CAUSAL RELATIONSHIPS BETWEEN EXCHANGE RATES AND STOCK PRICES IN MALAYSIA AND THAILAND DURING THE 1997 CURRENCY CRISIS TURMOIL

Huzaimi Hussain
Department of Economics, UiTMCS, Kota Samarahan, Sarawak.

Venus Khim-Sen Liew
Faculty of Economics and Management, UPM, Serdang, Selangor.

This version: 10 May 2004

ABSTRACT

Using Granger (1969), Sim (1972) and Geweke *et al*. (1982) causality tests, this study finds a feedback causal relationship between exchange rate and stock price in Malaysia, whereas a unidirectional causal relationship running from exchange rate to stock price in Thailand. The stock markets of these countries are also found to be closely linked, with a feedback causal relationship between them. Most importantly, this study is able to identify the path through which the fall in Thai baht was transmitted to Malaysian ringgit plunge during the 1997 Currency Crisis turmoil.

JEL classifications: F31, G10.

Keywords: Granger causality, exchange rates, stock prices, Malaysia, Thailand.

1.0 INTRODUCTION

The discovery of causal relationship in foreign exchange and stock exchange markets is of great importance in the policy matters. By causal relationship (more commonly known as Granger-causal relationship in the literature) we are refering to the situation whereby the movement of one market precedes the movement of the other. In particular,

researchers refer to the phenomena whereby changes in the exchange rates followed by changes in stock prices as exchange rates Granger-cause stock prices. Similarly, stock prices Granger-cause exchange rates would mean changes in the former occurs before the latter. Suppose, we know in an economy that exchange rates Granger-cause the stock prices, policy-makers may fortify the economy's stock market by enhancing her exchange rate market conditions, for instance, reducing exceessive fluctuations of exchange rates or regulating favorable exchange rate policy. Conversely, if stock prices are found to Granger-cause exchange rates, then exchange rate conditions may be strengthen via improving the stock markets' fundamentals.

This study investigates this Granger –causation (henceforth referred as causation for simplicity) relationship in the context and Malaysia and Thailand for the period just after the outbreak of the Asian Currency Crisis, which started its episode in June 1997. Daily composite stock indices, which reflect the overall stock markets performance and daily spot exchange rates of these two neighboring countries, are deployed in this study. The contributions of this study to the existing literature are twofold. First, it provides more robust findings based on not only the commonly used Granger causality test (Granger, 1969), but also its neglected variants namely the Sim causality test (Sim, 1972) and Geweke-Meese-Dent causality test (Geweke, Meese and Dent, 1982)[1]. It is argued that our results will be more robust than previous ones as we have included two more test procedures which are actually improvements of the Granger causality test. Second, it shows the path through which the Malaysian exchange rate market was affected by the

[1] Note that the null hypothesis of these tests is A does not cause B, and thus some researchers called them non-causality tests.

collapse of the Thai currency market in 1997, thereby giving some insight to the policy makers in solidifying and making our financial system more resilient to external distractions.

2.0 CAUSAL RELATIONSHIP BETWEEN EXCHANGE RATES AND STOCK PRICES

2.1 Theoretical Backgrounds

The theoretical justification on whether exchange rates Granger-cause the stock prices or vice versa have been attempted via the traditional and the portfolio approaches. The former postulates that changes in exchange rates will lead to changes in stock prices, therefore the Granger-cause direction should flow from foreign exchange market to stock exchange market, whereas the portfolio approaches suggests the converse. Basically, from the traditional point of view, the appreciation (depreciation) of a local currency has two major implications. First, increase (decrease) indebtedness in term of foreign denomination currency. In other words, companies in local country have to pay more (less) for the foreign denominated debt and ultimately companies' cash flows deteriorate (improves). Second, increase (decrease) in production costs, especially in those developing economies which productions rely heavily on imported raw materials. The consequences are twofold; loss (gain) in price competitiveness and the companies' revenues. The above mentioned logic amounted to depreciatiation (appreciation) of companies' net worth and stock prices in general.

On the other hand, portfolio balance approach or simply portfolio approach emphasises on the role of capital account transaction. In this point of view, exchange rates are like other commodities determined by market demand and supply forces. Rising (falling) stock prices would atttract capital flows from foreign investors, who sell the foreign (local) currency in substitute for local (foreign) currency. Thus, a rise (fall) in stock prices will appreciate (depreciate) the exchange rates due to an increase in the demand (supply) of local currency. Moreover, an increase (decrease) in stock prices causes an increment (reduction) in wealth of domestic investors thereby increasing (reducing) the demand for local currency and subsequently pushing up (pulling down) the local interest rates. The raising (lowering) of interest rates will encourage capital inflows (outflows), resulting in the appreciation (depreciation) of exchange rates.

Note that, there is a possibility that changes in one market condition which lead to changes in the other will have feedback effect if both the traditional and portfolio approaches work simultaneously. As such, it is not impossible to observe a bi-direction of Granger-causality relationship between foreign and stock exchange markets. Of course, another possibility would be these two markets are independent of each other, meaning that there is no Granger-causal relationship between them.

2.2 Empirical Evidences

Recently, there is a growing literature which reports that foreign exchange markets and stock exchange markets are inter-related. Typically, using daily data for eight countries, Ajayi and Mongoue (1996) show significant interactions between foreign exchange and

stock markets. Among other examples include the works of Abdalla and Murinde (1997), Granger *et al*. (2000), Pan *et al*. (2000), Jumah *et al*. (2001), Ramasamy *et al*. (2001), Baharumshah *et al*. (2002), and Hatemi-J and Irandoust (2002)[2]. Unsurprisingly, most of these studies based their researches on the Granger-causal relationship between these two markets, for the reason stated in the preceding section. Results of studies show that both approaches to the determination of Granger-causal relationship have supportive evidences.

Empirical evidences favorable to the unidirection of Granger-causality flowing from exchange rates to stock markets have been provided by Abdalla and Murinde (1997), Wu (2000) and Pan *et al*. (2000). Abdalla and Murinde (1997) show that exchange rates lead stock prices in all countries under study, that is, India, South Korea, Pakistan and Philippines. Pan *et al*. (2000) find that daily exchange rate Ganger-cause daily stock price based on the data from seven East Asian countries namely Hong Kong, Japan, Korea, Malaysia, Singapore, Taiwan and Thailand. They report that the impact is even stronger after the Asian Currency Crisis. Wu (2000) employs cointegration analysis evidences that Singapore currency's appreciation against the US dollar and Malaysian ringgit, and depreciation against the Japanese yen and Indonesian rupiah have positive long-run effects on stock prices.

In sharp contrast, Ramasamy *et al.* (2001) and Hatemi-J and Irandoust (2002) find empirical evidences supportive of the portfolio balance approach, which postulates that

[2] Smyth and Nandha (2003) may be an exception. They find interdependence between exchange rats and stock prices in India and Sri Lanka. However, the two markets in both Pakistan and Bangladesh are found independence from each other in their same study.

changes in stock markets lead exchange rates. Ramasamy *et al.* (2001) investigate the causality relationship between stock and currency markets in Malaysia, and choose Thailand and Korea as proxy countries for Malaysia since the study period considered were during ringgit was pegged to US dollar. The presence of Granger causality was found running from stock price to exchange rate, and no causality from exchange rate to stock price. Hatemi-J and Irandoust (2002) show the existence of unidirectional Granger causality running from stock prices to effective exchange rates in the case of Sweden.

The results documented in Granger *et al*. (2000) and Smyth and Nandha (2003), however, show that the direction of Granger cause is different for different countries. Granger *et al*. (2000) reveal that exchange rate lead stock prices with positive correlation for data from Singapore and Thailand. The same authors find, however, that Taiwan is supportive of the portfolio approach, where stock prices lead exchange rates with negative correlation. Meanwhile, Indonesia, South Korea, Malaysia and Philippines are found to exhibit bidirection of causal relationship. Using Granger causality test, Smyth and Nandha (2003) find evidence supportive of exchange rates lead stock prices in India and Sri Lanka. Yet, the same study reports the independence of two markets in both Pakistan and Bangladesh as no causality or cointegration relationships have been observed.

.

3.0 OVERVIEW ON ASIAN CURRENCY CRISIS

In the early 1990's, Asian Economy which was known as "miracle" had attracted international fund managers/lenders to bring their capital in. Unfortunately, the failure in Thai financial system in 1997 had ensued panic and massive capital outflow in the Asian

region, leading to the so-called Asian Currency Crisis (Bank Negara Malaysia, 1998). The episode of Asian Currency Crisis began in Thailand in June 1997. Given its huge current account deficit and fragile financial system, added with the collapse of its major finance company, Finance One which experienced huge losses on both domestic and foreign creditors, speculators were confident that Thailand might be forced to devalue its currency. The speculative attack was successful that forced Thai central bank to allow the bath to float downward on July 2. The attack then spread to other currencies, namely the Philippine peso, the Indonesian rupiah, the Malaysian ringgit, and the South Korean won.

Some researchers contended that the crisis was due to contagion effect, which stipulates that if one currency fall, the neighboring currency would fall too. In particular, when Thai baht depreciated, the commodities in Thailand would be cheaper than in Malaysia. In order to increase her competitiveness, Malaysia thus must follow suit and devalue the ringgit. Speculators (currency traders) meanwhile spotted the opportunities and intervened by short selling the ringgit (Mohamad, 2000). This had ultimately amounted the devastation of East Asian economy.

In sharp contrast, Mishkin (2000) argues that instead of speculation, the root cause of the crisis is the weakness in the system itself, or institutional structure of the debt markets. Using asymmetric information analysis, he stipulates that weak supervision by bank regulators and lack of expertise in monitoring borrowers at banking institutions had amounted to deteriorations of bank' net worth or capital. This increases in loan losses had brought about the shrink of financial resources and ultimately lead to the contraction in economic activities. The plunge in stock market occurred simultaneously with the onset

of the crisis. Since most companies is East Asia had debt denominated in foreign currencies like dollar and yen, currency depreciation which interact with the financial system deteriorated the situation.

To this end, note that this study instead of seeking for the root cause, focuses on part of the chronicle by establishing the direction of interdependence between exchange rates and stock prices not only in Malaysia but also in Thailand, where the crisis started, with the optimism that our empirical findings could give some insight to the policy makers in solidifying and making our financial system more resilient to external distraction.

4.0 METHODOLOGY AND DATA

4.1 Causality Tests

The earliest econometrics procedure capable of determining whether or not an event leads the other is none other than the seminal work by Granger (1969). Since the introduction of now commonly called Granger causality test, the literature has been flooded with empirical evidences on the causality relationship between economics variables including the stock prices and foreign exchange rates.

Granger causality test procedures involve estimating the following pairs of regressions:

$$Y_t = a_0 + a_1 Y_{t-1} + \ldots + a_n Y_{t-n} + b_1 X_{t-1} + \ldots + b_m X_{t-m} + e_t \qquad (1)$$

and

$$X_t = c_0 + c_1 X_{t-1} + ... + c_n X_{t-n} + d_1 Y_{t-1} + ... + d_m Y_{t-m} + u_t \quad (2)$$

where Y_t and X_t are the two series undergoing test to determine their causal relationship, and coefficients a's, b's , c's and d's are constants to be estimated. e_t and u_t are two independent error terms.

According to Granger, if

(i) $H_{A(1)} : b_1 = b_2 = ... = b_m = 0$ is not rejected, then X does not cause Y. Otherwise X causes Y.

(ii) $H_{A(2)} : d_1 = d_2 = ... = d_m = 0$, is not rejected, then Y does not cause X. Otherwise, Y causes X.

To decide whether or not to reject the null hypothesis $H_{A(1)}$ (or $H_{A(2)}$) of the Granger causality test, Granger applies the *F* test of overall significance, computed as:

$$F = \frac{(RSS_R - RSS_{UR})/m}{RSS_{UR}/(T-k)} \quad (3)$$

where RSS_{UR} is the unrestricted residuals sum of squares from the estimated Equation (1) [or Equation 2)] and RSS_R is the restricted residuals sum of squares from the estimated Equation (1) [or Equation 2)] under the null hypothesis. F statistics follows F distribution with m and $(T-k)$ degrees of freedom, where m, k and T are, in that

order, the number of restrictions, the numbers of regressors (including the constant term) in the right-hand side of Equation 1 or 2 and the sample size. If the computed F value exceeds the critical F value at chosen level of significance, the null hypothesis is rejected implying evidence of causality. Otherwise, the null hypothesis is not rejected implying causal relationship.

There are four possible outcomes of this Granger causality test:

1) Unidirectional causality from X to Y (denoted $X \rightarrow Y$) if $H_{A(1)}$ is rejected but $H_{A(2)}$ is not rejected.
2) Unidirectional causality from Y to X (denoted $Y \rightarrow X$) if $H_{A(2)}$ is rejected but $H_{A(1)}$ is not rejected.
3) Bidirectional or feedback causality (denoted $Y \leftrightarrow X$) if both $H_{A(1)}$ and $H_{A(2)}$ are rejected.
4) Y and X are independence if both $H_{A(1)}$ and $H_{A(2)}$ cannot be rejected.

An alternative causality test is provided in the work of Sim (1972), who exploits the fact that the future cannot cause the present.

$$Y_t = a_0 + h_1 X_{t+1} + ... + h_m X_{t+m} + v_t \quad (4)$$

and

$$X_t = c_0 + j_1 Y_{t+1} + ... + j_m Y_{t+m} + w_t \quad (5)$$

Under Sim causality test,

(iii) if X is to cause Y, then the null hypothesis, $H_{A(4)}: h_1 = h_2 = ... = h_m = 0$ must be rejected. Otherwise X does not cause Y.

(iv) if Y is to cause X, then the null hypothesis, $H_{A(5)}: j_1 = j_2 = ... = j_m = 0$ must be rejected. Otherwise Y does not cause X.

Although Granger and Sim causality tests are different in practice, their testing procedures are equivalent theoretically (Doan, 1996). Moreover, Sim causality also has four possible outcomes as the Granger causality test. Interestingly, although the choice between Granger and Sim causality tests is not clear (Granger, 1995, p. 632), the former is vastly adopted in the literature whereas the latter is almost forgotten[3].

Geweke *et al*. (1982) combine the Granger and Sim causality tests to improve the robustness of Sim causality test, which they find is sensitive to failure to correct for autocorrelated residuals. The resulted Geweke-Meese-Dent (GMD) causality test involves estimating the following pairs of regressions:

$$Y_t = a_0 + a_1 Y_{t-1} + ... + a_n Y_{t-n} + b_1 X_{t-1} + ... + b_m X_{t-m} + h_1 X_{t+1} + ... + h_m X_{t+m} + \mu_t \quad (6)$$

and

[3] One plausible reason is that the former instead of the latter is included in most commercialize econometrics softwares.

$$X_t = c_0 + c_1 X_{t-1} + ... + c_n X_{t-n} + d_1 Y_{t-1} + ... + d_m Y_{t-m} + j_1 Y_{t+1} + ... + j_m Y_{t+m} + \omega_t \quad (7)$$

The analysis of Geweke-Meese-Dent is similar to Granger and Sim causality tests and thus not explained to conserve space. This study employs all these three causality tests, not for the purpose of formally contrasting their robustness, but for the sake of exploiting every potential causality relationship. Thus, they are treated as complementary tests in this study, to provide more robust results than previous ones, which mostly use only the Granger causality test.

4.2 Data

As for exchange rate data, this study deploys the US dollar based daily spot exchange rates of Malaysia (MYR/USD) and Thailand (THB/USD). Our daily stock prices include Kuala Lumpur Stock Exchange Composite Index (KLCI) and Stock Exchange of Thailand Index (SETI)[4]. We use daily data as we argue that it contains more information than lower frequency data. In particular, in this era of financial liberalization and economic globalization, coupled with the advancement in information and communication technology, changes in one financial market at this moment will be transmitted to other markets in the next moment. Market reactions and transaction activities are thus better captured in the daily data than weekly or monthly data. Furthermore, Granger *et al*. (2000) mention that the use of monthly data may not be

[4] Sources of data: KLCI and SETI data are available at http://finance.yahoo.com/m2?u, provided by Yahoo.com [accessed on 5 May 2004]. MYR and THB data are provided by Pacific Exchange Rate Service, Sauder School of Business, Univerisity of British Columbia [http://fx.sauder.ubc.ca/plot.html, accessed on 5 May 2004].

adequate in describing the effect of capital movement, which is intrinsically a short-run occurrence. To accomplish our objective of study, that is to determine the causal relationship between exchange rates and stock prices in the two neighboring countries during the turmoil of the 1997 Currency Crisis, we choose to analyze sample period covering 2 July 1997 to 31 August 1998[5]. All variables are in their logarithmic forms.

5.0 RESULTS AND INTERPRETATIONS

A preliminary data analysis using the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests shows that all variables are stationary in their first difference forms but not in their levels. This is obviously seen in Table 1, which summarized the unit root tests results. As the variables in the causality tests must be stationary, otherwise spurious results might be obtained, we thus proceed with our causality tests using the first difference version of the variables under study. The causality relationship between exchange rates and stock prices in Malaysia and Thailand are reported in Table 2.

Table 2 shows that the null hypothesis of exchange rate does not cause stock price has been rejected in Malaysia at 5% significance level by the Granger causality test but not the other two tests. As we regard the three causality tests as complimentary in this study, causality is considered presence if at least one of the test procedures has been rejected at 10% or better significance levels. Based on this rule, we thus conclude that there is a causality running from exchange rate to stock price in Malaysia. In addition, the null

[5] Malaysia government pegged its ringgit to US dollar on 1 September 1998, making MYR/USD data not suitable for this study beyond this date. Ramasamy *et.al.* (2001), nonethekess, circumvent this problem by using Thai baht and Korean won based ringgit in their study. It is argued here that using based currency other than US dollar may be inappropriate as the Thai baht depreciate with respect to US dollar during the outnreak of the crisis.

hypothesis of stock price cause exchange rate has also been rejected in Malaysia by the Sim (5%) and Geweke-Meese-Dent (10%). This implies that causality running from stock price to exchange rate is also working in the Malaysian financial markets. Taken together, our findings suggest the existence of a bidirectional causality relationship between exchange rate and stock price in Malaysia. Our finding from Malaysia is in line with Granger *et al*. (2000) and Pan *et al*. (2000) but in contrast to Ramasamy *et al.* (2001) who find unidirectional causality from stock price to exchange rate in the same country and also Wu (2000) who show unidirectional causality from exchange rate to stock price instead. Applying similar interpretation to Thailand, a unidirection causality from exchange rate to stock price has been detected at 10% level. There is no reverse causality relationship at 10% level. Thus, the findings in Thailand is consistent with th works of Granger *et al*. (2000) and Pan *et al*. (2000), who find Thailand case supportive of the traditional aproach.

Table 1: Unit Root Tests

Variable	Levels				First Differences			
	ADF Test		PP Test		ADF Test		PP Test	
	t_u	t_τ	t_u	t_τ	t_u	t_τ	t_u	t_τ
SETI	0.080	-1.392	0.359	-1.443	-7.935[I]	-7.982[I]	-14.457[I]	-14.464[I]
KLCI	-0.902	-2.004	-1.041	-2.139	-7.829[I]	-7.802[I]	-14.361[I]	-14.329[I]
MYR	-2.138	-2.210	-1.978	-2.095	-8.324[I]	-8.417[I]	-15.921[I]	-19.947[I]
THB	-2.337	-1.794	-2.193	-1.690	-7.200[I]	-7.354[I]	-15.912[I]	-16.005[I]
Critical Values								
1%	-3.54	-3.99	-3.54	-3.99	-3.54	-3.99	-3.54	-3.99
5%	-2.87	-3.43	-2.87	-3.43	-2.87	-3.43	-2.87	-3.43
10%	-2.57	-3.14	-2.57	-3.14	-2.57	-3.14	-2.57	-3.14

Note: Superscript ([I]) denotes statistical significant at 1% level.

Table 2

Testing for causality relationship between exchange rate and stock price within country.

Null Hypothesis	Causality Tests [*p*-value]		
	Granger	Sim	GMD
Malaysia			
$\Delta MYR \mapsto \Delta KLCI$	4.085 [0.044]^{V}	0.620 [0.431]	0.743 [0.389]
$\Delta KLCI \mapsto \Delta MYR$	1.119 [0.291]	4.061 [0.045]^{V}	3.770 [0.053]^{X}
Thailand			
$\Delta THB \mapsto \Delta SETI$	0.317 [0.578]	2.825 [0.094]^{X}	3.246 [0.070]^{X}
$\Delta SETI \mapsto \Delta THB$	2.708 [0.101]	0.260 [0.610]	0.262 [0.609]

Notes: A $\mapsto$ B stands for A does not cause B. Meanwhile, $\Delta Z = Z_t - Z_{t-1}$ is the first difference of a variable *Z*. Superscripts (^{I}), (^{V}) and (^{X}) denote significant at 5% and 10% resprctively.

The next task in this study is to investigate the interactions between the exchange rates and stock prices across countries. Additional causality tests have been conducted to accomplish this mission and the results are summarised in Table 3.

Table 3

Testing for causality relationship between exchange rate and stock price across country.

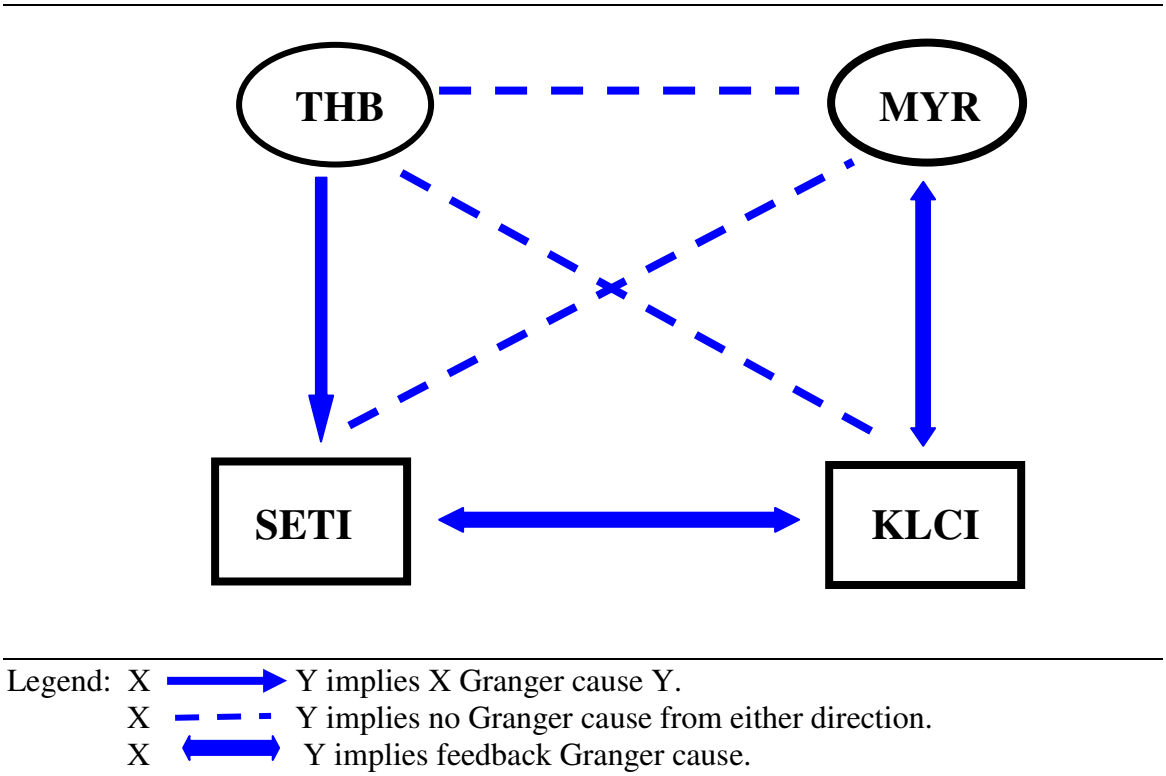
Null Hypothesis	Causality Tests [*p*-value]		
	Granger	Sim	GMD
$\Delta SETI \mapsto \Delta KLCI$	5.008 [0.007]^{I}	6.283 [0.003]^{I}	5.068 [0.007]^{I}
$\Delta KLCI \mapsto \Delta SETI$	6.029 [0.015]^{V}	6.733 [0.010]^{V}	5.860 [0.016]^{V}
$\Delta THB \mapsto \Delta MYR$	0.007 [0.935]	0.658 [0.418]	0.498 [0.481]
$\Delta MYR \mapsto \Delta THB$	1.526 [0.217]	0.059 [0.808]	0.237 [0.627]
$\Delta SETI \mapsto \Delta MYR$	0.211 [0.646]	1.734 [0.188]	1.472 [0.226]
$\Delta MYR \mapsto \Delta SETI$	1.526 [0.218]	0.059 [0.808]	0.237 [0.627]
$\Delta KLCI \mapsto \Delta THB$	2.059 [0.152]	1.741 [0.188]	1.741 [0.713]
$\Delta THB \mapsto \Delta KLCI$	2.039 [0.154]	0.141 [0.709]	0.158 [0.697]

Note: See notes to Table 2.

From Table 3, it is observed that there is a bidirectional causality between the stock prices of Malaysia and Thailand (significant at at least 5% level). This suggests a close interrelation between the stock markets of the two neighbouring countries. However, the foreign exchange markets in these two countries are independence from each other as we fail to detect any causality relationship between the US dollar dased baht and ringgit, even at 10% significance level by all tests. In addition, there is also no direct relationship among foreign exchange markets and stock exchange markets in these countries. This can be seen from the fact that at conventional significance level, there is no causal relationship between SETI and MYR/USD, and between KLCI and THB/USD. Our finding is robust in the linear framework. It is unknown whether or not nonlinear causality exist in the above markets. This issue will be taken up in our next research.

The causal relationships investigated in this study may be more obvious by transforming information in Table 3 into Figure 1. One interesting information revealed in Figure 1 is that during the sample period of study, changes in baht currency market was transmitted via the Thailand stock market to the Malaysia stock market, where its impact was further extended to the ringgit currency market. This finding is supportive of the accusation that the ringgit was negatively effected by the drastic depreciation of US dollar based baht during the 1997 Asian Currency Crisis.

Figure 1: Causality Relationship between exchange rates and stock indices in Malaysia and Thailand.



Legend: X → Y implies X Granger cause Y.
X - - - Y implies no Granger cause from either direction.
X ⟷ Y implies feedback Granger cause.

6.0 CONCLUSIONS

This study investigates the causal relationship between the foreign exchange and stock exchange markets in Malaysia and Thailand during the turmiol of the 1997 Asian Currency Crisis. Among others, our results show that there is a feedback causal relationship between these two markets in Malaysia. On the other hand, our finding in the case of Thailand is supportive of the traditional approach, which postulates a unidirectional causality running from stock prices to exchange rates. As this study includes not only the commonly used Granger (1969) causality test but also its alternatives (Sim, 1972 and Geweke *et al*., 1982 causality tests), our findings are more

robust than previous ones and thus may be regarded of confirming the similar findings of Granger *et al*. (2000) and Pan *et al*. (2000). As for the interaction between the two stock markets in Malaysia and Thailand, a strong feedback causality relationship between them has been detected, implying these two markets are closely linked.

Perhaps, the most important discovery of this study is the finding of the path on how the fall in Thai baht had been transmitted to the Malaysian ringgit. In particular, changes in baht is transmitted via the close tie between Thailand and Malaysia stock exchange markets to the ringgit. According to this finding, the transmittion mechanism may be visualised as follows. The fall in the culprit baht caused the stock exchange market participants to experience a significance loss in their return on their portfolio returns in the Thailand stock market. Hence international investment firms pull their hot money away from the Thailand stock market leading to a fall in the stock prices. As the stock exchange markets in Malaysia is closely related to that of Thailand, international investors also have lost their confidence in this market, causing them to reduce if not totally eliminate the weightage of Malaysian stocks in their investment portfolios. As such they cash off their stocks and later substitute their ringgit revenue for foreign currency in particulat the US dollar. This had resulted in the excess supply of ringgit in the foreign exchange rate markets, which exerted a downwards pressure on the ringgit and until it is no more sustanable, the ringgit plunged as was the baht. Hence, it appears that the reaction of Malaysian government in imposing capital control in preventing hot money flowing out of the country and the restrictive measure on the trading of ringgit in

the foreign exchange markets effective from 1 September 1998 was a right move in countering the turmoil of Malaysian foerign rate and stock exchange markets.

REFERENCES

Ajayi, R.A. and Mongoue, M. (1996),"On the dynamic relation between stock prices and exchange rates", *Journal of Financial Research*, Vol. 19, 193 – 207.

Abdalla, I.S.A., Murinde, V. (1997). "Exchange rate and stock price interaction in emerging financial markets:evidence on India, Korea, Pakistan and the Philippines", *Applied Financial Economics*, Vol. 7, pp. 25–35.

Baharumshah, A. Z., Masih, A.M.M. and Azali, M. (2002). 'The stock market and the ringgit exchange rate: a note', *Japan and the World Economy*, 14, pp. 471–486.

Bank Negara Malaysia. (1998). "The East Asian Crisis – causes, policy responses, lessons and issues", *Working Paper*, No. 4.

Doan, T.A. (1996). *RATS User's Manual Version 4*, Estima, Evanston.

Geweke, J., Meese, R. and Dent, W. (1982). "Comparing alternatives tests of causality in temporal system", *Journal of Econometrics*, Vol. 21, pp. 161 – 194.

Granger, C. W.J. (1969). "Investigating causal relations by econometrics models and cross spectral methods", *Econometrica*, 37, pp. 424 – 438.

Granger, C. W.J., Huang, B.N. and Yang, C.W. (2000). "A bivariate causality between stock prices and exchange rates: Evidence from recent Asian flu", *The Quarterly Review of Economics and Finance*, Vol. 40, pp. 337 – 354.

Gujarati, D.N. (1995). *Basic Econometrics*, 3rd Edition, MacGraw-Hill, New York.

Hatemi-J, A. and Irandoust, M. (2002). "on the causality between exchange rates and stock prices: a note", *Bulletin of Economic Research*, Vol. 54, No. 2, pp. 197 - 203.

Mohamad, M (2000). *The Malaysian Currency Crisis: How and Why It Happened*, Pelanduk Publication, Malaysia.

Smyth, R. and Nandha, M. (2003). "Bivariate causality between exchange rates and stock prices in South Asia", *Applied Economics Letters*, Vol. 10, No. 11, pp. 699-704.

Sim, C.A. (1972). "Money, income and causality", *American Economic Review*, Vol. 62, pp. 540-552.