiwen Li on

Appendix 6

Interview Questions
Part A: For Supervisors in Regulatory Authorities

1. What is your role and employment history within APRA (or in the field of banking risk management supervision)?

2. Could you talk some about the current situation in risk management within Australia banking system?

3. What aspects of the current framework do you think are unsatisfactory for the purposes of banking risk management system? What aspects seem to be working well?

4. Do you think the framework of Basel II represents a sensible response to deficiencies in the 1988 Capital Accord which known as Basel I?

5. Could you tell me your opinion on three-pillar framework of Basel II? Do you think the pillars could work efficiently and effectively during risk management?

6. If they are, whether Australian Banks can be benefit from Basel II?

7. And at which aspects will the benefit arise?

8. In detail, with following instruments, what is your opinion about their possible performance in risk management within Australian Banks?

    A. Do you think adopting internal rating as risk-weighting basis for certain qualified banks could establish comparable "optimal" risk-weighting system and result more" true" measures of risk?

    B. If yes, do you think this approach could make Australian's banks have better performance in risk management?

    C. As supervisor, what is your opinion about Basel II affirm the position of Supervision and its complementary function in banking risk management?

    D. Does it strengthen the supervision on Australian Banks' behavior in risk management?

    E. Do you think the market discipline in Basel II could improve the market incentive in banking risk management?

    F. If yes, how about possible performance of market discipline in Australian Banks?

    G. Could you tell me you opinion on emphasis of public disclosure in Basel II? Do you think the involvement of public interest group through this way could bring more efficiency to risk management?

H. For Australian Banks, what changes do you think may arise with public disclosure in risk management?

9. Could talk some about the regulatory arbitrage happened in Australian Banks?

10. Do you think Basel II has ability to resolve that problem?

11. If yes, to what extent you think Basel II could avoid be gamed?

12. Do you think there are problems during implementation process in Australia with Basel II?

13. If yes, Can you identify what the problems are?

14. Could you talk about the aspects need to be paid attention during implementation process in Australia with Basel II?

According to released Basel II, APRA designed the implementation arrangement and time schedule of Basel II adopted in Australia:

15. What do you think about whether this time schedule is convenient for all Australian Banks?

16. If no, Can you identify the problems? Who will feel inconvenient for APRA's arrangement? And why that happens?

17. Do you think the APRA's implementation arrangement has well considered the structure and characteristics of Australian Banking System?

18. If no, Could you identify them?

19. And could you identify what need to do to amend it?

Part B: For Bank Interviewees

1. What is your role and employment history in risk management area of this bank?

2. Could you talk about the current situation in risk management within your bank?

3. And what method to be used for measuring market risk, credit risk and operational risk in your bank?

4. What aspects of the current framework do you think are unsatisfactory for the purposes of banking risk management system? What aspects seem to be working well?

5. Do you think the framework of Basel II represents a sensible response to deficiencies in the 1988 Capital Accord which known as Basel I?

6. Could you tell me your opinion on three-pillar framework of Basel II? Do you think the pillars could work efficiently and effectively during risk management?

7. If they are, whether Australian Banks can be benefit from Basel II?

8. And at which aspects will the benefit arise?

9. In detail, with following instruments, what is your opinion about their possible performance in risk management within Australian Banks?
    A. Do you think adopting internal rating as risk-weighting basis for certain qualified banks could establish comparable “optimal” risk-weighting system and result more” true” measures of risk?

    B. If yes, do you think this approach could make your bank have better performance in risk management?

    C. What is your opinion about Basel II affirm the position of Supervision and its complementary function in banking risk management?

    D. Do you think your bank may benefit from that?

    E. If yes, what benefit do you think will bring to your bank?

    F. Do you think the market discipline in Basel II could improve the market incentive in banking risk management?

    G. If yes, how about possible performance of market discipline in your banks?

    H. Could you tell me you opinion on emphasis of public disclosure in Basel II? Do you think the involvement of public interest group through this way could bring more efficiency to risk management?

    I. For your banks, what changes do you think may arise with public

disclosure in risk management?

10. Could you talk about current operational risk management and control situation in your bank?

11. Do you think the emphasis on charging the capital of operational risk in Basel II could well help avoiding management failure, how about in your bank?

12. Do you think Basel II has ability to regulatory arbitrage happened in Australian Banks?

13. If yes, to what extent you think Basel II could avoid be gamed?

14. Do you think there are problems during implementation process in your bank with Basel II?

15. If yes, Can you identify what the problems are?

16. And what need to do to resolve those problems?

17. Could you talk about the aspects need to be paid attention during implementation process in your bank with Basel II?

According to released Basel II, APRA designed the implementation arrangement and time schedule of Basel II adopted in Australia:

18. What do you think about whether this time schedule is convenient for your Bank?

19. If no, Can you identify the problems? And why such problem exists in your bank?

20. According to the situation of your bank, what do you think about APRA's implementation arrangement? Is there any worry about implementation in your bank?

21. If yes, Could you tell me what are the worries and why they exist in your bank?