Chapter 2: Literature Review

While quite a number of researches had been carried out to study the time series relationship between stock prices and currency exchange rates in various parts of the world in different periods, compared to developed countries, academic research that conducted on the relationship between performance of stock market and currency exchange rate in Malaysia is limited. Some of the reasons could be due to the assumption that tight movement of Ringgit Malaysia against the US Dollar before the eruption of Asian financial crisis had little relevance to the movement of local stock market and more developed markets usually attract more attention than markets in emerging countries which are relatively smaller in size. Before embarking on the study of Malaysia market, it is imperative to review some previous literatures of related topics for different markets, different periods and using different models and methodology. Various theories and approaches applied to explain the relationship between currency exchange rate and stock price will be mentioned before zooming into the few of previous empirical studies related to the relationship, looking at the general behaviour of the relationship worldwide, then in some developed markets, looking at it geographically into Asian countries, South East Asian markets, neighbouring countries, and last but not least, in Malaysia markets.

2.1 Theories on relationship between stock price and currency exchange rate

Among the theories and approaches applied to explain the relationship include traditional approach, portfolio balance approach, asset market approach and equity parity.

In traditional approach, as highlighted by Granger, Huang and Yang (1998), from the microeconomics aspect, the movement in currency exchange rate is expected to have impact on the profit of firms and performance of share prices. From macroeconomics point of view, appreciation of currency exchange rate under flexible exchange rate regime will make the products of firms less competitive as thus lower their stock prices. In both cases, the currency market changes lead the stock market changes. In this approach, appreciation of currency exchange rate leads to lower stock price and vice versa.

In another approach, a downward movement of the stock market would lead to intensive outflows from the market. This decreases the demand for money, lower interest rate and hence causes depreciation in currency. This approach which is also known as portfolio approach, suggests that the stock market causes the changes on currency. Contrary to traditional approach, in portfolio balance approach, strength of stock market and currency exchange rate move in same direction. Ooi & others (2009) added that in portfolio balance approach, this is particularly relevant during a currency crisis.

Ooi & others (2009) brought up asset market approach which argues that there is no relationship at all between exchange rate and stock price as it considers exchange rate as an essential part of an asset price in terms of foreign currency. The factors that affects the currency exchange rate

presently may not be the same factors that affects the future currency exchange as the significance of factors that affect the movement of currency exchange rate such as export performance, supply shock, political events, productivity loss, war, stock market crash, hyper inflation and other policy variables change over time. This leads to the argument that there should not be any causal relationship between these two variables.

Another theory used to explain the relationship between performance of stock market and the movement of currency exchange rate is equity parity. Ong & Izan (1999) used weekly data of spot and 90-day forward exchange rates for Australia and the Group of Seven countries (Canada, France Japan, United Kingdom, Germany, Italy and United States), and spot and 90-day futures equity prices for Australia, Britain, France and the United States between October 1986 and December 1992 to analyse share market and exchange rates from the aspect of equity parity as it was contended by the author that share prices, which rapidly adjust to new information and market development, could be suitable indicators of real economic activity which could be used in models of currency exchange rate determination. The author hypothesised that 'law of one price" as similarly applied in purchasing power parity (PPP) and interest rate parity (IRP), should ensure that the rate of return from investing in one country's index would be equal to the rate of return on the foreign stock index plus the appreciation of the foreign currency against local currency, so that the real return from investing in either country is the same after adjusting for exchange rate and risk difference. It was concluded in the research that equity parity holds between stock markets and exchange rates in a way that a depreciation in a country's currency would

cause her share market returns to rise and vice versa. It was also found that the reaction from share price to exchange rate changes was a very rapid one within week, with Australian and British share markets appeared to react instantaneously to news, except for US market, which took four weeks to incorporate leads from currency movement. However, the limitation in this study with regards to this equity parity model was that it was applicable to equity markets with similar risk levels and economy growth. For equity markets with different risk structures, the equity model would be applicable if risk-adjusted equity returns were used.

A nation's dealings with the rest of the world affects its exchange rate, reserves level, interest rate, overall economic growth and thus the stock market performance. Kim (2003) explained that the small number of early studies between the relationship stock prices and currency exchange rate might be due to fixed exchange rate regime of Bretton Woods era, a period which exchange rate hardly moved. However, this relationship has become more significant after generalized floating of major currencies in year 1973. The remarkable increase in capital flow and world trade made currency exchange rates as one of the significant determinant in stock prices and spur interest in the relationship between stock prices and currency exchange rate. However this was contested by Baharumshah, M. Masih, & Azali (2002). In monetary theory of exchange rate determination, economics variables such as money, income and interest rates are among important variables as determinant of exchange rate. It was found in their literature review found that the monetary theory of exchange rate determination worked poorly in countries with floating exchange rate regime. This led to economists

concluding there was a significant variable missing from the model. So the authors extend the model to include the effect of stock prices in the exchange rate equation in attempt to bridge the gap. Using macroeconomic variables and quarterly currency exchange rate spanning from year 1976 to year 1996, they found that equity market was significant in affecting the exchange rate and in explaining part of the parameter in the model.

2.2 Previous studies on the relationship between stock prices and currency exchange rates in various markets

Besides understanding different approaches in explaining the relationship and observing the relationship between these two variables, it will be helpful to go a step further by examining if linkage and causality between these two variables exist, and to determine the causality relationship whether it is unilateral, from one market to another or it is bilateral causal relationship.

The relationship between the two variables varies across different countries at different periods due to dissimilar economic conditions in different countries. Cumperayot, Keijzer, & Kouwenberg (2006) carried out a study on the linkages between stock market and currency returns during volatile periods for 26 countries for the period from year 1996 to 2005, whether extreme movement in currency exchange rate and extreme stock market returns tend to happen simultaneously or whether one market leads another market. For countries like United States, Canada, Switzerland and Brazil, significant depreciation in currency markets reduced the probability of sharp decline in equity markets as depreciation in currency increased export competitiveness, and thus improving the earning of local economy, leading to positive effect on equity market. On the other hand, the authors hypothesized

that unlike export orientated nations, sharp decline in currency exchange rate was not necessarily positive to stock markets in emerging markets as there were potential negative impact on domestic lenders with debt denominated in foreign currencies and on the stability of the local banking system. However, the support for the hypothesis was weak as the result showed Malaysia was the only market among the emerging countries under study found to have significant positive link from depreciation in currency to declines in stock market declines.

We now look at the relationship in developed markets such as the United States and United Kingdom. Kim (2003) studied the long run equilibrium relationships among the aggregate stock price, industrial production, real exchange rate, interest rate and inflation in the United States for a period of 1974 to 1998 was studied using monthly data. It was found that the S&P 500 stock price is negatively related to the strength of US Dollar.

Meanwhile, Dimitrova (2005) focused on the United States and United Kingdom on the study of the linkage between stock market and currency exchange rate between January 1990 and August 2004 which might explain fluctuations in either market. It was revealed that depreciation (appreciation) in currency exchange rate may depress (boost) the stock market. However, when stock market rose (dropped), the currency is expected to depreciate (appreciate), showing the currency and equity having ambiguous correlation. In the case of financial crisis, plunge in currency exchange rate could cause fall in stock market. When stock market collapses, the currency exchange rate will be stronger and this will lead to rebound in stock market. In such case, the

joint causality relationship between stock market and currency exchange rate market contributed to market self-healing during a financial crisis.

In Asia region, a research was performed by Pan, Fok, & Liu (2007) to find out the dynamic linkages between exchange rate and stock prices for seven East Asian countries which include Hong Kong, Japan, Korea, Malaysia, Singapore, Taiwan and Thailand for the period between January 1988 and October 1998. The results showed most of the countries had significant causal relations between stock prices and exchange rates. Before the 1997 Asian financial crisis, exchange rate had significant causal relation from exchange rate to equity market for Hong Kong, Japan, Malaysia and Thailand, while there was causal relation from stock prices to exchange rate for Hong Kong, Korea and Singapore. (There was bi-directional causal relation between equity market and currency exchange rate in Hong Kong.) However, during the turbulent period of Asian financial crisis, it was found that there was no significant causal relation from equity markets to currency exchange rates, significant causality was found from exchange rates to stock prices for all the countries except only Malaysia which could be due to imposition of capital control during the crisis period. What aggravated the plunge in both currency exchange rates and stock prices during the Asian financial crisis was the sudden dislocation of asset demand which could be due to herding behavior, loss of confidence or even panic of investors, resulting in shift of portfolio preference to more stable developed countries, causing massive outflow of capital and oversupply of local currencies. The article went on to explain that possible differences in the relation between currency exchange rates and stock prices could be due to factors such as

size of each economy, degree of development of each country, rate of growth and maturity of financial markets. Other than Japan which was considered developed countries, the remaining other six countries were referred to as newly-industrialised countries which deployed trade-led approach such as softening the local currency exchange rate to increase local firms' competitiveness to protect their economic growth. In general, developing countries do not practice free float currency exchange and have tighter capital controls. As such, the swing in currency exchange rate is unlikely to be in full response to movement of stock prices. Another reason for weaker relation between currency exchange rate and stock prices in developed countries is that major developed countries are able to reduce currency exposure risk by dictating the cross border transaction to be denominated in their countries' currency and also in these countries, exchange rate hedging instruments are more readily available in these matured markets. From the results of causality test, it was concluded that unilateral causal relation from exchange rates to stock prices in these countries during crisis reflected the view that the financial crisis was indeed a currency-lead-stock-price financial crisis where sharp plunge in currencies was followed by sharp fall in stock markets. For test of cointegration using Johansen's (1991), the results were mixed for these seven countries. For Malaysia, there was lack of cointegration and the author explained this phenomenon could be due to managed floating exchange rate arrangement, strong capital control imposed and noise contained in daily data.

Phylaktis & Ravazzolo (2005) carried out a research on the dynamics between stock prices and exchanges rates using monthly data in the markets

of Pacific Basin countries between year 1980 and 1998. The result showed that the stocks and foreign currency exchange markets are positively related and it was also found that US market acted as a conduit for these links.

In South-East Asian region, few studies had been carried out related to the relationship between currency exchange rate and stock market, particularly on the event of Asian financial crisis near the end of twentieth century. A research for countries in South East Asian countries was performed by Jun (2001) for Philippines and Thailand during pre-crisis and crisis periods, the first two countries facing massive price movement in financial assets during the Asian financial crisis. It was found that general benchmark stock indices often fail to provide valuable insights into currency crises but some sectoral indices particularly those of banking and finance sectors seem to have caused pressure on the currency exchange rate where depreciation in domestic currency was linked to fall in stock prices, showing a drop in stock these banking and financial related indices caused depreciation in exchange rates. It was also casually observed that the stock prices in these two countries had declined before the authorities in those two countries allowed depreciation in their currencies in July 1997.

A separate study was carried out by Wu (2001) to analyse asymmetric movements of exchange rates and stock prices in neighbouring Singapore pre and during Asian financial crisis. It was found that Singapore, a small country with open economy, also as one of the international financial hubs in Asia, has active offshore Asian dollar market, high level of international trade and investment, her currency Singapore Dollar against developed countries' currencies is negatively related to stock price whereas relationship between

Singapore Dollar against Malaysian Ringgit and stock prices was positive. One of the reasons cited for opposite impact of developed countries' currencies versus Singapore Dollar against Malaysia Ringgit versus Singapore Dollar had on the Singapore stock market was that when a negative shock hit the Singapore Dollar, they are buying more of Singapore currency and equity since they appeared more attractive than Malaysian assets as they had anticipated the Singapore currency's future appreciation and higher future rate of return. As Singapore is a country with highly open economy with high international trade and investment, the stability of the currency exchange rate is crucial in maintaining price stability. The currency exchange rate has been emphasized and placed its emphasis as the intermediate target of monetary policy while maintain and control economic growth as its ultimate target. For instance, depreciation of currency exchange rate is necessary when domestic inflation drops significantly and economic growth is in jeopardy during financial downturn.

In Ooi & others (2009) which studied the causal relationship between exchange rates and stock prices for Thailand and Malaysia, using currency exchange rate with reference to Thai Baht, it was found that stock price unidirectionally Granger caused currency exchange rate had more significant casual relationship compared with causal relationship from currency exchange rate to stock price. Portfolio balance approach could be applied to explain the relationship of the two variables for the post-crisis period.

Closer back home, Goh (1989) found that Malaysian Ringgit Exchange as well behaved like other major currecncies which moved in random walk

manner.Any shock effect on the foreign exchange market would leave a long-lived effect on the future movements of the exchange rate.

Immediately after the eruption of Asian financial crisis, Yahya (1998) tried to determine the significance of relationship and correlation between the returns on the indices of Kuala Lumpur Stock Exchange and the returns on the Ringgit Malaysia per US Dollar foreign currency exchange for year 1997. The strength of linear relationship between the two variables are measured by determining the correlation coefficient. It was found that the returns on the indices of Kuala Lumpur Stock Exchange and the returns on the Ringgit Malaysia per US Dollar foreign currency exchange had negative and moderately significant correlation and the correlation was stronger when the movement of currency and stock indices were volatile during the second half of the year. The author also lagged each variable by one day against another variable and worked out the coefficient of correlations. It appeared that the were no correlation if the variables were lagged against another. This revealed that the movement of stock market and foreign currency exchange Ringgit Malaysia per US Dollar was not affected by the closing level of another variable previous one day. One of the limitations of the study was long term relationship between the two variables could not be analysed and concluded as the study was limited to a period of 1 year.

In separate study, the test on cointegration between stock market and exchange rate in Malaysia was performed by Ismail & Isa (2006). It was found that the two variables were not cointegrated for monthly data for the period of from year 1990 to year 2005.

A study carried out by Hasan (2000) showed that the fluctuation of KLCI had been closely related to the movement in currency exchange rate during the Asian financial crisis.

In Baharom, Royfaizal & Habibullah (2008), the authors applied Johansen cointegration to analyse the causal effect between two macroeconomic variables, the currency exchange rate using real effective exchange rate (REER) and stock price for two separate periods, i.e. pre crisis (from January 1988 to June 1997) and post crisis (from July 1998 to December 2006) periods in Malaysia. The results obtained showed no long term relationship between stock price and exchange rate for both periods under review. Also concluded, the relationship between stock price and currency exchange rate pre crisis did not alter post crisis. However, in Azman-Saini, Habibullah, & Law (2007) which studied the causality effects between stock prices and exchange rates in Malaysia using a new Granger non-causality test proposed by Toda and Yamamoto (*Journal of Econometrics*, 66, 225-50, 1995) for the period of from January 1993 to August 1998, it was found that there was interaction between stock prices and currency exchange rates pre-crisis period and it was observed that currency exchange rates led stock prices during the said Asian financial crisis period, reflecting the importance of currency exchange rate had on the well-being of stock prices. Similar to what had been elaborated by Baharom, Royfaisal, & Hasbullah, (2008), it was explained that currency appreciation affect product international competitiveness and trade balance position, leading to drop in outputs and profits, which in turn affects the stock prices. It argued that currency exchange rate leads stock prices with positive correlation. On the other hand, portfolio-

balance model contended that wealth and equity would affect the exchange rates through demand for money. Bullish stock prices lead to greater demand for money accompanied by higher interest rates, which will attract inflow of foreign fund and lead to appreciation in the said currency. In this case, stock prices lead exchange rate with negative correlation. The results of unit root test using all three augmented Dickey-Fuller, Philip-Perron and mean stationary test proposed by Kwiatkowski showed the stock prices are currency exchange rates are non-stationary at level but stationary at first-difference. Further test revealed that there were bi-directional causality between stock prices and exchange rates for the pre-crisis period (from January 1993 to December 1996) and one-way causality running from exchange rates to stock price during crisis period (from January 1997 to August 1998).