



UNIVERSITI PUTRA MALAYSIA

**EFFICIENCY AND PRODUCTIVITY OF THE MALAYSIAN
FOOD MANUFACTURING INDUSTRY, 1983-2000**

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By

ALIAS RADAM

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

October, 2007



Dedicated to my

beloved wife:

Normala Buang

loving son and daughters:

Mohd Asrul Fahmy Alias

Nurul Ezantey Alias

Nurfarahin Alias

Nurul Ashyikin Alias

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in
fulfilment of the requirements for the degree of Doctor of Philosophy

**EFFICIENCY AND PRODUCTIVITY OF THE MALAYSIAN
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Chairman: Professor Mad Nasir Shamsudin, PhD

Faculty: Agriculture

Food manufacturing industry has been the backbone of Malaysia's economic stability and growth for decades. The food-manufacturing sector experiences a rather volatile trend during 1993-2000. Due to emphasis given by the government, the manufacturing sector grew by 9.17 percent per annum in 1993 as compared to the previous year, where the sector contributed 45.8 percent to overall increase in GDP. The rate of annual change increment declined from 7.8 percent in 1994 to 6.0 percent in 1995, and this trend continued till 2000. The annual increment dropped by -2.5 percent in 1998, mainly due to the lack of financial support and capital constraints as Malaysia experienced financial crisis during this period. Evidence such as the value of output, exports, employment



generations and value added revealed significant disparity. This disparity begs the question as to the sustainability the food manufacturing sector under the rapid growth of other sectors. The relevant indicators have include's efficiency and productivity of the sector which provide as the benchmark for performance analysis.

This study aims to examine the performance of the Malaysian Food Manufacturing Industries in terms of productivity and efficiency during the period 1983 – 2000. The non-parametric Data Envelopment Analysis (DEA), approach are utilized to compute the Malmquist Total Factor Productivity (TFP) indices.

The empirical results indicate that only 26.7 percent of the Malaysian food manufacturing industries are closed to the frontier. The average of the technical efficiency of food manufacturing industry increased from 86.5 percent in 1983 to 92.1 percent in 2000. This increase could be due to a gradual narrowing of the gap between the “normal” and “best” practice industries. The average of the scale efficiency of food manufacturing industry increased from 91.8 percent in 1983 to 94.1 percent in 2000 while the average of the pure efficiency of food manufacturing industry increased from 93.9 percent in 1983 to 94.1 percent in the same period.

The findings also indicate that between 1983-2000 the annual rate of TFP growth varied. TFP increased by 2.1 percent in 1985, 0.2 percent (1989), 4.2 percent

(1990), 4.0 percent (1992), 1.2 percent (1993), 0.1 percent (1997) and 1.7 percent (1998). Overall TFP annual growth rate decreased an average rate of 0.02 percent per annum over the entire 1984-2000 period. Results show that the efficiency change and technical change seem to move in opposite direction. The average technical change (TECHCH) declined over the period under study (-0.6 percent per year) and its contribution to TFP growth is largely due to the increase in the efficiency change (0.4 percent per year).

The food manufacturing industries has a strategic role for Malaysia in the context of globalization. The increasing importance of processed food exports when compare with primary commodities confirms this sector as a key component of export growth strategies. At the same time, it was noted that these opportunities are currently heavily concentrated on a limited number of traditional product categories. The empirical estimates of the Malaysian food manufacturing efficiency and productivity performance point to the fact that a greater investment in R&D is needed. To maintain high efficiency, a stable and well-informed environment is called for.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**KECEKAPAN DAN PRODUKTIVITI INDUSTRI PERKILANGAN
MAKANAN DI MALAYSIA, 1983-2000**

Oleh

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Industri perkilangan makanan telah menjadi tulang belakang kestabilan dan pertumbuhan ekonomi Malaysia untuk beberapa dekad yang lepas. Industri ini mengalami arah aliran yang tidak menentu sejak 1993-2000. Disebabkan oleh tumpuan yang diberi oleh kerajaan, sektor perkilangan ini berkembang dengan kadar 9.17 peratus setahun dalam tahun 1993 berbanding tahun sebelumnya, dimana sektor ini menyumbangkan 45.8 peratus kepada peningkatan keseluruhan keluaran dalam negara kasar. Walau bagaimanapun, kadar peningkatan tahunan telah menurun dari 7.8 peratus dalam tahun 1994 kepada 6.0 peratus pada tahun 1995, dan arah aliran ini berterusan sehingga tahun 2000. Peningkatan tahunan jatuh sebanyak -2.5 peratus pada tahun 1998, terutamanya disebabkan kekurangan sokongan kewangan dan kekangan modal

oleh kerana Malaysia mengalami krisis kewangan didalam tempoh masa tersebut. Beberapa petunjuk seperti seperti nilai output, eksport, penjaan pekerjaan dan nilai ditambah menyaranakan perbezaan ketara antara industri perkilangan makanan dan sektor lain. Jurang diantara sektor ini telah menimbulkan persoalan sama ada industri perkilangan makanan dapat bertahan dengan pertumbuhan yang meningkat bagi sektor lain. Petunjuk yang sesuai termasuklah kecekapan dan produktiviti bagi sektor yang merupakan penanda aras analisis prestasi.

Tujuan kajian ini adalah untuk menyiasat prestasi industri pembuatan makanan di Malaysia dari segi produktiviti dan kecekapannya untuk tempoh masa 1983-2000. Pendekatan tidak-berparameter 'Data Envelopment Analysis' (DEA) adalah digunakan untuk mengira indek Jumlah Faktor Produktiviti Malmquist (TFP).

Keputusan empirikal menunjukkan hanya 26.7 peratus sahaja industri perkilangan makanan di Malasia hampir disempadan (frontier). Purata kecekapan teknikal industri perkilangan makanan meningkat dari 86.5 peratus pada tahun 1983 kepada 92.1 peratus pada tahun 2000. Peningkatan ini mungkin disebabkan berkuangnya jurang diantara amalan yang "normal" dengan amalan "terbaik" dikalangan industri. Purata skala kecekapan industri pembuatan makanan telah meningkat dari 91.8 peratas pada tahun 1983 kepada

94.1 peratus pada tahun 2000, sementara purata kecekapan tulin industri pembuatan makanan meningkat dari 93.9 peratus pada tahun 1983 kepada 94.1 peratus didalam tempoh masa yang sama.

Keputusan kajian juga menunjukkan diantara tahun 1983-2000 purata tahunan pertumbuhan TFP ada berbagai. Sebagai contoh, TFP telah meningkat sebanyak 2.1 peratus pada tahun 1985, 0.2 peratus (1989), 4.2 peratus (1990), 4.0 peratus (1992), 1.2 peratus (1993), 0.1 peratus (1997) dan 1.7 peratus (1998). Keputusan kajian juga menunjukkan TFP berkurangan dengan kadar purata 0.02 peratus setahun untuk keseluruhan tempoh masa 1984-2000 bagi keseluruhan industri pembuatan makanan. Keputusan kajian juga menunjukkan perubahan kecekapan dan perubahan teknikal kelihatannya bergerak kearah yang bertentangan. Purata perubahan kecekapan teknikal (TECHCH) mengalami arah aliran yang menurun untuk tempoh masa kajian (- 0.6 peratus setahun) dan sumbangan terhadap pertumbuhan TFP adalah disebabkan peningkatan didalam perubahan kecekapan (0.4 peratus setahun).

Industri perkilangan makanan mempunyai peranan strategic didalam kontek globalisasi. Peningkatan kepentingan eksport makanan diproses apabila dibandingkan dengan komoditi utama mengesahkan sector ini merupakan kunci utama strategi pertumbuhan eksport. Pada masa yang sama, peluang ini hanyalah tertumpu kepada beberapa kategori keluaran tradisional sahaja.

Anggaran empirikal keupayaan produktiviti sektor perkilangan makanan di Malaysia menunjukkan pelaburan yang besar didalam penyelidikan dan pembangunan (R&D) adalah diperlukan. Untuk mengekalkan kecekapan yang tinggi, persekitaran yang stabil dan maklumat yang sempurna adalah diperlukan.

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I certify that an Examination Committee met of 30 October, 2007 to conduct the final examination of Alias Radam on his Doctor of Philosophy thesis entitled “Efficiency and Productivity of the Malaysian Food Manufacturing Industries, 1983-2000” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulation 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Putra Malaysia or other institutions.

ALIAS RADAM

Date: 27 October, 2007

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LIST OF ABBREVIATIONS

AE	Allocative Efficiency
ASEAN	Association of Southeast Asian Nation
BEA	Bureau of Economic Analysis
CES	Constant Elasticity of Substitution
CRS	Constant Returns to Scale
DEA	Data Envelopment Analysis
DMU	Decision Making Units
EE	Economic Efficiency
EFFCH	Efficiency Change
FAMA	Federal Agricultural Marketing Authority
FDI	Foreign Direct Investment
FIMA	Food Industries of Malaysia
GDP	Gross national Product
LP	Linear Programming
MAJUIKAN	National Fisheries Development Authority
MAJUTERNAK	National Livestock Development Authority
MARDI	Malaysian Agricultural Research and Development Institute
MIC	Malaysian Industrial Code
MIDA	Malaysian Industrial Development Authority
NAP3	Third National Agricultural Policy
NBER	National Bureau of Economic Research
NPC	National Productivity Center

OECD	Organization for Economic Co-operation and Development
OPP3	Third Outline Perspective Plan
PE	Pure Efficiency
PECH	Pure Efficiency Change
RM	Ringgit Malaysia
SE	Scale Efficiency
SECH	Scale Efficiency Change
SIRIM	Standard and Industrial Research Institute of Malaysia
SSL	Self Sufficiency Level
TE	Technical Efficiency
TECHCH	Technical Efficiency Change
TFP	Total factor Productivity
TFPCH	Total Factor Productivity Change
TFPG	Total factor Productivity Growth
VRS	Variable Returns to Scale