

ARE FINANCIAL SECTOR POLICIES EFFECTIVE IN DEEPENING THE MALAYSIAN FINANCIAL SYSTEM?

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Abstract

This paper provides an empirical assessment of the effects of financial sector policies on development of the financial system in Malaysia over the period 1959-2005. The technique of principal component analysis is used to construct a summary measure of interest rate policies in order to account for the joint influence of various interest rate controls imposed on the Malaysian financial system. The results show that economic development, interest rate controls and capital liquidity requirements positively affect the level of financial development. However, higher statutory reserve requirements and the presence of directed credit programs appear to be harmful for development of the Malaysian financial system. The results provide some support to the argument that some form of financial restraints may help promote financial development.

Keywords: Financial development; financial liberalization; Malaysia.

JEL classification: E44; E58; O16; O53

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1. Introduction

As part of the emergence of the new theories of endogenous economic growth over the past two decades, there has been a surge of interest in the potential role played by financial development in economic development. With few exceptions, these studies have consistently shown that financial development has a beneficial impact on economic growth. Importantly, most studies have ignored the possibility of reverse causation in the finance-growth nexus. When financial development is specified as the dependent variable instead, the individual country case studies evidence of Demetriades and Luintel (1997, 2001) and Ang and McKibbin (2007) show that economic growth has a positive impact on financial development. Hence, although the positive correlation between financial development and economic growth is already a stylized fact as verified by many empirical studies, an important and yet somewhat under-researched issue is what determines financial development?

Development of the financial system is shaped by financial sector policies. Despite liberalizing interest rates in 1978, the Malaysian financial system continues to operate within the context of repressionist policies through the provision of subsidized credit to certain priority sectors. This paper addresses the important question of how government intervention in the financial system (including statutory reserve requirements, directed credit programs, capital liquidity requirements and interest rate controls) has affected development of the financial sector. This question is of significant relevance for the formulation of financial sector policies.

It is interesting to take Malaysia as a case study for this subject for several reasons. Firstly, with rapid economic growth following the industrial transformation that took place in the 1970s and 1980s, Malaysia has evolved in recent years to be a leading country in the developing world. Accompanying this development has been a

significant improvement in its financial system. Financial development, in terms of the emergence of more financial institutions and financial instruments, has improved tremendously over the last few decades. In fact, measured by private credit/GDP, Malaysia had one of the highest levels of financial development in the world in 2000, only after the United States, Japan, Cyprus, Switzerland and Hong Kong. Secondly, Malaysia has a rich history of financial sector reforms. Various financial restructuring programs aimed at achieving a better financial system have been launched since the 1970s (Ang, 2007a; Ang and McKibbin, 2007). However, there is little empirical evidence providing policy makers with the necessary information as to how these reforms have impacted on development in the financial system. Finally, Malaysia has a relatively good database by the standard of developing countries. This provides an added incentive for the research. The availability of a set of sufficiently long time series data allows for a meaningful time series investigation.

The paper proceeds as follows. Section 2 provides an overview of the financial sector policies adopted in Malaysia. Section 3 discusses the analytical framework. Model and data are described in section 4. Section 5 describes the econometric techniques employed in this study. The estimated results are presented and analysed in section 6, and the last section concludes.

2. Financial Sector Reforms: The Malaysian Experience

2.1 Liberalization of the financial sector

Bank Negara Malaysia (the Central Bank of Malaysia, henceforth BNM) has actively pursued interest rate liberalization, with the objective of developing a more market-driven financial system. BNM followed a gradual approach in interest rate reforms, beginning in the 1970s by cautiously liberalizing interest rates. The major

phase of interest rate liberalization occurred in 1978 when commercial banks were allowed to set deposit and lending rates freely (Hussein, 1994). However, the market-determined interest rate mechanism was interrupted from October 1985 to January 1987, when BNM imposed controls on interest rates to mitigate the impact of the world economic recession on Malaysia. In February 1987, BNM abandoned the pegged deposit rate regime, and in September 1987 turned to the use of the base lending rate (BLR) to control interest rates. These interest rate controls remained in force until 1991 (Yusof, Hussin, Alowi, Lim and Singh, 1994).

From February 1991, the BLR of banking institutions was completely freed from administrative control. All commercial banks and finance companies were allowed to set their own deposit and lending rates. Lending rates were subject to a maximum of 4 percentage points above the declared BLR. As a result of this policy, deposit and lending rates were competitively determined by market forces. Furthermore, in 1995 a new BLR framework was introduced to reduce time lag by linking the BLR to the weighted monthly average of the 3-month inter-bank rate. In order to further reduce the transmission lag, in 1998 the BLR was linked to the 3-month BNM intervention rate instead of to the 3-month inter-bank rate (BNM, 1999).

2.2 Inadequacies of the reforms

The liberalization policies adopted by BNM seem to have worked well at the early stage of development, when financial development was observed. The ratio of private credit to GDP increased remarkably from 19 per cent in 1970 to 49 per cent by 1980. In the 1980s, the Malaysian financial sector underwent a radical transformation and deepening along with expansion in the economy. The upshot of this transformation was the emergence of a broader, deeper, more organized and better

structured financial system. However, Malaysia has never completely and consistently liberalized its financial sector. In the past, the main components of reform policies have been liberalization of the interest rates, improvement of the regulatory and supervisory framework, and opening up of the domestic financial sector. The reform programs also appear to have been narrow in scope, where much of BNM's efforts have been focused on eliminating interest controls (Bascom, 1994).

In addition, some of the liberalization measures were introduced as instruments to tackle certain problems in the economy during specific time periods. For example, Malaysia experienced an acceleration of capital account opening in the 1990s following the stock market booms. However, capital controls were put in place temporarily in 1994, and from 1998 to 2005, to manage exchange rate fluctuations. Furthermore, although measures have been introduced to enhance banking sector competition, restriction of foreign banks participation still prevails. Therefore, it appears that the financial sector policies adopted by Malaysia are not consistent since the liberalization measures taken did not represent a continuous and steady policy to liberalize the financial system (Hussein, 1994).

Quite apart from the liberalization policies pursued, a series of directed credit programs were implemented in 1975. During that year, at least 50 per cent of total lending made by banks had to be advanced to the native Malay community.¹ The requirement was reduced to 20 per cent in the following year, and then adjusted upward to 30 per cent in 1996. The programs also include minimum lending to other

¹ These programs arise from the New Economic Policy (NEP), which was instituted in 1970 in response to the May 1969 racial riots. The NEP aimed at improving inter-ethnic relations through the eradication of poverty by raising income levels and increasing opportunities for all Malaysians irrespective of race. However, the implementation of the NEP involved a series of pro-Malay affirmative action programs, with the objective of expanding the corporate shareholding, employment and education opportunities of the native Malays so they would be able to improve their standard of living. The NEP then became the key reference for the formulation of economic development policies, remaining in place for the next two decades and beyond.

priority sectors, including agriculture, manufacturing, small and medium size enterprises and to individuals for housing loans, but the Malay community is the largest beneficiary group. These programs remain in force to-date.

In sum, it appears that repressionist measures, such as interest rate controls and directed credit programs, coexist with a structuralist policy of promoting the creation of more financial institutions. These financial sector policies, liberalization or repression, and the development that follows, can have a significant impact on the evolution of the financial system in Malaysia.

3. Analytical Framework

3.1 Financial development and economic development

Expansion of the financial system may be induced by higher per capita income due to increased demand for financial services. This is based on Robinson's (1952) hypothesis that more financial institutions, financial products and services will emerge in response to greater demand for financial services when an economy expands. The cost of financial services involves a significant fixed component so average costs will fall if the volume of transactions increases. As such, wealthier economies have a greater demand for financial services and are more able to afford a costly financial system. This implies that the level of real economy activity crucially affects financial development.

3.2 Interest rate restraints

The McKinnon-Shaw framework suggests that interest rate controls, particularly interest rate ceilings, may distort the economy in several ways. First, it may discourage entrepreneurs from investing in high risk but potentially high-yielding investment projects. Second, financial intermediaries may become more risk averse

and offer preferential lending to established borrowers. Third, borrowers who obtain their funds at relatively low cost may prefer to invest only in capital intensive projects. McKinnon (1973) and Shaw (1973) argue in favour of liberalizing the financial sector by way of removing interest rate controls and allowing the market to determine its own credit allocation in order to deepen the financial system.

However, some counter arguments suggest that liberalizing interest rates may not necessarily lead to higher financial development. For instance, with deposit insurance, the absence of interest rate controls may result in overly risky lending behaviour among banks due to moral hazard problems (Villanueva and Mirakhor, 1990; McKinnon and Pill, 1997). Using a dynamic model of moral hazard, Hellmann, Murdock and Stiglitz (2000) show that an increase in banking competition following liberalization of the financial sector (including removing interest rate restraints) may result in a weaker banking system. Studies have also shown that a significant increase in interest rates, which often follows from interest rate liberalization, is systematically related to financial crises (see Demirguc-Kunt and Detragiache, 1998a, b). In fact, Stiglitz (1994) argues that interest rate restraints may lead to higher financial saving in the presence of good governance in the financial systems. When depositors perceive restrictions as policies aimed at enhancing the stability of the financial systems, they may well be more willing to keep their savings in the form of bank deposits, thereby increasing the depth of the financial systems. Hence, the theoretical impact of a change in interest rates on financial development is unclear.

3.3 Other financial sector policies

The McKinnon-Shaw school of thought proposes that government restrictions on the operation of the financial system, such as directed credit programs, reserve and liquidity requirements (dubbed “financial repression”), may inversely affect the

quality and quantity of investment and thus hinder financial development. Kim and Santomero (1988) and Gennotte and Pyle (1991) show that capital requirements increase a bank's portfolio risk and hence may result in inefficient allocation of resources. This is arguably the case when the funds related to these repressionist programs are not allocated efficiently to generate productive returns.

However, in principle, adequate reserve and liquidity requirements are necessary to ensure the smooth functioning of banks. Liquidity shortages may induce insolvency problems and trigger financial stability. Minimum reserve and liquidity requirements are particularly important for financial systems which are not sufficiently sophisticated, which is often the case in developing countries (Arestis, Demetriades, Fattouh and Mouratidis, 2002). Similarly, directed credit programs may lead to increased investments in the targeted sectors, which may generate productive gains throughout the economy (Schwarz, 1992). Therefore, the impact of these financial sector policies on financial development is ultimately an empirical matter

4. Empirical Specification and Data

The empirical specification of the steady-state equation for financial development in Eq. (1) draws upon the theoretical considerations discussed above.

$$FD_t = f(ED_t, IRR_t, SRR_t, DCP_t, CLR_t) \quad (1)$$

The independent variables, with the expected signs in the parentheses, are given as:

- ED_t = economic development (+)
- IRR_t = interest rate restraints (?)
- SRR_t = statutory reserved requirements (?)
- DCP_t = directed credit programs (?)
- CLR_t = capital liquidity requirements (?)

The above financial development specification also includes a dummy variable to account for the impact of the Asian financial crisis, which takes the value of 1 for the period 1997-98. Except for economic development, the impact of each type of financial sector policies on financial development is theoretically ambiguous. The standard approach used in the literature is followed by taking the ratio of private credit to GDP as the measure of financial development (FD_t).² Economic development (ED_t) is measured by gross domestic product at 1987 constant prices. The policy variables statutory reserve ratio (SRR_t), directed credit programs (DCP_t) and capital liquidity ratio (CLR_t) are measured in percentages. DCP_t is measured by the priority sector target lending rate of the native Malay community.

The construction of the index of interest rate restraints (IRR_t) requires more detailed discussion. To measure the intensity of the interest rate restraint (IRR_t), it is necessary to take various interest rate policies into consideration. However, using all these variables in the equation of financial development may pose some econometric problems since the underlying policy variables may be highly correlated. On the other hand, using them individually may also lead to omitted variables bias since the central bank may impose some of these controls concurrently. Thus, this study proposes to construct an index for interest rate restraints following the approach of Demetriades and Luintel (1997, 2001) and Ang and McKibbin (2007).

Six series were collected for these interest rate repressionist policies. These include a maximum lending rate for priority sectors, a policy intervention rate, a minimum lending rate, a maximum lending rate, a minimum deposit rate, and a maximum deposit rate. These policy controls were translated into dummy variables, which take the value of 1 if a control is present and 0 otherwise. Using these six

² See, e.g., Demetriades and Hussein (1996), Demetriades and Luintel (1997), Thangavelu and Ang (2004), Ang (2007b) and Ang and McKibbin (2007), among others.

variables, a summary measure of interest rate restraint, which represents the joint impact of the various interest rate control policies, was developed by employing the method of principal component analysis. Theoretically, this new index is able to capture most of the information from the original dataset that consists of six policy variables. Given its conciseness, this approach sufficiently deals with the problems of multicollinearity and over-parameterization.

[Insert Table 1 about here]

Table 1 presents the results obtained from principal component analysis. The eigenvalues indicate that the first principal component explains about 52.8 per cent of the standardized variance, the second principal component explains another 18.9 per cent and so on. The first principal component is computed as a linear combination of the six interest rate policy measures with weights given by the first eigenvector. In this case, the four largest principal components are extracted, and they are able to capture 95.3% of the information from the original data set. The remaining principal components are not considered since their marginal information content is relatively small. The percentages of variance are adjusted to make sure that their absolute values sum up to one. These adjusted values are then used as the weights to compute the index. In this connection, the first principal component, which accounts for 52.8 per cent of the total variation of the policy variables, has a weight of $52.8/95.3$, and so on.

Annual data covering the period 1959-2005 were used in the study. The data series were directly obtained or compiled from Economic Report of the Ministry of Finance, Annual Report of Bank Negara Malaysia, Money and Banking in Malaysia (1994) of Bank Negara Malaysia, Monthly Statistical Bulletin of Bank Negara

Malaysia, World Development Indicators (2006) of the World Bank and International Financial Statistics (2006) of the International Monetary Fund. FD_t , ED_t and IRR_t were measured in natural logarithms.

5. Econometric Methodology

The objective of our empirical estimation is to examine the long-run relationship between financial development and its determinants. We begin the analysis by maintaining the assumption that the data generating process for the relationship between the underlying variables is a log-linear vector autoregressive (VAR) model at levels. The testing procedure involves three steps. First, we perform an integration analysis for each variable using the augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test. The second step is to test for cointegration using the Johansen approach for the VARs constructed in levels. If cointegration is detected, the third step is to estimate the long-run relationship with an error-correction framework. The VAR model is given as:

$$\mathbf{x}_t = \boldsymbol{\mu} + \sum_{j=1}^p \boldsymbol{\phi}_j \mathbf{x}_{t-j} + \boldsymbol{\varepsilon}_t \quad (2)$$

where $x_t = [FD_t, ED_t, IRR_t, SRR_t, DCP_t, CLR_t]'$, $\boldsymbol{\mu}$ is a vector of constant terms and $\boldsymbol{\phi}_j$ is a matrix of VAR parameters for lag j . The vector of error term $\boldsymbol{\varepsilon}_t \sim \text{IN}(\mathbf{0}, \boldsymbol{\Omega})$, where $\boldsymbol{\Omega}$ is the variance-covariance matrix of the residuals. The VAR model in Eq. (2) can be transformed into a vector error correction model (VECM) after some mathematical manipulation, as given in Eq. (3).

$$\Delta \mathbf{x}_t = \boldsymbol{\mu} + \mathbf{x}_{t-1} + \lambda \sum_{j=1}^{p-1} \boldsymbol{\gamma}_j \Delta \mathbf{x}_{t-j} + \boldsymbol{\varepsilon}_t \quad (3)$$

where $\Delta = 1 - L$, λ is the long-run multiplier matrix. By normalizing FD_t , the cointegrating vector can be interpreted as the long-run equation for the financial development equation.

Since the small sample properties of VECM are unknown, we also consider two other alternative estimators – the unrestricted error-correction model (UECM) and dynamic ordinary least squares (DOLS) estimator – to obtain long-run estimates for the financial development equation. The UECM estimator of Inder (1993) involves running the following regression to estimate the long-run parameters:

$$FD_t = \alpha_0 + \sum_{j=1}^k \beta_j DET_{j,t} + \sum_{i=0}^p \gamma_i \Delta FD_{t-i} + \sum_{i=0}^p \sum_{j=1}^k \delta_{ji} \Delta DET_{j,t-i} + \varepsilon_t \quad (4)$$

where DET_t is a vector of k determinants of FD_t , including ED_t , IRR_t , SRR_t , DCP_t and CLR_t . Inder (1993) demonstrates that under this framework the problems of endogeneity bias are minimal and relatively unimportant in many situations. If endogeneity is a concern, an instrumental variable (IV) technique can be used to correct for simultaneity bias. To do this, we follow the IV approach of Bewley (1979) by using the first lags of the variables as instruments for the current differenced terms to obtain valid standard errors so that proper inferences can be drawn from the results.

Stock and Watson (1993) show that the DOLS estimator is asymptotically efficient. Based on Monte Carol simulation, this estimator is found to perform well in finite samples compared to other asymptotically efficient estimators. The estimation involves adding leads and lags of the first differenced regressors to the specification, as shown in Eq. (5). This procedure corrects for potential endogeneity problems and provides estimates of the cointegrating vector which are asymptotically efficient.

$$FD_t = \alpha_0 + \sum_{j=1}^k \beta_j DET_{j,t} + \sum_{i=-p}^p \gamma_i \Delta FD_{t-i} + \sum_{i=-p}^p \sum_{j=1}^k \delta_{ji} \Delta DET_{j,t-i} + \varepsilon_t \quad (5)$$

The long-run model for FD_t can be obtained from the reduced form solution of Eq. (4) and Eq. (5) by setting all differenced terms of the regressors to be zero, i.e., $\gamma_i = \delta_{ji} = 0$.

6. Empirical Findings

Two standard unit root tests were used to assess the order of integration of the underlying variables - the Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test. The results reported in Table 2 show that all variables appears to be integrated at order one, or $I(1)$. Given that all the underlying variables share common integration properties, we can now proceed to testing for the presence of a long-run cointegrating relationship between the variables.

[Insert Table 2 about here]

It is well-known that the Johansen approach may be sensitive to the choice of the lag length, we therefore conduct a series of nested likelihood ratio tests on first-differenced VARs to determine the optimal lag length (p) prior to performing cointegration tests. Given the sample size, we have considered a maximum lag length of three. The optimal lag length is found to be one. Cointegration tests are then performed for the VARs at levels. In Table 3, both the results of trace test and maximum eigenvalue test unanimously point to the same conclusion that there is one cointegrated equation, at the 1% level of significance.

[Insert Table 3 about here]

The long-run elasticities of the financial development equation were estimated using three different time series approaches, i.e. VECM, UECM and DOLS, denoted as Model A, Model B, Model C, respectively. The results for the model estimated using VECM are presented in the first column of Table 4. The second and third columns give results estimated by UECM and DOLS, respectively. In general, these three approaches give quite similar results. Except for IRR_t in Model A that uses the VECM approach, all variables enter the long-run equation significantly at the conventional level. The signs and magnitudes of the coefficients also appear reasonable.

[Insert Table 4 about here]

Economic development enters the long-run equation significantly at the 1% level with the expected positive sign. Specifically, the long-run elasticity of financial development with respect to economic development is found to be in the range of 2.726-4.593. The results imply that the process of financial development in Malaysia has been shaped by a higher level of economic activity, which results in an increased demand for financial services. Such a finding corroborates the empirical evidence of several studies, including Demetriades and Luintel (1997, 2001), Arestis, Demetriades, Fattouh and Mouratidis (2002), Ang (2007b) and Ang and McKibbin (2007). Since economic expansion serves to deepen the financial system, greater efforts by the government are necessary to ensure sustained development in the economy.

The long-run elasticities of financial development with respect to interest rate restraints are found to be 0.149 for Model B (UECM approach) and 0.194 for Model

C (DOSL approach). The estimated coefficient is not statistically significant in Model A and its magnitude is negligible. The finding of a positive influence of interest rate restraint corroborates the results of Arestis, Demetriades, Fattouh and Mouratidis (2002) for the Philippines experience. The results imply that the interest rate restraints imposed on the Malaysian financial system seem to have deepened the financial system. This is probably due to the presence of a sound institutional framework, which has enabled these repressionist policies to be carried out effectively and resulted in a favourable effect on the financial system.

Statutory reserve requirements enter the equation significantly, but with varying degree of significance. Specially, its long-run elasticity is found to be -0.101, -0.052 and -0.071 for Model A, Model B and Model C, respectively. The coefficients are quite precisely estimated at the 5% level of significance. The results tend to support the McKinnon-Shaw thesis that high reserve requirements retard financial development.

Directed credit programs pertaining to the native Malay community is found to have an unfavourable effect on development of the Malaysian financial system. The coefficients, in the range of 0.013-0.081, enter the financial development equations significantly in all models with a negative sign. Although the magnitudes of these coefficients appear to be relatively small, the results nevertheless call for removal of these distortionary policies. Allowing funds to operate in a free market environment would foster development of the Malaysian financial system.

The results from all models show a positive capital liquidity requirements long-run elasticity in the range of 0.069-0.133. These effects are statistically significant at the 1% level. Thus, the evidence points to the importance of maintaining adequate capital liquidity to ensure the smooth functioning of the financial system.

Finally, the dummy variable that captures the effect of the Asian financial crisis was found to be statistically insignificant, and was therefore dropped from the estimation.

7. Conclusions

This paper attempts to assess the impacts of several types of financial sector policies, including interest rate controls, statutory reserve requirements, directed credit programs and capital liquidity requirements, on development of the financial system in Malaysia. Principal component analysis is used to construct a summary measure of interest rate policies to address the difficult problem of measuring the extent of interest rate restraints. The results suggest that financial development in Malaysia positively depends on the level of economic development. Financial repressionist policies, in the form of high reserve requirements and directed credit programs favouring the native Malay community, appear to have retarded financial development. However, the results do not provide full support for the financial liberalization thesis. Specifically, interest rate restraints appear to be an effective device for deepening the financial sector. Similarly, maintaining adequate capital liquidity seems critical for shaping the financial system. These mixed findings of the effects of financial sector policies on financial development highlight the importance of considering each component of the financial sector policies separately.

References

- Ang, J.B. "Are Saving and Investment Cointegrated? The Case of Malaysia (1965-2003)." *Applied Economics*, 2007a, forthcoming.
- _____. "Financial Development and the FDI-Growth Nexus: The Malaysian Experience." *Applied Economics*, 2007b, forthcoming.
- Ang, J.B. and McKibbin, W.J. "Financial Liberalization, Financial Sector Development and Growth: Evidence from Malaysia." *Journal of Development Economics*, 2007, forthcoming.
- Arestis, P.; Demetriades, P.O.; Fattouh, B. and Mouratidis, K. "The Impact of Financial Liberalization Policies on Financial Development: Evidence from Developing Economies." *International Journal of Finance and Economics*, 2002, 7(2), pp. 109-121.
- Bascom, W.O. *The Economics of Financial Reform in Developing Countries*. London: Macmillan, 1994.
- Bewley, R. "The Direct Estimation of the Equilibrium Response in a Linear Dynamic Model." *Economics Letters*, 1979, 3, pp. 357-361.
- BNM. *Bank Negara Malaysia Annual Report*. Kuala Lumpur: Bank Negara Malaysia,
- _____. *Monthly Statistical Bulletin*. Kuala Lumpur: Bank Negara Malaysia,
- _____. *Money and Banking in Malaysia*. Kuala Lumpur: Bank Negara Malaysia, 1994.
- _____. *The Central Bank and the Financial System in Malaysia: A Decade of Change 1989-1999*. Kuala Lumpur: Bank Negara Malaysia, 1999.
- Demetriades, P.O. and Hussein, K.A. "Does Financial Development Cause Economic Growth? Time-Series Evidence from Sixteen Countries." *Journal of Development Economics*, 1996, 51(2), pp. 387-411.
- Demetriades, P.O. and Luintel, K.B. "The Direct Costs of Financial Repression: Evidence from India." *Review of Economics and Statistics*, 1997, 79(2), pp. 311-320.
- _____. "Financial Restraints in the South Korean Miracle." *Journal of Development Economics*, 2001, 64(2), pp. 459-479.
- Demirguc-Kunt, A. and Detragiache, E. "The Determinants of Banking Crises in Developing and Developed Countries." *International Monetary Fund Staff Papers*, 1998a, 45(1), pp. 81-109.

- _____. "Financial Liberalization and Financial Fragility," Pleskovic, B. and Stiglitz, J.E. (Ed), In: *Annual World Bank Conference on Development Economics*. Washington D.C.: 1998b, 303-331.
- Gennotte, G. and Pyle, D. "Capital Controls and Bank Risk." *Journal of Banking and Finance*, 1991, 15(4-5), pp. 805-824.
- Hellmann, T.F.; Murdock, K.C. and Stiglitz, J.E. "Liberalization, Moral Hazard in Banking, and Prudential Regulation: Are Capital Requirements Enough?" *American Economic Review*, 2000, 90(1), pp. 147-165.
- Hussein, A.A. "Financial System," Jomo, K.S. (Ed), In: *Malaysia's Economy in the Nineties*. Petaling Jaya: Pelanduk Publications, 1994, 137-170.
- Inder, B. "Estimating Long-Run Relationships in Economics: A Comparison of Different Approaches." *Journal of Econometrics*, 1993, 57(1-3), pp. 53-68.
- Kim, D. and Santomero, A.M. "Risk in Banking and Capital Regulation." *Journal of Finance*, 1988, 43(8), pp. 1219-1233.
- McKinnon, R.I. *Money and Capital in Economic Development*. Washington, D.C.: Brookings Institution, 1973.
- McKinnon, R.I. and Pill, H. "Credible Economic Liberalizations and Overborrowing." *American Economic Review*, 1997, 87(2), pp. 189-193.
- MOF. *Economic Report*. Kuala Lumpur: Ministry of Finance Malaysia,
- Robinson, J. "The Generalization of the General Theory," (Ed), In: *The Rate of Interest and Other Essays*. London: Macmillan, 1952, 67-142.
- Schwarz, A.M. "How Effective Are Directed Credit Policies in the United States? A Literature Survey." *The World Bank Policy Research Working Paper Series No.: 1019*, 1992.
- Shaw, E.S. *Financial Deepening in Economic Development*. New York: Oxford University Press, 1973.
- Stiglitz, J.E. "The Role of the State in Financial Markets," Bruno, M. and Pleskovic, B. (Ed), In: *Proceedings of the World Bank Annual Conference on Development Economics, 1993: Supplement to The World Bank Economic Review and The World Bank Research Observer*. Washington, D.C.: World Bank, 1994, 19-52.
- Stock, J.H. and Watson, M.W. "A Simple Estimator of Cointegrating Vectors in Higher Order Integrated Systems." *Econometrica*, 1993, 61(4), pp. 783-820.
- Thangavelu, S.M. and Ang, J.B. "Financial Development and Economic Growth in Australia: An Empirical Analysis." *Empirical Economics*, 2004, 29(2), pp. 247-260.

Villanueva, D. and Mirakhor, A. "Strategies for Financial Reforms: Interest Rate Policies, Stabilisation and Bank Supervision in Developing Countries." *International Monetary Fund Staff Papers*, 1990, 37(3), pp. 509-536.

Yusof, Z.A.; Hussin, A.A.; Alowi, I.; Lim, C.-S. and Singh, S. "Financial Reform in Malaysia," Caprio, G., Atiyas, I. and Hanson, J.A. (Ed), In: *Financial Reforms: Theory and Experience*. Cambridge: Cambridge University Press, 1994, 276-320.

Table 1: Principal component analysis for the interest rate restraint index

	<u>Principal component</u>					
	1	2	3	4	5	6
Eigenvalues	3.171	1.135	0.853	0.561	0.206	0.075
% of variance	0.528	0.189	0.142	0.093	0.034	0.012
Cumulative %	0.528	0.718	0.860	0.953	0.988	1.000
Variable	<u>Eigenvector</u>					
	1	2	3	4	5	6
PSR_t	-0.491	0.024	0.125	-0.570	0.249	-0.596
PIR_t	-0.360	0.485	-0.418	0.522	-0.231	-0.368
MIL_t	0.440	0.155	0.593	0.100	-0.414	-0.499
MAL_t	-0.295	0.631	0.542	0.030	0.186	0.431
MID_t	0.329	0.518	-0.384	-0.608	-0.303	0.124
MAD_t	0.491	0.273	-0.129	0.148	0.766	-0.243

Notes: PSR_t = maximum lending rate for priority sector, PIR_t = policy intervention rate, MIL_t = minimum lending rate, MAL_t = maximum lending rate, MID_t = minimum deposit rate and MAD_t = maximum deposit rate.

Table 2: Test results for unit roots

	<u>ADF</u>		<u>PP</u>	
	Levels	First-differenced	Levels	First-differenced
FD_t	-0.401	-2.641*	-0.169	6.587***
ED_t	-3.078	-5.508***	-2.303	-5.508***
IRR_t	-2.558	-6.476***	-2.651	-6.469***
SRR_t	-2.267	-6.278***	-2.451	-6.278***
DCP_t	-1.203	-9.264***	-2.428	-29.414***
CLR_t	-0.234	-6.105***	-0.284	-6.077***

Notes: *, ** and *** indicate 10%, 5% and 1% level of significance respectively. For ADF, AIC is used to select the lag length and the maximum number of lags is set to be five. For PP, Barlett-Kernel is used as the spectral estimation method. The bandwidth is selected using the Newey-West method.

Table 3: Johansen Cointegration Tests

Hypothesis	Trace test		Max. eigenvalue test	
	Test-stat	p-value	Test-stat	p-value
$r = 0$	125.967***	0.000	65.410***	0.000
$r \leq 1$	60.557	0.219	28.951	0.173
$r \leq 2$	31.605	0.634	18.842	0.427
$r \leq 3$	12.763	0.902	7.725	0.920
$r \leq 4$	5.039	0.805	4.479	0.806
$r \leq 5$	0.560	0.454	0.560	0.454

Notes: r is the number of cointegrated vector. *, ** and *** indicate 10%, 5% and 1% level of significance, respectively.

Table 4: Long-run estimates of the financial development equation

	<u>Model A: VECM</u>		<u>Model B: UECM</u>		<u>Model C: DOLS</u>	
	Coefficient	t-stats	Coefficient	t-stats	Coefficient	t-stats
<i>Intercept</i>	-39.169***	-14.408	-24.825***	-12.743	-28.588***	-10.577
ED_t	4.593***	15.110	2.726***	13.031	3.150***	9.623
IRR_t	0.002	0.012	0.149**	2.281	0.194**	2.287
SRR_t	-0.101***	-3.291	-0.052**	-2.584	-0.071***	-3.524
DCP_t	-0.081***	-7.966	-0.013*	-2.034	-0.025**	-2.206
CLR_t	0.133***	8.171	0.069***	6.020	0.085***	7.292

Notes: *, ** and *** indicate 10%, 5% and 1% level of significance, respectively.