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Research Article

Corporate risk management: An empirical evidence on foreign currency derivatives' use by Malaysian nonfinancial firms

Abdullah Bin Omar[1], Haris Khurram[2], Maqsooda Parveen[3],
Abdul Rauf Kashif[4], Muhammad Ahmed Shehzad[5]*, Neelam Bukhari[6]

[1]Department of Business Administration, National College of Business Administration & Economics, (NCBA&E) Lahore, (Sub-campus Multan), Pakistan
[2]Department of Sciences & Humanities, FAST-NUCES, (Chiniot Campus), Pakistan
[3,5,6]Department of Statistics, Bahauddin Zakariya University, Multan, Pakistan
[4]Institute of Southern Punjab, Multan, Pakistan

*Corresponding Author email: ahmad.shehzad@bzu.edu.pk

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ABSTRACT

During the last decade, the issue of using financial hedging instruments get attention of top management specially of nonfinancial firms due to increase in cross-border trade and variations in foreign exchange rates. As Malaysia is an open economy with high exchange rate fluctuations, this study test different corporate hedging theories in Malaysian context and investigated factors that can better explain the use of foreign currency derivatives. We found weak evidence for underinvestment theories as well as 'Risk Management Committee', but strong evidence for financial distress theories. We also find support for size and market-openness hypothesis but weak support for liquidity hypothesis. However, in robustness test, all proxies of underinvestment theory and Risk Management Committee is found to be significant when model is run after excluding SIZE variable. Finally, our results run counter to the conjecture that high exchange rate exposure firms are more inclined towards derivative usage.

Keywords: *Hedging; Exchange-Rate Risk; Foreign Currency; Financial Derivatives*

JEL Classification: G32, F31

1. INTRODUCTION

The turbulences on the financial markets during the last decade have strikingly shown the importance of financial risk management for firms (Arnold et al., 2014). In an era of financial innovation, derivative financial instruments open a new avenue for corporate managers to facilitate them in achieving desirable pattern of firm's cash flows (Wang, 2009). This study aims to investigate the propensity of Malaysian firms towards the use of financial hedging instruments. Three potential issues warrant this investigation. Firstly, rationales for corporate risk management for developed economies have been subject to ample empirical investigation, including Joseph and Hewins (1997), Graham and Rogers (2000) and Haushalter (2000), but unfortunately, little attention has been devoted for developing and emerging economies like Malaysia. Secondly, due to the lack of empirical evidences on Malaysia, several factors of corporate hedging have not been well addressed by past studies. Studies on Malaysia, such as Fazillah et al. (2008), Ameer (2010) and Chong et al. (2014), fail to predict those factors that are more relevant and appropriate for Malaysian market and cannot provide conclusive and realistic evidences on corporate hedging determinants.

Finally, previous studies on Malaysia provide evidence on the influence of several hedging factors over the combined use of different derivative instruments, such as foreign currency derivatives (FCDs), interest rate derivatives and commodity price derivative (see, for example, Ameer, 2010; Ameer et al., 2011; Shaari et al., 2013). The drawback of investigating the combine use of all hedging instruments is that the intention and purpose of using each derivative type is quite different from each other. Thus, the determinants for using all derivative instruments together expected to be quite different from each individual hedging type determinants, hence likely to create bias. Furthermore, to explore the determinants of FCDs alone for Malaysian market is

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more relevant and appropriate because Malaysian firms are more likely to face high FX rate risk due to: (i) high volatilities in Malaysian exchange rate during sample period; and, (ii) high market openness. This ultimately induce the Malaysian firms towards the use of FCDs as compared to any other type of derivative instrument. Unfortunately, to best of authors' knowledge, the determinants of FCDs are not solely and separately addressed for Malaysian market by any previous study. These three aforementioned issues provide adequate reason for conducting this study and proposes a unique empirical model with the appropriate factors to test corporate hedging rationales that are considered to better describe the use of FCDs and deemed more relevant for Malaysian market.

This study has two significant novel contributions towards empirical literature. Firstly, this study introduces a new variable in empirical model, i.e., Risk Management Committee (RMC) with this conjecture that the use of FCDs by Malaysian firms can be better explained by RMC. This impact of RMC in connection with FCDs use, to best of author's knowledge, yet not tested by any previous study. In corporate firms, RMC is responsible for identifying and mitigating organizational risk including currency risk, hence, firms having RMC are more likely to face exchange rate risk and expected to be the users of FCDs. Second novelty is that this study tests the effect of FX risk (also referred as FX exposure) on FCDs' use. Use of FCDs by firms without having FX risk is quite irrational and unnatural. As Malaysian firms face more exchange rate volatility during sample period, therefore, the use of FCDs is more likely to be explained by FX rate exposure. The effect of FX rate risk on FCDs use at firm level is still under-researched by past empirical studies.

2. LITERATURE REVIEW

There is a significant amount of research on the topic of corporate risk management. Some of these previous empirical studies attempt to explore factors that compel corporate firms to use hedging instruments, some studies measure FX exposure of different economies, and some studies explore the relationship between firm value and risk management. In context to the scope of this study, literature is limited to studies about FX exposure and determinants of corporate hedging.

RMC, in public listed firms, is established to forecast the risk that firm is likely to face and develop risk management program to mitigate that risk. It deals with several types of risk including financial risk. Although, there are several Malaysian studies that discuss RMC but in different contexts. Abdullah and Ismail (2016), for example, examine the effectiveness of RMC in influencing hedge accounting practices among non-financial firms listed on the Bursa Malaysia during 2013. Likewise, Abdullah and Chen (2010) and Hassan et al. (2012) explore the relationship between RMC and the disclosure level of financial instruments information from an agency theory perspective among Malaysian listed firms during 2008 and 1999 to 2003 respectively. All these studies examine the role of RMC in different contexts but none of the study discuss RMC in relation to hedging determinants which is a substantial gap in literature.

According to Froot et al. (1993), firms may face underinvestment problem and forego opportunities to invest in positive NPV projects due to shortage of internal financing and liquidity problem, while external financing is also expensive. Shaari et al. (2013) and Ameer (2010), for example, conduct their studies on Malaysia and determine the use of derivatives by using a sample of 97 and 112 nonfinancial firms over the period of 2010–2011 and 2003–2007 respectively. Both studies find positive significant relationship for the capital-expenditure ratio in relation to derivative use. Similarly, Gatopoulos and Loubergé (2013) find that firms tend to use more FCDs with large capital expenditures. Contrary to these studies, Bartram et al. (2009) provide evidence of derivative usage on 50 countries and find inverse relationship between derivative use and capital expenditure which is counter to the theory prediction.

To test underinvestment problem, several studies use a ratio of market-to-book value as a proxy of growth opportunities and find mixed results. For example, Ameer (2010) finds that market-to-book value ratio and use of derivatives by Malaysian nonfinancial firms are positively associated with each other. Similarly, Lin et al. (2008) explore the relation between US firms and hedging activities and significant positive association was found between derivative use and market-to-book value ratio. Consistent with these results, Allayannis and Ofek (2001) provide evidence on US firm's hedging decisions and conclude that the use of hedging instruments are positively and significantly explained by market-to-book value ratio.

Several proxies used by several studies to test the relation between hedging and financial distress. Most common proxies are interest coverage ratio and leverage ratio. Several studies use interest coverage ratio as a proxy of financial distress and find divergent results. Afza and Alam (2011) test the ability of paying debt cost of Pakistani public listed firms and find negative and insignificant relationship between interest coverage ratio and derivative use. In a same way, Géczy et al. (1997), while providing evidence against currency derivative use, report that FCDs are negatively explained by interest coverage ratio. Similarly, Bartram et al. (2009) find inverse relationship between derivative use and interest coverage ratio for a large sample consist of more than 50 countries.

The most common proxy used by several studies to test firm's hedging decisions in financial distress situation is leverage ratio. Shaari et al. (2013) find that highly leveraged firms of Malaysia are more intend to use derivatives. For large amount of sample, Bartram et al. (2009) find derivative users have significantly higher leverage. Howton and Perfect (1998) find that interest rate derivative users positively respond towards leverage as opposed to currency derivatives users. The study of Berkman and Bradbury (1996) on US firms also report the positive relationship between leverage and the use of derivative instruments.

Most of the empirical studies on hedging determinants depict the derivative use as an increasing function of firm size. Afza and Alam (2011), for example, provide support for the direct relationship between size of a firm and usage of hedging instruments. Results of Allayannis and Ofek (2001) exhibit that use of derivatives are positively and significantly explained by firm size. However, Nance et al. (1993) also highlight some specific reasons of the effect of firm size on hedging incentives which implies that large size firms are more probable to induce towards hedging.

The impact of hedging on firm value of Shariah compliant firms is examined by Zamzamir@Zamzamin et al. (2021) by employing system GMM for dynamic panel data. They examined the influence of derivatives usage on firm value by collecting a sampled data of 59 non-financial firms over the period of 2000 to 2017. They found that hedging significantly contributes to firm value of shariah compliant firms based on non-linear framework. A recent study conducted by Bazih and Vanwalleghem (2021) examining the determinants of banks' hedging of emerging market and the impact of using derivatives on bank value along with their stability and total risk. Their results suggests that although derivative usage appears to reduce emerging market bank value, it does not affect total risk.

It is generally agreed that the unpredictability of firm's sale generated from foreign business operations and higher movement in FX rate influence the firms' cash flows pattern and level of profitability (Afza & Alam, 2011). Géczy et al. (1997) suggest that with high uncertainty in firm's cash flows due to higher level of foreign business operations and greater variation in FX rates results in greater potential benefits from FCDs use. Afza and Alam (2011) find significant positive effect of foreign sales on hedging decision by Pakistani public listed firms. A firm's incentive to hedge with derivatives can also be influenced by its liquidity. Afza and Alam (2011), for example, find that nonfinancial firms of Pakistan negatively respond towards hedging with the level of liquidity. Findings of Lin et al. (2008) exhibit that liquidity level US firms is negatively associated with derivative usage.

3. METHODOLOGY

3.1. DATA AND SAMPLE SELECTION

Sample is selected from the Main Market of Malaysian Stock Exchange (Bursa Malaysia) over the period of 2008 to 2014 because an adequate information regarding firm's risk management activities, hedging policies are available in annual reports due to compliance of Financial Reporting Standard (FRS) 139. Out of total 806 firms, we dropped financial firms, delisted firms and firms having missing data which left sample size to 314. Finally, sample is further restricted to only those firms that hold Ex Ante FX rate risk indications in their annual reports over the study period. This criterion left the final sample 224 firms. Data is collected from Datastream and annual reports.

3.2. Model Specification

This study employs logistic regression model for determining factors that induce Malaysian firms towards the use of FCDs.

$$FCDit = \alpha 0 + \alpha 1\ RMCit + \alpha 2\ CAPEXit + \alpha 3\ MTBVit + \alpha 4\ INCOVit + \alpha 5\ LVRGit + \alpha 6\ SIZEit + \alpha 7\ FSTSit + \alpha 8\ LIQit + \mu it \quad (1)$$

where for each ith firm and period t, FCD and RMC are estimated by dummy variable with '0' and '1', and

CAPEX = Capital expenditures as a percentage of total sales
MTBV = Market value of a firm deflated by book value of a firm
INCOV = Earnings before interest and tax scaled by interest expense
LVRG = Long-term debt deflated by total assets
SIZE = Log of firms' total assets
FSTS = Foreign sales as a percentage of total sales
LIQ = Current assets of a firm scaled by current liabilities
μ = Residual of binary logistic regression model

4. Results and Discussion

4.1. Descriptive Statistics

Table 1 depicts some descriptive statistics of explanatory variables of logistic model. The mean value of RMC is 0.4171 with a standard deviation of 0.4932. Similarly, for the first proxy of underinvestment theory, Mean, median and standard deviation of CAPEX are 4.9077, 3.5700 and 4.09968 respectively. If these results are compared with Ameer (2010), who also conduct his study on Malaysia over the period of 2003 to 2007, mean and median values of 16.41 and 5.50 respectively are surprisingly higher than that of the current study. This difference may be due to difference in sample periods which signifies that Malaysian firms are having more growth and investment opportunities in the period of 2003 to 2007; but afterwards these opportunities become reduced possibly due to Asian financial crises. Likewise, surprisingly high average CAPEX value 22.92 is reported by Sprcic and Sevic (2012) for Croatian and Slovenian companies for the year 2005. Close to the current study values, Graham and Rogers (2000) report mean CAPEX value of 6.13 for US firms. Finally, the first and third quartiles for CAPEX are 2.0700 and 6.4650 respectively.

For the second proxy of underinvestment theory, strikingly high average MTBV 4.68 is reported by Nguyen and Faff (2010) for Australian firms and 5.4971 reported by Chaudhry et al. (2014) for Pakistani firms as compared to current study average value of 0.9471. Likewise, Lievenbrück and Schmid (2014) report 2.17 mean MTBV for worldwide energy utilities. Finally, the first and third quartiles for MTBV are 0.5900 and 1.1800 respectively with the standard deviation value of 0.53402.

Results reveal that INCOV is 11.0768 with the minimum of -25.84 and maximum of 39.37. Mean value shows that, on average, Malaysian firms' earnings are 11 times higher than their interest expense. Results of Berkman et al. (2002) demonstrate that industrial firms of Australia are facing more financial distress situation than Malaysian firms with the mean and median interest values of 1.97 and 1.91 respectively. Howton and Perfect (1998) report higher mean interest coverage value of 32.41 for US firms as these firms are larger in size and more profitable, hence, more likely to cover their interest expense with their earnings. However, their data have more dispersion with standard deviation value of 115.64 as compared to current study value of 14.89. Finally, first and third quartiles of INCOV are 2.0404 and 21.2221 respectively.

Table 1. Descriptive statistics of explanatory variables of logistic model

Predictor	Mean	Minimum	Q1	Median	Q3	Maximum	Std. Dev.
RMC	0.4171	0.000	0.0000	0.0000	1.0000	1.00	0.4932
CAPEX (%)	4.9077	0.000	2.0700	3.5700	6.4650	17.31	4.09968

MTBV	0.9471	-0.61	0.5900	0.8100	1.1800	2.81	0.53402
INCOV	11.0768	-25.84	2.0404	5.9330	21.2221	39.37	14.88701
LVRG	0.0556	0.000	0.0145	0.0293	0.0932	0.19	0.05460
Total Assets	424,684	2,597	138,264	294,431	821,814	934,137	335,899
SIZE	19.7149	14.77	18.7447	19.5	20.527	24.83	1.569
FSTS (%)	28.8178	0.000	8.3840	23.1310	44.2200	110.04	25.08500
LIQ	2.3813	0.000	1.4125	1.9941	2.8630	6.55	1.39738

Mean and median values of leverage (LVRG) are 0.0556 and 0.0293 respectively that are almost similar with Ameer (2010) who reports a mean of 0.0953 and a median of 0.0572 for Malaysian firms from year 2003 to 2007. This shows that no significant change arises in financial leverage level of Malaysian firms from 2003 to 2014. Choi et al. (2013) and Howton and Perfect (1998) report slightly higher mean and median values of leverage ratio for US firms than those of the current study. Former report 0.207 and 0.170 values while later report 0.30 and 0.26 values for mean and median respectively. LVRG is maximum at 0.19 which is significantly lower than maximum value of 1.337 reported by Choi et al. (2013); however, the dispersion in their leverage data is 0.200 which is higher than current study, i.e., 0.05460.

The maximum and minimum values of size (SIZE) are 24.83 and 14.77 respectively with the mean value of 19.7149. Finally, first and third quartiles of SIZE are 18.7447 and 20.527 respectively with the standard deviation of 1.569. Similarly, the average foreign sales ratio (FSTS) is 28.8178 which is higher than 19.99 reported by Lin et al. (2008) for Fortune 500 firms. First and third quartiles are 8.3840 and 44.2200 respectively with the median of 23.1310. Finally, average liquidity ratio (LIQ) is 2.3813 which is higher than 1.91 reported by Jalilvand (1999) for Canadian firms. Nguyen and Faff (2010) and Howton and Perfect (1998) report almost similar average liquidity ratios with 2.54 and 2.13 respectively, while Berkman et al. (2002) report relatively lower mean liquidity ratio of 0.71 for Australian firms. Highest LIQ is recoded as 6.55 whereas first and third quartiles are 1.4125 and 2.8630 respectively.

4.2. Correlation Analysis

Pearson's correlation is employed for the purpose of measuring the degree of relationship among explanatory variables. Correlation results between the explanatory variables of logistic model are illustrated in Table 2. It is evident from the table that none of the correlation coefficient is greater than 0.8 or 0.9 which might lead to the problem of multicollinearity (Gujarati & Porter, 2009). The largest correlation coefficient is 0.360 between SIZE and LVRG which is less than 0.9. Similarly, the smallest correlation coefficient is – 0.028 between RMC and FSTS.

Table 2. Correlation matrix between explanatory variables

	RMC	**CAPEX (%)**	**MTBV**	**INCOV**	**LVRG**	**SIZE**	**FSTS (%)**	**LIQ**
RMC	1							
CAPEX (%)	.040	1						
MTBV	0.136**	0.107**	1					
INCOV	0.059*	-0.018	0.076**	1				
LVRG	0.119**	0.217**	0.011	-0.244**	1			
SIZE	0.259**	0.241**	0.183**	0.090**	0.360**	1		
FSTS (%)	-0.028	0.012	0.017	-0.014	-0.008	0.201**	1	
LIQ	-0.024	-0.059*	-0.019	0.200**	-0.294**	-0.196**	-0.099**	1

** Correlation is significant at the 0.05 level* *** Correlation is significant at the 0.01 level*

4.3. Results and Discussion of Logistic Regression Model

The relationship between firm characteristics and hedging is tested through logistic regression model. Results reveal that RMC found to be insignificant ($\alpha 1 = 0.138$, p-value = 0.260); indicating that the likelihood of using of FCDs is not explained by RMC. The presence of RMC does not have any impact on FCDs use by Malaysian firms. Two plausible explanations could be given of insignificant relationship between these two. Firstly, the financial and operating risks are adequately encountered and managed by predefined policies and systems through audit committee and RMC, Malaysian firms may not feel additional need to move towards derivative markets. Secondly, RMC is formulated not only to control and manage foreign currency risk but also different

other types of risks such as strategic risk and compliance risk. So, it is probable that firms who are facing little or no exchange rate risk, may significantly suffer from other types of risk and RMC is engaged in mitigating those risks.

Table 3. Results summary of explanatory variables of logistic model

Predictor	**Coefficient Estimate**	***P-value***	**Odds Ratios**	**Std. Error**
Constant	-8.116	0.0000***	0.000	0.806
RMC	0.138	0.2600	1.148	0.122
CAPEX (%)	-0.004	0.7990	0.996	0.015
MTBV	0.120	0.2860	1.127	0.112
INCOV	0.008	0.0820*	1.008	0.004
LVRG	3.116	0.0090***	22.558	1.193
SIZE	0.546	0.0000***	1.727	0.063
FSTS (%)	0.010	0.0000***	1.010	0.002
LIQ	-0.014	0.7670	0.986	0.048
Hosmer-Lemeshow Test	*p-value* = 0.517			
	df = 8			
McFadden R^2	0.2984			
Total observations (N)	224			
Expectation-Prediction Test for Logistic Regression				
Predication Evaluation (Success Cutoff = 0.5)		Correct Prediction (%)	Incorrect Predication (%)	
	FCDs Nonusers	(1,006) 92.7	(79) 7.3	
	FCDs Users	(125) 25.9	(385) 74.1	
	Total	(1,131) 72.1	(437) 27.9	

**** significant at 1% ** significant at 5% * significant at 10%*

To test the underinvestment theory, two proxies, CAPEX and MTBV, are selected. CAPEX is found to be insignificant indicating that investment opportunities for Malaysian firms do not have any impact on derivative usage. This finding is in line with Fauver and Naranjo (2010) who also find insignificant relation between capital expenditure and propensity to use derivatives. Similarly, MTBV is also statistically insignificant implying that growth opportunities do not affect firm's hedging pattern. This finding is in line with Afza and Alam (2011), Allayannis and Ofek (2001), Géczy et al. (1997), Mian (1996), Nguyen and Faff (2003) and Rossi Júnior (2007) who also find MTBV insignificant in relation with derivative use.

Likewise, INCOV and LVRG are used to test the financial distress cost theory and both are found to be significant which signifies that financial distress firms use FCDs to hedge their exchange rate risk. However, in contrast with theory, INCOV coefficient is found to be positive indicating that Malaysian firms use derivatives even when they are in a good position of paying their fixed cost. This is contrary to the notion that financial distress firms with low ability to cover their interest cost are more likely to incline towards derivative use. A plausible explanation of this finding is that firms with high level of interest cost (and low interest coverage ratio) are more likely to use interest rate derivatives (instead of FCDs) to hedge their interest rate exposure. They might not be facing currency exposure; therefore, they are not using FCDs.

On the other side, LVRG results are in line with the theory that the greater the firm's leverage, the more likely the firm is to use derivatives. Finding reveal that LVRG is positively and significantly ($\alpha 5 = 3.116$, p-value < 0.01) affecting the use of FCDs indicating that highly leveraged firms are more likely to engage in derivative transactions. Odds ratio is amazingly high implying that the likelihood of using FCDs increases by approximately 22 times as LVRG increases by one unit. These results are consistent with Berkman et al. (2002), Choi et al. (2013), Khumawala et al. (2016) and Nguyen and Faff (2002) who also find significant positive relationship between leverage and propensity to use derivatives.

Size (SIZE), as an explanatory variable, is tested in logistic model against the use of FCDs by Malaysian firms. Consistent with insights from the corporate sector literature, it is found that the interaction between hedging and firm size captures a large majority of the hedging premium. SIZE is highly significant with a positive coefficient indicating that level of FCDs usage by Malaysian firms increases with the increase in firm size; while odds ratio exhibits 1.727 times increase in probability of using FCDs with one unit increase in SIZE. Results are in line with Berkman et al. (2002), Choi et al. (2013), Fauver and Naranjo (2010), Fok et al. (1997), Khumawala et al. (2016) and Nguyen and Faff (2002) who also observe a strong positive relationship between firm size and the

likelihood of FCDs use. However, results of current study about SIZE are generally stronger than those observed in previous studies (such as Afza & Alam, 2011; Allayannis & Ofek, 2001; Ameer, 2010; Bartram et al., 2009; Nguyen & Faff, 2002). The finding also supports the argument of Nance et al. (1993) and Graham and Rogers (2000) that implementing derivatives hedging programs at corporate level require adequate financial resources, large fixed cost and expert personnel, and larger firms have more specialized resources and trained staff to effectively implement hedging policies and use derivative instruments. In contrast, small size firms are less likely to obtain potential advantages to offset these costs, therefore they are less likely to induce towards derivative instruments.

High uncertainty in firm's cash flows due to higher level of foreign business operations and cross-border trade result in greater potential benefits from FCDs use (Afza & Alam, 2011; Géczy et al., 1997). Therefore, the impact of foreign sales (FSTS) on hedging through FCDs is tested in logistic model. Results demonstrate that Malaysian firms with greater foreign business operations and international business linkages are getting higher hedging incentives. FSTS is highly significant with positive coefficient representing that firms with high level of foreign trade are likely to face higher level of FX exposure; therefore, more induce to use hedging instruments. Odds ratio depicts that one unit increase in FSTS enhance the chances of using derivatives by 1.010 times. The results are in line with Ameer (2010), Afza and Alam (2011), Choi et al. (2013), Lin et al. (2008) and Géczy et al. (1997) who also find significant direct relation between FSTS and derivative use.

Firms with higher levels of liquidity will lower the likelihood of financial distress as funds will be available to pay debt claims and will have less need to access derivative market for hedging. The extent to which liquidity works as a substitute of hedging for Malaysian firms is tested in empirical regression model by using a proxy, i.e., current ratio (LIQ). Results show that the level of liquidity has no influence on the firm's decision to use derivative to hedge. The result is consistent with the Fok et al. (1997), Géczy et al. (1997), Nguyen and Faff (2002, 2010) and Raghavendra and Velmurugan (2014) who also find insignificant relationship between LIQ and derivatives usage. The failure of the current ratio in explaining FCDs use may reflect an inappropriate empirical proxy. Although, the current ratio is commonly used to measure the ability of a firm to meet short-term financial obligations, however, there is a likelihood that current ratio may not be able to appropriately measure the financial slack of a firm which is generally used for investment purpose, since several items of current assets, such as inventories and debtors, may not be quickly and easily convertible into cash. Therefore, derivatives use is tested by using quick ratio in robustness as an alternate measure of liquidity which excludes the amount of inventory from current asset value.

For the goodness of fit, Hosmer-Lemeshow (HL) test is computed for the logistic regression model. Small p-value (usually under 5%) of HL test indicates that the model is a poor fit (Hosmer et al., 2013). As the p-value of HL test is greater than 50% (i.e. 0.517), therefore logistic model is good fit and well-specified. Similarly, the value of McFadden R2 between 0.2 to 0.4 represents that the model is good fit (McFadden, 1973). As the obtained value of McFadden R2 is between this range therefore logistic model is good fit. Finally, the results obtained from Expectation-Predication test are also provided in same table. Results show that overall, the model correct predicts 1,131 (72.1%) firm-year observations of the binary responses. Related to this case, 1,006 (92.7%) of the derivative nonusers are correctly classified in contrast to 125 (25.9%) of users who are correctly classified. This latter statistic does point to a legitimate concern over the logistic regression model—it is poor at correctly classifying users of FCDs in sample.

5. ROBUSTNESS ANALYSIS

5.1. SENSITIVITY OF FX RATE RISK IN THE LOGISTIC MODEL

As the prime intention of firms behind using hedging instruments is to mitigate risk, similarly the key motivation behind using FCDs is to mitigate FX rate risk which arises due to the fluctuations in FX rates. The benefit of using FCDs helps firms in mitigating their exchange rate risk (Hodgson, 1999; Shiu, 2007) and provide additional benefits like lessen market imperfections, reduce financial risk, and shareholders wealth maximization (Hardwick & Adams, 1999). Malaysian economy suffered from high fluctuations in Malaysian

exchange rate against US Dollar during the floating exchange rate system in sample period as can be clearly observed in Figure 1.

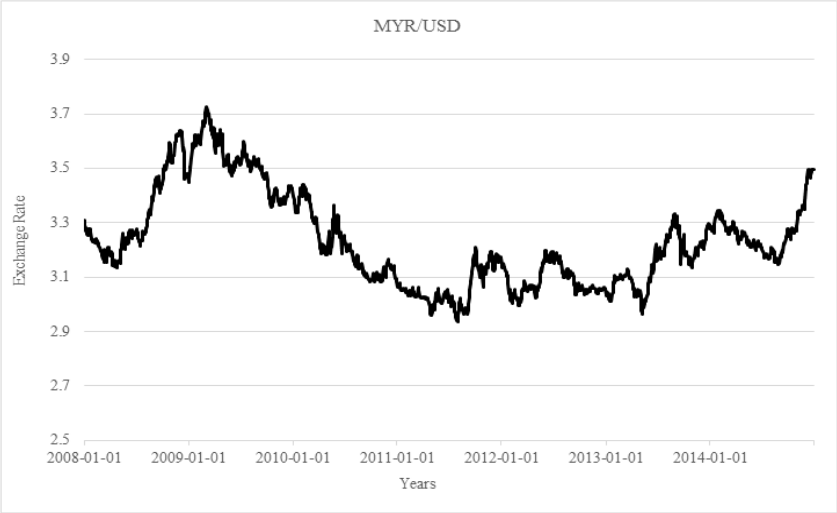

Fig. 1. FX rate between MYR and USD over the period of 2008 to 2014

(Source: https://www.imf.org/external/np/fin/data/param_rms_mth.aspx)

This issue warrants further investigation to examine the sensitivity of FX rate risk against FCDs use. Therefore, to achieve this objective we include a new variable 'FX rate risk' in logistic model to capture its effect on FCDs use. We run the regression model by taking the log of exchange rate returns between Malaysian Ringgit and USD. Results reveal the coefficient of FX risk is highly and statistically significant and negatively associated with hedging ($\beta 1 = -0.528$, p-value < 0.01). This rejects our conjecture that FX rate exposure and FCDs use are likely to be positively related with each other. Odds ratio indicates that one unit increase in $\beta 1$ decreases the likelihood of using FCDs by 0.528 times.

There can be several justifications of negative relationship between the use of FCDs and FX rate risk. Malaysian firms, for example, may employ non-derivative hedging techniques to avoid financial risk instead of using FCDs. Similarly, during the periods of uncertainty, firms sometimes prefer natural hedging techniques in order to manage their FX risk (Arterian, 1993; Chowdhry & Howe, 1999). Firms, for instance, may use foreign currency debt to mitigate their FX risk which acts as a natural hedge for foreign revenues and receipts (Judge, 2006). In relation to foreign currency debt, several studies (see Allayannis & Ofek, 2001; Elliott et al., 2003; Géczy et al., 1997; Graham & Rogers, 2002 among others) argue that the use of foreign currency debt is an adequate substitute of derivative financial instruments in hedging FX exposure.

5.2. Sensitivity of 'SIZE' in Logistic Regression Model

Correlation analysis did not find severe correlation between explanatory variables as the highest correlation is found 0.360, and the VIF value of all variables is also less than two which confirms the absence of multicollinearity issue. However, unlike other variables such as FSTS, the correlation coefficients between SIZE and other variables are highly significant at 1% significance level which signifies that SIZE may have considerable influence on the significance of other explanatory variables. Therefore, the sensitivity of SIZE in logistic model is tested by dropping it from the model and results are presented in Table 4. Results suggest that SIZE co-opts the explanatory power of the RMC, MTBV and LIQ as it has significant influence on the results of these three explanatory variables. For example, RMC which was previously insignificant, now become highly statistically significant at 1% level. Similarly, MTBV now become highly significant at 1% level which was previously insignificant. Likewise, INCOV which was previously significant at 10% level now become highly significant at 1% level. In a same way, LIQ now become statistically significant at 10% level which was previously insignificant. All these facts validate the effects of SIZE on other variables in logistic model as it significantly influences other explanatory variables.

Table 4. Results showing sensitivity of SIZE in logistic model

Predictor	Results after omitting SIZE from logistic model		Results after omitting RMC, MTBV and LIQ from logistic model	
	Coefficient Estimate	P-value	Coefficient Estimate	P-value
Constant	-1.597	0.000***	-8.374	0.000***
RMC	0.369	0.002***	---	---
CAPEX (%)	0.010	0.485	-0.002	0.870
MTBV	0.273	0.010***	---	---
INCOV	0.013	0.002***	0.008	0.065*
LVRG	5.744	0.000***	3.216	0.006***
SIZE	---	---	0.576	0.000***
FSTS (%)	0.014	0.000***	0.010	0.000***
LIQ	-0.081	0.090*	---	---

**** significant at 1% ** significant at 5% * significant at 10%*

Although results provide evidence that SIZE co-opts the explanatory power of the RMC, MTBV and LIQ, logistic model is again estimated by omitting RMC, MTBV and LIQ to examine the effect of their omission on SIZE. Results are presented in Table 4 in last two columns. It is evident from the table that the significance of SIZE does not change when RMC, MTBV and LIQ are omitted as it is still significant at 1% level. This shows that there is no impact on SIZE by the omission of these three explanatory variables.

6. CONCLUSION

This study is conducted to explore the factors that contributes in determining the use of hedging instruments by financial firms. Due to high volatilities in Malaysian FX rates, we are particularly interested in determining the use of FCDs, therefore several risk management theories are tested along with different hedging factors in relation to derivatives' use. In addition to that, we add new variable in a logistic regression model 'RMC' to capture the effects of hedging instruments which yet not done by any previous researcher. Results indicate the insignificant results for RMC and proxies for underinvestment theories, i.e., CAPEX and MTBV, implying that the likelihood of using FCDs is not explained by these variables. However, when the robustness analysis is performed by removing SIZE from our model, above three variables' coefficient become surprisingly significant.

Similarly, financial distress cost theory is tested by two variables; INCOV and LVRG and both are found to be significant, indicating that financial distress firms hedge their risk through FCDs. Size is also tested in logistic model and SIZE is found to be highly significant with a positive coefficient indicating that the level of FCDs usage by Malaysian firms increases with the increase in firm size; this result support our size conjecture which assumes a positive relationship between SIZE and FCDs. In the same way, the theory about firm's market openness is also tested through FSTS variable and it is found highly significant with positive coefficient representing that firms with high level of foreign trade are likely to face higher level of FX exposure; therefore, more induce to use hedging instruments. Finally, the extent to which liquidity works as a substitute of hedging for Malaysian firms is tested by using a proxy, i.e., current ratio (LIQ). Results show that the level of liquidity has no influence on the firm's decision to use derivative to hedge.

7. PRACTICAL IMPLICATIONS, LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The study has some significant practical implications for Malaysian nonfinancial firms, Bursa Malaysia Derivatives Berhad and Malaysian government. Firstly, Malaysian firms should use operational hedging techniques (like parallel loans or credit swaps) as well as implement effective internal control mechanism through audit committee or RMC to mitigate their FX rate risk if hedging through financial instruments is costly for them or hedging contracts in derivative market relatively expensive. On the other side, firms that have high foreign business operations are facing financial distress situation are highly encouraged to use currency derivatives to bring themselves out from insolvency risk. Similarly, firms with high leverage burden are also suggested to use derivative instruments in order to cover their debt risk.

Secondly, results have implication for Bursa Malaysia Derivatives Berhad regarding financial risk management policies for listed firms. Although current policies of Bursa Malaysia Derivatives Berhad safeguard Malaysian firms from financial risk. For example, in transactions particularly related to derivative financial instrument, Bursa Malaysia employ effective risk management process to prevent any adverse systemic impact on the market by changing initial margin requirements on hedging contracts and through the maintenance of clearing funds for counter parties of derivative transactions (Hui-Nee, 2014). However, results of this study have further implications for Bursa Malaysia Derivatives Berhad in offering new or improve existing derivative products to assist Malaysian firms in mitigating their FX exposure specially in a period of high fluctuations in FX rates.

Finally, the study findings have implications for Malaysian government as well to formulate risk management strategies at national level to safeguard domestic firms that involve in cross-border trade and small & medium enterprises from FX rate risk, so that the reduction in FX rate risk may significantly and favorably affect the GDP and national income of Malaysian economy. Moreover, Malaysian government may impose taxes on firm's income generated from hedging strategies as this policy will increase government revenues at national level.

Any study cannot be without limitations. As this study is limited to single Asian economy, therefore it is suggested for future researches to undertake the same investigation on multiple Asian economies to provide better insight about Asia as a whole. Furthermore, future studies should conduct the same study by covering latest time period specially for the Covid-19 period to address the current burning issue.

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