The Exchange Rate Exposure of Foreign Sales and Foreign Purchases of Malaysian Manufacturing Companies

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Abstract

This study analyses the impact of foreign currency exposure on equity return of Malaysian public listed manufacturing companies over 2008-2011. We covered 50 companies with majority having foreign sales or/and foreign purchases exposure. Our investigation is to find out whether the exposure is coming from their foreign sales or foreign purchases; whether their hedging activities in foreign sales and in foreign purchases matters; and whether multiple currency exposure in foreign sales and in foreign purchases have any impact on their equity returns. We find that hedging on foreign sales has significantly reduces the foreign currency exposure while foreign purchase remain a concern as the volatility of the foreign purchase currency has reduces their equity returns. However, we also find that hedging in foreign purchases have a positive impact on equity return when exchange rate of foreign purchase has becomes more volatile. Lastly, multiple foreign currency exposure either in foreign sales or foreign purchases does not have any effect on equity return.

Keywords Exchange rate, foreign sales, foreign purchases, hedging, multiple currencies

INTRODUCTION

Exchange rate exposure has become substantial for manufacturing companies that deal with foreign currency based activities including imports, exports, financing and investment. It is widely viewed that exchange rate exposure affect corporate cash flows and equity return, thus it is key concern to management by implementing risk management and business strategy management as

corporate objectives. In this context, hedging instruments have become the central focus of the literature. The relation of hedging and firm value was addressed by Smith and Stulz (1985) who proposed that for value maximizing, hedging was part of overall corporate financing policy. They suggested that hedging could affect firm value through changes in tax liabilities, changes in stakeholder contracting costs or interdependencies between the choice of financial policy and future real investment decisions. This implied that hedging could increase a firm's value by simultaneously reducing external claims such as taxes paid to government; bankruptcy costs (both direct and indirect); and/or agency costs to align managerial interests with the interests of capital suppliers.

Empirically, Nguyen and Faff (2003), Chalmers and Godfrey (2000) and Chalmers (2001) have investigated the impact of derivatives reporting for firms in Australia while Ameer (2010) examined the factors that influenced the demand of derivatives in Malaysia listed companies. However, we found that these studies did not address the differential hedging impact on foreign sales currency and foreign purchases currency which may influence the company's equity return and generally inconsistent empirical evidences were reported on the foreign activities engaged by companies. For example, Shapiro (1975), Jorion (1990), He and Ng (1998), Doukas et al., (2003), among others, suggested that foreign sales was the main component of exchange rate exposure. Li et al., (2010), in contrast, showed that foreign sales did not have impact on exchange rate exposure in Taiwan. Similar finding was observed by Bartov and Bodnar (1994) who found no evidence of exchange rate exposure for U.S. multinationals. Most of these studies show little information whether currencies exposure from foreign sales or foreign purchases poses impact on the exchange rate exposure. So we think it is important to find out if the exposures to foreign sales currency or exposure to foreign purchases currency affects manufacturing company's equity return.

Malaysia as a small and open economy that heavily relies on export led-growth development had experienced various type of exchange rate regimes during 1970s to 2000s. Malaysia is among the pioneer group in East Asia that received foreign direct investments of multinational companies since the 1970s. Manufacturing sector in Malaysia grows rapidly in the past decades and it plays a key role in driving the growth of Malaysia economy. As one of the world's largest exporters of semiconductor components and devices, manufacturing sector has therefore contributed as the major engine of export growth and modernizer of domestic supply chains for the past four decades. Since manufacturing companies in Malaysia has active foreign trade activities, their exchange rate exposure are substantial and could affect their equity return.

Our paper focuses on three objectives. The first is to find the differential effect of exchange rate exposure of foreign sales currency and foreign purchases currency on company's equity return. In short, we find foreign purchases currency has greater exposures and will reduce profitability and equity return.

This phenomenon is probably due to lesser manufacturing companies hedge their foreign purchases currency compared to foreign sales currency and higher raw material cost in foreign purchases. Our second objective is to investigate whether hedging activities matter on the exchange rate exposure to foreign sales currency and foreign purchases currency. The result shows that lesser hedging activities for foreign purchases currency compared to foreign sales currency cause higher exchange rate exposure and lower profitability and equity return. Furthermore, the higher raw material cost in foreign purchases also reduces profitability and equity return. Our third objective is to examine whether the scope of foreign currency exposure matters, i.e. we examine multiple foreign currencies exposure in foreign sales and foreign purchases will have an impact on company's equity return. We report insignificant result on this factor.

The remaining writing of this paper is arranged as the following: section 2 discusses our methodology and data. Section 3 provides the results and discussion and finally section 6 offers our conclusion.

DATA AND METHODOLOGY

Our sample covered public listed manufacturing companies from 3 sectors, comprising Industrial Products, Consumer Products and Trading/Services sector that are listed in Main Market of Bursa Malaysia from 2008 to 2011. We covered 27 companies in consumer products, 21 companies in industrial products and 2 companies in Trading/ Services sector from manufacturing industry. Majority of these 50 companies have foreign sales or/and foreign purchases exposure. The data extracted from the public listed companies audited report reflect the companies' information which included holding company and its subsidiaries.

Our dependent variable is equity return, and we control for company size, Ln(MV); liquidity/ trading volume, Ln(VO) and return on asset (ROA). The subject variable of our study is exchange rate volatility of foreign sales (EXVsc) and foreign purchases (EXVpc). The exchange rate volatility series are generated from GARCH(1,1) model.

The moderating variables are the scope of foreign currency exposure and hedging activity. The magnitude of foreign currency exposure referred to the degree of exchange rate exposure of multiple foreign currencies from foreign trade a activity that is more than 5% of the total foreign sales and total foreign purchases.

Our baseline model is given as below:

$$R_{i=} \alpha_0 + \beta_1 LnMV_{it} + \beta_2 LnVO_{it} + \beta_2 LnROA_{it} + \varepsilon_i \qquad (1)$$

where R_i is the equity return of company i, α_0 is the constant term, the three control variables are company size which is proxy by (1) market capitalization value, or more commonly known as market value of the company stock,

(LnMV); (2) trading volume that is to proxy for market liquidity (LnVO); and the return on asset (ROA) of the company; the β_1, β_2 and β_3 are the estimated coefficient respectively, and finally ε_i is idiosyncratic error term.

To investigate the impact of currency exposure we divide the subject currency exposure into 2 variables, namely the exchange rate volatility of foreign sales and foreign purchases. Thus our baseline model is extended to:

$$R_{i=} \alpha_0 + \beta_1 LnMV_{it} + \beta_2 LnVO_{it} + \beta_2 LnROA_{it} + \beta_4 (EXVsc_{,it}) + \beta_5 (EXVpc_{,it}) + \varepsilon_i \quad (2)$$

where $EXVsc_{,it}$ and $EXVpc_{,it}$ are exchange rate volatility in foreign sales and foreign purchases of company i at time t, respectively; β_4 and β_5 are the estimated coefficients for both the variables, respectively.

In order to investigate the effect of hedging activity, we added interaction terms of the exchange rate volatility variables with the company's hedging dummies. The extended the model is shown as below:

$$R_{i=} \alpha_0 + \beta_1 LnMV_{it} + \beta_2 LnVO_{it} + \beta_2 LnROA_{it} + \beta_4 (EXVsc_{,it}) + \beta_5 (EXVpc_{,it}) + \beta_6 (EXVsc_{,it} \times D^{sc\text{-}hedge}) + \beta_7 (EXVpc_{,it} \times D^{pc\text{-}hedge}) + \varepsilon_i \quad (3)$$

where $D^{sc\text{-}hedge}$ is hedging in foreign sales, and $D^{pc\text{-}hedge}$ is hedging in foreign purchases. To examine the scope of foreign currency exposure, we have interacting both the volatility of the exchange rate variables with a multiple foreign currency dummies, as shown below:

$$R_{i=} \alpha_0 + \beta_1 LnMV_{it} + \beta_2 LnVO_{it} + \beta_2 LnROA_{it} + \beta_4 (EXVsc_{,it}) + \beta_5 (EXVpc_{,it}) + \beta_6 (EXVsc_{,it} \times D^{sc\text{-}multi}) + \beta_7 (EXVpc_{,it} \times D^{pc\text{-}multi}) + \varepsilon_i \quad (4)$$

where $D^{sc\text{-}multi}$ is the multiple foreign currency dummy in foreign sales, and $D^{pc\text{-}multi}$ is the multiple foreign currency dummy in foreign purchases.

PRELIMINARY DATA ANALYSIS

Before proceed to the regression estimation, in this section, we report the basic statistics of foreign currency exposure of the sample firms, their hedging coverage and the scope of their foreign currency exposure, i.e. the number of foreign currency that they are exposure to. This allows us to gauge the characteristic of the data that we are analyzing in the regression analysis in the later part. These are tabulated into 5 tables.

Table 1 reports that majority (more than 40 companies across years consistently) of the sample manufacturing companies have foreign currency exposure in both foreign sales and foreign purchases. We can see that majority of them had foreign currency exposure in foreign sales with the largest range between MYR1-10 million follow by the class MYR11-20 million and quite a number have exposure of MYR21-30 million, MYR31-40 million and below MYR1 million. Only a handful has exposure beyond 41 million but there

are a few having exposure of more than 100 million ringgit. As for foreign purchases, majority of the manufacturing companies have foreign currency exposure between MYR1-10 million, followed by the class below MYR1 million and MYR11-20 million.

Table 1 Foreign Currency Exposure by Scale

Panel A: Scale of Exposure in Foreign Sales					Panel B: Scale of Exposure in Foreign Purchases				
Amount in million MYR	2008	2009	2010	2011	Amount in million MYR	2008	2009	2010	2011
< 1 mil	2	4	6	4	< 1 mil	13	15	11	11
1-10 mil	21	20	18	17	1-10 mil	20	18	20	18
11-20 mil	12	10	10	11	11-20 mil	6	5	4	2
21-30 mil	4	5	3	5	21-30 mil	1	3	2	2
31-40 mil	4	3	3	0	31-40 mil	0	1	1	1
41-50 mil	0	2	2	0	41-50 mil	2	1	2	0
51-60 mil	0	0	0	2	51-60 mil	0	1	1	2
61-70 mil	0	1	1	1	61-70 mil	0	0	0	0
71-80 mil	1	0	0	1	71-80 mil	0	0	1	0
81-90 mil	0	0	1	0	81-90 mil	0	0	0	1
91-100 mil	0	0	0	0	91-100 mil	0	0	0	0
> 100 mil	2	1	0	1	> 100 mil	1	1	0	1
Total	46	46	44	42	Total	43	45	42	38

Table 2 report the exposure by foreign currencies. Panel A in Table 2 showed that the USD had the highest percentage used in export activities for our sample of manufacturing companies over the 4 years from 2008 to 2011. The other foreign currencies were widely used included EUR, SGD, THB, GBP, AUD and RMB. In Panel B we also notice that the USD had the highest percentage used in import activities for the sample manufacturing companies over the sample period. The other foreign currencies were widely used include RMB, IDR, HKD, SGD, JPY, EUR and GBP. This shows that the manufacturing companies had highest foreign currency exposure in USD compared to other foreign currencies in both foreign sales and purchases activities.

In Table 3, we tabulate the number of companies that have hedging in foreign sales and foreign purchases, but not both hedging in foreign sales and foreign purchases in the same year. The data were extracted from Financial Risk Management Objectives and Policies at Notes to The Financial Statements in the audited company's annual report. In short, quite a number of companies engage in hedging in foreign sales but only a handful have hedging in foreign purchases.

Table 2 Percentage of Foreign Currency Exposure by Currencies

	2008	2009	2010	2011
Panel A: Percentage of Foreign Currency Used by Sector in Foreign Sales				
Consumer products				
USD	51%	56%	48%	52%
EUR	2%	0%	0%	0%
SGD	0%	0%	2%	2%
THB	0%	0%	5%	2%
Industrial products				
USD	34%	35%	34%	31%
EUR	2%	0%	0%	2%
GBP	0%	0%	2%	0%
AUD	2%	0%	2%	2%
RMB	2%	0%	2%	5%
SGD	0%	5%	2%	2%
UAED	2%	0%	0%	0%
Trading/ Services				
USD	2%	2%	2%	0%
GBP	2%	2%	0%	0%
Panel B: Percentage of Foreign Currency Used by Sector in Foreign Purchases				
Consumer products				
USD	45%	49%	49%	55%
RMB	2%	2%	0%	0%
IDR	5%	2%	2%	3%
HKD	2%	2%	2%	3%
SGD	2%	2%	2%	3%
Industrial products				
USD	34%	27%	34%	26%
RMB	2%	4%	5%	5%
JPY	2%	4%	2%	5%
EUR	0%	2%	0%	0%
GBP	0%	0%	2%	0%
Trading/ Services				
USD	2%	2%	0%	0%
GBP	2%	2%	0%	0%

Note: UAED represents United Arab Emirates Dirham

Table 3 Number of Companies with Hedging

	2008	2009	2010	2011
Foreign sales	27	22	17	18
Foreign purchases	2	3	6	6
Total	29	25	23	24

Table 4 reports the percentage of foreign sales and purchase that were hedged in various currencies. The statistics shows that hedging contracts on both foreign sales and purchases were mainly on USD. The other foreign currencies hedged for foreign sales activities were SGD, and EUR.

Table 4 Percentage of Hedging by Currencies

	2008	2009	2010	2011
Panel B: Percentage of Foreign Currency Hedging in Foreign Sales				
USD	74%	73%	88%	89%
SGD	7%	14%	6%	0%
EUR	7%	9%	6%	6%
AUD	4%	0%	0%	0%
JPY	4%	0%	0%	0%
GBP	4%	5%	0%	0%
RMB	0%	0%	0%	6%
Panel B: Percentage of Foreign Currency Hedging in Foreign Purchases				
USD	50%	100%	83%	83%
EUR	50%	0%	0%	17%
SGD	0%	0%	17%	0%

To gauge the scope of foreign currency exposure we look into the number of foreign currency exposure or so-called the multiple foreign currency exposure. Table 5 tabulates the number of many companies that have multiple foreign currency exposure of at least 5% or more of the foreign sales or foreign purchases value. From Table 3 we notice that majority manufacturing companies had 1 to 2 foreign currency exposures with in both foreign sales and foreign purchases. The maximum number of foreign currency exposures is 4 in both cases.

In short, from the data gathered, we found about half of the sample companies have multiple foreign exchange exposure in both foreign sales and foreign purchases, and USD was the major exchange rate exposure. At the same time, USD was also the major exchange rate used in hedging for foreign sales and foreign purchases. The large use of USD in the foreign activity either

import or export for the manufacturing companies in Malaysia could be explained by the fact that US has been the largest trading partner of Malaysia and USD remain the hard currency in of Malaysian trades with other major partners. The large use of USD also increased the hedging activity by using the forward contract to reduce the volatility of USD in the foreign sales and foreign purchases. At the same time, the exchange rate volatility in foreign purchases had higher value compared to exchange rate volatility in foreign sales, thus the foreign purchases had higher exposure to exchange rate volatility due to its lower hedging activities over the 4 years from 2008 to 2011.

Table 5 Number of Companies with Multiple Foreign Currencies Exposure

	2008	2009	2010	2011
Panel A: More than 5% Exposure in Foreign Sales				
0 currency	3	4	6	8
1 currency	26	25	23	22
2 currencies	14	15	17	16
3 currencies	5	4	3	3
4 currencies	2	2	1	1
Total	50	50	50	50
Panel B: More than 5% Exposure in Foreign Purchases				
0 currency	6	5	7	12
1 currency	24	20	20	22
2 currencies	13	17	17	10
3 currencies	6	7	4	5
4 currencies	1	1	2	1
Total	50	50	50	50

REGRESSION RESULT

The regression estimates for Model 1 is reported in Table 4 while the others are reported in Table 5. Model 1 in Table 4 reports the estimates for the baseline Model (1) with only the 3 control variables. The significant of the size (LnMV) and profitability (ROA) variables are as expected and their sign are correctly estimated. Liquidity (LnVO) however is not statistically significant. In Model 2, the estimates for the control variables remain consistent even after we added the exchange rate volatility variables. Both models have a fair value of adjusted R2, with 56.97% and 63.76%, for Model 1 and Model 2, respectively.

The regression results of Model 2 in Table 6 shows that the exchange rate volatility in foreign purchases have negative and significant influence on equity return but the exchange rate volatility in foreign sales has no significant influence on equity return. The negative impact of exchange rate volatility

on equity return is expected as documented in the literature, however, our study here further shown that this exposure is actually coming from foreign purchases. This outcome is largely due to manufacturing companies have relatively higher hedging in foreign sales as compared to foreign purchases, as reported in Table 2. Actually these manufacturing companies have slightly higher value of exposure in foreign sales, as shown in Table 1 but obviously the higher exposure in foreign sales has been covered by the higher hedging activities and hence causes lesser impact to profitability and firm equity return. Additionally, the higher financial cost in foreign purchases when the USD appreciates over the sample period might have causes a significant decline in firm profitability and lower equity return as most manufacturing companies need more USD as cash flow to pay for their foreign purchases.

Table 6 Estimation for the Impact of Currency Volatility from Foreign Sales and Foreign Purchases

	Model 1	Model 2
Constant	-343.0697***	-345.1326***
	(29.6960)	(40.3962)
	[0.0000]	[0.0000]
LnMV	63.7941***	58.2846***
	(10.9499)	(9.8044)
	[0.0000]	[0.0000]
ROA	2.6209***	2.6550***
	(0.2410)	(0.1179)
	[0.0000]	[0.0000]
LnVO	5.2962	6.5678
	(3.5262)	(3.9909)
	[0.1395]	[0.1071]
EXVsc	-	9.7937
		(12.3221)
		[0.4311]
EXVpc	-	-19.1046***
		(4.3540)
		[0.0001]
N	185	145
R^2	0.5767	0.6502
R^2 adjusted	0.5697	0.6376

Note: figure in the parenthesis () is standard error, figure in the bracket is probability value. The asterisk *, **, *** represent significant at 10%, 5% and 1%, respectively.

Model 3 allows us to directly test the impact of hedging activities. The regression results of Model 3 in Table 7 showed that hedging on foreign purchases has positive influence on equity return when the volatility of the currency of foreign purchases increases but the hedging on foreign sales has no significant impact. This implies that manufacturing companies that practice hedging might actually benefit from currency volatility in foreign purchases either by reducing cost of imports in raw material or positive proceed from their derivative contracts.

As for the third research question on multiple foreign currencies we find no significant statistical result from the interaction terms reported in Model 4 in Table 7. So we conclude that even though some manufacturing companies have multiple foreign currencies, it does not affect the impact of currency volatility in foreign purchases on firm equity return. Probably the manufacturing companies that have multiple foreign currencies will manage its treasury management with natural hedging where the same foreign currency sales and foreign currency purchases will match each others to mitigate the exchange rate exposure.

Table 7 Estimation for Magnitude of Exposure and the Impact of Hedging

	Model 3	Model 4
Constant	-334.7090***	-344.7899***
	(40.1426)	(40.5226)
	[0.0000]	[0.0000]
LnMV	55.9497***	58.1998***
	(8.9566)	(9.7077)
	[0.0000]	[0.0000]
ROA	2.6772***	2.6636***
	(0.1163)	(0.1172)
	[0.0000]	[0.0000]
LnVO	6.8467*	6.5616
	(3.9684)	(3.9891)
	[0.0917]	[0.1073]
EXVsc	10.1753	12.7373
	(12.4540)	(13.2246)
	[0.4184]	[0.3409]
EXVpc	-19.3064***	-20.6569***
	(4.3889)	(5.8853)
	[0.0001]	[0.0011]

EXVsc x $D^{sc\text{-}hedge}$	1.2349	-
	(1.0479)	
	[0.2451]	
EXVpc x $D^{pc\text{-}hedge}$	2.2599***	-
	(0.2074)	
	[0.0000]	
EXVsc x $D^{sc\text{-}multi}$	-	-1.7611
		(3.3622)
		[0.6031]
EXVpc x $D^{pc\text{-}multi}$	-	0.7778
		-1.5686
		[0.6225]
N	145	145
R^2	0.6651	0.6512
R^2 adjusted	0.648	0.6334

Note: figure in the parenthesis () is standard error, figure in the bracket is probability value. The asterisk *, **, *** represent significant at 10%, 5% and 1%, respectively.

CONCLUSION

In conclusion, this study delivers three important findings. First the hedging on foreign sales has significantly reduces the foreign currency exposure of manufacturing companies in Malaysia over the sample period 2008-2011, a period where world trade has been disturbed by the aftermath of the global financial crisis and European sovereign debt crisis that saw major disruption to world trade. The foreign purchase exposure however, as shown in our result, remains a concern as it can affect the equity returns of these companies. This finding can provide guideline to management to outline the risk management policy with hedging instrument on the purchase side in order to mitigate the currency exposure and to better control of foreign currency outflow in foreign purchases. The management of the manufacturing industry need to stay competitive in their business and further improves the financial position in order to survive in the uncertainties of the current global economy situation.

Second, the findings shows the hedging in foreign purchases, although relatively less in value as compared to hedging in foreign sales, has a positive effect on firm equity returns when exchange rate of foreign purchase become more volatile but this is not for hedging in foreign sales. These manufacturing companies actually enjoy reducing cost of imports in raw material or collect handsome proceed from their derivative contracts. This positive outcome shows the evidence how manufacturing companies can achieve higher equity

return as investor might build confidence in companies that practice effective treasury management.

Third, we show that multiple foreign currency exposure either in foreign sales or foreign purchases do not have any effect on equity return. The manufacturing company might have structure its operations so that they can operationally hedged against the foreign currency exposure by diversifying the import operations with export sales. This study however offer no further precise picture of how Malaysian manufacturing companies actually performs these natural hedging and thus further study is warranted to draw a conclusion on this.

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