Journal of
Economics, Banking and Finance
Volume 2, Issue 1, 2008

The Composition of Capital Flows to Malaysia: Forecasting the Effects of Removing the Ringgit Peg

Goh Soo Khoon, Universiti Tunku Abdul Rahman, Perak Darul Ridzuan,31900, Malaysia.
gohsk@mail.utar.edu.my

Abstract

This paper examines the effects of the ringgit peg on the composition of Malaysian capital flows. Using a multivariate system framework, the impact of removing the controls on capital flows is simulated. The results suggest that private short- and long-term capital may decline, regardless of whether the controls are lifted or remain in place. However, official capital flows may increase, suggesting that Malaysia may become more dependent on official flows than private capital flows following the removal of controls on the ringgit.

Introduction

Malaysia has been a recipient of capital flows for several decades. In the 1990s, as with many other developing countries, it experienced a huge surge in capital inflows. This served to focus the attention of policymakers on the macroeconomic implications of such flows. While capital flows contribute to Malaysia's overall development in terms of growth, employment, foreign exchange earnings, and the transfer of technology, such flows are only of major concern when they become a source of macroeconomic instability (Bank Negara Malaysia, 1994). The flow of capital raises several questions for policymakers. Such questions include whether the inflows are temporary or permanent: how can capital flows be handled given the potential for the sudden reversal of such flows? Furthermore, one of the difficulties for policymakers in an open economy is the imperfect information on this matter. Malaysia attempted to address the issues by introducing a variety of controls over capital flows in the 1990s. Malaysia has also been identified with the group of countries that have used exchange controls to manage short-term capital flows (Latifah, 2002). The use of such selective exchange controls occurred, for example, in 1993–1994; these have since been removed. Different measures were introduced in September 1998 to manage capital outflows and address speculation against the ringgit during the Asian crisis. Nevertheless, Malaysian authorities have always emphasized that controls were only used as a second-best choice under certain circumstances, and only implemented on a temporary basis (Mustafar, 2000).

Few studies have analyzed, either qualitatively or quantitatively, the effectiveness of Malaysia's capital controls.[1] Preliminary evidence suggests that the temporary selective capital controls implemented have thus far provided little evidence of damaging costs, contrary to the fears of orthodox analysis that these sorts of controls have serious detrimental effects on the economy (Kaplan and Rodrik, 2001; Edison and Reinhart, 2001; Athukorala, 2001; Latifah, 2002).

[1] The assessment of effectiveness is based on the effects of capital controls on capital flows and the achievement of policy objectives (such as exchange rate stability, monetary policy autonomy, and financial stability).

Some studies found that the controls have had a negative impact on the types of capital flows. Tamirisa (2001), for instance, used various capital control indices and found that the controls had some effect on portfolio investment flows in Malaysia. Goh (2005) examined the effect of capital controls on the composition of capital flows in Malaysia. The study discussed how, under predetermined exchange rate rules, the contribution of selective controls was to increase monetary autonomy without taxing private long-term capital flows or foreign direct investment. Although the selective capital controls in Malaysia affect only some capital flow components, the results show that the controls not only reduced the total flows (hence increase monetary autonomy), but to some extent also influenced private long-term flows.

The selective controls implemented in 1998 were intended to be a temporary measure. After nearly seven years of a ringgit peg to the US dollar, Malaysia abandoned this peg in an almost instantaneous reaction to a similar move by China on July 21, 2005. This allowed the ringgit to operate as a managed float against a basket of currencies, similar to how it was managed before the currency controls were introduced on September 1, 1998.[2] Although the ringgit remains nontradable offshore ostensibly to reduce the risk of speculative activities by hedge funds, the managed float allowed the value of the ringgit to be determined primarily by economic fundamentals.

To date, and as far as the authors are aware, there is no study that examines the likely impact on the types of capital flows were the controls on the ringgit to be removed. This paper aims to fill this gap in the literature. The analysis employs a multivariate system framework to establish a model of capital flows and capital controls and then simulates the impact of removing the controls on the ringgit on capital flows in Malaysia. The empirical results suggest that both private long-term and short-term capital may decline. However, official capital flows may increase, suggesting that Malaysia may as a result become more dependent on official rather than private capital flows.

The remainder of the paper is divided into three sections. Section 2 elaborates on the magnitude, composition, and the determinants of capital flows in Malaysia. Section 3 presents the simulation results based on the dynamic multivariate model. Section 4 provides some policy implications and concludes the study.

Capital flows to Malaysia — magnitude, composition, and their determinants

The Malaysian Balance of Payments compiled by the Department of Statistics provides a means of measuring capital flows. Before 2001, the Balance of Payments was compiled in conformity with the methodology set forth in the Fourth Edition of the Balance of Payments Manual of the International Monetary Fund (IMF). Using this format, the capital account was classified according to an original contractual maturity of more than one year (long term) or one year or less (short term).[3]

The long-term capital account records official and private capital flows. Official capital flows reflect the long-term external financing needs of the public sector, including Federal Government Loans, Nonfinancial Public Enterprise (NFPE) loans, and others. In general, this represents government borrowing from abroad to finance the current account deficit. Private long-term capital flows record equity-related flows such as corporate investment or loan capital that could result in higher debt servicing obligations. The short-term capital account captures almost all private short-term

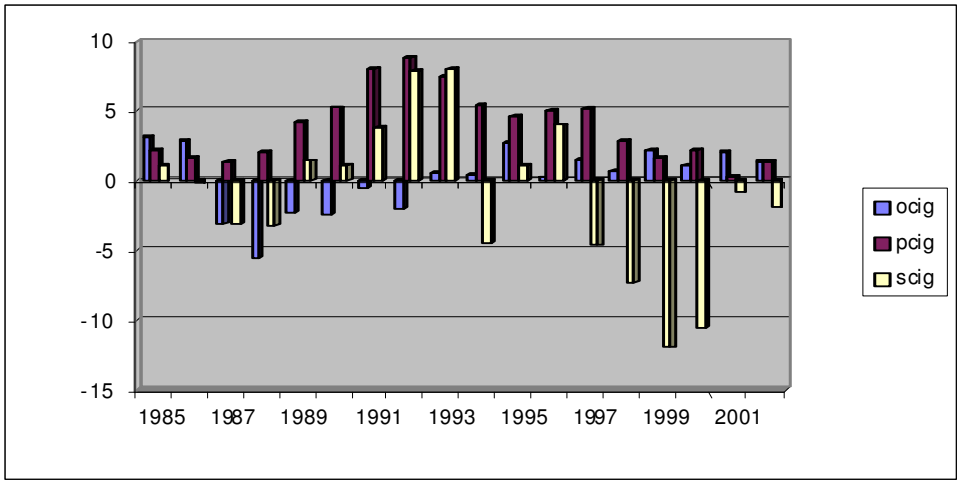
[2] The currencies included in the basket and their exact proportions comprise information not available in the public domain.

[3] The Balance of Payments data from 2001 onwards have been reclassified in accordance with the BPM5 format. The capital account has been redesignated as the capital and financial account, where the financial account is classified according to the type of investment, that is, direct investment, portfolio investment, and other investment.

flows. A major component of short-term capital flows comprises the net external assets and liabilities of the banking sector. All of these data are reported on a net basis (Bank Negara Malaysia, 2003).

There were two phases of capital inflows during the 1990s. The first phase was from 1989 to 1993, and the second from 1994 until the 1997 financial crisis. Figure 1 depicts the components of the capital flows, including the ratio of official capital flows to GDP (*ocig*), the ratio of private long-term capital flows to GDP (*pcig*), and the ratio of short-term flows to GDP (*scig*).

Figure 1. Capital account by type as percentages of nominal GDP



Source: Data collected from Bank Negara Statistics Bulletin, various issues. The y-axis measures capital flows per GDP, the x-axis measures years. *ocig*: the ratio of official capital flows to GDP; *pcig*: the ratio of private long-term capital flows to GDP; *scig*: the ratio of private short-term capital flows to GDP.

As shown in Figure 1, the volatile short-term capital flows was the main cause of the two cycles found in the capital inflows. In the first phase, the rapid increase in short-term capital 'overfinanced' the current account deficit, and international reserves accumulated dramatically. This phase was terminated by several administrative policy measures in 1994. Short-term capital inflows turned to outflows in 1994. After 1994, short-term capital began to flow in again, and the second phase commenced, although its magnitude was not as substantial as in 1993. When the Asian currency crisis occurred, short-term capital changed from being an inflow in 1996 (approximately 4.1% of GDP) to an outflow in 1997 (approximately 4.6% of GDP). The short-term capital account recorded substantial net outflows in 1998, mainly due to the decline of portfolio investments by foreign investors. However, short-term capital flows stabilized in the last quarter of 1998 following the implementation of a one-year holding period for portfolio investments in Malaysia effective September 1, 1998.

Long-term capital, particularly private long-term capital, flowed steadily and substantially during the 1990s. The bulk of the increase in private long-term capital appears to result from an increase in foreign direct investment (FDI) (Bank Negara Malaysia, 1997). FDI inflows have contributed significantly to the surpluses in the private long-term capital flows since 1989, the bulk of which were concentrated in the oil and manufacturing sectors (Bank Negara Malaysia, 1994). FDI inflows averaged more than 6% of GDP during the 1990s, peaking in 1992 when they accounted for 8.7% of GDP. FDI is now returning to Malaysia after contracting during the Asian financial crisis, but has yet to reach its pre-crisis level.

In summary, the two cycles of capital inflows in the 1990s seem to have been caused mainly by fluctuations in short-term capital. It should be noted that the financial crisis took place during the second boom of short-term capital inflows after 1995 (Akihiro, 2000).

The question of the determinants of capital flows has been an important issue in international finance. However, empirical evidence concerning these determinants is scarce. This may be because of the poor availability of capital flow data and the well-known difficulties of estimating capital flow equations (Johnston and Ryan, 1994). The study of capital movements is generally more difficult than real sector variables (such as the current account) as capital movements are both monetary and financial phenomena. Capital flows are also significantly influenced by changes in expectations regarding rates of return and risks, including changes in interest rates, exchange rate depreciation, and capital controls. They are not usually dependent on observed *ex ante* outcomes, as expected variables are usually unobservable (Leamer and Stern, 1972). Earlier studies on the determinants of capital flows primarily focused on industrial countries. Evidence in these countries has been provided by Branson (1968), Kouri and Porter (1974), Hodjera (1973), and Root and Ahmed (1979). In the 1980s and 1990s when capital flows to developing countries became more abundant, studies on those countries increased. These include those by Fry (1988), IMF (1991), Schadler et al. (1993), Seno Adji (1995), Fernandez Arias and Montiel (1996), and Seno Adji et al. (1996).

There are two main approaches used to explain private capital flows: the portfolio balance approach, based on Branson's (1968) extension of the Markowitz–Tobin portfolio selection model, and the monetary approach to the balance of payments, following Kouri and Porter (1974). The former focuses on the role of risk-adjusted returns, and the latter on the role of monetary disequilibrium in explaining capital movements.

According to the portfolio approach, equilibrium in financial markets occurs when the available stock of national money and other financial assets is equal to the stock demands for these assets based on current wealth, and wealth accumulation continues only until current wealth is equal to desired wealth. Branson (1968) used the Markowitz–Tobin model of portfolio selection to explain the allocation of wealth between domestic and foreign assets. In this model, the proportion of foreign assets (A^f) in a given stock of wealth is a function of the domestic and foreign interest rates (i and i^*), the measure of exchange rate expectation or more precise risk (e), and the stock of wealth (w):

$$\frac{A^f}{w} = f(i, i^*, e, w) \qquad (1)$$

The total derivative of expression (1) yields:

$$dA^f = f(i, i^*, e, w)dw + w(f_i di + f_{i^*} di^* + f_e de) + \varepsilon \qquad (2)$$

where ε is the error term. The first component on the right-hand side measures the continuing 'flow effect' of portfolio growth on capital flows, and the second measures the 'stock effect' of portfolio adjustment associated with changes in interest rates and other relevant variables. Data problems have usually led to the exclusion of the wealth term from empirical studies of capital movements, with changes in wealth proxied by income and other explanatory variables represented by Z. Equation (2) can be specified as:

$$dA^f = \alpha_o + \alpha_1 di + \alpha_2 di^* + \alpha_3 de + \alpha_4 dY + \alpha_5 dZ + \varepsilon \qquad (3)$$

Because of the generally unsatisfactory empirical findings found in early works, Equation (3) tends to be further modified by replacing all changes with levels and replacing the expectation of

exchange rates with actual exchange rates (Johnston and Ryan, 1994). This results in a simpler expression:

$$dA^f = \alpha_o + \alpha_1 i + \alpha_2 i^* + \alpha_3 e + \alpha_4 Y + \alpha_5 Z + \varepsilon \qquad (4)$$

Assuming relative purchasing power parity holds, then $e = \pi - \pi^*$, Equation (4) can be rewritten in terms of the real interest rate differential as:

$$dA^f = \alpha_0 + \alpha_1[(i - \pi) - (i^* - \pi^*)] + \alpha_2 Y + \alpha_3 Z \qquad (5)$$

where α_1 and α_2 are expected to be positive, dA^f is the net capital flow as a percentage of GDP, i and i^* are the domestic and foreign interest rates respectively, and π and π^* are the domestic and foreign inflation rates respectively. Y is domestic real GDP growth and Z is a group of variables including a dummy for the Asian currency crisis (*dummy*), different types of capital controls indices (*oc*, *cpfout*, *cpfin*, *crm*), the real exchange rate depreciation (*rerd*), and the government budget deficit (*bg*).[4] This basic form, along with a variety of other explanatory variables, has been well used to explain individual items in the capital account and the net magnitude of capital flows. Ordinary least squares (OLS) regression techniques are used to estimate Equation (5). For the analysis, capital flow data from the Malaysian balance of payments capital account are specified. The basic data are expressed in millions of ringgit and cover the period from1991 Q1 to 2002 Q4, comprising 48 quarterly observations. Capital flows are classified as: long-term official and private capital flows (*oci* and *pci*); short-term capital flows (*sci*); and total capital flows (*tci*) as the sum of the three flows. The analysis centers on net flows because the focus is on net financing. Consistent with Equation (5), the net capital flows are expressed as a percentage of GDP (*tcig*, *ocig*, *pcig*, and *scig*).[5]

Full details of the estimation results are available in Goh (2005). The results show that the portfolio model explains Malaysian capital flows well. The control on outflows and inflows appears to have had a negative effect on short-term flows, at least to some degree. A tightening of controls on inflows and outflows appears to have been associated with decreases in net short-term flows to Malaysia (see Tables 2 and 3 in Goh (2005), pages 11 and 12). The coefficient of GDP growth and the real interest rate is shown to be significant and is the correct sign for all capital flows, except *ocig*, suggesting that this model applies only to private capital transactions. The coefficient of *scig* to GDP growth is positive and its magnitude is the highest among the several equations. This may indicate that market-related variables are heavily weighted by portfolio investors. The coefficient for *ocig* is positive and significantly related to the budget deficit per GDP, implying that international borrowing is important in financing the Malaysian budget deficit. The Asian currency crisis variable is also significant in explaining short-term capital and portfolio investment, confirming the general perception that short-term capital flows are sensitive not only to macroeconomic fundamentals, but also to market sentiment.

Nonetheless, it would be misleading to look at capital flows individually because causal or feedback relationships could exist among them. It is a truism in international economics that the balance of payments is a multivariate system with each flow eventually affecting all others (Branson, 1968). Thus, using the several possible determinants of capital flows in Malaysia discussed earlier, a dynamic multivariate equation system framework is used first to establish a model of capital flows and capital controls, and then to simulate the impact of the release of these controls.

---

[4] Initially, the analysis also considered additional macroeconomic variables, including government expenditure per GDP, changes in the trade balance, and real stock return. As these variables were found to be insignificant at the 10% level, they were excluded from the subsequent analysis.

[5] Although the Central Bank of Malaysia compiles data on monthly capital flows, such data are not publicly available. Instead, the analysis employs quarterly data.

Policy simulation

The ringgit was pegged at 3.8 to the dollar in September 1998, when former Prime Minister Mahathir Mohamad imposed capital controls to halt a steep slide during the Asian financial crisis. Other controls were lifted as the economy revived, but the peg remained until July 21, 2005. After 2005, the ringgit was allowed to float against a basket of currencies. In this section, we examine the economic scenario that would follow a decision by the Malaysian authorities to release the controls on the ringgit. What would be the impact on the different types of capital flows? Would total flows increase?

A dynamic multivariate equation system framework is used to establish a model of capital flows and capital controls and then simulate the impact of releasing these controls. The general approach used is to estimate a system with the types of capital flows as endogenous variables, and with all lagged endogenous and exogenous variables as right-hand side variables, discarding the variables that are not significant statistically and refitting the equation.

To avoid the possibility of spurious regression through the specification of nonstationary series, all variables were tested for stationarity using Augmented Dicky–Fuller (ADF) and Phillips–Perron (PP) tests. The statistics in Table 1 indicate that all the variables are stationary in levels.

Table 1. Stationarity tests

Variable	ADF		PP
Dependent variable	*t-statistics* (ρ)	Q(20)/(prob)	*t-statistics*
tcig (c)	–2.97 (0)**	18.20 (0.20)	–4.98***
ocig (c)	–6.60 (0)***	23.12 (0.12)	–6.62***
pcig (c)	–4.60 (0)***	18.16 (0.31)	–4.71***
scig (c)	–4.55 (0)***	11.20 (0.79)	–3.34**
Independent variable			
growth (c)	–4.21 (4)***	23.42 (0.27)	–7.45***
rd (c)	–3.31(1,3)	7.57 (0.99)	2.90 *
rerd (c)	–5.96 (0)***	5.30 (0.99)	–5.98***
bg (c)	–8.90 (1)***	10.04 (0.96)	–14.75***

Notes: The ADF test is based on the following model: $\Delta x_t = \beta_0 + \beta_1 x_{t-1} + \sum_{i=1}^{T} \beta_2 \Delta x_{t-i} + \varepsilon_t$.

The PP test is based on the following model: $x_t = \beta_0 + \beta_1 x_{t-1} + \varepsilon_t$.

(c) means a constant is included. (ρ) denotes the chosen lag length to include in each series. Q(20) refers to the Q-statistics with 20 degrees of freedom. prob refers to the probability level at that degree of freedom. The MacKinnon (1991) t-critical values for the ADF and PP tests for the sample size of 50 are 1% –3.58, 5% –2.93, 10% –2.60 respectively. ***, **, and * denote statistical significance at 1%, 5%, and 10% levels, respectively.

The results of the dynamic multivariate system are presented in Table 2. The estimated equations have reasonably good fit as evident from their values of R^2. The extent of variation of the dependent variables explained varies between 31% and 65%, and the regression coefficients are significant and display the expected signs.[6] All the residuals from this dynamic multivariate system comprise white noise as indicated by the Ljung–Box statistics.

[6] The budget deficit and the real exchange rate depreciation were found to be insignificant at the 10% level and so were excluded from any subsequent analysis.

Table 2. Dynamic multivariate system

$$pcig = \underset{}{0.0096} + \underset{(0.046)}{0.165}oc(-2) - \underset{(0.042)}{0.147}oc(-3) + \underset{(0.103)}{0.19}growth(-1) + \underset{(0.1153)}{0.615}growth(-2)$$
$$(0.0122)$$

$$+ \underset{(0.099)}{0.447}growth(-3) + \underset{(0.0969)}{0.224}growth(-4) + \underset{(0.049)}{0.167}rd(-2) - \underset{(0.046)}{0.109}rd(-3)$$

$$R^2 = 0.60 \quad LB^1_1 = 1.729(0.18) \quad LB^1_2 = 2.07(0.354) \quad LB^1_3 = 4.62(0.20) \quad LB^1_4 = 7.77(0.10)$$
$$LB^2_1 = 0.224(0.64) \quad LB^2_2 = 0.898(0.638) \quad LB^2_3 = 0.915(0.82) \quad LB^2_4 = 3.58(0.465)$$

$$JBtest = 1.077(0.584)$$

$$scig = \underset{}{-0.0007} - \underset{(0.082)}{0.137}oc(-4) + \underset{(0.252)}{0.384}growth(-1) + \underset{(0.246)}{1.15}growth(-2) + \underset{(0.257)}{0.53}growth(-3)$$
$$(0.029)$$

$$\underset{(0.256)}{0.926}rd(-1) + \underset{(0.0604)}{0.356}rd(-2) - \underset{(0.054)}{0.154}scig(-2) - \underset{(0.1129)}{0.225}pcig(-1) - \underset{(0.330)}{0.773}dummy$$

$$R^2 = 0.65 \quad LB^1_1 = 2.07(0.15) \quad LB^1_2 = 2.14(0.341) \quad LB^1_3 = 5.75(0.12) \quad LB^1_4 = 6.38(0.17)$$
$$LB^2_1 = 0.98(0.32) \quad LB^2_2 = 1.10(0.577) \quad LB^2_3 = 3.45(0.32) \quad LB^2_4 = 4.68(0.32)$$
$$JBtest = 0.7769(0.6781)$$

$$ocig = \underset{}{0.034} + \underset{(0.031)}{0.0475}oc(-3) - \underset{(0.033)}{0.078}oc(-4) - \underset{(0.0149)}{0.032}rd(-2) + \underset{(0.038)}{0.075}scig(-2) - \underset{(0.099)}{0.2534}pcig(-1)$$
$$(0.010)$$

$$R^2 = 0.31 \quad LB^1_1 = 3.598(0.06) \quad LB^1_2 = 4.65(0.097) \quad LB^1_3 = 4.66(0.198) \quad LB^1_4 = 4.74(0.31)$$
$$LB^2_1 = 0.016(0.90) \quad LB^2_2 = 0.128(0.938) \quad LB^2_3 = 0.16(0.98) \quad LB^2_4 = 0.16(0.997)$$
$$JBtest = 0.569(0.723)$$

Notes: *pcig*: private long-term capital per GDP; *scig*: short-term capital per GDP; *ocig*: official capital per GDP; *oc*: overall controls index; *growth*: real GDP growth rate; *rd*: real interest rate differential; *dummy*: Asian currency crisis. $LB^1_{(j)}$ is the Ljung–Box statistic for the joint significance of autocorrelations of the standardized residual for q lags. $LB^2_{(j)}$ is the Ljung–Box statistic for the joint significance of autocorrelations of the square standardized residuals for q lags. Figures in parentheses are p-values.

Given the adequate performance of the model as a dynamic system, dynamic simulations were generated for 20 periods from 2003. Two simulations were performed to assess their impact on the types of capital flows:

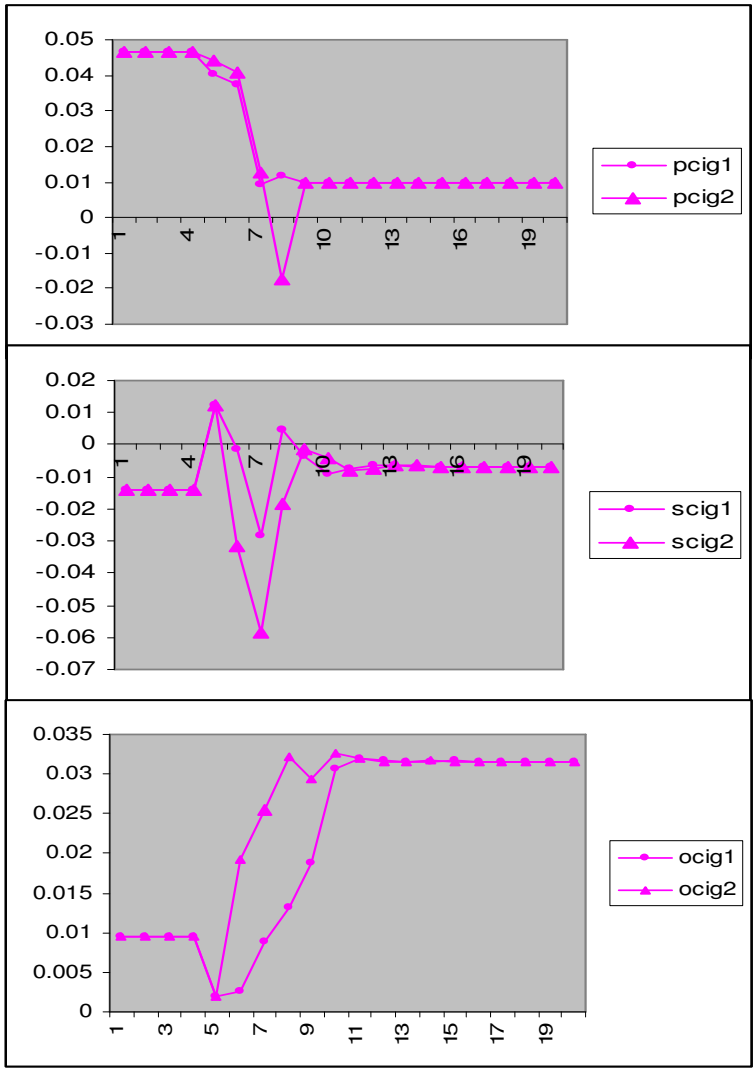
(i) assuming the controls were lifted in 2003; and
(ii) assuming the controls remained in place for a further five years.

The estimated model also contained other macroeconomic variables, such as the growth rate and interest rate differentials. These variables have been estimated as representing a first-order autoregressive or AR(1) process.

The simulation forecasts are presented in Figure 2. The simulation began at period five after allowing for lags. Figure 2 indicates that regardless of whether or not the controls are lifted, both private long-term and short-term capital flows will decline. The decline in both types of capital flows is greater when the controls remain for some time as opposed to if the controls are lifted immediately. For example, *pcig* will decline up to 4.4% by the fourth quarter when the controls

remain intact. If the controls are lifted, the *pcig* will only decline up to 3.7%. The *scig* shows an initial increase in the first period, from –1.4% to 2.6%, before it declines to –2.8% if the controls are lifted, or a further decrease to –5.8% if the controls remain. After this period, *scig* shows an increase up to the ninth quarter before it stabilizes in the eleventh period. The official capital flows show different behavior compared with private capital flows. The *ocig* shows an increasing trend regardless of the situation; however, *ocig* increases more if the controls remain in place.

Figure 2. Policy simulation



Notes: The x-axis measures the number of simulation periods, the y-axis measures capital flows per GDP. $pcig_1$, $scig_1$, and $ocig_1$ are under Simulation 1 and $pcig_2$, $scig_2$, and $ocgi_2$ are under Simulation 2.

Concluding remarks

This study has conducted a simple simulation exercise to examine the likely impact on the types of capital flows if controls on the ringgit were removed. Extending Goh's (2005) analytical framework, this study has developed a multivariate system framework to establish a model of capital flows and capital controls, and then simulates the impact of removing the controls on the ringgit on capital flows in Malaysia. The sample comprises quarterly data from 1991 to 2002. It is

interesting to observe that both private long-term and short-term capital flows may decrease, while official capital flows may increase if the controls on the ringgit were removed. This suggests that the country would have to rely more on official capital flows than private flows in the future. Nevertheless, the results of the policy simulation are suggestive rather than confirmative. This analysis has indicated that continuing or removing the ringgit peg may reduce private capital flows. This sheds light on a number of policy implications, particularly the impact on private long-term flows such as FDI. FDI in Malaysia is an important catalyst for growth, increasing exports and expanding knowledge and providing an economic vehicle towards the Malaysian 2020 vision (Linda and Phang, 1992; Chowdhury and Mavrotas, 2006). Thus, a fall in FDI would have a negative impact, which suggests that there is a need to critically examine the policy framework, institutions, procedures, and processes to make Malaysia an even more attractive destination for FDI.

In addition, the results also suggest that Malaysia may become more dependent on official flows than on private capital flows following the removal of the controls on the ringgit. This is alarming as the Malaysian Government is progressively reducing its public investment commitments to help reduce the budget deficit. Since the Asian currency crisis in 1997, the government has been running deficits to help stimulate economic growth. In 1998, the government recorded a deficit of 1.8% of GDP in 1999 as a result of a stimulus package enacted in September 1998. However, Malaysia cannot rely on budget deficits to stimulate growth. More private investment is therefore required to provide a basis for continuing strong economic growth, particularly in light of the economic dependence in government capital spending during the last five years.

References

Chowdhury, A. and Mavrotas, G. (2006). FDI and Growth: What Causes What? *World Economy*, 29, 9–19.

Ahn, Y.S. (1997). *The Major Determinants of Various Types of Capital Flows and the Degree of Financial Capital Mobility in Developing Countries*, Faculty of Claremont Graduate School. University of Claremont.

Akihiro, N. (2000). *Capital Flows in Malaysia: The Impact and Policy Implications*, ISIS Malaysia, 2000.

Athukorala, P. (2001), *Crisis and Recovery in Malaysia: the Role of Capital Controls*. Cheltenham: Edward Elgar.

Bank Negara Malaysia. (1994) *Annual Report 1994*, Bank Negara Malaysia: Kuala Lumpur, 1994.
——. (2003) Annual Report 2003, Bank Negara Malaysia: Kuala Lumpur, 2003.

Benkwitz, A., Lutkepohl, H. and Neumann, M.H. (2000), Problems Related to Confidence Intervals for Impulse Responses of Autoregressive Processes. *Econometric Reviews.* February, 19(1), pp. 69–103.

Benkwitz, A., Lutkepohl, H. and Wolters, J. (2001), Comparison of Bootstrap Confidence Intervals for Impulse Responses of German Monetary Systems. *Macroeconomic Dynamics.* February, 5(1), pp. 81–100.

Branson, W.H. (1968), *Financial Capital Flows in the U.S. Balance of Payments*. Amsterdam: North-Holland Publishing Company.

Bruggemann, R. and Lutkepohl, H. (2000), Lag Selection in Subset VAR Models with an Application to a U.S. Monetary System. *World Conference Econometric Society, Seattle*.

Buch, C. and Hanschel, E. (1999), The Effectiveness of Capital controls — The case of Slovenia. *Kiel Working Paper*, June, No. 933.

Cailloux, J. and Griffith-Jones, S. (1997), International Capital Flows, What Do We Know About Their Volatility? Evidence from Latin American Countries, *CESSEFI Working Paper* Series No 03/97, Sorbonne University.

Cardoso, E. and Goldfajn, I. (1997), Capital Flows to Brazil: The Endogeneity of Capital Controls. *IMF Working Paper, Washington, DC: International Monetary Fund*.

de Gregorio, J., Edwards, S. and Valdes, R. (2000), Controls on Capital Inflows: Do They Work? *Journal of Development Economics*, 63(1), 59–83.

Edison, H. and Reinhart, C.M. (2001), Stopping Hot Money. *Journal of Development Economics*, 66(2), 533–53.

Efron, B and Tibshirani, R.J. (1993), *An Introduction to the Bootstrap*. Chapman and Hall, New York.

Fernandez Arias, E and Montiel, P.J. (1996), The Surge in Capital Inflows to Developing Countries: An Analytical Overview. *World Bank Economic Review.* January, 10(1), pp. 51–77.

Fry, M.J. (1988), *Money, Interest, and Banking in Economic Development*. Baltimore and London: The Johns Hopkins University Press.

Goh, S.K. (2005), New Empirical Evidence on the Effect of Capital Controls on Composition of Capital Flows in Malaysia. *Applied Economics*, 37(13), 1491–1505.

Hall, P. (1992), *The Bootstrap and Edgeworth Expansion*. Springer, New York.

Hodjera, Z. (1973), "International Short-term Capital Movements: A Survey of Theory and Empirical Analysis." *International Monetary Fund Staff Papers*, *20*(3), pp. 683–740.

International Monetary Fund (1991), *Determinants and Systematic Consequences of International Flows, Occasional Paper 77*. Washington D.C: International Monetary Fund.

Johnston, R. B. and Ryan, C. (1994), "The Impact of Controls on Capital Movements on the Private Capital Accounts of Countries' Balance of Payments: Empirical Estimates and Policy Implication." *International Monetary Fund Working Paper*, *WP/94/78*.

Kaplan, E. and Rodrick, D. (2001), "Do the Malaysia Capital Controls Work?" *CEPR Working Paper*, 2754.

Kouri, P. and Porter, M.G. (1974), "International Capital Flows and Portfolio Equilibrium." *Journal of Political Economy*, 83(3), pp. 443–68.

Latifah, M.C. (2002), "Capital flows and Capital Controls: the Malaysian Experience," K. T. Lee, *Globalization and the Asia Pacific Economy.* Routledge: London and New York, 135–64.

Leamer, E.E. and Stern, R.M. (1972), "Problems in the Theory and Empirical Estimation of International Capital Movement," F. Machlup, W. S. Salant and L. Tarshis, *International Mobility and Movement of Capital.* New York: Columbia University Press for the National Bureau for Economic Research, 171–206.

Linda, Y.C. Lim, Phang E.F. (1992), “Foreign Direct Investment and Industrialisation in Malaysia, Singapore, Taiwan and Thailand." *Journal of Asian Studies*, 51(4), pp. 985–987.

Lutkepohl, H. (1993), *Introduction to Multiple Time Series Analysis, Second Edition*. Springer: New York, London.

MacKinnon, J.G. (1991) " Critical Values for Cointegration Tests." R.F. Engle and C.W.J. Granger, Long Run Economic Relationships: Reading in Cointegration. Oxford University Press, pp.267-76.

Mustafar, Hj. Mohd. N. (2000), "Controlling capital Surges: Lessons from Capital Controls in 1994 and 1998–99," *National Seminar on Strengthening the Macroeconomic Fundamentals of the Malaysian Economy, 5–6 June 2000. The Pan Pacific Hotel.* Kuala Lumpur.

Rojas-Suarex, L. (2002), "Comments on Did the Malaysian Capital Controls Work?," E. Sebastian and A. F. Jeffery, *Preventing Currency Crises in Emerging Markets.* The University of Chicago Press, 123–25.

Root, F.R and Ahmed, A.A. (1979), "Empirical Determinants of Manufacturing Direct Foreign Investment in Developing Countries." *Economic Development and Cultural Change*, 27(4), 751–61.

Schadler, S., Maria, C., Adam, B. and Robert, K. (1993), *Recent Experience with Surges in Capital Inflows, Occasional Paper, 108*. Washington DC: International Monetary Fund.

Seno Adji, S. (1995), "The Effects of Macroeconomics and Political Factors on Capital Flows to Developing Countries." *Claremont: The Claremont Graduate School.*

Seno Adji, S., Ahn, Y.S., Holsey, C.M. and Willett, T.D. (1996), "Political Instability, Political Capacity, and Capital Flows to Developing Countries," M. Abertman and J. Kugler, *Political Capacity and Economic Behaviour.* Boulder: Westview Press, 127–48.

Soto, M. (1997), "*Controles a los Movimientos de Capital: Evidence Empirica del Caso Chileno,"* Mimeo, Banco Central de Chile.

Tamirisa, N. (2001), "Capital Controls in Response to the Asian Crisis," K. Meesook, et al., *Malaysia: From Crisis to Recovery. IMF Occasional Paper No. 207,* 50–70.

——. (2004), "Do Macroeconomic Effects of Capital Controls Vary by Their Type? Evidence from Malaysia." *IMF Working Paper, Washington, DC: International Monetary Fund. WP/04/3*.

Valdes-Prieto, S. and Soto, M. (1998), "The Effectiveness of Capital Controls: Theory and Evidence from Chile." *Empirica*, 25(2), pp. 133–64.