Article can be accessed online at http://www.publishingindia.com

An Empirical Study on Factors Affecting the Usage of Currency Derivatives with Reference to India

Ankita Srivastava*

Abstract

The present paper examines the use of currency derivatives in order to understand the driving forces behind its usage. The analysis carried on 83 non-banking Indian firms revealed that firms with greater growth opportunities and less financial constraints are more likely to use currency derivatives. This result suggests that firms might use derivatives to reduce cash flow variation that might otherwise preclude firms from investing in valuable growth opportunities. The overall analysis reveals that debt ratios i.e. foreign currency borrowing and long term debt ratio along with the income ratios like export ratio and profit before tax are the important microeconomic variables for using currency derivatives

Keyword: Currency Derivatives, Foreign Currency Borrowing, Long Term Debt Ratio, Export Ratio Profit Before Tax etc

Introduction

Investment on securities such as shares, debentures, bonds etc. are profitable as well as exciting. It is indeed rewarding but involves a great deal of risk. Shapiro (2006) describes the emergence and growth of the market for derivative instruments can be traced back to the willingness of risk averse economic agents to guard themselves against uncertainties arising out of fluctuations in asset prices. Kawaller, the President of Kawaller & Company, LLC and Managing Director of the Kawaller Fund in Brooklyn, NY (2008) analysed the prevailing scenario and stated that currency risk is an inherent aspect of international commerce. Fortunately, for enterprises that function in this space-particularly for those that transact with counterparties having major currencies as their functional currency, there are a variety of derivative instruments that can be used in connection with these risks, including forward contracts, futures contracts, options, and cross currency interest rate swaps. Familiarity with these tools, while necessary, isn't enough. Managing these risks requires enterprise wide coordination. Otherwise, the risk mitigating efforts by a subsidiary or related party may end up exacerbating the exposure of the consolidated entity.

The financial sector reforms in the decade of 1990s have transformed the Indian capital markets into a contemporary one that is vibrant and global. The year 2001 was special for the Indian capital markets as the derivatives segment was introduced. A derivative is a financial instrument, which derives its value from some other financial price. The most commonly used derivatives contracts are forwards, futures, options and swaps. With the introduction of the derivatives, the speculative trades have shifted to a more restricted environment with risk inhibition measures like margining, monitoring and inspection of the activities of a variety of participants. Derivatives trading commenced in India in June 2000 after the SEBI granted the approval to this effect in May 2001. On October 1, 2008 BSE (Bombay Stock Exchange) launched its currency derivatives segment in dollar-rupee currency futures as the exchange traded currency futures contracts facilitate easy access, increased transparency, efficient price discovery, better counterparty credit risk management, wider participation and reduced transaction costs. A large variety of derivative contracts have been launched at exchanges across the world including India. Some of the factors driving the growth of financial

* Research Scholar, ICFAI University Dehradun, Uttarakhand, India. E-mail: ankita.srivastava2007@gmail.com

derivatives are:

1. Increased volatility in asset prices in financial markets.
2. Increased integration of national financial markets with the international financial markets.
3. Marked improvement in communication facilities and sharp decline in their costs.
4. Development of more sophisticated risk management tools, providing a wider choice of risk management strategies.
5. Innovations in the derivatives markets, which optimally combine the risks and returns over a large number of financial assets, leading to higher returns, reduced risk and lower transactions costs as compared to individual financial assets.

Literature Survey

Junior (2011) studied the exchange rate exposure and its determinants for a sample of non-financial Brazilian firms. The data for analysis were collected from both companies' annual reports and Economatica, a database that contains stock market and financial data for all Latin American publicly traded companies. A sample of Brazilian non-financial publicly traded companies from 1996 to 2006 was used. The sample contains information for all companies in the database in 1996 and existed until 2006, a total of 173 companies. The final sample comprised more than 50 percent of all publicly traded companies in Brazil and 67.9 percent of all market capitalisation. The Sao Paulo stock exchange index (IBOVESPA) was adopted as the domestic stock market return because the it is the most important and liquid stock market in Brazil. The savings account interest rate was used as the risk-free interest rate. The analysis revealed that the number of firms exposed to exchange rate fluctuations was higher in periods of crisis and under a fixed exchange rate regime. In addition, the results indicated, though companies' international activities, operational hedging, and financial policies are important determinants of firms' exposure, the changes in companies' exposure that took place when Brazil moved from a fixed to a floating exchange rate regime were mainly driven by changes in companies' foreign currency borrowing and the use of derivatives that occurred in that period.

Allayanis, Lel and Miller (2011) examined the impact of currency derivatives on firm value, using a broad sample of firms from 39 countries with significant exchange-rate exposure. Derivatives can be used for managers' self-interest, for hedging or for speculative purposes. The paper hypothesizes that investors can appeal to a firm's internal (firm-level) and external (country-level) corporate governance to draw inferences on a firm's motive behind the use of derivatives, since well-governed firms are more likely to use derivatives to hedge rather than to speculate or pursue managers' self -interest. The analysis supported the hypothesis as strong evidences that the use of currency derivatives for firms that have strong internal firm-level or external country-level governance is associated with a significant value premium. A positive and significant association between a firm's use of currency derivatives and value for the sample of firms with exposure, suggesting that on average the use of foreign currency derivatives for foreign firms with exchange-rate exposure adds value.

Al-Shboul and Alison (2009) investigated the impact of the use of derivative on the foreign exchange-rate risk exposure with respect to the firm's ownership structure for a sample of 62 Australian multinational corporations. The three variables used as proxies for a firm's ownership structure are the percentage of the shares held by directors, block-holders, and institutions. The sample firms for the study were primarily taken from the Australian Stock Exchange (ASX) database consisting of the largest 500 Australian listed firms. Applying a reference point of January 2004, 485 firms were initially identified. The four specific selection criteria were applied in finalizing the number of firms in the sample which resulted in a final sample of 62 large, Australian multinational corporations. A two stage market model had been used. The study found that the use of foreign currency derivatives was associated with exposure reduction. The percentages of shares held by block-holders and institutions were found to be significantly positively related to foreign exchange risk exposure, while the percentages of shares held by directors was not significantly associated to exposure.

Anand and Kaushik (2008) surveyed the Indian firms to examine management's motivations for usage of foreign currency derivatives in corporate India vis-à-vis the rest of the world. The study examined whether management motivations differs between users and nonusers of currency derivatives and also between those who have documented foreign exchange risk management policy

and those who have not in a factor-analytic framework. A questionnaire was developed based on study of derivatives use in Australia by Bensen and Oliver. It listed in detail both, the motivations and hindrances to the use of derivatives for achieving the 'hedging risk' objective. The population of companies selected for the study consisted of 640 companies with foreign exchange exposure, which were common across two most widely used Indian stock market indices namely S&P CNX 500 and BSE 500 firms as at the end of March 31, 2004. Of the 640 requests, 55 completed questionnaires were returned by November 2005, resulting in a response rate of 8.59%. Financial information on the population and the sample firms on profitability, size, forex exposure, and risk criteria were taken from CMIE PROWESS database. The variables considered for profitability of firms were: 'profits after tax',' cash flow from operations', 'return on net worth', and 'return on capital employed'. Firm size had been measured in terms of: 'net sales', 'net worth', and 'net fixed assets'. Forex exposure had been looked at in terms of: 'gross exposure' (imports as a percentage of sales) and 'net exposure' (imports net of exports as a percentage of sales).The variables considered for risk were: 'interest coverage ratio', 'current ratio', 'quick ratio', 'debt-to-equity ratio' and beta. Of the 55 firms that responded to the survey, 46 or 84% indicated that they use foreign currency derivatives to manage risk, and 38 or 70% indicated that they had a documented foreign exchange risk management plan/ policy/ programme. The results suggested that the major motivations for the use of foreign currency derivatives for hedging are: 'to reduce volatility in the profits after tax (PAT)'; 'to reduce risks faced by the management'; 'to facilitate budgeting and control process in the firm'; 'to reduce volatility of cash flows'; and 'to improve value of the firm'.

Benson and Faff (2004) assessed the currency risk management policies for a sample of Australian international equity trust. Currency risk management had been studied in the context of exchange rate exposure and performance measures. The study considered different economic climate from 1995 to 2001 with special emphasis on Asian crisis in mid-1997. The results suggested that a large percentage of funds implement specific currency risk management policies. The relationship between currency risk management policies and performance of funds had also been studied using Treynor and Mazuy (1966) and Henriksson and Merston (1981) models for selectivity performance. The analysis revealed that generally funds were unable to outperform the market index.

Allayanis and Ofek (2001) examined whether firms use foreign currency derivatives for hedging or for speculative purposes. A sample of S&P 500 non-financial firms for 1993 was used. The data on year-end notional value of forward contracts reported in the footnotes of the annual reports of all the S&P 500 nonfinancial firms in 1993. The S&P 500 financial firms had been excluded because most of them were also market-makers in foreign currency derivatives; hence, their motivation for using derivatives could be very different from that of the nonfinancial firms. The sample's notional values of foreign currency derivatives also include foreign currency options, if a firm disclosed a combined number. However, these values did not include foreign currency swaps. The total sample consisted of 378 firms with a mean value of sales of $7345 million. Approximately 42.6% of the 378 firms in the sample that had complete foreign currency derivatives data use foreign currency derivatives. In all tests the ratio of foreign currency derivatives to total assets was used. The regression analysis revealed that firms use currency derivatives for hedging, as their use, significantly reduces the exchange rate exposure firms' face. The result also suggested that, while the decision to use derivatives depends on exposure factors (i.e., foreign sales and foreign trade) and on variables largely associated with theories of optimal hedging (i.e., size and R&D expenditures), the level of derivatives used depends only on a firm's exposure through foreign sales and trade.

Allayanis and Weston (2001) studied the use of foreign currency derivatives and its potential impact on firm value. The analysis was done on 720 large non-financial U.S. firms for the period 1990-1995. Tobin's Q had been used as a proxy for firm value. The result suggested that there was a positive relation between firm value and foreign currency derivatives usage. The analysis also revealed that the firms which were exposed to exchange rate used hedging as a strategy against these fluctuations.

Aggarwal and DeMaskey (1997) documented that for the Asian emerging markets, hedging currency risks using futures and options in major currencies such as the Japanese yen could be beneficial and result in improved Sharpe performance indexes (SPIs). The data used in the study covered the 10-year period, January, 1983—December, 1992, and are taken from the United States

Department of Agriculture(USDA), IMIVl Yearbooks, International Monetary Fund Statistics, Futures Industry Institute Data, Philadelphia Stock Exchange, and the Federal Reserve Bulletin. The results suggested that SPIs for investments in Hong Kong, Singapore, and Taiwan dollars increased by large amounts with cross hedges using derivatives in any of the developed country currencies. It also indicated that, on average, fairly small proportions of emerging market currency risk were eliminated even though all of the minimum risk hedge ratios are significant. However, overall these results showed that a currency risk-management strategy that cross-hedges Asian emerging market investments by using options and futures denominated in the more liquid developed-country currencies could improve the risk-return combination of such portfolios. These results were of practical and policy interest.

Christopher, Minton and Schrand (1997) examined why and which kind of firms use currency derivatives and differentiated among existing theories of hedging behavior. The paper also aimed to identify the determinants of currency derivatives usage. The study used the data of 372 out of Fortune 500 non-financial firms. All these 372 firms were exposed to foreign currency risk from foreign operations, foreign denominated debt or high concentration of foreign competitors in their industries. Approximately 41% of these firms use currency swaps, forwards, futures, options or combination of these instruments. The analysis suggests that firms with greater growth opportunities and tighter financial constraints are more likely to use currency derivatives. The analysis for determinants suggests that research and development expenses and short term liquidity are significant variables for firms with foreign operations. Pre-tax income and sales have been found as significant variable for foreign denominated firms.

Huffman and Makar (2001) examined the firm value effects of exchange rate changes in relation to the use of short-term foreign exchange derivatives (FXD) for U.S. multinationals. In this paper, recently available data on FXDs has been incorporated into the analysis of foreign currency exposure for U.S. MNCs operating in the manufacturing sector. It provides the evidence that the lagged firm value effects of changes in exchange rates are particular to low FXD users, and that the magnitude of such currency exposure decreases monotonically across FXD user groups. The results indicate that cross-sectional differences in the magnitude of lagged currency exposure are inversely related to FXD use.

Objectives

To identify (from literature) the firm specific i.e. microeconomic factors affecting the need of currency derivatives and to study the relationship between the identified variables and usage of currency derivatives in Indian context.

Data and Methodology

The sample comprised 83 non-banking firms out of NSE 100 firms from the classification of CMIE Prowess database. The multiple regression analysis has been done to see the impact. These 83 companies represent various industries and the data for banks is unavailable for the dependent variable i.e. forex spending to total spending. So banks have been dropped from the analysis. The time period for the data for the study is 2008-2013 (six years). The analysis has been done on cross sectional basis which means firm wise in order to see the year after year change in their pattern.

Selection of Variables

Dependent Variable

The motive of the paper is to see derivatives use, not "hedging," so the dependent variable might measure speculation rather than hedging. Therefore, the study considers firms' motives in using currency derivatives to speculate and the implications of speculation for the results. The dependent variable used for the study is foreign currency spending to total expenditure.

Independent Variables

Two measures of borrowing capacity as proxies for a firm's pre-hedging probability of financial distress has been used: the interest coverage ratio and the long-term debt ratio The lower a firm's coverage ratio and the higher its long-term debt ratio, the greater the probability of financial distress. Consequently, the *expected* costs of financial distress for those firms are greater, assuming that exogenous bankruptcy costs are constant across firms. Therefore, the lower a firm's coverage ratio and the

higher its long-term debt ratio, the more likely the firm is to use derivatives, ceteris paribus. Nance *et al* 1993. predict negative relations between derivatives use and these debt instruments.

Nance *et al.* also argue that firms can reduce the expected financial distress and agency costs associated with long-term debt by maintaining greater short term liquidity. The variable used as proxy for a firm's short-term liquidity is the quick ratio. The quick ratio, a variant of the current ratio, measures a firm's ability to repay short-term operating liabilities with readily available cash.

Two variables as proxies for the growth opportunities available to firm have been used. RD is the ratio of a firm's research and development expenditures to sales; PPE is the ratio of a firm's capital expenditures for property, plant, and equipment to firm size.

Christopher *et al.*(1997) argue that the likelihood of using currency derivatives is also positively related pretax income and sales (PBT/sales), and foreign-currency borrowing. These results are consistent with the argument that the benefits of hedging are greatest and the costs lowest for firms with extensive foreign exchange-rate exposure.

Firms with greater variation in cash flows or accounting earnings resulting from exposure to foreign exchange-rate risk have greater potential benefits of using currency derivatives. The measure of this variation related to operating activities has been taken using the absolute value of the ratio of foreign income (export) to total sales The higher a firm's foreign income, the greater the benefits from hedging.

Firm size (SIZE) is a proxy for economies of scale in the costs of hedging. As discussed in Nance *et al.*, there are alternative arguments for either a positive or negative relation between firm size and hedging activity. For example, smaller firms should hedge more, ceteris paribus, because of the inverse relation between firm size and bankruptcy costs (Warner, 1977).

Data Analysis

The data have been analysed using multiple regression analysis. This is a cross sectional study which has used the data for 83 NSE listed companies.

The model used for analysis is:

FX exp/Total exp = α +β1Ln TA+β2 QR+ β3ICR+β4 PBT/Sales +β5 FCB/TB+ β6LTD+β7 R&D exp/Total Exp +β8 PPE+β9 Export sales/total sales+e where the terms meaning has been defined below:

FX exp/Total exp = Foreign currency expenditure to total expenditure

Ln TA = measure of firm size

QR= Quick Ratio

ICR= Interest coverage ratio

PBT/Sales= Profit before tax to sales ratio

LTD= Long term debt ratio

R&D/exp/total exp= Research and Development expenditure to total expenditure

PPE= Plant, property and equipment to total assets ratio

The year wise analysis has been shown in Table 1.

Table 1: Year wise analysis

Year	*R Square*	*Std. Error of the Estimate*	*F Change*	*Sig. F Change*	*Durbin-Watson*
2008	.554	.23389447	6.038	.016	2.078
2009	.438	.17387237	3.466	.002	2.161
2010	.794	.23069802	1.631	.017	1.522
2011	.567	.18683780	1.422	.058	2.067
2012	.648	.19642204	1.277	.006	2.154
2013	.589	.17425726	2.939	.005	2.110

The results clearly suggest that the model used for the analysis is significant but further more variables should be included in order to improve the values of R square. R square suggests us that how much variation in the dependent variable is occurring due to independent variables taken for the study. This is further confirmed by the significant values of F which indicate the right inclusion of independent variables. The Durbin – Watson values popularly known as DW statistics for autocorrelation is also within the ranges of no autocorrelation or zone of indifference. The coefficients values for different years have been given in Table 2 (a) through (f).

Table 2 (a): Coefficients (2008)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.145	.178		-.816	.417		
	lnintcov	.016	.015	.169	1.050	.298	.406	2.466
	quickratio	.011	.015	.083	.716	.477	.774	1.291
	ltdtota	.848	.344	.335	2.468	.016	.570	1.754
	ppetosize	.130	.136	.108	.957	.342	.830	1.205
	fcbtota	.584	.343	.220	1.704	.093	.630	1.586
	rndtosales	-.378	1.374	-.031	-.275	.784	.846	1.182
	pbttots	.000	.000	-.141	-1.305	.197	.902	1.108
	lnta	.018	.017	.116	1.032	.006	.838	1.194
	exporttosales	.263	.080	.386	3.270	.002	.752	1.329

Table 2 (b): Coefficients (2009)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.136	.168		-.786	.417		
	lnintcov	.012	.011	.189	1.063	.298	.406	2.466
	quickratio	.009	.006	.093	.702	.477	.774	1.291
	ltdtota	.845	.654	.328	2.568	.006	.570	1.754
	ppetosize	.136	.226	.128	.897	.342	.830	1.205
	fcbtota	.594	.263	.280	1.654	.063	.630	1.586
	rndtosales	-.428	1.374	-.042	-.375	.784	.846	1.182
	pbttots	.000	.000	-.135	-1.207	.197	.902	1.108
	lnta	.028	.017	.226	1.552	.016	.838	1.194
	exporttosales	.323	.280	.256	2.270	.023	.752	1.329

Table 2 (c): Coefficients (2010)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.045	.237		-.189	.851		
	lnTA	.022	.024	.116	.891	.377	.776	1.288
	quickratio	-.039	.056	-.087	-.702	.485	.867	1.153
	rndtosales	-.913	1.669	-.070	-.547	.586	.805	1.242
	pbttosales	-.002	.001	-.425	-2.660	.010	.518	1.930
	exporttosales	.278	.100	.374	2.770	.007	.726	1.378
	ppetosize	.142	.181	.103	.782	.437	.768	1.301
	LTDtoTA	.797	.613	.219	1.299	.099	.466	2.145
	FCBtoTA	.021	.551	.006	.038	.070	.583	1.716
	lnintcov	.000	.021	-.006	-.031	.975	.405	2.471

Table 2 (d): Coefficients (2011)

Model		*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig.*	*Collinearity Statistics*	
		B	*Std. Error*	*Beta*			*Tolerance*	*VIF*
1	(Constant)	-.176	.203		-.869	.388		
	lnint.cov	.012	.015	.137	.785	.435	.430	2.323
	PBTtosales	.000	.000	-.312	-2.263	.027	.686	1.457
	FCBtoTA	.336	.427	.114	.787	.034	.626	1.597
	PPEtosize	.081	.136	.075	.595	.554	.816	1.226
	LnTA	.029	.020	.186	1.458	.050	.798	1.253
	quickratio	.000	.025	-.003	-.027	.978	.866	1.155
	exporttosales	.240	.093	.346	2.573	.012	.719	1.392
	LTDtoTA	.317	.461	.113	.689	.094	.487	2.053
	RnDtosales	-.772	1.241	-.079	-.622	.536	.803	1.245

Table 2 (e): Coefficients (2012)

Model		*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig.*	*Collinearity Statistics*	
		B	*Std. Error*	*Beta*			*Tolerance*	*VIF*
1	(Constant)	-.132	.219		-.601	.550		
	lnint.cov	.020	.013	.240	1.455	.150	.473	2.112
	PBTtosales	-6.937E-5	.000	-.280	-2.209	.031	.802	1.247
	FCBtoTA	.615	.368	.244	1.669	.100	.603	1.657
	PPEtosize	-.002	.161	-.001	-.011	.991	.740	1.351
	LnTA	.021	.021	.130	.976	.333	.729	1.371
	quickratio	.011	.018	.073	.614	.041	.901	1.110
	exporttosales	.143	.081	.208	1.764	.082	.927	1.079
	LTDtoTA	.661	.508	.205	1.301	.098	.522	1.915
	RnDtosales	.046	.105	.053	.438	.063	.872	1.147

Table 2 (f): Coefficients (2013)

Model		*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Sig.*	*Collinearity Statistics*	
		B	*Std. Error*	*Beta*			*Tolerance*	*VIF*
1	(Constant)	-.189	.122		-1.552	.126		
	LTDtoTA	.511	.404	.179	1.266	.010	.549	1.821
	RnDtoSales	-.071	.938	-.009	-.076	.043	.858	1.165
	FCBtoTA	.135	.328	.057	.410	.683	.569	1.756
	PPEtosize	-.299	.163	-.248	-1.827	.072	.594	1.683
	PBTtosales	-1.017E-5	.000	-.056	-.309	.758	.338	2.957
	quickratio	.025	.037	.079	.685	.096	.829	1.206
	exporttosales	.121	.067	.274	1.805	.076	.473	2.113
	LnTA	.045	.012	.618	3.880	.000	.431	2.323
	lnintcovratio	-.003	.012	-.034	-.222	.025	.478	2.091

Results and Conclusion

The result of year 2008 suggests that the long term debt ratio, foreign currency borrowing to total assets ratio, firm size and export income ratio are the most contributing variables which have driven the company to use foreign exchanges. These variables are significant at 5%, 10% and 1% respectively.

The result of year 2009 also suggests that the long term debt ratio, foreign currency borrowing to total assets ratio, firm size and export income ratio are the most contributing variables which have driven the company to use foreign exchanges. These variables are significant at 1%, 10% and 5% respectively. For the year 2010 PBT ratio, export ratio, long term debt ratio and foreign currency borrowing ratio are significant at 1% and 10% which means that in this year export income has grown which might be a result of recovery from the meltdown of year 2008.

For the year 2011 again PBT ratio, export ratio, firm size, foreign currency borrowing ratio, long term debt ratio are significant. The significant FCB and long term ratio along with significant export ratio indicates the overwhelming response to the increase in export income. It means due to increase in export income companies got interested in investing more and more in Foreign operations

For the year 2012 PBT ratio, export ratio, quick ratio, foreign currency borrowing ratio, long term debt ratio and R&D ratios are significant. The significant R&D ratio again signifies companies' grown interest in developing products which meet global requirement and generate foreign income. The continuous significance of foreign currency borrowing and long term debt indicates more investment in Forex generation.

The variables which played a significant role in driving the Forex usage in the year 2013 are long term debt ratio, R&D ratio, PPE ratio, quick ratio, export ratio, firm size and interest coverage ratio. The interest ratios in this year and might possible in next few years come significant because of companies' enough debt and enough debt paying capacities. Here enough debt paying capacities has been mentioned due to significant PBT ratio and export income ratio which have been found significant in almost all the years of analysis. The significant PPE ratio might be due to substantial increase in companies fixed assets due to overall profits and this directly increases the firm size which also has been found significant.

The overall analysis reveals that debt ratios (FCB and LTD) along with the income ratio (export ratio and PBT ratio) are the main driving force for forex usage by companies' which is in line with the results of Christopher *et al.* (1997). Though some other variables were found to be significant in different years but the vital variables are the above mentioned ones along with some unidentified variables which need to be identified in further studies.

References

Aggarwal. R., & DeMaskey, A. L. (1997). Using derivatives in major currencies for cross-hedging currency risks in Asia emerging markets. *The Joumal of Futures Markets,* 17(7), 781-796.

Allayanis, G., & Weston, J. P. (2001). The use of foreign currency derivatives and firm market value. *The Review of Financial Studies*, spring, 14(1), 243–276.

Allayanis, G., Lel, U., & Miller, D. P. (2011). *The use of foreign currency derivatives, corporate governance, and firm value around the world.*Allayannis, G., & Ofek, E. (2001). Exchange rate exposure, hedging, and the use of foreign currency derivatives. *Journal of International Money and Finance*, 20, 273–296.

Al-Shboul, M., & Alison, S. (2009). The effects of the use of corporate derivatives on the foreign exchange rate exposure. *Journal of Accounting – Business & Management*, 16(1), 72-92.

Anand, M., & Kaushik, K. P. (2008). *IIMB Management Review*, September

Benson, K. L., & Faff, R. W. (2004). The relationship between exchange rate exposure, currency risk management and performance of international equity funds. *Pacific-Basin Finance Journal,* 12, 333– 357.

Christopher, G., Minton, A. G., & Schrand, C. (1997). Why firms use currency derivatives. *The Journal of Finance*, 52(4).

Henriksson, R. D., & Merton, R. C. (1981). On market timing and investment performance: Statistical procedures for evaluating forecasting skills. J. Bus., 54, 513-533.

Huffman, S., & Makar, S.D. (2001). Foreign exchange derivatives, exchange rate changes and the value of the firm: U.S. multinationals' use of short-term financial instruments to manage currency risk. *Journal Of Economics And Business, 53.*

Nance, D. R., Clifford W. S., Jr., & Smithson, C. W. (1993). On the determinants of corporate hedging. *The Journal of Finance*, 48, 267-284.

Kawaller, I. G. (2008). Hedging currency exposures by multinationals: Things to consider. *Journal of applied Finance,* Spring/Summer

Rossi, J. L. (2011). Exchange rate exposure, foreign currency debt and the use of derivatives: Evidence from Brazil. *Emerging Markets Finance & Trade,* 47(1), 67–89.

Serafini, D. G., & Sheng, H. H. (2011). The use of foreign currency derivatives and the market value of Brazilian companies listed at the bovespa stock exchange. *RAC, Curitiba*, 15(2), 283-303.

Shapiro, A. C. (2008). *Multinational financial management* (8th ed.) pp. 246-279. Wiley Student Edition, Wiley India (P.) Ltd., New Delhi.

Treynor, J., & Mazuy, F. (1966). Can mutual funds outguess the market?. *Harvard Business Review*, 131-136.

Warner, J. B. (1977). Bankruptcy costs: Some evidence. *The Journal of Finance*, 32, 337-348