HEDGING FOREIGN EXCHANGE RISKS WITH CURRENCY DERIVATIVES

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Abstract

The continuing liberalization of Indian economy has resulted in extensive inflow of foreign capital into India. High economic growth and capital account liberalization led to increased currency exposures of both domestic entities and foreign counterparts, leading to a rise in the demand for risk management instruments for hedging exposure linked to real and financial flows. This volatility in financial markets requires investors (individual as well as corporate) to be aware of the risks associated with currency fluctuations and the use of Foreign Exchange derivatives market for minimizing the risks due to exposure to foreign currencies. Most individual and corporate investors use currency derivatives for effectively managing their foreign exchange exposures. This research paper focuses on the various alternatives available to the Indian corporate for hedging financial risks and the perceptions, apprehensions and expectations of common investors who are investing/ would be investing in currency derivatives market.

Introduction

Each country has its own currency through which both national and international transactions are performed. All the international business transactions involve an exchange of one currency for another. If any Indian firm borrows funds from international financial market in US dollars for short or long term then at maturity the same would be refunded in particular agreed currency along with accrued interest on borrowed money. It means that the borrowed foreign currency brought in the country will be converted into Indian currency, and when borrowed funds are paid to the lender then the home currency will be converted into foreign lender's currency. Thus, the currency units of a country involve an exchange of one currency for another.

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The price of one currency in terms of other currency is known as exchange rate. The foreign exchange markets of a country provide the mechanism of exchanging different currencies with one and another, and thus, facilitating transfer of purchasing power from one country to another. With the huge growth of international trade and finance all over the world, trading in foreign currencies has grown tremendously over the past several decades. Since the exchange rates are continuously changing, the firms are exposed to the risk of exchange rate movements. As a result the assets or liability or cash flows of a firm which are denominated in foreign currencies undergo a change in value over a period of time due to variation in exchange rates. This variability in the value of assets or liabilities or cash flows is referred to exchange rate risk. Since the fixed exchange rate system has fallen in the early 1970s, specifically in developed countries, the currency risk has become substantial for many business firms. As a result, these firms are increasingly turning to various risk hedging products like foreign currency futures, foreign currency forwards, foreign currency options, and foreign currency swaps. Currency-based derivatives are used by exporters invoicing receivables in foreign currency, unwilling to protect their earnings from the foreign currency depreciation by locking the currency conversion rate at a high level. Their use by importers hedging foreign currency payables is effective when the payment currency is expected to appreciate and the importers would like to guarantee a lower conversion rate. Investors in foreign currency denominated securities would like to secure strong foreign earnings by obtaining the right to sell foreign currency at a high conversion rate, thus defending their revenue from the foreign currency depreciation. A high degree of volatility of exchange rates creates a fertile ground for foreign exchange speculators. The most commonly used instrument among the currency derivatives are currency forward contracts. These are large notional value selling or buying contracts obtained by exporters, importers, investors and speculators from banks with denomination normally exceeding 2 million USD. The contracts guarantee the future conversion rate between two currencies and can be obtained for any customized amount and any date in the future. They normally do not require a security deposit since their purchasers are mostly large business firms and investment institutions, although the banks may require compensating deposit balances or lines of credit. Their transaction costs are set by spread between bank's buy and sell prices. Exporters invoicing receivables in foreign currency are the most frequent users of these contracts. They are willing to protect themselves from the currency depreciation by locking in the future currency conversion rate at a high level.

Foreign Exchange Risk Management

Exchange rate risk management is an integral part of every firm's decisions about foreign currency exposure (Allayannis et al., 2001).Firms dealing in multiple currencies face a risk (an unanticipated gain/loss) on account of sudden/unanticipated changes in exchange rates, quantified in terms of exposures. Exposure is defined as a contracted, projected or contingent cash flow whose magnitude is not certain at the moment and depends on the value of the foreign exchange rates. The process of identifying risks faced by the firm and implementing the process of protection from these risks by financial or operational hedging is termed as foreign exchange risk management. In risk management of the underlying assets using financial derivatives, the basic strategy is Hedging i.e., the trader holds two positions of equal amounts but opposite directions, one in the underlying markets, and the other in the derivatives markets, simultaneously. Currency risk hedging strategies entail eliminating or reducing this risk, and require understanding of both the ways that the exchange rate risk could affect the operations of economic agents and techniques to deal with the consequent risk implications.

Hedging Strategies/ Instruments

A derivative is a financial contract whose value is derived from the value of some other financial asset, such as a stock price, a commodity price, an exchange rate, an interest rate, or even an index of prices. The main role of derivatives is that they reallocate risk among financial market participants, help to make financial markets more complete.

Forwards: A forward is a made-to-measure agreement between two parties to buy/sell a specified amount of a currency at a specified rate on a particular date in the future. The depreciation of the receivable currency is hedged against by selling a currency forward. If the risk is that of a currency appreciation (if the firm has to buy that currency in future say for import), it can hedge by buying the currency forward. For example, if Reliance Industries Limited (RIL) wants to buy crude oil in US dollars six months hence, it can enter into a forward contract to pay INR (Indian Rupee) and buy USD (US Dollar) and lock in a fixed exchange rate for INR-USD to be paid after 6 months regardless of the actual INR-Dollar rate at the time. In this example, the downside is an appreciation of Dollar which is protected by a fixed forward contract. The main advantage of a forward is that it can be tailored to the specific needs of the firm and an exact hedge can be obtained. On the downside, these contracts are not marketable; they can't be sold to another party when they are no longer required and are binding.

Hedging Instruments for Indian Firms

Table 1

List of currency Derivatives used for Hedging FX Risk in Indian Firms

Instruments	Outstanding Foreign Exchange Forward and Option Contracts upto 31st March, 2011 (Rs. Crores)	Nature of Exposure
Infosys		
Forward Contracts	3637	To mitigate the risk of changes in foreign exchange rates on trade receivables and forecasted cash flows denominated in certain foreign currencies.
Reliance Industries		
Currency Swaps	4,567.03	Earnings in all businesses are linked to USD. The key input, crude oil is purchased in USD. All export revenues are in foreign currency and local prices are based on import parity prices as well.
Options	28,180.96	
Forward Contracts	31,583.95	
Tata Consultancy Services		
Forward Contracts & Options	4649.67	Revenues largely denominated in foreign currency, predominantly US$, Euro, Australian $, and Canadian $
Ranbaxy		
Forward Contracts	2510.33	Exposed on accounts receivable and loans payable. Exposure in USD and Jap Yen
Dr. Reddy Labs		
Currency options	15385	Foreign currency earnings through export, currency requirements for settlement of liability for import of goods.

Source: From respectiveannual reports of the companies for year ending2010-11

Futures: A futures contract is similar to the forward contract but is more liquid because it is traded in an organized exchange i.e. the futures market. Depreciation of a currency can be hedged by selling futures and appreciation can be hedged by buying futures. Advantages of futures are that there is a central market for futures which eliminates the problem of double coincidence. Futures require a small initial outlay (a proportion of the value of the future) with which significant amounts of money can be gained or lost with the actual forwards price fluctuations. This provides a sort of leverage. The previous example for a forward contract

for RIL applies here also just that RIL will have to go to a USD futures exchange to purchase standardized dollar futures equal to the amount to be hedged as the risk is that of appreciation of the dollar.

Options: A currency Option is a contract giving the right, not the obligation, to buy or sell a specific quantity of one foreign currency in exchange for another at a fixed price; called the Exercise Price or Strike Price. The fixed nature of the exercise price reduces the uncertainty of exchange rate changes and limits the losses of open currency positions. Options are particularly suited as a hedging tool for contingent cash flows, as is the case in bidding processes. Call Options are used if the risk is an upward trend in price (of the currency), while Put Options are used if the risk is a downward trend. Again taking the example of RIL which needs to purchase crude oil in USD in 6 months, if RIL buys a Call option (as the risk is an upward trend in dollar rate), i.e. the right to buy a specified amount of dollars at a fixed rate on a specified date, there are two scenarios. If the exchange rate movement is favorable i.e., the dollar depreciates, then RIL can buy them at the spot rate as they have become cheaper. In the other case, if the dollar appreciates compared to today's spot rate, RIL can exercise the option to purchase it at the agreed strike price. In either case RIL benefits by paying the lower price to purchase the dollar.

Swaps: A swap is a foreign currency contract whereby the buyer and seller exchange equal initial principal amounts of two different currencies at the spot rate. The buyer and seller exchange fixed or floating rate interest payments in their respective swapped currencies over the term of the contract. At maturity, the principal amount is effectively re-swapped at a predetermined exchange rate so that the parties end up with their original currencies. The advantages of swaps are that firms with limited appetite for exchange rate risk may move to a partially or completely hedged position through the mechanism of foreign currency swaps, while leaving the underlying borrowing intact. Apart from covering the exchange rate risk, swaps also allow firms to hedge the floating interest rate risk. Consider an export oriented company that has entered into a swap for a notional principal of USD 1 mn at an exchange rate of 42/dollar. The company pays US 6months LIBOR to the bank and receives 11.00% p.a. every 6 months on 1st January and 1st July, till 5 years. Such a company would have earnings in Dollars and can use the same to pay interest for this kind of borrowing (in dollars rather than in Rupee) ,thus hedging its exposures.

Foreign Debt: Foreign debt can be used to hedge foreign exchange exposure by taking advantage of the International Fischer Effect relationship. This is demonstrated with the example of an exporter who has to receive a fixed amount of dollars in a few months from

present. The exporter stands to lose if the domestic currency appreciates against that currency in the meanwhile, so to hedge this he could take a loan in the foreign currency for the same time period and convert the same into domestic currency at the current exchange rate. The theory assures that the gain realized by investing the proceeds from the loan would match the interest rate payment (in the foreign currency) for the loan.

The recent period has witnessed amplified volatility in the INR-US exchange rates in the backdrop of the sub-prime crisis in the US and increased dollar-inflows into the Indian stock markets. In this context, the paper has attempted to study the choice of instruments adopted by prominent firms to stem their foreign exchange exposures. All the data for this has been compiled from the 2010-2011 Annual Reports of the respective companies. A summary of the foreign exchange risk hedging behaviour of select Indian firms is given in Table 1.

Review of Literature

Harvey (1991) examined the volatility implications of round-the-clock foreign exchange trading with transaction data on futures contracts from the Chicago Mercantile Exchange and the London International Financial Futures Exchange. They found higher U.S.-European and U.S.-Japanese exchange-rate volatilities during U.S. trading hours and higher European cross-rate volatilities during European trading hours. While the disclosure of private information through trading may partly explain these volatility patterns, they concluded that the increased volatility is more likely driven by macroeconomic news announcements. An analysis of inter- and intra-day data also revealed that volatility increases at times that coincide with the release of U.S. macroeconomic news.

Bessembinder (1992) examined the uniformity of risk pricing in futures and asset markets. Tests against a general alternative do not reflect complete integration of futures and asset markets. As predicted, estimates of the 'zero-beta' rate for futures are close to zero, and premiums for systematic risk do not differ significantly across assets and futures. There is, however, evidence consistent with a specific alternative model presented by Hirshleifer (1988). Returns in foreign currency and agricultural futures vary with the net holdings of hedgers, after controlling for systematic risk. These results imply a degree of market segmentation and support hedging pressure as a determinant of futures premiums.

McCurdy (1992) studied weekly data for foreign currency futures prices are examined for evidence of risk premium. Covariance risks are measured with respect to the excess returns from benchmark portfolios for consumption and wealth. When the parameters

representing the prices of the covariance risks are held constant, no risk premiums are detected. However, when these prices are allowed to vary with the conditional expected returns and variances of the benchmark portfolios, possibly reflecting changing investment opportunities, strong evidence of risk premiums is obtained.

The article by Glen and Jorion (1993) focused on "buy and hold" strategies, constructed purely as hedges, which are described in a later section. A number of studies on foreign exchange markets claim that foreign exchange movements contain a predictable component. Glen and Jorion (1993) and Levich and Thomas (1993) showed that by taking positions in foreign exchange derivatives based on forecasts of exchange rate movements, it is possible to earn "excess returns." The key unresolved issue regarding these returns is whether they represent compensation for risk exposure. Exploiting apparent foreign exchange market inefficiencies may offer the potential to enhance expected return without increasing risk.

Samant (1997) suggested that external commercial borrowings have emerged as a cheaper financing option due to the interest rate differential in foreign currency as compared to Rupee borrowings. Though the foreign loan is cheaper in terms of interest rate, it is fraught with risks, viz. exchange rate risk, forward premium levels and economic factors like influence of RBI on spot rates etc. and therefore a detailed hedging strategy along with proper internal control systems is to be laid down by corporate. It is necessary for the company to ascertain the risk bearing capacity and specifically realistic projections of imports and exports over the tenure of the loan and realistic projections of profitability during the currency of loan to be made so as to absorb the exchange rate movement.

Deosthalee (1997) while analysing the Monetary and Credit Policy 1997-98, elaborated on two measures aimed at providing flexibility to corporate in foreign exchange dealings and enabling the Forex market to gain in depth. Firstly, allowing corporate to book forward contracts based on likely receivables and payables according to business projections subject to maximum of average export-import turnover in the preceding two years. This measure is aimed at facilitating the development of long term forward transactions since companies, which have long-term receivables, and payables can take a long-term view. Secondly, the credit policy allows the development of Rupee-Forex Swap market. This gives freedom to Ads to run a swap book within their open position limits and thereby facilitates development of currency swap market and long-dated forward market in India. All these measures provide considerable freedom to corporate treasury. Their success will however, hinge on how they review and formalize their risk management policies and control

mechanisms. In a liberalized environment, risk management could make all the difference between success and stagnation.

Bodnar et al. (1998) confirmed that options are less frequently used than forwards. Furthermore, they found that options were mainly used in long term exposures. Firms avoid using options either because of the cost they incur in order to get the options or because they find another instrument that is better suited for given exposures. According to them, German and US companies use derivatives primarily to manage foreign exchange risk. They said that the main purpose of using derivatives in exchange rate risk management is to minimize the variability of cash flows.

Allayannis and Ofek (2001) found significant evidence that exporters prefer the use of foreign currency derivatives when hedging their operations. They explained this by nature of exporting, which can require customized, short term contracts that are better served by derivatives rather than by long term foreign debt. The advantage of derivative is that they have predetermined cost and are accessible by all companies whereas foreign debt is limited to large firms.

Need and Objectives of the Study

Paraphrase of literature revealed that there is a spectrum of opinions regarding foreign exchange hedging. These studies have proved the efficacy of currency derivatives being used by various international corporate for managing foreign exchange risks, but currency derivatives are a new phenomenon in India, so a need arises to conduct an analysis of investors' perception regarding currency derivatives as a hedging tool in India.

Objectives of the Study

- To understand the perception of investors regarding investment in currency derivatives.
- To find out the factors affecting the investment in currency derivatives.
- To identify the risks involved while investing in currency derivatives.

Data Base and Methodology

This paper focuses on use of currency derivatives as an investment alternative by individual investors as well as risk management tool by Indian corporates. Basically, the spotlight is on three areas: Identify the various alternatives available to the Indian corporate

for hedging financial risks, Awareness level of investors regarding currency derivatives and factors affecting purchase behavior towards currency derivatives. The data was collected from both primary and secondary sources. Secondary data was collected through the annual reports of the company and primary data was collected by conducting surveys which was carried out through a non-disguised structured questionnaire having open-ended, close-ended, and dichotomous and Likert scale based questions. The questionnaire was sent to 125 individuals operating in the state of Punjab. "Pilot survey' for pre-testing the questionnaire was conducted in case of twenty respondents. After the pilot survey certain modifications were introduced in the questionnaire and finally modified questionnaire was used for the detailed study. During editing stage of the responses, it was found that some of the questions in the questionnaire were incomplete. Finally only 100 respondents were retained for the purpose of analysis and results are based on the same. The data has been analyzed using percentages and weighted average score for ranking. For analyzing the questionnaire, simple as well as cross tabulation has been used along with percentages.

Data Analysis and Interpretation

Table 2

Demographic Profile

Demographics	**No. of Respondents**	**Percentage of Respondents**
Age		
18-25 years	20	20
26-35 years	45	45
36-45 years	25	25
Above 45	10	10
Total	**100**	**100**
Gender		
Male	100	100
female	0	0
Total	**100**	**100**
Occupation		
Govt. Employees	5	5
Private Employees	30	30
Businessman	65	65
Total	**100**	**100**
Income (Rs.)		
15,000-25,000	20	20
25,000-35,000	50	50
35,000-50,000	20	20
Above 50,000	10	10
Total	**100**	**100**

Table 3

Type of investors participating in Currency Derivatives Market

Participation	Number of Respondents	Percentage of Respondents
Speculator	27	27
Arbitrager	12	12
Hedger	61	61
Total	**100**	**100**

Table 3 shows that a majority of the respondents i.e. 61 percent participate in currency derivatives as a hedger while 27 percent of the respondents participated in currency derivatives as a speculator.

Table 4

Proportion of Currency Derivatives in Investment

Proportion	Number of Respondents	Percentage of Respondents
Less than 25%	70	70
25-50%	12	12
50-75%	15	15
More than 75%	3	3
Total	**100**	**100**

Table 4 shows that fair majority of the respondents (70 percent) have less than 25% of their entire investment in currency derivatives as these appear to be risky investments.

Table 5

Time Period of Contract in Currency Derivatives

Duration	Number of Respondents	Percentage of Respondents
Less than 1 month	67	67
1-2 month	14	14
2-3 month	19	19
Total	**100**	**100**

Table 5 indicates that 67 percent of the people have involved themselves in the contract of 1 month expiry, whereas 19percent of respondents enter into contracts with expiry period of 2-3 months.

Table 6

Factors affecting Investment in Currency Derivatives

Factors	Number of Respondents	Percentage of Respondents
Hedges risk	22	22
Low transaction Cost	7	7
Price discovery	8	8
Insurance against future	15	15
Unlimited profits	6	6
Less margin money	42	42
Total	**100**	**100**

Table 6 analyzes various factors affecting the investment in currency derivatives and shows that 48 percent of the respondents believed that less margin money was the factor that prompts them to invest in currency derivatives and 22 percent of the respondents believed that hedges risk was the factor that prompts to invest in currency derivatives and 15 percent of the respondents think that insurance against future was the factor that prompts to invest in currency derivatives while rest of them(very less) believed that low transaction cost and price discovery were the main factors that prompt to invest in currency derivatives. That indicates that most important factor being considered by the respondents is less margin money and should further be reduced so as to attract more and more investors.

Table 7

Most Important Risk Factors in Currency Derivatives Investments

Factors	Rank 1	Rank 2	Rank 3	Rank 4	Total	Rank
To maintain M2M margin	50	20	20	10	190	2
Very high fluctuations	60	4	6	30	206	1
Less time period to hold the financial instrument	45	35	15	5	180	3
Heavy lots	45	45	7	3	168	4

Table 7 provides for the various risk factors that influence the investor's decision regarding investing in currency derivatives. For analysis, weighted average score method was used where 1 rank was the most preferred rank and 5 was the least preferred rank. It shows that majority of the respondents felt that very high fluctuation is the most risky factor and it was given rank 1. Then maintaining M2M margin is also considered risky and was given rank 2. Then less time period to hold the financial instruments were considered as rank 3 and rank 4 was given to heavy lots.

Table 8

Barriers in Participating in Currency Derivatives

Factors	Number of Respondents					W.A.S.	Rank
	SA	A	N	D	SD		
Less knowledge about currency derivatives	50	21	13	9	7	26.5	1
Traditional settlement system	21	15	7	34	23	18.5	3
Lack of innovative products	42	20	21	11	6	25.4	2
Low open interest limit	15	10	15	35	25	17	4

Table 8 indicates that majority of the respondents believe that lack of knowledge about the currency derivatives is the main barrier that prevents investors from investing in derivatives market and it was ranked at number 1. Then lack of innovative products got Rank 2, so there should be innovations in the products or the features of the product can be enhanced/ innovated. The traditional settlement system is also a barrier at number 3 so settlement could be made a bit faster. Rank 4 was given to lower open interest limit.

Conclusion

In the current scenario, investing in derivative markets is a major challenge ever for the investors. Currency Derivatives acts as a major tool for hedging the risk caused by exchange rate fluctuations. This study identifies that a perception with majority of investors is that currency derivatives trading can be used for hedging, particularly. The nature of the derivatives instruments are to reduce the risk involved in trading so real time investors are taking currency derivatives trading for reducing their risk involved in trading and making profits and they considered these to be important factors for making investment. The investors should be made aware of the various hedging and speculation strategies, which can be used for reducing their risk. Awareness about the various uses of currency derivatives can help investors to reduce risk and increase profits as the lack of knowledge appears to be the most significant barrier to investors that prevents the investors from investing.

References

Allayannis, G., & Weston, J. (2001).“The Use of Foreign Currency Derivatives and Firm Market Value,” Review of Financial Studies, 14(2), 243-276.

Allayannis, G., Ofek, E. (2001).“Exchange rates exposure, hedging, and the use of foreign currency derivatives,” Journal of International Money and Finance, 20, 273-296.

Bessembinder, H. (1992). “Uniformity of Risk Pricing in Futures and Asset Markets,” *Journal of Financial Study*. 18(3), 10-28.

Bodnar,G., Marston, H. & Hayt, W. (1998) Survey of Risk Management by U.S. Non-Financial Firms,” Financial Management, 27(4),

Deosthalee, Y.M. (1997).“Optimal Cash Management-Onus on Corporate Treasury” The Chartered Accountant, Journal of ICAI, New Delhi.

Glen,J., & Jorion, P. (1993). “Currency Hedging for International Portfolios,” Journal of Finance, 48(2), 1865-1886.

Harvey, C. (1991).“Volatility Implications of around-the-clock Foreign Exchange Trading with Transaction Data on Futures,” Journal of Financial Study, 4(3), 543-569.

McCurdy, T.H. (1992).“Weekly Data for Foreign Currency Futures Prices,” Journal of Financial Study, 5(1), 65-83.

Samant, R. (1997).“Foreign Currency Loan-For Better or For Worse?” The Chartered Accountant, Journal of ICAI, New Delhi