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Malaysia's Time Varying Capital Mobility

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Abstract

This paper examines the dynamics of the degree of capital mobility for Malaysia for the period 1991Q1-2009Q4. Generally Malaysia has been an open economy for trade, however periodic episodes of capital control such as those in 1994 and 1998 means that the level of capital mobility in Malaysia might be time varying. In order to measure the degree of capital mobility, this paper uses the Shibata and Shintani (1998) model that examines the relationship between consumption and output. The results show that for the period investigated, the degree of capital mobility relatively low, especially after the 1997/98 East Asia financial crisis. Meanwhile the periods of capital control show a reduction in the degree of capital mobility.

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1. Introduction

Untrammelled international capital mobility encourages capital flows, stimulates investment, and consequently improves economic growth.[1] However, it may also increase a country's susceptibility to the negative effects of capital flow reversal, especially that of short-term portfolio capital (World Bank, 1999; Stiglitz, 2000). Capital mobility may also hinder policy makers' ability to independently control the country's monetary policy. The trade off between growth and volatility makes it important to identify a country degree of capital mobility.

Malaysia has depended on capital inflows as one of its sources of investment. The large drop in private investment rate after the 1997/98 East Asian financial crises magnified the importance of foreign capital inflows. Indeed, the Malaysian government has aggressively pumped public money into the economy because of the reduction in private investment. However, this money has not been able to lift investment to the pre-crisis level. The newly proposed New Economic Model (NEM)[2], which emphasizes the need for the Malaysian economy to be market driven[3], has also accentuated the importance of foreign capital. In investigating whether public investment and foreign direct investment (FDI) crowd in or crowd out private domestic investment (PDI), Ang (2009) shows that FDI and public investment complement Malaysia's PDI and that both public investment and FDI stimulate PDI in the long run. This relationship indicates that impediments in capital flow will affect Malaysia negatively.

An important characteristic with regards to capital movements in Malaysia is the periodic changes in government policy towards the control of capital flows and interest rate. Malaysia saw instances of capital control to deter both excessive inflow and outflow of capital. For example, during the 1997/98 East Asian financial crisis, the government imposed control over the outflow of capital, especially short-term portfolio capital. There was also the imposition of selective capital control in 1994 to control the excessive inflow of foreign portfolio capital. These selective controls and the stop-and-go process of liberalization mean that the level of capital mobility may vary during different periods.

Given the possibility that the degree of capital mobility is time varying, this paper examines the dynamics of the degree of capital mobility for Malaysia. This paper differs from previous studies that measure the level of capital mobility in Malaysia in that it does not assume the degree of capital mobility to be constant. The period chosen is from the first quarter of 1991 to the fourth quarter of 2009. The selection is based on the availability of quarterly data. The period chosen saw two selective capital control phases, controlling both the inflow and outflow of capital. The period studied is also different from previous studies in that a large portion of the data are from after the 1997/98 East Asian financial crisis, furthermore quarterly data are used. The importance of the time-varying nature of capital mobility, especially for countries under structural reform, was suggested by Evans, Kim, and Oh (2008); Papapetrou (2006); and Sun (2004). Following Sun (2004), the degree of capital mobility is measured using the Shibata and Shintani (1998) model of consumption-output

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[1] Empirical literature finds weak support for an exogenous positive effect of FDI on economic growth. Findings in this literature indicate that a country's capacity to take advantage of FDI externalities might be limited by local conditions, such as the development of local financial markets or the educational level of the country; i.e., absorptive capacities. See Laura and Rodrguez-Clare (2004) for surveys of findings.

[2] The goals of the NEM are for Malaysia to be a country of high income in which all communities should benefit from the growth of the economy (inclusiveness) and whose growth is sustainable.

[3] However, fierce objection from PERKASA (Malay rights NGO) has led to certain aspects of the market-oriented NEM to be watered down; i.e., certain affirmative action programs similar to the New Economic Policy (1971-1991) are reintroduced.

nexus, and the Kalman filtered coefficient of capital mobility is used to measure the dynamics of the degree of capital mobility in Malaysia.

2. Financial Liberalization and Capital Flows

Malaysia's economy has been very open to trade, capital flows, or foreign exchange transactions (Ang, 2009). Its economic success has been attributed to commitment in maintaining an overall pro-market and outward-oriented policy stance (Athukorala, 2000). For example, Malaysia's average trade over the GDP ratio of 206.6% for the period of 2000-2005 is one of the highest in the world[4], suggesting a high degree of integration and dependence on the world economy. The trade liberalization index based on Sachs and Warner (1995) and Wacziarg and Welch (2008) indicates that Malaysia's economy has been considered open since the 1960s. The International Monetary Fund (IMF) has classified Malaysia as an economy with no restrictions on capital account transactions since 1974, as reported by the Annual Report on Exchange Arrangement and Exchange Restrictions, and in 1968, Malaysia received the IMF Article VIII status[5] for liberalizing its current account transactions (Umezaki, 2006; Johnson, Mitton, Kochhar, and Tamirisa, 2006).

Malaysia's need for an open economy is punctuated by the small domestic market with a population of 27 million people (in 2010); hence, external demand is important for economic growth, especially for industries to achieve the required economy of scale. The importance of an open economy for Malaysia is further evidenced by its heavy reliance on FDI. Obiyathulla and Ruzita (2001) indicate that rapid GDP growth in the 80s and 90s was financed by three broad means: rapid domestic monetary growth, large current account deficits, and most importantly rapid private capital inflows.

The long-term private capital flows (mainly FDIs) increased steadily during the 1980s, and the flow was especially strong in the 1990s. The inflow of FDI into Malaysia was helped by the New Economic Policy (NEP), aimed at promoting the private sector, and the favourable interest rate differentials (Fay and Jomo, 2001), which turned Malaysia into one of the greatest recipients of FDI and portfolio flows in Southeast Asia. Policy reforms including the introduction of the Investment Incentives Act of 1968, the establishment of free trade zones in the early 1970s, and the provision of export incentives alongside the acceleration of open policy in the 1980s have also induced the flow of FDI into the country. The government also introduced more liberal incentives, including allowing a larger percentage of foreign equity ownership in enterprise under the Promotion of Investment Act (PIA) of 1986. This effort resulted in a large inflow of FDI after 1987 (the inflow of FDI grew at an annual average rate of 38.7 percent between 1986 and 1996) (Karimi and Yusop, 2009).

Even though Malaysia's economy has been relatively open (especially to trade) since the 1970s, it has also gone through a gradual process of financial liberalization. The process is however subjected to stop-and-go measures. The first major phase of financial liberalization occurred in the period after the separation of common facilities and institution from Singapore in 1973[6], where Bank Negara Malaysia (Central Bank of Malaysia, henceforth BNM) allowed commercial banks to determine the deposit and lending rates in October 1978. (However, the maximum interest rates to be charged by the banks for loans to

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[4] Singapore 397.1%, Hong Kog 322.48%, and Luxembourg 272.18%. Source: World Bank, World Development Indicators.

[5] IMF members accepting the obligations of Article VIII undertake to refrain from imposing restrictions on making payments and transfers for current international transactions or from engaging in discriminatory currency arrangements or multiple currency practices, except with IMF approval.

[6] On September 16, 1963, the Federation of Malaya, Singapore, Sabah, and Sarawak formed Malaysia. In 1965, Singapore separated from Malaysia because of political conflict.

special groups or priority sectors remained unchanged.) The separation also saw the floating of Malaysian Ringgit in June 1973. However, during the world recession and the plunge of commodity price in 1985, BNM regained control of interest rates from October 1985 to January 1987. In September 1987, BNM used the Base Lending Rate (BLR) to control interest rates; this remained in force until 1991, when it was lifted, and the BLR of the banking institutions has been completely freed from the administrative control of BNM starting from February 1991 (Ang, 2009).

Short-term capital flows that comprise mainly portfolio investments began to surge in the early 1990s. The influx of short-term financial capital in the beginning of the 1990s, mainly in the form of portfolio capital, created a bubble in the asset price, but it also contributed to the investment boom in the country. In the face of the massive capital inflows in the beginning of the 1990s, BNM tried to stabilize both the exchange rate and money supply through sterilized intervention (Bank Negara Malaysia, 1999). In 1993, short-term flows exceeded long-term flows, and a large share of the short-term inflow was for portfolio investment. However, the flow of short-term capital reversed drastically in 1994, as BNM was forced to repress the inflow of short-term capital.

The 1997 Asian Financial Crisis saw the Ringgit under significant downward pressure. It was initially attacked in May 1997, and the pressures intensified in July following the devaluation of the Thai Baht on July 1997. The two immediate consequences of the crisis were the sharp depreciation of the Ringgit and the massive decline of the equity market. The flow of Ringgit funds from the onshore to the offshore markets resulted in an increase in domestic interest rates, which contributed to the aggravation of domestic economic conditions as well as in the corporate and banking sectors. Apart from economic uncertainty caused by the currency crisis, there was also an increase in political uncertainty caused by the rift between the prime minister and the deputy prime minister. In September 1998, Malaysia surprised the world by announcing the imposition of selective exchange controls, which for the first time since its independence made the Ringgit nonconvertible.

The post-crisis period saw a precipitous decrease in investment rates, from 41.8% in the pre-crisis period to 28.5% post-crisis[7]. The reduction in investment also occurred in other East Asian countries that are affected by the crisis (see Jongwanich and Kophaiboon, 2008; Kinkyo, 2007; Rousseau and Kim, 2007). These decreases in investments may also be related to the degree of capital mobility.

The interrupted liberalization process, punctuated with episodes of capital control and dependence of these countries on the world economy suggests that the level of capital mobility in Malaysia might be time varying, dependent on the process of reform and the world economic condition. Given the process of liberalization, we expect the degree of capital mobility in Malaysia to be high while periods of capital control may reduce mobility. However, previous studies have been inconclusive with regard to the degree of capital mobility. Table 1 summarizes studies measuring the degree of capital mobility for Malaysia. Studies testing capital mobility framework involving nominal interest rate comparisons, consumption correlation, and consumption smoothing models generally indicate a high degree of capital mobility in Malaysia (De Brouwer, 1999; Goh, Lim and Olekalns, 2006; Ghosh and Ostry, 1995; Goh, 2007, 2008), while those involving saving-investment frameworks by regressing domestic saving on investment demonstrate relatively low levels of capital mobility in Malaysia (Manmingi, 1997; Bagnai and Manzocchi, 1996).

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[7] Fixed investment rates and the average from 1990-96 for pre-crisis and the average from 2000-05 for post-crisis periods are used. Source: World Development Indicators.

Table 1. Summary of Studies Measuring Malaysia's Capital Mobility

Study	Period	Method	Conclusion
Ghosh and Ostry (1995)	1970 -1990	Consumption smoothing	High mobility
Bagnai and Manzocchi (1996)	1962-1998	Saving-Investment	Low Mobility
Manmingi (1997)	1970 -1990	Saving-Investment	Low Mobility
Chan and Baharumshah (2003)	1971 -1999	Saving-Investment	High Mobility
Goh et al. (2006)	1978 -2002	Nominal Interest Comparison	High Mobility
Ang (2007)	1965 - 2003	Saving-investment	Low Mobility
Goh (2007)	1960 - 2000	Consumption smoothing	High mobility
Goh (2007)	1960 - 2000	Consumption smoothing	High mobility
Goh et al. (2009)	1971-2007	Output-consumption	High mobility

3. Measuring Capital Mobility

Methods to measure capital mobility have included examination of (i) the purchasing power and interest parity, (ii) the Feldstein and Horioka (1980) saving-investment nexus, (iii) Ghosh and Ostry (1995) consumption smoothing, and (iv) the Shibata and Shintani (1998) consumption-output nexus (see Frankel and MacArthur, 1998; Frankel, 1992; Moosa, 1996).

In this study we use the model proposed by Shibata and Shintani (1998) to measure the degree of capital mobility. The model is based on the small open economy version of the permanent income model with imperfect international capital markets from Campbell and Mankiw (1989, 1990, 1991). The model posits that if capital mobility is perfect, then consumption changes are independent of net output changes, as consumption does not need to depend on output or income. In an autarky, a country's consumption is limited to its net output, as the only source of spending is domestic income; hence, consumption is dependent on output. The model is chosen because the small country assumption used in the model is more likely to be satisfied by Malaysia; furthermore, the model enables the interpretation of the degree of capital mobility. The degree of capital mobility ranges from 0 to 1, where in the extreme case of perfect capital mobility, the degree of capital mobility λ (or the correlation between consumption and net output) is equal to 0, and in the extreme case of autarky, λ is equal to 1.

Considering a situation somewhere in between autarky and perfect international capital mobility, Shibata and Shintani (1998) show that aggregate consumption can be represented as:

$$C_t = (1 - \lambda)C_t^p + \lambda C_t^a = (1 - \lambda)C_t^p + \lambda X_t \tag{1}$$

where C_t^p is consumption under perfect capital mobility, C_t^a is consumption under financial autarky, and X_t is the country's net output. In the extreme case of perfect capital mobility where λ is equal to 0, C_t is equal to C_t^p so that the consumption behaviour of the representative agent becomes that of the market with perfect capital mobility, and when λ is equal to 1, consumption is correlated with net output. Shibata and Shintani (1998) show that ΔC_t^p can be represented by a rational forecast error, ε_t, thus C_t^p in equation (1) can be eliminated by taking the first difference of (1), which gives us:

$$\Delta C_t = \lambda \Delta X_t + (1 - \lambda_t)\varepsilon_t = \lambda_t \Delta X_t + \mu_t \tag{2}$$

The Kalman filter recursive procedure is applied to equation (2) to measure the degree of capital mobility.

4. Data and Results

The data cover the period from the first quarter of 1991 to the fourth quarter of 2009.
All data used in this study are from the IMF International Financial Statistics. The net output variable X is the gross domestic product subtracted by government consumption expenditure, fixed capital formation, and the changes in inventories. Government consumption is excluded from total consumption (C).

We first investigate the order of integration of the series. Given the low power of the augmented Dickey-Fuller (ADF) test, we also apply the KPSS test, which has stationarity as its null hypothesis. The results are shown in Table 2. The test statistics suggest that both the changes in consumption and output are I(0).

Table 2. Unit Root Test Results

Time Series	ADF		KPSS	
	Level	Difference	Level	Difference
C	-1.9643	-3.4922**	0.2706**	0.0836
X	-0.0152	-8.5188**	1.1977**	0.3637

Notes: The lag lengths are selected according to the Schwartz Information Criterion (SIC) rule.
* and ** denote significance at the 5% and 1% levels, respectively.

We then estimate the time varying coefficient of λ_t using the Kalman filter recursive procedure. Following Ogawa (1990), we use the ordinary least square (OLS) estimate of λ as the initial value for Kalman filter recursive estimation. Ogawa (1990) has also used the same technique to show the time-varying estimates of the fraction of liquidity constrained households in Japan. We plot in Figure 1 the dynamics of the coefficient λ_t and its confidence interval, jointly with the constant coefficient λ obtained from the OLS estimator. Figure 1 shows that the coefficient λ_t is between 0.3248 and 0.8169 but is greater than 0.5 for most of the time period, meaning that capitals are relatively less mobile. The period before 1994 shows a relatively mobile period during which λ_t is below 0.5, but the 1994 capital control reduces the degree of capital mobility significantly.

Figure 1. Time Varying Capital Mobility in Malaysia
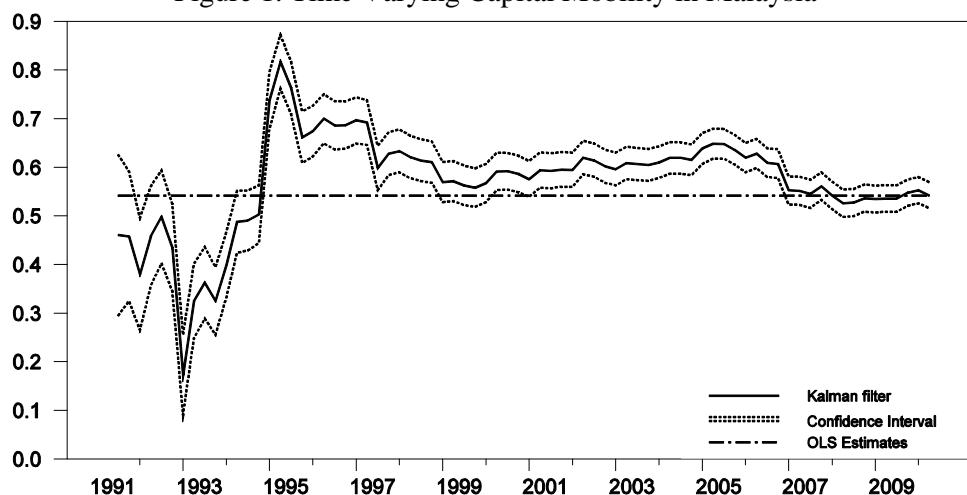
The degree of capital mobility also exhibits large variation, especially during the first phase of capital control in 1994, when there was a sudden decrease in the degree of capital mobility. It is also noted that, throughout most of the period, the confidence interval for λ_t does not contain λ, meaning that the mobility of capital is not constant.

5. Conclusion

This paper examines the dynamics of Malaysia's capital mobility for the period 1991Q1-2009Q4 following Shibata and Shintani (1998). The model posits that, under perfect capital mobility, changes in consumption should be uncorrelated with changes in net output and vice-versa. This paper assumes that the degree of capital mobility is time varying. Episodes of capital control and crisis during the period investigated suggest that the degree of capital mobility may not be constant. Time-varying Kalman filtered estimation of the capital mobility coefficient shows that the correlation between changes in consumption and changes in net output is between 0.3248 and 0.8169. This means that capital mobility is relatively less mobile in Malaysia, especially after the 1997/98 East Asia financial crisis. The results also show that the periodic capital controls in Malaysia are effective in influencing the degree of capital mobility.

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