ARE VALUES OF MALAYSIAN COMPANIES AFFECTED BY FOREIGN EXCHANGE RATE CHANGES?

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ABSTRACT

This paper studies the foreign exchange risk of Malaysian firms traded on the Kuala Lumpur Stock Exchange (KLSE). It aims to understand whether there exists any relationship between foreign exchange variability and firm value as well as whether firm value was influenced by lagged exchange rate.

Monthly closing prices of the stocks on the KLSE from 1990 to 1996 were used. The selection of firms was based on the reporting of foreign exchange gains/losses on the profit and loss account as well as changes in the foreign exchange reserves in the balance sheet.

It was found that 19.5% of firms' values were significantly exposed to foreign exchange risk leading to the conclusion that the results did not indicate that foreign exchange risk is a significant factor in determining firm value. Lagged exchange rate changes were also found to be inconclusive in the determination of firm value.

1. INTRODUCTION

The business world has little doubt about the existence of currency risks. The problem has been greatly aggravated since currencies began to float after the breakdown of the Bretton Woods Agreement in 1973. Since then, currencies have fluctuated sharply, and this has caused very large gains and losses if the risks are not avoided or managed.

As Malaysia is a small and open economy, exchange rate variability is a major concern. Since the introduction of the flexible exchange rate system in 1973, the exchange rate has shown itself to be somewhat volatile (Bank Negara Malaysia, 1994). Malaysian firms have been at the forefront of the country's push for greater economic diversification. This has coincided with a steady process of liberalizing capital account transactions. A major relaxation in 1987-89 was accompanied by steps to

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de-regulate the financial system (Hood, 1998). With these developments, it is possible that the vulnerability of the cash flows of Malaysian firms to exchange rate movements have increased. Therefore, it would be interesting to examine whether Malaysian companies exhibit any evidence of foreign exchange exposure. Before going further, a discussion of foreign exchange exposure would be in order.

Foreign exchange exposure is a measure of the potential for a firm's profitability, net cash flow, and market value to change because of a change in exchange rates (Eiteman, Stonehill, and Moffett, 2001). Foreign exchange exposure can be sub-divided into three categories: transaction exposure, economic exposure and translation exposure.

Foreign exchange exposure can be however mitigated by financial and operational hedging undertaken by a firm. Financial hedging can be done through the use of forward contracts, money market hedging, options, and other derivative instruments. As for the operating hedging, it can be undertaken by matching foreign income to foreign expenses, diversifying operations into different regional markets, and currency swaps.

In the wake of the Asian financial crises, it has been reported in the local business press that many Malaysian firms suffered from dramatic Ringgit devaluation. Some reported tremendous losses due to foreign exchange variability. Others like the electric utility company, Tenaga Nasional Berhad, suffered due to having loans denominated in foreign currency especially the Yen and the U.S. dollar which had appreciated sharply against the Ringgit. Most firms, which had borrowed in foreign currency, did so as the interest rates on foreign debt were substantially lower than domestic interest rates during that period.

In the early 1990s, the major industrial countries adopted low interest rates in response to the recession. Interest rates in Japan were reduced dramatically after the failure of its economy to recover from the collapse of the property and stock market bubbles in 1989-90, while the U.S. official rates were cut drastically in an effort to overcome debt deflation. The relatively higher returns in high-growth, low-risk Asian economies with a record of relatively stable exchange rates made them attractive investment locations.

A large part of the inflows was due to the attempt of domestic and non-financial firms to reduce their financing costs by borrowing from cheaper foreign markets, thus accumulating foreign-currency liabilities that were not balanced by foreign currency assets. These losses resulted in the value of Malaysian firms

listed on the Kuala Lumpur Stock Exchange (KLSE) taking a huge beating during the period of the Asian financial crises.

Thus, it goes to show that there is some possible linkage between foreign currency exposure and firm value. The linkage can appear in two forms. Firstly, the hedging or lack of it can possibly affect firm value as it influences the degree a firm is exposed to foreign exchange risk. Secondly, in the event of currency devaluation, foreign investors especially institutional investors pull out of the domestic stock market as currency devaluation causes their domestic portfolios to be worth less. This linkage has no direct connection to the hedging policies undertaken by the firm in order to mitigate its foreign exchange exposure.

Research Objective

The major objective of the paper is to examine the foreign currency exposure of KLSE listed stocks. Specifically, this study attempts to examine whether the value of Malaysian firms listed on the KLSE is affected by exchange rate changes.

Organization of the Study

This study looks at all the stocks that were listed and traded on the KLSE from the period of 1990-1997. Using a model developed by previous researchers, the study attempts to gauge the level of foreign exchange exposure of Malaysian firms.

This paper is organized as follows: The next section summarizes key literature in the area of foreign exchange exposure which covers the diversity in opinion on the subject matter, the theoretical framework and the hypotheses to be tested; Section 3 presents the research methodology and models to be tested as well as the data sources that were used; Section 4 sets out the results of the study while the final section offers the conclusion and recommendations based on the results.

2. LITERATURE REVIEW

There is extensive literature examining the relationship between foreign exchange exposure and firm value, the measurement of foreign exchange exposure and the determinants of exchange rate exposure. The focus would be on empirical studies conducted in developed countries and a few touching on Malaysia.

Empirical investigations on the relationship in developed countries have on a whole, been mixed. Some studies have found a strong relationship between sensitivity of firm value to foreign exchange variability. However, other studies have found the relationship to be a weak one. There seems to be no common consensus among researchers on the issue, which has fueled tremendous debate.

Hudgins and Turner (1995) found that real exchange rate did not meet the normal significant tests for inclusion as a priced factor, extending a generally accepted Arbitrage Pricing Theory (APT) framework put forth by Chen, Roll and Ross (1986). Based on the model put forth by Adler and Dumas (1984), Jorion (1990), from a sample of 287 firms, over the period 1971 through 1987, found significant cross-sectional variation in exposure, but the measure of exposure (the co-efficient on changes in the exchange rate from a regression on the firm's stock return) was not significantly different from zero for the pooled sample. Furthermore, only 15 firms out of the 287 firms exhibited significant variance in the return to their stock that was significantly correlated with exchange rates over the sample period.

Employing a sample of U.S. firms from 1979 to 1989 with consistently large foreign currency adjustments reported on their past annual financial statements that are negatively correlated with the corresponding changes in a trade-weighted index of the U.S. dollar, Bartov and Bodnar (1994) found that abnormal returns of these firms showed no correlation with the contemporaneous change in the dollar.

A recent study conducted by Chiao and Hung (2000) on exchange-rate exposure of Taiwanese exporting firms listed on the Taiwan Stock Exchange Corporation (TSEC) from January 1981 to December 1997 found no corroboration that most exporting firms were individually exposed to exchange-rate risk for all sub-periods identified.

Choi and Prasad (1995), who used a model of firm valuation to examine 409 U.S multinational firms during the period from 1978-1989, found that exchange rate fluctuations did affect firm value. Specifically, 60 percent of firms with significant exchange risk exposure gained from a depreciation of the U.S. dollar. The evaluation of exchange rate sensitivity during different U.S. dollar regimes revealed a higher percentage of firms with significant exchange rate exposure during the weak-dollar regime.

In examining the foreign exchange exposure of Japanese multinational corporations, He and Ng (1998) found 25 percent of the sample of 271 firms experienced economically significant positive exposure effects for the period of January 1979 to December 1983. Miller and Reuer (1998) using a multiple

currency model found empirical evidence that 13 percent to 17 percent of U.S. manufacturing firms are exposed to foreign exchange rate movements.

Examination of the relationship between foreign exchange exposure and firm value in developing countries has been limited. A recent study undertaken by Doidge, Griffin and Williamson (2000), using the traditional regression framework, found that it was difficult to detect exchange rate exposure across 21 developed and 29 developing countries. Nevertheless, it was noted that exposure was generally greater in emerging markets than in developed markets. The analysis on a country by country basis estimated for portfolios of high foreign sales firms revealed significantly positive exposure in Hong Kong and New Zealand and significantly negative exchange rate exposure in Canada, Germany, Italy, Japan, Malaysia, Spain and the U.S.

Ramasamy (2000) in examining Malaysian multinationals during the period before and during the Asian financial crises, found 56 out of 146 firms having significant exposure to foreign exchange exposure. However, contrary to conventional wisdom that a depreciating local currency has a positive effect on firm value, all but 2 of the firms sampled showed significant negative exposure.

Othman and Zaidi (2000) examining the relationship between exchange rate changes and stock index changes before and during the currency turmoil found that exchange rates tended to move in tandem with the stock market indices during the period of currency turmoil. Nevertheless, when tests of causality were employed using the Granger causality, the results were mixed at best indicating there was inconclusive evidence that fluctuation in the Ringgit had any influence on the movement of the stock market, or vice versa.

Researchers have offered differing opinions with regards to the insignificant influence of foreign exchange variability on firm value. We will discuss a number of possible explanations below.

Risk management activities undertaken by the firm could mitigate the foreign exchange exposure. This can be done using financial hedging and operational hedging. Financial hedging includes the use of forward contracts, futures, currency options and other derivative instruments. Examples of operational hedging could mean the sourcing of factor inputs overseas and facility location decisions to adapt to favorable exchange rate movements (Palia and Thomas, 1997). Using the data on hedging activity for 276 multinational firms from 1992 to 1996, Crabb (2001) found evidence that previous findings of no

significant exposure for large cross-sectional samples were likely due in part to the financial hedging activities of multinational firms.

The insignificance of the findings could also be due to experimental issues and sample selection procedures. One of these was the specification of the exchange rate variable and its assumed relationship to a firm's stock returns. Some researchers used a basket of currencies to represent the exchange rate variable (Jorion, 1990; Pritamani et al., 2001; He and Ng, 1998). In reality, many companies might be exposed to just one or two currencies. As different exchange rates did not perfectly correlate with each other, the typical research design does not pick up the exact exchange rate exposure faced by each firm (Palia and Thomas, 1997).

The unit of measurement may also have an effect on the findings. Studies based on portfolio data (Bodnar and Gentry, 1993; Jorion, 1990 and Prasad and Rajan, 1995) and market-index data (Ma and Kao, 1990) have found minimal or no evidence of exchange rate fluctuations affecting stock returns. When aggregating across firms from different industries, the mixing of net importers and net exporters in a portfolio could underestimate exchange rate exposure since the exposure of each group of firms has an opposite impact on firms value due to a movement in the currency (Doidge et al., 2000).

In order to detect the differences in the unit of measurement, Choi and Prasad (1995) developed a model of firms' valuation using firm level analysis and aggregation into industries. They found significant exchange risk exposure at the firm level only. On the contrary, when aggregating the data into 20 SIC-based industry groups, there was limited supporting evidence of exchange rate exposure.

Bartov and Bodnar (1994) have put forth another explanation for the limited success of prior studies in documenting significant relations between changes in the dollar and contemporaneous stock returns. They attribute it to the existence of mispricing arising from systematic errors by investors in the estimation of the relation between the fluctuations in the dollar and firm value. Evidence found in their research showed that lagged changes in the dollar were a significant variable in explaining current stock returns. This was because, first, firms published their financial reports with a lag, and second, investors did not use all freely available information to predict future changes in firms' values.

Othman and Zaidi (2000) observed that investors took at least six months to realize the negative effect of currency depreciation on the stock market. They attribute this to the "slow learning effect" of the

investors to link the downfall of the stock market with the depreciation of the currency. Examining this lagged relationship in two sub periods, Bartov and Bodnar (1994) found the lagged relationship tended to weaken over time.

Differences in sampling procedures have also led to differences in findings. Amihud (1993) used only large U.S. exporting firms as the basis of study. However, the findings showed no exchange rate exposure for a sample of 32 large exporting firms. The reasoning could be that firms with large foreign sales hedged their foreign exchange exposure making it difficult for researchers to detect foreign exchange exposure effect on firm value. Therefore, using sample of firms with foreign sales did not preclude them from being exposed to exchange rate exposure. To solve this sample problem, Bartov and Bodnar (1994) identified firms with large foreign currencies adjustments reported in the financial statements that were consistently negatively correlated with changes in the U.S. dollar. In essence, this was the use of an accounting measure of exposure (gains or losses reported from translating assets and liabilities.

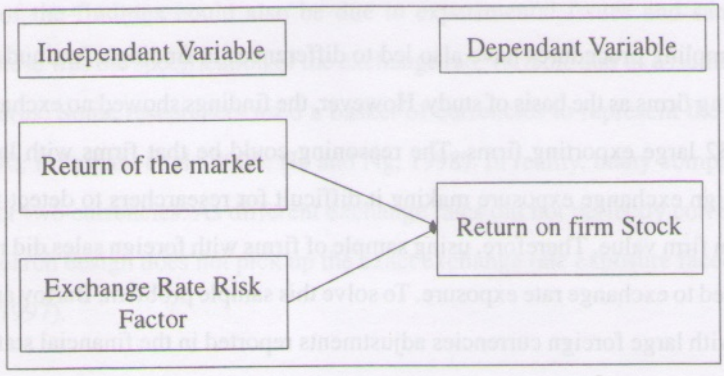
The separation of sample firms into exporters and importers could also improve the significance between exchange rate exposure and firm value. Pritamani et al. (2001) divided the analysis into importers and exporters and investigations revealed that importing firms show greater sensitivity to changes in exchange rate than exporting firms. This indicated that exporting firms were naturally hedged against currency risk and did not need to explicitly account for operating exposure.

A preliminary survey conducted by Rubi Ahmad (1997) found 57 percent of Malaysian firms deemed foreign exchange exposure management as very important. Malaysian firms also are noted for strictly avoiding speculation with the purpose of earning excess profits. According to Rubi Ahmad (1997), this showed that Malaysian firms were conservative in their approach towards foreign exchange management.

In the 1990s, many companies in Malaysia increased their financial leverage as they used debt financing to expand their business. Many are family-owned business who prefer the use of greater financial leverage rather than dilute the controlling stake of the family through issuance of new equity. Companies like Tenaga Nasional Berhad and Telekom Malaysia Berhad have through their longstanding relationship with the government as former public utilities borrowed substantial amount in foreign currencies as part of the government's plan to bring greater infrastructure development to the country. The reasoning behind the borrowing in foreign currencies was that Malaysian banks could not undertake to loan such a massive amount and the interest rates for foreign loans were lower than domestic interest rate during that period.

3. THEORETICAL FRAMEWORK AND RESEARCH METHODOLOGY

Figure 1: Market Model for Foreign Exchange Exposure



A firm can possibly have negative or positive exposure. Positive exposure suggests that a depreciation of the Ringgit against other foreign currencies has a positive impact on the stock returns of Malaysian firms. Negative exposure, therefore means that Malaysian firms experience an adverse valuation effect when the Ringgit depreciates and benefit when the Ringgit appreciates. However, care must be made in interpreting the economic meaning of a firm with a zero exposure. A zero exposure does not imply that the firm's value is independent of exchange rate, but rather that the firm's value is affected in the same degree as the market portfolio (Bodnar and Wong, 2000). The modeling of the relationship is presented in Figure 1.

Model for Foreign Exchange Rate Exposure

Dumas (1978), Adler and Dumas (1984) and Hodder (1982) suggest the measurement of foreign exchange exposure to exchange rate changes as the regression coefficient of the real value of the firm across all states of nature.

The model to be used to determine the effect of exchange rate exposure changes on the value of the firm will be based on a two-factor model suggested by He and Ng (1998). Thus, exposure can be measured by the following regression model.

$$r_{it} = \beta_{io} + \beta_{ix} r_{xt} + \beta_{im} r_{mt} + E_{it} \qquad (1)$$

where r_{it} is the rate of return on the ith corporation's stock, r_{xt} is the rate of the return on a trade-weighted currency exchange rate index, measured as the Malaysian Ringgit price of the foreign currency, r_{mt} is the rate of return on a market portfolio, and E_{it} is the random error. Hence, β_{ix}, the slope coefficient of the regression, is the exchange-rate exposure measure because it describes the sensitivity of stock returns to unanticipated changes in exchange rates.

Therefore, an appreciation in the Ringgit makes exporting goods more expensive thus causing export sales to fall. Consequently, the exporting firm's value would be hurt by an appreciation of the Ringgit. On the other hand, importing firms would benefit from the appreciation of the home currency. Therefore, the β_{ix} coefficient should be negative for importing firms and positive for exporting firms. However, the sign of β_{ix} becomes less distinct for a firm that exports as well as imports. In this case the sensitivity of the firm value to exchange rate fluctuations depends on the elasticity of the firm's demand for foreign goods (its imports) relative to the elasticity of the foreign market's demand for the firm's goods (its exports). Unless pertinent information about the type of corporations –exporting, importing or net exporting/importing firms – is available, the resulting sign of β_{ix} is empirically determined by estimating equation 1 (He and Ng, 1998).

The inclusion of the rate of return on a market portfolio has two beneficial effects. First, as the market portfolio is the best variable we know of to explain stock returns, its inclusion in the exposure model reduces the residual variance of the regression and improves the precision of the exposure elasticity estimates. Second, the market return implicitly acts as a control for the macroeconomic factors that are correlated with the exchange rate and affect the valuation of all firms in the market. This improves the ability to interpret the resulting exposure elasticities in terms of the corporate finance based models (Bodnar and Wong, 2000).

Research Method

All stocks listed on the KLSE between the periods of January 1990 to December 1996 were considered. This period was taken because it was the period during which the KLSE had gone through a 'bull' as well as a 'bear' period (KLCI month end closing reaching a high of 1275.0 points and a low of 459.1 points – See Appendix 2). One reason, why the period of extreme exchange rate volatility, which occurred during the Asian financial crises, was not taken was because that period had already been measured by two previous studies namely Ramasamy (2000) and Othman and Zaidi (2000). Also, that period denotes the pegging of the Malaysian Ringgit to the U.S. Dollar, which might not be an accurate measure of foreign exchange exposure due to the effect of the fixed exchange rates.

After determining the period of study, the determination of firms to be incorporated into the study is undertaken. Firms incorporated into the study were chosen based on the criteria as set out by Bartov and Bodnar (1994) whereby they reported either foreign exchange gains/losses in the profit and loss accounts during the period or there were reported changes in the foreign exchange fluctuation reserve appearing in the balance sheet. Previous researchers have used the ratio of foreign sales over total sales to determine firms to be incorporated in their studies (Jorion, 1990; He and Ng, 1998; Crabb, 2001). The underlying reason that the procedure was based on criteria specified by Bartov and Bodnar (1994) is mooted by the fact that the scope of the research is based on Malaysian firms as a whole, and not only on multinationals as other researchers have done. Some firms, which do not have foreign operations, may still be susceptible to foreign exchange variability if they import machinery and raw material inputs to produce goods or services that are sold domestically.

A total of 245 firms were listed for the entire period of analysis. Of these, 66 firms did not report any foreign exchange gains/losses or any changes in the foreign exchange fluctuation reserve in the balance sheet during the entire period of analysis. 10 firms had incomplete data. Five firms had no stock information in the METASTOCK database. Therefore, this leaves 164 firms with complete stock price information that meet the identified criteria.

The calculation of individual firm monthly returns of firm i based on a simple return formula as below.

$$r_{it} = (P_{it} - P_{i(t-1)}) / P_{i(t-1)} \qquad (2)$$

where P_{it} = Current month closing stock price

$P_{i(t-1)}$ = Previous month closing stock price

The month end closing figures for the KLCI were used to calculate the price weighted market value returns. The formula used to calculate the market returns (r_{mt}) is listed below.

$$r_{mt} = (KLCI_t - KLCI_{t-1}) / KLCI_{t-1} \qquad (3)$$

where $KLCI_t$ = KLCI for current month

$KLCI_{t-1}$ = KLCI for previous month

The trade-weighted exchange rates used in the exchange rate exposure model are based on weightings of total yearly bilateral trade between Malaysia and Europe (this includes the Eurozone countries, the United Kingdom, Denmark and Sweden), Japan, United States and Singapore and for exchange rate, is based on the bilateral exchange rates, defined as the Ringgit per unit of foreign currencies for Euro (for Eurozone countries), Danish Krone, British Pound, Swedish Krona, Singapore Dollar and Japanese Yen. The weights are given in Table 1. Nominal exchange rates are used as the results can be interpreted in the context of the market model.

Table 1: Currency Weights Based on Bilateral Trade Between Malaysia and Corresponding Countries

Country	1990	1991	1992	1993	1994	1995	1996
Europe	14.31	13.64	14.30	13.39	14.77	15.26	15.50
Singapore	26.51	26.90	27.43	26.05	24.76	23.36	25.30
Japan	27.71	29.49	27.64	28.27	27.60	28.87	28.47
US	23.80	22.42	24.39	26.24	26.92	26.59	25.20
U.K.	6.62	6.28	5.26	5.17	4.98	4.91	4.53
Denmark	0.30	0.30	0.35	0.28	0.25	0.23	0.26
Sweden	0.74	0.99	0.63	0.59	0.73	0.78	0.74
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Data

This study is based on secondary data from several sources as follows:

a. METASTOCK for the month end share prices adjusted for any subsequent capitalization changes for KLSE Main Board and Second Board firms and the month end KLCI index.

b. The *International Financial Statistics Supplement of the International Monetary Fund on Direction of Trade Statistics Year Book* for bilateral trade between Malaysia and various countries to be included in a trade-weighted exchange rate index.

c. Monthly exchange rate data on various exchange rates were obtained from financial currency website, www.x-rates.com. Rates are gathered from the Federal Reserve Bank of New York, representing 12 noon buying rates and the International Monetary Fund according to their availability.

4. RESULTS AND ANALYSIS

Based on the criteria for identifying the relevant firms to undertake this study, cross-sectional linear regression analysis was used to determine the relationship between firm value and foreign exchange exposure. Each firm's stock returns (r_{it}) had to be regressed against the returns on the market portfolio (r_{mt}) and the rate of return of the trade-weighted exchange rate index (r_{xt}). Essentially this meant that altogether 164 regressions were estimated using monthly returns data for a period of 84 months (January 1990 to December 1996). Naturally, each firm's regression equation needed to be analyzed in accordance with the assumptions of linear regression analysis.

The assumptions of the multiple regression analysis were essentially met. There were no major autocorrelation problems seen in among the dependent and independent variables. The Durbin-Watson statistic measuring autocorrelation was well within the limits of 1.5 to 2.5. With regards to the assumption of normality of the data, it was found that the normality assumptions of the cross sectional regressions for the firms in the study were not violated. However, the achievement of the normality assumptions for certain firms was only obtained after outliers more than 2.5 standard deviations were omitted.

The third assumption of linear regression was also met. There was no indication of multicollinearity problems among the variables being studied. The VIF statistics and the condition index were well below 10 and 30 respectively. Finally, the assumption of constant variance was also tested and the results seem to indicate that this assumption was also not violated.

The results of the regression analysis to find cross sectional variation of firm return towards foreign exchange risk indicated that 32 firms out of 164 firms had significant coefficients for the rate of return of the trade-weighted foreign exchange rate index (r_{xt}) at a 10 percent level. This is 19.5% of all firms studied. Table 2 shows a listing of the 32 firms and their β_{ix}, β_{im}, R_2, and the F-Statistics. Of the 32 firms, 75% (n=24) exhibited a positive relationship changes between the trade-weighted exchange rate and firm returns whereas 25% (n=8) exhibited a negative relationship between the trade-weighted exchange rate and firm returns. Firms with significant positive exposure coefficients gained when the Ringgit depreciates and are likely to be net exporters. On the other hand, firms with negative foreign exchange exposure gain from the appreciation of the Ringgit and are likely to be net importers.

The percentage of firms (19.5%) which have significanct foreign exchange exposure obtained in this study is lower than the findings of Ramasamy (2000) where 38.4% of Malaysian multinational were

significantly exposed to the foreign exchange risk just before and during the Asian financial crises. There are a few possible reasons for this conflicting results. The time period of analysis can make a difference. The period chosen for this study can be considered a period of relative exchange rate stability. There were no sudden movements of the Ringgit against major currencies during the period of study. The percentage change in the trade weighted exchange rate has fluctuated between a tight range of –4.31% to 5.35% representing a spread of only 10%. In terms of the nominal rates of the respective currencies, it is shown that most operate within a narrow band. Therefore, the possibility of low significance due to the stability of exchange rates during the period of analysis cannot be discounted.

Table 2: Listing of Firms With Significant Foreign Exchange Exposure

Counter #	Company Name	B_{ix}	B_{im}	R^2	F-statistic
4022	Wijaya Baru Global Bhd	0.271	0.536	0.321	17.461
2283	Tronoh Mines Malaysia Bhd	0.260	0.723	0.558	45.451
4596	Uniphone Telecommunications Bhd	0.250	0.770	0.622	64.860
2658	Ajinomoto (Malaysia) Bhd	0.244	0.730	0.540	41.738
4073	Pilecon Engineering Bhd	0.221	0.827	0.709	90.355
2186	Kuchai Development Bhd	0.213	0.759	0.582	47.260
4243	WTK Holdings Bhd	0.213	0.516	0.295	15.686
4014	OYL Industries Bhd	0.198	0.562	0.367	21.994
8028	Autoways Holdings Berhad	0.189	0.425	0.180	9.437
2844	Cement Industries of Malaysia Bhd	0.183	0.711	0.521	42.394
1767	Petaling Garden Bhd	0.181	0.802	0.640	67.454
8001	MOL.Com Bhd	0.174	0.571	0.339	19.783
2704	Uniphoenix Corporation Bhd	0.167	0.684	0.473	34.600
3549	Kinta Kellas Public Limited Company	0.164	0.810	0.668	78.319
2941	Datuk Kramat Holdings Bhd	0.163	0.652	0.469	32.674
4375	South Malaysia Industries Bhd	0.154	0.729	0.580	48.256
2178	MMC Engineering Group Bhd	0.152	0.748	0.581	44.363
2143	Avenue Assets Bhd	0.145	0.683	0.471	32.504
3948	Mycom Bhd	0.144	0.727	0.565	46.694
3158	Techno Asia Holdings Bhd	0.144	0.670	0.457	32.457
1627	Island & Peninsular Bhd	0.143	0.658	0.464	33.373
4006	Oriental Holdings Bhd	0.137	0.714	0.519	40.394
3859	Multi-Purpose Holdings Bhd	0.129	0.756	0.575	50.148
1295	Public Bank Bhd	0.127	0.762	0.608	58.266
1945	PJ Development Holdings Bhd	-0.109	0.818	0.694	86.360
3298	Hexza Corporation Bhd	-0.128	0.826	0.688	78.318
1724	Paramount Corporation Bhd	-0.134	0.842	0.757	107.278
1716	Asia Pacific Land Bhd	-0.148	0.707	0.501	34.183
2003	Kulim (Malaysia) Bhd	-0.150	0.675	0.493	38.437
1007	Arab-Malaysian Development Bhd	-0.157	0.792	0.667	77.211
2593	The United Malacca Rubber Estates Bhd	-0.199	0.748	0.620	59.573
2607	Inch Kenneth Kajang Rubber PLC	-0.212	0.445	0.271	13.566

Another possible explanation for the low percentage is the use of short period horizons whereby to analyze equation 1 monthly horizons were used. Chow, Lee and Solt (1997) have pointed out that on average, the effect of unanticipated changes in the real exchange rate on earnings was negative over

short horizons but positive over long horizons. Therefore, the interest-rate and cash-flow effects of exposure were offsetting over shorter horizons but complementary over long horizon periods. This result may explain why this research, which focuses strictly on monthly horizons, has failed to find an association between stock returns and exchange rates.

However, the main reason for the difference in the results could be due to the hedging undertaken by Malaysian firms during the period of study which may have mitigated their foreign exchange exposure. Firms with significant operations overseas as well as import and export goods and services would have the incentive to hedge their foreign exchange exposure. In contrast, the significance of foreign exchange exposure in Ramasamy 's (2000) study might have been attributed to the fact that the increased exposure just before and during the crises might have been due to the inability of the hedgers to completely rollover their hedges when derivatives became prohibitively expensive The liquidity in the derivatives market declined so dramatically that hedgers had a difficult time maintaining their positions (Allayannis, Brown and Klapper, 2001). In this sense, hedgers suffered increased foreign exchange exposure during the period of the Asian financial crises.

Lagged Exchange Rate Changes

As there is some evidence in previous studies (Bartov and Bodnar, 1994) that lagged exchange rate changes influence the value of the firm, equation 1 was modified to include the parameter of lagged exchange-rate effects as follows:

$$r_{it} = \beta_{io} + \beta_{ix} r_{xt} + \beta^{L}_{ix} r_{xt-1} + \beta_{im} r_{mt} + E_{it} \qquad (4)$$

where the parameter β^{L}_{ix} measures the effect of lagged exchange-rate changes on stock returns. Based on the results obtained by Amihud (1994), the lagged relationship is tested up until the 6^{th} lag.

In order to test this alternative model, multiple regression analysis was again run for each of the 164 firms using equation 4. The selected lag length in equation 4 is 6 and was consistent with Amihud (1993) who argues that exchange-rate changes affected stock returns of exporting firms only with lags up to 2 quarters.

Table 3 depicts the list of firms that have significant lagged foreign exchange exposure. Of the 164 firms, only 3.66% (n=6) firms' returns showed significant relationship with lagged trade-weighted

exchange rates at a significance level of five percent. At a 10 percent significance level, only 7.92% (n=13) of firms' returns were significantly related to lag trade-weighted exchange rates. Most firms' rate of return is positively correlated with lagged exchange rates indicating that depreciation in the Ringgit benefits these firms. There were also a small number of firms whose returns are negatively correlated with the lagged trade-weighted exchange rate index. These firms' are benefit from an appreciation of the Ringgit against other currencies.

Table 3: Listing of Firms With Significant Lagged Foreign Exchange Exposure

Counter #	Company Name	B_{ix}	B_{ix-6}	B_{im}	R^2	F-statistic
3212	George Town Holdings Bhd	0.077*	0.978	0.733	0.567	30.944
2356	Sarawak Enterprise Corporation Bhd	-0.054*	0.285	0.736	0.608	36.197
3794	Malayan Cement Bhd	0.029*	0.194	0.690	0.514	25.420
4235	Lion Land Bhd	-0.035*	0.188	0.478	0.265	7.950
3581	Lion Corporation Bhd	0.041*	0.166	0.706	0.524	26.766
2844	Cement Industries of Malaysia Bhd	0.232	0.163	0.813	0.723	55.816
3735	Magnum Corporation Bhd	0.109*	0.145	0.699	0.517	26.015
1201	Malaysian General Investment Corp Bhd	0.033*	0.130	0.827	0.685	45.644
1155	Malayan Banking Bhd	0.026*	0.116	0.816	0.677	48.853
1007	Arab-Malaysian Development Bhd	-0.152	0.109	0.788	0.663	46.501
2178	MMC Engineering Group Bhd	0.157	-0.150	0.645	0.482	21.744
8028	Autoways Holdings Berhad	0.182	-0.207	0.410	0.236	6.991
4693	Naluri Bhd	-0.021*	-0.217	0.423	0.224	6.549

*The B_{ix} variable is not significant

One possible explanation of lack of a relationship between lagged exchange rates and firm returns is the prospect of the efficient market hypothesis working. The semi-strong version of the efficient market hypothesis (EMH) posits that all publicly available information is impounded, as soon as it becomes available, in share prices. Evidence from previous research has found that the Kuala Lumpur Stock Exchange (KLSE) appeared near efficient in the semi-strong sense for both earnings and dividends increase and decrease announcement (Annuar Md. Nasir and Shamsher Mohamad, 1993). Therefore, it is possible that information regarding losses and gains due to exchange rate risk, which were published with the earnings and dividend announcements, were used by investors to adjust their risk premia for individual firms thus negating any effect of the exchange rate risk Given the small number of firms whose value is affected by lagged foreign exchange changes, there is not enough evidence to conclude

that Malaysian firm exhibit significant foreign exchange exposure to lagged foreign exchange variability.

5. CONCLUSION

Risk aversion has been the underlying assumption of investment theory. Therefore, the influence of foreign exchange risk on firm value has been the concern of researchers in the developed world. The Asian financial crisis in 1997 has shown that East Asian firms are possibly vulnerable to foreign exchange risk. One lesson learnt from the crises is the need to have sound management practices to mitigate the risks involved in doing business. One possible way is to have appropriate risk management techniques especially on foreign exchange risk as a firm diversifies its business across national boundaries.

This study showed that the values of 19.5% or approximately one-fifth of the firms studied were influenced by foreign exchange fluctuation during the period of 1990 to 1996. Thus, the findings of this paper do not offer strong evidence on foreign exchange exposure of Malaysian firms. The firms could have probably mitigated the foreign exchange risk by hedging their exposures to it. The cental bank's measure in controlling the fluctuation of the Ringgit within a managed band during the 1990s has also probably reduced the significance of the risk. It takes a huge jolt in the form of the 1997 Asian financial crises to uncover just how far the Government's foreign exchange management has helped Malaysian firms.

In order to reap the benefits of the lessons learnt from the 1997 Asian financial crises, Malaysian firms must undertake sound risk management strategies albeit proactive ones to negate the effect of foreign exchange variability.

Limitations of the Study

The possibility that hedging was used which caused an insignificant number of firms' values being related to foreign exchange risk cannot be proven without a doubt as there was no source to substantiate that firms listed on the KLSE hedge their foreign exchange exposures. So far, there is not much research done to determine the extent of derivatives usage as a hedging instrument. Previous studies in developed countries have documented substantial usage of derivatives as hedging instruments.

Bodnar and Wong (2000) have also pointed out that the choice of the market portfolio is a crucial issue as different constructions of the market portfolio have different correlations with the exchange rate. Their findings indicate that the choice of a market portfolio has a direct impact on the nature and

interpretation of the resulting exchange rate exposure estimates. This methodological problem appears to be the root of the contradictory results of the sign of the average impact of exchange rate changes on stock returns and the sign of the average impact of the exchange rate changes on profits. Therefore, the results of this study need to be treated with caution in light of these developments.

Suggestions for Further Studies

In addition to the analysis of foreign exchange variability influence on firm value at the firm level, further research could also be conducted at the industry level. There has been evidence (He and Ng, 1998, Bodnar and Gentry, 1993) that firms in a related industry could have different levels of foreign exchange exposure vis-à-vis other industries. Analysis at the industry level could also be undertaken in the Malaysian context.

There is a need to further extend this study to incorporate a comparison in terms of the effect of foreign exchange variability against firm value across multiple countries especially in the ASEAN context. It is then possible to see whether there are any differences among ASEAN countries of the impact of foreign exchange variability and the effects of different methods of risk management strategies undertaken by firms in different countries.

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