Journal of
Business & Financial Affairs

Raghavendra and Velmurugan, J Bus Fin Aff 2014, 3:3
DOI: 10.4172/2167-0234.1000125

Research Article Open Access

The Determinants of Currency Hedging in Indian IT Firms‘

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Abstract

This paper explores the factors which determine the usage of currency derivatives by Indian IT companies. It has taken a total of 18 large IT firms in India. Those have disclosed the currency derivative data in their financial reports from 2011 to 2013; this study uses cross-sectional panel data and applies a multiple regression model. For this reason, the firm-specific features such as financial distress cost, underinvestment cost, multinationality, firm size, Taxation and Liquidity are regressed against the notional amount of currency derivatives reported for hedging activities. Finally result found that Size (Total assets) and Underinvestment (PE ratio) is the major determinant factors of the currency derivative usage in large Indian IT firms.

Keywords: Hedging; Financial distress; Under investment; Derivatives; Size; Multinationality

Introduction

IT firms in India use to involve in hedging activity to protect themselves against of exposures like volatility in interest rates, commodity prices and foreign exchange rates. In order to overcome this exposure some instruments used for hedging are financial derivatives. The costs of financial distress, underinvestment, and taxes are some of the reasons put forward to explain the widespread use of hedging activities [1].

To minimize foreign exchange risk, firms can involve in either currency hedging or operational hedging or both to reduce their exchange rate exposure. According to corporate risk management, by lowering the volatility of cash flows, the cost of firms' financial distress can be reduced and firm's value can be increased. In the perspective of managers' reputations, managers can prefer to conduct risk management activities to express their strategies. All these arguments prove the theory of Modigliani and Miller with regard to the worthlessness of firm value and risk management activities. Financial derivatives instruments to hedge against exchange rate risk would support firms to mitigate their risk and also benefitted by a reduction in a firm's exposure to financial risk and market imperfections, leading to value creation for shareholders. However, derivatives are risky instruments that might bring huge losses to a firm. Several previous studies have attempted to find if firms behave according to the principles established in the theories of optimal hedging. One of the main difficulties has been obtaining the necessary information. Prior 1990's, hedging information was considered to be an important element of the firm's competitive strategy, and, thus, it was considered confidential. The increasing demands on firms for expose of information, partly due to changes in accounting and business regulations made it possible in developed countries for this type of information to become a part of the financial reports of large firms.

Recent, and ongoing, huge losses on derivatives transactions announced by Indian IT firms. Feeling the heat of the global economic recession, Apart from that, derivative contracts backfiring during the past year was one of the main reasons. Therefore, the ensuing fears for systemic risk highlight the need for focused research on firms risk management activity and derivative practices.

Literature Review

Katie Hundman analyzed of the determinants of financial derivative usage in Commercial banks, the sample of the study was banks with assets over $500 million. By using regression model estimates the determinants of derivative use by commercial banks based on pooled time series, cross sectional quarterly data for 38 banks for the period 1995 to 1997. The result found that larger banks tend to use derivatives to a greater extent than smaller banks and those banks with a greater proportion of credit risk are more likely to use derivatives. Interest rate exposure, Capitalization, Credit risk, Profitability, Bank size among these variables, it is found that no relationship between bank profitability and derivative use.

Niclas Hagelin examined on the determinants factors of Swedish firms' hedging decisions. The study used data on firm characteristics include accounting data, stock price data and data on ownership structure from companies' annual reports of 1997-98. By using Logit regression tests he found that firms hedge transaction exposure with currency derivatives to increase firm value by reducing indirect costs of financial distress or alleviating the underinvestment problem.

Talat Afza and Atia Alam [2] aimed to determine the factors affecting firms hedging policies of both foreign currency and interest rate derivative instruments of 105 non-financial firms listed on Karachi Stock Exchange for the period of 2004-2008. By using Logit regression model on firm's decision to use hedging instruments. The result found the negative effect of financial distress, taxes, underinvestment and managerial risk aversion. Though, inconsistent with the theory, interest coverage ratio demonstrated positive effect on firms hedging policies.

Charumathi [3] explored the factors which determine the usage of derivatives by large Indian non-financial companies. By taking 49 companies in 2007, 68 companies in 2008, 56 companies in 2009, the derivative data in their annual reports, used cross sectional panel data for three years from 2007 to 2009 and applied a multiple regression

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Received September 24, 2014; **Accepted** November 11, 2014; **Published** November 30, 2014

Citation: Raghavendra RH, Velmurugan PS (2014) The Determinants of Currency Hedging in Indian IT Firms`. J Bus Fin Aff 3: 125. doi:10.4172/2167-0234.1000125

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model. Those variables are financial distress cost, underinvestment cost, multinationality, economies of scale, firm size and agency variables are regressed against reported notional amount of derivatives. Finally found that size is the major determinant of the derivative usage by large Indian non-financial companies.

Naveed et al. examined the determinants the factors affecting the firm's decision on derivative usage in risk management practices by using the 75 Pakistani non-financial firms listed in Karachi Stock Exchange for the period of 2007 to 2011. By using regression model, they pooled variables like derivative usage as dependent variable and dividend per share, quick ratio, debt, Price to earnings ratio, Ratio of market to book value of equity, foreign purchase, EBDIT, depreciation and tax, market value of firm, size as independent variable. Finally result found that that there is a strong relationship between the derivatives usage and firm's foreign purchase, growth options, liquidity and size.

Research gap

Above mentioned detailed reviews are concentrating about determinants of currency hedging in corporate firms in developed countries, not many studies have been attempted on the determinants of derivative usage in IT firms and Studies about Indian IT firms are nil. Though Charumathi [3] studied the determinants of derivative usage by large Indian non-financial Firms, failed to concentrate on export oriented IT firms. However, there are no studies on the determinants of derivative usage in IT firms in India. So the present study intends to fill this gap.

Objectives of the study

This research initiates to model the factors which determine the usage of currency derivatives by major IT firms in India.

Research Methodology

Data

The data has been collected from firms annual reports, which are available on the NSE website or concerned IT firms' websites. In India there is no regulation to disclose the derivative aspects by any companies, so there are not many IT firms which have disclosed the details of derivative usage in their annual reports. To understand the extent of derivatives used by the firms, they need to use any one of the derivative instruments like forward, option, future, and currency swaps, and the notional values have to be disclosed.

Sample

The sample is arranged by studying the annual reports of 18 large IT firms which are highly involved in currency hedging activity. (Highly involved, Moderately involved and Not involved IT firms are categorized in the level of currency hedging activity during survey to collect a research data from primary sources, Out of the 103 firms that responded to the survey, 54 respondent state that they use derivatives moderately involved and 24 firms represented as highly involved in currency hedging activity) Those selected IT firms are listed in the National Stock Exchange (NSE), data has been collected for the financial years of 2011 to 2013. The rationale behind selecting the highly involved IT firms are, Smith and Stulz [1] argue that when the ownership structure is more concentrated, the motivation to hedge increases as the owners are less likely to hold well-diversified portfolios. Since the manager of the firm often handles the hedging activity, his/her risk aversion can be an important factor for managing risk. In order to capture this relationship, this study will focus on highly involved firms. Out of 24 IT firms highly involved in hedging activity, only 18 firms' met our criteria of data on derivatives and other variables are taken in to consideration.

Dependent variables

Notional value of currency derivative: Nominal or notional amounts outstanding are known as the gross nominal or notional value of all deals concluded and not yet settled on the reporting date. For contracts with variable nominal or notional principal amounts, the basis for reporting is the nominal or notional principal amounts at the time of reporting.

The dependent variable is the extent of derivative as in the study by Allayannis and Ofek [4], hence the total notional value of currency derivatives like Forward, option, Future and swaps are used by IT firms in India.

There are many reasons to why we use notional amount as a measure of derivative usage. The group of Thirty states that "Activity in OTC derivatives can be measured in two ways: by the notional principal contracts, either the amount outstanding at a particular period (e.g., annually or quarterly), and by the number of transactions. These measures provide a rough, but nevertheless useful, measure of the level of activity in derivatives, both in the aggregate and at the individual firm level", only the notional principal amounts outstanding at end of the year are publicly available for Indian IT firms.

Independent variables

The proxies discussed above in Table 1, constitutes independent variables of the present study.

Financial distress costs

Risk management can minimize the costs associated with financial

Author	Variables affecting the decision to hedge with derivatives
Stephen R. Goldberg et al.	Taxes Investment opportunities Size Multinationality
Mian	Taxation Size
Geczy et al.	Size Degree of exposure
Allayannis Ofek	Size R&D expences Degree of exposure
Hagelin	Underinvestment
Luis A. Otero González	Liquidity Earnings per share Size (log value)
Epharaim Clark and Amrit judge	Financial distress Underinvestment Tax
Andrew Marshall et al.	Financial distress Size Underinvestment Tax Multinationality Liquidity
B. Charumathi and Hima Bindu Kota	Financial distress Underinvestment Multinationality Size

Table 1a: Some of the studies based on the variables affecting the decision to hedge with derivatives.

Si no	Factors		Proxy variables
1	**Financial Distress**	DRatio (Debt ratio)	Total debt divided by the book value of assets
		DER (Debt-equity ratio)	Ratio of long-term debt to shareholders' equity
2	**Under Investment/ Investment opportunities**	PE (Price-Earnings Ratio)	Ratio of Price per share to the annual earnings per share
		RDEXP(R&D Expenses/sales)	Ratio of R& D expenses to total sales
		EPS (Earning per share)	The portion of a company's profit allocated to each outstanding share of common stock
3	**Multinationality**	FE (Foreign exchange sales/ total sales)	Ratio of foreign exchange sales to total sales
4	**Size**	REV (Revenue)	Natural logarithm of the total revenue
		TotAsset (Total Asset)	Natural logarithm of the total assets
5	**Taxation**	Taxes	Total tax paid
6	**Liquidity**	Current ratio	Current Asset divided by Current liability

Table 1b: variables considered for the present study.

distress. By minimizing the chance of financial distress, an optimal debt-ratio can be easily obtained. Many previous studies like, Nance et al. [5]; Akshay madhava [6]; Geczy et al. [7]; and Briggs [8] looked on whether economic theories for optimal hedging can determine derivatives usage by firms. Two of these studies found a positive relation between hedging and leverage while the remaining two failed to find connection. Mayers and Smith argue that hedging activity can reduce the probability of the firm encounters in financial distress by minimizing the variance of firm value, and also reduces the expected costs of financial distress [9]. The enormity of this cost reduction is a positive function of probability that a firm can encounter financial distress if it does not hedge and the costs the firm incurs if it does not encounter financial distress. Nance et al. [5] recognized the hypothesis that the likelihood of bankruptcy increases along with leverage (book value of Debt divided by book value of Capital). To proxy for financial distress costs, we used two variables those are Debt Ratio (DRATIO) and Debt–Equity Ratio (DER). Debt Ratio is defined as total debt divided by the book value of assets. Debt–Equity Ratio is a measure of a firms' financial leverage calculated by dividing the total liabilities by stockholders' equity.

Underinvestment costs/investment opportunities

A company with high growth opportunities suffers from a larger underinvestment and is more prone to use derivatives to hedge. Myers characterizes firm's prospective investment opportunities as options and with fixed claims in the capital structure, taking a Net Present Value (NPV) project in certain states reduces shareholders' wealth. Accordingly shareholders have incentive to forego some positive NPV projects. Hedging can help to control by restricting the states in which the firm would default on bond payment. Hence, companies with more growth options in their investment opportunity set to undertake a hedging program aimed at minimizing variance in value. Adverse FX movements can reduce firms' ability to undertake positive net present value investments. The possibility of having to forego positive net present value investments is referred to as underinvestment. Since hedging can reduce the probability of adverse FX movements it can add value. Following Allayannis and Ofek [4] it is argued that a firm with more growth opportunities would face higher underinvestment costs and have a greater incentive to hedge.

We used three measures to underinvestment/investment opportunities. To proxy for the three variables: PE Ratio (PE) is the first measure, second measure is the R&D Expenses/Sales (RDEXP) and Earning Per Share (EPS) is the third measure.

Multinationality

Present study samples are exposed to foreign exchange risk. However, it could be argued that companies with higher levels of multinational operation have greater foreign exchange risk exposure and thus receive more benefits from hedging. Goldberg et al. and others found that foreign sales in explaining the foreign exchange derivative usage. Allayannis and Ofek [4], used the ratio of foreign sales to total sales as a measure of Multinationality.

For multinationality, we used a proxy as: Foreign Sales divided by Total Sales (FE). We predict a positive relationship between multinationality and derivative usage.

Size

To proxy for size, we use two variables: Revenue (natural logarithm of the total revenue) (REV) and Size (SIZE) that is measured by the value of total asset (natural logarithm of the total asset). There are several reasons how the size of the firm can affect the incentive to hedge. Financial distress can lead to situations where the firm faces direct legal cost. For smaller firms, this cost might be a higher portion of the market value of the firm which implies that these firms are more likely to hedge. Additionally, small firms are likely to have fewer natural hedging alternatives. These firms might have a smaller product range, thereby making them more exposed to volatility in demand. This is an additional argument as to why one can expect that smaller firms in fact should use more derivatives than larger firms. However, several studies argue that large firms are more likely to have the resources to warrant the use of derivatives compared to smaller firms [10]. This is based on an economy of scale argument, meaning that larger firms are more likely to employ managers with the specialized information to set up a derivatives program. Moreover, large firms often have more developed risk management systems than smaller firms. Finally, the market for trading derivatives includes a portion of transaction cost. By once again looking at economies of scale, it can be argued that this cost is easier to bear for larger firms [11].

Taxation

Smith and Stulz [1] showed that hedging could reduce expected tax payments when firms were subject to a progressive tax system. Therefore, a greater convexity in the tax function should lead to a greater likelihood of hedging.

Liquidity

If small firms are financially constrained they can reduce the probability of default by carrying more liquid assets. It has been

suggested that there would be less hedging if Firms can also reduce the probability of default by investing in more liquid assets; therefore, we construct a currency ratio. Also more liquid firms have greater flexibility in meeting cash flow needs and thus they have less need to use FX hedging instruments. To proxy for economies of liquidity, we use one variable: current ratio i.e., Current asset is divided by the Current liability.

Model used

The linear multiple regression models developed for estimate the factors which determine the derivative usage by selected IT firms in India:

To explore the determinants factors' influence on currency derivative usage and the significance of that influence, we have used a multiple linear regression model. In this model dependent variable takes the notional value of firms which use derivatives. Independent variable takes the value for firms which used as factors. In order to find an analysis of identifiable factors considerably affecting the motivation of companies to use currency derivatives, we constructed a multiple linear regression model describing this relationship. The decision to use logistic regression as a probability model is determined by the type of the dependent variable. In this study, we use multi logistic regression including the use of derivatives as a dependent variable and certain factors as an independent variable. The first step was to identify the main components which may have a significant impact on the usage of currency derivatives. It has been determined on the basis of risk management theory and previous studies. In order to verify the hypotheses, we find that the use of currency derivatives may be related to the financial distress, underinvestment costs/investment opportunities, multinationality, company's size, taxation and liquidity. In this way we can formulate the first theoretical model describing the problem:

$$TOTDER = \beta_0 + \beta_1 DRATIO + \beta_2 DER + \beta_3 PE + \beta_4 \text{RDEXP} + \beta_5 EPS + \beta_6 FE + \beta_7 REV + \beta_8$$

$$TOASSET + \beta_9 TAXATION + \beta_{10} CURR + \varepsilon_i$$

Where TOTDER refers to notional amount of total derivatives of a firm, DRATIO refers to Debt ratio of a firm, DER refers to Debt Equity Ratio of a firm, PE refers to Profit earnings ratio of a firm, RDEXP refers to ratio of Research and Development Expenditure to total sales, EPS refers to Earning Per Share of a firm, FE refers to ratio of foreign exchange sales to total sales, REV refers to Natural logarithm of the total revenue, TOASSET refers to Natural logarithm of the total assets, TAXATION refers to Total tax paid and CURR refers to Current Asset divided by Current liability. The multiple logistic regression models that we estimate for the period of 2011 to 2013 [12]. By using this equation and the multiple logistic regression procedure, we try to answer the question about the influence of various factors known from theory and other empirical studies.

Hypotheses

To achieve the objectives, the study tested the following null hypotheses:

$\mathbf{H_0}$**:** There is no relationship between Currency derivative usage and

$\mathbf{H_{01a}}$: Debt Ratio as a proxy for financial distress,

$\mathbf{H_{01b}}$: Debt equity ratio as a proxy for financial distress,

$\mathbf{H_{01c}}$: PE ratio as a proxy for under-investment,

$\mathbf{H_{01d}}$: R & D Expenses/sales as a proxy for under-investment,

$\mathbf{H_{01e}}$: EPS as a proxy for under-investment,

$\mathbf{H_{01f}}$: Revenue as a proxy for size,

$\mathbf{H_{01g}}$: Total asset as a proxy for size,

$\mathbf{H_{01h}}$: Foreign sales/total sales as a proxy for multinationality,

$\mathbf{H_{01i}}$ **:** Tax paid as a proxy for Taxation,

$\mathbf{H_{01j}}$: Current ratio as a proxy for Liquidity.

Research Methodology and Data

As mentioned, no study has been taken on the determinants factors of currency derivative usage by IT firms in India. The methodology used for this study is empirical in nature unlike other previous studies on derivative usage. Though, the tools used are similar to that of majority of the financial empirical studies, specifically, multiple linear regression models [13]. Regarding the data, this study used the notional value of currency derivatives as a dependent variable and certain factors as independent variable which is disclosed in the annual reports of the particular IT firms in India.

Data Analysis

The Table 2 shows the summary of descriptive statistics for the variables chosen for the study. The result indicated that the mean values of currency derivative (notional amount of total currency derivatives of a firm) are 35736000000 and its standard deviation value is 164603000000, this indicates that our sample supports that larger companies are more likely to use currency derivatives [14]. Mean value of Revenue (Natural logarithm of the total revenue) is 24.1388 and its Std deviation is 1.70887 respectively and about Total assets (Natural logarithm of the total assets of firm) mean value is 24.1116 and its Standard deviation value is 1.70570. Debt ratio of the firms mean value is 0.235 and its standard deviation value is 0.83711 only, about Debt equity ratios mean value is 0.1298 and its standard deviation value is 0.17927 respectively [15]. PE ratio (Profit earnings ratio of a firm) mean value is 0.3287 and its std deviation value is 0.55220 only, RD exp (Research and Development Expenditure to total sales) mean value is 0.0123 and its standard deviation value is 0.03081only, EPS (Earning Per Share of a firm) mean value is 36.7813 and its std deviation value is 42.08994. FE to sales (Percentage of foreign sales to the total sales of a firm) mean value is 0.6891 and its standard deviation value is 0.17334 only. Tax paid mean value is 5.0126E9 and its std deviation value is 9.50808E9 only and liquidity (Current asset is divided by current liability) mean value is 2.1356 and its std deviation value is 1.05171 respectively [16].

	Mean	Standard Deviation	N
Derivative	3.5736E10	1.64603E11	54
Revenue	24.1388	1.70887	54
Total assets	24.1116	1.70570	54
Debt ratio	.2385	.83711	54
Debt equity ratio	.1298	.17927	54
PE ratio	.3287	.55220	54
RD exp	.0123	.03081	54
EPS	36.7813	42.08994	54
FE to sales	.6891	.17334	54
Tax paid	5.0126E9	9.50808E9	54
Current ratio	2.1356	1.05171	54

Note: Results computed by using SPSS 16.0

Table 2: Descriptive Statistics.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
2	.677[b]	.458	.437	1.23527E11	1.847

b. Predictors: (Constant), PE ratio, Total assets

c. Dependent Variable: Total derivative/factors

Note: Results computed by using SPSS 16.0

Table 3: Model Summary.

Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	6.578E23	2	3.289E23	21.554	.000[b]
	Residual	7.782E23	51	1.526E22		
	Total	1.436E24	53			

b. Predictors: (Constant), PE ratio, Total assets
c. Dependent Variable: Total derivative/factors Note: Results computed by using SPSS 16.0

Table 4: ANOVA.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
2	(Constant)	1.192E12	3.243E11		3.677	.001		
	PEratio	-2.616E11	4.037E10	.878	6.480	.000	.579	1.726
	Totalassets	-4.441E10	1.307E10	.460	3.398	.001	.579	1.726

a. Predictors in the Model: (Constant) PE ratio, Total assets
b. Dependent Variable: Totalderivatives/factors
Note: Results computed by using SPSS 16.0

Table 5a: Coefficients.

The Table 3 shows the model summary of the multiple linear regressions for the sample firms. The R-Squre of the model equals .458 percent and adjusted R-square model equals .437 per cent. This means that only 43.7 per cent of the changes in the dependent variable (TOTDER) are due to the variations of the independent variables used in this model. The result of Adjusted R^2 is relatively similar to those reported in other studies such as Allayannis and Ofek [4]. It is not surprising that the power of the multiple logitistic regression is low. Present studies sample size is small relative to other studies. We use 11 variables, while there are 54 observations only.

Table 4 shows the result of ANOVA, by using the analysis of variance, it is found that F-test of the model is equal to 21.554 and it is significant at the 1 per cent level of significance.

From Table 5a, we estimate the above model using logistic regression by pooling all firm-year observations in SPSS.16.0, to establish the factors which had the greatest influence on financial derivatives use in the evaluated firms. For that purpose, the selected dependent variable was "financial derivatives use" and the independent variables were the ten identified factors. It is clear that two of the ten independent variables were significant that there is a positive relationship between the usages of currency derivatives [17]. (a) PE (Profit earnings ratio proxy of Underinvestment) ratio is positive and also significant at the .001 level of significance; It is because IT firms are required to hold a certain percentage of investment on the riskiness of their asset, this result may indicate that IT firms with greater tendencies towards risk are more likely to use derivatives. (b) Total asset (Proxy for Size) is positive and significant at the .000 level; it indicates that selected larger IT firms tend to use currency derivatives to a greater extent than other IT firms. IT firms hold more capital relative to assets also tend to be more frequent users of derivatives according to this model. This result supporting the theoretical predictions that due to economies of scale, larger IT firms are more likely to hedge. This result supports some of the findings for large financial or non-financial firms [4]. Result found that null hypotheses of H_{01c} and H_{01g} are rejected. Hence there is a relationship between derivative usage and PE ratio as a proxy for under-investment and Total asset as a proxy for size.

Total model effect is: TOTDER= $\beta 0 + \beta 3$ PE + $\beta 8$ TOASSET+ εi

=0.1192-0.02616-0.0441

Accordingly, the result was that the influencing variables for the model that presented significant relationship with the dependent variable were: (a) PE ratio (Underinvestment) (b) Total asset (Size).

The most interesting findings, in Table 5b, that there is a positive relationship between the use of derivatives and; (a) Research and Development exp (b) Foreign sales to total sales (c) Taxation; and (d) Current ratio;. The coefficient of these variables, namely, 0.215, 0.314, 0.724, and 0.419 respectively are positive but not significant at both the 1 per cent and 5 per cent confidence levels. Hence, the null hypotheses $H_{01d,}$ $H_{01h,}$ H_{01i} and H_{01j} are accepted. So, there is no relationship between derivative usage and R&D exp, FE, Taxation and Current ratio. There is a negative relationship between the use of derivates and (a) Revenue; (b) Debt ratio; (c) Debt equity ratio and (d) EPS. The coefficient of these variables, namely, -897, -1.499, -1.306 and -1.424 respectively are negative but not significant at both the 1 per cent and 5 per cent confidence levels. Hence, the null hypotheses $H_{01f,}$ $H_{01a,}$ H_{01b} and H_{01e} are accepted. So there is no relationship between derivative usage and Revenue, Debt ratio, Debt equity ratio and EPS. According to the results of model 1, financial distress costs (the proxy is DRatio, Debtequity ratio) do not affect the hedging likelihood but this significant finding is consistent with a number of prior studies of larger firms and generally there is support avoidance of financial distress as one of the key objectives of foreign exchange hedging in Nguyen and Faff [18] and El-Masry and Ahmed [19] studies. There is no evidence from the linear regressions in line with the underinvestment (PE ratio, R&D exp, and EPS) for IT firms. It could be that since small firms generally have higher growth than larger firms, the impact of the decision to hedge on this growth is not as considerable as in large firms. It is also possible that this proxy does not fully capture a strong relation between investment opportunity and the foreign exchange hedging decision.

It is fond that there is no support for the taxation hypothesis can be an indication that the influence of the tax is not a determining factor for derivative usage by IT firms in India. There is also no support for some of the other determinants of hedging, including Multinationality (FORSALES), liquidity (Current Ratio). Further, as our sample firms have a high level of liquidity (Current Ratio), this argument might not be as important in the decision to hedge in comparison to larger IT firms [20]. Hence, that there is no statistical significant relationship between derivative usage by IT firms in India and the Liquidity (current ratio). Likewise several cases the direction of the relationship is inconsistent with the previous studies.

The values of variance inflation factor (VIF) for all the independent variables have also been checked and none of the independent variable indicates any occurrence of a serious multi co linearity problem.

The above Table 5c contains the residuals statistics which comprises the unstandardized predicted and residuals values along with the standardized predicted and residuals values. Standardized values have a mean of 0 and a standard deviation of 1. It means that residuals are normally distributed and there are no outliers of influential data points in the present study.

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
2	Revenue	-.233[b]	-.897	.374	-.126	.158	6.322	.150
	Debt ratio	-.156[b]	-1.499	.140	-.207	.958	1.044	.555
	Debt equity ratio	-.136[b]	-1.306	.198	-.182	.973	1.028	.571
	RD exp	.023[b]	.215	.830	.030	.946	1.057	.550
	EPS	-.158[b]	-1.424	.161	-.197	.841	1.189	.529
	FE to sales	.033[b]	.314	.755	.044	.969	1.032	.562
	Tax paid	.109[b]	.724	.472	.102	.474	2.109	.295
	Current ratio	.044[b]	.419	.677	.059	.979	1.022	.569
C. Dependent Variable: Total derivatives/factors Note: Results computed by using SPSS16.0								

Table 5b: Excluded variables.

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-2.4292E11	5.7565E11	3.5736E10	1.11406E11	54
Residual	-2.33945E11	6.37096E11	-.00048	1.21174E11	54
Std. Predicted Value	-2.501	4.846	.000	1.000	54
Std. Residual	-1.894	5.158	.000	.981	54

a. Dependent Variable: Total derivatives/factors
Note: Results computed by using SPSS 16.0

Table 5c: Residuals Statistics.

	Current ratio	Revenue	RD exp	FE to sales	Debt ratio	PE ratio	Debt equity ratio	Tax paid	EPS	Total assets
Current ratio	1.000									
Revenue	-.068	1.000								
RD exp	-.097	.174	1.000							
FE to sales	-.271	.137	.004	1.000						
Debt ratio	.422	-.037	.210	-.376	1.000					
PE ratio	-.005	.173	-.035	.131	.035	1.000				
Debt equity ratio	.364	-.288	-.469	-.060	-.085	-.181	1.000			
Tax paid	-.221	-.193	.045	-.088	.210	-.380	.248	1.000		
EPS	-.419	.004	-.120	.192	-.753	.091	-.104	-.382	1.000	
Total assets	.219	-.679	-.188	-.035	.121	.366	.034	-.362	-.028	1.000

Table 6: Correlation Matrix.

Variables	Relationship	Sig. at 1% & 5%	Hypothesis	H_0 Accepted/ Rejected
DRATIO	Negative	No	H_{01a}	Accepted
DER	Negative	No	H_{01b}	Accepted
PE Ratio	Positive	Yes	H_{01c}	Rejected
RDEXP	Positive	No	H_{01d}	Accepted
EPS	Negative	No	H_{01e}	Accepted
FE sales	Positive	No	H_{01f}	Accepted
Revenue	Negative	No	H_{01g}	Accepted
Total assets	Positive	Yes	H_{01h}	Rejected
Taxation	Positive	No	H_{01i}	Accepted
Current ratio	Positive	No	H_{01j}	Accepted

Table 7: Results when Derivative is tested by null hypotheses.

In the above Table 6, we estimated the Pearson correlation coefficients in order to find out whether there is a linear correlation between the dependent and the independent variables, and if so, how they correlate with each other between dependent and independent variable of the study.

We found that larger IT firms in India have significantly higher use of currency derivatives. This mainly suggests only the large IT firms are capable of engaging in currency derivatives trading due to economies of scale in establishing and at the same time maintaining the expertise (Table 7). Consistent with the concept that larger IT firms have economies of scale in setting up a hedging programme, thus we found a positive and significant relationship between firm size, underinvestment and usage of currency derivatives. The same result found in the previous studies by Ameer [21], Charumathi and Kota [4], Géczy et al. [7], Goldberg et al. [22], Nance et al. [5], Nguyen and Faff [18], Shu and Chen [23], Nance and Smith [24].

The arguments on financial distress, Taxation and Liquidity for hedging failed to provide realistic evidences in predicting a IT firm's currency derivative usage Davies et al. [25], Ali Fatemi and Glaum [26], Nguyen and Faff [18] and Shu and Chen [23] also reported similar results.

Conclusion

In the present study, we explored the major determinants of derivative usage by IT firms annual reports for the period of 2011 to 2013. The present study is important due to huge mark-to market losses undergone by Indian IT firms and an imperative need to study the currency derivative usage. The theoretical rationale for hedging includes financial distress costs, underinvestment, Taxation, Liquidity, size related issues and alternative approaches for hedging. The empirical evidence shows that the determinant of IT firm's currency derivative use is firm size (Total assets) and underinvestment (PE ratio) which suggests that only large IT companies are able to afford currency derivatives. The financial distress hypothesis, underinvestment,

Taxation and Liquidity and rationale for alternate methods of hedging failed to provide convincing evidences in predicting a IT firm's currency derivatives usage [27-29].

Finally, an interesting issue for scope of further research would be to conduct the same studies in other corporate firms in India, or testing with different variables other than the present studies independent variable to the same firms also analyze alternative time periods.

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