UNIVERSITI PUTRA MALAYSIA

ECONOMIC IMPACTS OF SMALL, MEDIUM AND LARGE AGRICULTURAL-BASED SECTORS

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ECONOMIC IMPACTS OF SMALL, MEDIUM AND LARGE AGRICULTURAL-BASED SECTORS

By

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November 2016

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Growth in final demands does not bring considerable implications on structural changes and growth of the agriculture sector in Malaysia. The current macroeconomic models are unable to provide explicit answer to this issue because they ignore the dualities in production technologies. The major limitation of the current macroeconomic models is production sectors are aggregative and thus homogeneity biases underlying in the models could not be avoided. In particular, one might get a false impression that development in some sector will "trickle down" equally to benefit all sectors in particular the agriculture sector. To tackle this issue, what is needed is a systematic methodological approach that links the different dualistic production structures and for this reason, input-output approach is used. This study has two objectives. First, it develops a new dataset for macroeconomic models that split the production sectors according to sizes—small, medium and large sectors. The new dataset which is termed as the IO TECH is also the biggest contribution from this study. Second, using the new dataset, it analyzes the key drivers for upstream and downstream agricultural SMEs and large sized agricultural-based sector. Results indicate that growth linkages between agricultural SMEs and large agricultural-based sector with other large sized sector in the production chain are weak—with the growth stimuli mostly benefitted the large sized sector. Among all of the agricultural-based sectors regardless of their sizes, the Oils and Fats sector and Food Products sector are identified as the main key drivers.

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Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains

**IMPAK EKONOMI DARIPADA SEKTOR BERASASKAN PERTANIAN
BERSAIZ KECIL, SEDERHANA DAN BESAR**

Oleh

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Pertumbuhan dalam permintaan akhir tidak membawa kesan yang besar
terhadap perubahan struktur dan pertumbuhan sektor pertanian di Malaysia.
Model makroekonomi semasa tidak dapat memberikan jawapan yang tepat
kepada isu ini kerana model tersebut mengabaikan faktor dualiti di dalam
teknologi pengeluaran. Kelemahan utama dalam model makroekonomi semasa
adalah sektor pengeluaran diagregatkan dan perkara ini menyebabkan salah
tafsiran terhadap keadaan sebenar di dalam ekonomi negara. Khususnya,
pembangunan di dalam satu sektor pengeluaran akan di salah tafsirkan untuk
memberikan manfaat yang sama terhadap semua sektor pengeluaran
terutamanya kepada sektor pertanian. Untuk mengatasi isu ini, perkara utama
yang diperlukan adalah satu pendekatan metodologi yang sistematik yang dapat
menghubungkan faktor dualiti di dalam struktur pengeluaran dan untuk itu,
pendekatan input-output digunakan. Kajian ini mempunyai dua objektif.
Pertama, ia akan membangunkan set data untuk model makroekonomi yang
memisahkan sektor pengeluaran berdasarkan saiz–sektor kecil, sederhana dan
besar. Set data yang dibangunkan juga akan menjadi sumbangan utama
daripada kajian ini. Kedua, dengan menggunakan set data tersebut, ia akan
digunakan untuk menganalisis sektor pemangkin terhadap perusahaan
pertanian bersaiz kecil, sederhana dan besar di bawah kategori sektor huluan
dan hiliran. Dapatan kajian menunjukkan bahawa hubungan pertumbuhan
antara sektor pertanian bersaiz kecil, sederhana dan besar dengan sektor
bersaiz besar yang lain adalah lemah–ransangan pertumbuhan akan lebih
memberikan manfaat kepada sektor yang bersaiz besar. Tanpa mengira faktor
saiz untuk setiap sektor yang berasaskan pertanian, sektor Minyak dan Lemak
dan Produk Makanan merupakan sektor yang dikenalpasti sebagai sektor
pemangkin.

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I certify that a Thesis Examination Committee has met on 29 November 2016 to conduct the final examination of Chakrin A/L Utit on his thesis entitled "Economic Impacts of Small, Medium and Large Agricultural-Based Sectors" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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I hereby confirm that:
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Declaration by Members of Supervisory Committee

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- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

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Supervisory
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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
HEM	Hypothetical Extraction Method
ICT	Information and communication technology
MSIC	Malaysia Standard Industrial Classification
MyCC	Malaysia Competition Commision
NAP	New Agricultural Policy
OECD	Organisation for Economic Co-operation and Development
RoS	Rest of sectors
SMEs	Small and Medium Enterprises
SME Corp.	SME Corporation Malaysia

CHAPTER 1

INTRODUCTION

1.1   Introduction

In the period of 2010-2015, the economic prosperity in Malaysia is highly contributed by the services sector. The amount of contribution of this sector to the total amount of gross domestic product (GDP) ranging from 54.6% in year 2010 to 56.2% in 2015 (Department of Statistics Malaysia, 2016). Another sector that shows high percentage of contribution is the manufacturing sector with the average amount of contribution of 24.5%. Agriculture sector also contributed significantly to the economy with the average contribution of 10.2% annually. While the remaining amount of GDP are generated by construction and mining and quarrying sector. For both of the sectors, the amount of annual contribution are less than 5.0%. However, the small contribution of these sectors to the economy does not mean that they are not important since the percentage of contribution is determined by the sectoral sizes.

Looking from the perspective of growth, the GDP expands at an average annual rate of 5.5%. Between these years, the sector that exhibit the largest growth rate is the construction sector with the average growth of 10.7% annually. High growth rate of this sector is rooted from the government initiative under the Tenth Malaysia Plan to stimulate the growth of the economy through construction industry due to its high multiplier impacts and backward linkages (Economic Planning Unit, 2010). Residing in the second position with the highest average annual growth rate is the services sector (6.2%) followed by manufacturing (4.9%), mining and quarrying (3.2%) and agriculture (2.6%).

Based on the relative sectoral growth, it is found that agriculture sector in particular failed to exhibit high growth rate despite its large size and the impressive growth of the economy. One of the major reason behind this issue is the existence of the dualistic economic structures. In this case, the dualities exist in many aspects of the economy, ranging from the labor market to the product market. For the product market, there is a huge difference between the sectoral production technologies. Representing the production technologies based on the respective size of the sector (small, medium and large sized sector) is highly relevant to identify the reason for why growth of the agriculture sector is lacking. Based on the definition used by the Department of Statistics Malaysia (2005), small, medium and large sector can be defined using their relative number of employees or the amount of their annual sales turnover as shown in Table 1.1. The definition then are separated for manufacturing sector and rest of the sectors which include agriculture, mining and quarrying, construction and services.

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Table 1.1 Definition of small, medium and large sector in Malaysia

Firm size	Definition
Manufacturing sector	
Small	Between 5 and 50 full-time employees/Between RM250,000 and less than RM10 million annual sales turnover
Medium	Between 50 and 150 full-time employees/Between RM10 million and RM25 million annual sales turnover
Large	More than 150 full-time employees/more than RM25 million annual sales turnover
Rest of sectors (Agriculture, mining and quarrying, construction and services)	
Small	Between 5 and 20 full-time employees/Between RM200,000 and less than RM1 million annual sales turnover
Medium	Between 20 and 50 full-time employees/Between RM1 million and RM5 million annual sales turnover
Large	More than 50 full-time employees/more than RM5 million annual sales turnover

Source: Department of Statistics Malaysia, 2005

The composition of small and medium enterprises (SMEs) in the economy is substantially high. In total, SMEs accounted for 97.3% (645,136 establishments) from the total number of 662,939 establishments in 2010, while the rest of 2.7% (17,803 establishments) are essentially large establishments (Department of Statistics Malaysia, 2012). For the sectoral breakdown, 90.0% of SMEs are operating under services sector, 5.9% manufacturing, 3.0% construction, 1.0% agriculture, and 0.1% mining and quarrying.

In a detailed sectoral classification, the amount of output and value added generated by SMEs are the highest for the services sector. The respective amount of output and value added generated by this sector is equivalent to RM286.6 billion and RM165.3 billion. High contribution of this sector to the total SMEs output and value added is due to the large composition of SMEs in this sector. SMEs under manufacturing sector also produced a significant amount of output and value added of RM194.0 billion and RM38.1 billion. The third largest contributor for the SMEs performance is the construction sector with the amount of contribution of RM20.1 billion for output and RM7.5 billion for value added. While agriculture sector only produced a total of RM5.2 billion of output and RM2.7 billion of value added. The rest of the total amount of output and value added of RM507.1 billion and RM213.9 billion are generated by mining and quarrying sector. Although the SMEs has dominated the total number of establishments in the Malaysian economy, they only generated 28.5% of total national output, 30.2% of value added and employs 52.7% of the total workforce.

Another important explanation for the small growth in agriculture sector is some portion of its contribution to GDP are being captured under the manufacturing sector. This situation happens as some of the downstream agriculture sub-sectors are primarily operating under manufacturing sector. The sub-sectors included are the food processing sectors. Statistically, the share of downstream

agriculture sub-sectors to the GDP produced by manufacturing sector ranging between 12.5% until 12.9% from year 2010 to 2015. Through this statistics, it partly explains why the growth recorded for agriculture sector is the lowest although the economy expands at an impressive rate annually.

To address the issue of the dualistic aspect and contribution of downstream agriculture sub-sectors being captured under the manufacturing sector, input-output modeling technique is utilized. This technique is supported by the use of input-output table released by the Department of Statistics Malaysia (2014). Input-output modeling technique is frequently used by economists to study the relationship between different production sectors. Basically, this technique shows the interdependency between production sectors in the economy. Interdependency means production sectors will purchase goods and services from other sectors as intermediate inputs for their production, and in turn produce outputs which are then sold to other sectors and consumers. In the case of downstream agriculture sub-sectors and dualistic economic structure, input-output may help to assess the relationship between the production sectors.

With the current national input-output table presents the economic sectors in the aggregated form without any separation between sectoral sizes, the table will be extended to capture the components of SMEs in the economy. For this purpose, each of the economic sectors will be separated based on their sizes (small, medium and large). This attempt will help us to address the issue of why growth for agriculture sector is lacking despite it relatively big size in the economy. On the other hand, representing the sectors in particular for the agriculture sector based on sizes also helps to identify the drivers of the small, medium and large agricultural-based sectors for both upstream and downstream part. Although the main focus of this study is on agriculture sector, the development of the extended input-output table will covers every production sectors and this will become the main contribution from this study.

1.2   Problem Statement

The growth of the agriculture sector can be linked with the dualistic economic structures. The dualities which can be referred to the production technologies or the sectoral sizes may affect the development of a particular sector over the years. In the case of agriculture sector, small, medium and large sized agricultural-based sectors has the potential to bring different implication to the economy since each of the sectors will exhibit different magnitude of growth.

On the other hand, it can be clearly seen that the average annual growth of agriculture sector is the lowest compared to other production sectors despite its large size and the impressive growth of the economy. This situation happened since the contribution of downstream agricultural-based sectors that generate higher amount of value added are accounted as the contribution of

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manufacturing sector to GDP. Thus, the contribution and growth of agriculture sector has been basically underestimated.

Additionally, a few notable agriculture policies has been initiated by the government to stimulate the growth of agriculture sector such as the National Agricultural Policy (NAP) and National Agrofood Policy. However, the agriculture sector continue to perform below par since the policies tend to ignore the dualistic aspects of economic structure as mentioned before. Thus, failing to recognize the dualistic economic structure in the policies implies that homogeneity assumption cannot be avoided.

1.3   Research Questions

This study aims to answer two major research questions as follows:
 I. What are the structural forces that can be put forward to explain the lower impacts of economic growth on agriculture sector?
 II. What are the key drivers for upstream and downstream agricultural SMEs and large sized agricultural-based sectors?

1.4   Objectives

This study develops a new methodology that account for the dualistic production technologies and the contribution of upstream and downstream agricultural-based sectors. Specifically, the study sets out to:
 I. To develop a new dataset that split the production technologies or sectors according to sizes (small, medium and large) to explain the lower impacts of economic growth on agriculture sector; and
 II. To analyze and identify the key drivers for upstream and downstream agricultural SMEs and large sized agricultural-based sectors.

1.5   Significance of the Study

In relation to policy purposes, this study has two main contributions. First, it develops a new dataset (let us termed as IO-TECH for short) that improves the current macroeconomic models. The IO-TECH will be developed by expanding the current national input-output table to include the dualistic aspects of the economic structure which are the three different production technologies. The technologies are distinguished on the basis of firm or sector sizes—small, medium and large sector. The development of this dataset will provide policy guidance for identifying and monitoring the key drivers for different sizes agricultural-based sectors. Currently, there is still no dataset in Malaysia neither from the Department of Statistics nor any other relevant agencies that make such a distinction.

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Second, it can be used to examine the extent to which growth in final demand affects the generation of value added for different sizes agricultural-based sectors. This analysis is very important to evaluate spillover effects or backward linkages among the different sizes agricultural-based sectors. In this case, if the sector exhibits high backward linkages, it gives the indication that the sector has high potential to assist and facilitate business activities of other segments in the economy. In other words, the increase in the production activities of one particular agricultural-based sector will also boost the production activities of other sectors in order to satisfy the increase demand for the intermediate inputs.

1.6   Organization of the study

This thesis contains five chapters. Chapter 1 presents the introduction of the study, problem statement, research questions that need to be answered, objectives to be achieved and significance of the study.

Chapter 2 presents past literatures related to this study. The chapter is divided into two parts. First part of the chapter give the introduction for what will be described in Chapter 2. Meanwhile the second part reviews the past literatures. For a better understanding, this part is separated into four themes: (I) aggregation bias, (II) technological differences and dualistic economic structures, (III) SMEs studies, and (IV) agricultural policy.

Chapter 3 describes the methodological approach undertaken. The chapter started with a brief introduction. As the study employs the input-output modelling technique, the main dataset used is the national input-output table. In the process of achieving the objectives of this study, the national input-output table needs to be expanded and the structure of the new dataset or IO-TECH is described. Then, data sources and harmonization of data, and data estimation process are explained.

Chapter 4 presents the major findings from the analyses conducted on IO-TECH. The first part of this chapter give a brief introduction to the chapter. The rest of the chapter provides the findings on the structural interdependencies, the contribution of agricultural SMEs to the economy and finally reveals their key drivers or the new growth enhancer that should be promoted.
Last but not least, Chapter 5 summarizes the whole study by detailing the motivation and relevance of the study, major findings, outlines the policy recommendation and address the limitations of the study.

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