

# IMF Working Paper

---

## Do Macroeconomic Effects of Capital Controls Vary by Their Type? Evidence from Malaysia

*Natalia T. Tamirisa*

## IMF Working Paper

Policy Development and Review Department

### Do Macroeconomic Effects of Capital Controls Vary by Their Type? Evidence from Malaysia

Prepared by Natalia T. Tamirisa<sup>1</sup>

Authorized for distribution by Dominique Desruelle

January 2004

#### Abstract

**This Working Paper should not be reported as representing views of the IMF.**

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

This paper examines how the macroeconomic effects of capital controls vary depending on which type of international financial transaction they cover. Drawing on Malaysia's experiences in regulating the capital account during the 1990s, it finds, in an error-correction model, that capital controls generally have statistically insignificant effects on the exchange rate. Controls on portfolio outflows and on bank and foreign exchange operations facilitate reductions in the domestic interest rate, while controls on portfolio inflows have the opposite effect, in line with the theoretical priors. Controls on international transactions in the domestic currency and stock market operations have statistically insignificant effects on the interest rate differential.

JEL Classification Numbers: F21, F32, F40, G18

Keywords: Malaysia, capital, exchange, controls, portfolio, flows, investment, Asian crisis

Author's E-Mail Address: [ntamirisa@imf.org](mailto:ntamirisa@imf.org)

---

<sup>1</sup> I am grateful to Peter Clark, Dominique Desruelle, Enrica Detragiache, Robert Flood, Javier Hamann, Juha Kähkönen, Jun Il Kim, Tim Lane, Mauro Mecagni, Gian Maria Milesi-Ferretti, İnci Ötker-Robe, Martin Schindler, Judit Vadasz, Luis Valdivieso, Qing Wang, and the staff of Bank Negara Malaysia for helpful comments.

Contents	Page
I. Introduction .....	3
II. Capital Flows and Their Regulation in Malaysia.....	5
A. 1994 Controls.....	8
B. Asian Crisis Controls.....	9
III. What Do the Quantitative Data Tell Us? .....	10
IV. An Error-Correction Model with Capital Controls.....	14
V. Conclusion .....	18
Appendix.....	19
References.....	22
Tables	
1. Descriptive Statistics.....	11
2. Unit Root Tests .....	15
3. Cointegration Analysis.....	16
4. Conditional Error-Correction Model .....	17
5. Macroeconomic Effects of Capital Controls.....	18
Appendix Table	
1. Changes in Capital Account Regulations, 1991–2002 .....	19
Figures	
1. Capital Flows, 1990–2002 .....	6
2. Capital Controls, 1991–2002 .....	13
3. Capital Controls and Macroeconomic Variables, 1991–2002 .....	14

## I. INTRODUCTION

Malaysia's experiences with temporary controls on short-term capital flows are germane for the contemporary debate on how developing countries can manage integration into the world financial markets. In 1994, Malaysia resorted to controls on *inflows* of short-term capital to reestablish monetary control amid rising inflationary pressures. Several years later, during the Asian crisis, Malaysia restricted *outflows* of short-term portfolio capital and de-internationalized the use of its domestic currency to contain speculation against the ringgit, stabilize short-term capital flows, and regain monetary policy independence. How successful was Malaysia's strategy of using temporary controls to manage short-term capital flows? The profession has not yet reached a consensus on this issue.<sup>2</sup>

As regards the role of capital controls in Malaysia's recovery from the Asian crisis—a particularly controversial topic that has received closer attention in the academic and policy literature than Malaysia's earlier capital controls—the authorities consider that capital controls were a critical component of the policy mix. By eliminating the offshore trading of the ringgit and thus curtailing the speculative pressures on the exchange rate, controls enabled them to ease the monetary and fiscal policies and rehabilitate the banking and corporate sectors.

Analytically, it is difficult to differentiate the effects of capital controls from other contemporaneous factors. As Rudiger Dornbusch summed up in 2001:

The costs or benefits of capital controls remain ambiguous. Malaysia had more favorable pre-conditions, it did not do appreciably better, and the timing of controls coincided with the reversal of the yen appreciation, the end of the crisis elsewhere, and Fed rate cuts that put an end to the crisis atmosphere in world markets. However, because the costs are ambiguous, there is no evidence that the institution of capital controls or the failure to apply an explicit IMF program has yet resulted in any obvious detrimental effects.<sup>3</sup>

---

<sup>2</sup> The literature on Malaysia's 1994 controls is scarce and is largely limited to case studies. Malaysia's experiences with capital controls during the Asian crisis were discussed more extensively in the literature and were examined empirically as well. Latifah (2002) recounts the history of Malaysia's capital controls from the perspective of a senior Malaysian policy maker. Dornbusch (2001), Edison and Reinhart (2001), Kaplan and Rodrik (2001), Tamirisa (2001), and Kochhar and others (1999) focus on Malaysia's experiences with capital controls during the Asian crisis. Ariyoshi and others (2000) and Ishii, Ötoker-Robe, and Cui (2000) feature Malaysia in their extensive case studies of countries using capital controls. Reinhart and Reinhart (1999) evaluate effects of increases in Malaysia's reserve requirements during 1989–1994 against predictions of their theoretical model and experiences of other countries.

<sup>3</sup> For a general discussion on the economic costs and benefits of capital controls, see Eichengreen and others (1998) and Dooley (1996).

Furthermore, in tandem with imposing capital controls, Malaysia pegged the ringgit to the U.S. dollar at a rate at which many analysts believed the ringgit was undervalued.<sup>4</sup> The undervaluation made capital controls largely redundant: they became necessary neither for sustaining the exchange rate regime, despite an aggressive monetary and fiscal expansion, nor for engineering a recovery, which was largely led by exports. And since they were imposed after a substantial amount of capital had already left Malaysia, controls were not tested by any significant pressures for capital outflows either.

The costs of controls are also not obvious. Beyond the immediate but short-lived deterioration in credit ratings and spreads, it would seem far-fetched to attribute the post-crisis decline in foreign investment and activity in financial markets exclusively to capital controls. Moreover, the Malaysian authorities have taken steps to minimize the costs of controls, relaxing them shortly after introduction, so that in their strongest form capital controls were effectively in place for less than six months.

Given the difficulty of disentangling the effects of capital controls from other policies, it is not surprising that the existing empirical studies tend to attribute Malaysia's successful recovery to capital controls. Kaplan and Rodrik (2001), for example, find that Malaysia's recovery was faster and less painful when they compare Malaysia's performance during the one year after the introduction of capital controls to Korea's and Thailand's performance during the one year after the start of their IMF-supported programs. This analysis, of course, assumes that the economic situation in Malaysia in September 1998, when the country introduced capital controls, was similar to that in other crisis countries when they adopted IMF-supported programs. If September 1998 is used as a common reference point for the analysis, Malaysia's performance appears to be on a par with that of the comparator countries. Applying a gamut of time-series methodologies to daily financial data from 1995 to mid-1999, Edison and Reinhart (2001) conclude that the Malaysian controls achieved their objectives of greater interest rate and exchange rate stability and policy independence. The authors use two crisis countries that did not resort to capital controls as benchmarks for comparison, while noting the challenges of constructing an appropriate counterfactual against which Malaysia's capital controls can be evaluated.<sup>5</sup>

All in all, the current empirical literature treats the Malaysian capital controls as a single, time-invariant policy instrument. This analytical simplification is helpful, but it precludes exploring how the effects of Malaysia's capital controls depended on their design. Both the 1994 and 1998 capital control packages were intricate layouts of regulatory changes, which spanned various international financial transactions—portfolio and other

---

<sup>4</sup> See, for example, IMF (1999) and Meesook and others (2001). In the authorities' view, whether the ringgit was undervalued is debatable, given that some other currencies in the region had depreciated more than the ringgit during the crisis.

<sup>5</sup> There is also a strand of the literature emphasizing the political-economy motivation for Malaysia's capital controls during the Asian crisis (Haggard and Low, 2001, Johnson and Mitton, 2001; and Jomo, 2001). Johnson and Mitton (2001), for example, find that capital controls benefited firms with strong political connections. Latifah (2001) underscores another political-economy aspect of capital controls—protecting Malaysia's thirty-year progress in achieving “growth with equity” and in ensuring political and social stability.

capital investment, the international use of the ringgit, operations of commercial banks, foreign exchange, and (in 1998) stock market transactions—and evolved in a nonlinear manner over time. This paper contributes to the literature by discriminating among the effects of these different types of capital controls.

We examine the macroeconomic effects of Malaysia's capital account regulations in a simple error-correction model on monthly data from January 1991 to December 2002. Net portfolio inflows are modeled as a function of internal and external factors, as reflected in the real exchange rate and the real interest rate differential, and different types of capital controls. The extensiveness and intensity of capital controls are measured using specially constructed indices (similar to those used in Tamirisa 2001 and 1999).

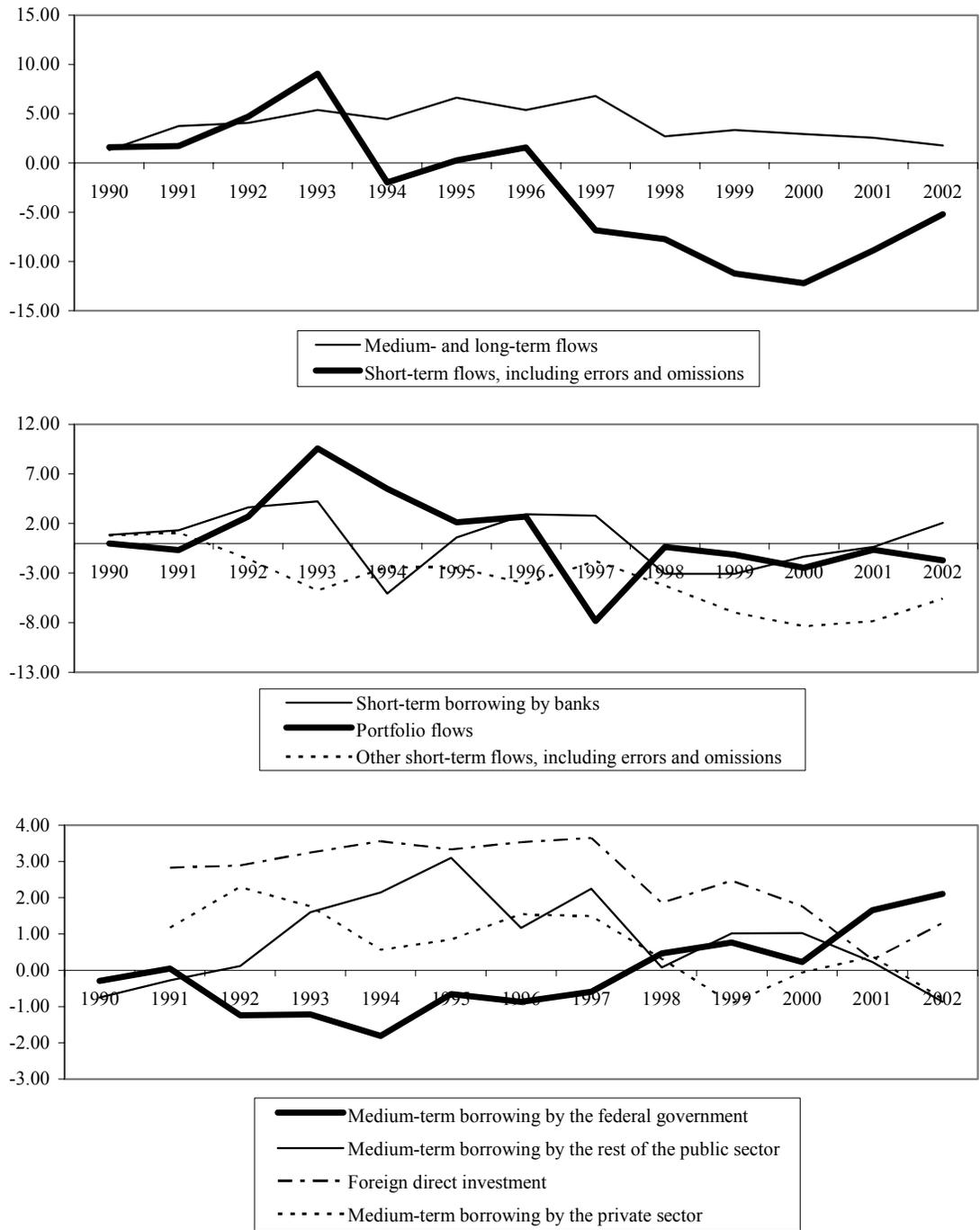
To preview the findings, the macroeconomic effects of capital controls generally vary depending on which type of international financial transaction they cover. Controls on portfolio outflows and on bank and foreign exchange operations tend to reduce the real interest rate differential, suggesting that they facilitate reductions in the domestic interest rate. Controls on portfolio inflows have the opposite effect, in line with the theoretical prior that countries use these controls to maintain the domestic interest rates above the international level. Controls on international transactions in the domestic currency and on stock market operations have no statistically significant effect on the interest rate differential. All controls have small and statistically insignificant effects on the real exchange rate.

The rest of the paper is organized as follows: Section II reviews trends in flows and regulation of the capital account in Malaysia during the 1990s. Section III describes the data necessary for a formal analysis of the relation between the two. Section IV presents an error-correction model linking the key macroeconomic variables and capital controls, and discusses the estimated effects of different capital controls. Section V concludes.

## **II. CAPITAL FLOWS AND THEIR REGULATION IN MALAYSIA**

The composition of foreign capital inflows in Malaysia varied notably during the past decade (Figure 1). Before the Asian crisis, Malaysia enjoyed strong inflows of foreign direct investment, but after the crisis these inflows failed to recover to their earlier levels. Declining until 1994 and then generally rising with the fiscal stimulus during and after the Asian crisis, medium-term borrowing by the federal government partly offset trends in borrowing or deleveraging by the rest of the public sector. Medium-term private borrowing fluctuated, with notable declines in 1994 and 1998–1999. Short-term inflows rose sharply in the early 1990s, largely on the account of portfolio equity investment and, to a lesser extent, external borrowing by banks. In 1993, for example, short-term inflows exceeded long-term ones. During the Asian crisis, in the late 1990s, short-term flows fell dramatically, again largely on the account of portfolio investment.

Figure 1. Capital Flows, 1990–2002  
(In billions of U.S. dollars)



Sources: Data provided by the Malaysian authorities, IMF staff estimates.

This pattern of capital flows partly reflected Malaysia's relatively liberal, yet fine-tuned, regulations pertaining to the capital account.<sup>6</sup> In 1968 Malaysia removed restrictions on payments and transfers for current international transactions, accepting obligations of the IMF's Article VIII. Exchange and capital account regulations were relaxed further in 1973, as Malaysia changed its official exchange regime from a fixed exchange rate to a floating one. Subsequently the authorities periodically have reviewed capital account regulations, most notably in 1986–1987, gradually liberalizing them, for example, by lowering the quantitative limits requiring approval. Overall, the structure of Malaysia's capital account regulations since the early 1970s up to the Asian crisis can be summarized as follows:

- Export proceeds had to be repatriated and sold to a domestic bank, primarily to encourage the development of the domestic foreign exchange market.
- Portfolio inflows and outflows were generally free of restrictions. An exception was portfolio investment abroad by resident corporations with domestic borrowing which was restricted to prevent the outflow of domestic funds abroad.
- Domestic and international credit transactions in foreign currency were carefully controlled. External borrowing by banks and their domestic lending in foreign currency were subject to prudential regulations. Symmetrical controls existed for residents' domestic borrowing in foreign currency. Their external borrowing above a certain limit required approval, which reportedly was given for projects that generated or saved foreign currency. This measure helped promote the "natural hedging" of private debt service payments, whereby residents borrowing externally could meet their external obligations through their foreign currency inflows.
- International trade and financial transactions in the ringgit were allowed, if not promoted. As a result of this, and partly in support of the offshore trading of the Malaysian securities, an active market for the ringgit developed offshore, mainly in Singapore.<sup>7</sup> Domestic borrowing in the ringgit by non-resident controlled companies above a certain limit was subject to approval, which was given for the financing of companies' productive investments in Malaysia, provided they had invested a certain amount of their own capital into Malaysia.

Changes in Malaysia's capital account regulations stemmed not only from periodic reviews. Most importantly, the authorities viewed selective, temporary controls as a policy option to mitigate the adverse impact of short-term flows on the domestic economy (Latifah, 2002). On two occasions Malaysia put this policy principle to a test.

---

<sup>6</sup> Latifah (2002), Ariyoshi and others (2000), and various issues of the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*.

<sup>7</sup> See Ishii, Ötoker-Robe, and Cui (2001) for a general discussion of the reasons for the emergence of the offshore currency markets for emerging market and industrial countries' currencies.

### A. 1994 Controls<sup>8</sup>

In the early 1990s, especially in 1992-93, Malaysia experienced record inflows of short-term capital, mainly in the form of portfolio investment in equities, but also external bank borrowing and nonresident ringgit deposits with banks. These inflows were largely driven by the large interest rate differential in favor of Malaysia and market expectations of ringgit appreciation, given that the authorities maintained a stable exchange rate under a tightly managed floating exchange rate regime.

The sheer magnitude of inflows presented a monetary policy dilemma for the Malaysian authorities: to give priority to containing inflation or to discouraging short-term inflows. (In the authorities' view, allowing the ringgit to appreciate would have had undesirable effects on trade and long-term investment.) As inflows soared in 1993, the authorities also became increasingly concerned about the macroeconomic implications of what they viewed as an inherently volatile, speculative capital inflows and banks' ability to intermediate them efficiently.

The authorities initially focused on controlling inflationary pressures and mopping up excess liquidity through sterilization. These operations proved costly (given the long-lasting fiscal surpluses, Treasury bills were in short supply and the authorities had to issue central bank bills at a notably higher rate than the return on foreign assets) and self-defeating (by keeping interest rates high, sterilization operations encouraged further inflows). Besides sterilization, the authorities also gradually increased statutory reserve requirements. But despite these measures, they were not able to reestablish control over the monetary conditions, and inflows continued.

Then, in January-February 1994, the authorities introduced administrative capital controls, in combination with prudential regulatory measures, to limit short-term inflows directly and to regain the monetary policy autonomy:

- Residents were prohibited from selling private and government debt securities with less than one year maturity and money market instruments to nonresidents and from engaging in non-trade-related swaps or forward transactions with nonresidents.
- Asymmetric open position limits (ceilings on banks' net liability position excluding trade-related and foreign direct investment flows) were imposed, aimed at curtailing banks' external borrowing for portfolio and other nontrade transactions.
- Commercial banks were required to place with the central bank the ringgit funds of foreign banks maintained in non-interest bearing accounts.<sup>9</sup> Subsequently, banks'

---

<sup>8</sup> See Latifah (2002) and Ariyoshi and others (2000).

<sup>9</sup> This measure was analogous to the unremunerated reserve requirements on foreign borrowing used by Chile during the 1990s.

eligible liability base was redefined to include all inflows of funds from abroad, making them subject to reserve and liquid asset requirements.

Most of these measures remained in place for less than a year, except for reserve requirements on foreign liabilities of banks. The authorities viewed the latter measures as useful to level the playing field between domestic and external sources of funding.

In parallel with imposing capital controls, the authorities curtailed sterilization operations and lowered interest rates, which also helped discourage capital inflows. Fiscal policies remained tight. Portfolio inflows and short-term borrowing by banks declined sharply during 1994 (although a year later short-term borrowing by banks recovered).

### **B. Asian Crisis Controls<sup>10</sup>**

Like other Asian currencies, the ringgit came under intense pressure in 1997, especially in the offshore market. Domestic funds started to flee the country through bank and other channels, and foreign investors started to liquidate their portfolio, mainly equity, holdings. By end-August 1998, Malaysia had lost about one third of its reserves or close to \$10.5 billion in capital outflows, the ringgit had depreciated by about 65 percent against the U.S. dollar, and the stock market had fallen by 75 percent from the pre-crisis levels of end-December 1996.

The authorities' initial policy response aimed at breaking the link between the domestic and offshore interest rates. In August 1997 they imposed limits on ringgit non-trade-related swap transactions with nonresidents, with a fleeting success: Ringgit funds continued to flow offshore, and pressures on domestic interest rates continued to build up. Although the authorities raised domestic interest rates by several percentage points, the almost 20 percent differential with offshore rates remained. Concerned about accelerating economic contraction and growing problems in the corporate and banking sectors, the authorities hesitated to raise interest rates any further.

Instead, in September 1998, Malaysia introduced a package of capital controls aimed to eliminate the offshore ringgit market and regain monetary independence, while at the same time preventing any further capital outflows:

- To close all potential channels for taking speculative positions against the ringgit and transferring ringgit abroad, investors were required to repatriate all ringgit held offshore back to Malaysia, licensed offshore banks were prohibited from trading in ringgit assets, and residents were prohibited from granting or receiving ringgit credit vis-à-vis nonresidents.
- To prevent capital outflows by nonresidents as well as residents, the authorities imposed a one-year holding period on nonresidents' repatriating proceeds from the

---

<sup>10</sup> See Latifah (2002), Tamirisa (2001), Ariyoshi and others (2000), and Kochhar and others (1999).

sale of Malaysian securities and a prior approval requirement beyond a certain limit on residents' transferring capital abroad.

- To eliminate potential loopholes for circumvention of capital controls, the authorities also prohibited offshore trading of ringgit assets,<sup>11</sup> demonetized large-denomination ringgit notes, and amended the Company Act to limit dividend payments.

Concurrently, the authorities pegged the ringgit to the U.S. dollar, at an undervalued rate, relaxed monetary and fiscal policies, and accelerated corporate and financial sector reforms.

For trade and direct investment transactions, the authorities preserved the status quo regime. Besides the requirement to settle trade transactions in foreign currencies, current account transactions remained free of restrictions. Repatriation of profit, interest, dividends, fees, and commissions, and rental income from portfolio investment and other forms of ringgit assets also remained free. Direct investment was exempt from the holding period.<sup>12</sup>

Since September 1998, the authorities have gradually relaxed controls on portfolio outflows. The one-year holding period was removed in mid-February 1999, when the repatriation of portfolio capital by nonresidents became subject to a graduated levy. In September 1999, the levies was unified at the ten percent level, and then removed in May 2001. The prohibition on the extension of credit to nonresidents was relaxed in December 2000. Banks were allowed to extend intraday credit of up to RM 200 million and overnight credit of up to RM 10 million to nonresident stock-broking companies and global custodian banks for nonresidents' purchases of securities on the Kuala Lumpur Stock Exchange. The quantitative limits on imports and exports of ringgit and foreign currency notes were relaxed for border traders in selected areas in March 1999.

### III. WHAT DO THE QUANTITATIVE DATA TELL US?

To explore the macroeconomic implications of Malaysia's capital controls further, we compile monthly data on macroeconomic and regulatory variables, covering the period from January 1991 to December 2002.<sup>13</sup> Summary statistics and correlations for all data series are presented in Table 1.

Series on net foreign portfolio assets in Malaysia (denoted by *SPFAS*) are constructed as cumulative flows from Bank Negara Malaysia's *Cash Balance of Payments Reporting System*, adjusted for valuation changes using the Kuala Lumpur Stock Exchange Composite

---

<sup>11</sup> Trading in Malaysian shares on Singapore's Central Limit Order Book was *de facto* prohibited as a result of a strict enforcement of the existing law requiring Malaysian shares to be registered in the Kuala Lumpur Stock Exchange prior to trade.

<sup>12</sup> Repatriation of proceeds from sale of immovable property and profits from MESDAQ (where growth and technology stocks are listed), commodities, and futures traded on the Malaysian exchange were also exempt.

<sup>13</sup> The sample period is constrained by the availability of data on foreign portfolio assets.

Index (in line with Lane and Milesi-Ferreti, 1999) and taken in the logarithmic terms.<sup>14</sup> The series on foreign portfolio assets in Malaysia are then normalized by foreign portfolio assets held globally, to isolate the country-specific trends in foreign portfolio holdings. The global holdings of foreign portfolio assets are proxied by net U.S. investment in foreign portfolio assets from the U.S. Treasury's *International Capital System*, adjusted for valuation changes using the Morgan Stanley Capital Indices (MSCI) Global Index, excluding changes in the U.S. prices, and taken in the logarithmic form. The initial values for asset series are based on the U.S. and Malaysia's international investment positions at end-1990, available from the IMF's *International Financial Statistics (IFS)*.

Other macroeconomic data are also from the *IFS*. The real exchange rate (*REXR*) is the CPI-based rate of the ringgit vis-à-vis the U.S. dollar, in the logarithmic terms. The real interest rate differential (*RRDIF*) is calculated using the money market rate in Malaysia for the domestic interest rate, the Eurodollar rate in London for the world interest rate, and the percentage change in Malaysia's and U.S. consumer price indices.

Table 1. Descriptive Statistics

A. Summary Statistics

	<i>SPFAS</i>	<i>REXR</i>	<i>RRDIF</i>	<i>CPFIN</i>	<i>CPFOUT</i>	<i>CRM</i>	<i>CBNK</i>	<i>CSM</i>
Mean	0.45	4.41	0.30	0.08	0.21	0.41	0.14	0.40
Standard deviation	0.07	0.18	1.94	0.19	0.13	0.17	0.15	0.47
Minimum	0.31	4.06	-3.45	0.00	0.11	0.27	0.00	0.00
Maximum	0.57	4.63	5.87	0.93	0.78	0.75	0.44	1.00

B. Correlations

<i>SPFAS</i>	1.00	0.68	0.04	0.15	-0.40	-0.49	-0.41	-0.54
<i>REXR</i>	0.68	1.00	0.42	0.30	-0.48	-0.77	-0.80	-0.93
<i>RRDIF</i>	0.04	0.42	1.00	0.14	-0.56	-0.58	-0.65	-0.51
<i>CPFIN</i>	0.15	0.30	0.14	1.00	-0.14	-0.30	-0.06	-0.38
<i>CPFOUT</i>	-0.40	-0.48	-0.56	-0.14	1.00	0.77	0.67	0.60
<i>CRM</i>	-0.49	-0.77	-0.58	-0.30	0.77	1.00	0.76	0.91
<i>CBNK</i>	-0.41	-0.80	-0.65	-0.06	0.67	0.76	1.00	0.82
<i>CSM</i>	-0.54	-0.93	-0.51	-0.38	0.60	0.91	0.82	1.00

Source: The author's estimates.

<sup>14</sup> Equities accounted for about 80 percent of foreign portfolio flows to Malaysia during 1991–2002 (CEIC database).

The strength of capital controls is approximated by the unique monthly indices, similar to those used in Tamirisa (2001 and 1999) (Figure 2). The indices cover:

- controls on inflows and outflows of portfolio capital (denoted by *CPFIN* and *CPFOUT*, respectively), for example, a prohibition for residents to sell Malaysian securities to nonresidents or the imposition of a waiting period for nonresidents to convert ringgit proceeds from the sale of Malaysian securities.
- controls on international transactions in the ringgit (*CRM*), for example, a prohibition for residents to grant ringgit credit facilities to nonresidents.
- controls on bank operations and foreign exchange market transactions (*CBNK*), for example, a ceiling on banks' net external liability position or a limit on banks' outstanding swap transactions with nonresidents.
- controls on stock market operations (*CSM*), for example, a ban on short-selling of the listed stocks.

These indices summarize changes in Malaysia's capital account regulations during 1991–2002, which are described in detail in Table 1 of the Appendix.

For each category of capital account transaction, the capital control index is constructed as the weighted sum of the individual capital controls in this category which were in place in a given month normalized by the weighted cumulative sum of capital controls introduced since January 1991. Weighting allows us to capture better the gradual changes in capital controls, especially the unwinding of the Asian crisis controls.

Weights are assigned based on considerations relating to the monitoring and enforcement of capital controls by the Malaysian authorities. Prohibition is given the weight of 1. Quantitative limits, approval requirements, and a tax greater than ten percent have the weight of 0.5: Bank Negara Malaysia (BNM) apparently succeeded in monitoring and enforcing capital controls in general and quantitative limits in particular through close collaboration with commercial banks, building on the pre-existing relationship with the banks that reflected the fact that many capital account transactions had already been subject to BNM approval.<sup>15</sup> Approval requirements in Malaysia reportedly are not equivalent to outright prohibitions or notification requirements: approvals are issued based on specific criteria, the applicability of which is assessed in each particular case, and approval is issued or not issued depending on this assessment. Lastly, notification requirements, a tax less than ten percent, and other similar measures are given the weight of 0.2.

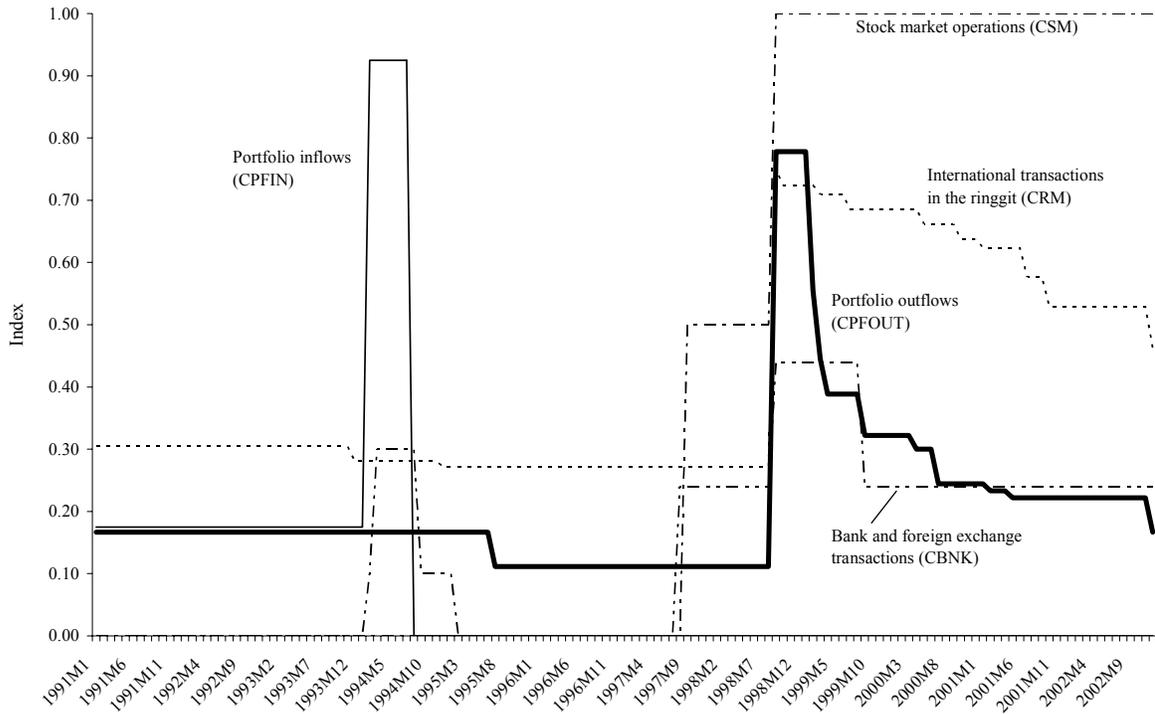
By construction indices reflect the extensiveness and intensity of capital controls. They range from 0 to 1, with higher values indicating tighter and/or more extensive controls.

---

<sup>15</sup> Bank Negara Malaysia's reputation as a strict regulator might have also prevented foreign banks from exploring ways to circumvent controls, for fear of losing their local franchises.

Although indices are constructed as the *de jure* measures, in Malaysia's case, they are likely to reflect the *de facto* strength of controls as well, given that the enforcement of capital account regulations in Malaysia has been reportedly strong (see Tamirisa, 2001).

Figure 2. Capital Controls, 1991–2002

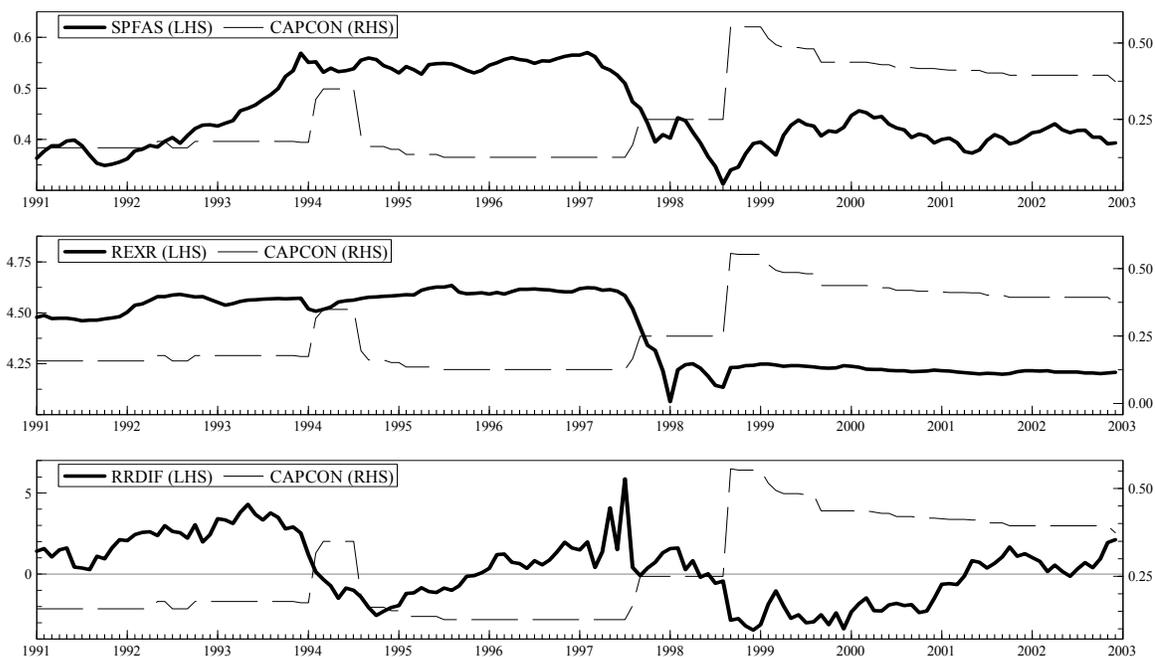


Source: The author's estimates.

Next, we juxtapose changes in capital controls and various macroeconomic variables graphically (Figure 3). For the illustrative purposes, in this figure, capital controls are represented by an aggregate index (*CAPCON*), which is a simple average of the five indices for categories of capital control described above. The aggregate index clearly identifies the two episodes when Malaysia used temporary controls on short-term capital flows, but does not show the specific design of the respective packages of capital controls.

The behavior of the series is interesting in several respects: Even after controlling for the global trends, foreign portfolio investment in Malaysia exhibits strong growth during November 1991–December 1993; it subsequently stabilized, before declining sharply in March 1997. It started to recover in September 1998, but never returned to its pre-crisis levels. The real exchange rate has been appreciating gradually until May 1997, and remained broadly stable, albeit at a much lower level, following a large depreciation during the crisis. The real interest rate differential was positive during 1991–1993 before turning negative in 1994. Following financial market jitters during the first half of 1997, the interest rate differential turned negative in the middle of 1998. In recent years, a small positive differential emerged.

Figure 3. Capital Controls and Macroeconomic Variables, 1991–2002 <sup>1/</sup>



Sources: The IMF's *International Financial Statistics*, Bank Negara Malaysia's *Cash Balance of Payments Reporting System*, the U.S. Treasury's *International Capital System*, Bloomberg, and the author's estimates.  
<sup>1/</sup> RRDIF is in percent, REXR and CAPCON are indices, SPFAS is a share.

#### IV. AN ERROR-CORRECTION MODEL WITH CAPITAL CONTROLS

Next we examine macroeconomic effects of different types of capital controls in a simple empirical model of foreign portfolio investment in Malaysia.<sup>16</sup> In line with the portfolio balance approach, we model net inflows of foreign portfolio investment in Malaysia as a linear function of external and domestic factors such as the real exchange rate; domestic and foreign interest rates and inflation, as summarized in the real interest rate differential, and different types of capital controls.<sup>17</sup> The model controls for policies other than capital controls implicitly, via the exchange rate and the domestic interest rate and inflation included in the real interest rate differential.<sup>18</sup> The error-correction framework also allows us to

<sup>16</sup> Although capital controls covered portfolio investment and did not extend to direct investment, they might have discouraged the latter indirectly (Figure 1), to the extent that they led foreign investors to perceive Malaysia as a less secure destination for direct investment. Modeling the relation between direct investment and capital controls requires a different conceptual framework and is beyond the scope of this paper.

<sup>17</sup> For a discussion of this conceptual approach to modeling capital flows, see Cardoso and Goldfajn (1998); Calvo, Leiderman, and Reinhart (1996); and Fernandez-Arias and Montiel (1995). The structure of the model is broadly in line with a comprehensive macroeconomic model constructed by Liu (2001) for Malaysia.

<sup>18</sup> Monthly data on the fiscal balance are not available. The monthly industrial production index was not included in the model as this makes the cointegrating vector unstable. Likewise, the domestic interest rate was not adjusted for expected depreciation as this yields an unstable equilibrium relation. Liu (2001) explains the

(continued...)

control for deviations of the key macroeconomic variables from their long-run equilibrium levels, via the error-correction term included in the short-run dynamic equations.

We determine the order of integration for the variables in the data set using Dickey-Fuller (ADF) tests. All series—foreign portfolio assets, the real exchange rate, and the real interest rate differential—appear integrated of order one (Table 2).

Table 2. Unit Root Tests <sup>1/</sup>

<i>H0</i>	<i>SPFAS</i>	<i>REXR</i>	<i>RRDIF</i>
<i>I(0)</i>	-1.73	-2.22	-1.68
<i>I(1)</i>	-6.52*	-9.48*	-16.91*

Source: The author's estimates.

<sup>1/</sup> ADF statistics are based on the highest significant lag. Constant and trend are included. An asterisk indicates significance at the 1 percent level.

Next we test for cointegration using Johansen's maximum likelihood procedure with 12 lags (Table 3).<sup>19</sup> The null of no cointegration is rejected in favor of one cointegrating relationship. The recursively estimated eigenvalue is reasonably stable over time. Individual tests on the feedback coefficients show that foreign portfolio assets are weakly exogenous, i.e., there is no feedback from the cointegrating relationship to this variable. All variables are significant in the cointegrating vector. The cointegrating vector is given by:

$$CI = SPFAS - 0.725 REXR + 0.013 RRDIF - 0.002 TREND. \quad (1)$$

In the long run, higher foreign portfolio assets in Malaysia are associated with an appreciating exchange rate and a positive trend growth. The negative relation between foreign portfolio holdings in Malaysia and the real interest rate differential is counterintuitive at the first sight, to the extent that a higher world interest rate should represent an increase in the opportunity cost for industrial countries' investing in an emerging market country. This line of thinking, however, assumes that the emerging market country is competing actively with domestic investors from industrial countries for their countries' funds. In an extensive study of capital flows, Chen and Khan (1997) show that this is not the case for all emerging

---

difficulty of identifying an equilibrium relation linking various markets in Malaysia by the authorities' relatively heavy-handed approach to macroeconomic management, which tends to distort the role of market forces in adjustment.

<sup>19</sup> Capital control measures are not included in the cointegration analysis, as by construction they contain numerous structural breaks, hindering the identification of a stable cointegrating relation. Moreover, the capital control indices proxy *changes* in capital account regulations.

markets: when the U.S. interest rate dropped, only high growth Asian Newly Industrialized Economies<sup>20</sup> could attract portfolio equity investment from the U.S.—flows to other Asian emerging markets fell.

Table 3. Cointegration Analysis <sup>1/</sup>

A. Eigenvalue statistics									
	p = 0			p = 1			p = 2		
Trace test	43.71**			17.93			5.77		
Max test	25.78**			12.16			5.77		
B. Standardized eigenvectors $\beta$				C. Standardized feedback coefficients $\alpha$					
	<i>SPFAS</i>	<i>REXR</i>	<i>RRDIF</i>		<i>SPFAS</i>	<i>REXR</i>	<i>RRDIF</i>		
<i>SPFAS</i>	1.00	-3.15	-5.62	<i>SPFAS</i>	0.04	0.02	0.00		
<i>REXR</i>	-0.74	1.00	4.38	<i>REXR</i>	0.22	0.02	0.00		
<i>RRDIF</i>	0.01	-0.05	1.00	<i>RRDIF</i>	-18.20	0.35	-0.05		
<i>TREND</i>	0.00	0.00	0.02						
D. Tests of weak exogeneity $\chi^2$ (1)				E. Tests of significance $\chi^2$ (1)					
	<i>SPFAS</i>	<i>REXR</i>	<i>RRDIF</i>		<i>REXR</i>	<i>RRDIF</i>	<i>TREND</i>		
	0.19	3.14***	11.66*		13.31*	9.57*	13.59*		

Source: The author's estimates.

<sup>1/</sup> Cointegrated VAR model includes 12 lags, a constant, a trend, and seasonal factors. \* (\*\*, \*\*\*) indicates significance at the 1 percent (5 percent, 10 percent) level.

Weak exogeneity in the cointegrating vector allows us to analyze it in a two-equation conditional error-correction model, whereby the exchange rate and the interest rate differential change in response to various types of capital controls and a disequilibrium among foreign portfolio assets, the exchange rate, and the interest rate differential. The model can be summarized in the general form as follows:

$$\begin{aligned} DREXR &= \varphi(DSPFAS, DREXR, DRRDIF, CI, CPFIN, CPFOUT, CRM, CBNK, CSM) \\ DRRDIF &= \psi(DSPFAS, DREXR, DRRDIF, CI, CPFIN, CPFOUT, CRM, CBNK, CSM), \end{aligned} \quad (2)$$

where  $D$  indicates the first difference, and operators for 11 lags are dropped for simplicity.

Next we reduce the above congruent autoregressive distributed lag model to a parsimonious encompassing model (Table 4). The application of the general-to-specific modeling methodology (Hendry, 1995) ensures that the parsimonious model is well

<sup>20</sup> Hong Kong, Special Administrative Region; Korea, Singapore, and Taiwan Province of China.

Table 4. Conditional Error-Correction Model <sup>1/</sup>

	Equation for DREXR				Equation for DRRDIF				
	Coefficient	Standard error	t-value	t-probability	Coefficient	Standard error	t-value	t-probability	
Constant	0.68	0.11	6.27	0.00	Constant	-21.29	4.08	-5.21	0.00
DRRDIF_1	0.00	0.00	3.91	0.00	DRRDIF_1	-0.68	0.06	-10.70	0.00
DRRDIF_10	0.00	0.00	3.24	0.01	DRRDIF_2	-0.24	0.07	-3.62	0.01
DREXR_1	0.32	0.05	6.25	0.00	DREXR_3	-7.47	1.87	-4.00	0.00
DREXR_2	-0.28	0.06	-4.90	0.00	DREXR_5	-8.20	2.48	-3.31	0.01
DREXR_3	0.15	0.06	2.45	0.04	DSPFAS_1	-10.45	3.89	-2.69	0.03
DREXR_5	-0.26	0.05	-5.20	0.00	DSPFAS_6	-19.06	3.97	-4.80	0.00
DREXR_7	-0.29	0.05	-6.27	0.00	DSPFAS_10	-13.51	3.91	-3.46	0.01
DREXR_9	-0.27	0.06	-4.49	0.00	CI_2	-7.45	1.40	-5.31	0.00
DREXR_11	0.34	0.05	6.66	0.00	CPFIN_1	3.58	0.53	6.81	0.00
DSPFAS	0.33	0.07	4.47	0.00	CPFIN_4	-1.93	0.58	-3.33	0.01
DSPFAS_8	0.19	0.08	2.46	0.04	CPFIN_6	1.33	0.53	2.51	0.04
CI_11	0.23	0.04	6.30	0.00	CPFIN_9	-0.94	0.43	-2.20	0.06
CPFIN	0.04	0.01	4.84	0.00	CPFOUT_4	-3.84	1.46	-2.63	0.03
CPFIN_1	0.04	0.01	4.43	0.00	CPFOUT_5	3.61	1.01	3.57	0.01
CPFIN_4	-0.10	0.01	-8.98	0.00	CPFOUT_8	-2.49	0.70	-3.56	0.01
CPFIN_5	0.02	0.01	2.20	0.06	CRM_4	4.85	1.96	2.47	0.04
CPFIN_6	0.04	0.01	4.84	0.00	CRM_11	-4.21	1.12	-3.76	0.01
CPFIN_10	-0.03	0.01	-3.94	0.00	CBNK	-11.46	1.39	-8.25	0.00
CPFOUT	0.25	0.02	12.50	0.00	CBNK_3	8.20	1.53	5.38	0.00
CPFOUT_1	-0.28	0.02	-13.50	0.00	CBNK_5	-3.38	1.41	-2.39	0.04
CPFOUT_2	0.21	0.03	6.06	0.00	CBNK_8	3.74	1.14	3.27	0.01
CPFOUT_3	-0.13	0.04	-3.23	0.01	CSM	-2.26	1.09	-2.07	0.07
CPFOUT_5	-0.22	0.03	-7.70	0.00	CSM_1	3.23	1.06	3.03	0.02
CPFOUT_6	0.28	0.03	10.20	0.00	CSM_7	-2.56	0.67	-3.84	0.01
CPFOUT_7	-0.13	0.03	-4.21	0.00	CSM_10	2.67	0.88	3.03	0.02
CPFOUT_8	0.09	0.03	2.93	0.02					
CPFOUT_10	-0.08	0.02	-3.73	0.01					
CRM_3	0.12	0.05	2.35	0.05					
CRM_4	-0.11	0.03	-3.13	0.01					
CRM_8	0.13	0.05	2.77	0.02					
CRM_10	-0.16	0.04	-3.83	0.01					
CBNK	-0.21	0.02	-10.30	0.00					
CBNK_2	-0.04	0.02	-1.91	0.09					
CBNK_3	0.22	0.03	7.65	0.00					
CBNK_9	-0.06	0.02	-2.49	0.04					
CBNK_11	0.05	0.02	3.18	0.01					
CSM_3	-0.22	0.02	-13.50	0.00					
CSM_5	0.52	0.02	24.40	0.00					
CSM_6	-0.46	0.04	-12.40	0.00					
CSM_7	0.26	0.04	5.93	0.00					
CSM_8	-0.29	0.05	-6.18	0.00					
CSM_9	0.10	0.02	4.77	0.00					
CSM_10	0.09	0.03	3.60	0.01					

Single equation tests:

Sigma = 0.01  
 Portmanteau (12) = 18.13  
 AR test: F (1, 7) = 26.08 (probability 0.00)  
 ARCH test: F (1, 91) = 2.49 (probability 0.12)  
 Normality test:  $\chi^2$  (2) = 0.46 (probability 0.80)

Sigma = 0.45  
 Portmanteau (12) = 8.41  
 AR test: F (1, 7) = 14.64 (probability 0.01)  
 ARCH test: F (1, 91) = 0.05 (probability 0.82)  
 Normality test:  $\chi^2$  (2) = 1.48 (probability 0.48)

System tests:

Number of observations = 132  
 Number of parameters = 78  
 Log-likelihood = 431.85  
 Portmanteau (12) = 38.22  
 AR test: F (4, 180) = 0.41 (probability 0.80)  
 Normality test:  $\chi^2$  (4) = 2.21 (probability 0.70)

Source: The author's estimates.

<sup>1/</sup> "D" denotes the first difference. "CI" denotes the cointegration vector. Standard errors are heteroscedastic consistent. The DREXR equation includes dummy variables for 1994(1) and 1997(1) and seasonal factors lagged by 7 and 8 months. The DRRDIF equation includes dummy variables for 1992(1) and 1997(3, 5, 7).

specified: The goodness-of-fit measures are adequate. Although the null hypothesis of no autocorrelation is rejected for individual equations, for the system as a whole there is no evidence of autocorrelation. Standard errors are consistent estimates even if the residuals were to be heteroscedastic in an unknown way. Normality holds. Constancy is accepted on the basis of the one-step and breakpoint Chow tests.

The results suggest that the magnitude and direction of the macroeconomic effects arising from changes in Malaysia's capital account regulations tend to vary by the type of capital controls (Table 5). Controls on portfolio inflows had a positive, statistically strong impact on the real interest rate differential, consistent with their theoretical role of driving a wedge between domestic and international interest rates so that the domestic rate stays above the international level. Controls on portfolio outflows had the opposite effect, implying that they facilitated reductions in the domestic interest rate. Controls on bank and foreign exchange operations, which supported controls on portfolio outflows, also helped lower the domestic interest rates, possibly because they helped delink the onshore and offshore financial markets. Controls on international transactions in the ringgit and on stock market operations had no statistically significant effects on the interest rate differential. Notwithstanding their measurable effects on the interest rate differential, the effect of all capital controls on the real exchange rate was statistically insignificant, broadly in line with the findings of other country studies reviewed by Dooley (1996).

Table 5. Macroeconomic Effects of Capital Controls <sup>1/</sup>

	<i>DREXR</i>	<i>DRRDIF</i>
<i>CPFIN</i>	0.01	2.04 *
<i>CPFOUT</i>	0.00	-2.72 *** <sup>2/</sup>
<i>CRM</i>	-0.02	0.64
<i>CBNK</i>	-0.04	-2.90 ***
<i>CSM</i>	0.02	1.08

Source: The author's estimates.

<sup>1/</sup> Aggregating across lags. \* (\*\*\*) denotes significance at the 1 percent (10 percent) level.

<sup>2/</sup> Significant at the 11.5 percent level.

## V. CONCLUSION

This paper explores the macroeconomic effects of different types of capital controls, focusing on Malaysia's experiences in the 1990s. The pattern of Malaysia's capital account regulations was intricate, covering a diverse array of international financial transactions and evolving in a complex manner over time. In an error-correction framework, we find that the macroeconomic effects of capital controls generally varied depending on their type. Controls on portfolio outflows, and bank and foreign exchange operations facilitated interest rate reductions, while controls on portfolio inflows had the opposite effect. The impact of controls on the real exchange rate was negligible.

Table 1. Changes in Capital Account Regulations, 1991–2002 <sup>1/</sup>

Date	Measure	Category
1991	No changes	
4/20/1992	Total borrowing by residents in foreign currency from domestic commercial and merchant banks to finance imports of goods and services was restricted to the equivalent of RM 1 million (previously there were no limits).	Borrowing in foreign currency domestically and abroad
7/9/1992	Borrowing under the Export Credit Refinance Facilities (both pre- and post-shipment financing) by non-resident controlled companies would be considered domestic borrowing.	Borrowing in foreign currency domestically and abroad
10/24/1992	Offshore guarantees obtained by residents to secure domestic borrowing, except offshore guarantees (whether denominated in ringgit or foreign currency) without recourse to Malaysian residents and obtained from the licensed offshore banks in Labuan to secure domestic borrowing, were deemed as foreign borrowing. In cases where an offshore guarantee is denominated in ringgit, it was subject to the condition that, in the event the guarantee is called on, the licensed offshore banks in Labuan must make payments in foreign currency (with some exceptions), not in ringgit.	Borrowing in foreign currency domestically and abroad
12/14/1992	Residents and the offshore companies in Labuan were prohibited from transacting with the residents of dealing in the currency of the FYR Yugoslavia (Serbia and Montenegro) without specific prior approval from the Controller of Foreign Exchange.	Currency requirements
12/22/1993	Nonresident controlled companies involved in manufacturing and tourism-related activities were freely allowed to obtain domestic credit facilities to finance the acquisition and/or the development of immovable property required for their own business activities.	International transactions in ringgit
1/17/1994	A ceiling was placed on the net external liability position of domestic banks (excluding trade-related and direct investment inflows) (removed on January 20, 1995).	Bank and foreign exchange transactions
1/24/1994	Residents were prohibited to sell the following Malaysian securities to nonresidents: banker's acceptances; negotiable instruments of deposit; Bank Negara bills; treasury bills; government securities (including Islamic securities) with a remaining maturity of one year or less.	Inflows of portfolio and other capital
2/7/1994	Residents were prohibited to sell to nonresidents all forms of private debt securities (including commercial papers, but excluding securities convertible into ordinary shares) with a remaining maturity of one year or less.	Inflows of portfolio and other capital
2/7/1994	The restriction on the sale of Malaysian securities to nonresidents was extended to both the initial issue of the relevant security and the subsequent secondary market trade.	Inflows of portfolio and other capital
2/23/1994	Prohibition of forward transactions (on bid side) and nontrade-related swaps by commercial banks with foreign customers to curtail the speculative activities of offshore agents seeking long positions in ringgit (lifted on August 16, 1994).	Bank and foreign exchange transactions
8/12/1994	Residents were permitted to sell to nonresidents any Malaysian securities.	Inflows of portfolio and other capital
12/1/1994	Residents may borrow in foreign currency up to a total of the equivalent of RM 5 million from nonresidents and from commercial and merchant banks in Malaysia.	Borrowing in foreign currency domestically and abroad
12/1/1994	Nonresident-controlled companies were allowed to obtain credit facilities, including immovable property loans, up to RM 10 million without specific approval, provided that at least 60 percent of their total credit facilities from banking institutions were obtained from Malaysian-owned financial institutions.	International transactions in ringgit
12/1/1994	Nonresidents with valid work permits may obtain domestic borrowing to finance up to 60 percent of the purchase price of residential property for their own accommodation.	International transactions in ringgit
6/27/1995	Corporate residents with a domestic credit facility were allowed to remit funds up to the equivalent of RM 10 million for overseas investment purposes each calendar year.	Outflows of portfolio and other capital
2/1/1996	The threshold for the completion of the statistical forms for each remittance to or receipt of funds from, nonresidents was raised from amounts exceeding RM 50,000 to RM 100,000 or its equivalent in foreign currency.	Payments for invisible transactions
8/4/1997	Controls were imposed on banks to limit outstanding noncommercial-related ringgit offer-side swap transactions (i.e., forward order/spot purchases of ringgit by foreign customers) to \$2 million per foreign customer or its equivalent. Hedging requirements of foreigners for trade-related and genuine portfolio and foreign direct investment investments were excluded.	Bank and foreign exchange transactions
8/4/1997	Residents are allowed to enter into non-commercial-related swap transactions up to a limit (no limits previously).	Bank and foreign exchange transactions
8/28/1997	A ban on short-selling of the listed securities on KLSE was introduced to limit speculative pressures on stock prices and exchange rates.	Stock market transactions

Table 1. Changes in Capital Account Regulations, 1991–2002 (Continued)

Date	Measure	Category
9/1/1998	A requirement introduced to repatriate all ringgit held offshore (including ringgit deposits in overseas banks) by October 1, 1998 (BNM approval thereafter).	International transactions in ringgit
9/1/1998	Approval requirement was imposed to transfer funds between external accounts (freely allowed previously) and for the use of funds other than permitted purposes (i.e., purchase of RM assets).	International transactions in ringgit
9/1/1998	Licensed offshore banks were prohibited to trade in ringgit assets (allowed up to permitted limits previously).	International transactions in ringgit
9/1/1998	A limit was introduced on exports and imports of ringgit by residents and nonresident travelers, effective September 1, 1998 (no limits existed previously).	International transactions in ringgit
9/1/1998	Residents were prohibited from granting ringgit credit facilities to nonresident corresponding banks and stockbroking companies (subject to a limit previously).	International transactions in ringgit
9/1/1998	Residents were prohibited from obtaining ringgit credit facilities from nonresidents (subject to a limit previously).	International transactions in ringgit
9/1/1998	All imports and exports were required to be settled in foreign currency.	International transactions in ringgit
9/1/1998	All purchases and sales of ringgit facilities can only be transacted through authorized depository institutions.	International transactions in ringgit
9/1/1998	Approval requirement for nonresidents to convert RM in external accounts into foreign currency, except for purchases of RM assets, conversion of profits, dividends, interest, and other permitted purposes (no such restrictions previously)	Outflows of portfolio and other capital
9/1/1998	No restriction on conversion of ringgit funds in external accounts of nonresidents with work permits, embassies, high commissions, central banks, international organizations, and missions of foreign countries in Malaysia.	Outflows of portfolio and other capital
9/1/1998	A 12-month waiting period for nonresidents to convert RM proceeds from the sale of Malaysian securities held in external accounts (excluding FDI, repatriation of interest, dividends, fees, commissions, and rental income from portfolio investment). No such restrictions previously.	Outflows of portfolio and other capital
9/1/1998	A prior approval requirement beyond a certain limit for all residents to invest abroad in any form (previously applied only to corporate residents with domestic borrowing).	Outflows of portfolio and other capital
9/1/1998	Trading in Malaysian shares on Singapore's CLOB OTC market became de facto prohibited as a result of strict enforcement of the existing law requiring Malaysian shares to be registered in KLSE prior to trade.	Stock market transactions
9/1/1998	A specific limit on exports of foreign currency by residents and up to the amount brought into Malaysia for nonresidents (previously, no restriction on export of foreign currency on person or in baggage of a traveler; export by other means required approval, regardless of amount).	Export and import of currency
12/12/1998	Residents are allowed to grant loans to nonresidents for purchases of immovable properties from December 12, 1998 to January 12, 1999.	International transactions in ringgit
1/13/1999	Capital flows for the purpose of trading derivatives on the commodity and monetary exchange of Malaysia and the Kuala Lumpur options and financial futures exchange were permitted for nonresidents, without being subject to the rules governing external accounts, when transactions were conducted through "designated external accounts" that could be created with tier-1 commercial banks in Malaysia. (From September 1999, the classification of tier-1 and tier-2 banks became no longer applicable: All commercial banks were allowed to open designated accounts for nonresidents.)	Derivatives
2/15/1999	The 12-month waiting period replaced with a graduated system of exit levy on the repatriation of the principal of capital investments (in shares, bonds, and other financial instruments, except for property investments) made prior to February 15, 1999. The levy decreased over the duration of the investment, and thus penalized earlier repatriations; the levy was 30 percent if repatriated less than 7 months after entry, 20 percent if repatriated in 7-9 months; and 10 percent if 9-12 months. No levy on principal if repatriated after 12 months.	Outflows of portfolio and other capital
2/18/1999	Repatriation of funds relating to investments in immovable property is exempted from the exit levy regulations.	Outflows of portfolio and other capital
3/1/1999	The ceiling on the import and export of ringgit for border trade with Thailand was raised.	International transactions in ringgit
4/5/1999	Investors in MESDAQ were exempted from the exit levy introduced on February 15, 1999.	Outflows of portfolio and other capital
7/8/1999	Residents were allowed to grant overdraft facility in aggregate not exceeding RM200 million for intra-day and not exceeding RM5 million for overnight to a foreign stockbroking company subject to certain conditions.	International transactions in ringgit
9/21/1999	Commercial banks were allowed to enter into short-term currency swap arrangement with nonresident stockbrokers to cover for payment for purchases of shares on the KLSE and in outright ringgit forward sale contract with nonresidents who have firm commitment to purchase shares on the KLSE, for maturity period not exceeding five working days and with no rollover option.	Bank and foreign exchange transactions
10/4/1999	Residents are allowed to grant RM loans to nonresidents for purchases of immovable properties from October 29, 1999 to December 7, 1999.	International transactions in ringgit
3/14/2000	Funds arising from sale of securities purchased by nonresidents on the CLOB can be repatriated without payment of exit levy.	Outflows of portfolio and other capital
4/24/2000	Nonresident controlled companies raising domestic credit through private debt securities were exempted from RM 19 million limit and the 50:50 requirement for issuance of private debt securities on tender basis through the fully automated system for tendering, to develop domestic bond market.	International transactions in ringgit
6/29/2000	Administrative procedures issued to facilitate classification of proceeds from the sale of CLOB securities as being free from levy.	Outflows of portfolio and other capital

Table 1. Changes in Capital Account Regulations, 1991–2002 (Concluded)

Date	Measure	Category
7/27/2000	Residents and nonresidents were no longer required to make a declaration in the traveler's declaration form as long as they carry currency notes and/or travelers' checks within the permissible limits. For nonresidents, the declaration was incorporated into the embarkation card issued by the Immigration department.	Export and import of currency
9/30/2000	Licensed offshore banks in the Labuan international offshore fin center were allowed to invest in RM assets and instruments in Malaysia for their own accounts only and not on behalf of clients. The investments could not be financed by ringgit borrowing.	International transactions in ringgit
12/1/2000	Foreign-owned banks in Malaysia were allowed to extend up to 50 percent (previously 40 percent) of the total domestic credit facilities to nonresident controlled companies, in case of credit facilities extended by resident banks. This is to fulfill Malaysia's commitment under the GATS.	Domestic lending by foreign-owned banks
12/20/2000	Licensed com banks were allowed to extend intraday overdraft facilities not exceeding RM 200 mil in aggregate and overnight facilities not exceeding RM 10 mil (previously 5 mil) to foreign stockbroking companies and foreign global custodian banks.	International transactions in ringgit
2/1/2001	The exit levy on profits repatriated after one year from the month the profits are realized was abolished. Portfolio profits repatriated within one year remained subject to the 10 percent levy.	Outflows of portfolio and other capital
5/1/2001	The 10 percent exit levy imposed on profits arising from portfolio investments repatriated within one year of realization was abolished.	Outflows of portfolio and other capital
6/1/2001	All controls on the trading of futures and options by nonresidents on the MDEX were eliminated. The Commodity and Monetary Exchange of Malaysia and the KLSE were merged to form the MDEX.	Derivatives
6/13/2001	Resident insurance companies were allowed to extend ringgit policy loans to nonresident policy holders with the terms and conditions of the policies. The amount of RM loans extended may not exceed the policy's attained cash surrender value and may be for the duration of the policies.	International transactions in ringgit
7/10/2001	Resident financial institutions were allowed to extend ringgit loans to nonresidents to finance the purchase or construction of any immovable property in Malaysia (excluding financing for purchases of land only) up to a maximum of three property loans in aggregate.	International transactions in ringgit
11/21/2002	Banks are allowed to extend additional RM credit facilities to nonresidents up to an aggregate of RM5 mil per nonresident to finance projects undertaken in Malaysia. Prior to this, credit facilities in RM to a nonresidents for purposes other than purchases of three immovable properties or a vehicle were limited to RM 200,000	International transactions in ringgit
12/3/2002	In addition to obtaining property loans to finance new purchases or construction of any property in Malaysia, nonresidents may also refinance their RM domestic property loans. The above is subject to a maximum of three property loans.	International transactions in ringgit
12/3/2002	The limit of RM 10,000 equivalent in foreign currency for investment abroad by residents under the Employee Share Option/Purchase Scheme has been removed. Effective this date, general permission is granted for overseas investment for this purpose.	Outflows of portfolio and other capital
12/3/2002	Payments between residents and nonresidents as well as between nonresidents for RM assets are liberalized to allow payments to be made either in RM or foreign currency (previously, only in RM)	Settlement

Sources: The IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*, Bank Negara Malaysia's *Annual Reports* and *Exchange Notices*, various years.

<sup>1/</sup> The table does not cover changes in regulations pertaining to foreign direct investment and real estate transactions.

## REFERENCES

- Ariyoshi, Akira, Karl Habermeier, Bernard Laurens, İnci Ötker-Robe, Jorge Ivan Canales-Kriljenko, and Andrei Kirilenko, 2000, Capital Controls: Country Experiences with Their Use and Liberalization, *Occasional Paper* No. 190 (Washington: International Monetary Fund).
- Bartolini, Leonardo, and Allan Drazen, 1997, Capital Account Liberalization as a Signal, *American Economic Review*, 87 (March), 138–154.
- Calvo, Guillermo A., Leonardo Leiderman, and Carmen M. Reinhart, 1996, Inflows of Capital to Developing Countries in the 1990s, *Journal of Economic Perspectives*, 10 (Spring), 123–139.
- Cardoso, Eliana, and Ilan Goldfajn, 1998, Capital Flows to Brazil: The Endogeneity of Capital Controls, *Staff Papers*, 45(1), March (Washington: International Monetary Fund).
- Dooley, Michael, 1996, A Survey of the Literature on Controls over International Capital Transactions, *Staff Papers*, 43(4), December, 639–680 (Washington: International Monetary Fund).
- Dornbusch, Rudiger, 2001, Malaysia: Was It Different? *NBER Working Paper* No. 8325, June, National Bureau of Economic Research.
- Edison, Hali, and Carmen M. Reinhart, 2001, Stopping Hot Money, *Journal of Development Economics*, 66 (2001), 533–553.
- Eichengreen, Barry, and others, 1998, *Capital Account Liberalization: Theoretical and Practical Aspects*, *Occasional Paper* No. 172 (Washington: International Monetary Fund).
- Fernandez-Arias, Eduardo, and Peter J. Montiel, 1995, The Surge in Capital Inflows to Developing Countries: Prospects and Policy Response, *Policy Research Working Paper* No. 1473, June (Washington: World Bank).
- Grilli, Vittorio, and Gian Maria Milesi-Ferretti, 1995, Economic Effects and Structural Determinants of Capital Controls, *Staff Papers*, 42 (September), 517–551 (Washington: International Monetary Fund).
- Haggard, Stephan, and Linda Low, 2000, *The Political Economy of Malaysian Capital Controls*, mimeo (University of California, San Diego).
- Hendry, David F., 1995, *Dynamic Econometrics* (Oxford University Press).

- International Monetary Fund, 1999, IMF Concludes Article IV Consultation with Malaysia, *Public Information Notice* No. 99/88, September 8, available at [www.imf.org](http://www.imf.org).
- Ishii, Shogo, İnci Ötker-Robe, and Li Cui, 2001, Measures to Limit the Offshore Use of Currencies: Pros and Cons, *IMF Working Paper* No. 01/43 (Washington: International Monetary Fund).
- Johnson, Simon, and Todd Mitton, 2001, Cronyism and Capital Controls: Evidence from Malaysia, *NBER Working Paper* No. 8521, October, National Bureau of Economic Research.
- Jomo, K.S., 2001, *Malaysian Eclipse: Economic Crisis and Recovery* (London and New York: Zed Books).
- Kaplan, Ethan, and Dani Rodrik, 2001, Did the Malaysian Capital Controls Work? *NBER Working Paper* No. 8142, February, National Bureau of Economic Research.
- Kochhar, Kalpana, R. Barry Johnston, Michael Moore, İnci Ötker-Robe, Scott Roger, and Dmitri Tzanninis, 1999, Malaysia: Selected Issues, *IMF Country Report* 99/86 (Washington: International Monetary Fund).
- Latifah, Merican Cheong, 2002, Capital Flows and Capital Controls: The Malaysian Experience, in *Globalization and the Asia Pacific Economy*, edited by Kyung Tae Lee (London and New York: Routledge).
- Liu, Olin, 2001, *Model-Based Framework for Macroeconomic Management*, International Monetary Fund, unpublished.
- Meesook, Kanitta, 2001, Comparative Review of Policies and Performance, 1997-2000, in Kanitta Meesook and others, Malaysia: From Crisis to Recovery, *Occasional Paper* No. 207 (Washington: International Monetary Fund).
- Reinhart, Carmen M., and Vincent R. Reinhart, 1999, On the Use of Reserve Requirements in Dealing with Capital Flow Problems, *International Journal of Finance and Economics*, 4 (January), 27–54.
- Tamirisa, Natalia T., 1999, Exchange and Capital Controls as Barriers to Trade, *Staff Papers*, 46 (January), 69–88 (Washington: International Monetary Fund).
- , 2001, Capital Controls in Response to the Asian Crisis, in Kanitta Meesook and others, Malaysia: From Crisis to Recovery, *Occasional Paper* No. 207 (Washington: International Monetary Fund).