An Investigation into the Effects of the Use of Financial and Operational Hedges on Australian Corporate Foreign Currency Risk Exposure

Thesis submitted by

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in February 2008

for the degree of Doctorate of Philosophy
in the School of Business
James Cook University
STATEMENT ON SOURCES

Declaration

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

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ACKNOWLEDGEMENTS

Writing this thesis is the most intense experience in my academic life. It has been a long project involving clear objectives, planning, focus, and determination. However, the accomplishment of this project has not been achieved without the support of many people. Each of them has been very important to this work and it is my great pleasure to express my appreciation to them.

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Mohammad Al-Shboul

February 2008
ABSTRACT

The purpose of this thesis is to investigate the effects of the use of financial and operational hedging on foreign exchange rate exposure among Australian multinational corporations. Since the flotation of the Australian dollar at the end of 1983, Australian firms have become increasingly exposed to foreign exchange rate risk. To eliminate this risk, Australian firms have undertaken substantial corporate hedging programs, which are both financial and operational in nature. It is notable that there has been an increase in financial hedging techniques such as derivatives and foreign-currency denominated debt, and operational hedging such as diversifying and spreading subsidiaries across foreign countries. Despite the substantial involvement in corporate hedging strategies, there is a paucity of Australian research studies examining the relationship between the use of financial and operational hedging by firms and their levels of foreign exchange rate exposure.

A two-stage market model was used to investigate the main research problem using a sample of 62 Australian multinational corporations. The first-stage model – Jorion’s (1991) model – was adopted, to test the first hypothesis of whether there exists a relationship between stock returns and changes in exchange rates, by estimating the exposure coefficients to foreign currency risk during the period from January 2000 to December 2004. Next, the second-stage model utilised cross-sectional regression models to examine the effects of the use of financial hedging, separately and/or in combination with, operational hedging on foreign exchange risk exposure. This second-stage model was estimated for the 2004 financial year data to test seven hypotheses. These seven hypotheses were related to whether the use of financial separately, or in combination with, operational hedging effectively reduced exposure. Therefore, eight main research hypotheses were tested in the study.

Findings of the study were that there is only weak evidence to support the hypothesis that stock returns were sensitive to changes in value of the Australian dollar. It was found that the use of foreign currency derivatives was significantly related to exposure reduction. The use of foreign debt was also found to be significantly related to exposure reduction, indicating that foreign debt is used for hedging purposes. Furthermore, the combined use of these two financial hedging strategies was found
to be significantly associated with the exposure reduction. By the same token, these two financial hedging strategies were found to be substitutive to each other in reducing exposure. Operational hedging proxies were also significantly associated with the exposure reduction. This latter finding indicates that, for the purposes of hedging, firms diversify and disperse foreign operations and subsidiaries across countries and geographical regions. In addition, the combined use of financial and operational hedging was found to be negatively associated with exposure. Finally, the use of financial hedging was found to complement operational hedging in reducing exposure.

The models used in this study could be applied to further research into the relationship between the use of financial and operational hedging and exposure. This could be achieved by using different time spans, different markets (countries) data, and larger samples, together with other measures. As Australian firms are greatly exposed to foreign exchange rate risk and consequently are heavily involved with financial and operational hedging activities, the results of this study could be beneficial to corporate managers, individual and corporate investors, researchers, derivatives designers and regulators.

**JEL classification:** F23; F31; F37; G30; G32

**Keywords:** foreign exchange risk exposure; multinational firms; International Finance; financial Risk management; operational hedging; financial hedging; financial derivatives.
PUBLICATIONS FORM THE RESEARCH

Conferences (refereed):


Papers (refereed):


TABLES OF CURRENCY SYMBOLS AND ABBREVIATIONS

CURRENCY SYMBOLS

The following currency symbols are used frequently in this dissertation:

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<tr>
<td>AUD</td>
<td>Australian Dollar</td>
</tr>
<tr>
<td>CAD</td>
<td>Canadian Dollar</td>
</tr>
<tr>
<td>CHF</td>
<td>Swiss Franc</td>
</tr>
<tr>
<td>CPAM</td>
<td>Capital Asset Pricing Model</td>
</tr>
<tr>
<td>EUR</td>
<td>European Union Euro</td>
</tr>
<tr>
<td>FJD</td>
<td>Fijian Dollar</td>
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<tr>
<td>GBP</td>
<td>United Kingdom Pound</td>
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<tr>
<td>DM</td>
<td>Douche Mark</td>
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<tr>
<td>HKD</td>
<td>Hong Kong Dollar</td>
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<tr>
<td>IDR</td>
<td>Indonesian Rupiah</td>
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<tr>
<td>INR</td>
<td>Indian Rupee</td>
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<tr>
<td>JPY</td>
<td>Japanese Yen</td>
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<tr>
<td>KRW</td>
<td>Korean Won</td>
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<tr>
<td>KWD</td>
<td>Kuwait Dinar</td>
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<tr>
<td>MXP</td>
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<td>MYR</td>
<td>Malaysian Ringitt</td>
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<tr>
<td>NOK</td>
<td>Norwegian Krone</td>
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<tr>
<td>NZD</td>
<td>New Zealand Dollar</td>
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<tr>
<td>PHP</td>
<td>Philippine Peso</td>
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<td>SAR</td>
<td>Saudi Arabian Riyal</td>
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<td>SBD</td>
<td>Solomon Island Dollar</td>
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<td>SEK</td>
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<td>Singapore Dollar</td>
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<td>SUR</td>
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<td>THB</td>
<td>Thai Baht</td>
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<tr>
<td>USD</td>
<td>United States Dollar</td>
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<td>ZAR</td>
<td>South African Rand</td>
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The following abbreviations are used frequently in this dissertation:

3SLS  Three-Stage Least Squares
AASB  Australian Accounting Standards Board
ABS  Australian Bureau Of Statistics
ADF  Augmented Dickey-Fuller Test
AGSM  Australian Graduate School of Management
AIET  Australian International Equity Trust
AOI  All Ordinary Index
APT  Arbitrage Pricing Theory
AR  Autoregressive Order Scheme
ARCH  Autoregressive Conditional Heteroskedastic
ARMA  Autoregressive Moving Average
ASX  Australian Securities Exchange
BIS  Bank For International Settlements
BLO  The percentage of shares held by block-holders
BLUE  Best Linear Unbiased Estimators
CAPEX  The percentage of capital expenditures to total assets
CLRM  Classical Linear Regression Model
CMT  Capital Market Theory
CPAM  Capital Asset Pricing Model
CR  Current ratio
DER  Derivatives to Total Assets Ratio
DF  Dickey-Fuller Test
DIR  The percentage of shares held by directors
DW  Durbin-Watson Test
EBIT  Earnings Before Interest And Taxes
EMH  Efficient Market Hypothesis
EMS  European Monetary System
Eq(s)  Equation(s)
EWI  Equally-Weighted Index
FASB  Financial Accounting Standards Board
FCD  Foreign Currency Derivatives
FDD  Foreign Currency Denominated Debt
FDI  Foreign Direct Investment
FS  Foreign Sales Ratio
FX  Foreign Exchange
GARCH  Generalized Autoregressive Conditional Heteroskedastic
GDP  Gross Domestic Products
GLS  Generalized Least Squares
GMM  Generalized Method Of Moment
HERF1  Herfindahl Index 1 (country level)
HERF2  Herfindahl Index 2 (geographical region level)
IAS  International Accounting Standards
IMF  International Monetary Funds
INS The percentage of shares held by institutions
IPC International Parity Conditions
IRR Internal Rate of Return
LEV Leverage ratio
LM Lagrange Multiplier
MERM Multilateral Exchange Rate Model
MLE Maximum Likelihood Estimation
M-M Modigliani and Miller Theorem
MNCs Multinational Corporations
MSCI Morgan Stanley Capital International
NAB National Australia Bank
NAFTA North American Free Trade Agreement
NPV Net Present Value
NRC The natural logarithm of the number of subsidiaries per country.
NRF The natural logarithm of the number of subsidiaries per geographical region.
NSGM The number of business segments
NZ New Zealand
OLS Ordinary Least Squares
OTC Over-the-Counter
p.a. Per Annum
PER Price-to-Earnings
POT Pecking Order Theory
PPP Purchasing Power Parity
RBA Reserve Bank of Australia
RD Research And Developments
RIP Real Interest Rate
ROA Return on Assets
SASB Statements of Accounting Standards Board
SDR Special Drawing Right
SFE Sydney Futures Exchange
Size Firm Size
SIZE The Size of the firm
SUR Seemingly Unrelated Method
TWI Trade Weighted Index
TWIVER Trade-Weighted Index Value Excess Return
U.K. United Kingdom
U.S. United States
UEH Unbiased Efficiency Hypothesis
UIP Uncovered Interest Parity
VaR Value-at-Risk
VWR Value-Weighted Index
WLS Weighted Least Square
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