



“An empirical analysis of Forex Management among Selected IT Companies In India”

AUTHOR

Mr. Nitin Badeja¹ & Dr. Suresh .C. Jain²

1. Research Scholar , Department of Accountancy & Business Statistics, University of Rajasthan, Jaipur (Rajasthan)

2. Prof (Retd), Department of Accountancy & Business Statistics, University of Rajasthan, Jaipur (Rajasthan)

ABSTRACT

The economic liberalisation in early nineties and deregulation of exchange rates in 1993 facilitated the introduction of interest rate and foreign exchange derivatives in India. Uncertainty about exchange rates causes foreign exchange exposures having significant effect on the earnings of the firms. Foreign exchange derivatives are used by firms to mitigate foreign exchange exposures. The use of derivatives is still a highly regulated in India due to partial convertibility of rupee. Currently, futures, forwards, swaps and options are available in India. This paper deliberates on the various alternatives available to Indian corporate for hedging foreign exchange risks. The paper aims to study the strategic uses of foreign exchange derivatives by Tata Consultancy Services Limited to manage its foreign exchange exposures. The paper concludes that since, in addition to proper mix of foreign exchange derivative instruments in foreign exchange risk management strategy, the precise prediction of foreign exchange rate plays a very significant role in successfully managing the foreign exchange exposure of a firm, more emphasis should be given on the accurate prediction of relevant exchange rates.

Keywords: Foreign exchange exposure; derivatives; forwards; futures; options; Swaps

INTRODUCTION:

Firms doing international business normally face foreign exchange exposures on account of unanticipated changes in exchange rates. A foreign exchange exposure is defined

as a contracted, projected or contingent cash flow whose magnitude is not certain at the moment and depends on the foreign exchange rates in future. Firms have a common practice of using a hedging technique to protect themselves from the foreign exchange exposures. In hedging, firms use foreign exchange derivatives to mitigate the foreign currency exposures. The scope of this paper is limited to the analysis of management of the foreign exchange exposures faced by the Tata Consultancy Services Limited.

This paper attempts to study the various alternatives available to Indian corporates for hedging foreign exchange risks. This paper aims to provide a perspective on managing the risk that firms face due to fluctuating exchange rates. It investigates the prudence in using the tools to mitigate the foreign exchange exposures by Tata Consultancy Services.

The Reserve Bank of India, in a circular issued in October 2001, had said that banks must scrutinise and review unhedged forex exposures of clients that have large exposures. In February 2012, a similar circular with stronger wording was issued in which RBI said that banks should “rigorously evaluate” the risk emerging out of the unhedged forex exposure and price that risk in while extending credit facilities to these companies.¹ In January 2014, the RBI put rules in place asking banks to make provision against unhedged forex exposures of their clients.

REVIEW OF LITERATURE:

Exchange Rate Exposures:

The main types of exchange rate exposure are described below:

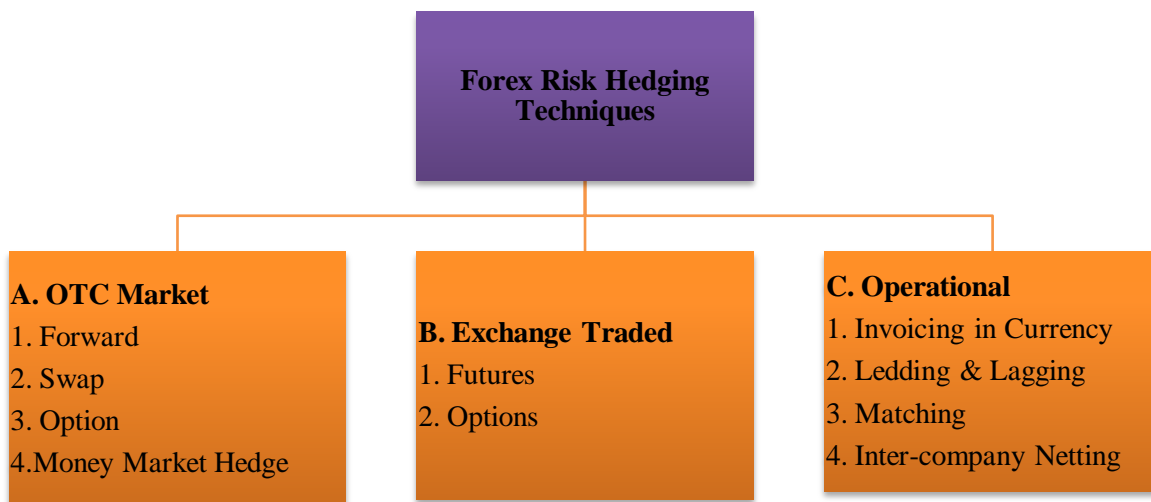
- i. *Transaction Exposure* is defined as a measure of change in the value of outstanding financial obligations which are committed prior to a change in exchange rate and are to be settled after the exchange rate changes. Transaction exposure is initiated by the possibility that the future cash flow may change as a result of exchange rate changes.
- ii. *Economic Exposure* represents to the possibility of the change in the present value of the firm's expected future cash flows due to unexpected change in exchange rates. It is also called operating exposure. It measures the change in the present value of the firm, which results from any change in future operating cash flows caused by unexpected changes in exchange rates. Operating exposure measures the impact of unanticipated exchange rate changes on the firm's revenues, operating costs and operating net cash flows over a medium time horizon.

iii. Translation exposure is a short term exposure. It relates to foreign assets that are exposed to due to exchange rate uncertainty, while domestic assets are not exposed to this exchange rate uncertainty. Translation exposure arises on the consolidation of assets, liabilities and profits denominated in foreign currency in the process of preparing consolidated accounts in home currency.

Foreign Exchange Exposure Hedging Techniques:

Chart 1 shows different techniques on the basis of their availability, which are generally used by firms to their manage foreign exchange exposures.

Chart 1



These techniques have been discussed below:

(i) Forward:

Most popular and direct method of hedging foreign exchange exposure is by currency forward contracts. This is a first generation foreign exchange derivative. A forward is an agreement between two parties, a buyer and a seller, to buy or sell a currency at a specified rate on a particular date in future. The main benefit of a forward is that it can be tailored to the specific requirements of the firm and an exact hedge can be obtained.

(ii) Futures:

A futures contract is similar to the forward contract but is more liquid as it is traded in an organised exchange. However, futures is a standardised contract unlike a forward which is a tailor made contract. A futures contract is subject daily settlement procedure to guarantee

each party that claims against the other party will be settled. Futures require a small initial outlay.

(iii) Options:

Holder of a Currency options has the right, but not the obligation, to buy or sell foreign currency at an agreed price, within a specified period of time. A call option gives the option buyer the right, without obligation, to purchase agreed the currency by paying another agreed currency at the agreed price on or before agreed date. A put option gives the option buyer the right, without obligation, to sell the agreed currency for another agreed currency at the agreed price on or before the agreed date.

(iv) Swaps:

Swap contract is an agreement to exchange one currency for another currency at a predetermined exchange rate, which is the swap rate, on sequence of future dates. As such, a swap contract is like a portfolio of forward contracts with different maturities. Swaps are very flexible in terms of amount and maturity; the maturity ranging from few months to 20 years.

(v) Money market hedge:

Forex risk can be hedged by lending and borrowing in the domestic and foreign money markets. Firms may borrow (lend) in foreign currency to hedge its foreign currency receivables (payables). For example, an Indian firm has to receive 1 million dollar from an U.S. importer after three months. The Indian firm will borrow USD from the market today. Then it will sell the USD in the market for rupees. After three months, it will receive USD from importer and will make USD payments to the lender. Thus, the exchange rate risk is mitigated.

(vi) Choice of the invoice currency:

Mitigating forex risk through the choice of invoice currency is an operational technique. Firms may, sometimes, invoice their foreign sales or purchases in domestic currency so that the other party absorbs exchange rate risk.

(vii) Lead/lag method:

This is also an operational technique. 'Lead' means to pay or receive early, whereas 'lag' means to pay or receive late. The firm would like to lead soft currency receivables and lag hard currency receivables to void the loss from depreciation of the soft currency and benefit

from the appreciation of hard currency. Similarly, the firm will attempt to lead the hard currency payables and lag soft currency payables.

(viii) Matching

Cash flows in one of the pairing currencies can be offset against cash flows in the others. For example, an Indian firm has its receivable in one currency say EUR and a payable not in the same currency but closely related currency say GBP. The movement in two currencies are closely related so that a loss (gain) on payable due to an appreciation (depreciation) of GBP vis-à-vis INR will be closely matched by the gain (loss) on the receivable due to appreciation (depreciation) of the EUR.

(ix) Exposure netting:

A firm having different receivables and payables in diverse currencies can net out its exposure in each currency by matching receivables with payables. Netting can be done between inflows and out flows of different currencies arising from cross border transactions of different entities of the group. The centralization of firm's exchange exposure management function in one location will help it in applying exposure netting aggressively.

Studies on Foreign Exchange Exposure Management:

The studies related to foreign exchange exposure of firms can be put into three categories- first, the studies based on the efficacy of foreign exchange derivatives in managing foreign exchange risk of firms; second, the studies related to the practices of firms in managing foreign exchange exposures, and third, the studies related to the choice of hedging instruments in managing foreign exchange risk. Selected studies on management of foreign exchange exposure are shown below in Table 1.

(a) Studies on effectiveness of foreign derivatives in managing forex exposure

There are evidences showing the reduction of foreign exchange exposure with the use of tools for managing the exposure. Allayanis and Ofek (2001) use a multi-variate analysis on a sample of S & P 500 non-financial firms and calculate a firm's exchange rate exposure using the ratio of foreign sales to total sales as a proxy. They isolate the impact of use of foreign currency derivatives on a firm's foreign exchange exposures. They find that the use of derivatives in fact reduce exchange rate exposures.

Wong (2000) studies the foreign exchange exposure of the U.S. manufacturing firms. He uses to study the association between foreign exchange exposure and derivative disclosures

required. The study finds weak association between derivative disclosures and foreign exchange exposure. The suggested reason is failure in controlling for firms' inherent exposures and shortcomings of the accounting disclosures.

According to Oosterhof (2001) study, the empirical results for the theoretical hypotheses are mixed, even though corporate risk management can substantially increase firm value. The major determinant of derivatives' use is firm size. The mixed results indicate that corporate risk managers, willingly or unwillingly, do not behave in an optimal way. The study shows the benefits of corporate risk management and the sources of these benefits.

Bodnar et al. (2003) examine the influence of institutional differences on corporate risk management practices in the USA and the Netherlands. The study documents several differences in the firms' uses and attitudes towards derivatives and attempts to attribute them to the differences in the institutional environments between the USA and the Netherlands. The study finds that institutional differences appear to have an important impact on risk management practices and derivatives use across US and Dutch firms.

Forwards, futures and options are preferred in managing short term foreign exchange exposures. Options gives opportunity to tap unlimited profit caused by upward movement in price of currency, while at the same time avoiding the forex risk at minimal cost. Options are preferred when currency exchange rates are quite volatile. Swaps are generally used hedging long term exposure. Pricing method is generally preferred by corporate in managing short term foreign exchange exposures.

DATA AND RESEARCH METHODOLOGY:

First of all, we should know the nature and quantum of the exposure. Then, we have to find which hedging techniques are being used by the firm. In last, are these techniques/strategies appropriate to the given exposure and circumstances?

Data Sources:

The study is based on annual reports, data collected from the treasury, interaction with the Treasury and other relevant study material related to the company. The study evaluates the foreign exchange exposure of the company and assesses the appropriateness of the hedging strategy employed by the company.

Measure of Foreign Exchange Exposure:

The foreign exchange exposure of a firm can be measured by the responsiveness of return on its stocks to change in foreign exchange rate. A standard two factor model has been employed to estimate the exchange rate sensitivity coefficient of the firm. This model can be described as given below:

$$R_{it} = a + \beta_1 e_{it} + \beta_2 R_{mt} + u_{it}$$

Where, R_{it} is the return on company's stock at time t , e_{it} is the change in foreign exchange rate, and R_{mt} is the stock market return. Coefficients β_1 and β_2 provide the measure of exchange rate exposure and systematic risk of company i and u_{it} is the error term.

The return of company i for period t has been computed as given below:

$$R_{it} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Where, P_t is price of stock of company i in period t and P_{t-1} is previous period price of the stock. Similarly, return on NIFTY 500 and exchange rate (U.S. \$ per Rupee) have been calculated.

A positive β_1 indicates exposure to appreciation of foreign currency (U.S. Dollar). Foreign exchange exposure has been assessed for 2012-2017, taking end of the month figures into consideration.

Sensitivity Analysis:

The sensitivity analysis of company's profits/revenues to changes in foreign exchange rate has also been carried out. The sensitivity analysis shows the effect of 1% or 10% depreciation/appreciation in the value of foreign currency on the profit of the company. The results of sensitivity analysis can be used to verify the nature of forex exposure as measured by above two factor model.

Foreign Exchange Derivative Instruments:

The uses of foreign exchange derivatives by the company to manage foreign exchange exposures have been studied. The different derivative strategies- a combination of like - forwards, swaps, options, futures, invoice pricing, matching etc. used by the company to meet these foreign exchange exposures have been analysed.

Appropriateness of Foreign Exchange Derivative Instruments:

The appropriateness of instruments has been judged by comparing the instrument used by the company with the instrument that should have been used in these circumstances according to theory and the practices adopted by firms.

Foreign Exchange Exposure Management Policy:

The policies adopted to manage the foreign exchange exposures by the company have been analysed. It also includes internal control mechanism used by the company.

Comparative Analysis:

The comparison of instruments used by the company with instruments used by global firms as provided by review of literature has been carried out.

Forex Exposure of Tata Consultancy Services Limited:

Tata Consultancy Services Limited is one of the world's top information technology service-providers. It has over 353,000 employees and a global delivery footprint that covers over 145 solution centres. The company was founded in 1968 as part of the Tata group. The company has 58 subsidiaries as on March 31, 2017. It has no associate companies or joint venture companies. The functional currency of the company and its Indian subsidiaries is Indian rupee, whereas the functional currency of foreign subsidiaries is the currency of those countries.

The company earns more than 90% in foreign exchange. Revenues are largely denominated foreign currency, predominantly USD, EUR, GBP, AUS, CAD, SAR and SWF. More than the half of earnings are from North American area. About one-fourth of its earnings are from Europe. Any depreciation of foreign currency (USD and other relevant currencies) would lead decline in revenues when measured in the domestic currency (Rupee). Thus, for such a company having predominantly foreign currency earnings, the management of foreign exchange exposures becomes significant.

Foreign Exchange Exposure of the Company:

Foreign exchange exposure of stocks of Tata Consultancy Services Limited using two factor models is given below in Table 1. The results show that the returns of the company are exposed to depreciation of foreign currency (USD).

Table 1: TCS: Foreign Exchange Exposure

	Constant	Exchange rate	Nifty	R²	F-Statistics
Coefficient	0.0119	-0.3478	0.1686	0.03	0.94
p-value	0.172	0.177	0.437		0.000

The exchange rate sensitivity is calculated by aggregating the net foreign exchange rate exposure and a simultaneous parallel foreign exchange rates shift of all the currencies by 10% against the respective functional currencies of TCS and its subsidiaries. The depreciation of foreign currencies have impact on the net profit of the company. The sensitivity results support the company's exposure to depreciation of foreign currency as shown by two factor model.

Table 2: TCS: Expected increase (decrease) in Group's profit before tax due to 10% appreciation (Depreciation) of respective foreign currency (Rs crores)

Particulars	As on March 31		
	2015	2016	2017
Expected decrease/increase	82	73	288

Source: Annual Report, various issues.

Table 4 shows the revenue growth analysis of the company. The analysis shows that exchange rate affects the revenues significantly. In 2010, the revenues of the company grew by 8% and out of this 2% point was due to exchange rate impact, while in 2017 the exchange rate contributed 0.3% point of revenue growth.

Table 3: TCS: Analysis of Revenue Growth (%)

Growth attributed to	Fiscal years							
	2010	2011	2012	2013	2014	2015	2016	2017
Business growth	6.0	28.5	23.0	16.1	17.3	17.0	11.9	8.3
Impact of exchange rate	2.0	(4.2)	8.0	12.7	12.6	(1.3)	2.9	0.3
Total growth	8.0	24.3	31.0	28.8	29.9	15.7	14.8	8.6

Source: Annual Report, various issues.

Foreign Exchange Risk Management Techniques:

The table 4 depicts number of contracts, notional amount and fair value of outstanding currency options at the end of the reporting period. The company uses option contracts in large amount as compared to forward contracts. This strategy has been observed among many information technology firms recently in India.² It shows that the company intends to retain the benefit of favourable movements in prices of the underlying currency, while at the same time avoiding risk.

Table 4: TCS: Outstanding currency option contracts which have been designated as cash flow hedges

Foreign currency	As on March 31, 2015			As on March 31, 2016			As on March 31, 2017		
	No of contracts	Notional amount of contracts (million)	Fair value (Rs crores)	No of contracts	Notional amount of contracts (million)	Fair value (Rs crores)	No of contracts	Notional amount of contracts (million)	Fair value (Rs crores)
USD	-	-	-	9	225	41.4	6	150	9.0
GBP	18	297	67.1	8	160	51.9	45	318	60.0
EUR	2	171	87.8	24	285	19.5	27	198	40.0
AUD	6	97	31.2	21	228	(12.5)	6	60	11.0

Source: Annual Report, various issues.

The table 6 depicts number of contracts, notional amount and fair value of outstanding currency forwards at the end of the reporting period. The company uses less forward contracts to manage foreign currency exposures in agreement with the after-thought strategy.

Table 6: TCS: Outstanding currency forwards contracts designated as cash flow hedges

Foreign currency	As on March 31, 2015			As on March 31, 2016			As on March 31, 2017		
	No of contracts	Notional amount of contracts (million)	Fair value (Rs crores)	No of contracts	Notional amount of contracts (million)	Fair value (Rs crores)	No of contracts	Notional amount of contracts (million)	Fair value (Rs crores)
USD	-	-	-	-	-	-	-	-	-
GBP	-	-	-	-	-	-	5	125	5.0
EUR	-	-	-	-	-	-	3	91	15.0

Source: Annual Report, various issues.

It clearly portrays that the TCS Limited does not use swaps at all. The obvious reason is that it has no liability in foreign currency.

TCS suffered a loss Rs. 277 crores in the first six months of 2009 on forex derivatives trading (on options). The CFO said that it was unthinkable to expect the rupee to depreciate as the foreign money was flowing into Indian market in 2008. In July 2009, TCS decided to

halve the tenure of its hedging contracts in future due to the continuing unpredictability in the rupee market. Earlier the company had a policy of hedging its dollar exposure for a period of two years or more.³

The company also suffered loss on derivative instruments in 2013. TCS used „range forward options“ to hedge its risk on foreign revenues which predominantly in USD. A range forward option contract provides protection against adverse exchange rate movements, while retaining some potential upside in case the currency appreciates. Losses can multiply in case the rupee moves out of the range. This had happened in the second quarter of 2013. More than fifty percent of TCS hedges were in the form of range forward options. The rupee depreciated against USD to a good extent.

Table 7 shows net gain (loss) on derivative instruments transferred to profit and loss account. It transferred loss on forex derivative instruments in 2011, 2012 and 2014. While, the company transferred profit on derivative instruments to profit and loss account in 2010, 2013, 2015, 2016 and 2017. In 2017, the company transferred a profit of Rupee 1522 crores on derivative instrument to profit and loss account.

Table 6: TCS: Net gain on derivative instruments (foreign exchange forward, options and future contracts) transferred to statement of profit and loss (Rs. crores)

Year	2010	2011	2012	2013	2014	2015	2016	2017
Gain/loss	91.5	(8.9)	(192.8)	272.0	(66.6)	1363.9	180.6	1522.0

Source: Annual Report, various issues.

RISK MANAGEMENT POLICY:

The company has adopted a well-defined policy for management of foreign exchange exposures. The risk management policy of TCS has been summarised below:

- Risk management policy is approved by Board of Directors which states risks, means to mitigate these risks; defining authorities, responsibilities and controls and stating broad parameters within which treasury has to function. Policy is reviewed by Board periodically.
- Risk management board is responsible for policy implementation, strategy formulation and periodic review of decisions.
- TCS Treasury is a not a profit centre but a facilitator with an objective of protecting accounting/ budgeted rates and thereby reducing unpredictability and volatility.
- The company follows globally used FAS 133 accounting standard.

- The policy allows use of only simple accounting compliant structures. It necessitates that each hedge has to be mapped with a specific set of underlying. No exotics are allowed.
- Hedging policy is to hedge the 'net' exposure.

The following basic instruments are used by TCS Limited to manage forex exposure:

Instrument	Advantage	Disadvantage
Forward contracts	Full downside protection, No cost	No participation in case of upside
Vanilla options	Full upside and downside protection	Initial cost
Range forward options	Complete down side protection Generally no upfront cost	Upside participation up to a level

Table 8 reveals information relating to the company's policy to manage the forex exposure and other relevant parameters. The company uses centralised approach and the treasury is assigned the task of forex exposure management. The company manages the transaction and translation exposures. The company uses both OTC and Exchange traded forex derivatives to manage its foreign exchange exposures.

TCS quarterly reviews its hedging policy. Internal control policy includes regular management report on positions, limits & guidelines framed by top management and internal audit.

TCS evaluates the risk associated with foreign exchange fluctuations. Simple foreign exchange derivatives are used by the company in managing foreign exchange risks. The time horizon of the forex derivatives in use is less than one year. The third generation derivatives are not used by the company.

The company does forecast the exchange rate of relevant currencies. It also takes consultancy services from external experts. The company uses to make changes in its hedging strategy in response to exchange rate fluctuations.

TCS follows a currency hedging policy that is aligned with market best practices, to limit the impact of exchange volatility on earnings and collections. Hedging strategy is monitored by the Risk Management Committee on a regular basis.

The company and its subsidiaries report quarterly to its management committee, an independent body that monitors foreign exchange risks and policies implemented to manage its foreign exchange exposures. Company maintains hedging account. Foreign currency denominated assets and liabilities are translated at the exchange rate prevailing on the balance sheet date and exchange gains and losses arising on the settlement and restatement are recognised in the statement of profit and loss.

CONCLUSION:

The main findings of the study, grouped on the basis of parameters set in the objectives of the study, have been discussed below:

(i) Effectiveness of forex derivatives in managing foreign exchange exposure:

There are evidences in literature showing the reduction of foreign exchange exposures of firms with the use of tools for managing the exposures.

(ii) Understanding and Approach:

Forex exposures are managed by the treasury department in Tata Consultancy Services Limited. The company uses centralised approach to manage the foreign exchange exposures. The company changes its strategy in response to the fluctuations in exchange rates.

(iii) Evaluation and Forecasting:

Tata Consultancy Services Limited evaluates the risk associated with foreign exchange rates. It uses the Value at risk and Price value of a basis point methods to evaluate the foreign exchange risks. The company does forecast the exchange rates of relevant currencies for internal use. It also takes consultancy services from external experts. The sensitivity analysis shows the revenues of TCS are affected by the depreciation of concerned foreign currencies.

(iv) Derivative Techniques Used:

The TCS has more than 90 percent of its revenue in foreign currencies. The depreciation of rupee against foreign currencies appears to increase the revenue of the company in its functional currency i.e., rupee. Since TCS has no foreign exchange liability, it does not use swaps at all to manage exposures. It uses foreign exchange options on a large scale. Since it has revenues in foreign currencies, option contracts are best bet to gain maximum benefit (potential benefit) and mitigating forex risks at the minimum cost when exchange rates are volatile. In addition, the company also uses, on a small scale, foreign exchange forwards and futures to mitigate foreign exchange exposure. Tata Consultancy Services Limited uses short term forex derivatives (up to one year) to manage forex exposure.

REFERENCES

- Abor, Joshua Y., (2005). Managing foreign exchange risk among Ghanaian firms, *Journal of Risk Finance*, Vol. 6, pp. 306-318.
- Allayannis, George and Ofek, Eli, (2001). Exchange rate exposure, hedging and the use of foreign currency derivatives, *Journal of International Money and Finance*, 20 (2001), pp. 273 –296.
- B. Charumathi and Hima Bindu Kota (June 2012). On the Determinants of Derivative Usage by Large Indian Non-financial Firms”, *Global Business Review*, Sage Publishing, Vol. 13 No. 2 pp. 251 –267.
- Bengt Pramborg, (2003). Foreign Exchange Risk Management by Swedish and Korean Non-financial Firms: A Comparative Survey, *Pacific-Basin Finance Journal*, Vol. 13, pp. 343-366.
- Bodnar, G.M., Jong A. and Macrae, V., (September 2003). The Impact of Institutional Differences on Derivatives Usage: A Comparative Study of U.S. and Dutch firms, *European Financial Management*, Vol. 9, pp. 271-297, Available at SSRN.
- Dash Mihir, (Sept. 2009). Forex Risk Management Strategies for Indian IT Companies, *SSRN Electronic Journal*.
- Dash, M., Babu, N., Kodai, M., and Vivekaand, B.Y. (2008). An Empirical Study on Forex Risk Management Strategies, *Indian Journal of Finance*, Vol. II, No. 8.
- Debasish Sathya Swaroop, (2008). Foreign Exchange Risk Management Practices –A Study in Indian Scenario, *BRAC University Journal*, Vol. V, No. 2, pp. 81-91.
- Eun Cheol S. and Resnick Bruce G., (2008). *International Financial Management*, Tata McGraw Hill Education Private Limited, New Delhi.
- Gambhir, Neeraj and Goel, Manoj, (2003). *Foreign Exchange Derivatives Market in India: Status and Prospects*, kumarprasun.yolasite.com.
- Géczy Christopher, Minton Bernadette A. and Schrand Catherine, (1997). Why Firms Use Currency Derivatives, *The Journal of Finance*, Volume 52, Issue 4, Pages 1323–1354.
- Jamal Mecklai, (2016). Managing risk: Here is how to handle foreign exchange exposure, August 31, *Financial Express*.

- Madura Jeff, (2008). *International Financial Management*, Cengage Learning India Private Limited, New Delhi.
- Mitra Anupam, (Dec. 2013). Comparative Analysis of Foreign Exchange Risk Management Practices among Non-Banking Companies in India, *Africa Development and Resources Research Institute Journal*, Vol. 3, No.3, pp.38-51.
- Oosterhof, C.M., (2001). *Corporate Risk Management: An Overview*, Research Report, SOM Research Institute, University of Groningen, Groningen, The Netherlands.
- P. G. Apte, (2012). *International Financial Management*, Tata McGraw Hill Education Private Limited, New Delhi.
- Pichler, Karl and Loderer, Claudio F., (2000). Firms, Do You Know your Currency Risk Exposure? *Survey Results*, Available at SSRN: <https://ssrn.com>.
- Reid W. Click and Joshua D. Coval, (2002). *The Theory and Practice of International Financial Management*, Prentice-Hall, Inc., New Jersey, USA.
- Sahu, Suprava, (Aug 2017). Financial Derivatives Use in Top Corporate Entities in India: A Trend Analysis, *International Research Journal of Engineering and Technology*, Volume 04, Issue 08, pp. 276-281.
- Shapiro Alan C. (2003). *Multinational Financial Management*, John Wiley and Sons (Asia) Pte. Ltd., Singapore.
- Tata Consultancy Services Limited, *Annual Report*, Various issues.
- Tholons, (June 2011). Foreign Exchange Risk Management for Indian IT services Companies, www.tholons.com.
- Wong, M.H. Franco, (Autum 2000). The Association between SFAS No. 119 Derivatives Disclosures and the Foreign Exchange Risk Exposure of Manufacturing Firms, *Journal of Accounting Research*, Vol. 38, No. 2.
- Yazid, A. S. and Muda, M. S., (2006). The Role of Foreign Exchange Risk Management in Malaysia, *Irish Journal of Management*, Vol. 40, Dublin.