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ABSTRACT

The current study aims to investigate the factors affecting firm's decision to use foreign exchange derivatives. Sample of the study was taken from non-financial companies of Pakistan Stock Exchange, out of which 90 firms (which uses the Foreign exchange derivative (FX) were considered as sample for the study. The data was secondary in nature and was collected from annual reports of listed companies of Pakistan stock exchange, while the stock prices were collected from business recorder website. For the data analysis this study has used Logit model. The empirical outcomes shows that the financial distress costs have positive and significant effect on Foreign Exchange derivatives whereas Interest coverage ratio and size have significant effect on derivative. Assets growth over cash flow has insignificant effect of Foreign Exchange derivatives. Those firms who have higher foreign sale are more likely to use the instruments of Foreign Exchange derivative. The firms that are on larger magnitude restrict over financial distress are more likely to use Foreign Exchange. Future research could be focused on determining the factors influencing the usage of interest rate derivative instruments and extent of such derivative usage.

Keywords: Financial distress cost (FDC), Foreign exchange derivatives, Interest coverage ratio.

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I. INTRODUCTION

Derivatives contract can be defined as it is a contract or deal and agreement of two parties for an asset or underlying asset. It is a financial instruments and its price is determined not in cash but through some underlying assets such as currency, commodity, and stocks. Commonly, the underlying asset or derivative is supposed as the estimated or intended price of the goods. In the financial arena, this sort of business has been getting popularity with great speed and in the last three decades it has achieved leap and bound progression. Thus, derivative or derivative contract is considered as one of the most essential methodology of business and thus, its importance cannot be denied at any cost. Due to the acute popularity of derivative or derivative contracts in the modern trend of business, some of its fundamental types are exercised all across the world; such as the adoption of forward contracts, future contracts, option contracts and swaps are most popular and commonly adopted methods of trade which are commonly exercised at various Exchanges of the world.

According to (John, 2012) he stated that the term derivative has been introduced in 1988 and going through multi eras it has achieved high progression and thus, in short time span it prevailed over the market. The popularity of derivatives is very much evident from its numerous dimensions and types which are widely exercised in the market; such as trade in credit derivatives, interest rate derivative, foreign exchange derivative, and insurance derivatives. The series of derivatives did not stop here at this point but it constantly increasing its roots and too many other derivatives have been established with the passage of time. In recent time's interest rate, foreign exchange, and equity derivative products have engendered its roots in the modern trend of business. The term derivative has also co-operative to develop new ideas such the idea of risk management and risk measurement are out-comes of derivative business and transaction. Apart from this, Capital investment appraisal is also evolving itself with the derivative trend of business off and on; and this type of evaluation is called real option.

Nouman et al., (2017) However, in recent past credit crises began and thus the derivative term of business was targeted by the critics and it became an object of severe criticism due to its

risk associated factors and manners of business. Due to several financial risks the divergence in net income has increased as well as the firms' profitability has expanded because of penetration

into current market. Due to the instability in rates of Foreign Exchange (FX) the managers of multinational firms' are concentrating on significance of management techniques to decrease the risk factors associated with the invariance of cash flow due to foreign operations. The movements in Exchange rate at high level and unpredictability of foreign sales, the profitability of the firm's level have highly been effected. Because of such circumstances the Global operators are of the view that different contracts and agreement in association to the capital flow have indicated that derivative trends of business is highly effective to increase the exchange rate.

Afza and Alam (2011) In addition to this it's worth to mention here that most of the countries have been confronting exchange sudden change and thus facing floating exchange rates and variations; therefore, their cash flows are estimated from their international operation which are highly exposed to the exchange rate risk. Hence, the consequences enlighten the fact that different procedures and methods are adopted time to time to minimize the risk factors up-to possible extent for those firms who are highly disposed of to the exchange rate risks. Apart from this, Asian crises which are known as "Contagion crises" in (1998), has multiplied the Foreign exchange (FX) derivatives to the exchange rate risk of those countries which have multiple firms coping with various business including both multinational firms and Asian firms as well. The depreciation of political and economic environment increased the level of the risk, although factor of production with lower cost and new opportunities are provided for multinational companies. Pakistani stock market indicates the higher stock price from the past few years and the volatility's ratio are the sufficient indicators which are associated with instability of market. In the previous five decades the State Bank of Pakistan has reported a remarkable degree in import and export volume approaching to 61 and 36 percent respectively which is the indication of significant increase. The volume of foreign trade increase has shown the exposure faced by corporation due to fluctuation of exchange rate. The business regulation of financial derivatives have formulated exercise of the power and derived by State Bank of Pakistan (SBP); under the Foreign Exchange (FX) regulation Act (1947) and Banking company ordinance 1962 regulate and supervise financial institution entering into derivatives transaction. Managing foreign exchange risk is a fundamental component in the safe and sound management of all institutions

that have exposures in foreign currencies. Now a day's majority of the firms are facing this risk. Therefore, the awareness of corporation to use the derivatives have been increased in risk management in recent years to protect themselves against the risk. However, regardless of how

large a firm is, the possibility of facing financial distress always exists in unfavorable circumstances. As this issue is not well explored yet in developing and third world countries, especially, in Pakistan (Nouman et al. (2017)). The existing empirical evidence is mainly based on developed countries whereas a few empirical investigations had been undertaken in Asian countries to identify the factors effecting the firms hedging polices. Although researchers have tried to determine factors affecting exchange rate of Pakistani rupee, yet no study had explored the factors, both endogenous and exogenous, affecting the firm's decision to use FX derivative instruments for hedging firms' FX rate risk in Pakistan. Derivative plays an important role in different ways, in both hedging and speculations. The empirical results of the current study may provide policy guidelines to the firms having Foreign exchange transaction as the usage of Foreign exchange derivatives instrument may allow them to smooth their future cash flows by reducing behavior of managers and shareholders to minimize the agency cost of debt and equity. The importance of derivatives usage in a firm to hedging risk and its impact is considerable studied by examiner in the developed country. The study is conducted in Pakistan by determined the factors which influence the firms decisions to use foreign exchange derivatives as an instrument for hedging propose. This study may be helpful for practitioners, policy makers, and managers in finding out whether the factors influence the firm's decision. The current endeavor has the objectives of:

- To identify the factors affecting firms decision to use Foreign Exchange (FX) derivatives.
- To find out the relationship between the factors that affect the firm's decision to use Foreign Exchange (FX) derivatives.

II. LITERATURE REVIEW

2.1 Empirical Review

The Exchange rate risk is a source of risk which may have negative effect on profitability and the cash flow of firms. Exchange rate risk management has become a practice of firms. It is mostly

assumption that Shareholders are able to minimize the risks by creating an expanded portfolio. While on the other hand, given literature on risk management presents that with the help of derivative instruments corporation try to minimize firm risk exposure.

Stulz (1984) their study makes contribution in two directions. The first direction of this paper presents a model in which value maximizing firms pursue active hedging policies. Secondly the direction of this paper is optimal hedging policies for risk-averse agents. This paper consciously focuses the analysis on hedging foreign exchange (FX) derivatives through forward contract on foreign currencies. While empirical evidence presented by (Stulz1984) show that, under current condition of market, corporation that have operating attribute For example, tax convexity , growth opportunities , higher financial distress costs, managerial holding and liquidity constraints, for having a chance to improve enterprise value by techniques for hedging.

Bessembinder (1991) their study focuses on corporate risk hedging with forward contract and increase the value by falling the incentives to under invest. This is occur because of hedge can reductions the sensitivity of senior claim and value to incremental investments, and also allowed to Equity holders and to capture a superior portion of the incremental benefit from new investments. Through hedging firm also allowed to credibly commit to meet obligations in states where it otherwise could not, which also the contract term improve the firm negotiate with the creditors, manager and customers. The benefit of individual hedging cannot be duplicated and each result are hold independent of agents risk performance.

Mian (1996) their study provide the empirical evidence on the detriments of corporate hedging decision. The study showed that the indication of currently mandated requirement of financial reports and in specific the constraints placed on anticipatory hedging. In this paper the hedging data were acquired from annual reports 1992. As a hedgers classified out of the (771) firms, and (543) firms disclose information in their annual reports on the hedging activities; and the remaining (228) firms are reported to use of derivatives but there is no information related to hedging activities. Based on the indication they draw the following conclusion with respect the hedging model: evidence is inconsistent with the financial model of distress cost; mixed evidence with respect to capital market imperfection, contraction cost, and tax based model; and uniformly indication supports the hypothesis that hedging activities exhibition economies of scale.

Fok et al. (1997) the purpose of their study is hedging to reduce the earning volatility, the firm value increase through the corporate hedging. We found that hedging can reduce profitability of

financial distress, also can reduce the Agency cost of debt, and also can reduce the agency cost of equity. On the other hand, we found that there is no support for the hypothesis that hedging increases the value of the firm reducing expected tax liability. Now we suggest that the ownership structure of corporate may affect the desirability of hedging. This study analysis the role of the ownership structure in the relation between firm value hedging.

Marc et al. (2000) in their study the use of derivative of Risk management on the European continent is almost Non-existent. The usage of derivative of Non-Financial large firm investigates in Belgium. The descriptive indication of the study provide as respective several question that are raise in literature. Why firm do hedging? Which Financial risk is being managed? Which kinds of derivative are used for which kind of purpose? How the performance measurement and reporting does structured? large firms result shown that operating in Belgium are engaged in risk management as compared in USA firms in Europe focus more on the reduction in earnings volatility than cash flows volatility.

Allayannis and ofek (2001) their Study examined that whether the foreign currency derivatives use firm for hedging or for speculative purpose took a sample of (500) Non-financial firm for (1993), the indication shown that use of currency derivative a fir factors and also largely associated variables with theories of optimal hedging. They find the firm use d m use for hedging, as their use, of significantly to reduce the firm Exchange rate Exposure. They also find that, firm decision to use derivatives depends on exposure derivatives as a hedge as compare to speculate in foreign exchange market. The empirical result shown that firm is use currency derivatives and also foreign debt as a hedge.

2.2 Hypothesis of the study

H1: There is a significant effect of factors affecting the firm's decision to use foreign exchange derivatives.

H0: There is no significant effect of factors affecting the firm's decision to use foreign exchange derivatives.

H2: There is a positive effect of factors affecting the firm's decision to use foreign exchange derivatives.

H0: There is a negative effect of factors affecting the firm's decision to use foreign exchange derivatives.

III. METHODOLOGY

3.1. Population

The current study has treated the financial and non-financial firms which are listed in Pakistan Stock Exchange (PSX) as the population of the study for a period of 2009-2015. A list of firms is mentioned in Appendix 1.

3.2 Sample

The current study has taken only Non-Financial firms as the sample of the study. The sample is based on criteria i-e only those firms were considered which disclose the information which is related to the usage of derivatives and also make the information published on their own annual reports on their website. The study has also excluded those firms whose data was not available in sampling period. The final sample of the current study is 90 Non-financial firms which based on the criteria mentioned above for seven year with 630 observations.

3.3. Data Collection

Secondary data was collected from BSA and also from the annual reports of respective firms. The Stock price was taken from the website of Business recorder.

3.4. Variable of the Study

The current study took the following dependent and independent variable.

3.4.1. Dependent Variable

3.4.1.1 Foreign Exchange Derivative

Foreign exchange risk represent that the fair value of future cash flow of financial instruments can alter because of change in Foreign Exchange risk. Use of foreign exchange derivatives is taken as dependent variable. According to (Mian, 1996) stated that foreign Exchange derivative is measured through dummy variable. If any firm use foreign asset, income or sales that give a 1 value in dummy variable and if a firm does not use a derivative and for those variable dummy will be 0.

3.4.2. Independent variable

3.4.2.1 Financial distress cost (FDC)

Financial distress cost shows that risk management can reduce the costs of financial distress. According to (Lin et al. 2008) stated that the more debt a firm used to finance its operation the more it is at risk of experiencing financial distress there are various cost related with financial distress including bankruptcy cost and conflict of interest. Financial distress cost (FDC) is the ratio of Tangible asset over Total asset.

$$FDC = \frac{\text{Tangible assets}}{\text{Total assets}}$$

3.4.2.2. Interest Coverage Cost

Interest coverage ratio shows that the firm ability to covers its interest owed to the firms its Debts. According to (Afza and Talat 2011) interest coverage Cost is a ratio which is used to decide how simply a firm can pay their Interest expenses outstanding debt. The ratio is calculated by of Earnings before Interest expenses (EBIT) by Interest expresses.

$$INOCV = \frac{\text{Earning befor income tax}}{\text{Interest Expenses}}$$

3.4.2.3 Asset Growth over Cash Flow (AGCF)

According to Bartram et al., (2009) stated that Asset growth over cash flow is a ratio of additional of Tangible Asset and depreciation over the additional of Net income and depreciation. Assets Growth over cash flow representing that how the firm's ability to convert growth into assets.

$$AGCF = \frac{\text{Tangible Assets} + \text{depreciation}}{\text{Net income} + \text{depreciation}}$$

3.4.2.4 Taxes

If a firms pay taxes then take a value 1 for dummy variable and otherwise 0. (Howten, 1998) the profit of the firms increase the Tax also increases.

3.4.2.5 Foreign sales

Sale of the firms which is outside the country is considered foreign sale. Foreign sales are those income derived from sales of exported goods. According to (Haushalter, 2001) stated that Log of Foreign sales repressing foreign exchange (FX) derivatives.

$$LFS = \text{LN (Foreign sale)}$$

3.4.3 Control Variable:

3.4.3.1 Size:

According to Allayannis (2001) as compare to larger firms the smaller firms are less likely to hedge. The size of the firms is calculated by taking natural log of the total assets.

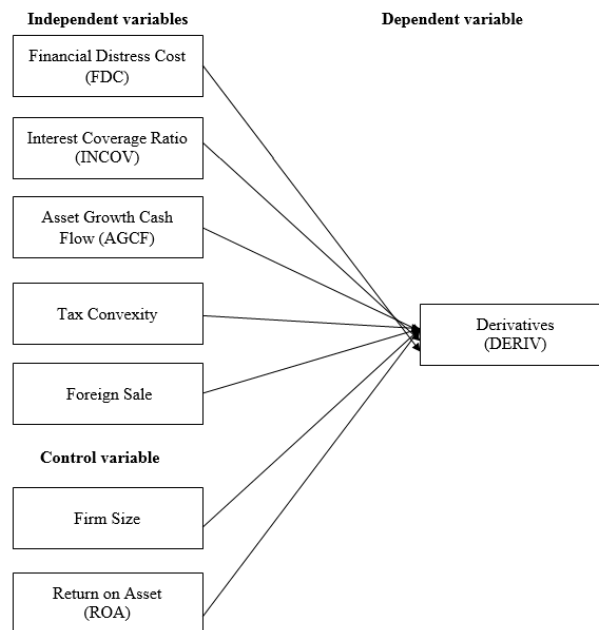
$$SIZE = \text{LN (Total assets)}$$

3.4.3.2 Return on Assets:

According Ameer (2001) stated that Return on assets is considered has profitability, return on assets is a financial ratio of net income divided by total Asset.

$$ROA = \frac{\text{Net income}}{\text{Total assets}}$$

3.5. Conceptual Framework



3.6 Econometric model:

Model

$$DERIV_{it} = \alpha + \beta_1 FDC_{it} + \beta_2 INCOV_{it} + \beta_3 SIZE_{it} + \beta_4 AGCF_{it} + \beta_5 ROA_{it} + \beta_6 TAX_{it} + \beta_7 LFS_{it} + e_{it}$$

Whereas:

DERIV= Foreign exchange derivatives

FDC= Financial distress cost

INCOV= Interest coverage ratio

SIZE= Firm size

AGCF= Asset growth cash flows

ROA= Return on asset

TAX= Tax convexity

LFS= Log of foreign sales

e= Error term.

IV. RESULTS AND DISCUSSION

4.1 Correlation matrix:

Correlation coefficient is presented in Table 4.1.1 firms operating characteristic are dividend in two groups. The result of correlation coefficient of Table 4.1.1 A show that Interest coverage ratio, Size, Asset Growth Cash Flow, and Foreign Sale have positive relationship with Financial Distress Cost, while Tax and Return on Asset have negative relationship whit Financial Distress Cost. Without all the asset and financing variables, make clear that Profitable firm are large in size, and have higher the Interest Coverage ratio, further ability to change its growth into asset in place

Table 4.1.1: Correlation Matrix

Variable	Financial Distress Cost (FDC)	Interest Coverage Ratio (INCOV)	Firm Size	Asset Growth Cash Flow(AGCF)	Return on Asset (ROA)	TAX Convexity	Log of Foreign Sales (LFS)
FDC	1.00						
INCOV	0.094	1.00					
SIZE	0.009	0.188	1.00				
AGCF	0.121	0.123	0.059	1.00			
ROA	-0.125	0.020	0.060	0.030	1.00		
TAX	-0.056	0.059	0.174	0.067	0.009	100	
LFS	0.003	0.184	0.492	0.049	0.048	0.275	1.00

4.2.1 Descriptive statistics

Table 4.2.1 Present the descriptive statistic of variable of the study in three table 4.2.1, 4.2.2 and 4.2.3 for the full sample, user and non-user respectively. Table 4.2.1 depicts statistic for a total sample of 90 firms and 630 observation.

Starting from dependable variable mean value of Foreign Exchange Derivative is 0.722 which is different from there median value is 1. The mean value of Financial Distress Costs is 0.397 in the whole sample. The Interest coverage ratio means value is 1.669. In a total sample the size value is 6.514. While Asset Growth Cash flows is 2.608. The mean value of Return of Asset is -0.033. The mean value of Taxes is 0.963 it mean the majority of the firms pay taxes. The mean value of log of foreign sales is 4.850.

Table 4.2.1: Descriptive statistic

Variable	N0	Mean	Std.dev	Median	Min	Max
Deriv	630	0.722	0.448	1.00	0.000	1.000
FDC	630	0.397	0.216	0.405	0.000	1.000
INCOV	630	1.669	2.474	1.240	-8.580	13.78
SIZE	630	6.514	0.674	6.520	2.921	8.321
AGCF	630	2.608	9.534	2.065	-34.09	218.3
ROA	630	-0.033	1.615	0.040	-39.09	0.811
TAX	630	0.963	0.187	1.000	0.000	1.000
LFS	630	4.850	2.397	5.740	0.000	7.831

4.4 Results of Logit Model.

Table 4.4.1 represents the results of logit model, the study has used a Binary dependent variable that is why the logit regression model was applied to find out the determinants of foreign exchange derivatives usage of non-financial firms. The results shows the LR statistic with the coefficient value of 331.6 and the p-value of 0.000 which is highly statistically significant, indicating that all the variable included in the logit model are important and significant determinants of Foreign exchange derivatives. The variable of financial distress costs has a positive coefficient value and statistically significant relationship at the level of 1% with the usage of foreign exchange derivatives. It indicates that if the firms increase their financial distress cost the log of logit of usage of foreign exchange derivatives will also increase. According to the theory of financial distress cost the firms which have a higher distress cost is more likely to exercise for hedging the foreign exchange derivatives. The variable of interest coverage ratio is positive coefficient value and statistically significant relationship at the level of 10% with the usage of Foreign exchange derivatives. The empirical result stated that a firm increase interest coverage than the firm also increases foreign exchange derivatives. According to the theory the firm have high capability of paying its cost of interest is more likely to exercise for hedging the foreign exchange derivatives. The empirical result suggests that the firm has more ability to cover interest on debt holder. The variable of size is positive coefficient value and statistically significant relationship at the level of 5% with the usage of Foreign exchange

derivatives. The empirical result indicates that a firm increase size than the firm also increases foreign exchange derivatives. The size has significant impact on foreign exchange derivative because large firm have more chances to hedge foreign exchange derivatives. The variable of Asset growth over cash flow and Profitability ratio is positive coefficient value and statistically insignificant relationship at the level of 5% with the usage of Foreign exchange derivatives. The result indicates that they are not consistent with the theory because it have no significant impact on firm value. The variable of Tax is positive coefficient value and statistically significant relationship at the level of 5% with the usage of Foreign exchange derivatives. The empirical result stated that a firm increase Tax than the firm also increases foreign exchange derivatives so tax increase the firm value so taxes are more likely to hedge foreign instrument. The variable of foreign sale is positive coefficient value and statistically significant relationship at the level of 1% with the usage of Foreign exchange derivatives. The empirical result stated that a firm increase foreign than the firm also increases foreign exchange derivatives so the firm have foreign sale are more likely to hedge foreign exchange derivatives.

Table4.4.1: Result of Logit Model.

	<i>Coefficient</i>	<i>Std. Error</i>	<i>z</i>	<i>p-value</i>	
Const	-7.827	1.538	-5.087	<0.000	***
FDC	2.843	0.595	4.776	<0.000	***
INCOV	0.111	0.062	1.797	0.072	*
SIZE	0.423	0.215	1.968	0.049	**
AGCF	-0.016	0.016	-0.984	0.324	
ROA	0.014	0.223	0.065	0.947	
TAX	1.798	0.771	2.330	0.019	**
LFS	0.704	0.066	10.584	<0.000	***
Mean dependent var		0.722	S.D. dependent var		0.448
McFadden R-squared		0.445	Adjusted R-squared		0.423
Log-likelihood		-206.41	Akaike criterion		428.83
Schwarz criterion		464.40	Hannan-Quinn		442.64
LR (statistic)		331.62			
LR (Prob statistic)		0.0000			

Note: Significant at: *10%, **5% and ***1%.

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

The current study examines the factors that effecting decisions of firms of Foreign exchange (FX) derivatives. For the current study selected a data as a sample of 90 Non-Financial firms' listed in Pakistan Stock Exchange (PSX) for time period of (2009-2015). The Data was collected from the firms' annual reports of the respective firms. The stock price is taken by form business recorder website. Foreign currency derivative is measured through dummy variable, if a firm use will value 1 otherwise 0. The firms who use Debt for management of their finance are more likely at risk of developing final distress which ultimately make them Unplayable to pay their Debt. The calculation of were Financial distress cost (FDC) is the ratio of tangible asset over total asset. The Interest coverage ratio (INCOV) is calculated by Earning before income Tax (EBIT) divide by Interest Expenses. Log of foreign sales represent foreign exchange (FX) derivatives. Assets growth over cash flows (AGCF) is a ratio of additional of tangible assets and depreciation over additional of net Income and depreciation and leverage is define to total debt to total assets. Other control variables are also defined separately. Descriptive statistic was used to identify the average and standard deviation of different variable. Correlation Matrix was used to identify the association of different variables. In order to identify influence of Foreign distress cost (FDC), Tax Convexity, Profitability and Foreign exchange (FX) derivatives by Firms for using Foreign Exchange derivatives instruments that are used for Hedging, Logit Model was applied, The overall result depicts that the financial distress cost, interest coverage ratio, Size, TAX, and foreign sale have significant and positive effect on foreign exchange derivatives while Asset Growth over cash flow and Return on assets have insignificant on foreign exchange derivatives.

5.2. Conclusion

The current study extends the existing literature by identified factors which effect the firm's decisions to use foreign exchange derivative as an instruments for hedging exchange rate exposure of 90 Non-financial firms which is listed in Pakistan stock exchange for a period of 2009-2015. The empirical result of the current study support the hedging theory by (Smith and Stulz 1985) that foreign exchange derivatives are used to enhance shareholder wealth by minimizing foreign exchange (FX) derivatives. The empirical result of the current study co-

efficient of financial distress cost, interest coverage ratio, size, profitability and foreign sales is positive is consistent in term of direction and condition with the risk management theory. Contrary to the financial distress theory, The Convexity of Tax is also measured through the losses of that tax and its result in a positive effect over the decision of the firm to use Foreign Exchange is consistent with the theory of management. This might be the result of improper measurement of the tax convexity and also the fact is involved that the management of risk passed over the benefit which is tax deductible measure of the losses of tax. The Growth shows a positive effect on the hedging policies of the firm and also has a significant effect on the derivatives of the firms to hedge the risk of Exchange rate. The empirical result also examines a relationship between corporate exchange derivative and that of the firm's Foreign Exchange (FX) disclosure. There is also a significant and positive relationship between the foreign sales of the firm and also its decision to use the Foreign Exchange derivative for Hedging.

5.3. Recommendation

- Financial distress cost has a significant and positive effect on Foreign exchange derivative so it is positively affected with more use of FDC by firm.
- Interest's coverage has a positives and significant affect on Foreign exchange derivatives so it is positively affected with more use of INCOV by firm.
- Size has a positives and significant affect on Foreign exchange derivatives so the firm should increase size and it is positively affect from Foreign exchange derivatives.
- Tax has a positives and highly significant affect on Foreign exchange derivatives so the firm should use Tax and it is positive effect on Foreign exchange derivatives.
- Foreign sales have a positives and significant affect on Foreign exchange derivatives so it is positively affected with more use of LFS by firm..

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