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THE IMPACT OF TOTAL FACTOR PRODUCTIVITY GROWTH ON FOOD MANUFACTURING INDUSTRY IN MALAYSIA (1975-2000)

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ABSTRACT

Total factor productivity growth (TFPG) is one determinant of efficiency and effectiveness with both labour and capital resources are used to produce output. In other words, total factor productivity (TFP) means making smarter and better use of the labour and capital resources available. In the past, the Malaysia economy was propelled by input-driven growth. Labour was the main source of economic growth in the 1960s and 1970s; and capital, in the 1980s. Making the best use of our labor and capital resources, and putting in place systems that will encourage innovations and achieve greater output per unit input must sustain Malaysia's economic growth. We now have to depend more on TFP growth to increase the economy's output. For companies, better TFP performance means higher profitability. Larger profits make possible reinvestment and further expansion of business. For employees, the rewards take the form of higher wages and bonuses, more benefits, better work environment and job security. Above all, higher TFP gives all of us the means to enjoy a higher standard of living. In this paper TFPG has been measured by applying the Divisia index for Malaysian food manufacturing industry for the 25 years period of study. In this study to find out about TFPG Auto regression estimator was applied to two model generated from a production function to measure the shift in the production function of Malaysia food industry. To avoid autocorrelation the estimator was applied to time series data for the food manufacturing over the period 1975-2000.

INTRODUCTION

Total factor productivity growth (TFPG) is of crucial significance in the context of economic growth in developing countries as these economies are often faced with an acute shortage of productive resources. During the initial phases of industrialization in the

developed countries, the prices of industrial goods relative to those of agriculture declined under a situation of competitive pricing, mainly because of productivity increases. The high price elasticity of demand for industrial goods coupled with the high income elasticity of demand thus provided an impetus (from the demand side) to industrial growth in these countries. On the other hand, industrial growth in developing countries particularly in India is seldom accompanied by rapid productivity growth.

Some scholars report rapid accumulation in combination with low total factor productivity growth in Asia (Kim and Lau, 1994; Young, 1995), but others emphasize that despite rapid accumulation TFP growth in East Asia has been quite respectable when compared to other developing regions in the world (Nehru and Dhareshwar, 1994, Collins and Bosworth, 1996; Nadiri and Son, 1997; Timmer, 2000).

In this paper, we decompose Total Factor Productivity Growth (TFPG) for the Malaysian Food industries (3-digit level) during 1980-2000. And we will analyze patterns of TFPG among Food industries to provide some policy implications. And the research question of this paper is: What is the rate of TFP growth in Malaysian Food industry?

The Malaysian Economy

Malaysia's economy was largely based on agriculture before the independence in 1957. There were very few manufacturing industries then, and these industries were mainly confined to the production of simple products such as processed packaging of food and simple consumer goods. Soon after independence, Malaysia began to industrialize, mainly to diversify and create employment opportunities. Given the heavy dependence of Malaysia's exports on a few primary commodities, specifically rubber and tin and the serious under-employment problem which the country was facing at that time, it was inevitable for Malaysia to concentrate on the dual objectives of economic diversification and employment generation (Chee, 1973).

TRANSFORMATION OF THE MALAYSIAN ECONOMY: AN OVERVIEW

The Malaysian economy has experienced rapid economic growth during the past few decades - averaging over 8.0% for 1970-80, 5.2 % for 1980-1990, and 8.7 for 1990-97 Hoon and Muhammad: 1996), (WDI 1999). The rapid economic growth has been accompanied by low inflation, reduced unemployment, falling poverty, reduction in income inequalities, and rising per capita income. Malaysian per capita income (current GNP per capita) rose from US$ 380 in 1970 to US$ 4, 370 in 1996. From 1980 to 1996, the per capita income grew at an annual average rate of 6.81 (World Bank: 1999a).

The Manufacturing sector has been a dominant force in the Malaysian growth experience, contributing significantly to output, employment, and exports. The manufacturing sector has been the fastest growing sector of the Malaysian economy, followed by industrial sector, which includes manufacturing plus mining, construction, electricity, water, and gas, and the services sector. After keeping a growth rate of around 9 per cent during 1980-90, the manufacturing sector grew at an annual average rate of 13 per cent during 1990-96

(Annual Average % Growth)

Gross domestic product		Agriculture		Industry		Manufacturing		Services	
1980-90	1990-96	1980-90	1990-96	1980-90	1990-96	1980-90	1990-96	1980-90	1990-96
5.2	8.7	3.8	1.9	7.2	11.2	8.9	13.2	4.2	8.5

Source: World Bank: 1999a

Table 1 Growth of Output

This unprecedented rapid economic growth has been accompanied by a marked structural transformation of the Malaysian economy. Whilst, the agriculture sector's share in GDP declined from 28 per cent in 1975 to 12 per cent in 1997, the contribution of the industrial sector grew from 31 per cent in 1975 to 47 per cent in 1997. Most of this surge came from an expanding manufacturing sector, with its contribution to GDP doubling in a span of little over

two decades. During the above period the services sector grew in absolute terms, however, its contribution to the national economy remain steady.

(% of GDP)	1975	1985	1995	1996	1997
Agriculture	28.0	19.3	13.0	12.8	12
Industry	31.3	35.5	43.2	46.2	47
Manufacturing	16.9	18.5	32.5	34.3	34
Services	40.7	45.2	43.8	41.0	41

Source: World Bank: 1999a, 1999b

Table 2 Changing Structure of the Malaysian Economy

Along with its declining significance in GDP, the role of agriculture as a major employer has also diminished, with the proportion of the total labour force in agriculture falling from 52 per cent in 1970 to 27 per cent in 1990 (World Bank: 1999a, 1999b). A continuation of this trend has seen this figure fall to 17 per cent in 1996. On the other hand, the growth of the manufacturing sector during the above period led to increased employment opportunities in this sector, which employed 27 per cent of the labour force in 1996 (Ministry of Finance: 1997). The main reason for this surge in manufacturing sector employment has been the rapid growth record of export and domestic market - oriented industries.

This study will add to the theoretical analysis and empirical evidence pertaining to the patterns of TFP growth in the Malaysian manufacturing sector. Though labor and capital productivity are convenient for quick analysis, these partial productivity measures may not provide a complete picture and understanding of nation's productivity performance. Overall economic efficiency can only be fully gauged by measuring the joint productivity trends of both labor and capital in terms of its shares and quality contributions to TFPG.

The Malaysian economy will continue to face challenges arising from globalization and liberalization. As such it is necessary to accelerate the shift in the economic development strategy from input driven to one that is productivity driven by enhancing the contribution of Total Factor Productivity (TFP). The improvement in TFP will enable the economy to move to a higher production frontier with more efficient use of capital and labor.

Thus, under the seventh Malaysia Plan (1996-2000), the strategy is shifted from input-driven growth to productivity-driven growth in which the contribution of the total factor

productivity will be enhanced. TFP measures the efficiency of the utilization of both capital and human resources. Higher TFP growth indicates efficient utilization and management of resources, materials and inputs necessary for the production of goods and services.

What Is Total Factor Productivity (TFP)?

TFP measures the efficiency and effectiveness with which both labor and capital resources are used to produce output. In other words, TFP means making smarter and better use of the labor and capital resources available. A simplified way of expressing TFP is:

TFP = Output / (Capital + Labor)

The term "Multifactor Productivity" (MFP) is sometimes used interchangeably with TFP by economists. When concerned with measurement, there is a difference between the two terms. The term TFP suggests that all inputs (labor, capital and intermediate inputs such as raw materials, energy, etc) are taken into account in its computation – that is, the denominator of the TFP ratio includes all inputs. As the term MFP does not give such a connotation, it is considered more accurate because most measures of TFP are, in reality, computed on the basis of only labor and capital inputs. However, only those concerned with measurement and the term TFP continues to be used more widely usually make the distinction between MFP and TFP.

Benefits Of Productivity Improvement

In view of the scarcity of resources and impending global competitiveness. Improving productivity becomes crucial and vital as it affects all sectors of the economy various forms. Increase in productivity means an increase in wealth to be shared by the workers, employers, shareholders, government and the nation. To an individual or a worker, improved productivity means: Increase in compensation- gains resulting from improved productivity are shared by workers in the from of in crease in wages and salaries to sustain their efforts.

Better working condition- in a company with a high level of productivity, better working environment and better emotional climate are fostered. Job security- A firm attaining a high level of productivity is more stable. Better sense of well- being workers derive greater sense

of well-being when they see their efforts are paid off. Development of skills and capabilities- a fair share of productivity generated is also deployed in employees training and development to ensure progressive rise in productivity.

What are the factors determining TFP?

TFP is determined by a host of causes, which interact with one another in subtle ways. Key causal factors include:

- Changes in the Quality of Labor – improvement in the variables that affect the productive capacity of workers. One major component of labor quality is human capital investment, mainly in education and skills upgrading which is a key determinant of productivity.
- Changes in Capital Structure – changes in the composition of total capital. Capital can be classified broadly into machinery and equipment or construction and works. The output yield from machinery and equipment is direct and more immediate compared to that for construction and works. A change in the mix of capital would have an impact on the short- to medium-term growth of TFP.
- Technical Progress – advances in knowledge including technological and organizational advances.
- Resource Reallocation – a movement of labor and capital resources between different groupings, such as from one industry to another. As industry TFP levels differ, changes in the distribution of resources across industries may affect aggregate TFP growth for the economy.
- Demand changes – changes in demand through economies of scale that come with the growth of domestic and international markets. In the short term, cyclical fluctuations in demand, which influence capacity utilization rates, could also affect TFP growth.

The importance of TFP growth in Malaysia's future economics

In the past, the Malaysia economy was propelled by input-driven growth. Labor was the main source of economic growth in the 1960s and 1970s; and capital, in the 1980s. We have now come to an innovation-driven phase of economic development where labor and capital resources can no longer be the main sources to increase output. The reason is that our labor supply is dwindling and there is a limit to which capital investments can continue to grow before diminishing returns set in. From now on, making the best use of our labor and capital resources, and putting in place systems that will encourage innovations and achieve greater output per unit input must sustain Malaysia's economic growth. We now have to depend more on TFP growth to increase the economy's output.

METHODOLOGY FRAMEWORK

From the literature review and references, the methodology frequently used in estimating the Total Factor Productivity in Malaysian manufacturing sector is the Division Index model developed by Gollop & Jorgensen (1980) and the Divisia Index approach in aggregating output and input (Maisom and Arshad, 1992).

Given the Neoclassical Production Function

$Q = F(K,L)$

Where

Q = output

K = capital

L = labor

Divisia Index basically decomposes the growth of out put into the contribution of changes in inputs and TFP. The theoretical framework are as follows; Consider a production function of sectoral capital input K_i, labor input L_i, material Input M_i, and time T.

$$Q_i = F_i (K_i, L_i, M_i, T) \qquad (I = 1,\ldots,n)$$

$$\text{Then, } \frac{\partial \ln Q_i}{dT} = \frac{\partial \ln Q_i}{\partial \ln K_i}\frac{d \ln K_i}{dT} + \frac{\partial \ln Q_i}{\partial \ln L_i}\frac{d \ln L_i}{dT} + \frac{\partial \ln Q_i}{\partial \ln M_i}\frac{d \ln M_i}{dT} + \frac{\partial \ln Q_i}{\partial T} \quad (I = 1,\ldots,n)$$

Where the rate of growth in output overtime is a function of the rate of growth of inputs overtime multiplied by their output elasticities, and the rate of growth in out put due to time alone.

Under the assumption of producer equilibrium,

$$\frac{\partial \ln Q_i}{\partial \ln K_i}(K_i, L_i, M_i, T) = \frac{P_K^i K_i}{q_i Q_i} = V_K^i \quad , \quad \frac{\partial \ln Q_i}{\partial \ln L_i}(K_i, L_i, M_i, T) = \frac{P_L^i L_i}{q_i Q_i} = V_L^i$$

$$\frac{\partial \ln Q_i}{\partial \ln M_i}(K_i, L_i, M_i, T) = \frac{P_M^i M_i}{q_i Q_i} = V_M^i$$

Where q_i, P_K^i, P_L^i, P_M^i denotes the prices of outputs, intermediate, capital and labor inputs respectively. Hence, the output elasticities with respect to each input are equal to their respective value share V_K^i, V_L^i, V_M^i.

The assumption of constant return to scale implies that the sum of value shares of the sectoral inputs is equal to unity;

$$V_K^i + V_L^i + V_M^i = 1 \qquad I = 1,2,\ldots,n$$

Therefore, the rate of change of out put over time can be express as follows:

$$\frac{\partial \ln Q_i}{dT} = V_K^i \frac{d \ln K_i}{dT} + V_L^i \frac{d \ln L_i}{dT} + V_M^i \frac{d \ln M_i}{dT} + V_T^i$$

Where V_T^i is Divisia quantity index of rates of technical change or

$$V_T^i = \frac{\partial \ln Q_i}{dT} - V_K^i \frac{d \ln K_i}{dT} - V_L^i \frac{d \ln L_i}{dT} - V_M^i \frac{d \ln M_i}{dT}$$

the Divisia index usually formulated in terms of continues time. However, available data is usually in the form of discrete time. The discrete version of the Divisia Index as developed by

Tornquist (sudit 1984) shows how the indexes of the sect oral rates of technical change for two discrete points of time, T and (T-1) can be derived from the following:

$$\overline{V}_T^I = [(\ln Q_i(T)) - \ln Q_i(T-1)] - \overline{V}_K^I[\ln K_i(T) - \ln K_i(T-1)] - \overline{V}_L^I[\ln_i(T) - \ln L_i(T-1)] - \overline{V}_M^I[\ln M_i(T) - \ln M_i(T-1)]$$

where:

$$\overline{V}_K^I = 1/2V_K^I(T) + V_K^{I(\ )}(T-1) \quad , \qquad \overline{V}_L^I = 1/2V_L^I(T) + V_L^I(T-1)$$

$$\overline{V}_M^I = 1/2V_M^I + V_M^I(T-1)$$

Or the average of technical change, $\overline{V}_T^I$ is the difference between the rate of growth in out put between time(T-1) and time (T) and the weighted sum of the rates of growth of he three inputs, with the weighted being the average value share of the inputs.\

Definition of Terms

Output (Q)

The output proxied by the Total Output which includes the summation of value of products manufactured, income from industrial services rendered to others, value of goods sold in the same condition, closing stock goods in process, capital expenditure on own construction and all other output less opening stock of goods in process

Labor Input (L)

The labor input variable used in this study was based on the number of persons employed, rather than on the number of hours worked. seven types of labor input based on the following categories were considered: Managerial-professional and Non-professional

Skilled workers-Direct and contract, Semi skilled workers –Direct and Contract

Unskilled workers –Direct and contract, Indirect paid employees (full and part time)

Working proprietors and parents, Unpaid family members

Capital Input (K)

Capital Input is measured as the value of fixed assets as at the end of a calendar year, based on department of statistic (DOS) data. The unavailability of suitable deflator for land and building resulted in the omission of these two assets from the value of fixed assets. Hence, this study constitutes three main item only, that are the transport and equipment, machinery and equipment and furniture and fittings which is then deflated with the index of fixed asset price (IPC).

ANALYSIS OF THE STUDY

Empirical analysis was carried out to measure the productivity Growth Indicators for Food manufacturing industries for the study period (1975-2000). In order to study effect of government policies to improve the Food manufacturing sector productivity growth, the study was spilt into four phases. These four phases, which correspond with the major policy changes, are 1975-1979,1980-1986,1987-1993 and 1994-2000. The result s generated using the two earlier mentioned models for used the empirical analysis.

The period of 1970s witnessed the birth of Malaysia's era of export-oriented economy. The policy shifted from import substitution to labor intensive and export oriented industries with electronics and textiles as main areas of emphasis and growth.

The use of total factor productivity overcomes the problems of single productivity indicators such as labor productivity and capital productivity by measuring the relationship between output and its total inputs (a weighted sum of all inputs), thereby giving the residual output changes not accounted for by the total factor input changes. Improvement and slowdown of total factor productivity contribution to the annual average growth rates of the food manufacturing industries is dependent on the inputs used for production in these industries. As noted earlier, these inputs are either of low quality or insufficient to meet the demand of the industries.

Statistical Discussion

To avoid autocorrelation the estimator was applied to time series data for the food manufacturing over the period 1975-2000 were employed. There is no survey for reference

year 1980. The model refereed to Divisia index (Jorgenson et all, 1987) expressed the decomposition of growth value of output into the contribution of changes in capital, labor, material inputs and total factor productivity.

The period of 1970s witnessed the birth of Malaysia's era of export-oriented economy. During the period of 1970-1979 the contribution of labor productivity growth to food manufacturing industries productivity was positive in term of average annual growth rate of industry. The contribution of food manufacturing industry capital deepening growth to the labor productivity growth in term of average annual growth rate was positive.

The decade of 1980s saw further diversification of the economy into more advanced industries. The Heavy Industries Corporation of Malaysia (HICOM) was conceived in 1980. As a result of these policies the range of economic activities and source of growth had become more diversified. During the period (1975-2000), the contribution of labor productivity growth to food manufacturing industry productivity growth was mainly positive.

The period of (1987-1993), witnessed further diversification of the economy into more advanced industries. Also, during this period the economic structural transformation took place in the Malaysia's economy, and the manufacturing sector became an engine of growth.

In this period the policy makers developed the first Industrial Master Plan and gave priority to food manufacturing industries among the twelve other industries to spears head Malaysia's industrial development. During the period (1987-1993), the contribution of labor productivity growth to food manufacturing industry productivity was mainly positive. The Seventh Malaysia Plan was launched in 1996 following a period of high growth with stability. The Seventh Malaysia Plan, while reemphasizing the concept of balanced development, also introduced the strategy of productivity-driven growth of the economy to enhance the resilience of the nation to face the challenges of the twenty-first century.

The growth of Total Factor Productivity

The average annual rate of growth of output, inputs and total Factor Productivity (TFP) for Malaysian Food manufacturing sector are showed in Table1. From the table it can be seen that the average annual Growth of TFP for the period under study is -0.01076.

Real Input and Output Growth

Average annual value of output growth for the food-manufacturing sector for the period under study is 12.40 % . In terms of cost of input growth, material inputs has recorded the average growth with 8.67% while the average annual growth rate for capital is 5.6%. In terms of salaries and wages growth, the average growth with 8.5% is calculated.

Salim Udin(1979) suggested an alternative way to verify the under utilization of capital is to test Verdoon`s Law. The law states that the growth of productivity is positively related to the growth of output. This is because the expansion in output enables productivity to increase. Hence, higher output growth leads to higher productivity growth.

Trend Analysis

Trend analysis of the result showed there is a positive correlation (0.68) between value of fixed asset and total factor productivity in food manufacturing sector and also there is a positive correlation between the value of output and total factor productivity growth. And also cost of input growth rate and total factor productivity growth, 0.70 and 0.78 respectively are representing the degree of correlation respectively. The highest correlation degree appeared between the salaries and wage growth rate and total factor productivity growth is 0.83 .

The average annual output growth rate was 8.1%, the average annual cost of input growth rate was 8.6%, the average annual salaries and wages growth rate was 8.6% and the average annual value of fixed assets growth rate was 5.6% for the period of the study (1975-2000). When the period of study was broken down according to changes in government policies there was a positive correlation between output and total factor productivity average annual growth rate during 1975-1980 and 1987-1993 with relative contribution of 0.16 and 0.81 respectively. However, the correlation between output and total factor productivity growth was negative for period 1980-1986 with relative contribution of –0.03, and the correlation between value of output growth and total factor productivity growth for period 1994-2000 was 0.92 which is the most strong correlation between these two variables among this period of study.

Throughout the period 1975-2000 the correlation between labor productivity and total factor productivity in terms of average annual growth rates was positive, 0.05. Chart show the pattern of labor productivity and total factor productivity growth during the period of study.

The period 1980-1987 represented positive correlation between labor productivity and total factor productivity growth. They contributed 0.17 in terms of average annual growth rates of food manufacturing industries. The period 1987-1993 indicated negative correlation between labor productivity and total factor productivity growth. They contributed –0.81 in terms of average annual growth rates of food manufacturing industries.

The period 1994-1997 indicated the positive correlation between labor productivity and total factor productivity growth. They contributed 0.17 in terms of average annual growth rates. When put together annual growth rates of food manufacturing industries output, capital, inputs, labor and total factor productivity inputs for the period 1975-2000, looking at the total factor productivity growth of food manufacturing industries according to the changes in government policies, indicated that the average annual growth rates of -0.00504 in 1975-1979 , –0.00879 in 1980-1986, -0.00124 in 1987-1993 and –0.03181 in 1994-2000.

CONCLUSIONS

Background of the study

Total factor productivity growth (TFPG) is of crucial significance in the context of economic growth in developing countries as these economies are often faced with an acute shortage of productive resources. Malaysia's economy was largely based on agriculture before the independence in 1957. There were very few manufacturing industries then, and these industries were mainly confined to the production of simple products such as processed packaging of food and simple consumer goods. Soon after independence, Malaysia began to industrialize, mainly to diversify and create employment opportunities. Given the heavy dependence of Malaysia's exports on a few primary commodities, specifically rubber and tin and the serious under-employment problem that the country was facing at that time, it was inevitable for Malaysia to concentrate on the dual objectives of economic diversification and employment generation.

The average growth of TFP for Malaysian manufacturing sector for the period of 1985-1995 has been estimated using growth accounting based on Johansen and Juselius Multivariate method. The findings of the study indicated that for the Food manufacturing sector during 1975-2000 (Appendix I), the average growth of TFP is (-0.012) per cent, which is comparable to NPC measure (3.2 per cent). The capital input is the main contributor to value added followed by labor with the contribution of 17.25 per cent and 10.25 per cent respectively. The overall analysis suggest that slow growth of TFP associated with unskilled labor, under utilization of capital and low R&D activities for both private and public sectors.

The other interesting findings of the study is that total factor productivity growth (4.32 per cent) per annum contributes more to labor productivity growth compared to the contribution of capital deepening (3.03 per cent). The degree of capital deepening varies across the individual manufacturing industries. The results also suggest that the Capital Deepening is seen to be the main contributor to Labor Productivity in capital-intensive industries such as petroleum & refineries, while Total Factor Productivity seems to be the main contributor of labor productivity for the rest of the manufacturing sector. These findings are complementary with previous work done by Dollar & Sokoloff (1990) for the South Korean manufacturing industries for 1963 to 1979.

The period 1970s witnessed the Malaysia's era of export-oriented economy. During this period only the correlation between food manufacturing industry labor productivity was positive. The period of 1980-1986 witnessed further diversification of the economy into more advanced industries such as Heavy Industries Corporation of Malaysia (HICOM). The correlation between labor productivity and total factor productivity average annual growth are of food manufacturing industry was positive in this period.

During the period 1987-1993, the manufacturing sector grew faster and became the engine of growth in Malaysia economy. The correlation of labor productivity is positive with total factor productivity average annual growth rate of food manufacturing industry. In general it can be concluded that the productivity growth and the performance of the Malaysia food-manufacturing sector had undergone improvement during the period under study. Both labor productivity and output growth contributed positively to the productivity growth of the

Food manufacturing sector. However, output growth contributed more that labor productivity to the total factor productivity growth of the food-manufacturing sector.

Although, there were improvements in the productivity and performance of the food manufacturing sector, there was an imbalance in growth between this sector and other manufacturing industries in Malaysia. A number of factors are responsible for imbalance. These ranges from industry related problems such as inconsistent supply and low quality of raw materials, high labor cost and lack of skilled manpower, difficulties in securing finance and poor technological inputs to problems relating to changes and implementation of government policies for industrialization. With adequate measure these problems can be addressed and this will lead to further improvement in productivity growth and performance of the food manufacturing industry.

There are more than 9000 food processing factories in Malaysia, of which 95% are classified as small-scale. Small-scale enterprises are defined as those, which have shareholders' funds or net assets of US$200,000 or less, while a medium-size enterprise is one with net assets of US$200,001 - US$1.0 million. Food processing companies are generally perceived as agro-based industries, which have a strong backward linkage. However this is not the case in Malaysia, where it is estimated that over 70% of the raw materials used in food processing are imported (Ministry of International Trade and Industry 1993). This is particularly true in the production of animal feed and wheat-based products.

POLICY RECOMMENDATIONS

This study shows that the food manufacturing industry is an important sector in Malaysia's economic development. The first Industrial Master Plan (1986-1995) identified the food manufacturing industry sector as priority industry among 12 industries that must contribute to Malaysia's industrial development. The importance of the food-manufacturing sector, beside its connection with many Malaysia's economic sector, is in its influence on the nation's diet.

Further more, it plays a role as strategic product, especially in time of political fluctuations and in the advent of war or famine. Therefore, the starting point for the policy

recommendations is to offer policies that can help overcome the main problems of the food-manufacturing sector, especially the inefficiency and low productivity. The following are the main factors that affect the inefficiency and low productivity of the food manufacturing industry:

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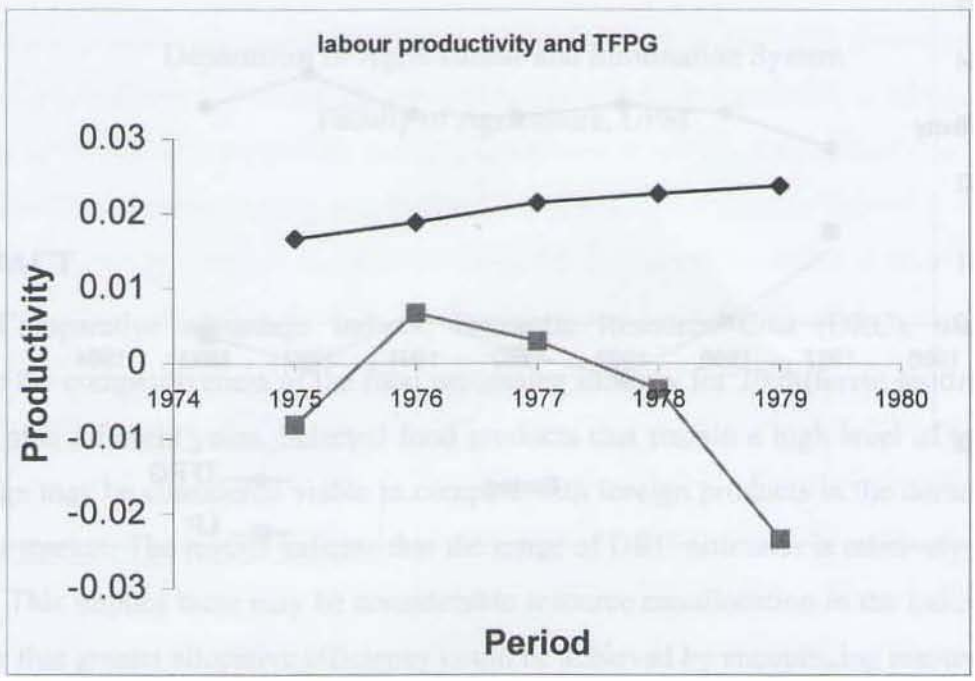
APPENDIX 1

Total Factor Productivity Growth for period of the study

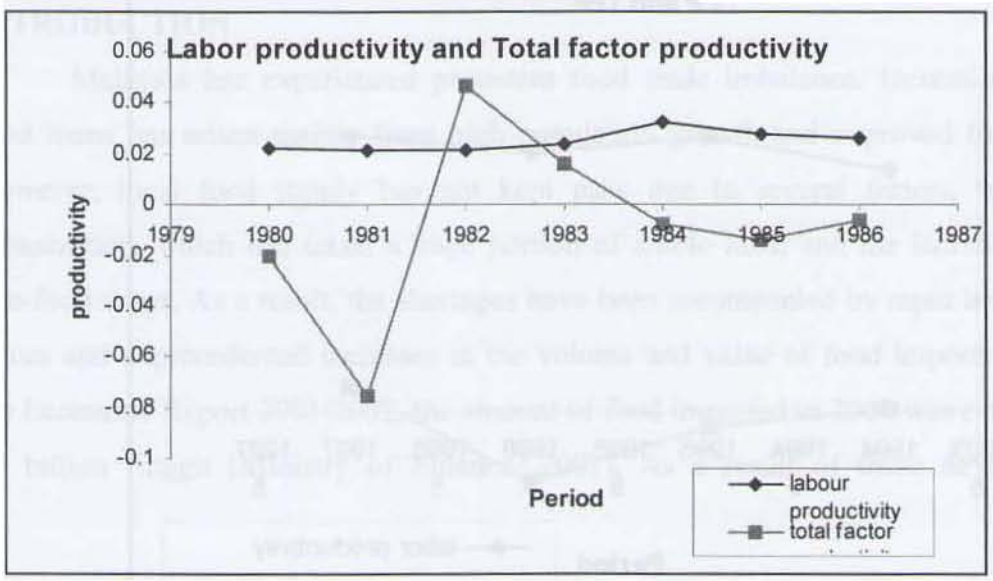
Year	*TFPG*
1975	-0.00814169
1976	0.006747509
1977	0.002923868
1978	-0.003320425
1979	-0.023393968
1980	-0.020443039
1981	-0.07559021
1982	0.04696301
1983	0.015715703
1984	-0.007776365
1985	-0.014372017
1986	-0.006019149
1987	0.012114406
1988	0.000257004
1989	-0.00897133
1990	-0.005087184
1991	0.001573375
1992	-0.006823466
1993	-0.00172223
1994	8.46035E-05
1995	-0.003145289
1996	-0.013276008
1997	0.004637185
1998	0.004064473
1999	0.025168906
2000	-0.240259911

APPENDIX 2 correlation

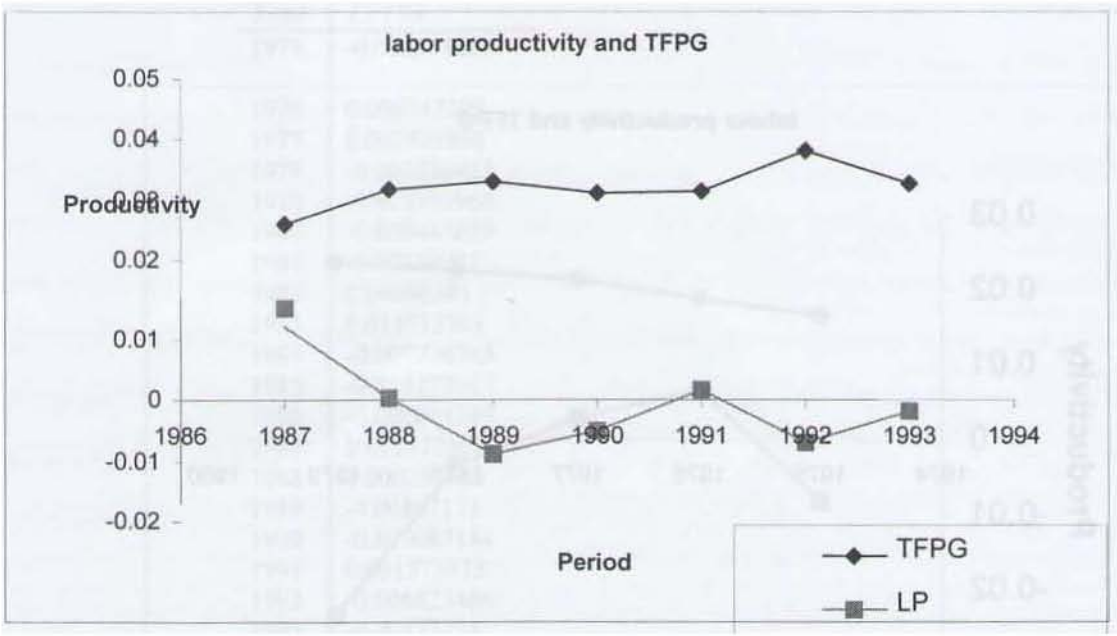
Graph 1 : Correlation between LP and TFPG (1975-1980)



Graph 2 : Correlation between LP and TFP (1980-1986)



Graph 3 : Correlation between LP and TFPG (1987-1994)



Graph 4: Correlation between LP and TFPG (1994-1997)