Analyzing Bank Negara Malaysia’s Behaviour in Formulating Monetary Policy: An Empirical Approach

Mohamad Hasni Shaari
Centre for Applied Macroeconomic Analysis (CAMA)
College of Business and Economics
Declaration

Unless otherwise indicated this thesis is my own work.

MOHAMAD HASNI SHAARI
December 2008
Acknowledgments

I want to express my gratitude to:

my employer, Bank Negara Malaysia for the opportunity it has given me to pursue a doctoral study at the Australian National University (ANU);

my supervisor, Professor Warwick McKibbin for his guidance and encouragement throughout the duration of my study at the ANU;

my thesis advisors, Professor Farshid Vahid and Dr. Timothy Kam for their helpful comments and suggestions on this thesis, and to Jennifer Gippel for her excellent editorial assistance;

my friends who were together in the PhD Economics program at the ANU, in particular to Tang Hsiao Chink, Philip Liu, Arief Ramayandi, Eddie Cheung and Arief Machmud for their assistance and countless discussions on various issues and matters related and unrelated to the topic of this thesis;

my colleagues in Bank Negara Malaysia, particularly to Roslaini Omar, Hazilah Harun and Roslina Hitam for their considerable assistance in facilitating my study at the ANU.

Last, but not least I am forever indebted to my family. To my two sisters, Kak Mas and Kak Ni, thank you for your endless encouragement and support. A special appreciation goes to my dearest wife, Juwita Busah. Thank you for all your sacrifices and the continuous love, support and company that you provided in all these years. To my children, Kamalia, Shahirah and Hariz, your love, joy and company made the journey of the 4-year PhD Economics program at the ANU, a less grueling period.

I dedicate this thesis to my parents, Shaari Ahmad and Che Som Othman.
Abstract

In an economic system, the central bank is entrusted with the responsibility of formulating monetary policy. Despite its important role and significant contribution in influencing the well being of other economic agents in the economy, in general, little is known about a central bank's underlying behaviour in executing this task. Among the key questions that the non-policymakers raise on this area are: How do central bankers actually formulate monetary policy? Do they behave systematically and follow any form of rule? What are the objectives that they want to pursue? How do they prioritize these different objectives? How does their policy behaviour evolve over time? What happens if they act differently?

Existing studies which analyze a central banks’ behaviour in formulating monetary policy, are mostly concentrated on the experience of developed economies. However, developing economies face a different institutional structure, as well as a different set of constraints and shocks, hence, it would be interesting to analyze how a central bank under this different economic environment performs its monetary policy mandate. This thesis looks at the behaviour of Bank Negara Malaysia (The Central Bank of Malaysia) in formulating monetary policy in Malaysia during the period 1975-2005.

There are four major aspects of Bank Negara Malaysia’s (BNM) policy behaviour that are examined in this thesis. Firstly, with regard to its policy reaction function - does BNM set interest rates according to some form of policy rule or purely on a discretionary manner? After identifying the systematic component of its policy action, we try to establish BNM’s policy objectives and preferences. This will help in understanding the rationale behind its policy action. The third aspect is whether BNM’s policy behaviour changes over time. Lastly, with the use of an estimated Dynamic Stochastic General Equilibrium (DSGE) model, we conduct some policy experiments to observe the possible impact on the Malaysia’s economic outcomes were BNM to behave differently to what we envisaged its policy behaviour has been.
# Contents

## 1 Introduction

1.1 What do we want to know about a Central Bank’s Behaviour in Formulating Monetary Policy? .................................................. 3

1.2 Formulation of Monetary Policy in Malaysia in Three Decades: 1975-2005 ............................................................. 7

1.3 Outline of the Thesis ............................................................... 15

## 2 Theoretical and Empirical Framework to Analyze a Central Bank’s Behaviour in Formulating Monetary Policy

2.1 Monetary Policy Rules ......................................................... 20

2.2 Modelling a Central Bank’s Problems ...................................... 26

2.3 Empirical Methods to Analyze a Central Bank’s Behaviour ........... 32

2.4 Conclusion ................................................................. 35

## 3 Estimating Bank Negara Malaysia’s Reaction Function with a Simple Interest Rate Rule

3.1 Specification of Simple Interest Rate Rule ................................. 39

3.2 Specification of BNM’s Reaction Function ............................... 41
3.3 Estimation Results ........................................... 45
3.4 Evolution of BNM’s Reaction Function .................. 50
3.5 Conclusion ..................................................... 59
3.6 Appendix ....................................................... 62

4 Identifying Bank Negara Malaysia’s Policy Preferences: Estimating Parameters of its Loss Function 65
4.1 Model Set-up ................................................... 66
4.2 Estimation Set-up ............................................. 73
4.3 Estimation Results ............................................ 81
4.4 Discussions on Understanding BNM’s Behaviour in Formulating Monetary Policy in Malaysia ..................... 91
4.5 Conclusion ..................................................... 100
4.6 Appendix ....................................................... 102

5 An Estimated DSGE Model of the Malaysian Economy: Full Sample Period 1975Q1 to 2005Q2 103
5.1 The Open Economy DSGE Model ......................... 106
5.2 Estimation Strategy .......................................... 133
5.3 Estimation Results for Full Sample Period: 1975Q1 to 2005Q2 .... 142
5.4 Comparing Results between FA and NFA DSGE Models .......... 152
5.5 Conclusion ..................................................... 158
5.6 Appendix ....................................................... 160
6 An Estimated DSGE Model of the Malaysian Economy: Sub-sample Periods and Possible Identification Problems

6.1 Estimation Results for Sub-sample Period

6.2 Possible Identification Problems

6.3 Conclusion

7 Simulating Bank Negara Malaysia’s Behaviour in Formulating Monetary Policy: Policy Experiment using a DSGE Model

7.1 Assumptions

7.2 Simulation Results

7.3 Conclusion

7.4 Appendix

8 Conclusion

8.1 What Have We Learned?

8.2 Limitations and Area for Further Research

Bibliography

Definition and Source of Data
List of Tables

1.1 Malaysia’s Key Macroeconomic Indicators .............................................. 8

3.1 BNM’s Estimated Reaction Function with Different Specifications: 1975Q1-2005Q2 ............................................. 46

3.2 BNM’s Estimated Reaction Function: Sub-sample Periods ................. 51

3.3 Results of Chow Test for Structural Break .............................. 62

3.4 Results of Unit Root Test ......................................................... 62

3.5 Correlation Between Dependent Variables and Instruments in IV Estimation ......................................................... 63

4.1 Estimation Results of SOEM: 1975Q1 to 2005Q2 .......................... 82

4.2 Diagnostics for Residuals of Estimated SOEM Equations Across Different Sample Periods ................................................................. 83

4.3 Comparison of Statistical Moments Across Different Sample Periods ......................................................................................... 84

4.4 Estimation Results of SOEM: Sub-sample Periods ...................... 85

4.5 Estimation Results of SOEM: Sub-sample Periods (continue) ........ 86

4.6 Estimated Parameters of BNM’s Loss Function ........................ 88

5.1 Summary of Log-linearized System of Equations ....................... 132
5.2 Prior Distributions ......................................................... 139
5.3 Posterior Distributions: 1975Q1-2005Q2 ............................. 143
5.4 Comparison of Variance Decomposition: FA vs. NFA model ..... 155
5.5 Model Fit: FA vs. NFA Model Specification .......................... 156
5.6 Estimated DSGE model for Malaysia: Comparison with Ramayandi (2008) ................................................................. 161

6.1 Posterior Distributions: FA Model for Sub-sample Periods ........ 168
6.2 Posterior Estimates with More Diffuse Priors: 1975Q1-2005Q2 .... 178
6.3 Posterior Estimates with More Diffuse Priors: 1975Q1-1986Q4 .... 181
6.5 Posterior Estimates with More Diffuse Priors: 1998Q3-2005Q2 .... 182

7.1 Simulation Results under Different Policy Preferences: Without Exchange Rate Smoothing ................................................. 195
7.2 Simulation Results under Different Policy Preferences: With Exchange Rate Smoothing ...................................................... 197
7.3 Summary of Log-linearized System of Equations ....................... 210
7.4 Parameter Value used in the Simulation Exercise ..................... 211
List of Figures

1.1 Malaysia’s Economic Development 1975-2005 .......................... 9

3.1 Malaysia’s GDP Growth 1975Q1-2005Q2 ............................. 55

3.2 Malaysia’s Inflation Rate 1975Q1-2005Q2 ............................. 56

4.1 Residuals of Interest Rates Equation: 1975Q1-2005Q2 ............... 89

4.2 Residuals of Estimated SOEM Equations Across Different Period ... 102

5.1 Prior and Posterior Distributions: FA Model 1975Q1-2005Q2 .......... 144

5.2 Prior and Posterior Distributions: NFA Model 1975Q1-2005Q2 .......... 145

5.3 FA vs. NFA Specification: Comparison of IRF 1975Q1-2005Q2 .......... 154

5.4 FA vs. NFA Specification: Comparison of IRF 1975Q1-2005Q2 (continue) 162

5.5 FA vs. NFA Specification: Comparison of IRF 1975Q1-2005Q2 (continue) 163

5.6 FA vs. NFA Specification: Comparison of IRF 1975Q1-2005Q2 (continue) 164

6.1 Prior and Posterior Distributions: Sub-Sample Period ................. 169

6.2 Prior and Posterior Distributions: Sub-Sample Period (continue) .... 170

6.3 Prior and Posterior Distributions: 1975Q1-2005Q2 Period ............. 177