

Impact of Pegging on Malaysian Ringgit after the Onset of the Asian Financial Crisis in July 1997

*Che Ani Mad, Nik Kamariah bt. Nik Mat,
Nasruddin Zainudin, Nor Hayati bt. Ahmad, and
Engku Ngah Sayudin Engku Chik*

INTRODUCTION

The International Monetary Fund (IMF) (1999) claimed that the fixing of the Malaysian ringgit (hereafter called the ringgit) to the United States dollar (USD), at RM3.80 per USD since September 1998, has prevented the ringgit from correcting itself to its true market value. IMF and Malaysian Institute of Economic Research (MIER) estimated that the ringgit remained undervalued by about 16 percent to 18 percent in 1999. On the other hand, market participants, that is, businessmen and investors largely perceived that the ringgit remained "undervalued" by a larger margin. They contended that the undervalued ringgit was instrumental in fostering Malaysia's export growth since it provided a competitive price advantage to Malaysia's exports against similar products and services of other Association of South East Asian Nations (ASEAN) economies (IMF, 1999).¹

In contrast, Abidin and Mahmood (2000) argued that the recent surge in Malaysia's export was basically due to a natural phenomenon. As the domestic economy contracted during the crisis (Asian financial crisis [AFC]), export income became the main Malaysian source of economic growth. They rationally argued that as the weak domestic demand stalled most investments, Malaysian producers have no other alternatives but to export their commodities overseas. The export proceeds (regardless of the level of exchange rate) were then channeled into the domestic economy to provide liquidity and to sustain domestic consumption. The strong export expansion in 1999 was expected to absorb most of the excess export

inventories and ultimately new investments would be made to meet the growing (domestic and overseas) demand since the economy was recovering.

They further argued that when the international capital began to flow into the region in the third quarter of 1998, some of the East Asian currencies such as South Korea, Thailand, and the Philippines (except Indonesia) appreciated against the USD. This was also a natural economic phenomenon because these countries did not exercise any significant control over the in- and outflow of funds, Malaysia meanwhile pegged its currency against USD, besides imposing selective capital controls in order to keep its currency stable, at least against USD. A stable ringgit reduces uncertainty, improves investors' confidence, promotes investments, and fosters economic growth.

In addition, many researchers began to argue that Malaysia's export and economic growth was also basically due to its ability to weather the crisis using its own "homegrown remedy." For instance, Eam, So, and Mithani (2000), using Impulse Response Function Analysis, empirically argued that Malaysia's growing export growth was due to the expected economic recovery by the year 2000, provided no external shock emerges. Mahbob and Govindan (2000) and Salleh and Radzi (2000) expressed a similar argument.

Against this backdrop, this study attempts to examine two major issues: the stability of the ringgit and the relationship between the real effective exchange rate (REER) of ringgit and Malaysia's export performance, especially after the Asian financial crisis of July 1997.

LITERATURE REVIEW

Evolution of Malaysia's Exchange Rate: An Overview (1980–1997)

Like many other ASEAN countries, Malaysia has experienced a consistent upward and downward market exchange rate pressure over the 1980–1997 period. The exchange rate of the ringgit fluctuated according to financial and economic environments. Historical data revealed that Malaysia's export and exchange rate of the ringgit normally had a negative relationship.² When the exchange rate of the ringgit increased, Malaysia's export performance declined. On the other hand, when the exchange rate of the ringgit declined, Malaysia had favorable export and economic performances, for instance, during 1980 to the end of 1983.

The expansion in the industrial sector during 1980 to 1983 brought a boom in the construction sector and further contributed to an expansion in the nontradable sectors. The expansion in the nontradable sectors subsequently caused domestic price to fluctuate (IMF, 1999) and led to

eventual appreciation of the ringgit. This caused Malaysia's export commodities to be more expansive in the international market. Malaysia's terms of trade (TOT) began to deteriorate in early 1984. The deterioration that was initially expected to be temporary turned out to be permanent. Thus, the Malaysian authority decided to allow the ringgit to steadily depreciate in 1984. The ringgit exchange rate decreased in 1985, in terms of nominal and REER. It declined further, especially after the Plaza Accord when the U.S. dollar was allowed to depreciate. The ringgit proportionately depreciated because it had been kept fairly stable against the U.S. dollar and Singapore dollar. The depreciation of the ringgit was further exacerbated by the recession that hit Malaysia in 1985 to the first half of 1986. The recession caused Malaysia's terms of trade (export over import) and the Malaysian ringgit to deteriorate further in tandem with the economic performance.

Thus, owing to this relationship "export-lead-industrialization policy" was adopted to replace the old less effective "import-substitution policy" during the mid-1980s. Trade and exchange rate policies were gradually liberalized to support the new export-lead-industrialization policy. The policy reduces the international market prices of Malaysian commodities and significantly promotes Malaysia's export growth. As a result, Malaysia's export growth subsequently expanded the industrial sectors, particularly the manufacturing sector which subsequently was responsible for Malaysia economic growth (IMF, 1999).

Malaysia experienced a surge in capital inflows in terms of Foreign Direct Investment (FDI) and portfolio funds during the second half of the 1980s (1986) to the first half of the 1990s. This was due to its outward orientation policy, economic openness, infrastructure developments, the gradual elimination of export-import barriers and commitment under the Asian Free Trade Association (AFTA) and World Trade Organization (WTO).³ The outward orientation policy led Malaysia to experience a consistent growth in gross domestic product (GDP) and export with an average growth rate of around 7.8 percent in GDP (Salleh and Radzi, 2000) and 17.2 percent in export. As a result, Malaysia's share in world merchandise exports rose from 0.75 percent in 1990 to over 2.0 percent in 1997.

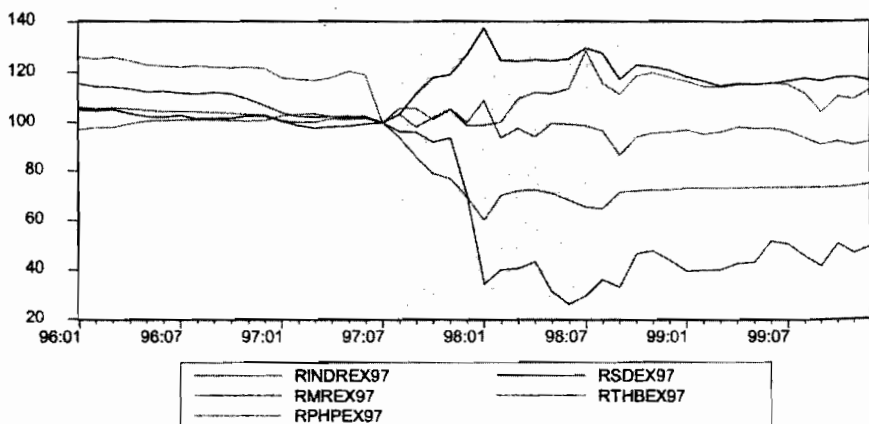
The increasing capital inflows, on the other hand, put pressure on the ringgit to appreciate and this led to a huge buildup in Malaysia's foreign reserves. The ringgit gradually strengthened in REER terms by about 15 percent between the second half of the 1980s to July 1997 (IMF, 1999). However, the appreciation of the ringgit was quickly eliminated owing to a fast declining exchange rate since the onset of the AFC in July 1997.⁴ The ringgit was undervalued by more than 47 percent against the U.S. dollar during the AFC period (IMF, 1999) (see Figures 13.1 and 13.2). It

remained undervalued by about 23 percent at the end of the study period (December 1999).

Recent Development of the Malaysian Ringgit Exchange Rate

The average intratrade between ASEAN countries had decreased from an average of 47 percent in 1996 to an average of 23.2 percent in 1999. However, since the onset of AFC, Malaysia's contribution in terms of exports to ASEAN countries had also declined to 26 percent in 1999, while its imports had increased from 20.4 percent in 1997 to 22.9 percent in 1999 (Abidin and Mahmood, 2000; IMF, 1999). Abidin and Mahmood (2000) further noted that the United States was becoming one of Malaysia's significant trading partners since the fixing of ringgit to USD at RM3.80 in September 1998. Eam, So, and Mithani (2000), and Abidin and Mahmood (2000) argued that the growth on Malaysia's export and its economy were mainly due to its natural phenomenon. Malaysian producers have to export their commodities overseas as the domestic demand and the demand from ASEAN countries stalled. Thus, the IMF claimed that Malaysia's exports and economic growth were at the expense of ASEAN economies could be easily disputed for two reasons. First, Malaysia imported more than it exported to those ASEAN countries that experienced almost similar economic difficulties as Malaysia. Secondly, Malaysia was one of the founding members of the ASEAN and being one that adopted an international economic policy "enrich your neighbor" was unlikely to pursue such an unfriendly international trade policy.

Figure 13.1
Real exchange rate of Asian currencies (July 1997 = 100).



It was obvious that there were differences between Malaysia and the rest of the ASEAN countries in terms of the approaches taken to weather the AFC crisis. It was the only badly hit country that refused to adhere to IMF prescriptions on how to handle and to curb the crisis since Malaysia was not subjected to the regulatory framework imposed by the IMF "rescued policy." Although, Malaysia initially did attempt to use IMF prescriptions, it subsequently found that those prescriptions merely improved the economic distortions (Mahbob and Govindan, 2000) rather than addressing the real issues of the crises (Yoon and McGee, 2000). Owing to these factors, Malaysia formulated the National Economic Action Council (NEAC) to develop a short-term "homegrown" measure. Thus, on September 2, 1998, Malaysia pegged its exchange rate to USD and imposed selective capital controls, as the essence of the remedy, to tackle the crisis. The action was praised to be a workable remedy by businessmen, investors, and academicians alike (Salleh and Radzi, 2000) as well as by IMF itself.⁵

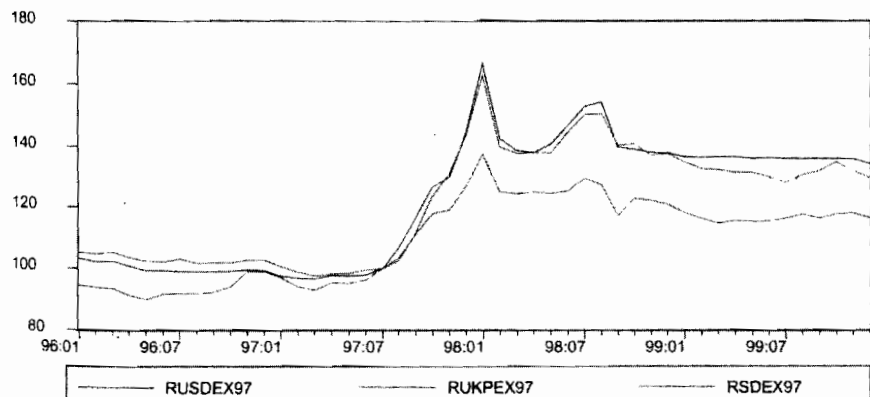
Against this backdrop, this study is organized as follows. The section entitled "Data" discusses data collection and interpolation. The section "Statistical Approach" examines the methodology and the approaches of the study. Finally "Conclusion" presents the findings, conclusion, and direction of future related studies.

Data

Published monthly data from January 1996 to December 1999 (48 time-series data) was used in this study. The data was extracted from IMF

Figure 13.2

Real exchange rate of Malaysian ringgit to U.S. dollar, UK pound, and Singapore dollar (January 1996 to December 1999).



monthly bulletins and the Central Bank of Malaysia (CBM) quarterly and monthly bulletins. Data such as the amount of fiscal deficit and the population growth which were available only on quarterly basis were interpolated (using Lotus programs) into monthly series. This is executed to fulfill the statistical time series requirement that no data gap should exist between the series.

The input data was first verified manually against the sources to minimize input errors. The data was then converted into graphs, histograms, and simple statistics: mean, minimum, and maximum values to spot for possible input errors. The graphs and data series were then compared against earlier researchers' graphs and data series, for example, Tzanninis (1999a) whenever available before they were properly employed in the analysis.

Statistical Approach

Using Tzanninis (1999a) and IMF (1999) as the related studies and Figure 13.3 as the guide, this study:

1. divides the study period into three subperiods:
 - January 1961–July 1997: pre-AFC period;
 - July 1997–September 1998: AFC period;
 - September 1998–December 1999: Pegging to USD period.

Figure 13.3 clearly suggests that there was a structural change in between the study period: July 1997–September 1998. The existence of structural change served as the primary reason for the data series to be divided into the above three sub-periods. According to Enders (1995, pp. 243–250), the structural change must be accounted for, otherwise, the statistical results may be considered spurious or provide no economic value.

2. employs both descriptive and quantitative analyses to strengthen the arguments and the findings of this study.

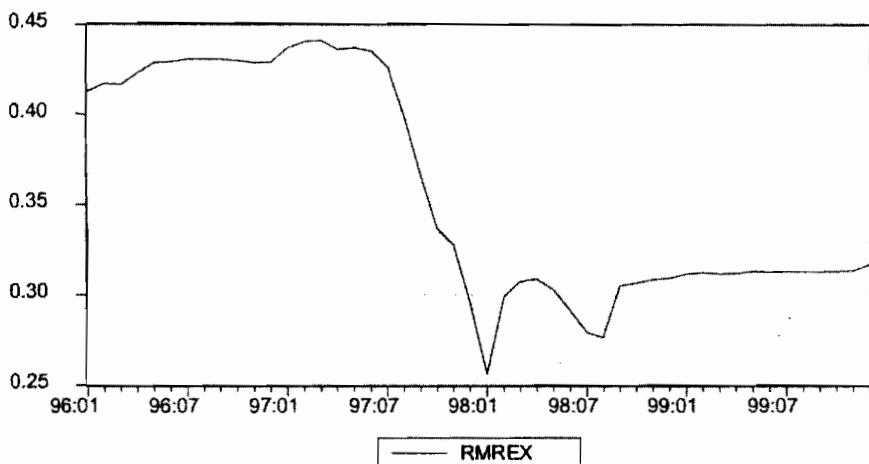
Descriptive Analysis

Stability of Malaysian Ringgit

According to Valentine and Mennis (1980), there are various statistical measures that can be used to test stability or dispersion of data series. Among the statistical measures include range, variance, standard deviation, coefficient variation, and mean absolute deviation. Brigham (1995), like many other finance researchers, employed standard deviation and coefficient variation to measure risk and the stability of the variables. This study similarly uses standard deviation and coefficient variation to measure the stability of the ringgit over the study period and the three sub-periods. The results are shown in Table 13.1.

Figure 13.3

The movement of real exchange rate of the Malaysian ringgit (January 1996 to December 1999).



As expected, the impact of pegging and selective capital controls are found to be effective in stabilizing the Malaysian ringgit against USD. The standard deviations: σ , and coefficient variation (CV), as shown in Table 13.1 suggest that the volatility of the Malaysian ringgit in terms of REER after the pegging has been reduced by approximately half as compared to the pre-AFC period ($\sigma = 0.003/0.008 = 0.375$; $CV = 0.009/0.018 = 0.500$). Obviously, the ringgit was significantly more stable after the pegging to USD compared to the period during the crisis, July 1997 to September 1998 ($\sigma = 0.003/0.062 = 0.048$; $CV = 0.009/0.173 = 0.052$).⁶

The volatility of the ringgit, in terms of REER, after the pegging has also been significantly reduced against other ASEAN currencies (see Appendix 13.1). Thus, the statistical results clearly show that the pegging of ringgit to USD has significantly caused the ringgit to be more stable after the crisis period. The stable ringgit reduces exchange rate uncertainty, encourages businessmen and investors to invest, improves business confidence, promotes new investments, and subsequently stimulates export and economic growth in Malaysia. At this junction, this article will proceed to test the key economic determinants of REER before and after the AFC using quantitative analyses.

Quantitative Analyses

The Determinants of REER

Tzanninis (IMF, 1999) used 1979 to 1998 annual data such as EXIM, TOT, CAP, and BLS (see Appendix 13.2 for additional details). He employed

Table 13.1
The Stability of Real Malaysia Ringgit Exchange Rate to U.S. Dollar

	Study period	Prior to the AFC	During the AFC but before pegging and SCC ¹	After pegging and SCC to Dec. 1999
	1996:1–1999:12	1996:1–1997:7	1997:7–1998:9	1998:9–1999:12
	48 obs.	19 obs.	15 obs.	16 obs.
Mean	0.358	0.429	0.318	0.311
σ	0.062	0.008	0.046	0.003
CV	0.173	0.018	0.146	0.009
Changes in gap between the period				
σ	-	0.129	0.742	0.048
CV	-	0.104	0.844	0.052

1. Pegging refers to fixing exchange rate at RM3.80 per U.S. dollar on September 2, 1998 and SCC means selective capital control.

Standard deviation is calculated using E-View Statistical Package: $\sigma = \sqrt{\sum (x - \bar{x})^2 / N}$.

Coefficient variation (CV) is manually calculated. $CV = \sigma/k$; where k is the arithmetic average of the observations \equiv mean.

Changes in gap between the period are calculated by dividing the observed σ and CV of the sub-period by the study period, that is, σ for 1996: 1–1997: 7/ σ over the studying period (0.008/0.062 = 0.129)

Augmented Dickey-Fuller statistics to test for unit root and subsequently conducted cointegration tests. His results suggests that:

1. Both the dependent and independent variables are stationary in the first difference, hence co-integration analysis among the level variable is therefore required,
2. the depreciation of the ringgit since the onset of the AFC has resulted in a gain in Malaysia's competitiveness,
3. the ringgit was undervalued by about 16 percent to 19 percent in 1998,
4. historically, misalignments of the ringgit has tended to correct by itself within two to three years.

This study offers no dispute. In fact, it provides evidence to support Tzanninis's findings. However, it should be noted that, although this study attempted to replicate the analysis using unit-root and cointegration tests similar to Tzanninis (IMF, 1999), it was unable to pursue the tests.⁷ According to Enders (1995), the statistical results of the monthly time series would provide no economic value due to a structural change in

Malaysia's real effective exchange rate (REER) as shown in Figure 13.3 earlier. The unit-root and cointegration statistical results obtained are not shown here. In order to overcome this limitation, Box-Jenkins autoregressive moving average (ARMA) statistical procedures can be employed as one of the alternatives (Enders 1995, pp. 95–97). Nevertheless, Box-Jenkins ARMA statistical procedures may also provide no economic value if the data for the study period is analyzed in isolation since the statistical results may also provide no explanation property as shown in Table 13.2.

Although the regression result in Table 13.2 using Tzanninis (IMF, 1999) model shows a very high goodness-of-fit over the study period, the results, however, provide no economic value. Figure 13.4 suggests clearly that owing to the structural change, the residual of the regression does fluctuate beyond the acceptable bands, that is, during the crisis period: July 1997–September 1998.

The study proceeds to test the key economic determinants of REER using the Tzanninis (IMF, 1999) model below. The theoretical details of the variables are briefly described in Appendix 13.2.

Table 13.2
Dependent Variable: RMREX

Method: Least Squares

Date: 06/19/00 Time: 15:50

Sample(adjusted): 1996:03 1999:12

Included observations: 46 after adjusting endpoints

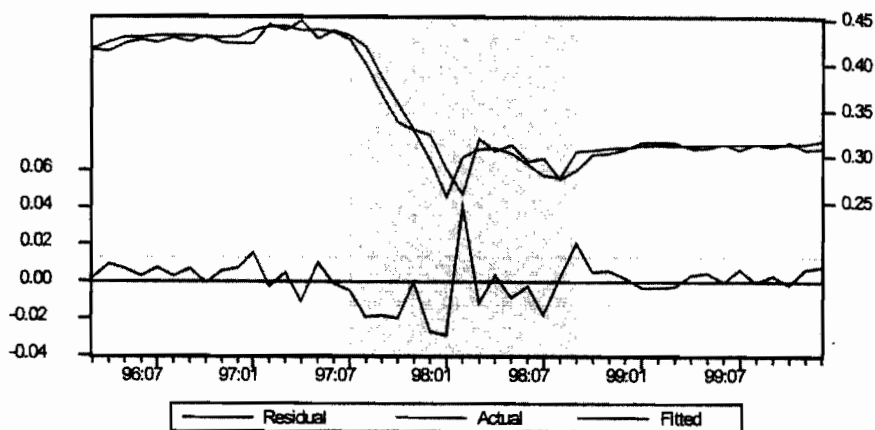
Convergence achieved after 16 iterations

Backcast: 1996:02

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.295089	0.155046	1.903236	0.064605
EXIM	-0.003655	0.018090	-0.202047	0.840958
TOT	-0.014912	0.022235	-0.670674	0.506485
FGOEGDP	-0.061575	0.104369	-0.589970	0.558703
BLS	-0.000460	0.000429	-1.073537	0.289801
M31B	0.013381	0.008380	1.596739	0.118608
AR(1)	0.960343	0.038496	24.94665	3.65E-25
MA(1)	0.357796	0.159963	2.236748	0.031249
R-squared	0.962506	Mean dependent var		0.355610
Adjusted R-squared	0.955599	S.D. dependent var		0.061942
S.E. of regression	0.013052	Akaike info criterion		-5.682944
Sum squared resid	0.006474	Schwarz criterion		-5.364920
Log likelihood	138.7077	F-statistic		139.3547
Durbin-Watson stat	1.911819	Prob(F-statistic)		0.000000
Inverted AR Roots	0.96			
Inverted MA Roots	-0.36			

Figure 13.4

Residual, actual, and fitted IMF model of real exchange rate of the Malaysia ringgit (January 1996 to December 1999).



$$\text{RMREX}_t = \alpha + \beta_1 \text{EXIM}_t + \beta_2 \text{TOT}_t + \beta_3 \text{FGOEGDP}_t + \beta_4 \text{BLS}_t + \beta_5 \text{M31B}_t + \epsilon_t$$

Table 13.3 presents the selected statistical results using Box-Jenkins ARMA statistical procedures employing maximum likelihood and step-wise statistical processes. The results suggest that the REER's determinants are dynamic: they change over time, that is, over the various subperiods, due to the differences in the economic environments. The statistical results in Table 13.3 also suggest that:

1. The higher exchange rate of the ringgit leads to lower export (and subsequently decreases import because Malaysia's export commodities generally have a high percentage of import content). The inverse relationship holds true. Therefore, the Real Malaysian Ringgit Exchange Rate (RMREX) is found to have a negative relationship with the level of Malaysia's export and import, although the magnitude of the impact is small, as shown by the coefficient of $\beta_1 \text{EXIM}_t$.

The deterioration of export (and import) prior and during the crisis was reflected by the overvaluation of the ringgit and hence provided a negative impact on the level of exchange rate of the ringgit. The exchange rate of the ringgit subsequently had to decline toward its market level to bring down the price of Malaysian commodities to competitive levels. During early 1998 the ringgit exchange rate declined to more than RM4.00 per USD. When it bounced back to RM3.80 per USD, Malaysia pegged the ringgit to USD in September 1998. At the same time, the exchange rate of other ASEAN currencies (except Indonesia), continued to appreciate. The pegging did not only help reducing entrepreneurs', businessmen's, and traders' uncertainty but also led the price of Malaysian commodities to remain relatively cheaper. Thus, the fixing of the ringgit to USD successfully spurred Malaysia's export growth and is partly

Table 13.3

$$\text{RMREX}_t = \alpha + \beta_1 \text{EXIM}_t + \beta_2 \text{TOT}_t + \beta_3 \text{FGOEGDP}_t + \beta_4 \text{BLS}_t + \beta_5 \text{M31B}_t + \epsilon_t$$

Variables Coefficient	Study period	Prior to the AFC	During the AFC before pegging and SCC	After the pegging and SCC to Dec. 1999
(1)	(2)	(3)	(4)	(5)
α	0.217** (2.122)	0.460*** (31.104)	1.078*** (16.722)	0.343*** (88.782)
β_1			-0.344*** (-9.103)	-0.006** (-2.931)
β_2			-0.176** (-2.407)	
β_3			-0.473*** (-4.618)	
β_4	-0.001* (1.815)	0.001* (1.901)		-0.001** (-2.385)
β_5	0.013 (1.633)	-0.005*** (-2.068)	0.040*** (3.491)	-0.003*** (-7.283)
AR(1)	0.960*** (26.056)	0.586*** (3.984)		0.282 (1.759)
MA(1)	0.403*** (2.750)	0.928*** (32.135)	-1.910** (-2.483)	-0.943*** (-12.398)
Adj. R^2	0.958	0.872	0.972	0.971
Se (ϵ_t)	0.007	0.001	0.001	0.001
D.W.	1.919	1.434	2.247	1.921
F Value	257.23	28.14	98.29	100.57

1. RMREX, EXIM, TOT, FGOEGDP, BLS, and M31B refer to the real Malaysian ringgit exchange rate to the U.S. dollar, total exports and imports over gross domestic product, total exports over total imports, federal government official expenditure over gross domestic product, the Balassa-Samuelson effect (per capita real growth in manufacturing over per capita real growth in services), and the difference between M3 (broad money supply), and M1 (based money supply) in billion Malaysian ringgits to reflect capital inflow, respectively.
2. The figure in parentheses are t statistics. ***, **, and * refer to 1 percent, 5 percent, and 10 percent level of significance, respectively.
3. AR and MA refer to autoregression or Cochran-Orcutt model and Moving Average (Markov model), respectively. The Multivariate Time Series Regression technique used in this study employs Advanced Box-Jenkins statistical technique, which is a combination of AR and MA models utilizing Maximum Likelihood and Stepwise procedures to select the best statistical results.
4. Adj. R^2 , D.W., Se (ϵ_t), and F refer to adjusted R squared, Durbin-Watson statistics, standard error of regression, and F value, respectively.
5. The selection of the statistical results was based on:
 - i. Durbin-Watson statistics, which are close to 2.0. The data can be assumed to be normally distributed.
 - ii. The highest adjusted R squared and F value as well as the lowest standard error of regression where the results are expected to provide the best goodness-of-fit of the linear regression.

also responsible in steering Malaysian economy toward a speedier recovery from the crisis.

2. The terms of trade (TOT) and Federal Governments Official Expenditure over Gross Domestic Products (FGOEGDP) provided a significant impact during the crisis than during the stable economic environment. Both variables provide negative impact to the level of exchange rate of the ringgit as suggested by negative coefficients of β_2 TOT_t and β_3 FGOEGDP_t, respectively. The results are justifiable at least for two reasons:
 - i. during the crisis, Malaysia obviously experienced deterioration in TOT. The price of export commodities temporarily declined while the price of import commodities temporarily increased as the exchange rate of the ringgit declined.
 - ii. the more the government spent, the higher the supply of fund in the economy as compared to the commodities available, hence the price of the commodities became more expensive while the value of money became cheaper as the market was willing to spend more on the limited supply of the available commodities. This led to a negative relationship between the FGOEGDP and the exchange rate of the ringgit.
3. The relationship between exchange rate of the ringgit and productivity may be positive or negative. It is positive if the growth in productivity increases. Productivity leads to cheaper production costs, and the commodities can be exported at competitive prices in the international market. Thus, the demand for the ringgit will be higher to provide a positive impact on its exchange rate. The opposite holds true. The negative relationship between Balassa-Samuelson effect (BLS) and RMREX after the pegging and over the study period, supports the contention suggested by the Abidin and Mahmood (2000) and Mahbob and Govindan (2000) analyses that the level of productivity in Malaysia has declined since early 1990s. Although the magnitude of the impact of BLS exhibited in Table 13.3 is small, its implication on the long-term impact of Malaysian export and economic growth performances warrant a serious concern.⁸
4. Theoretically, the amount of the available fund in the economy exerts a downward pressure on the commodity prices and hence the real exchange rate. However, during the crisis the amount of the available fund provides a positive impact on the real exchange rate. This may possibly be due to the "liquidity crisis and bank run." In other words, owing to the market uncertainty, the market expects that as the amount of the available fund declines in an economy owing to the liquidity crisis and bank run, the market confidence on the exchange rates of the ringgit also decline. However, the relationship between the real exchange rate of the ringgit became negative when there was no more liquidity crisis and bank run. The market confidence that had been built under the National Economic Recovery Plan (NERP) was restored to normal when the available fund in the economy exerted a downward pressure on the real exchange rate as shown by coefficient β_5 in Table 13.4.

Table 13.4 provides additional statistical evidence confirming the earlier literature that export and real exchange rate are negative related. In the case of Malaysia, the study shows that the lower exchange rate of the

Table 13.4

$$\text{MALEXPT}_t = \alpha + \beta_1 \text{RMREX}_t + \beta_2 \text{MALIMPT}_t + \epsilon_t$$

Variables Coefficient	Study period	Prior to the AFC	During the AFC before pegging and SCC	After the pegging and SCC to Dec. 1999
(1)	(2)	(3)	(4)	(5)
α	0189.743 (0.030)	19.482*** (5.956)	36.292*** (4.324)	80.945** (2.268)
β_1	-18.422** (-2.410)	-16.242** (-2.108)	-38.256** (-2.236)	-243.432* (-2.057)
β_2	0.615*** (5.001)	0.248*** (3.345)	0.083 (0.315)	1.026*** (7.696)
AR(1)	0.995*** (32.821)	-0.378** (-2.194)	0.736* (2.175)	
MA(1)	-0.701*** (-5.117)	-0.977*** (38.573)	-1.925*** (-3.102)	0.990*** (58529-93)
Adj. R^2	0.941	0.858	0.918	0.908
Se (ϵ_t)	1.106	0.526	0.602	0.676
D.W.	2.052	2.349	1.992	2.480
F Value	183.78	26.70	40.30	50.10

Notes: See Table 13.3.

Sources of data: See Table 13.3.

ringgit has consistently been responsible for a higher export growth of Malaysian commodities over the study and subperiods, as evidenced by the coefficient of β_1 in Table 13.4.

The results presented in Table 13.4 further support the contention of the earlier literature that Malaysian export commodities contain a large proportion of import content, as signified by β_2 . It is also interesting to note that the large magnitude of imports after the pegging of the ringgit suggests that the industries began to replenish their inventories to meet the increasing demand for exports. This further signifies a growing investors' confidence in the economic recovery. This confidence has been highlighted by Mahbob and Govindran (2000), Abidin and Mahmood (2000), and Eam, So, and Mithani (2000) through their descriptive and empirical analyses of the recovery of the Malaysian economy.

CONCLUSION

The pegging of the ringgit and selective credit controls on September 2, 1998 were not intended to provide a competitive advantage for Malaysia's

export and economic growth. It was initially intended to insulate Malaysian economy from future speculative attack on the ringgit that might further distort the economy (Mahbob & Govindan, 2000). The undervaluation of the ringgit compared to other ASEAN currencies that did not undergo pegging made Malaysian commodity prices more competitive and the ringgit more stable, promoted investors' confidence, increased investment as a result, and improved current account balance. All of these resulted in the speedy economic recovery of Malaysia.

Malaysia, which practices an open-economic policy and intends to comply with its AFTA and WTO commitments, cannot rely on the undervalued ringgit to promote its exports and economic growth over a long period. Nor can it sustain the undervalued ringgit since the market will adjust the value of the ringgit accordingly in the long run. Thus, it needs to launch a policy of promoting productivity-enhancing measures to maintain its long-run competitiveness as seriously proposed by Abidin and Mahmood (2000), Mahbob and Govindan (2000), and Salleh and Radzi (2000). Measures including investment and training in new technology, incentives to promote a larger usage of domestic components in its exports, innovations in product design, fostering additional export incentives, and ensuring credit availability are among other measures that must be seriously and immediately considered by the relevant authorities. Thus, additional studies of the impact of these measures will be essential as significant inputs to foster Malaysian long-term economic development.

NOTES

We wish to record our thanks to Professor Dr. Sudin Haron, the Dean of School of Finance and Banking, Universiti Utara Malaysia (UUM) for his consistent encouragement, support, and ideas for the completion of this chapter. A similar appreciation goes to Professor Mohammad Alias, from the School of Economics, UUM. We are also glad to record our appreciation to our research members, Puan Norafifah Ahmad and En. Khairul Anuar Adnan, for their support and assistance.

1. Some respectable businessmen in the street even argued that the ringgit remained undervalued by about 30 percent. The imposition of selective capital control (SCC) and pegging of the ringgit exchange rate to the U.S. dollar on September 2, 1998, has led the ringgit to remain broadly unchanged, while other ASEAN currencies continued to appreciate and further strengthened (owing to the gradual depreciation of the U.S. dollar). Thus, Malaysian commodity prices were cheaper than the rest of the ASEAN countries.

2. See Tzanninis (1999b) for detailed additional discussion.

3. See CBM (1999) for detailed additional discussion.

4. This was due to liquidity crisis and bank run as suggested by the recent literature.

5. Nominal One Malaysia Ringgit Exchange Rate to Nominal U.S. Dollar

	Study Period	Prior to the AFC	During the AFC	After Pegging
			Pegging and SCC**	And SCC to Dec. 1999
	1996:1–1999:12	1996:1–1997:7	1997:7–1998:9	1998:9–1999:12
	48 obs.	19 obs.	15 obs.	16 obs.
Mean	0.320	0.398	0.281	0.263
σ	0.067	0.004	0.047	0.000
CV	0.210	0.010	0.166	0.001

6. It must be noted that owing to the annual data employed by Tzanninis (IMF, 1999), it is highly possible that this must have been overlooked and unintentionally ignored by Tzanninis. Nevertheless, the implications to the results are not serious since a long annual data time series was employed.

7. See Tzanninis (1999a), Abidin and Mahmood (2000), and Mahbob and Govindan (2000) for additional detailed discussions.

REFERENCES

- Abidin, M. A., and A. Mahmood. (2000). "Export Competitiveness of Malaysian Manufacturing: An Assessment." Paper presented at the National Seminar Strengthening the Macroeconomic Fundamentals of the Malaysian Economy, Kuala Lumpur, June 5–6.
- Brigham, E. (1995). *Fundamentals of Financial Management*, 7th ed. New York: The Dryden Press.
- Eam, L. H., L. T. So, and D. M. Mithani. (2000). "The Shock Effect of Terms of Trade Fluctuations on Economic Growth: The Malaysian Case." Paper presented at the National Seminar Strengthening the Macroeconomic Fundamentals of the Malaysian Economy, Kuala Lumpur, June 5–6.
- Enders, W. (1995). *Applied Econometric Time Series*. New York: John Wiley and Sons.
- International Monetary Fund (IMF). (1999). Staff Country Report, no. 99186. Washington, D.C.
- Khoon, G. S., and D. M. Mithani. (2000). "The Determinants of Real Exchange Rates: The Malaysian Experience: 1973–1997." Paper presented at the National Seminar on Strengthening the Macroeconomic Fundamentals of the Malaysian Economy, Kuala Lumpur, June 5–6.
- Mahbob, S., and K. Govindan. (2000). "Macroeconomic Fundamentals of the Malaysian Economy: Before and After the Crisis." Paper presented at the National Seminar on Strengthening the Macroeconomics Fundamentals of the Malaysian Economy, Kuala Lumpur, June 5–6.
- Meera, A. K., and H. A. Aziz. (November 2000). "The Malaysian Financial Crisis of 1997: Is the Monetary Sector the Culprit?" Working paper. Department of Business Administration, International Islamic University, Malaysia.
- Salleh, K., and N. A. Radzi. (2000). "The Resilience of the Economy: Preparing for the Next Crisis." Paper presented at the National Seminar on Strengthening

the Macroeconomics Fundamentals of the Malaysian Economy, Kuala Lumpur, June 5-6.

Tzanninis, D. (1999a). "Malaysian Exports and Competitiveness." In *Malaysia: Selected Issues, IMF Staff Country Report*, No. 99/86 (August), pp. 28-54. Washington, DC: International Monetary Fund.

———. (1999b). *The Central Bank and the Financial System in Malaysia—A Decade of Change: 1989-1999*. Kuala Lumpur: Bank Negara Malaysia.

Valentine, J. L., and E. A. Mennis. (1980). *Quantitative Techniques for Financial Analysis*, rev. ed. Homewood, IL: Richard D. Irwin.

Yoon, Y., and R. W. McGee. (2000). "The Asian Financial Crisis: A Gratuitous Unnecessary Tragedy?" In *Managing Global Business in the Internet Age, The 5th International Conference in Global Business & Economic Development, New Jersey, Conference Proceeding*, Vol. 2 (pp. 925-932). Seton Hall University, South Orange, NJ.

APPENDIX 13.1

Stability of Malaysian Ringgit against Foreign Currencies: Real Foreign Exchange Rate of 100 Unit Foreign Currencies to One Malaysian Ringgit

		Study Period	Prior to the AFC	During the AFC Before Pegging and SCC ²	After Pegging and SCC to Dec. 1999
		1996:1-1999:12	1996:1-1997:7	1997:7-1998:9	1998:9-1999:12
Selected ASEAN Countries		48 obs.	19 obs.	15 obs.	16 obs.
Indonesia	Mean	0.067	0.100	0.053	0.040
	σ	0.031	0.005	0.027	0.005
	CV	0.435	0.048	0.517	0.113 ³
Thailand	Mean	8.596	9.008	8.068	8.514
	σ	0.581	0.428	0.602	0.296
	CV	0.068	0.047	0.075	0.035
Philippines	Mean	8.547	8.879	8.511	8.120
	σ	0.425	0.184	0.454	0.283
	CV	0.050	0.021	0.053	0.035 ³
Singapore* ¹	Mean	1.824	1.644	1.959	1.904
	σ	0.169	0.039	0.160	0.040
	CV	0.093	0.024	0.082	0.021

1. RM per unit of foreign currencies.

2. SCC stands for Selected Capital Control executed on September 2, 1998.

3. An increase in the volatility of Indonesian rupiahs and Philippine pesos against MR may be due to the instability of those currencies, instead of MR. MR was found to be more stable after the pegging against other ASEAN currencies as well as selected developed countries' currencies: including United States dollar, United Kingdom pound and Japanese yen.

APPENDIX 13.2

Stability of Malaysian Ringgit against Foreign Currencies: Real Foreign Exchange Rate of One Unit Foreign Currencies to Malaysian Ringgit

Selected Developed Economies (Major Trading Partners)					
United States	Mean	2.874	2.329	3.197	3.211
	σ	0.486	0.043	0.418	0.030
	CV	0.169	0.019	0.131	0.009
United Kingdom	Mean	4.664	3.703	5.268	5.244
	σ	0.857	0.110	0.699	0.147
	CV	0.184	0.030	0.133	0.028
Japan	Mean	2.422	2.073	2.464	2.775
	σ	0.349	0.145	0.223	0.176
	CV	0.144	0.070	0.091	0.063

1. RM per unit of foreign currencies.

2. SCC stands for Selected Capital Control executed on September 2, 1998.

3. An increase in the volatility of Indonesian rupiahs and Philippine pesos against MR may be due to the instability of those currencies, instead of MR. MR was found to be more stable after the pegging against other ASEAN currencies as well as selected developed countries' currencies: including United States dollar, United Kingdom pound and Japanese yen.

NASRUDDIN ZAINUDIN
 Profesor Madya
 Fakulti Kewangan dan Perbankan
 Universiti Utara Malaysia

APPENDIX 13.3

DETERMINANTS OF MALAYSIA'S LONG-RUN EQUILIBRIUM REAL EFFECTIVE EXCHANGE RATE (REER)

An empirical model was developed to test the determinants of Malaysia's long-run Equilibrium Real Effective Exchange Rate (REER), based on the earlier reported model by Tzanninis (IMF, 1999). The Tzanninis model is, however, built on some preexisting paradigms and the model has taken into account the available data and major factors affecting the REER.

CONCEPTUAL ISSUES

The Degree of Openness in Trade policy is proxied by the sum of exports and imports over GDP (EXIM). The relaxation of control is suggested to promote export competitiveness that eventually fosters both export and import. On the contrary, import control is suggested to lead to an overvalued exchange rate.

The External Economic Environment is proxied by terms of trade (TOT). TOT is the ratio of Malaysia's total export value over total import value. An increase in the ratio implies a greater growth in export as compared to import. This leads to a positive impact on current account and thus an appreciation of the REER.

Real Productivity of the Domestic Economy is proxied by per capita real growth in manufacturing less per capita real growth in services. The higher productivity growth in the tradable than in the nontradable goods (services) sector, eventually leads to raise in wages and prices of service sector, and eventually leads to a real appreciation of the REER. The impact is known as the *Balassa-Samuelson* (BLS) effect.

Fiscal policy is defined as the ratio of government consumption to GDP. In our case government consumption is defined as Federal Government Official Expenditure over GDP (FGOEGDP). Higher government expenditure increases the supply of money and thus pushes up the price of nontraded goods, which eventually promotes to an appreciation of the REER. Some scholars have already noted that fiscal policy provided a significant influence on REER while Tzanninis (1999b) observed the opposite.

Capital inflows would exert an upward pressure on the REER. In our case, the relevant data for net total capital inflows (capital outflows less capital inflows are not available). Thus, the difference between M3 less M1 [broad money less base money in the domestic economy (M31B)] was used as the proxy.