THE IMPACT OF FOREIGN EXCHANGE RATE HEDGING TOWARDS FIRM VALUE: CASE OF INDONESIA'S LISTED MANUFACTURING FIRMS

Erlin Anggreani Riadi* and Mandra Lazuardi Kitri
School of Business and Management, Institut Teknologi Bandung, Indonesia
Email: erlin.anggreani@sbm-itb.ac.id

Abstract. *This paper analyzes the use of financial derivative assets for foreign exchange rate hedging purpose and its effect on firm value using the data of Indonesia's manufacturing companies who do export sales and conduct foreign exchange rate hedging activities using derivatives. The period of research in this paper is 2009 until 2018, capturing the trend of strengthening and weakening of Rupiah against USD. This research used the percentage of foreign exchange rate hedging towards amount of foreign account receivable in the same currency as the independent variable and Tobin's Q ratio representing the firm value. This research used multi-linear regression and found that foreign exchange rate hedging activities with derivatives does not significantly affect the firm value in Indonesia's manufacturing companies.*

Keywords: Hedging; derivative use; firm value; Tobin's Q

INTRODUCTION

Based on data from Badan Pusat Statistik's (2019), until the beginning of 2019 Indonesia's export commodity is still dominated by non-oil and gas, contributing around 91% of Indonesia's total export. Manufacturing industry, which play major role in Indonesia's export, has three sub-sectors which are basic industry and chemical, various industry, and consumption goods industry. Based on data from Indonesia Stock Exchange, there are 64 basic industries and chemicals companies, 23 various industries companies, and 41 consumption goods companies.

Being a sector that dominates Indonesia's export made this industry is exposed to foreign exchange rate risk higher than companies in other industries. This is caused by the transactions with parties outside Indonesia from the export activities that are done with any currencies other than Rupiah especially the receivables, thus there are risk arising from the volatility of the foreign exchange rate. The movement of Rupiah compared to hard currencies such as USD in the last 10 years made a pattern that can be noticed visually. In the first five years, which is 2009 until 2013 we can see that the trend of Rupiah's movement towards USD was strengthening, but the next five years which is 2014 until 2018 the performance of Rupiah towards USD was weakening.

The volatility of exchange rate can be perceived as chance to gain more revenue if Rupiah's trend is strengthening towards other currencies, or can be perceived as risk if Rupiah's trend is weakening towards other currencies. In order to mitigate and minimize the risk of lost due to foreign exchange rate volatility some companies practice foreign exchange hedging. Despite the theory stating that only weakening trend of currencies that needs foreign exchange rate hedging policy, having financial hedging policy can help improving the firm performance and increase the value of the firm (Ahmed, Azevedo, & Guney, 2014). The terms of increasing the value of the firm is align with the purpose of every firms, which is increasing shareholders' wealth. In other research, a contradictory result was found saying that hedging can only reduce stock returns variance only at short horizon, the evidence from this research shows that in several years long, hedging does not only fail to reduce the stock return variance, it actually increases the variance, or in short words hedging is only effective for short term use (Froot K. A., 1993).

As stated before, financial hedge through derivatives is usually used by manufacture companies to manage the risk they are exposed to. Based on data from financial reports of manufacture companies, there are companies that practice financial hedge but also there are companies that don't do that. The question is whether the financial hedging has significant effect on companies performance that later reflect to shareholder's wealth or not. The result from this research may help investors whether they need to consider the financial hedging policy in a certain manufacturing companies in their investment decision and help manufacturing companies to decide whether they need to have a financial hedging policy or not in order to improve the firm value.

This research focuses on analyzing the relationship between foreign exchange rate hedging activities with firm value in the case of Indonesia's listed manufacturing firms in 2009 until 2018. The researcher test the research question using multi-linear regression and only focuses on firms that use derivative for foreign exchange rate hedging purpose in the period of examination. Therefore this research is limited to the population and methodology selected.

LITERATURE REVIEW

Exchange rate is the major uncertainty source for multinationals and exporter companies, it is four times more volatile compared to the interest rates and ten times more volatile compared to inflation (Jorion, 1990). Furthermore in that research he explains that exchange rate risk exposure represents the sensitivity of the firm value to exchange rate random movement, this means the bigger percentage of sales that a certain company do in currencies other than the currencies they use in their country, the more volatile that company's firm value. Based on IMF data per Q4 2018 US Dollar is the most used currency in the world compared to other currencies in the world, making USD become the hardest currency in the world due to its popularity. The term "hard currency" refers to currencies that are used by a nation that is economically and politically stable, this currencies are widely accepted among many countries as a form of payment and may be preferred over that nation's domestic currency (Chen, 2019).

A common definition of exchange rate risk is related to the effect of unexpected exchange rate movements on the firm value (Madura, 1989). It is important for firms to measure and manage their exchange rate risk exposure to reduce firm's vulnerabilities from major exchange rate movements, which can affect profit margins and value of assets severely (Papaioannou, 2006). Furthermore he explains that in order to manage the exchange rate risk, a firm must determine the specific type of current risk exposure, what hedging strategy that would be effective, and the available instrument that can be used by the firm to manage the risk.

Exchange rate risk management is a crucial part in every firm's decision about their foreign exchange rate exposure (Allayannis, Ihrig, & Weston, 2001). Since the managerial goal is to increase company value and avoid bankruptcy, they have to make strategy to mitigate and minimize the risk in some specific way and this is where derivative instruments play critical role as hedging instruments for greater development (Giraldo-Prieto, Uribe, Bermejo, & Herrera, 2017).

Large unpredictable changes in exchange rates, interest rate, and/or commodity prices might be the cause of firm's profitability and market value's volatility. The basic logic of risk management relies on the consideration whether a firm hedges or not. If it doesn't hedge then there are variability of cash flows generated by assets in place, which later makes variability in amount of money raised externally or variability in the amount of investment. Since the variability is undesirable due to probabilities of loss then some risk mitigation is needed in this case, that can be done through hedging (Froot, Scharfstein, & Stein, 1993).

Firm value is a financial matrix that reflects the market value of the firm after taking into account both shareholders and debtholders, it tells us how much a business or a firm worth (Fin Wiser Advisory). Tobin's Q ratio is a ratio that might serve as a proxy of the firm value in the eye of investors, to be specific this ratio is calculated by dividing the market value of assets of a company with its book value (Wolfe & Sauaia, The Tobin's Q as a Company Performance Indicator, 2003). Firms with Tobin's Q ratio larger than 1,00 have been found to be better in terms of investment opportunity (Lang, Stulz, & Walkling, 1989), have better potential in growth (Tobin & Brainard, 1968).Hatem, 2017 found that Firms that use derivatives for hedging purposes have larger Tobin's Q score, which is commonly measured as value creation for the firm. Furthermore, the research shows that relatively higher firm value is associated with foreign exchange rate hedging actions (Bessler, Huan, & Conlon, 2018)

METHODOLOGY

The methodology used in this research is multi-linear regression using panel data. Mandatory classical assumptions test is done before the data processing step to ensure the quality of data used in this research. Panel data analysis only require three classical assumptions test which are multicollinearity test, autocorrelation test, and heteroscedascity test *(Wooldridge, 2015)*. In order to determine the significance of influence of the independent variables towards the dependent variable, Wald Test will be conducted and follows conventional confidence level which is 95%.

This research uses multi-linear regression analysis because it is the most appropriate analysis technique that is fit with the data and can answer the research questions, thus will provide proper conclusions about this research. This sort of regression is utilized to model a relationship between the independent variables with the dependent variable. In this research the percentage of hedging towards the firm's amount of foreign account receivable in the same currency acts as the independent variable, along with 5 other control variables which are average firm size, average ROA, average debt to equity ratio, average investment growth, and average current ratio. All of those variables will be set as the independent variable to test the relationship of foreign exchange rate hedging towards firm value that will be represented by Tobin's Q ratio as the dependent variable. All of the data analysis will be conducted in SPSS software.

The formula of this research is
$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \beta_3 x_{i3} + \beta_p4 x_{i4} + \beta_p5 x_{i5} + \beta_p6 x_{i6} + \epsilon$$

Where yi is the dependent variable which is the Tobin's Q score for each company, xi is the independent variables which are the hedging percentage and the control variables, β0 is y-intercept, βp is slope coefficients for each independent variables, and ϵ is the error or residuals.

In this research, the independent variable is Hedge per Foreign Account Receivable and the data type is ratio. The Hedge per Foreign Account Receivable data is obtained by finding the amount of foreign currency hedge and the amount of foreign account receivable and then dividing the amount of hedge with the amount of foreign account receivable in the same currency. In case if the firms conduct foreign currency hedging for more than one currency then the percentage of hedge is calculated one by one per currency. In this research the control variables are firm size, profitability ratio (ROA), leverage ratio (debt to equity), investment growth, and liquidity (current ratio). Dependent variable is a variable in which this research is focusing on and needs some techniques to measure the changes. The dependent variable of this study is Tobin's Q ratio which represents the firm value. The value of Tobin's Q ratio is obtained by dividing the market value of equity and debts to the company's total assets representing the book value of the company.

Hypotheses is the supposition about the relationship between at least two variables which is stated in the form of declarative sentence or statement and links each variables with the others within the research (Kerlinger, 2006). Below is listed the hypotheses that researcher have set over this research.
H0: Foreign exchange rate hedging does not significantly affect the firm value
H1: Foreign exchange rate hedging affects the firm value

FINDINGS AND ARGUMENT

After conducting the classical assumptions test one of the control variable which is average current ratio that represents the liquidity of the firms has multicollinearity problem, therefore researcher decided to exclude that control variable in the data processing. After removing one variable the classical assumption tests are done without any problem.
Moving on to the multi-linear regression analysis we can see the result from the picture below.

Table 1. Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,338[a]	,115	,080	,96697	1,982

a. Predictors: (Constant), Hedge_Per_AR, Av_ROA, Av_DtoE, Av_InvGrowth, Av_Firm_Size
b. Dependent Variable: TobinsQ

From the result above we can see that the R Square is relatively small which is only 0.115 which means the model explains only 11.5% of the variability of the data around its mean. However this measure of goodness of fit have a fatal attraction, although it is generally discussed among practitioner that it does not mean a thing, high values are still a source of pride and satisfaction to the authors (Cramer, 1987). R Square itself is a mixture of three factors: the impact of the explanatory variable, the degree of variation in this variable, and, the size of the spread around the regression line, and because it is affected by so many factors, R2 is unable to reflect any of them accurately (Moksony, 2015), therefore it is too soon to draw conclusion of this research solely based on the R Square score.

Table 2. Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1,413	,351		4,029	,000		
	Av_Firm_Size	-,011	,012	-,131	-,921	,359	,337	2,967
	Av_ROA	-,006	,012	-,081	-,488	,626	,252	3,975
	Av_DtoE	,023	,013	,233	1,760	,081	,391	2,557
	Av_InvGrowth	-,049	,189	-,034	-,257	,798	,403	2,484
	Hedge_Per_AR	-,158	,253	-,054	-,626	,532	,937	1,068

a. Dependent Variable: TobinsQ

Based on the coefficient table above, Hedge_Per_AR's significance level is far above 0.05, which means that the variable does not significantly affect the dependent variable, which is Tobin's Q ratio.

CONCLUSIONS

Based on the quantitative analysis conducted and result interpreted by analyzing the statistical outcome in the previous chapter researcher concludes that foreign exchange rate hedging does not have significant effect on the manufacturing firm's value in the case of Indonesia's manufacturing firms in the period of both strengthening and weakening trend of Rupiah's value against USD as hard currency. Therefore it is unnecessary for investors to consider the manufacturing firm's foreign exchange rate hedging activity in making investment decision when they want to invest in Indonesia's manufacturing firms since the hedging activities does not significantly affect the value of the firm. The result of this research shows that manufacturing firms in Indonesia does not have to have foreign exchange rate hedging with derivative use.

This research uses listed manufacturing firms in Indonesia who do export sales due to the big currency risk exposure. However manufacturing is not the only sector in Indonesia who does export sales, therefore it is not the only sector in Indonesia that is exposed to currency risk. Researcher suggests that further research can take bigger number of data consisting all firms in Indonesia who do export sales to identify the impact of foreign exchange rate hedging with derivatives to the firm value in Indonesia so that the conclusion drawn from the research can be more general and have bigger scope compared to this research.

Furthermore, although this research analyzed the impact of foreign exchange rate hedging and captured the strengthening and weakening trend of Rupiah against USD representing hard currencies and acts as the most used currencies in the world, the panel data is being processed once, hence it does not differ the impact of hedging in two different trends. There is possibilities that the impact of foreign exchange rate hedging towards firm value could be more or less significant compared to what this research has accomplished if the data is processed two times, one for the strengthening trend and one for the weakening trend.

Researcher believes that there is always room for improvement, therefore researcher encourages further research regarding this topic, especially with different sample and methods to help both investors and companies to determine the importance of foreign exchange rate hedging activities in exporter firms.

REFERENCES

Ahmed, H., Azevedo, A., & Guney, Y. (2014). The Effect of Hedging on Firm Value and Performance: Evidence from the Nonfinancial UK Firms .

Allayanis, G., & Ofek, E. (2001). Exchange Rate Exposure, Hedging, and The Use of Foreign Currency Derivatives. *Journal of International Money Finance*.

Allayannis, G., Ihrig, J., & Weston, J. (2001). Exchange Rate Hedging: Financial vs. Operational Strategies. *American Economic Review Papers and Proceedings*.

Allen, L. S. (2003). *Financial Risk Management: A Practitioner's Guide to Managing Market and Credit Risk.* New Jersey.

Anderson, R., & Sundaresan, S. (2000). A Comparative Study of Structural Models of Corporate Bond Yields: An Exploratory Investigation. *Journal of Banking and Finance*.

Ayturk, Y., Gurbuz, A., & Yanik, S. (2016). Corporate Derivative Use and Firm Value: Evidence From Turkey. *Borsa Istanbul Review*.

Azevedo, A. (2014). The Effect of Hedging on Firm Value and Performance : Evidence from The Nonfinancial UK Firms. *Hull University Business School*.

Bartram, S., Brown, G., & Fehle, F. (2009). International Evidence on Financial Derivatives Usage. *Journal of Finance and Management*.

Bessler, W., Huan, X., & Conlon, T. (2018). Does Corporate Hedging Enhance Shareholder's Value? A Meta-Analysis. *SSRN Electronic Journal*.

Boubala, H. (2010). Risk Management of SMMEs. *Cape Peninsula University of Technology*.

Chernenko, S., & Faulkender, M. (2011). The Two Sides of Derivative Usage: Hedging and Speculating With Interest Rate Swaps. *Journal of Finance and Quantitative Analysis*.

Chowdhry, B., & Howe, J. (1999). Corporate Risk Management for Multinational Corporations: Financial and Operational Hedging Policies. *European Finance Review*.

Coppola, F. (2019). *Exchange Rate Effects of U.S. Dollar Dominance in International Trade*. Diambil kembali dari American Express Company (US): https://www.americanexpress.com/us/foreign-exchange/articles/dominance-of-us-dollar-in-international-trade/

Cramer, J. (1987). Mean and Variance of R2 In Small and Moderate Samples. *Journal of Econometrics*.

DeMarzo, P., & Duffie, D. (1991). Corporate Financial Hedging With Proprietary Information. *Journal of Economic Theory*.

Fetimi, A., & Luft, C. (2002). Corporate Risk Management Costs and Benefits. *Global Finance Journal*.

Fin Wiser Advisory. (2018). *Enterprise Value Analysis.*

Fok, R. C., Caroll, C., & Chou, M. C. (1997). Determinants of Corporate Hedging and Derivatives: A Revisit. *Journal of Economics and Business*.

Froot, K. A. (1993). Currency Hedging Over Long Horizon. *NBER Working Paper No. 4355*.

Froot, K., Scharfstein, D., & Stein, J. (1993). Risk Management: Coordinating Corporate Investment and Financing Policies. *The Journal of Finance*.

Gay, G., Lin, C., & Smith, S. (2011). Corporate Derivatives Use and Cost of Equity. *Journal of Banking and Finance*.

Gerstein Fisher. (2015). To Hedge or Not to Hedge: Currency Hedging and International Investing.

Giraldo-Prieto, C. A., Uribe, G. J., Bermejo, C. V., & Herrera, D. C. (2017). Financial Hedging With Derivatives and Its Impact on the Colombian Market Value For Listed Companies. *Contaduria y Administracion*.

Goosen, K., Jensen, R., & Wells, R. (1999). Purpose and learning benefits of business simulations: A design and development perspective. *Developments in Business Simulation & Experiential Learning*, 133-145.

Hakala, J., & Wystup, U. (2002). Foreign Exchange Risk: Models, Instruments, and Strategies. *London: Risk Publications*.

Jorion, P. (1990). The Exchange Rate Exposure of US Multinationals. *The Journal of Business*.

Kerlinger, F. N. (2006). *Foundations of Behavioral Research.*

Khediri, K. B. (2010). Do Investors Really Value Derivative Use? Empirical Evidence from France. *The Journal of Risk Finance*.

Kritzman, M. (1993). *The Optimal Currency Hedging Policy with Biased Forward Rates.* Journal of Portfolio Management.

Lam, J. (2003). *Enterprise Risk Management: From Incentives to Control.*

Lang, L. H., Stulz, R., & Walkling, R. (1989). Managerial Performance, Tobin's Q, and The Gains From Successful Tender Offers. *Journal of Financial Economics*.

Leland, H. E. (1998). *Agency Cost, Risk Management and Capital Structure.* Journal of Finance.

Mackay , P., & Moeller, S. (2007). The Value of Corporate Risk Management. *The Journal of Finance*.

Madura, J. (1989). *International Financial Management, 2nd.* Minessota: West Publishing.

Marrison, C. (2002). *The Fundamentals of Risk Measurement.* New York: McGraw Hill.

Meera, A. K. (2002). Hedging Foreign Exchange Risk with Forwards, Futures, Options, and the Gold Dinar: A Comparison Note. *International Islamic University Malaysia*.

Moksony, F. (2015). Small Is Beautiful. The Use And Interpreatation of R2 in Social Research. *Szociológiai Szemle, Special issue*.

Nguyen, H., & Faff, R. (2007). Are Financial Derivatives Really Value Enhancing? Australian Evidence. *Deakin University Working Paper*.

Papaioannou, M. (2006). Exchange Rate Risk Measurement and Management: Issues and Approaches For Firms. *International Monetary Fund*.

Phan, D., Nguyen , H., & Faff, R. (2014). Uncovering the Asymmetric Linkage Between Financial Derivative and Firm Value - The Case of Oil and Gas Exploration and Production Companies. *Energy Economics*.

PWC. (2017). *PSAK Pocket Guide 2017.*

Ridley, D. (2015). *The Literature Review.*

Smith, C., & Stulz, R. (1985). The Determinants of Firms' Hedging Policies. *The Journal of Financial and Quantitative Analysis*.

Thavikulwat, P. (2004). Determining The Value of a Firm. *Developments in Business Simulation and Experiential Learning Volume 31*.

Tobin, J., & Brainard, W. (1968). Pitfalls in Financial Model Building. *The American Economic Review*.

Wolfe, J., & Sauaia, A. C. (2003). The Tobin Q As A Company Performance Indicator. *Developments in Business Simulation and Experimental Learning*, Volume 30.

Wooldridge, J. M. (2012). *Introductory Econometrics: A Modern Approach 5th Edition.* Cengage Learning.

Zhang, M. (2013). Foreign Exchange Risk Hedging and Firm Value: Empirical Study from MNCs in China. *Tilburg School of Economics and Management*.