



The Impact and Exposure of Changes in Exchange Rate Regime on Firms in Malaysia: Evidence from Stock Return and Foreign Exchange Rate

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This study is an adaptation and it compliments earlier research that has been conducted in this field. It examines the exposure of the exchange rates of firms in Malaysia between the period starting from 1990 to 2010 and it looks at the extent to which the exchange rate regime has undergone changes. The theoretical foundations are evident, but the empirical evidence is still inconclusive. These issues have been discussed and has become a challenging issue for the past twenty years. A number of firms are significantly exposed to four currencies (USD, SGD, JPY and GBP) especially against USD. However, based on further investigations using the panel data and pooled analysis with random effects (SUR), the results show an interesting dynamic. It was found that the number of firms with significant exposure did not increase from the peg to the de-peg period. Finally, recent research has placed emphasis on the importance and relevance of measuring firms' specific exchange rate exposure. Even though in some cases, the incidence is still a puzzle, a more comprehensive picture of the relationship between the firms' value and the exchange rate fluctuations could be established.

Key words: *exposure, exchange rate, regime, stock return.*



Introduction

A financial crisis is a situation whereby the country's financial institutions or assets suddenly lose, a large part of their values. Among the world's financial crises are The Mexico Peso Crisis 1995, the Asian Financial Crisis - Thai Baht 1997 and The Sub Prime Induced Financial Crisis - USA 2008. Malaysia was severely hit by the Asian financial crisis in 1997. This crisis is also known as the most contagious economic crisis in Asia. In order to sustain the economy, the Malaysian central bank had to change the exchange rate policy several times due to severe fluctuations in the exchange rate. When the country was hit by the Asian financial Crisis in 1997, it forced the country to switch its regime from floating to that of the fixed peg. However, in 2005, Malaysia de-pegged its currency to a managed float regime.

The question of whether the changes in the exchange rate policies would result in a positive or negative impact on the firm's exchange rate exposure. According to Engel (2009), should the question of the exchange rate policy be freely determined by the markets or should they be intervened by the government has also been debated for long periods of time. Therefore, this study is to find out what then is the impact on the listed firms in Malaysia when the exchange rate policies or regimes change? What is the degree of the impact of such changes? Do the changes really help to mitigate or reduce the risk of the exchange rate exposure towards the listed firms?

The empirical studies indicate that many firms in developing countries were exposed to risks in the foreign exchange rates, especially to fluctuations regarding the value of the U.S. dollar. According to Parsley et al. (2002), the exposure shows no signs of lessening, and it does not appear to diminish under an exchange rate peg. Parsley et al. (2002) adds that the exposure among the East Asian firms is much more widespread than those in the large firms in the Western industrialized economies, Australia and New Zealand. Even though exchange rate regimes have changed drastically; exchange rate exposure has not been reduced.

This study is an extension of previous research that had been carried out since the years of the free-floating policy and due to the Asian financial crisis; the government thus changed its policy to pegging the currency against USD. It is a further look into the Malaysian government's action of de-pegging the currency by using the managed float policy. Therefore, this study is to examine the behavior of the statistical measurements such as mean, standard deviation, volatility, and the correlation between MYR/X2 and USD/X during the time before, during and after the pegging based on the excess return of the firms' stock prices for the period between January 1990 and July 2010. The comparison will be among the Malaysian Ringgit (MYR), United States Dollar (USD), British Pound (GBP), Japanese Yen (JPY) and Korean Won (KRW). This will then partly complete the 'life cycle' of the currency policy changes in Malaysia.

Research Model

Two models were used for this study and the research model was selected based on the previous study by Bacha O. et al. (2013), and the software that used is *Eviews 6*. Since the research is an adaptation of the previous research as mentioned earlier, the research model will be of the same model according to De Jong et al. (2006) and Parsley and Popper (2006), the measurement of the firm's specific exchange exposure is as follows;

$$R_{it} = \alpha + \beta_1 \text{USD} + \beta_2 \text{SGD} + \beta_3 \text{JPY} + \beta_4 \text{GBP} + \epsilon_{it} \dots\dots\dots (1)$$

where;

- R_{it} ; = the returns of stock i in month t less the returns on the market index for the month t that gives excess returns of the firms. The market index is proxied by 30 of the largest companies' stock FTSE Bursa Malaysia KLCI.¹
- α = the intercept of the regression line.
- $\beta_1, \beta_2, \beta_3$ and β_4 = the betas or sensitivity of the exchange rates.
- USD, SGD, JPY, GDP = represents the exchange rates for the US Dollar, Singapore Dollar, Japanese Yen and Great Britain's Pound Sterling
- ϵ_{it} = the residual stock i in the of month t less the returns on the market index for the month t , in other words it was an error term with a zero mean and is uncorrelated with other explanatory variables.

The purpose of using the multiple bilateral exchange rate instead of a single trade weighted exchange rate is to allow the data or model to select the significant exchange rate for an individual firm and this has been supported by the previous study (Bacha O. et al. 2013; Osman, Jamaludin & Fathil, 2016).

The first model, Equation (1) basically states that a firm's excess returns is a function of, or is influenced by the changes in the four exchange rates. The excess returns is to measure the firm's level of marginal exposure. This is supported by the previous study by Bacha O. et al. (2013). As the implicit assumption of the constant variance in Eq. (1) is often untrue with the time series financial data, and in line with the previous studies, a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) (1, 1) specification to Eq. (1) and testing at 5% level of significance was added and employed to minimize the problem. Furthermore, according to Chris Brooks

¹The Kuala Lumpur Composite Index (KLCI) is now known as the FTSE Bursa Malaysia KLCI and adopts the FTSE global index standard from 6 July 2009 onwards. Earlier, the market index was proxied by the 100 stocks, KLSE CI.
http://www.bursamalaysia.com/website/bm/market_information/index_components.html



(2008), even though there are an infinite number of different types of non-linear models, only a small number of non-linear models have been found to be useful for modelling financial data. The most popular non-linear financial models are the ARCH or GARCH models which are used for modelling and forecasting volatility, and the switching models which allow the behaviour of a series to follow different processes at different points in time.

In addition, a Wald test was used to correct any potential multicollinearity since De Jong et al. (2006) indicates the specification as in the Eq. (1) which tends to underestimate exposure because of multicollinearity in the exchange rates. The Wald test was performed to test at the 5 % level of significance to see if all four exchange rate coefficients are simultaneously equal to zero. This test was carried out for all firms that showed no exposure at all to any of the currencies while using Eq. (1). If the currency coefficient is significant at the level of 5%, the Wald test is then rejected. Therefore, the firm will be included as being exposed to that currency.

The second model is used to analyze the exchange rate exposure on an overall basis across all sample firms and firms of subgroup firms. While the model specified in Eq. (1) would only enable us to estimate the exchange rate exposure for an individual sample firm only. The panel data analysis is conducted using a random-effects GLS regression model by stacking each of the 128 sample firm's data, as panel data and estimating an overall seemingly unrelated regression (SUR). In order to decide the best model between the random effect and the fixed effect model that would be able to fit with the data, the Hausman test was conducted. The preference between the fixed or random effect model can be carried out by examining the existence of correlation between the missing cross-sectional characteristics with the explanatory variables with hypothesis as follows;

- H₀: No correlation between the missing cross-sectional characteristics and explanatory variables
- H₁: There is a correlation between the missing cross-sectional characteristics and explanatory variables

From the output generated from the *Eviews 6* package, the result gained is as follows;

Result for Hausman comparative test between the Fixed effect and the Random effect model:

Item	Chi Square Statistics	p-value
<i>Cross section</i>		
<i>random</i>	0.001114	1.0000

As the above result indicates the value of the chi square statistics is lower than the critical p-value, thus it implies that the acceptance of the null hypothesis is at 5% significance level. It concludes that there is no correlation between the missing cross-sectional characteristics and explanatory variable, which means that the random effect model is preferred in this case.

The second model is shown in Equation (2) below:

$$R_o = [R_i] = \begin{bmatrix} \alpha 1 \\ \vdots \\ \alpha n \end{bmatrix} + \begin{matrix} \beta_{11} \text{ USD}_1 + \beta_{12} \text{ SGD}_1 + \beta_{13} \text{ JPY}_1 + \beta_{14} \text{ GBP}_1 \\ \beta_{11} \text{ USD}_t + \beta_{12} \text{ SGD}_t + \beta_{13} \text{ JPY}_t + \beta_{14} \text{ GBP}_t \\ \vdots \\ \beta_{n1} \text{ USD}_1 + \beta_{n2} \text{ SGD}_1 + \beta_{n3} \text{ JPY}_1 + \beta_{n4} \text{ GBP}_1 \\ \beta_{n1} \text{ USD}_t + \beta_{n2} \text{ SGD}_t + \beta_{n3} \text{ JPY}_t + \beta_{n4} \text{ GBP}_t \end{matrix} + \begin{bmatrix} e_1 \\ \vdots \\ e_n \end{bmatrix} \dots (2)$$

whereby; R_o is the overall/across sample return.

The data is run under *Eviews 6* software. The advantage of this model is that it can accommodate not only the cross-sectional correlation between the samples but also poll all the data from all the firms for all the years. Thus, by combining the time series of the cross-section observation, the panel data gives “*more informative data, more variability, less collinearity among variables, more degree of freedom and more efficiency*” (Gujrati, 2009; Hye & Dolgopolova, 2011).

Development of Research Hypotesis

This research is a quantitative research and the main emphasis of the quantitative research is on the deductive approach. A deductive approach is normally based on a positivistic perspective. It means that testable hypotheses are derived from the previous theories and will be examined by using the empirical data. In general, the deductive process is from the theory to the empirical data, while the inductive process is from the empirical data to theory (Saunders et al., 2007). Therefore, at the beginning of the research process, testable hypotheses were set up based on the research questions and previous theories. These hypotheses were used as a guideline to regress and perform the research models to analyze and find the results.

Consequently, the hypothesis was either rejected or confirmed when it had been tested against empirical observations. Finally, from the results, the existing theory was confirmed or modified. In this research, there is no intention to set up a new theory from the observation of the empirical data. This is largely due to the fact that, in the past three decades, the findings of the relationship between the stock return changes and foreign exchange rates movement were mixed.

Since this research is an adaptation from a previous study, there will be two research questions were re-examined in order to evaluate the exchange rate exposure of Malaysian listed firms and the consequence of policy change especially after the exchange rate currency was de-pegged are as follows:

- (i) What is the extent of currency exposure among the Malaysian listed firms?
- (ii) What was the impact of the change in the exchange rate regime on the exposure of firms?

The above two research questions were formulated in testable form as the following hypotheses:

Hypothesis 1: There is currency exposure among the Malaysian listed firms.

Hypothesis 2: Exchange rate regime has an effect on a firm's currency exposure.

Explanation of Variables

In this study, the dependent variable is the firm's excess returns based on the stock returns minus the Bursa Malaysia KL Composite Index. The independent variables are made up of four types of foreign exchange rates against the Malaysia Ringgit (MYR). The selected foreign currencies are USD, SGD, JPY and GBP. The relationship between the firm's performance and the changes in the exchange rate regime is indicated using the excess return and movement of the exchange rate as data and indicator of the degree of the firm's exposure and this will be examined as well. The analysis will be based on the firm's overall exposure and sub-periods, before pegging, during crisis, during the peg and most importantly for this research, the period following the de-peg. The relationship between types of industries and sub-periods will also be examined.

Methodology

After the Asian financial crisis, academics started to investigate the effects of the exchange rate volatility on firms' values in the Asian countries. It also shows that the effects of exchange rate movements on the value of a firm has become an important field which draws attention from both academic researchers and practical investment analysis. According to Jian F. L. et al. (2011), there is a discrepancy between theoretical predictions and observed levels of exchange rate exposure. It is based on the argument between former scholars such as Dominguez and Tesar (2006), who have identified the empirical studies present weak relationships between the exchange rate changes and



firms' stock prices. On the other hand, Bartram and Bodnar (2012) discovered puzzling phenomenon on foreign exchange exposure and stock returns. Therefore, for these reasons, it motivates and provides an opportunity to contribute more theories in related research from the empirical perspective. Therefore, the quantitative technique is better suited for this research as the study deals with numeric values that can be analysed through the use of suitable data analysis procedures like graphs, tables and charts.

Data Collection

In this research, even though the data had already been identified based on the previous research, the whole data needed to be collected once again and this data collection and eventual processing took an enormous amount of time and effort. The data was collected from the secondary data. According to Sekaran (2006), the advantage of seeking sources for secondary data is time saving and saves the cost of acquiring information. However, according to him, utilizing secondary data as the sole source of information has its drawback of becoming obsolete or outdated, and thus will fail to meet the specific needs of the particular situation or setting. For this reason, it is important to refer to sources that offer current and up-to-date information.

Hence, the researcher began with a list of all the Malaysia public listed firms that had been used in the previous research from the year 1990 onwards. In the previous research, the listed companies consisted of 158 firms but after eliminating for suspensions, trading halts (PN17), merging and other gaps in the data, 128 companies remained. Therefore, the data did not need to be run all over again based on across firms (sectoral analysis) and over time (by different sub periods), even though this study is more focused on the de-peg period. The data used to analyze in this research was extracted from the Bloomberg database at Bursa Malaysia similar as that which was done during the previous research.

The firm's stock price and exchange rates were downloaded on a monthly basis for the period January 1990 to July 2010, a period of 20 years. From this data, the monthly returns and excess returns were computed. Following the previous research in examining the firm-specific exposure, the researcher follows De Jong et al. (2006) and Parsley and Popper (2006) by using several bilateral exchange rates.

In the previous research, the author looked at the previous literature and Malaysia's direction of trade to choose the relevant foreign currencies. Thus, based on the direction of the trade, the author identified USD, Japanese Yen, Chinese Yuan, British Pound, Singapore dollar and the Euro to be relevant for the research. However, the Euro and the Chinese Yuan had to be dropped due to the short tenure for the Euro and serious multicollinearity problems for the Chinese Yuan when it was



“peg” to the US dollar. Therefore, the author focused on the monthly bilateral exchange rates of the USD, the Singapore dollar (SGD), Japanese Yen (JPY) and the Pound (GBP) against the Malaysian Ringgit (MYR). As per this research, the focus is on the exchange rates for the Malaysian Ringgit (MYR) against the same major four (4) currencies namely, USD, SGD, JPY and GBP. The exchange rate was defined as the number of MYR per unit foreign currency.

In order to answer the four research questions, analysis for both the sectoral and different sub periods will be conducted. The data collection was also be divided into the pre-peg period, peg period and the post-peg period. Subsequently, for each period, the mean and standard deviations were determined. Correlation was calculated to measure the degree of relationship between the excess return and USD, SGD, GBP and JPY for the firms that were shown to be not significant to any currencies using the Wald test.

Using the data, graphs were also generated to better illustrate the findings.

Analysis and Research Findings

Analysis and research findings are the sections where the empirical results from the regression Eq. (1) and panel data Eq. (2) were analyzed and explicated. The presentation and analysis of the data collected will be aligned with the chosen methodology and specifications. The analysis has been divided and discussed in two parts. The results of the test conducted on the sample will begin with the firm’s specific exposure. This will be followed by a discussion on firm’s exposure over time, based on the exchange rate regime. Thirdly, the analysis out of whether the firm’s specific exposure is time variant. Finally, the result of firms’ exposure based on the industrial sectors will be discussed.

Firm Specific Exposure

This section is to determine whether the firms are exposed to all the four currencies (USD, GBP, JPY and SGD) or part of the currencies or not at all. It also examines the direction and magnitude of the exposure. The results are based on the regression of Eq. (1) and Eq. (2). In Appendix 1, Charts 1 and 2 show the occurrence of exchange rate exposure from the samples of the listed firms in Malaysia for the period starting from January 1990 until July 2010.

The results of Eq. (1), when tested at a 5% level of significance, showed that out of 128 sample firms, a total of 89 or 70% of the firms have indicated a significant exchange rate exposure. Table 1 and Chart 1 shows the breakdown of the exposure by currencies. These results indicate that the level of exposure of the listed firms in Malaysia is very high. Nevertheless, the results have been



expected due to Malaysia's dependence on international trade. Bacha O. et al. (2013) have pointed out two reasons why the result of exposure was very high. Firstly, Malaysia is an open economy country with heavy dependence on international trade. Secondly, in previous studies, Muller and Verschoor (2007) examined the firms' exposure level against USD by comparing nine Asian countries including Malaysia, which showed very high sensitivity rate against the USD of more than 70%.

The elimination of a few firms compared to the previous paper and length of the time period will change some of the results when compared to the previous research.

Out of 128 sample firms, about 39 or 30% of the sample firms have no exposure to any of the four currencies. This result was finalized after the Wald test that was conducted for any possible multicollinearity problem that might have occurred in any of the firms that were given zero exposure at 5% level of significance. After the Wald test, there were firms that are not exposed to any currency. This result may be due to the firms trading only among the local industries that have had no relationship with any exchange rate or any trading that used foreign currencies except for the local currency (MYR). However, another reason for this result may be due to hedging. Crabb (2002) had discovered evidence as to why several previous studies had indicated an insignificant impact of the exchange rate movement on stock returns volatility for most multinational corporations, especially for the U.S. multinational corporations and the U.S. large exporters. The explanation is that these firms make use of financial hedging strategies to mitigate foreign currency exposure. However, according to Wen and Tang (2010), in their research on the exchange rate exposure of firms in four Asian markets including Malaysia, the effect on exchange rate exposure was found to be insignificant. This was the result of the involvement of leverage, foreign sales and hedging activities. Wen and Tang (2010) added that the relationship between the exchange rate and stock returns had varied from the markets with respect to the exchange rate regimes and level of capital controls.

Table 3 (Appendix 2) shows the important results for the overall across sample returns. When the data was run using the panel data analysis with the cross-section (SUR) random effects, the results (Table 5) indicated that the exchange rate exposure is significant to changes of the excess returns for the whole period including the crisis, pegging and managed float (de-peg) regimes. However, among the four currencies, the USD was statistically significant at 5% level with the exchange rate exposure, compared to the other three currencies. This is in compliance with the number of firms exposed to the USD which contributed the biggest percentage of 78% while the other three currencies only gave the exposure the range of between 20% to 31%.

From Table 3 (Appendix 2), the direction and magnitude of the exposure for the overall period can be observed. In order to get the magnitude and direction of exposure, from Eq (1), descriptive statistics was utilized were conducted on the coefficient of each exchange rate as each coefficient was affected differently or had different exposure against the excess returns due to the nature of the business. The USD, Yen and Pound showed negative betas whereas SGD indicated a positive beta. The result implied that this sample of firms ere the net importers from the three countries; United States, Japan and Great Britain and were also the net exporters in the case of the Singapore dollar. The negative coefficient also shows that there is an inverse relationship between the three currencies (USD, JPY and GBP) and excess returns. In other words, if the three currencies had appreciated or MYR had depreciated, the excess returns of the firms would have decreased. This is due to Malaysia's import value being greater than its export value in relation to these three countries. On the other hand, SGD had given a positive coefficient, indicating that any change in the SGD will give the same direction with the changes in the excess returns of the firms. The implication is that any appreciation in the SGD when compared to the MYR, the excess returns of the firms also appreciated or increased. This is in compliance with and is consistent with the findings from the previous studies (Bacha O. et al. 2013; Ping, 2017). The rationale of the result is that the volume of Malaysian exports through Singapore is substantial.

Hence, Hypothesis 1 has been accepted, that an extent of currency exposure among the Malaysian listed firms is extensive.

Exposure over Time to Exchange Rate Regime

Do changes of exchange rate regime have any impact on exchange rate exposure? In order to identify whether there was any impact towards the exposure of the Malaysian firms, there was a need to compare the de-pegging period with the periods during the crisis and the pegging. Therefore, the event that began with the sub-period of the Asian financial crisis (June 1997 – August 1998) will be analysed. The second sub-period was September 1998 until July 2005 which covered a period of the pegged Ringgit against USD.

After holding the fixed (pegged) exchange rate policy for 7 years, in August 2005, Malaysia rescinded the policy of pegging the Ringgit to the U.S. dollar and switched to another exchange rate regime. Therefore, the third sub-period which is the most important period, from August 2005 till July 2010, covers the period of de-pegging, whereby Bank Negara implemented the managed float regime which was based on a basket of currencies. The sub-period pertaining to the short-term pre-peg (the period before the crisis) was also included in this analysis in order to compare the results of before crisis, during crisis and after crisis. The period started from January 1990 till May 1997.

Appendix 3 (Chart 3 and Table 4) shows the breakdown of the exposure by currencies and sub-periods. In the year before the crisis, from the year 1990 until May 1997, the result shows that 65% of the firms were not exposed to any currency. Only 35% or a total of 48 firms were exposed to any of the currencies. During the crisis, 55% or a total of 70 firms were exposed to the currencies and only 45% or 58 firms had no exposure to any of the currencies. When the Malaysian government pegged the Ringgit against the USD, the number of firms exposed to all four currencies decreased to 59 firms which is equivalent to 35% and the number of firms that were not exposed to any currencies also increased to 69 firms, or 65%. The next period was the de-pegged period.

The results indicate that the number of firms which were exposed to any of the four currencies was 35% or 66 firms and the number of firms that were not exposed to all the currencies was 62 firms or 65%. Surprisingly, the percentage of the firms exposed and not exposed to all the currencies for the period of before crisis, pegged and de-pegged, gave the same results. Does this mean that the implementation of the pegging or de-pegging regime has no impact on the exchange rate exposure? The results also show that the percentage of firms exposed to one, two, three and four currencies, for the sub-period before the crisis, pegged and de-pegged era gave the same results. Each sub-period showed a percentage of 22% of the firms' exposure to one currency, 6% of the firms were exposed to two currencies, 6% of the firms were exposed to three currencies and 1% of the firms were exposed to four currencies. Nevertheless, before any conclusion were reached, other results needed to be explored and given due consideration.

Appendix 4 shows the results pertaining to the direction and magnitude of the exposure according to sub-periods. The descriptive statistical analysis of the mean coefficient according to the sub-periods was constructed to examine the magnitude of the direction of all four currencies between the overall period, the crisis period, pegging and de-pegging. Table 5 shows that for the overall period, all four currencies; USD, SGD JPY and GBP had negative mean coefficients. However, during the crisis, the entire mean coefficient substantially increased with negative (-ve) betas for the USD and the GBP while the SGD and the JPY indicated positive (+ve) betas. When the Malaysian government implemented the peg exchange rate regime, the mean coefficient decreased substantially with negative (-ve) coefficient betas in favour of the USD, JPY and GBP while SGD showed a positive (+ve) coefficient beta. However, during the de-pegging period, only the USD and JPY mean coefficient showed negative (-ve) coefficient betas. On the other hand, SGD and GBP presented the same positive (+ve) coefficient betas.

Chart 4 shows the breakdown of the number of firms exposed to the negative (-ve) and positive (+ve) coefficients. From the chart, it can be seen that for a different sub-period, most of the firms

with negative (-ve) betas coefficients were exposed to the USD, JPY and GBP. However, during the pegging period, a number of firms with positive (+ve) beta coefficients that were exposed to the JPY were found to be greater than the number of firms with negative (-ve) beta coefficients. On the other hand, the number of firms that were exposed to the SGD showed that positive (+ve) beta coefficients were greater than the negative (-ve) beta coefficients for different sub-periods. Appendix 5 (Panel Data Analysis) shows important results. Using Eq. (2), the researcher runs the panel data and pool it with the cross-section (SUR) random effects to analyse the significant level of excess returns that are exposed to each currency and identifies the direction and magnitude of the exposure.

For the overall period, the excess returns of the firms have an impact against the USD which is significant at a 5% level. The other three currencies, SGD, JPY and GBP have had no impact against the excess return of the firms. However, three of the currencies (USD, JPY and GBP) show a negative (-ve) coefficient which defines that any appreciation (depreciation) of the currencies will decrease (increase) the excess returns of the firms.

During the crisis, it shows that most of the firms have been exposed to USD and JPY. Both indicate results at 5% significant level. The results are to be expected as both countries (USA and Japan) are among the biggest import and export traders of Malaysia. As explained by Park and Alba (2007), since Japan was the major export market for Hong Kong, South Korea, Singapore, Taiwan, Thailand, Indonesia, Philippines and Malaysia, the subsequent loss in the competitiveness of exports to Japan had contributed significantly to the weakening of the current account balances, which in turn, contributed significantly to the loss of confidence and outflow of capital from the region, during the sharp appreciation of the U.S. dollar against the Japanese yen. According to Li, D. et al. (2010), Singapore has been mildly affected by the Asian financial crisis compared to the other countries due to active government management. It has huge currency reserves, so it managed to easily defend its currency and quickly bounce back. Therefore, the excess returns against the SGD does not have such a big variation during the crisis period.

The peg period showed that none of the currency affects the excess returns of the firms. However, USD, JPY and GPB mean coefficients showed negative (-ve) beta coefficients except for SGD. Surprisingly, during the de-peg period, none of the firms were exposed to the USD, SGD and JPY except for GBP, with a 10% significant level, which can be considered as a weak exposure. Therefore, if the 5% significant level were used, it can be concluded that during this period, none of the firms were exposed to any of these currencies. However, the USD still shows a negative (-ve) beta coefficient.



By comparing the overall period and de-peg period, or pegged period and de-pegged period, the results show a variance between the sub-periods. The overall period shows that the USD was significant but de-pegged period shows that the USD was not significant to the exposure of the firms. Theoretically, it is expected that between pegging and de-pegging, there will be different results, but surprisingly, both gave the same results at a 5% significant level. Both periods showed that none of the firms experienced any exposure against all the four currencies. Therefore, the USD remains as a source of exposure for the Malaysian firm's stock returns which is still elusive. On the other hand, this result is consistent with the findings by Bacha O. et al. (2013), Bordin D. (2008) and Dominguez and Tesar (2006) who have suggested that the firm's specific and overall exposures are different and many puzzles remain in the understanding of the exchange rate exposure.

Since some of the results show no difference of impact on the firms at specific exposure, the Hypothesis 2 on an exchange rate regime has its effects on the firms' exposure and this is partially accepted based on the time, situation and condition. Do the changes of the exchange rate regime contribute to the reduction of firms' exposure against USD? Bussière M., et al. (2010) found that there is a growth gains for the firms even though the currency collapse has been determined and the exchange rate regime is relatively rigid.

Conclusion

Pursuant to the findings, when looking at the exposure based on the sub-periods, the exposure varies across the variance of time and sub-periods. The results show that at different periods of time, as expected, firms tend to be exposed during the crisis period with no exposure during the pegged period, even though the Malaysian ringgit was pegged only to the US dollar. This incidence was the result of most Malaysian firms being exposed to the USD. Apart from this research, it has showed that the number of firms exposed to the USD at the highest rate among the four currencies in other research by Bacha O. et al. (2013), Muller and Verschoor (2007) and Wen and Tang (2010).

However, even though Malaysia de-pegged its currency against the USD, the result showed insignificant exposure against any of the currencies. Therefore, the USD remains a source of exposure for Malaysian firms' stock returns which still remains elusive. This result is also consistent with the findings by Bacha O. et al. (2013), Bordin D. (2008) and Dominguez and Tesar (2006) who have suggested that firm specific exposures are different between the period of time, and the puzzles remain embedded in understanding of exchange rate exposure.



As discussed earlier, the impact of the exchange rate against the firms' exposure remains elusive. This is the dilemma that is faced by the researchers and practitioners. However, while it may be difficult to create zero exposure to any currencies, at least changes in exchange rate regime might minimize the firms' exposure against the exchange rate. Other factors that influence the firms' exposure have to be looked into, based on the firms' business activities and risk profile. Bordin D. (2008) argued that the existence of a connection between the value of a firm and foreign exchange rate fluctuations is apparent. However, the nature of this relationship is very complex. Even though the theoretical foundations of the exchange rate exposure showed as evidence, the empirical study to a certain extent is incomplete.

In this study, there is a limitation arising from data collection. The exchange rate is taken on a monthly basis and may not be accurate. The elimination of some of the existing firms due to the changes in the firms' status such as merging, PN17, suspension and being dropped from Bursa Malaysia may give different data, even though it is from the same source.²

This research is important for both the conventional and the Islamic Economic Systems where it could contribute some ideas to the policy makers of the countries, such as Malaysia. There is still a lot of room to explore resulting from the findings of this research in order to find the best solution and instruments to mitigate and minimize the exchange rate exposure towards the firms, especially for Islamic finance. Future research could involve a comparison across countries on the impact of the exchange rate exposure when the exchange rate regime change can be conducted. A study between the shariah compliant and non-shariah compliant firms pertaining to the extent of the exchange rate exposure as to the policy switch could also be conducted. The study of how the cross-section exchange rate can affect the exchange rate regime of a country is another area that can be discussed.

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²This is supported by online book, Chapter 6: Primary and Secondary Data Sources stated that the accuracy is the third major concern of the user of secondary data from <http://www.scribd.com/doc/7179744/Primary-and-Secondary-Data-Sources>



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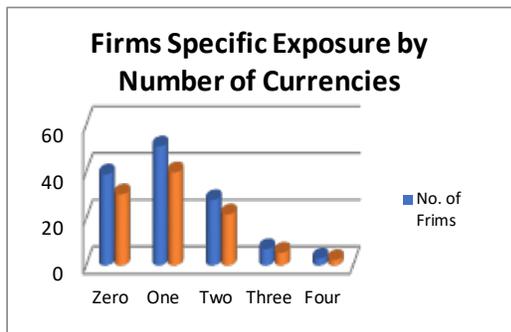
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Appendix 1

Table 1
Firms Specific Expose by Number of Currencies

Currencies Exposure	No. of Frims	Firms exposure in %
Zero	39	30
One	51	40
Two	28	22
Three	7	6
Four	3	2
Total	128	100

Chart 1



5% Significant level

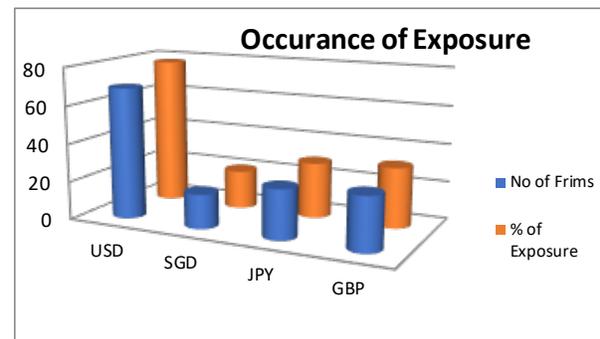
Table 2
Percentage of Firms with Significant Exposure by Currencies

Currency	No of Frims	% of Exposure
USD	69	78
SGD	18	20
JPY	26	29
GBP	28	31
Total No. of Firms Exposed	89	158 ¹

¹

Note: The sum total is more than 100% due to many firms have more than one exposure

Chart 2



5% Significant level

Appendix 2

Table 3

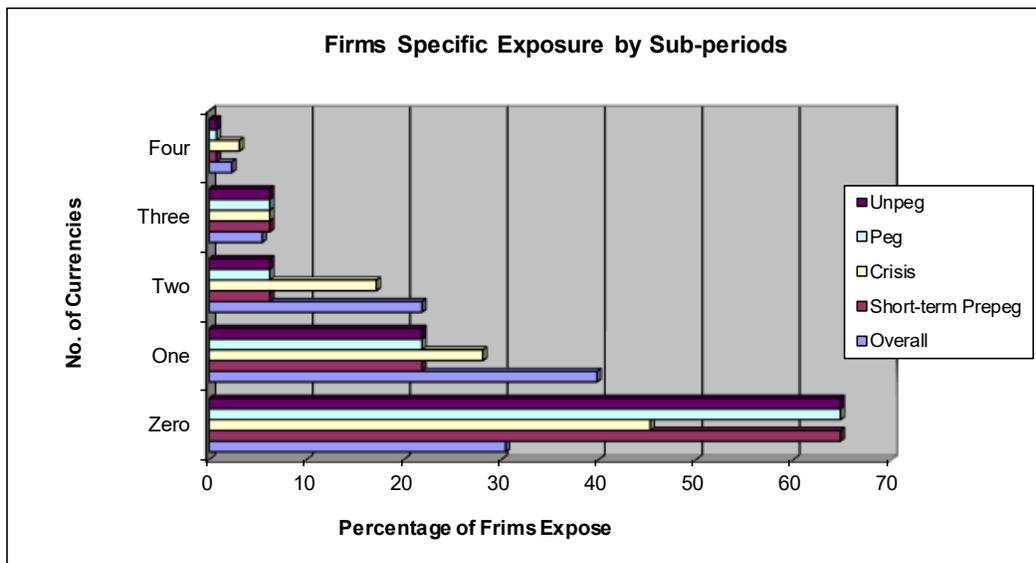
Dependent Variable: EXCESS_RETURN_?				
Method: Pooled EGLS (Cross-section random effects)				
Date: 07/01/11 Time: 16:11				
Sample: 1 246				
Included observations: 246				
Cross-sections included: 128				
Total pool (unbalanced) observations: 30625				
Swamy and Arora estimator of component variances				
Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002772	0.002683	1.033242	0.3015
USD	-0.353841	0.174894	-2.023176	0.0431
SGD	0.097848	0.247412	0.395487	0.6925
JPY	-0.033996	0.093277	-0.364465	0.7155
GBP	-0.152787	0.103455	-1.476848	0.1397
Random Effects (Cross)				

Appendix 3

Table 4 Firms Specific Exposure by Sub-Periods

Currencies Exposure	Overall		Short Term Prepeg		Crisis		Peg		Unpeg	
	No. of Frims	Firms exposure in %	No. of Frims	Firms exposure in %	No. of Frims	Firms exposure in %	No. of Frims	Firms exposure in %	No. of Frims	Firms exposure in %
Zero	39	30	80	65	58	45	69	65	62	65
One	51	40	28	22	36	28	36	22	38	22
Two	28	22	10	6	22	17	18	6	23	6
Three	7	5	9	6	8	6	5	6	3	6
Four	3	2	1	1	4	3	0	1	2	1
Total	128	100	128	100	128	100	128	100	128	100

Chart 3



Periods	Zero	One	Two	Three	Four
Overall	30	40	22	5	2
Short-term Prepeg	65	22	6	6	1
Crisis	45	28	17	6	3
Peg	65	22	6	6	1
Unpeg	65	22	6	6	1

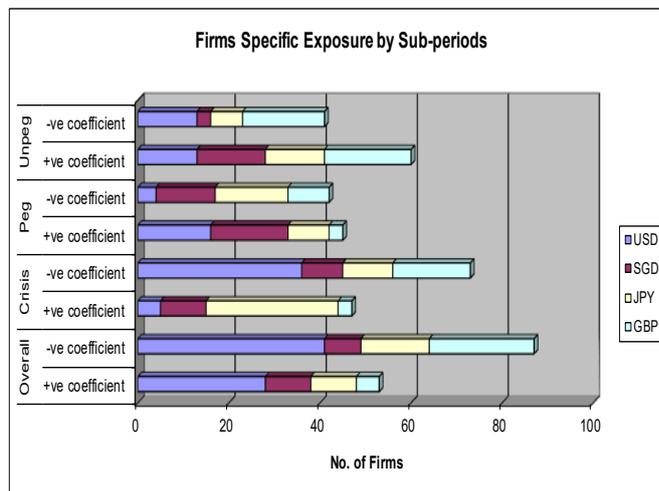
Appendix 4

Firms Specific Exposure by Sub-periods

Table 5

Firms Specific exposure by sub-periods	Overall Period				Crisis Period (Jun 97 - Aug 98)				Peg Period (Sept 98 - July 2005)				Unpeg Period (Aug 2005 - Jul 2010)			
	USD	SGD	JPY	GBP	USD	SGD	JPY	GBP	USD	SGD	JPY	GBP	USD	SGD	JPY	GBP
No. of Observations	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
Mean coefficient	-0.277	-0.044	-0.006	-0.106	-1.475	0.152	1.391	-0.902	-0.115	0.341	-0.162	-0.164	-0.253	0.554	-0.013	0.206
Standard deviation of coefficient	1.040	0.816	0.313	0.315	2.576	2.013	1.944	1.676	3.186	1.858	0.556	0.591	1.223	2.056	0.475	0.729
Maximum coefficient	1.535	2.675	1.076	0.759	4.953	4.734	8.249	2.490	6.328	7.728	1.081	1.408	2.903	7.717	1.525	2.856
Minimum coefficient	-4.008	-2.056	-1.116	-0.886	-10.149	-5.876	-4.077	-6.501	-8.406	-3.403	-2.129	-2.723	-4.586	-3.795	-1.228	-1.564
Firms with +ve coefficient	28	10	10	5	5	10	29	3	16	17	9	3	13	15	13	19
Firms with -ve coefficient	41	8	15	23	36	9	11	17	4	13	16	9	13	3	7	18

Chart 4



Currencies Exposure	Overall		Crisis		Peg		Unpeg	
	+ve coefficient	-ve coefficient						
USD	28	41	5	36	16	4	13	13
SGD	10	8	10	9	17	13	15	3
JPY	10	15	29	11	9	16	13	7
GBP	5	23	3	17	3	9	19	18
Total	53	87	47	73	45	42	60	41

Appendix 5

Dependent Variable: EXCESS_RETURN_?																								
Method: Pooled EGLS (Cross-section random effects)					Method: Pooled EGLS (Cross-section random effects)					Method: Pooled EGLS (Cross-section random effects)					Method: Pooled EGLS (Cross-section random effects)					Method: Pooled EGLS (Cross-section random effects)				
Sample: 1 246					Sample: 1 88					Sample: 89 103					Sample: 104 185					Sample: 186 246				
Included observations: 246					Included observations: 88					Included observations: 15					Included observations: 82					Included observations: 61				
Cross-sections included: 128					Cross-sections included: 128					Cross-sections included: 128					Cross-sections included: 128					Cross-sections included: 128				
Total pool (unbalanced) observations: 30625					Total pool (unbalanced) observations: 10525					Total pool (unbalanced) observations: 1912					Total pool (unbalanced) observations: 10384					Total pool (unbalanced) observations: 7804				
Swamy and Arora estimator of component variances					Swamy and Arora estimator of component variances					Swamy and Arora estimator of component variances					Swamy and Arora estimator of component variances					Swamy and Arora estimator of component variances				
Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)					Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)					Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)					Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)					Cross-section SUR (PCSE) standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.	Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003	0.003	1.033	0.302	C	0.01	0.005	1.51	0.131	C	0.053	0.018	2.985	0.003	C	-0	0.005	-0.35	0.73	C	0.004	0.003	1.128	0.259
USD	-0.35	0.175	-2.02	0.043	USD	0.6	0.51	1.177	0.239	USD	-1.73	0.67	-2.58	0.01	USD	-0.43	0.541	-0.8	0.426	USD	-0.3	0.223	-1.34	0.182
SGD	0.098	0.247	0.395	0.693	SGD	-0.52	0.601	-0.87	0.385	SGD	0.274	0.688	0.398	0.69	SGD	0.394	0.464	0.85	0.396	SGD	0.514	0.402	1.279	0.201
JPY	-0.03	0.093	-0.36	0.716	JPY	0.13	0.169	0.773	0.439	JPY	1.429	0.504	2.834	0.005	JPY	-0.21	0.173	-1.19	0.236	JPY	0.003	0.121	0.027	0.978
GBP	-0.15	0.103	-1.48	0.14	GBP	-0.3	0.162	-1.88	0.06	GBP	-0.81	0.56	-1.44	0.15	GBP	-0.22	0.232	-0.93	0.352	GBP	0.241	0.13	1.847	0.065
Random Effects (Cross)					Random Effects (Cross)					Random Effects (Cross)					Random Effects (Cross)					Random Effects (Cross)				