“Corporate hedging theories and usage of foreign currency loans: a logit model approach”

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ARTICLE INFO	Mahadevan Sriram and Srilakshminarayana Gali (2020). Corporate hedging theories and usage of foreign currency loans: a logit model approach. *Investment Management and Financial Innovations*, *17*(4), 367-377. doi:10.21511/imfi.17(4).2020.31
DOI	http://dx.doi.org/10.21511/imfi.17(4).2020.31
RELEASED ON	Friday, 18 December 2020
RECEIVED ON	Saturday, 03 October 2020
ACCEPTED ON	Monday, 07 December 2020

JOURNAL	"Investment Management and Financial Innovations"
ISSN PRINT	1810-4967
ISSN ONLINE	1812-9358
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
32	2	7

BUSINESS PERSPECTIVES

LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine

www.businessperspectives.org

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CORPORATE HEDGING THEORIES AND USAGE OF FOREIGN CURRENCY LOANS: A LOGIT MODEL APPROACH

Abstract

The present study has attempted to discuss the association between corporate hedging theories and the usage of foreign currency loans by companies listed in India. A total of 349 non-financial companies were selected, and the data for the financial year ending 31st March, 2018 were considered for the analysis. The descriptive statistics indicate that 55% of the sample companies had borrowed funds in foreign currency. The companies were highly levered and maintained adequate short-term assets to honor short-term obligations. A logit model was employed for analyzing the cross-sectional data. The dependent variable being binary ('0' for non-user of foreign currency loans and '1' for foreign currency loan user), the study found the variable 'industry type' to have a significant association with usage of foreign currency loans. Companies from the manufacturing sector were likely to use foreign currency loans than companies from the services sector. Debt to net worth, export to sales, revenue (log of revenue) were the variables that significantly influenced the likelihood of companies raising foreign currency loans. Interest coverage ratio had a negative influence on the likelihood of companies opting for foreign currency loans. Hosmer and Lemeshow test showed that the model is a good fit indicating 73% accuracy in predicting the users of foreign currency loans as 'foreign currency loan users'. Theories such as financial distress, size, and extent of international operations explain why companies raise foreign currency loans.

Keywords logit model, debt to net worth, export to sales, revenue, financial distress, size and international operations, interest coverage ratio, India

JEL Classification G32, G39, G30

Received on: 3rd of October, 2020
Accepted on: 7th of December, 2020
Published on: 18th of December, 2020

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Conflict of interest statement:
Author(s) reported no conflict of interest

INTRODUCTION

The foreign exchange rate exposure of non-financial companies has been extensively researched, and numerous studies have discussed how companies are sensitive to exchange rate volatility. The continuous movement in foreign exchange rates indicates that companies operating globally are exposed to exchange rate risk vagaries. Poor management of this exposure can affect the value of companies in the long run. Modigliani and Miller (1958) proved no relation between the value of a company and the financing decision due to the absence of imperfect market conditions (Velasco, 2014, p. 1). In the recent past, a slew of studies have indicated that hedging can increase the firm's value if imperfections are prevalent in the capital markets. For this purpose, theories have been developed on optimal hedging. These theories explain the reasons firms may be interested in hedging. The corporate hedging theories have addressed market imperfections such as financial distress cost, underinvestment problem, agency conflicts between managers and shareholders, etc.

Most of the studies on corporate hedging are based on the usage of derivatives to hedge exchange rate risks. Very few studies have focused on other types of operational and financial hedging to manage the risk. Recent

empirical studies have identified the usage of foreign currency debt as an important tool to hedge foreign exchange risk. Companies with export sales constituting a significant turnover portion are most likely to hedge foreign currency debt (Muff et al., 2008, p. 1). Borrowings denominated in foreign currency act as a natural hedge to a company's currency exposure in that currency. This is because companies with income in foreign currency can borrow in that currency to perform cash-flow matching and eliminate or reduce exchange rate risk (Vivel Búa, Otero González, & Fernandez Lopez, 2009, pp. 8-9). Besides, numerous empirical studies have reported using foreign currency debt as an operational hedge and suggest that the main reason for foreign currency borrowing is to manage exchange rate risk (Bradley et al., 2002). Therefore, any studies that ignore foreign currency borrowings may be overlooking important instruments to manage exchange rate risk.

The paper is organized as follows. Section 1 provides the theoretical framework. Section 2 contains the literature review of earlier studies and their key findings. Section 3 discusses the aims/objectives of the study. Section 4 describes the methodology and data set. Section 5 considers the results. Section 6 contains a full discussion of the results and compares the results with those in the literature. The last section concludes the paper.

1. THEORETICAL FRAMEWORK

The theoretical framework underpinning Forex hedging practices in the corporates is summarized further.

1.1. Financial distress

Smith et al. (1985) found that highly levered firms with cash-flow problems or nearing bankruptcy will hedge risk to mitigate financial distress and thereby increase shareholder value (Muff et al., 2008, pp. 7-8). Hedging risk can reduce the likelihood of a firm's financial distress cost by reducing cash flow volatility. The advantage one can get by reducing this cost from risk management depends on factors such as the likelihood of encountering distress and financial distress cost. The greater the possibility of distress, the greater the benefits of hedging risks. Subsequently, researchers have employed measures to proxy for financial distress, primarily based on the borrowing capacity of the firm or leverage. The findings from Froot et al. (1993) and Smith et al. (1985) provide support to theoretical arguments that the higher the probability of financial distress, the greater is the financial derivative use (Muff et al., 2008, p. 8).

1.2. Underinvestment

The underinvestment problem arises when a firm cannot make capital investments due to the high cost of external financing and lack of internally generated funds. Firms reduce their capex by roughly USD 0.35 for each dollar reduction in cash flows. Thus, a highly levered firm may be forced to take up sub-optimal investment strategies and forego profitable investment opportunities – the so-called underinvestment problem. Froot et al. (1993), Smith et al. (1985), Mayers et al. (1982), Bessembinder (1991) argue that through effective risk management, the issue of underinvestment is reduced (Charumathi & Kota, 2012, pp. 252-253). This happens when the management intends to maximize its wealth at the cost of bondholders and refuses to invest in low-risk projects. The conflict between equity and bondholders arises due to cash flow variation and the high cost of external financing – this can be resolved by hedging (Charumathi & Kota, 2012, pp. 252-253).

1.3. Hedging substitutes

Nance et al. (1993) and Froot et al. (1993) found that firms can mitigate the expected cost of financial distress and agency cost by maintaining a larger short-term liquidity position or by having a lower dividend pay-out (Muff et al., 2008, p. 9). Therefore, holding liquid assets will reduce financial distress. In general, holding high liquidity can be considered as a substitute for hedging activity. This is because the cost of holding liquid assets is lower than the cost of entering into financial hedging contracts.

1.4. Size and international operations

The relationship between firm size and the extent of using derivatives has been discussed in

http://dx.doi.org/10.21511/imfi.17(4).2020.31

the literature and empirically tested. Studies have found that smaller firms have reported larger use of derivatives than larger firms. Smaller firms are more likely to default due to their due to less diversified nature of their assets and restricted access to external sources of capital (Charumathi & Kota, 2012, p. 254). This observation indicates that smaller firms have a high demand for derivatives for hedging risks. Alternatively, size also reflects economies of scale, indicating a positive relationship between size and the likelihood of hedging (Charumathi & Kota, 2012, p. 254).

1.5. Managerial risk aversion

The studies done earlier found evidence that hedging increases with managerial shareholding and decreases with managerial option ownership. Graham and Rogers (2002) and Dunne et al. (2004) also find that hedging increases with managerial shareholdings only (Muff et al., 2008, p. 6). These findings conclude that managerial shareholdings and stock option plans are important determinants of hedging. Smith et al. (1985) argued that managers with more wealth invested in a firm will have greater incentives to hedge the firm's risk and that managers' compensation can influence their hedging choices. Haushalter (2000) and Jalilvand (1999) found no evidence that managerial risk aversion or shareholding affect corporate hedging (Charumathi & Kota, 2012, pp. 253-254). Ambiguity persists in analyzing the association between managerial holdings and hedging risks using derivatives.

1.6. Description of variables

2. LITERATURE REVIEW

To undertake the objectives of the study, the review of earlier studies that were associated with the topic under the study was carried out.

El-Masry et al. (2007) found that a firm's foreign operations affected the sensitivity to exchange rate exposure. Muff et al. (2007) identified variables such as low profitability and high growth opportunities as the most likely reasons companies choose currency derivatives to hedge risks. Vural-Yavas (2016) found variables such as firm size, foreign sales, profitability, and dividend yield, which increased the likelihood of hedging. Leverage, interest coverage had a negative impact on the likelihood of hedging. Similar findings were found in the studies by Afza and Alam (2011) and Velasco (2014). According to a study by Charumathi and Kota (2012), size was a major determinant of large Indian companies' derivative usage. Clark and Judge (2008) identified size, financial distress, and leverage as significant variables influencing companies to raise foreign currency loans.

Khan et al. (2017) provide evidence that companies with high financial distress cost, high export sales, and lower managerial holdings used derivatives to manage currency risk. Omar Bin Abdullah et al. (2017) reviewed earlier studies on the management of foreign exchange risk and found that international trade (exports and imports) results in a high level of foreign currency exposure in developed and developing economies. A survey of practicing managers was carried out by Mitra (2013). The findings indicate that corporates widely used the forward contract

Table 1. Variables for the study

Variable	Predicted sign as per theory	Symbol	Proxy for
Debt to total assets	+	DTA	Financial distress
Debt to net worth	+	DNW	Financial distress
Interest coverage ratio	–	ICR	Financial distress
Quick ratio	–	QR	Hedging substitutes
Log of revenue	+	lnR	Economies of scale
Promoters holding as a % of total holding	–	PH	Managerial risk aversion
Price to earnings ratio	–	PER	Underinvestment
Interaction between R&D and QR	–	RDQR	Underinvestment
Log of enterprise value	–	lnEV	Size
Export/total sales	+	EXS	International operations

to hedge foreign currency risk. Very few companies used other instruments like futures, options, and swaps. Pennings (2002) analyzed the factors affecting the behavior of initiating a position in the derivatives market. The study identified the manager's risk attitude, the manager's psychological reference price as the variables in initiating a futures contract. Naghai et al. (2018) compared the hedging strategies of selected US and Indian companies and found no significant (statistically) variables in explaining the decision to hedge exchange rate risk. According to them, the findings of the study did not support any theory behind hedging by companies.

2.1. Research gap

There have been several studies on managing currency risk both from a global and Indian perspective. Several studies in the global context have analyzed the determinants of hedging policies and identified variables significantly influencing hedging decisions. In the Indian context, Charumathi and Kota (2012) used multiple regression approaches to determine what factors influence the dependent variable, the dependent variable being the total value of derivative contracts used by the companies under study. However, not many studies have focused on hedging exchange rate risk using foreign currency loans/borrowings. Also, the 'industry effect' has not been captured while discussing risk management in previous research. The present study is an attempt to address the gap mentioned above. Developing a logit model will be imperative in explaining the relationship between corporate hedging theories and the usage of foreign currency loans.

3. AIMS

The paper aims to analyze the association between corporate hedging theories and the usage of foreign currency loans. Variables describing the theories are considered independent variables, and the dependent variable is a binary variable. Motivated by the change in the financial reporting requirements (IAS21) needing all companies in India to provide details on how exchange rate risk/exposure is managed, this paper has the following objectives:

1. To examine whether the users and non-users of foreign currency loans have different firm-level characteristics and interpret the results thereof.

2. To determine whether the corporate hedging theories satisfactorily explain companies' reasons for using foreign currency loans to hedge exchange rate risk.

4. METHODOLOGY

The data for the present study is from secondary sources. Major sources for the secondary data include annual reports of the companies and Capital Line database. Companies selected for the study belong to S&P CNX 500, which is India's first broad-based index. S&P CNX 500 represents 96% of the total market capitalization in India. A sample of 349 companies was finally considered for the analysis. The sample was arrived at after excluding banking companies and those companies for which complete data was not available. The study was conducted for the year ending 31st March, 2018 (FY 2017–2018). The number of year(s) for the present study is on similar lines as Linsley and Shrives (2006), Nguyen and Faff (2003), and Muff et al. (2008). It is to be mentioned that the number of samples considered for the present study is much higher than the samples of previous studies.

The paper includes descriptive statistics such as mean, standard deviation, skewness, and kurtosis to describe the variables used for building the model. To test the assumption of normality, Shapiro-Wilk test was employed. Based on this, a decision is made to either use the parametric test procedures or non-parametric procedures. If the normality is satisfied, t-test is employed. If not, the Mann-Whitney U test is used to test the significant difference between the companies that go for FCL and those that do not go for FCL.

The study employs logistic regression to model the probability of hedging decisions against non-hedging decisions (Pennings, 2002; Whidbee & Wohar, 1999). The dependent variable takes a binary response, wherein '1' is assigned to companies going for foreign currency loans, '0' for companies not going for foreign currency loans. The independ-

http://dx.doi.org/10.21511/imfi.17(4).2020.31

ent variables are debt/total assets, debt/net worth, promoters holding as % of total holdings, PE ratio, interest coverage ratio, quick ratio, R&D expenses to sales, ln (enterprise value), ln (revenue), exports to sales. Table 1 shows the theoretical relationship between the variables and the likelihood of raising foreign currency loans. The following is the logit model proposed in the study:

$$\ln\left(\frac{p}{1-p}\right)=\beta_0+\beta_1X_1+ \\ +\beta_2X_2+\beta_3X_3+\ldots+\beta_kX_k, \quad (1)$$

$\ln(p/(1-p))$ – log odds of companies using foreign currency loans against not using foreign currency loans and $X_1, X_2, X_3, \ldots, X_k$ are the independent variables used for the study. The probability of a company going for foreign currency loans (FCL) is modeled as follows:

$$p=\frac{1}{1+e^{-(\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\ldots+\beta_kX_k)}}.$$

The logistic regression estimates the parameters $\beta_1, \beta_2, \ldots, \beta_k$ in the model, such that the likelihood of the data used in the model is maximized. The parameters can be interpreted as the change in the log-odds associated with a one-unit change of the independent variable. β_1 is the change in the log-odds for a change in the category of the industry. To test the significance of the model, the study used the likelihood ratio test. Hosmer and Lemeshow test was employed for the analysis to test the goodness of fit of the logistic function. For testing the significance of the individual regression coefficients, Wald test was used.

The following equations will help interpret the coefficients when dummy variables for industry classification are introduced into the model with all the significant variables. The model X_1 corresponds to industry type and will be equal to 1 if the industry is manufacturing and 0 if the industry is services. X_2, X_3, X_4, X_5 denote the debt of net worth, interest coverage ratio, natural log of revenue, and export to sales. Equation (2) is for the services company, and equation (3) is for a manufacturing company:

$$\ln\left(\frac{p}{1-p}\right)=\beta_0+\beta_2X_2+\beta_3X_3+\ldots+\beta_kX_k, \quad (2)$$

$$\ln\left(\frac{p}{1-p}\right)=\beta_0+\beta_1X_1+ \\ +\beta_2X_2+\beta_3X_3+\ldots+\beta_k. \quad (3)$$

The difference between equations (2) and (3) is the coefficient β_1, which contributes to the odds of a company in the 'Manufacturing sector' opting for foreign currency loans. The model coefficients will be interpreted concerning services and manufacturing companies going for FCL or not.

5. RESULTS

Table 2 provides the descriptive statistics of the variables considered for the study and results of testing for normality. On average, 18% of the total assets are in the form of borrowings for the companies under study. Debt to net worth shows the proportion of borrowed funds

Table 2. Descriptive statistics

Source: Authors' results.

Variables	Mean	Std. deviation	Skewness	Kurtosis	Test for normality
Debt to total asset	.1795	.1650	.8369	.0700	0.0001
Debt to net worth	.8370	3.2224	14.4692	240.5993	0.0001
Interest coverage ratio	464.4948	3881.0818	16.0736	278.9548	0.0001
Quick ratio	1.4082	1.3994	4.4713	33.8351	0.0001
Natural log of revenue	24.5462	1.2984	.8247	1.2366	0.0001
Promoters holdings as % of total holdings	.5503	.1747	–.6813	.6660	0.0001
PE ratio	25.2548	193.4347	–5.9048	92.6104	0.0001
R&D expenses to sales	.0198	.2130	18.1263	334.6023	0.0001
Export to sales	.1491	.2322	2.3007	6.5781	0.0001
Natural log of EV	25.4564	1.2056	.4918	1.4241	0.0001
RDQR	.0303	.3220	18.0368	332.3876	0.0001

to shareholders funds, and the mean value of 0.83 indicates that the proportion of borrowed funds is high compared to shareholders funds. The interest coverage ratio (mean, 464 times) indicates that companies have adequate operating profits to honor all interest obligations. The companies' short-term solvency is more than adequate (the mean value of 1.40 > 1). The promoters of the company hold 55% of the holdings in all the companies. The results also indicate that around 15% of the total revenue is in the form of exports, and companies spend very little money on research and development. On average, 1.98% of the revenue is spent on research and development. The results using Shapiro-Wilk test indicate that the variables are not normally distributed.

Table 3 shows the univariate analysis results for foreign currency loan users and non-users of foreign currency loans as groups. As indicated by the *p*-values, except for variables "promoters holdings as % of total holdings", "PE ratio", and "RDQR", there exists a significant difference between the companies that choose FCL and those that do not choose FCL. The results indicate an association between the variables and the choice of foreign currency loans to hedge foreign exchange risks. This motivates in building a model to measure the level of influence that variables have on the chances of a company going for FCL.

Table 4. Number of companies with/without foreign currency loans

Source: Authors' classification.

Particulars	No. of companies
Companies with foreign currency loans	189
Companies without foreign currency loans	160
Total	349

Table 4 provides the number of companies with borrowings denominated in foreign currencies and the number of companies that do not have overseas borrowings. Figure 1, showing the classification of companies, is included in the Appendix. The table shows that 55% of the companies (189/349 = .55/55%) have raised money from overseas markets for meeting financing requirements. Around 45% of the companies have not raised any money from overseas markets.

Table 5. Classification of companies – industry type

Source: Authors' classification.

Particulars	No. of companies
Companies under 'Manufacturing sector'	262
Companies under 'Services sector'	87
Total	349

Table 5 provides the number of companies falling under 'Manufacturing' and 'Services'. The table shows that 55% of the companies (262/349 = .75/75%) belong to the manufacturing sector, and

Table 3. Results of univariate analysis (difference between means of users vs. non-users of foreign currency loans)

Source: Authors' analysis.

Variable	Mann-Whitney U	*p*-value	Significant
Debt to total asset	6735	2.10691E-19	Yes
Debt to net worth	6971	2.00364E-18	Yes
Interest coverage ratio	10784	2.48061E-06	Yes
Quick ratio	11775	0.000254163	Yes
Natural log of revenue	10602	9.44608E-07	Yes
Promoters holdings as % of total holdings	14510	0.449894386	No
PE ratio	12877	0.016169163	Yes
R&D expenses to sales	13936	0.151909153	No
Export to sales	12809	0.01012378	Yes
Natural log of EV	12523	0.005355783	Yes
RDQR	14474	0.404620357	No

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the rest belong to the 'Services' sector. Figure 2, showing the classification of companies as manufacturing and services, is included in the Appendix.

6. RESULTS OF THE LOGISTIC REGRESSION MODEL

The logistic regression model was built to identify the factors that are significantly influencing the likelihood of a company going for foreign currency loans (FCL). As proposed in equation (1), the response variable is the log odds of a company going for FCL, and the model is used to predict the chances of a company going for FCL, given the information on all the variables. Table 6 gives the results of the analysis. One can note that model 1 is with all the variables considered, and model 2 with those variables significantly influencing the likelihood of a company going for foreign currency loans.

The results in Table 6 indicate that the variables quick ratio, promoters holdings as % of total holdings, PE ratio, natural log of EV, RDQR (interaction between R&D expenses and quick ratio) are not significantly influencing the company's decision on choosing FCL. The rebuilt model, excluding variables that are not statistically significant, is shown in model 2.

The results in model 2 show a significant association between 'industry type' and usage of foreign currency loans. Manufacturing companies (companies in the 'Services' sector are considered a base category) are likely to raise foreign currency loans than the companies in the 'Services' sector. Based on the coefficient value, the chance of a manufacturing company raising foreign currency loans is 2.65 times higher than the companies in the other category. The paper finds that companies (manufacturing) with high borrowings (debt to net worth), export sales (export to sales), economies of scale (log of revenue) are likely to raise funds through foreign currency loans. The coefficient value of interest coverage ratio indicates that the likelihood of a company raising foreign currency loan decreases by (1-.99) 0.1%.

The paper looks at the accuracy of the model built, and Table 7 provides the details.

Table 7. Confusion matrix and statistics

Source: Authors' analysis.

Variables	Reference	
Prediction	X_0	X1
X_0	125	49
X_1	46	127
Accuracy: 0.7262		
95% CI: (0.6761, 0.7725)		
Sensitivity: 0.7310		
Specificity: 0.7216		

Table 6. Results of logistic regression

Source: Authors' analysis.

Model	Variables	B	*p*-value	EXP(B)	95% C.I. for EXP(B)	
					Lower	Upper
Model 1	Intercept	–7.8865	0.0072	0.0004	0.0000	0.1179
	Debt to net worth	1.1007	0.0000*	3.0063	1.7672	5.1142
	Interest coverage ratio	–0.0008	0.0793	0.9992	0.9983	1.0001
	Quick ratio	–0.0496	0.6433	0.9516	1.1640	2.2627
	Natural log of revenue	0.4842	0.0043*	1.6229	3.6405	46.8612
	Promoters holdings as % of total holdings	0.8743	0.2400*	2.3971	0.7713	1.1740
	PE ratio	–0.0014	0.3855	0.9986	0.9955	1.0017
	Export to sales	2.5697	0.0001*	13.0614	0.5576	10.3051
	Natural log of EV	–0.2321	0.1568	0.7929	0.5750	1.0933
	RDQR	–3.1322	0.2984	0.0436	0.0001	15.9872
	Industry type	1.0193	0.0011*	2.7711	1.5019	5.1128
Model 2	Intercept	–9.2388	0.0003	0.0001	0.0000	0.0149
	Industry type	0.9773	0.0012*	2.6571	1.4686	4.8077
	Debt to net worth	1.2227	0.0000*	3.3963	2.0143	5.7265
	Interest coverage ratio	–0.0008	0.0597*	0.9992	0.9985	1.0000
	Natural log of revenue	0.3132	0.0028*	1.3678	1.1136	1.6801
	Export to sales	2.1743	0.0003*	8.7964	2.7034	28.6218

Table 7 indicates that the model has the desired levels of accuracy. The overall accuracy of the model is 73%, which means 73% of the model's prediction is correct (either going for FCL or not going for FCL). Sensitivity of 73% shows that firms that raise foreign currency loans are correctly classified as users of foreign currency loans. Specificity of 72% shows that companies that do not raise foreign currency loans are classified as non-users of foreign currency loans. It is interesting to note that both the levels are above 70% and reflect the quality of the model in classifying the companies correctly.

From the likelihood ratio test (Chi-squared (5) = 97.3304 [0.0000]), the study infers that the model is significant. Also, Hosmer and Lemeshow goodness of fit (GOF) test (X-squared = 2.299, df = 8, p-value = 0.9704) indicates that the logistic model is a good fit for the data considered.

7. DISCUSSION

The study found that around 55% of the sample companies have raised foreign currency loans to hedge risks. As shown in Table 2, the descriptive statistics indicate that the sample companies were highly levered and maintained adequate liquidity to meet their short-term obligations. The companies also had adequate operating profits to honor all interest obligations, and a very small portion of the revenue was spent on research and development. The results of the univariate analysis indicate that values of 'users of foreign currency loans' for variables such as debt/net worth, log of revenue, export/total sales, interest coverage ratio, quick ratio, PE ratio were significant from 'non-users of foreign currency loans'.

The study found that companies in the 'manufacturing sector' were more likely to raise foreign currency loans than the companies in the 'Services sector'. Therefore, 'industry type' was significantly associated with the likelihood of companies raising loans in foreign currency. The variable debt to net worth was positively associated with the likelihood of companies borrowing in foreign currency. This indicates companies with high borrowings are likely to raise loans in foreign denominated currencies. The findings are consistent with the results of Keloharju and Niskanen (2001), Aabo (2006), and Clark and Judge (2008). Keloharju and Niskanen (2001) established the relationship between the debt level and the company's volume of foreign currency loan. The findings of Aabo (2006) indicate that if a company has a predisposition to use debt, it can be assumed to have a predisposition to use foreign debt. The findings also emphasize that companies with high borrowings locally raise foreign currency loans for refinancing their existing loans and take advantage of interest rate differentials between the local currency and foreign currency.

The variable lnR (natural log of revenue) was positively associated with the likelihood of companies raising foreign currency loans. Thus, economies of scale are a significant variable that determines the hedging activities. The results corroborate with the findings of Aabo (2006) that foreign currency loan raising can be an expensive hedging option for smaller companies. Companies with export sales (measured by export/sales) were also found to be significantly associated with the likelihood of raising foreign currency loans. The issue of foreign currency loans can act as a natural hedging instrument for companies with foreign income. In this case, the flow of liabilities meant for repayment of the principal and interest of the foreign currency loans would be compensated by income in that currency generated by foreign operations (Vivel Búa et al., 2009). Allayannis and Ofek (2001) found that companies with greater foreign currency exposure were most likely to use foreign debt. Interest coverage ratio was negatively associated with the likelihood of raising foreign currency loan/debt. It indicates that companies with high operating profits concerning the annual finance costs were less likely to raise foreign currency loans.

Based on the results, the study provides directions for future research, and they are as follows:

1. The present study has used debt/net worth as a proxy to financial distress to analyze its association with the likelihood of companies raising foreign currency loans. Additional variables such as credit rating, payback capacity, etc., and interaction between these variables will add new dimensions to the study.

http://dx.doi.org/10.21511/imfi.17(4).2020.31

2. Future studies can focus on tax aspects, especially with countries having a progressive tax system. Managing risks through foreign currency loans may reduce the expected tax payments.

3. Future studies can also classify the 'industry type' into specific sectors to explore the association with hedging foreign exchange risks for specialized sectors.

4. A longitudinal study in the form of panel data may be considered for future research to account for other control variables, which probably may explain the reasons for the usage of foreign currency loans.

CONCLUSION

The study concludes that theories such as financial distress, size, and extent of international operations explain the likelihood of companies raising foreign currency loans to hedge exchange rate risks. The present study's uniqueness is that it could establish an alternate technique for hedging risks apart from using financial derivatives in the Indian context. Foreign currency loans could be used as an alternative or in tandem with derivatives to hedge operational risks. Foreign currency loans help companies to refinance their loans borrowed in the local currency. This aspect connects well with the present scenario wherein most of the companies have borrowed in the local currency. FCL helps companies to repay their existing loans in the local currency and allows them the benefit of reduced interest on borrowings as the interest rates are much lower for the FCL when compared to the domestic borrowings. Companies with economies of scale and foreign currency exposure (export sales) may consider taking out foreign currency loans to hedge operational risks. The study has implications for the practitioners as they understand the variables which may encourage companies to raise foreign currency loans and the type of industries that borrowed/may borrow foreign currency loans from overseas markets.

AUTHOR CONTRIBUTIONS

Conceptualization: Mahadevan Sriram.
Data curation: Mahadevan Sriram.
Formal analysis: Srilakshminarayana Gali.
Funding acquisition: Srilakshminarayana Gali.
Investigation: Mahadevan Sriram.
Methodology: Srilakshminarayana Gali.
Project administration: Mahadevan Sriram.
Software: Srilakshminarayana Gali.
Supervision: Srilakshminarayana Gali.
Validation: Mahadevan Sriram.
Writing – original draft: Mahadevan Sriram.
Writing – review & editing: Mahadevan Sriram.

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APPENDIX

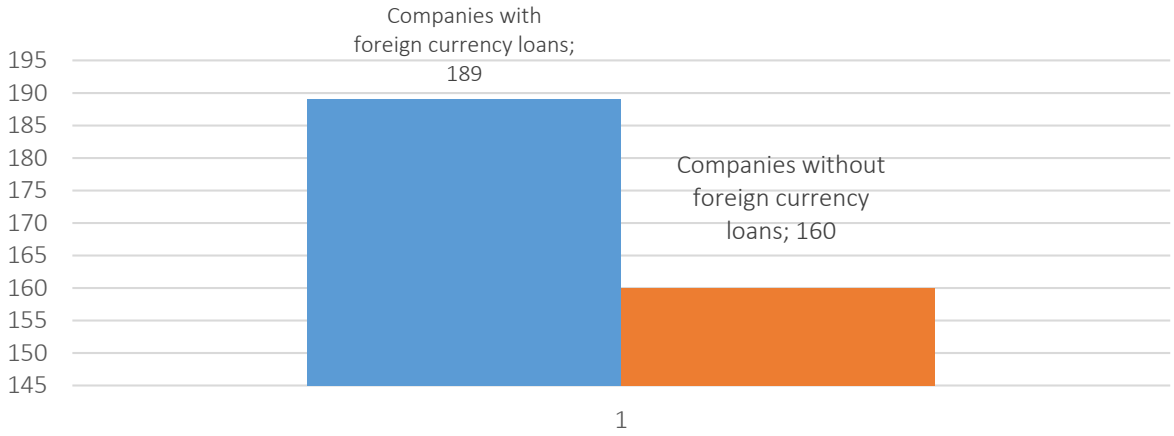

Figure 1. No. of companies with/without foreign currency loans

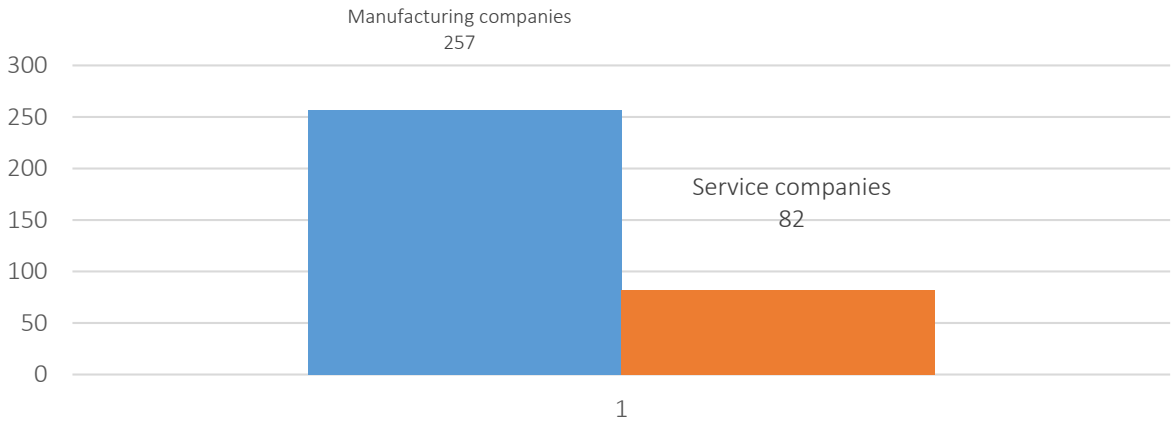

Figure 2. Classification of companies - industry type