

**THE EFFECT OF PRODUCTION OF SELECTED  
AGRICULTURE PRODUCTS AND MONEY SUPPLY ON GDP  
OF AGRICULTURE SECTOR IN MALAYSIA**

**DEVAKI KANAGA RETNAM**

**MASTER OF ECONOMICS  
UNIVERSITI UTARA MALAYSIA**

**2012**

**THE EFFECT OF PRODUCTION OF SELECTED  
AGRICULTURE PRODUCTS AND MONEY SUPPLY ON GDP  
OF AGRICULTURE SECTOR IN MALAYSIA**

**BY**

**DEVAKI A/P KANAGA RETNAM**

Project Paper submitted to the Research and Post Graduate Study, Othman Yeop  
Abdullah Graduate School of Business in fulfillment of the requirement for the  
Master Degree of Economics, Universiti Utara Malaysia.

January 2012

© DEVAKI A/P KANAGA RETNAM, 2012. All rights reserved.

## **PERMISSION TO USE**

In presenting this research in partial fulfillment of the requirement for a postgraduate degree from Universiti Utara Malaysia, I agree that the library of the university, Perpustakaan Sultanah Bahiyah may take it freely available for inspection. I further agree that permission for copying this research paper in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor or Dean, Research and Graduate Study Department, Universiti Utara Malaysia. It is understood that any copying or publication or use of this research paper or parts thereof for financial gain shall not be allowed without written permission. It is also understood that due recognition shall be to me and to Universiti Utara Malaysia for any scholarly use which may be made of material from my research paper.

Request for permission to copy or to make use of materials in the research paper, in whole or in part should be addressed to:

Dean

Research & Post Graduate Study

Othman Yeop Abdullah Graduate School of Business

Universiti Utara Malaysia

06010 UUM Sintok

Kedah Daruk Aman

## **ACKNOWLEDGEMENT**

Thanks to God because of the approval I can complete this project paper. Thank you for my dedicated family especially my parents Mr. Kanaga Retnam A/L Sri Raman and my mother, Mrs. Santha A/P Karuppiah, for their support and pray for my success. All the support and assistance from batch mates in the Masters Degree of Economics, College of Business, Universiti Utara Malaysia are greatly appreciated.

Special thanks for Dr Hussin bin Abdullah for his support, motivation, guidance and help me to complete this paper. Without his support, my study would not have been possible. At the same time, I would like to thank my unforgettable friends for contributing their effort for helping doing my task. Particular appreciation goes to Ms. Kalaivani A/P Kalimuthu, Mr. Yuvaraja Gurumurthy and Ms. Hafizah Ramli.

Finally, I would like to thank all parties who have given their support and cooperation either directly or indirectly to ensure that I completed this paper and can be awarded a Master Degree. Hopefully all the efforts and contributions are rewarded by God.

## ABSTRACT

*Agriculture sector plays the vital role in Malaysian economic because of the contribution of agriculture during the early stages of the national economic growth until now. The purpose of this paper is to examine the effects of the selected agriculture sector (palm oil, rubber, rice and saw logs) in the agriculture sector and to examine the impact of money supply across employment and productivity of labour and capital in agriculture sector. This paper uses the secondary data from year 1981 until 2010 from the Department of Statistics Malaysia, Malaysia Productivity Corporation (MPC) and Asian Development Bank (ADB). By using Johansen-Julies Cointegration model, the results showed there is long run relationship between dependent variable and independent variables. But, in Granger Causality model, result showed there is no relationship between money supply and productivity variables. While, this paper also conducts other tests such as Autocorrelation, Ramsey RESET and Histogram Normality Test.*

**Keyword:** Agriculture Sector, Money Supply, Johansen-Julies Cointegration, Granger Causality.

## ABSTRAK

*Sektor pertanian memainkan peranan penting dalam ekonomi Malaysia kerana sumbangan sektor ini pada peringkat awal pertumbuhan ekonomi negara sehingga kini. Tujuan utama kajian ini adalah untuk menguji kesan pertumbuhan sektor pertanian terpilih (minyak kelapa sawit, getah, padi dan kayu balak) dalam KDNK sektor pertanian dan untuk menguji kesan bekalan wang dalam pertumbuhan tenaga kerja dan produktiviti buruh dan modal dalam sektor pertanian. Sumber-sumber data sekunder dari Jabatan Perangkaan Malaysia, Perbadanan Produktiviti Malaysia (MPC) dan Bank Pembangunan Asia (ADB) dari tahun 1981 hingga tahun 2010 telah digunakan sebagai maklumat. Dengan menggunakan model Johansen-Julies Cointegration, keputusan telah menunjukkan bahawa wujud hubungan jangka panjang di antara pembolehubah bersandar dengan pembolehubah bebas. Tetapi dalam model Granger Causality menunjukkan bahawa tiada hubungan di antara pembolehubah bekalan wang dan produktiviti. Sementara itu, kajian ini juga telah menjalankan ujian-ujian yang lain seperti Autocorrelation, Ramsey RESET dan Histogram Normality Test.*

**Kata kunci:** Sektor Pertanian, Bekalan Wang, Johansen-Julies Cointegration, Granger Causality.

## **TABLE OF CONTENT**

PERMISSION TO USE	i
ABSTRACT	ii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENT	v
LIST OF TABLE	ix
LIST OF FIGURE	x
LIST OF ABBREVIATION	xi

### **CHAPTER 1: BACKGROUND OF STUDY**

1.1	Introduction	1
1.2	Issues	3
1.3	Problem Statement	7
	1.3.1 Decrease in GDP of Agriculture Sector	7
	1.3.2 Import Agriculture Products Exceed Export	8
1.4	Objectives	9
	1.4.1 General Objective	9
	1.4.2 Specific Objectives	10
1.5	Significant of Study	10
1.6	Organization of Study	11

## **CHAPTER 2: LITERATURE REVIEW**

2.1	Introduction	12
2.2	Agriculture Production Functions	12
2.2.1	The Cobb-Douglas Production Function	13
2.2.2	Algebraic Production Function	14
2.2.3	Ricardo's Quadratic Production Function	18
2.2.4	Frontier Metaproduction Functions	20
2.3	Money Supply and Agricultural Prices	21
2.3.1	Granger causality test	22
2.3.2	Macroeconomic-Agricultural Linkage Model	24
2.4	Affects Human Capital on Agriculture Productivity	26
2.4.1	Human Capital, Productivity and Labor Allocation	27
2.5	Conclusion	29

## **CHAPTER 3: DATA AND METHODOLOGY**

3.1	Introduction	30
3.2	Data	30
3.3	Model Specifications	31
3.4	Measurement of Variables	33
3.5	Procedure of Analysis	37
3.5.1	Unit Root Test	38
3.5.2	Vector Autoregressive Models (VAR)	40
3.5.2.1	Johansen Multivariate Cointegration Test	40
3.5.2.2	Granger Causality Test	41



3.5.3	Autocorrelation, Ramsey RESET and Histogram Normality Test	43
3.5.4	Robust Regression Analysis	47

## **CHAPTER 4: RESULTS AND DISCUSSION**

4.1	Introduction	48
4.2	Unit Root Test	48
4.3	Cointegration Test	51
4.3.1	Cointegration Test between Selected Agriculture Sector (lnPOt, lnRBt, lnRCt, lnSAWt) on Gross Domestic Product of Agriculture Sector lnGDPT (Model 1)	51
4.3.2	Ordinary Least Squares (OLS) Test between Selected Agriculture Sector (lnPOt, lnRBt, lnRCt, lnSAWt) on Gross Domestic Product of Agriculture Sector lnGDPT (Model 1)	53
4.4	Granger Causality Test	54
4.5	Autocorrelation, Ramsey RESET and Histogram Normality Test	56
4.5.1	Autocorrelation Test between Selected Agriculture Sector (lnPOt, lnRBt, lnRCt, lnSAWt) on Gross Domestic Product of Agriculture Sector lnGDPT (Model 1)	56
4.5.2	Ramsey RESET Test between Selected Agriculture Sector (lnPOt, lnRBt, lnRCt, lnSAWt) on Gross Domestic Product of Agriculture Sector lnGDPT (Model 1)	57
4.5.3	Histogram Normality Test between Selected Agriculture Sectors (lnPOt, lnRBt, lnRCt, lnSAWt) on Gross Domestic Product of Agriculture Sector lnGDPT (Model 1)	58
4.6	Robust Regression Analysis	59
4.7	Conclusion	60

## **CHAPTER 5: CONCLUSION AND POLICY IMPLICATIONS**

5.1	Introduction	62
5.2	Conclusion	62
5.3	Policy Implications	66
5.4	Recommendation for Future Studies	68

<b>REFERENCES</b>	69
-------------------	----

<b>APPENDIX</b>	72
-----------------	----

## LIST OF TABLES

<b>Tables No:</b>	<b>Title of Tables</b>	<b>Page</b>
Table 1.1	The Contribution of Agriculture to the Malaysian Economy	2
Table 1.2	Exports of Agriculture Sector (RM '000)	5
Table 1.3	Shares of Commodities in Agricultural Export, 1985-1995	6
Table 1.4	The Differences between Export and Import in 2003 (RM '000)	8
Table 2.1	Agriculture employment and productivity	26
Table 4.1	ADF Unit Root Tests in Levels and First Differences	49
Table 4.2	Johansen- Juselius Cointegration Tests (Model 1)	52
Table 4.3	Ordinary Least Squares Test (Model 1)	53
Table 4.4	Granger Causality Test (Model 2)	54
Table 4.5	Granger Causality Test (Model 3)	55
Table 4.6	Autocorrelation Test (Model 1)	57
Table 4.7	Ramsey RESET Test (Model 1)	58
Table 4.8	Histogram Normality Test (Model 1)	59

## LIST OF FIGURES

<b>Figures No:</b>	<b>Title of Tables</b>	<b>Page</b>
Figure 1.1	Malaysia: Gross Domestic Product by Industry of Origin (share of GDP (%))	4
Figure 2.1	Macroeconomic-Agricultural Linkage Model	25

## LIST OF ABBREVIATIONS

ADB	Asian Development Bank
ADB	Bank Pembangunan Asia
ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
FTZ	Free Trade Zone Area
GDP	Gross Domestic Product
IMD	International Institute for Management Development
KDNK	Keluaran Dalam Negara Kasar
MPC	Malaysia Productivity Corporation
MPC	Perbadanan Produktiviti Malaysia
NAP3	The Third National Agricultural Policy
NAP4	The Fourth National Agricultural Policy
OLS	Ordinary Least Squares
RESET	Regression Equation Specification Error Test
RGDP	Real Gross Domestic Product
VAR	Vector Autoregressive Model
VECM	Vector Error Correction Model

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Malaysia is well known as a beautiful country and rich with traditional culture in Asia and by economic development Malaysia is categorized as a developing country. Malaysia's competitiveness ranking surged into the top ten in the world as Asian countries took the first two spots after financial turmoil and an economic crisis by 20<sup>th</sup> May, 2010. According to latest IMD World Competitiveness Yearbook 2010, Malaysia's competitiveness ranking rose to 10<sup>th</sup> from 18<sup>th</sup> a year earlier, as the country benefited from strong demand from Asia as well as implementation of efficient government policies, especially government policies. On the other hand, Malaysia is now ranked in the 5<sup>th</sup> place as most competitive country in Asia Pacific because of high scores in business and government efficiency.

Recently, the Malaysian economy recorded 10.1 percent growth in the first quarter of year 2010, which was the highest quarterly growth in a decade. The Malaysian currency ringgit is Asia's best performing currency for year 2010, as foreign money has poured into domestic capital markets due to a combination of strong economic growth and rising interest rates. The ringgit has appreciated by about 6 percent

The contents of  
the thesis is for  
internal user  
only

## REFERENCES

- 18<sup>th</sup> Productivity Report (2010). Malaysia Productivity Corporation (MPC).  
[www.mpc.gov.my/mpc/images/file/APR/APRSnapshot.pdf](http://www.mpc.gov.my/mpc/images/file/APR/APRSnapshot.pdf)
- Azmi Shahrin Bin Abdul Rahim (2006). A Critical Assessment the Contribution of the Agriculture Sector in the Growth of the Malaysian Economy. Retrieved July 12, 2011, from  
<http://economics.dstcentre.com/The%20contribution%20of%20the%20agriculture%20sector%20to%20the%20Malaysian%20economy%20by%20Azmi%20Shahrin.pdf>
- David L. Debertin (1985). Developing Realistic Agricultural Production Functions for Use in Undergraduate Classes. *Southern Journal of Agricultural Economics*, pp. 207-214. Retrieved July 14, 2011, from  
<http://ageconsearch.umn.edu/bitstream/29983/1/17020207.pdf>
- Department of Statistics Malaysia. [www.statistics.gov.my](http://www.statistics.gov.my)
- Dietrich Vollrath (2004). Land Distribution and International Agricultural Productivity. Working Paper Series. Retrieved July 16, 2011, from  
[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=694768](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=694768)
- Fatimah Mohd. Arshad, Abdual Aziz Abdul Rahman, Wan Leong Fee and Wong Chee Yoong (1988). Malaysian Agriculture Policy: Issues and Directions. Kuala Lumpur : Percetakan Sinar Surya.
- James w. RIcharchon (1973). An Aggregate Agricultural Production Function for the U.S.A. In 1965-1969. Journal Article No. J-2603, pp.100-101. Retrieved July 21, 2011, from  
[http://digital.library.okstate.edu/OAS/oas\\_pdf/v53/p100\\_101.pdf](http://digital.library.okstate.edu/OAS/oas_pdf/v53/p100_101.pdf)
- Jirawat Jaroensathapornkul (2006). Fiscal and Monetary Policy Mixes Linkage to Thailand's Agriculture. *Thammasat Economic Journal* 2552, Vol 5, No. 5 pp. 34-54. Retrieved July 22, 2011, from  
<http://edocument.swu.ac.th/general/4800/pdf/11548000630.pdf>



Key Indicators for Asia and the Pacific (1999, 2010). Asian Development Bank (ADB). [www.adb.org/statistics](http://www.adb.org/statistics)

Khoo Khee Ming and D.Chandramohan (2002). Malaysian Palm Oil Industry at Crossroads and its Future Direction. *Oil Palm Industry Economic Journal*, Vol. 2(2). Retrieved July 22, 2011, from <http://www.chgs.com.my/download/Oil%20Palm%20Industry%20Economic%20Journal/vol2%20no2/Malaysian%20Palm%20Oil%20Industry%20at%20Crissroads%20and%20its%20Future%20Direction.pdf>

Kishore (2010). Rubber Cultivation in Malaysia. [http://kish.in/rubber\\_cultivation\\_in\\_malaysia/](http://kish.in/rubber_cultivation_in_malaysia/)

Larry C.Y. Wong (2007). Development of Malaysia's Agricultural Sector: Agriculture as an Engine of Growth. Retrieved August 02, 2011, from [http://www.isis.org.my/attachments/386\\_Territorial\\_Disputes\\_in\\_East%20Asia.pdf](http://www.isis.org.my/attachments/386_Territorial_Disputes_in_East%20Asia.pdf)

Marcel Fafchamps and Agnes R. Quisumbing (1998). Human Capital, Productivity, and Labor Allocation in Rural Pakistan. International Food Policy Research Institute (IFPRI), Discussion Paper No. 48. Retrieved August 13, 2011, from <http://www.ifpri.org/sites/default/files/publications/dp48.pdf>

Marno Verbeek (2006). *A Guide to Modern Econometrics* (2<sup>nd</sup> ed.). USA : John Wiley & Sons Ltd.

Ministry of Finance Malaysia. [www.treasury.gov.my](http://www.treasury.gov.my)

Mohd. Azwardi Bin Md. Isa and Kamaruddin Bin Radzuan (2005). Malaysia Agricultural Sector: Competitiveness In AFTA. In: The 6th Asian Academy of Management Conference , 9-11 December 2005, Casuarina Ipoh, Perak. Retrieved August 30, 2011, from <http://repo.uum.edu.my/250/>

- Productivity Report (2002). National Productivity Corporation.  
[http://www.utusan.com.my/utusan/special/others/laporan\\_produkktiviti\\_2002.pdf](http://www.utusan.com.my/utusan/special/others/laporan_produkktiviti_2002.pdf)
- Qazi Muhammad Adnan Hye (2009). Money Supply and Agricultural Prices - A Causality Analysis for Pakistan Economy (Quarterly Data Analysis). *Journal of Agricultural Research*, Vol. 47, No. 2. Retrieved August 15, 2011, from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1369194](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1369194)
- Qazi Muhammad Adnan Hye and Masood Mashkooor Siddiqui (2010). Money Supply, Exchange Rate, Industrial and Agricultural Product Prices: Evidence from Pakistan. *African Journal of Agricultural Research*, Vol. 5(22), pp. 2997-3002. Retrieved August 21, 2011, from <http://www.academicjournals.org/ajar/pdf/pdf%202010/18%20Nov/Hye%20and%20Siddiqui.pdf>
- Quantitative Micro Software (2004). E-View 5 User's Guide. USA : Quantitative Micro Software, LLC.
- Thomas M. Humphrey (1997). Algebraic Production Functions and Their Uses Before Cobb- Douglas. *Federal Reserve Bank of Richmond Economic Quarterly*, Vol. 83/1. Retrieved August 22, 2011, from [http://www.richmondfed.org/publications/research/economic\\_quarterly/1997/winter/pdf/humphrey.pdf](http://www.richmondfed.org/publications/research/economic_quarterly/1997/winter/pdf/humphrey.pdf)
- Viveka P. Kudaligama and John F. Yanagida (2000). A Comparison of Intercountry Agricultural Production Functions: A Frontier Function Approach. *Journal of Economic Development*, Vol. 25, pp. 57-78. Retrieved August 30, 2011, from <http://www.jed.or.kr/full-text/25-1/kudaligama.PDF>
- Yair Mundlak (1992). Agricultural Productivity and Economic Policies: Concepts and Measurements. Developing Country Agriculture and International Economic Trends, Working Paper No. 75. Retrieved August 30, 2011, from [http://www.oecd-ilibrary.org/development/agricultural-productivity-and-economic-policies\\_257184001567](http://www.oecd-ilibrary.org/development/agricultural-productivity-and-economic-policies_257184001567)