Fundamentals, Financial Liberalisation and Currency Crisis: a Study of Malaysia[#]

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Abstract. Financial liberalisation measures tend to exert upward pressure on the exchange market pressure (MP) variable for Malaysia. However, it has the desired effect of stabilising the Malaysian economy. Using quarterly data from first quarter 1970 to fourth quarter 2001, we assessed the impact of financial liberalsation using banking sector claims on the private (non financial) sector to GDP ratio on the exchange market pressure (MP) variable, which was based on a weighted average of the changes in the exchange rate and international reserves, and controlling for macroeconomic fundamentals. The model uses a currency crisis framework and assumes adaptive expectations.

Keywords: Asian crisis, exchange rate market pressure, financial liberalisation, macroeconomic fundamentals, Malaysia

JEL classification: F30, F41

1. Introduction

Casual observation of the recent Asian crisis and related empirical work have suggested the importance of links between financial liberalisation and crises. The Asian crisis spawned a strand of the third generation currency crisis models which puts the liberalisation of the financial sector, namely the banking sector, as the cause of fragility in the macroeconomy. The simultaneity of financial and currency crises happen against a background of open economies and highly integrated financial and capital markets.

Two theoretical papers that largely encompass the main characteristics of the domestic financial sector liberalisation and financial fragility are Dooley (1998) and Chang and Valesco (1998). Dooley (2000) linked foreign borrowings by the domestic financial intermediaries and the implicit/explicit government guarantee for their liabilities to the balance of payments crisis. Government assets (international reserves) are appropriated through high domestic interest rates that attract foreign capital inflows that may reverse when market expectations change. According to Chang and Valesco (1998), financial deregulation and increasing competition in the banking sector increases a bank's vulnerability to runs. Their findings suggest that banks become highly vulnerable to changes in consumer expectation, the mismatch of long-term assets and foreign currency denominated short-term liabilities and unsound government policies, such as the guarantee of private sector liabilities, and policy incompatibilities, for example, maintaining an exchange rate peg, and their role as lenders of last resort.

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Tornell *et al.* (2004) argue that liberalisation leads to faster growth because it eases financial constraint. Agents who take credit risk make the economy vulnerable to a crisis. Contract enforceability problems, often severe in developing countries, provide the pertinent link between financial liberalisation, fragility and growth. International bank flows that are induced by financial liberalisation spur growth of the financially constrained firms in the domestic non tradable sector. Foreign direct investments (FDIs) are imperfect substitutes for risky bank flows and the occasional crises that arise are a necessary part of a developing country's growth experience (Tornell *et al.* 2004).

Financial liberalisation measures, implemented since the 1970s, have undoubtedly contributed to rapid economic development in Malaysia since the 1980s. Ang (2007) shows that financial development leads to higher growth through promoting both private savings and more efficient private investment while Ang and McKibben (2007) state that economic growth leads to financial development. Both views are plausible because growth in the real sector spurs the financial sector to grow, thereby increasing competition and efficiency in the financial intermediaries and markets spurring further economic growth (Berthelemy and Varoudakis 1996).

Financial liberalisation is an essential part of a broad process of economic development, whereby a strong and efficient financial system is essential for sustained economic growth (Pill and Pradhan 1997). Financial intermediaries play an essential role in mobilising savings, evaluation of projects, managing risk, monitoring managers and facilitating transactions – all these are essential for technological innovation and economic development (King and Levine 1993b; Levine 1997). Moreover, a broad variety of financial markets and financial institutions enhances financial stability (Fry, 1998).

Studies on currency crises that emerged in the 1990s used a currency crisis framework to examine the impact of macroeconomic fundamentals on the exchange rate market pressure (usually defined as the weighted average of the changes in the nominal exchange rate, interest rate and the loss in international reserves). The studies essentially determined the macroeconomic fundamentals responsible for driving the market pressure to crisis levels (e.g. Frankel and Rose 1996; Corsetti *et al.* 1999a; Cerra and Saxena 2002; Kwack 2000).

This study contributes to the analysis of currency crisis by focusing on how financial liberalisation actually impacts on the vulnerability of a country to a currency crisis. Our interest here lies in determining if and how financial liberalisation has actually made the macroeconomy more stable by way of decreasing the vulnerability of the exchange market pressure to the state of selected macroeconomic fundamentals. This is important because much has been said about financial liberalisation contributing to the vulnerability of the Asian economies to speculative attacks in 1997. Existing studies generally test for the impact of financial liberalisation by controlling for macroeconomic fundamentals but we have taken the test one step further by considering the case of financial liberalisation as a background issue (implicitly assumed) with a direct impact on the exchange market pressure and the induced changes in selected macroeconomic fundamentals.

Marginal effects (elasticities) of *MP* with respect to the macroeconomic variables (fundamentals) that are lower with financial liberalisation and the induced financial development strongly suggest that financial liberalisation has strengthened the macroeconomic fundamentals of the Malaysian economy, effectively making the exchange rate market pressure less susceptible to the state of those fundamentals. Market pressure

tends to rise to crisis level with increasing domestic credit growth, a real depreciation, and rising budget deficits.

When financial liberalisation induces economic growth, rising incomes imply higher fiscal revenues and budget surpluses. Industrialisation and expanding external trade will induce current account surpluses. While an open capital account renders the current account sensitive to capital flows, macroeconomic stability is also promoted by growing reserves. Financial liberalisation leads to excessive domestic credit growth and capital inflows that may result in a real appreciation that adversely affects exports. However, these vulnerabilities are reduced under financial liberalisation as macroeconomic fundamentals strengthen.

Section 2 covers a survey of previous empirical studies on the impact of financial liberalisation on growth, financial fragility and crisis as well as a discussion on the macroeconomic variables and the essential exchange market pressure variable (*MP*). In Section 3, we discuss the model formulation and methodology; the empirical results are found in Section 4. Section 5 concludes with a discussion on our findings and their implications for policy.

2. Literature Review

The seminal work on finance and growth by Goldsmith (1969) found that a period of more rapid economic growth is accompanied by an above average growth rate of financial development but his study omitted other controlling factors that influence economic growth (Levine 1997). Levine and King (1993a; 1993b) found a strong positive relationship between financial development indicators and growth indicators, long-run per capita GDP growth, capital accumulation and productivity growth. Other studies show that equity market liberalisation and capital account openness improve welfare by lowering consumption growth volatility (Bekaert *et al*. 2006; Bekaert *et al.* 2001). According to Beck and Levine (2004), the economy grows when markets and banks facilitate and ease information and transactions costs thereby enhancing resource allocation.

Most studies on financial liberalisation, financial fragility and crisis employed panel data on selected countries over the period 1980 to the 1990s except for Cerra and Saxena (2002), Abdul Abiad (2003) and Lim (2005). In these studies financial liberalisation tend to be represented by key variables that capture deregulation and its related impact (e.g., interest rates, foreign liabilities, ratio of broad money to GDP, reserves to broad money ratio, and credit growth).

Kaminsky and Reinhart (1999) showed that a banking crisis tends to follow financial liberalisation, signaling a large proportion of balance of payments crises. Rapid credit growth at the onset of the crisis increases vulnerability to contagion (Tornell 1999). Although banking crises are not necessarily the immediate cause of a currency crisis, both are preceded by recessions (see Caramazza *et al.* 2000; Demirguc-Kunt and Detragiache 1998). Financial liberalisation and /or increased access to international capital markets not only fuel the boom phase of the cycle by providing access to financing but also produce more pronounced boom-bust cycles in stock market prices. However, partial liberalisation tends to trigger institutional reforms. The dynamic environment of financial liberalisation creates volatility that cannot be entirely controlled by prudential regulation and supervision (Weller 2001). In the long run, stock markets are more stable (Kaminsky and Schmuckler 2003).

Weak external accounts and having a common creditor increases vulnerability to spillovers or contagion from a devaluation and recession in other countries (Caramazza *et al.* 2000).) Financial fragility is associated with opening of the banking sector and increasing competition, excessively high real interest rates and inflation, a larger share of credit going to the private sector and an explicit deposit insurance scheme (e.g., Chang and Valesco 1998; Kwack 2000). The latter suggests excessive risk taking due to moral hazard and the lack of appropriate prudential regulation and supervision. The adverse impact of financial fragility can be reduced with a sound institutional environment (e.g., a low level of corruption and good contract enforcement) and sound prudential regulation (Demirguc-Kunt and Detragiache 1998).

Kwack (2000) and Corsetti *et al.* (1999b) stress the importance of balance sheet effects on the occurrence of a crisis. At the firm level, corporate crisis dynamics are triggered by a halt in capital inflows through corporate balance sheet channels, and are amplified into a severe recession by exchange rate depreciation, high interest rates, and current account adjustments (Stone 2000; Claessens *et al.* 2000).

Lim (2005) found that financial liberalisation generally stabilises the macroeconomic fundamentals of Indonesia, but tends to be destabilising on the macroeconomic fundamentals of South Korea. Cerra and Saxena (2000) showed that bank claims on the private sector, foreign liabilities and contagion are significant for explaining the crisis in Indonesia. However, financial deepening reduces vulnerability to crisis. Abdul Abiad (2003) found that real overvaluation (appreciation) explains the crisis in five Asian crisis economies. Market pressure rose with a credit boom in Malaysia and in Thailand with non FDI inflow and slowing growth.

2.1. The Exchange Market Pressure and Macroeconomic Variables

2.1.1 The Exchange Rate Market Pressure (*MP*) Variable

The *MP* variable encompasses the effects of changes in macroeconomic fundamentals that induce deteriorating market expectations culminating in a depreciating nominal exchange rate. Generally, an ample stock of international reserves enables successful defense of the currency against a speculative attack, and raising interest rates (subject to prevailing sound macroeconomic conditions) discourages an attack and stems capital flight.[1] Therefore, the rise in the exchange rate market pressure to the crisis threshold level (when the (implicit) peg is allowed to float) can be captured by a combination of the changes in the nominal exchange rate, international reserves and interest rate. Other methods for identifying a crisis range from identifying sharp jumps in a plot of the exchange rate, augmented by references to reliable and well-documented sources such as the IMF, to identifying a crisis based on deep depreciation alone (as in Frankel and Rose 1996 where a crisis entails a depreciation of at least 25 per cent, that is also a 10 per cent increase in depreciation).

In many studies, the measure of speculative market pressure is based on a weighted average of the percentage change in exchange rate depreciation and the percentage change in international reserves, where the weights are equal to the inverse of the (sample period)

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[1] There is some controversy over the ability of high interest rates to stem capital outflow, see for instance, Stiglitz (2000).

standard deviation or variance. Sometimes, both components are given equal weights (apparently) to reduce biasness. The interest rate changes are often omitted since data on developing economies are not complete. *MP* which consists of a weighted average of nominal exchange rate and reserves changes usually implies a sample-dependent crisis threshold level which is set (arbitrarily), sometimes, to ensure a certain percentage of crisis in the sample (e.g. Caramazza *et al.* 2000). This method of identifying a crisis has its drawbacks. In large samples, a high volatility regime will tend to dominate the whole sample. The fixed threshold will fail to identify a crisis that occurs in a low volatility regime, and ignores the shift in an exchange rate regime.

However, the (weighted average) exchange rate market pressure variable may also be defined by a time-varying and conditional variance weighted *MP* which allows greater volatility in the *MP* index that is generated by market uncertainty or shocks. This can be modeled using ARCH or variants of the ARCH models.

Bearing in mind the drawbacks of using an index and the associated problems of choosing a suitable crisis threshold level, our exchange rate market pressure (*MP*) is a weighted average of the nominal change in the exchange rate and (negative) change in reserves (the weights being equal to the inverse of the standard deviation for each series). The weights indicate the 'source' that drives the market pressure. The use of conditional variance in the constituents of *MP* (exchange rate and reserves changes) in our model performed poorly in a preliminary estimation of the static *MP* model; the results are inferior to those obtained by assuming unconditional variances (not shown here).

2.1.2 Macroeconomic Variables

It has been established that *MP* gradually rises (to crisis level) as depreciating pressure on the nominal exchange rate grows with market expectations of increasing deterioration in the macroeconomic fundamentals. The market may perceive that the fundamentals, such as a credit boom, current account deficits, fiscal deficits, rising real appreciation and declining reserves adequacy, are becoming increasingly inconsistent with the (implicit) peg and therefore, launches an attack on the currency, inducing losses and consequently a high and rising *MP*.

Specifically, in our model, *MP* is determined by (notation in parentheses): domestic credit growth (*Dldcredit*); the fiscal (surplus) balance (*Bdef*); the real exchange rate (*Rer*); the foreign exchange reserves-M2 ratio (*RM2*); and the current account to GDP ratio (*Ca*). These are the standard fundamental variables used in previous empirical studies on currencies crisis (e.g. Corsetti *et al.* 1999b; Kaminsky and Reinhart 1999; Frankel and Rose 1996; Masson 1998; Camarazza *et al.* 2000). The measure of financial liberalisation used in the final estimation is the bank claims on the private (non financial) sector to GDP ratio.[2] This variable is a measure of the funding provided by the financial system and more importantly, the demand for loans in the economy.

The measure of financial liberalisation captures the impact of financial deregulations, especially of interest rates, elimination of credit ceilings and easier entry into the banking sector to domestic banks and foreign banks which culminates in easier access to credit.

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[2] Two other measures, the M2 to GDP ratio and M1 to GDP ratio were dropped due to their weaker performance in a preliminary study. These variables were used in King and Levine (1993b).

Table 1: Definition of variables

Variable	Symbol	Definition
Market pressure	*MP*	Market pressure is a weighted average of the change in exchange rate and the change (losses) in international reserves, and the weights are equal to the inverse of the variances of the variables.
Domestic credit growth	*Dldcredit*	Domestic credit growth is measured as a first difference of the natural logarithm of domestic credit. Domestic credit growth is expected to have a positive effect on MP.
Fiscal balances-GDP Ratio	*Bdef*	Fiscal balances-GDP ratio is derived by dividing fiscal balances (IFS line 680..ZF) with nominal GDP (line 699..ZF) and the product multiplied by 100.
Real exchange rate	*Rer*	The real exchange rate is measured in two steps. We first take the natural logarithms of the average exchange rate (IFS line RF) multiplied by US consumer price index (line USI63) divided by domestic consumer price index (IFS line 63). Second, the first figure is subtracted from their past 12-quarter average. This two-step procedure is a measure of the deviation of real exchange rate from its three years previous average.
Current account-GDP ratio	*Ca*	Current account balances-GDP ratio is obtained by converting current account balances (IFS line 878) to domestic currency values using period average exchange rates (IFS line RF) and dividing the product by nominal GDP (IFS line 899..ZF) multiplied by 100.
Reserves-M2 ratio	*RM2*	The reserves to broad money ratio is derived as foreign reserves (IFS line 11d) converted to domestic currency values using end of period exchange rate (IFS line AE) divided by broad money (IFS lines 34 plus 35).
Bank Claims on (non-financial) private sector -GDP ratio	*IndexPSC*	The ratio of bank claims on the private non-financial sector to GDP is derived as bank claims on the private sector (IFS line 54825D…ZF) divided by nominal GDP (IFS line 899..ZF) multiplied by 100.

However, no one indicator of financial development is an adequate measure since the financial structure is an amalgam of financial instruments and institutions (Ford 2000). The currency crisis model incorporates the effect of financial liberalisation on the economy and implicitly on the macroeconomic fundamentals and their determination of *MP*. In effect, in static terms:

$$MP = f(Dldcredit, Bdef, Rer, Ca, RM2, IndexPSC) \tag{1}$$

The definition of the variables is given in Table 1.

3. Model Formulation and Methodology

Financial liberalisation and induced financial development have undoubtedly contributed to the economic growth of Malaysia. However, it has also partly been blamed for the severity of the crisis in the most affected Asian economies in 1997-98. Our aim here is to determine the impact of domestic financial liberalisation on the exchange rate market pressure (*MP*). Specifically, does domestic financial liberalisation stabilise domestic financial markets? If so, financial liberalisation should reduce the underlying effect on *MP*. Any short term or immediate impact can be expected to be destabilising perhaps due to the lack of a good regulatory framework and/or the more dynamic environment engendered by the reforms (Kaminsky and Schumkler 2003; Tornell *et al.* 2004; Weller 2001).

To quantify the impact of financial liberalisation on *MP* and the occurrence of a crisis, we measured the long-run elasticity of *MP* in respect of each macroeconomic fundamental, including the index of financial liberalisation. The process of financial liberalisation in Malaysia has been gradual, starting from the early 1970s, gaining momentum in the late 1980s and 1990s. Therefore, it is rational for us to estimate the effect of liberalisation over the whole sample period of the first quarter 1970 to the fourth quarter of 2001.

It has been established that *MP* rises to the crisis threshold level when macroeconomic fundamentals deteriorate. However, it is reasonable to expect that the current level of *MP* is determined by market expectations held in previous periods, of the state of the fundamentals in the next period. Therefore, any change in the nominal exchange rate is determined by the 'expected' values of the macroeconomic fundamentals in the current period and not their actual values. This is even more likely with the integrated and highly fluid world capital market, informational frictions (and possibly herding behaviour) and the growing disincentive for collecting country specific information.

We have considered several ways of forming market expectations (including using the Koyck (1954) distributed lags and the polynomial distributed lags (Almon 1965) – these are not shown here). We have to conclude that given the dataset, *MP* of Malaysia is best represented by the Duesenberry type adaptive expectations model popularised by Cagan (1956). Specifically, we assumed that the market forms an expectation at time *t*-1 of what the macroeconomic variables will be at time *t,* by reference to their experience of the past realised values of those variables and their recent change. In its simplest form, the expected value of *x* can be written as

$$E_t x_t = \alpha x_{t-1} + \phi(x_t - x_{t-1}) = \alpha x_{t-1} + \phi \Delta x_t \qquad (2)$$

where the expected value of *x* may be determined by its recent past value and its change at the end of the current period.

Empirical analyses proceeded in two stages: first we estimated the standard currency crisis model of *MP* (henceforth the fundamental *MP* model) to determine how the macroeconomic fundamentals determined *MP*. At this stage, financial liberalisation was merely assumed but not explicitly accounted for. Next, the extended model incorporating financial liberalisation was estimated. Therefore, the general model employed to study the impact of financial liberalisation on *MP* for Malaysia using Duesenberry adaptive expectations was as follows:

$$MP_t = \alpha_0 + \alpha_1 Dldcredit_{t-1} + \alpha_2 Bdef_{t-1} + \alpha_3 Rer_{t-1} + \alpha_4 Ca_{t-1} + \alpha_5 RM2_{t-1} + \alpha_6 IndexFD_{t-1}$$
$$(+) \qquad\quad (-) \qquad (+) \text{ or } (-) \qquad (-) \qquad (+) \text{ or } (-) \qquad (+) \text{ or } (-)$$

$$+ \phi_1 \Delta Dldcredit_t + \phi_2 \Delta Bdef_t + \phi_3 \Delta Rer_t + \phi_4 \Delta Ca_t + \phi_5 \Delta RM2_t + \phi_6 \Delta IndexFD_t + \varepsilon_t \qquad (3)$$
$$(+) \qquad\qquad (-) \qquad (+) \text{ or } (-) \qquad (-) \qquad (+) \text{ or } (-) \qquad (+) \text{ or } (-)$$

The first equation (fundamental model) estimated was similar to Equation (3) without the index of financial liberalisation, that is, assuming that $\alpha_6 = 0$ and $\phi_6 = 0$. In estimating the extended crisis model (Equation (3)), we were interested mainly in whether financial liberalisation has a direct impact on *MP*, that is, whether the hypotheses: $\alpha_6 = 0$ and $\phi_6 = 0$, can be rejected.

The impact of financial liberalisation is expected to induce a change in the macroeconomic fundamentals. For comparison, we present two sets of results, with and without financial liberalisation. If marginal effects (elasticities of *MP* with respect to macroeconomic fundamentals) are smaller with financial liberalisation, then it suggests that financial liberalisation may have stabilised domestic macroeconomic fundamentals, and therefore market expectations (*MP*) become less vulnerable to the state of the macroeconomic fundamentals. An unstable mean or variance of the *MP* may reflect a change in economic structure not attributed to domestic financial liberalisation alone because other reforms, especially in trade policy, were implemented during the same period.

The expected differences in elasticity/impact associated with the direct and indirect impact of financial liberalisation on the fundamentals are discussed next.

In the fundamental model, the nominal exchange rate (under a flexible exchange rate) will tend to rise when the market expects domestic credit growth to rise in the next period. The influence of domestic credit growth is greater under liberalisation as more savings are mobilised.[3] A weak supervisory and prudential framework and poor credit evaluation skills enable excessive risk taking.

Generally, an expected increase in fiscal deficits will exert rising pressure on the nominal exchange rate. It may signal a loose fiscal policy stance that can trigger inflationary pressure. If fiscal deficits were initially one of the motivations for financial repression, then economic growth that follows liberalisation may generate higher fiscal revenues (Fry 1998). The negative impact of fiscal deficit on *MP* is reduced but remains important in the presence of policy inconsistencies and other macroeconomic weaknesses.

An expected real depreciation exerts upward pressure on *MP* in a fixed or tightly managed exchange rate regime when the market perceives rising macroeconomic imbalances, for example, excessive credit growth, rising stock of NPLs, and sustained external imbalances. Otherwise, a rising real exchange rate improves the export competitiveness. Under partial liberalisation, an appreciating real exchange rate may dominate. The inflow of foreign capital into the domestic financial system creates inflationary pressure on the domestic economy.[4]

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[3] Savings rise induced by interest rate deregulation, lowering of reserves requirement and inter-mediation of foreign capital inflows by financial institution as well as expansion of financial institutions.

[4] In 1994 (Q1 to Q3) capital controls were imposed to stem the inflow of short-term foreign capital and to reduce inflationary pressure.

Under a competitive exchange rate policy, a depreciating real exchange rate exerts upward pressure on *MP*.

MP tends to rise with rising current account deficits. Declining trade and rising current account imbalances may signal declining growth. Although the current account balance becomes more sensitive to capital flows under financial liberalisation and capital openness, a lower negative impact on *MP* is anticipated. Rising current account surpluses lead to accumulation of reserves sufficient to support the currency in the event of a capital inflow reversal when market sentiment becomes negative. Over time, the economy also becomes more diversified.

A rising current account deficit and growing reserves inadequacy exert upward pressure on *MP*. Equally, strong capital inflow following financial liberalisation will raise *RM2*. Given the risk of capital inflow reversal, rising *RM2* may exert upward pressure on *MP*.

When a multitude of weak macroeconomic fundamentals are expected in the near future, *MP* is likely to rise to extreme levels as the nominal exchange rate depreciates and low reserves are depleted. Therefore, a currency crisis occurs under highly vulnerable macroeconomic conditions, with or without financial liberalisation. When the expected levels of the macroeconomic variables are realised by the changes at the end of the current period, the impact on *MP* is magnified.

The financial liberalisation index has a negative impact on *MP* when the prudential and regulatory framework is weak. In the long run, full liberalisation supported by a sound prudential and regulatory framework should stabilise the domestic financial market.

3.1 Data Analysis: Unit Root Test and Correlation Matrix

The results of the unit root tests are reported in Table 2. The data for Malaysia are generally stationary. ADF and Phillip-Perron tests reject the null hypothesis of a unit root for *MP*, domestic credit growth, the real exchange rate (*Rer*) and the current account-GDP ratio (*Ca*). The fiscal balances-GDP ratio is stationary around a linear trend at 1 per cent significance (5 per cent by the ADF test). The reserves-*M2* ratio is $I(1)$ and unit root test on the first difference rejects the null of a unit root at 1 per cent significance level. Therefore, the first difference of reserves-M2 ratio (denoted $\Delta RM2$) was used in the estimations. Bank claims on the private sector are stationary around a linear trend at 10 per cent significance level according to the ADF. The Phillip-Perron test indicates otherwise, but as noted in the literature, these tests have limited power.

4. Empirical Findings and Discussion

The results of the estimation of the fundamental *MP* model and the extended model with financial liberalisation are shown in columns I and II of Table 3, respectively. We will first examine the empirical findings of the fundamental model followed by the implications of financial liberalisation measures in terms of their impact effect on those macroeconomic determinants of *MP* (as shown in column II).

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[5] The *AR*(1) process included to eliminate serial correlation in the residuals was stable; the inverted root has a modulus of less than 1. The test for suspected endogeneity of bank claims on the private sector to GDP ratio (financial liberalisation proxy) and the real exchange rate is rejected.

Table 2: Tests for unit root

		Variable in levels	
		Augmented Dickey-Fuller	Phillip-Perron
MPMAS	Statistic	-7.48*	-7.3*
	No. of lags	0	4
	No intercept, no trend		
DLDCREDITMAS	Statistic	-2.19**	-5.12*
	No. of lags	2	4
	No intercept, no trend		
BDEFMAS	Statistic	-3.15*	-11.44*
	No. of lags	9	10
	Intercept, trend		
RERMAS	Statistic	-3.59*	-2.78***
	No. of lags	1	4
	No intercept, no trend		
CAMASR	Statistic	-2.41*	-7.155*
	No. of lags	4	4
	No intercept, no trend		
(Variable in first differences)			
RM2MAS	Statistic	-9.21*	-9.12*
	No. of lags	0	4
	No intercept, no trend		
(Variable in levels)			
IndexPSC	Statistic	-3.47**	n.s.
	No. of lags	4	
	Intercept and trend		

Note: *,** and *** denote 1%, 5% and 10% significance levels.

Table 3: Estimation of market pressure method: ordinary least squares

Variable	I (Fundamental model)		II (Extended model)	
	Coefficient (Std. error)	Elasticity (Fundamental model)	Coefficient (Std. error)	Elasticity (Third generation model)
Constant	-3.341** (1.597)	-	-12.035* (3.015)	-
DLDCREDIT (-1)	38.311** (18.423)	0.64	37.589** (17.979)	0.625
BDEF (-1)	-0.207* (0.07)	0.39	-0.181** (0.075)	0.342
RER (-1)	118.80* (15.414)	1.087	98.925* (14.695)	0.905
Δ*(RER)*	883.511* (22.853)	0.301	877.239* (22.226)	0.299
INDEXPSC (-1)	-		3.743* (1.137)	3.567
Δ*(INDEXPSC)*	-		11.108** (5.165)	
AR(1)	0.517* (0.083) inverted AR roots: 0.52		0.448* (0.091) inverted AR roots: 0.45	

Summary /diagnostic statistics

R^2	0.94		0.95	
Regression s. e.	6.91		6.55	
RSS	5198.25		4589.40	
F-statistic	372.675 (0.00)		298.01 (0.00)	
Normality test	0.73 (0.69)		0.805 (0.67)	
Serial correlation (2 lags)	1.18 (0.76)		1.545 (0.46)	
ARCH effects (5)	0.55 (0.45)		4.99 (0.42)	
Heteroscedasticity	25.88 (0.03)		44.25 (0.02)	
RESET test	0.13 (0.71)		5.07 (0.16)	
Sample period	1973Q2-2001Q4		1973Q2-2001Q4	
No. observations	115		114	

Note: *,** and *** denote 1%, 5% and 10% significance levels.
The above results are generated using Eviews version 4.1.

The estimates for the fundamental model of *MP* are unbiased, consistent but could be inefficient. The residuals are also independent of the explanatory variables. A stable AR(1) process was included to correct for autocorrelation.

The equation has a negative intercept that is statistically significant at 5 per cent. The model is also highly significant. The expected increase in domestic credit growth and the fiscal balances-GDP ratio have the anticipated signs. The expected depreciation and actual increase in the real exchange rate tend to exert upward pressure on *MP*. All the variables are significant at the 5 per cent significance level.

An expected increase in domestic credit growth and the fiscal deficits-GDP ratio will raise *MP*. Evidently, the real exchange rate is the most crucial: a 1 per cent expected depreciation results in a net 1.4 per cent rise in *MP*. In this specification, the influence of the other variables (the current account balance-GDP ratio and the reserves-M2 ratio) is probably subsumed in the real exchange rate.

When financial liberalisation is included in the estimation, the estimates of the extended model of *MP* remain consistent and unbiased with weak evidence of homoscedasticity.[5] Overall fit of the extended model remains good. *MP* in the extended model is largely explained by the lags of domestic credit growth, the fiscal balances-GDP ratio, the real exchange rate and the financial liberalisation index, *IndexPSC*.

The signs of the coefficients are unchanged. The financial liberalisation variable has a positive coefficient indicating that rising *MP* is associated with an expected real depreciation and a rising level of financial liberalisation.

Comparing the marginal effects of *MP* with respect to each of the relevant macroeconomic variables, the magnitudes of elasticity are generally lower with the inclusion of the financial liberalisation variable than without. As anticipated, domestic credit still exert considerable influence; *MP* rises by 0.62 per cent when credit is expected to grow by 1 per cent (compared to 0.64 per cent previously). A 1 per cent expected rise in fiscal deficit will tend to raise *MP* by 0.3 per cent (0.35% when financial liberalisation is implied). An expected real depreciation increases *MP* by a total 1.2 per cent compared to 1.39 per cent in the fundamental model. However, these largely lower magnitudes could be due to relatively high elasticity for the expected financial liberalisation. In total, an expected increase in financial liberalisation measures raises *MP* by 3.7 per cent suggesting that financial liberalisation is expected to have a destabilising impact on the Malaysian economy. This could be attributed to the openness of the economy and the integration of the domestic financial market with the world capital markets.

In summary, we can say that financial deregulation *per se* tends to have a destabilising impact on the Malaysian economy, exerting upward pressure on *MP*. However, the lower magnitudes of elasticity of *MP* by 13 per cent, 2.3 per cent and 1.2 per cent, respectively for a depreciating real exchange rate, domestic credit growth and budget deficit-GDP ratio, imply that market expectations and *MP* are now less sensitive to the shocks of the macroeconomic fundamentals. Nonetheless, these elasticities of such magnitude are still significant. They imply that financial liberalisation measures themselves need to be strengthened, that monetary and fiscal policies that are inconsistent with financial liberalisation measures and the exchange rate can be problematic. They may also imply that policies that adversely affect the current account-GDP ratio, reserves adequacy and economic growth will manifest in the domestic credit growth, real exchange rate and fiscal balance. For

a large part of the sample period, there were deficit fiscal balances, and fiscal surpluses were achieved from 1994 simultaneously with deficit current account balances. The currency crisis (policy incompatibility with the fixed exchange rate) in 1975 is clearly different from the crisis in 1997, which suggests the influence of a different economic and financial environment spurred by growth, financial liberalisation and other reforms.

5. Conclusion

We conclude that financial development has a largely stabilising influence on the Malaysian economy. The real exchange rate and domestic credit growth have the most impact on *MP* under liberalised financial market conditions. This may be the natural consequence of interest rate deregulation, reduced statutory reserves requirement (except in the late 1980s to control inflationary expectations), the open capital account (temporary reversals in 1994 and 1998) and an open stock market. In the short term, financial liberalisation measures are destabilising as they produce uncertainties and greater risk-taking in the economy.

The lower elasticity or impact effects point to the need for stronger prudential regulation and supervision. The economy remains vulnerable to weaknesses in the macroeconomic fundamentals that could be generated by inconsistent policies, such as capital openness, expansionary monetary policies, and a tightly managed exchange rate. Moral hazard and excessive risk taking induced by implicit or explicit guarantees of banking sector liabilities require more stringent supervision of the financial institutions.

Effective corporate governance is essential when bank balance sheets are exposed to balance the sheets of the corporate sector. At the end of 1997, private sector debts made up most of the total debts and although NPLs fell from over 35 per cent in 1985 to 4 per cent in 1997, banks were exposed to substantial lending for consumer credit, property and stock market investment (IMF 1998). Average domestic credit claims on the private sector was 88 per cent for 1994-1996 (Lim 2005). Increasing integration with the world capital markets emphasises the need for sound prudential regulation and supervision, and institutions as openness imposes a constraint on the ability of the government to pursue legitimate objectives (Stiglitz 2000). Baek (2006) showed that the highly volatile and speculative nature of portfolio inflows in Asia subject these economies to shifting global market sentiment and external factors (e.g. world interest rates).

A well developed financial system for Malaysia not only reduces capital flow volatility, it also ensures the most benefit from FDI in terms of technological transfer and economic growth (Levine 1997; Choong *et al.* 2004). Regular and accurate reporting of financial data produces sounder banks and strengthens market discipline (Demirguc-Kunt *et al.* 2006). Successful liberalisation requires appropriate monetary policies, institutional development and structural reforms to create the requisite stable environment (Pill and Pradhan 1997). The stock market dominates Malaysian firms' external financing, but a sound banking system is essential for growth of the financially constrained non traded sector (Tornell *et al.* 2004; Zhou 2008).

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