

## **A STUDY ON ASSET PRICE FLUCTUATION AND THE IMPACT OF FOREIGN EXCHANGE RATE ON EQUITY PRICING**

**Manas Ranjan Panda\* and Jayant Kumar Parida\*\***

*Abstract:* The present study took an attempt to identify the asset price fluctuations and the role of exchange rate as premium or discount for some common stocks with respect to 4 major international stock markets. Considering the data for approximately 10 stocks between 1<sup>st</sup> April 2003 to 31<sup>st</sup> March 2008, in USA, INDIA, United Kingdom and Germany, the study concludes that the average change in returns obtained due to currency volatility is high in case of Indian companies as compared to Germany and UK which implies that the currency volatility adds a premium to the return of the companies trade in Indian markets as compared to USA stock markets. At the same time, most of the UK and German companies are having positive returns implying the currency volatility acts as a discounting factor in the stock markets of UK and Germany. The negative Gamma at Indian and UK stock market concludes an inverse relationship between assets price movements and exchange rate fluctuations, where as a positive Gamma coefficient of Germany. Thus, it can be concluded that the Exchange Rate risk certainly affects the stocks trading in two different stock markets. But its effect and whether it acts as a premium or discount over the returns, depends on the foreign rate movement with respect to the stock market.

*Keywords:* Asset Price, Currency Risk, Exchange rate Risk, CAPM, ICAPM

### **INTRODUCTION**

Equity prices and exchange rates share is continuously drawing the attention of the researchers, including excess volatility in both scenarios with respect to their fundamentals. In the recent time is witnessing a spectacular increase in cross-border equity flows whose returns are affected by both equity returns and the exchange rate returns. It is obvious that changing exchange rates affect the competitiveness of firms engaged in international competition. A falling home currency promotes the competitiveness of firms in home country by allowing them to undercut prices charged for goods manufactured abroad. It enhances the profit probability and in other way increases the expected return requirement of the investors. Economic theory suggests that under a floating exchange rate regime, exchange rate appreciation reduces the competitiveness of export markets. Conversely, if the country is import denominated, exchange rate appreciation may have positive effect on the stock market by lowering input costs and is replicated in the financial market.

---

\* Consultant, Wipro Technologies Ltd. I Chennai I India, E-mail: manas.panda5@wipro.com

\*\* P. G. Dept. of Commerce Iutkal University I Orissa I India, E-mail: jayantakp@yahoo.co.in

Variability in exchange rate is a major source of systematic risk that affects the required return of a firm. Promotion of financial liberalization, substantial increase of international capital movements and adoption of floating exchange rate regimes by many countries has led the path for increased asset price and exchange rate volatility. The firm's exposure towards systematic risk has been increasing. At the corporate level, changes in exchange rates affect the firm value through changes in the future cash flows of the firm. Keeping this in mind, the present study is aiming to pay attention to analyze the asset price movements and the impact of exchange rate fluctuations on equity pricing with respect to some major currencies of the international market. The major contribution of this paper is to find out the way in which exchange rates and equity returns are jointly and endogenously determined. We assume that the world economy is having certain risk free rates and replication of stochastic processes for equity pricing. The exchange rate movements are considered exogenous to the system and its impact on equity pricing is determined from its required rate of return. Required rate of return of the investors are studied with the help of Capital Asset Pricing Model (CAPM) and International Capital Asset Pricing Model (ICAPM).

A quick review of recent past shows that in 1980's, economies opened their stock markets to foreign investors and soon after 1990's severe financial crises affected many of these countries. These events helped generating a strong debate on the effects of stock market liberalization and two specific concerns have been raised in the literature. First one observes co-movement in stock returns across national markets caused by liberalization. Some economists have referred to this effect as financial contagion. The second concern considers stock market return volatility. This issue has been raised by Stiglitz (2002) who states that: 'Capital-market liberalization is inevitably accompanied by huge volatility, and this volatility impedes growth and increases poverty. It increases the risks of investing in the country, and thus investors demand a risk premium in the form of higher-than-normal profits. To consider these issues it is necessary to have a model showing how discount rates in different countries change when the level of cross border consumption risk-sharing changes. The systematic risk premium is the risk premium found in standard CAPM's i.e., the covariance of a country's stock returns with respect to returns on the world market portfolio. The idiosyncratic risk premium measures the portion of country specific idiosyncratic risk which cannot be diversified away because of imperfect cross border risk sharing. It is given by the covariance of a country's stock returns with returns on the country's adjustment portfolio. This adjustment portfolio is so-called because it can be regarded as an adjustment to the world market portfolio. Thus international CAPM helped the investors showing that when there is a change in the level of cross border risk sharing; changes in the discount rate for the country are driven by changes in the idiosyncratic risk premium.

**BACKGROUND OF THE STUDY****Capital Asset Pricing Model (CAPM)**

The Capital Asset Pricing Model (CAPM) was developed by Sharpe (1964), Lintner (1965) and Mossin (1966) to estimate the risk and return in a market. CAPM is a model that describes the relationship between risk and expected return and that is used in the pricing of risky securities. It looks at risk and rates of return and compares them to the overall stock market. With CAPM one assumes that there are no transactional costs or taxation and assets and securities are divisible into small little packets. Basically, two conclusions emerge from Capital Asset Pricing Model. That is the normative conclusion where the optimal investment strategy for any investor is a combination of two portfolios; the market portfolio and the risk-free asset. Second, is the descriptive conclusion that is an equilibrium risk-pricing expression where the expected return on an asset  $i$  is the sum of the risk-free rate plus a market risk premium. On the basis of above exhibition, Expected Return on Asset,  $E(R_i)$  can be computed as follows

$$E(R_i) = R_0 + \beta_i (RP_M) \quad (1)$$

Where  $\beta_i$  is the domestic market exposure of the asset and  $RP_M$  is the domestic-market risk premium. The domestic CAPM extension can be justified only with the addition of two unreasonable assumptions; (1) Investors throughout the world have identical consumption baskets (2) Real prices of consumption goods are identical in every country. In other words, purchasing power parity holds exactly at any point in time.

**International Capital Asset Pricing Model (ICAPM)**

The ICAPM is developed under the assumption that nationals of a country care about returns and risks measured in their home currency. All assumptions of CAPM still hold. In the ICAPM, as in the domestic CAPM, the investors determine their demand for each asset by a mean-variance optimization using their domestic currency as base currency. The two conclusions that emerge from the ICAPM are the assumption of normative that identifies what should be the optimal investment strategy of investors. Second is the descriptive that indicates what should be the equilibrium risk-pricing relation for all assets. The normative conclusion is that the optimal investment strategy for any investor is a combination of two portfolios:

- A risky portfolio common to all investors. This is the world market portfolio optimally hedged against currency risk. The optimal hedge ratios depend on variables such as differences in relative wealth, foreign investment position and risk aversion.
- A personalized hedge portfolio used to reduce purchasing power risks. This is usually assumed to be the home risk-free rate

The risk-pricing expression for the ICAPM is that the expected return on an asset  $i$  is the sum of the risk-free rate plus the market risk premium plus various currency risk premiums. Hence Risk Pricing Expression for ICAPM can be expressed as follows

$$E(R_i) = R_0 + \beta_{iw} (RP_w) + \gamma_{i1} (SRP_1) + \dots + \gamma_{ik} (SRP_k) \quad (2)$$

Where  $\beta$  is the world market exposure of the asset and the  $\gamma$ 's are the currency exposures, or sensitivities, of the asset returns to the various exchange rates (1 to  $k$ ).  $RP_w$  is the world market risk premium and  $SRP_k$  are the currency risk premiums. In the similar fashion, the introduction of one foreign currency, the asset pricing equation of the ICAPM can be simplified to:

$$E(R_i) = R_0 + \beta_{iw} (RP_w) + \gamma_i (SRP_{FC}) \quad (3)$$

The ICAPM would also incorporate the various types of risk a market which is not integrated would involve like currency risk, other market default risk, and market failure risk due to sudden changes. As any country market cannot individually perform without the presence of other world market the beta to be considered has to be with respect to ICAPM and not CAPM, but as any market which is more integrated with world market or is more developed will have its CAPM reflecting the same beta as the ICAPM.

### Difference between CAPM and ICAPM

In the CAPM, investors care only about the wealth their portfolio produces at the end of the current period. In the ICAPM, investors are concerned not only with their end-of-period payoff, but also with the opportunities of the payoff. Like CAPM investors, ICAPM investors prefer high expected return and low return variance. But ICAPM investors are also concerned with the covariance of portfolio returns with state variables. As a result, optimal portfolios are "multifactor efficient," which means they have the largest possible expected returns, given their return variances and the covariance of their returns with the relevant state variables.

The ICAPM differs from the domestic CAPM in two respects:

- The relevant market risk is world (global) risk, not domestic market risk.
- Additional risk premiums are linked to an asset's sensitivity to currency movements. The different currency exposures of individual securities would be reflected in different expected returns.

### Impact of Currency Exposures on Stock Prices

- A local currency exposure is the sensitivity of a stock price (measured in local currency) to a change in the value of the local currency.
- The currency exposure of a foreign investment is the sensitivity of the stock price (measured in the investor's domestic currency) to a change in the value of the foreign currency.

- It is equal to one plus the local currency exposure of the asset
- A zero correlation between stock returns and exchange rate movements would mean no systematic reaction to exchange rate adjustments.
- A negative correlation would mean that the local stock price would benefit from a depreciation of the local currency.
- A positive correlation would mean that the local stock price would drop in reaction to a depreciation of the local currency.

### **Implication of GAMMA Coefficient**

The Gamma reflects the proportion of the face value of imputation credits that is capitalized into the current equity prices. A gamma of "1" suggests that the full face value of imputation credits is capitalized into current equity prices and that foreign investors have been willing to accept a corresponding reduction in their expected rate of return by this same amount. Alternatively, the gamma of "0" suggests that none of the value of imputation credits has been capitalized into equity prices and the foreign investors refuse to lower their required rate of return following the introduction of imputation credits.

### **Arguments for a Low Gamma**

Those ascribing a low value of imputation credit within the CAPM have tended to argue in the following logical form:

- The domestic economy is dependent on foreign capital to finance its investment.
- Foreign investors do not receive any value from imputation credits.
- For the companies to attract foreign equity, on which they are dependent, must offer foreign investors the CAPM rate of return available to them elsewhere.
- As foreign investors do not value imputation credits companies must offer a post tax rate of return where the value of gamma is zero

### **Arguments for a High Gamma**

Analysts supporting a higher value of gamma argue that

- International equity markets are indeed well integrated and the foreign investors place little or no direct value on imputation credits to be paid.

However, accepting a low value of gamma on the basis of foreign investors' valuations amounts to an explicit recognition that the 'international CAPM' rather than the 'domestic CAPM' is appropriate.

### **Objective of the Study**

On the basis of above discussion, the objective of the present research is to examine the asset price fluctuations and the impact of exchange rate movements on asset return with respect to three major currencies of the world. The present study assumes USA as the home country and the returns are calculated with respect to the stock markets of India, UK and Germany. Ten common stocks that are trading in the stock markets of USA, India, UK and Germany are considered and three bilateral currencies are taken into account to trace out the effects of currency movements on expected returns on these markets.

### **Nature and Source of Data**

The data period is spanning from 1st April 2003 to 31 March 2008 with daily closing price. The stock prices of some common stocks that are listed in the stock markets of each pair countries are collected from yahoo finance. T-Bill rate closer to one year of the respective countries are considered as the risk free rate for the economy. The study compares the returns between the stock markets of USA and India, USA and UK and between USA and Germany. With respect to the currencies, USA is considered as the home country and hence, the exchange rates are considered as the number of USA dollar per unit of the currency of another country. The country bench mark indices such as Sensex for India, DAX Index for Germany, FTSE 100 for United Kingdom and S & P 500 for USA are considered as market index for the stock markets of the respective countries. Three exchange rates such as US Dollar - Euro, US Dollar – Sterling and US Dollar – Rupees are utilized to trace out the currency risk factor in the stock return.

### **REVIEW OF EARLIER STUDIES**

**Buckberg, E. (1995)** investigates whether emerging stock markets are now part of the global financial market and characterizes return behavior in these markets. Tests of the conditional International Capital Asset Pricing Model (ICAPM) reveal that eighteen of the twenty largest emerging markets were integrated with the world market between December 1984 and December 1991, but that many of the same markets reject the model when data for 1977-84 are used. These results suggest that large capital inflows from industrial economies, beginning in the late 1980s, caused prices in emerging markets to reflect covariance risk with the world portfolio, thus inducing their consistency with the ICAPM. Stylized evidence from recent market openings suggests that opening expands markets in terms of participants, firms listed, and value, and promotes the capital flows necessary for integration.

**Menzly, L and Santos, T. Veronesi, P. ((2002)** proposed a general equilibrium model that successfully reproduces the historical experience of the cross section of US stock prices as well as the realized history of the market portfolio. The model achieves this while addressing traditional concerns in the asset pricing literature:

A high equity premium and volatility of returns, the long horizon predictability, and a low volatility of the risk free rate. The model combines a rich payoff structure with a habit persistence discount factor, which allows us to identify the effect on prices of idiosyncratic cash flow shocks versus business cycle components. It is concluded as, if assets have identical cash flow betas, the dispersion of individual price dividend ratios increases over business cycle peaks. This result survives if general covariance structure between dividend growth across different assets and consumption growth is allowed. Overall, the model links secular trends in prices to the lower share that these assets contribute to overall consumption but shows that business cycle considerations need to be included in order to fully account for the history of price levels.

**Sheng-Yung Yang and Shuh-Chyi Doong (2004)**, has studied the economic exposure of firms to exchange rate risks for G-7 countries. They have analyzed the stock markets through two portfolio models, those are Flow-Oriented" model and Stock-Oriented" model. They tried to explain the interaction between exchange rate and stock market volatility. The Flow-Oriented" model in which exchange rate movement affects output levels of firms and also the trade balance of an economy. Share price movements on the stock market also affect aggregate demand through wealth, liquidity effects and indirectly the exchange rate. Specifically a reduction in stock prices reduces wealth of local investors and further reduces liquidity in the economy. The reduction in liquidity also reduces interest rates which in turn induce capital outflows and in turn causes currency depreciation. The second is the "Stock-Oriented" model. In this model, the stock market and exchange rate link is explained through a country's capital accounts. The study concludes that the exchange rates are also more sensitive to stock market innovations and global portfolio investments because the rapid integration and deregulation of international financial markets since the 1980s has made the capital flows across borders easier and faster than ever before.

**Hui Guo, Christopher J. Neely and Jason Higbee (2004)** found that standard asset pricing models fail to explain the significantly negative delta hedging errors that occur as a result of the purchase of options on foreign exchange futures. Foreign exchange volatility does influence stock returns, however. The volatility of the exchange rate predicts the time series of stock returns and is priced in the cross section of stock returns.

**Alok Kumar Mishra (2004)** has examined whether the stock market and foreign exchange markets are related to each other or not. The study uses Granger's Causality test and Vector Auto Regression technique on monthly stock return, exchange rate, interest rate and demand for money for the period April 1992 to March 2002. The major findings of the study are (a) there exist a unidirectional causality between the exchange rate and interest rate and between the exchange rate return and demand for money; (b) there is no Granger's causality between the

exchange rate return and stock return. Through Vector Auto Regression modeling, the study confirms that though stock return, exchange rate return, the demand for money and interest rate are related to each other but any consistent relationship doesn't exist between them. The forecast error variance decomposition further evidences that (a) the exchange rate return affects the demand for money, (b) the interest rate causes exchange rate return change (c) the exchange rate return affects the stock return, (d) the demand for money affects stock return, (e) the interest rate affects the stock return, and (f) the demand for money affects the interest rate.

**Michael, J. B., Wang, A. W. and Xia Y. (2004)**, presented a simple valuation model with time-varying investment opportunities is developed and estimated. The model assumes that the investment opportunity set is completely described by the real interest rate and the maximum Sharpe ratio, which follow correlated Ornstein-Uhlenbeck processes. The model parameters and time series of the state variables are estimated using US Treasury bonds yields and expected inflation from January 1952 to December 2000. As predicted, the estimated maximum Sharpe ratio is related to the equity premium. In cross-sectional asset-pricing tests, both state variables have significant risk premia, which is consistent with Merton's ICAPM. Returns on the 30 industrial portfolios do not discriminate clearly between the three models. When both sets of portfolios are included as test assets all three models are rejected but the estimated risk premia for both ICAPM state variables are significant.

**Allen Shew (2008)**, tried to trace out the cause and effect relationships between exchange rate and stock returns of Singapore stock market during the periods of 1990 to 2006. The study found no evidence of causation both uni-directionally and bi-directionally between stock market and foreign exchange market.

**Turgut Tursoy, Nil Gonsel, Husam Rjoub (2008)**, In the paper "Macroeconomic Factors, the APT and the Istanbul Stock Market", empirically tested the Arbitrage Pricing Theory (APT) in Istanbul Stock Exchange (ISE) for the period of February 2001 up to September 2005 on monthly base by employing various macroeconomic variables like money supply (M2), industrial production, crude oil price, consumer price index (CPI), import, export, gold price, exchange rate, interest rate, gross domestic product (GDP), foreign reserve, unemployment rate and market pressure index (MPI) against eleven industry portfolios of Istanbul Stock Exchange to observe the effects of those variables on stocks' returns. The paper showed that the effect of macroeconomic variables varies among the various portfolios significantly and Macroeconomic factors do not exhibit significant effect on stock returns of Istanbul Stock Exchange market.

**Charles Adjasi, Simon K. Harvey and Daniel Agyapong (2008)**, studied the relationship between Stock Markets and Foreign Exchange market, and determined whether movements in exchange rates have an effect on stock market in Ghana. The Exponential Generalised Autoregressive Conditional Heteroskedascity (EGARCH) model was used in establishing the relationship between exchange



rate volatility and stock market volatility. It was found that there is negative relationship between exchange rate volatility and stock market returns. A depreciation in the local currency leads to an increase in stock market returns in the long run. Where as in the short run it reduces stock market returns. Additionally, there is volatility persistence in most of the macroeconomic variables. It was also found that an increase (decrease) in trade deficit and expectation in future rise in trade deficit will decrease (increase) stock market volatility. In addition, the consumer price index has a strong relationship with stock market volatility. Finally, there is the presence of leverage effect and volatility shocks in stock returns on the Ghana Stock Exchange.

**Shaharudin. Roselee S, Hon Su Fung (2009)**, investigated the predictability of the stock return of different sizes of firms listed in Bursa Malaysia for the period of January 1996 until July 2007. The macroeconomic variables used were Consumer Price Index, Industrial Production Index, money supply (M3), Interbank Money Market Transaction, three months and six months Treasury Bills Discount Rate and crude oil prices. Using factor analysis and Panel data regression techniques, this study found that stocks returns are significantly influenced by a number of systematic forces and their behavior can be explained only through the combined explanatory power of macroeconomic factors and large or small firm size.

#### **METHODOLOGY OF THE STUDY**

In the present study, USA is considered as the home country. In order to calculate the expected return and the risk from foreign exchange, the study considers a combination of USA versus one foreign country and the bilateral exchanges between these two countries. The exchange rate is considered as the number of USA dollar per unit of foreign currency. Taking an example of USA and India, the base country is USA and the foreign country is India. The expected returns have been calculated using the CAPM equation i.e. equation (1) mentioned above. The Beta values of all the 10 common stocks for both India and US have been calculated as the ratio of covariance of corresponding stock return and market return over variance of market return. Moreover the market risk premium for both the countries has been calculated by taking the difference of corresponding market return and risk free rate of return. Similarly the expected returns have been calculated for the 10 common stocks of other two foreign countries i.e. US-UK and US-Germany by using CAPM model. After calculating the expected return of all the common stocks for both base and foreign countries, their difference has been taken. From this difference the role of exchange rate will be clearly noticed. This exchange rate Risk is incorporated in International CAPM which captured through the model;

$$E(R_i) = R_0 + \beta_i (RPM) + \gamma_i (CR_{FC})$$

In the above model, the term " $\gamma_i (CR_{FC})$ " is the addition to the CAPM model and it incorporates the currency risk premium/discount obtained due to exchange

rate volatility. So the above calculated difference of expected return of base and foreign country stocks accounts for this term " $\gamma_i$  (CRFC)". Now this gamma factor has been calculated for every stock of each foreign country by taking the ratio of covariance of currency returns with corresponding stock return and variance of currency returns. Using this gamma value of each stock and the corresponding currency risk premium, the exchange rate or currency risk is calculated as follows

$$\text{Exchange Rate (or) Currency Risk, (CR)} = \text{Currency Risk Premium} / \text{Gamma}$$

Then the subsequent finds are analysed to conclude the asset price fluctuations and the role of exchange rate on equity pricing.

## FINDINGS OF THE STUDY

### Study of Return between the Stock Market of USA and India

Following the CAPM model for the respective countries' stock market, the expected returns for the common stocks listed on USA and India are presented in table 1 and the difference in expected returns along with gamma coefficient and currency risk factor is presented in Table 2. This difference in returns accounts for the currency risk premium/discount. As observed from the above table, all the values for this difference are negative. This implies that the stocks are giving more returns in India that is considered as foreign market as compared to the home market of USA. This shows that exchange rate volatility is having positive effect and it is providing a currency risk premium to the investors. The gamma calculated above acts as a multiplier to exchange rate volatility thereby resulting in Currency Risk Premium/Discount. This currency risk premium/discount is used in International CAPM to calculate the net expected return of a stock in foreign market. Gamma for ICICI Bank Ltd (-1.52) is the highest among all companies, whereas Infosys Technologies have the lowest Gamma value (-0.301). Also the magnitudes of variations in exchange rate have been quantified as Currency volatility.

**Table 1**  
**Expected Returns for the Common Stocks listed in USA and India**

Name of the Stocks	Expected Return	
	USA	India
Sterlite Industries	-0.0722	-0.0168
HDFC Bank Limited	-0.0541	-0.0400
Patni Computer Services	-0.0238	0.0096
Tata Motors Ltd	-0.0392	-0.0091
Wipro Limited Co	-0.0733	-0.0175
ICICI Bank Limited	-0.0872	-0.0476
Infosys Technologies	-0.0577	-0.0151
Mahanagar Telecommunication Nigam Limited	-0.0359	-0.0021
Satyam Computers	-0.0363	-0.0168

**Table 2**  
**Difference in Expected Returns between USA and India**

<i>Name of the Stocks</i>	<i>Difference in Returns</i>	<i>% Difference</i>	<i>Gamma (India)</i>	<i>Currency Risk</i>
Sterlite Industries	-0.0554	-5.5400	-1.91	0.0288
HDFC Bank Limited	-0.0141	-1.4130	-0.933	0.015
Patni Computer Services	-0.0334	-3.3429	-1.013	0.032
Tata Motors Ltd	-0.0301	-3.0060	-1.333	0.022
Wipro Limited Co	-0.0558	-5.5800	-0.908	0.099
ICICI Bank Limited	-0.0396	-3.9600	-1.527	0.025
Infosys Technologies	-0.0425	-4.2530	-0.301	0.141
Mahanagar Telecommunication	-0.0338	-3.3780	-1.248	0.027
Nigam Limited				
Satyam Computers	-0.0196	-1.9570	-0.734	0.026

### Study of Return between the Stock Market of USA and Germany

Similarly, the expected return of the 10 common stocks listed in NASDAQ (US) and DAX (Germany) is calculated using the CAPM models, which are shown below in Table 3. The difference in expected returns between the home country USA and foreign country Germany for the 10 common stocks is calculated as shown in Table 4. This difference in returns accounts for the currency risk premium/discount. As observed from the above table, all the values for this difference very small but are mostly positive. This implies that the stocks are giving more or less same returns in German market as compared to USA market implying the exchange rate volatility which is not having a major negative effect providing a small currency risk discount. The effect of currency fluctuations is highest in Vodafone as compared to Coke having a smallest among them. Gamma for Canon (-0.135) is the highest among all companies, whereas Prudential Finance have the lowest Gamma value (-0.017).

**Table 3**  
**Expected Returns of USA and Germany**

<i>Name of the Stocks</i>	<i>Expected Return</i>	
	<i>USA</i>	<i>Germany</i>
Coke	-0.00038	-0.00028
Vodafone	-0.03129	-0.00475
Honda	-0.01766	0.00294
Mcd	0.66712	-0.00023
Canon	-0.00141	0.00033
Unilever	0.00373	-0.00067
Ford motors	0.01728	0.00009
Prudential finance	0.02327	-0.00007
PepsiCo	0.00282	-0.00088
Citi group	0.01977	0.00027

**Table 4**  
**Expected Returns Difference of USA and Germany**

<i>Name of the Stocks</i>	<i>Difference in Returns</i>	<i>% Difference</i>	<i>Gamma (Germany)</i>	<i>Currency Risk</i>
Coke	-0.00010	-0.0102	-0.0381	0.0027
Vodafone	-0.02654	-2.6538	-0.0429	0.6184
Honda	-0.02060	-2.0602	-0.0559	0.3682
Mcd	0.66735	66.7351	-0.0234	-28.4786
Canon	-0.00174	-0.1738	-0.1360	0.0128
Unilever	0.00440	0.4402	-0.0377	-0.1167
Ford motors	0.01719	1.7189	0.0305	0.5639
Prudential finance	0.02334	2.3339	-0.0174	-1.3419
PepsiCo	0.00370	0.3699	0.0413	0.0896
Citi group	0.01950	1.9495	-0.0438	-0.4448

### **Study of Return between the Stock Market of USA and United Kingdom**

The expected return of 7 common stocks listed in NASDAQ (US) and London Stock Exchange (UK) is calculated using CAPM model, which are shown below in Table 5. Similarly the difference in expected returns between USA and UK for the 7 common stocks is calculated as shown in Table 6. This difference in returns accounts for the currency risk premium/discount. As observed from the above table, all the values for this difference very small but are mostly positive. This implies that the stocks are giving more or less same returns in UK (foreign) market as compared to USA market. This shows that exchange rate volatility is not having a major negative effect i.e. it is giving a small currency risk discount. The effect of currency fluctuations is highest in Barclays Plc. as compared to GSK having a lowest among them. Gamma for HSBC (0.05) is the highest among all companies, whereas Barclays (0.0067) have the lowest Gamma value.

**Table 5**  
**Expected Return of USA and UK**

<i>Name of the Stocks</i>	<i>Expected Return</i>	
	<i>USA</i>	<i>UK</i>
Barclay	0.0001645	0.024984
Vodafone	-0.05067	-0.05484
HSBC	0.0027505	0.012427
Bank of Ireland	-0.001276	0.009487
Bp plc	-0.000229	0.010975
GSK	0.000022	0.002344
Unilever plc	0.0005871	0.006727

**Table 6**  
**Expected Returns Difference of USA and UK**

<i>Name of the Stocks</i>	<i>Difference in Returns</i>	<i>% Difference</i>	<i>Gamma (UK)</i>	<i>Currency Risk</i>
Barclay	0.02482	2.4819	0.0068	3.6620
Vodafone	-0.00417	-0.4171	-0.0412	0.1012
HSBC	0.00968	0.9677	0.0580	0.1660
Bank of Ireland	0.01076	1.0764	-0.0731	-0.1471
Bp plc	0.01120	1.1204	-0.1031	-0.1086
GSK	0.00232	0.2322	-0.1381	-0.0168
Unilever plc	0.00614	0.6140	-0.0008	-7.3706

## CONCLUSION

The present study has observed very interesting relationships between the asset price fluctuations and the impact of exchange rate. It has been found that, the average change in returns obtained due to currency volatility is high in case of Indian companies that are around 4% as compared to Germany with 0.21% and UK with 0.87%. This result can be attributed to the fact that India being a developing economy is more prone to fluctuations in exchange rate as compared to the developed economies like Germany and UK. Moreover the change in returns for all the Indian companies is negative. This means that the currency volatility adds a premium to the return values i.e. the returns are increased when the companies trade in Indian markets as compared to when they trade in US markets. At the same time most of the UK and German companies are having positive returns. This means that the currency volatility acts as a discounting factor to the return values i.e. the returns are reduced when the companies trade in UK or German markets as compared to when they trade in US markets. Looking at the currency risk factor through Gamma coefficient, the study concludes that, the covariance between Indian Stock Market and the Exchange rate (i.e. USD- INR) is negative. This shows an inverse relationship between assets price movements and exchange rate fluctuations. Similar is the case with the covariance of UK stock market and Sterling-US Dollar exchange rate, which also comes out to be negative. But in case of German Stock market and Euro-US Dollar exchange rate, the covariance is positive. This positive effect might be because of Composite currency "Euro".

Thus, it can be concluded that the Exchange Rate risk certainly affects the stocks trading in two different stock markets. But its effect and whether it acts as a premium or discount over the returns, depends on the foreign rate movement. The effect of the foreign exchange market of an emerging economy would be significant enough to act as a premium over normal returns. While the effect of the foreign exchange market of a developed nation acts as a discount over normal returns which is observed by the present study.

### References

- Alok Kumar Mishra (2004), "Stock Market and Foreign Exchange Market in India: Are they Related?", *South Asia Economic Journal*, Vol. 5, No. 2, 209-232.
- Buckberg, E. (1995), "Emerging Stock Markets and International Asset Pricing," *The World Bank Economic Review*, Vol. 9, No. 1, pp. 51-74.
- Charles Adjasi, Simon K. Harvey and Daniel Agyapong (2008), "Effect of Exchange Rate Volatility on the Ghana Stock Exchange", *African Journal of Accounting, Economics, Finance and Banking Research* Vol. 3, No. 3.
- Hui Guo, Christopher J. Neely and Jason Higbee (2004), "Foreign Exchange Volatility is Priced in Equities", *Research Division Federal Reserve Bank of St. Louis Working Paper Series- No. 2004-029E*.
- Jeffrey Allen Shew (2008), "Causality Relationship between Foreign Exchange Rates and Stock Market, Close Evidence in Singapore", *Bryant Economic Research Paper*, Vol. 1, No. 11, spring 2008.
- Menzly, L and Santos, T., Veronesi, P. (2002), "The Time Series of the Cross Section of Asset Prices", [http://ssrn.com/abstract\\_id=329641](http://ssrn.com/abstract_id=329641)
- Michael, J. B., Wang, A. W and Xia Y. (2004), "Estimation and Test of a Simple Model of Intertemporal Capital Asset Pricing," *The Journal of Finance*, Vol. 59, No. 4, pp. 1743-1775.
- Shaharudin. Roselee S, Hon Su Fung (2009), "Does Size Really Matter? A Study of Size Effect and Macroeconomic Factors in Malaysian Stock Returns", *International Research Journal of Finance and Economics*, ISSN 1450-2887 Issue 24 (2009), Euro Journals Publishing, Inc
- Sheng-Yung Yang and Shuh-Chyi Doong (2004), "Price and Volatility Spillovers between Stock Prices and Exchange Rates: Empirical Evidence from the G-7 Countries", *International Journal of Business and Economics*, 2004, Vol. 3, No. 2, 139-153.
- Turgut Tursoy, Nil Gunsul, Husam Rjoub (2008), "Macroeconomic Factors, the APT and the Istanbul Stock Market", *International Research Journal of Finance and Economics*, ISSN 1450-2887 Issue 22 (2008), Euro Journals Publishing, Inc.

<b>Country Benchmark Indices that are considered for Market return for the respective countries</b>		
<i>Country</i>	<i>Market Index</i>	<i>Description of the Market Index</i>
India	BSE Sensex	The Bombay Stock Exchange Sensitive Index (Sensex) is a capitalization-weighted index. The selection of the index members has been made on the basis of liquidity, depth, and floating-stock-adjustment depth and industry representation. Sensex has a base date 1978-1979. The index uses free float.
Germany	DAX INDEX	The German Stock Index is a total return index of 30 selected German blue chip stocks traded on the Frankfurt Stock Exchange. The equities use free float shares in the index calculation. The DAX has a base date of December 31, 1987.
United Kingdom	FTSE 100 INDEX	The FTSE 100 Index is a capitalization-weighted index of the 100 most highly capitalized companies traded on the London Stock Exchange. The equities use an investibility weighting in the index calculation. The index was developed with a base date of January 3, 1984.
United States	S&P 500 INDEX	Standard and Poor's 500 Index is a capitalization-weighted index of 500 stocks. The index is designed to measure performance of the broad domestic economy through changes in the aggregate market value of 500 stocks representing all major industries. The index was developed with a 1941- 43 base periods.





This document was created with Win2PDF available at <http://www.win2pdf.com>.  
The unregistered version of Win2PDF is for evaluation or non-commercial use only.  
This page will not be added after purchasing Win2PDF.