

**EFFECT OF FINANCIAL FACTORS AND OPTIMUM
CURRENCY AREA ON REAL EXCHANGE RATE IN ASEAN-3
COUNTRIES**

TIANG A/L DIN PIAN

**MASTER OF ECONOMICS
UNIVERSITI UTARA MALAYSIA
2013**

**EFFECT OF FINANCIAL FACTORS AND OPTIMUM CURRENCY AREA
ON REAL EXCHANGE RATE IN ASEAN-3 COUNTRIES**

BY

TIANG A/L DIN PIAN

Dissertation Submitted to

Othman Yeop Abdullah, Graduate School of Business

Universiti Utara Malaysia

in Fulfilment of the Requirement for the Master Degree of Economics

PERMISSION TO USE

In presenting this dissertation in partial fulfilment of the requirements for a postgraduate degree from Universiti Utara Malaysia, I agree that the University Library make a freely available for inspection. I further agree that permission for copying of this dissertation in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor or, in their absence by the Dean of Othman Yeop Abdullah Graduate School of Business. It is understood that any copying or publication or use of this dissertation or parts thereof for financial gain shall not be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis/dissertation/project paper.

Request for permission to copy or make other use of materials in this dissertation/project paper, in whole or in part should be addressed to:

Dean of Othman Yeop Abdullah Graduate School of Business

Universiti Utara Malaysia

06010 UUM Sintok

ABSTRAK

Integrasi serantau telah menjadi subjek penting di kalangan ahli-ahli ekonomi dan di lihat mampu merangsang kerjasama kewangan serta aturan tukaran asing pada anggota negara ASEAN-3 seterusnya memperluaskan promosi koordinasi makro dengan sasaran utama untuk mengurangkan tahap pemeluapan makro ekonomi seperti pemeluapan kadar tukaran. Tujuan pembentukkan adalah untuk mengurangkan ketidaktentuan kadar tukaran dan mengelak ketidakselarasan kadar tukaran di kalangan anggota negara ASEAN. Kajian ini berhasrat untuk menyiasat tahap pengubah Kawasan Matawang Optima (OCA) dan Faktor Kewangan (FF) dalam konteks ASEAN-3 serantau dengan US Dollar digunakan sebagai matawang utama, juga kepentingannya sebagai rakan dagangan utama dengan negara ASEAN-3 serta menjadi matawang permintaan global. Secara amnya, kami mendapati beberapa pengubah faktor kewangan di dapati memberi sumbangan penting dalam menentukan perubahan kadar tukaran. Tambahan OCA memainkan peranan penting dalam menjelaskan kadar tukaran benar dagangan dua hala lagi.

ABSTRACT

Regional integration has become important subject among economists and is viewed capable of boosting monetary cooperation and foreign exchange arrangements among ASEAN-3 members thus promotes greater macro coordination, with the ultimate goal of reducing the extent of macroeconomics, such as real exchange rate. The purpose of the formation is to reduce exchange rate uncertainty and to avoid exchange rate misalignment among the ASEAN member countries. This research intends to investigate the extent of optimum currency area (OCA) variables and financial factors (FF) works within the context of ASEAN-3 countries with US Dollar used as anchor currencies, given their importance being major trading partners with the ASEAN countries and being the global demand currencies. In general, we found that several financial factors were found to have significant contribution on determining exchange rate variation. In addition, OCA variables have played an important role in explaining the bilateral real exchange rate.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my supervisor, Dr. Hussin Bin. Abdullah who gave me inspirations, encouragement and guidance in completing this thesis. His understanding, encouragement and personal guidance have provided me a good basis for my thesis.

Also, I would like to express my greatest gratitude towards the lecturers in Universiti Utara Malaysia who have helped throughout my study, either directly or indirectly.

Finally, I owe my love to my mother Tong Geon A/L Kling, thanks for the understanding and the sacrifices made. Your love and thought have guided me to be what I am today.

Last but not least, I would like to thanks all my friends who gave me their great support and cooperation to complete this thesis.

TABLE OF CONTENTS

	Page
PERMISSION TO USE	ii
ABSTRACT	iii
ABSTRAK	v
ACKNOWLEDGEMENTS	vii
APPROVAL	viii
DECLARATION	x
LIST OF TABLES	xiv
LIST OF FIGURES	xvi
LIST OF ABBREVIATIONS	xvii
CHAPTER	
1 OVERVIEW OF THE STUDY	
1.1 Introduction	1
1.2 ASEAN Exchange rate Regime	3
1.3 The Issues	5
1.4 Problem Statement	11
1.5 Objectives	13
1.6 Significance of Study	13
1.7 Scope of Study	14
1.8 Organization of Study	15
2 LITERATURE REVIEW	
2.0 Theoretical Literature	16
2.1 Theoretical Literature: Financial Factors	16
2.2 Theoretical Literature: Optimum Currency Areas Theory	19
2.3 Empirical Literature: Financial Factors	21
2.3.1 Domestic Financial Sector	21
2.3.2 Foreign Direct Investment (FDI)	22
2.3.3 Portfolio Investment (PI)	26
2.3.4 External Debt	29
2.3.5 Exchange Control	33
2.4 Empirical Literature: Optimum Currency Areas	35
2.4.1 Trade (Openness)	35
2.4.2 Growth Domestic Product (GDP)	37
2.4.3 Reserves	37
3 METHODOLOGY AND DATA	
3.1 Empirical Model	40
3.2 Estimation Procedure	44
3.2.1 Unit Root test	44
3.2.2 Phillips-Perron (PP) unit root test	45
3.2.3 Cointegration	45
3.2.4 Johansen and Juselius (JJ) maximum likelihood test	46
3.3 Data	48

4	RESULTS AND DISCUSSIONS	
4.1	Unit root tests	49
4.2	Cointegration test	52
4.3	Long-run Equation	55
4.4	Conclusion	58
5	CONCLUSIONS	
5.1	Summary	60
5.2	Conclusion	63
5.3	Policy Implication	64
5.4	Limitations of the Study	66
5.5	Suggestion for Further Studies	67
		68
	REFERENCES	

LIST OF TABLES

Table		Page
1.1	ASEAN-3 Economic Growth (GDP at constant prices; % change)	2
1.2	ASEAN-3 currency arrangements 1990, 1997, and 2001	4
4.1	Unit root test – Philips-Perron (1988) test for FF variables	50
4.2	Unit root test – Philips-Perron (1988) test for OCA variables	51
4.3	Cointegration tests – RER vs FF for ASEAN-3	54
4.4	Cointegration tests – RER vs OCA for ASEAN-3	54
4.5	Long run equation – RER vs FF	55
4.6	Long run equation – RER vs OCA	57
5.1	Summary of impacts on RER	62

LIST OF FIGURES

Figure		Page
1.1	Rupiah /USD Exchange rate	5
1.2	RM /USD Exchange rate	6
1.3	Rupiah /USD Exchange rate	6
1.4	Indonesia Rupiah Returns	7
1.5	Malaysia Ringgit Returns	7
1.6	Thailand Baht Returns	

CHAPTER 1

OVERVIEW OF THE STUDY

1.1 Introduction

The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967 in The Bangkok Declaration by the five original member countries, namely, Indonesia, Malaysia, Philippines, Singapore, and Thailand. Brunei Darussalam joined on 8 January 1984, Vietnam on 28 July 1995, Laos and Myanmar on 23 July 1997, and Cambodia on 30 April 1999. The ASEAN region has a population of about 542 million, a total area of 4.5 millions square kilometers; its total gross domestic product (GDP) in 2003 was US\$ 737 billion and a total trade of more than US\$ 790 billion.

Prior to the currency and economic crisis in 1997, ASEAN countries had recorded historically strong and impressive real economic growth for the past ten years since the late 1980s. On average, the real GDP growth rates for the ASEAN countries excluding Brunei in 1994 and 1995 were 7.6% and 7.9% respectively. Among the ASEAN member countries, the highest economic growth rate (in 1995) was recorded in Malaysia (9.5%), followed by Thailand and Singapore (8.7%), Indonesia (8.2%) and The Philippines (4.8%). From 1990 to 1997 ASEAN countries achieved higher economic growth than any others. They were viewed as model for advances in technology and economic improvement. Strong domestic consumption and investment plus large exports

The contents of
the thesis is for
internal user
only

REFERENCES

- Abbas, S. M. A. (2004). Evaluating the Success of Malaysia's Exchange Controls (1998-1999). *QEH Working Paper Series – QEHWPS113, January 2004*.
- Ahmad, M.H. and Ahmed, Q.M. (2003). Foreign Capital Inflows and Domestic Saving In Pakistan: Cointegration Techniques and Error Correction Modeling.
- Appell, D. (1999). Malaysia Simplifies Tax for Foreign Share Investors. *Asian Wall Street Journal*, New York, September 22
- Ariccia, D. G. (1999). Exchange rate fluctuations and trade flows: Evidence from the European Union. *IMF Staff Papers* 46, 315-334.
- Ariyoshi., A., K. Habermeier, B. Laurens, I. Otker-Robe, J.I. Canales-Kriljenko and A.Kirilenko (2000). Capital Controls: Country Experiences with Their Use and Liberalizations. *IMF Occasional Paper* 190, Washington, D.C.
- Balassa, B. (1964). The Purchasing Power Parity Doctrine: A Reappraisal. *Journal of Political Economy* 72: 584-596.
- Banerjee, A., Dolado, J. J. and Mestre, R. (1998). Error-Correction Mechanism Tests for Cointegration in a Single-Equation Framework. *Journal of Time Series Analysis*, Vol. 19, pp. 267-283.
- Bayoumi, T. and Eichengreen, B. (1998). Exchange rate volatility and intervention: Implications of the theory of optimum currency areas. *Journal of International Economics*, 45, 191-209.
- Bera, A.K. and C.M. Jarque (1981). An Efficient Large sample Test for Normality of Observations and Regression Residuals. *Australian National University Working Papers in Econometrics* 40, ANU, Canberra.
- Berg, Andrew and Catherine Patillo (1999). Are Currency Crises Predictable? A Test. *International Monetary Fund Staff Papers* 46 (June), pp.249-73.
- Bollerslev, T. (1986). Generalised Autoregressive Conditional Heteroskedasticity. *Journal of Econometrics*, Vol. 31, pp. 307-327.
- Brailsford, T. J. (1996). The empirical relationship between trading volume, returns and volatility. *Accounting and Finance*, Vol. 523-543, pp.89-106.
- Ch, Muhammad and Ali (1993). Pakistan's foreign dependence, its capacity for debt repayment and future prospects. *Pakistan Economic and Social Review*, Vol. 31. No. 1.

- Chia, S. Y. (1998). The Asian Financial Crisis: Singapore's experience and response. *ASEAN Economic Bulletin*, 15 (3), 297-308.
- Demarmels, R and Fischer A.M. (2003). Understanding Reserve Volatility in Emerging Markets: A Look at the Long-Run. *Stiftung Der Schweizerischen NationalBank, Working Paper No. 03.03*.
- Devereux, M. B. and Lane, P. L. (2003). Understanding bilateral exchange rate volatility. *Journal of International Economics*, 60, 109-132.
- Dickey, D.A. and W.A. Fuller (1979). Distribution of the Estimators for Autoregressive Time Series With a Unit Root. *Journal of the American Statistical Association* 74:427-431.
- Dickey, D.A. and W.A. Fuller (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit root. *Econometrica* 49:1057-1072.
- Edison, Hali J. and Carmen M. Reinhart (2000). Capital Controls During Financial Crises: The Cases of Malaysia and Thailand. In R.Glick, R.Moreno, and M.Spiegel, eds., *Financial Crises in Emerging Markets*, Cambridge University Press Cambridge, UK), Forthcoming.
- Edwards, Sebastian (1999b). How Effective Are Capital Controls? *NBER Working Paper* No. 7413 (November).
- Eichengreen, B. (1997). *European Monetary Unification: Theory, Practice, and Analysis*, The MIT Press, Cambridge Mass.
- Engle, R.F. and Granger, C.W.J. (1987). Cointegration and error correction: Representation, estimation and testing. *Econometrica*, 55, 251-276.
- Esquivel, G. and Larrain, F.B. (2001). The Impact Of G-3 Exchange Rate Volatility On Developing Countries.
- Esquivel, Gerardo and Felipe Larrain (1998). *Explaining Currency Crises*. Mimeo, Harvard Institute for International Development (June).
- Frankel, J. and Wei, S-. J. (1993). Trade blocs and currency blocs. *NBER Working Paper* 435.
- Frankel, Jeffrey and Andrew Rose (1996). Currency Crashes in Emerging Markets. An Empirical Treatment. *Journal of International Economics* 41 (November), pp. 352-366.
- Frenkel, J. and Mussa, M. (1980). The Efficiency of the Foreign Exchange Market and Measures of Turbulence. *American Economic Review*, 70(2), 374-81.

- Frenkel, M., Nickel, C., Schmidt, G. and Stadtmann, G. (2001). The Effects of Capital Controls on Exchange Rate Volatility and Output. *International Monetary Fund, IMF Working Paper, WP/01/187*.
- Furman, Jason and Joseph Stiglitz (1998). Economic Crises: Evidence and Insights from East Asia. *Brookings Papers on Economic Activity*, No. 2, pp. 1-119.
- Glick, R. and Hutchison, M. (2000). Stopping “Hot Money” or Signaling Bad Policy? Capital Controls and the Onset of Currency Crises.
- Goldstein, M. (1995), *Coping with Too Much of a Good Thing: Policy Responses for Large Capital Inflows to Developing Countries*, Institute for International Economics, Washington D.C.
- Granger, C. W. J. (1988). Some recent developments in a concept of causality. *Journal of Econometrics*, 39, pp. 199-211.
- Granger, C.W.J. and T. Terasvirta (1993) *Modeling Non-Linear Economic Relationships*, Oxford: Oxford University Press.
- Gregorio, Jose, Sebastian Edwards and Rodrigo Valdes (2000). Controls on Capital Inflows: Do They Work? *NBER Working Paper No. 7645* (April).
- Grilli, Vittorio and G.-M. Milesi-Ferretti (1995). Economic Effects and Structural Determinants of Capital Controls. *IMF Staff Papers* 42, pp. 517-51.
- Hanaki, N. (2000). Effects of policies and institutions on economic volatility and growth: A literature review. *Columbia University, September 1, 2000*.
- Harris, R.I.D. (1995), *Cointegration Analysis in Econometric Modeling*, London, Prentice Hall.
- Hausman, J.A. 1978. Specification Tests in Econometrics. *Econometrica*, 46, 1251-1272.
- Henry, C. and Longmore, R. (2003). Current Account Dynamics and The Real Effective Exchange Rate: The Jamaican Experience. *Bank Of Jamaica, March 2003*.
- Henry, P.B. (2005). Discussion of “Malaysian Capital Controls: An Assessment”. *Stanford University and NBER, February 2005*.
- Hull, J. (2000). Estimating Volatilities and Correlations. Chapter 15 in *Options, Futures and Other Derivatives*, (4th Edition)
- Hurley, D. T. and Santos, R. A. (2001). Exchange rate volatility and the role of regional currency linkages: the ASEAN case. *Applied Economics*, 33, 1991-1999.

- Hviding, K., Nowak, M. and Ricci, L. A. (2003). Can Higher Reserves Help Reduce Exchange Rate Volatility? An Empirical Investigation. *IMF Staff Papers*.
- IMF (1998). World Economic Outlook, May. Chapter 4: "Financial Crises: Characteristics and Indicators of Vulnerability."
- Inder, B. (1993). Estimating Long-run Relationships in Economics: A Comparison of Different Approaches. *Journal of Econometrics*, pp. 53-68.
- Ito, Takatoshi (1999). Capital Flows in Asia. *NBER Working Paper* No. 7134.
- Ito, Takatoshi and Richard Portes (1998). Dealing with the Asian Financial Crises. European Economic Perspectives, CEPR.
- Jason, C.W.N. and McAleer, M. (2002). Monetary Integration and Contagion. *Dept. of Economics, University of Western Australia*.
- Johansen (1988). statistical Analysis of cointegrating vectors. *Journal of Economic Dynamic and control*, Vol. 12, pp 231-254.
- Johansen and Juselius (1990). Maximum Likelihood Estimation and inference on Cointegration with applications the demand for money. *Oxford Bulletin of Economics and statistics*, Vol 52, No 2, pp 169-210.
- Johansen, S. (1988). Statistical Analysis of Cointegration Vectors. *Journal of Economic Dynamics and Control* 12:231-254.
- Johansen, S. and Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, 169-211.
- Johnston, B.R. and N. T. Tamirisa (1998). Why Do Countries Use Capital Controls? *IMF Working Paper* 98/181, Washington D.C.
- Jones, C.M., Kaul, G. and Lipson, M. L. (1994). Transactions, Volume and Volatility. *Review of Financial Studies*, Vol. 7, pp. 631-651.
- Juhn, G. and Mauro, P. (2003). Long-Run Determinants of Exchange Rate Regimes: A Simple Sensitivity Analysis.
- Kaminsky, Graciela, Saul Lizondo, and Carmen Reinhart (1998). Leading Indicators of Currency Crises. *IMF Staff Papers* 45 (March), pp. 1-48.
- Kaplan, E., and D. Rodrik (February 2001), "Did the Malaysian Capital Controls Work?" *NBER Working Paper* 8142.

- Kemme, D. M. and Teng, W. Y. (2000). Determinants of the Real Exchange rate, misalignment and implications for growth in Poland, *Economic Systems*, 24 (2), 171-205.
- Kikuchi, T. (2004). The Impact of Exchange Rate Volatility on Bilateral Exports in East Asian Countries. *Graduate School of Systems and Information Engineering, University of Tsukuba*.
- Kumar, Manmohan, Uma Moorthy, and William Peraudin (1998). Determinants of Emerging Market Currency Crises and Contagion Effects. Paper presented at CEPR/World Bank conference "Financial Crises: Contagion and Market Volatility," London, May 8-9.
- Lee, J. S. (1998). Exchange Controls: The Path To Economic Recovery In Asia? *Asian Development Bank, EDRC Briefing Notes, Number 4, October 1998*.
- Li, G. and Wickramanayake, J. (2004). Chinese Closed-End Fund Market (1998-2003): An Empirical Investigation.
- Ling, H. Y. P. (2001). Optimum currency areas in East Asia: A structural VAR approach. *ASEAN Economic Bulletin*, 18 (2), 206-217.
- Liu, O. (2000). Malaysia fashions own path to recovery, looks to strengthen growth. in *IMF Survey*, Vol. 29(17); pp. 282-284, International Monetary Fund.
- Ljung, G. M. and Box, G. E. P. (1978). On a Measure of Lack of Fit in Time Series Models. *Biometrika*, Vol. 65, pp/ 297-303.
- Madhur, S. (2002). Costs and benefits of a common currency for ASEAN. *ERD Working Paper No. 12*.
- Mehra, Y. (1991). An Error Correction Model of U.S. M2 Demand, *Economic Review, Federal Reserve Bank of Richmond*, 77, 3-12.
- Miller, S.M. (1991). Monetary Dynamics: An Application of Cointegration and Error-Correction Modeling, *Journal of Money, Credit, and Banking*, 23, 139-154.
- Neely, C. J. (1999). An Introduction to Capital Controls. *Federal Reserve Bank of St. Louis Review*, Vol. 81(6), pp. 13-30.
- Nell, K. S. (2001). Explaining Long-Run Growth In South Africa and OECD Countries: Implications For The Rest Of SADC Countries. *NIEP, September 2001*.
- Nelson, D. B. (1991). Conditional Heteroskedasticity in Asset Returns: A New Approach. *Econometrica*, Vol. 59, pp. 347-370.
- OECD (1999). Evaluating Malaysia's capital control 1998. *OECD*, Japan.

- Park and Song (1999). Managing Foreign Capital Flows: The Experiences of the Republic of Korea, Thailand, Malaysia and Indonesia. In G. Helleiner (ed) *Capital Account Regimes and the Developing Countries*, 1999, UNCTAD
- Pattichis, C. and Kanaan, M. (2004). The Balassa-Samuelson Hypothesis and Oil Price Shocks In A Small Open Economy: Evidence From Cyprus. *Open Economies Review* 15: 45-56, 2004.
- Perron, P. (1990). Testing for a Unit Root in a Time Series with a Changing Mean. *Journal of Business and Economic Statistics*, 8, 153-162.
- Pesaran, M.H. (1997). The Role of Economic Theory in Modeling the Long-run. *The Economic Journal*, 107, 178-191.
- Pesaran, M.H. (1999). An Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis. *Econometrics and Economic Theory in the 20th Century*.
- Pesaran, M.H. and Shin, Y. (1999). An Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis, in S. Strom (ed.). *Econometrics and Economic Theory in the 20th Century. The Ragnar Frisch Centennial Symposium*, 1998, Cambridge University press, Cambridge, (forthcoming).
- Pesaran, M.H., Shin, Y. and Smith, R.J. (1996). Testing for the Existence of a Long-run Relationship. *DAE Working Papers Amalgamated Series*, no. 9622, University of Cambridge.
- Phillips, P.C.B. and Loretan, M. (1991). Estimating Long-Run Economic Equilibria. *Review of Economic Studies*, Vol. 53, pp. 407-436.
- Phillips, P.C.B. and Perron, P. (1988). Testing for a Unit Root in Time Series Regression. *Biometrika*, 75, pp. 335-346.
- Radelet and Sachs (1998). The East Asian Financial Crisis: Diagnosis, Remedies, Prospects. *Brookings Papers on Economic Activity*, 1998:1
- Ramirez, M.D. and Khan, S. (1999). A Cointegration Analysis of Purchasing Power Parity: 1973 – 1996. *International Advances in Economic Research. Volume 5, Number 3, August 1999*.
- Ramsey, J.B. (1969). Tests for Specification Errors in Classical Linear Least Squares Regression Analysis. *Journal of the Royal Statistical Society* B31:350-371.
- Sachs, Jeffrey, Aaron Tornell, and Andres Velasco (1996). Financial Crises in Emerging Markets. The Lessons from 1995. *Brookings Papers on Economic Activity*, No. 1, pp. 147-215.

- Shabbir, T and Muhammad, A (1992). The effect of foreign private investment on economic growth in Pakistan. *The Pakistan Development Review*, Vol. 4, No. 31, pp. 831-841.
- Sun, Y (2000). Economic Development: An Analysis of Malaysia. *Social Science* 410, November, 2000.
- Supaat, S., Angela Jiun, P.S., Tiong, N.H. and Robinson, E. (2003). Investigating The Relationship Between Exchange Rate Volatility And Macroeconomic Volatility in Singapore. *Economic Policy Department, Monetary Authority of Singapore*.
- Terasvirta, T. (1994). Specification, Estimation, and Evaluation of Smooth Transition Autoregressive Models. *Journal of the American Statistical Association* 89:208-218.
- Vergil, H (2001). Exchange Rate Volatility in Turkey and Its Effect on Trade Flows. *Journal of Economic and Social Research* 4(1), 83-99.
- Weisskopf, T.E. (1972). The impact of foreign capital inflow on saving in under developing countries. *Journals of International Economics*, Vol. 1. No. 5.
- White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica* 48:817-838.
- Wolff, C.C.P (1987). Time-Varying Parameters and the Out-of-Sample Forecasting Performance of Structural Exchange Rate Models. *Journal of Business and Economic Statistics* 5:87-97.
- _____(2003). Towards An Exchange Rate Arrangement For East Asia: The Malaysian Perspective, *Final Report, MIER*.
- _____(1999a). Malaysia: Selected Issues. *IMF Staff Country Reports 99/86*, IMF, Washington, August,
- _____(1999b). Financial Sector Crisis and Restructuring: Lessons from Asia. *IMF Occasional paper* 188, Prepared by: Kochhar, Roger, Tzanninis, Johnston, Moore and Otker-Robe, International Monetary Fund, Washington, D.C.
- _____(1999). Capital Control Freaks: How Malaysia Got Away With Economic Heresy. *Slate*, www.slate.com, October