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Measurement of Foreign Currency Risk Exposure of Top Five BSE Sensex 30 Companies

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Abstract

Foreign exchange currency risk exposure is relevant to all firms operating in the market. Every firm faces direct risk exposure from their operations and indirect risk from the competition, interest rates and other factors. Also, in the growing markets, firms look to expand their markets and they are posed with risk from currency exchange rate movements. Thus, it is a necessity for all firms to analyse their risk exposure from time to time and enhance its performance. This paper aims to measure the risk exposure of BSE Sensex 30 companies which have large market capitalisation and the risk exposure is measured with the four most traded currencies. The paper finds that only 16% of the firms faced significant exposure from exchange rate movements. The degree of effect and the currency variables differ from firm to firm due to non-homogeneity of the firms. Large firms usually measure the risk exposure and take appropriate hedging for them. Only US Dollar and Pound have impact on some of the firms.

Keywords: *Foreign Currency, Exchange Rate, Risk Exposure, BSE Sensex 30, Economic Risk*

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INTRODUCTION

In today's era of globalisation and dynamic markets, companies look beyond their safe boundaries for opportunities to grow and survive. When there is intense competition in the existing markets, firms look to increase its revenues and reduce risk exposure by diversifying into new markets especially into foreign countries. The evidence of increased globalisation can be seen from the fact that in 2017, the global value of exports of goods and services was recorded at USD 17.73 trillion which turns to be the highest ever in the history. Also, the developing economies imports grew faster than those of the developed economies with an increase of 13 per cent. The exports from the developed economies grew by 12 per cent and reached a share of 43 per cent in the world trade (Anon., 2018). According to WTO, India's export grew by 13 per cent in 2017 and imports grew by 24% in 2017. Meanwhile, Indian exports constitute 1.68 per cent in 2017 and 2.48 per cent in imports in the world (Anon., 2018). The growing participation in the global trade encompasses the need for companies to analyse the foreign currency risk as the global trade involves significant currency exchanges. Also, the global recession in 2008 showed the companies across the globe the degree of currency risk affecting firms and reinstated the importance of mitigating the risk faced by them. Several companies were weakened by the crisis and forced them to enter into hedging to overcome the owes of the recession.

Currency exchange rate fluctuations is a significant macroeconomic variable affecting the firm's performance in the market. It can be recognised by analysing the operating cash flows and firms' value in relation to the changes in the exchange rates. According to Helhel, growing domestic and multinational firms are facing an important risk exposure from the currency exchange rate since the adoption of a flexible exchange rate in the globalised market. External shocks may create a relationship between exchange rates and stock returns and hence it is reasonable to expect a relationship between firm value and exchange rate movement. Importance of exchange rate risk management is seen in a growing importance on risk measurement and management strategies undertaken by the companies (Choi & Prasad, 1995). According to Agarwal and Harper, domestic which does not involve in significant international transactions also face risk exposure from currency exchange rate indirectly. The direct exposure risk can be contoured from hedging activities which could be represented in the balance sheet but there is no scope in the accounting process to account for the indirect risk exposure faced by the firms. This eliminates the need to only include only firms which have significant international transactions or multinational companies in the study (Aggarwal & Harper, 2010).

LITERATURE REVIEW

Traditionally the currency risk is classified into three factors namely transaction risk, translation risk and economic risk. Sarkis and Shu describe 'transaction exposure can be defined as the sensitivity of realized domestic currency values of the company's contractual cash flows denominated in foreign currencies to unexpected exchange rate changes'. Habibnia states, the transaction risk occurs across many sectors and it is significant for most of the international companies. It is usually hedged by entering into forward contracts and these activities can be seen in the balance sheets of the companies. These risks can be easily measured and therefore can

be hedged. "Translation exposure, also called accounting exposure, is the potential or risk for an increase or decrease in the parent's net worth and reported net income caused by a change in exchange rates since the last translation" (Sarkis & Shu, 2008). According to Habibnia, it mainly affects the balance sheet valuation. It is significant in the foreign subsidiary valuation and is measured by their net asset value in foreign currency. These risks are easily mitigated by the companies as they are measurable and mostly companies transfer or receive money from a foreign subsidiary in a lump sum in long intervals (Habibnia, 2013).

According to Sarkis and Shu, 'the economic exposure, also called the operating exposure, measures any change in the present value of a company resulting from changes in future operating cash flows caused by unexpected changes in currency exchange rates'. This risk type is indirect cannot be measured by the companies easily and most of the researches (Alder and Dumas, 1984) and (Dhagat & G, 2016) have been conducted in this type. Transaction and translation risk do not have a significant impact on the performance of the firms as they mitigated by the company. This paper is also in line with previous research and analyses the economic risk exposure of the companies. It was measured by regressing the stock price on the exchange rates (Sarkis & Shu, 2008).

According to Choi and Prasad, in their paper Exchange Rate Sensitivity and Determinants, exchange rate variability affects the value of the firm. The study involved 20 SIC industry groups during the 1978-89 period. The model used for analysing the exposure was the two-factor model which regressed the stock prices on the market return and the exchange risk factor. They had used the Ordinary least square method in the econometrics. The study had also proved that exchange rate fluctuations have an impact on the stock returns and 15% of the total firms was proved to face significant risk exposure (Choi & Prasad, 1995).

In the paper 'Estimating Exchange Rate Exposure' by Bodnar and Wong aims to show the strong relation and exposure of U.S. firms. The exposure of the firms to the currency fluctuations was calculated using the regression model approach by regressing the stock returns on the exchange rate fluctuations and the return on the domestic market. The study covers a 20-year period from 1997 to 1996. The study found that there is an inverse relationship between firm size and exchange rate exposure. Large firms tend to have a negative relation with the currency rate movement. Also, the paper had examined the exchange in the exposure level of the firm by using different construction of the market portfolio returns and found that the method of calculation of market portfolio has a significant effect on the exposure results of the firm. (Bodnar & Wong, 1999).

Dominguez and Tesar in their paper "A Re-examination of Exchange Rate Exposure" argued to find proof of significant exchange rate exposure of companies. This paper had also used the standard two-stage model in order to find currency exposure similar to other papers. It analysed the firm and industry level exposure in Chile, France, Germany, Italy, Japan, Netherlands, Thailand and UK. Chile firms show the lowest level of exposure and Japan firms showed the highest level of an exposure indicating that large economies' firms have a higher exposure rate than smaller ones. Chile, Germany and Italy have positive and negative exposure firms equally split. Whereas in France, Netherlands, Japan and UK, 60% of the firms have a positive

exposure. Only in Thai, 80% of the firms exhibit negative exposure. The paper finds that high degrees of exchange rate exposure both at the firm level and industry level across all the countries in the study (Dominguez & Tesar, 2001).

According to Griffin and Stulz in their paper "International and Exchange Rate Shocks: A Cross-Country Industry of Stock Returns" analyses competition shocks and exchange rate movements effect on the stock prices in the US. This paper also used the standard regression model in order to measure the risk exposure. The period of study was from 1995 to 1997. The study reveals that the exchange rate has a negligible impact on the stock returns of the firms. Also, the paper tells that the conclusion may differ based on the model, industry, measurement interval and other factors. Industry effects are more important and the exchange rate movements according to the paper (Griffin & Stulz, 2001).

Chue and Cook in the paper 'Emerging Market Exchange Rate Exposure' analysed the emerging companies' exposure to the domestic exchange rates. The study sampled over 900 emerging firms and found that 75% of them have negative exposure. A 1% depreciation in the currency decreases the stock value by 0.5%. The period of study was from 1999 to 2002. It uses the standard regression model to measure the risk exposure of the firms. Since the study involved the analysis of firms in many countries, it had taken yen-dollar and euro-dollar as instruments to measure risk exposure. The paper finds that the impact of the depreciation of the domestic currencies has a huge negative impact on the stock return of the firms. It also finds that the foreign currency debt outstanding component is a major determinant in the foreign exchange rate risk exposure. The study also proves that the devaluation of currencies is not desirable for emerging markets (Chue & Cook, 2004).

Aggarwal and Harper in their paper Foreign Exchange Exposure of 'Domestic' Corporations focused on the impact of the foreign exchange rate risk exposure on the domestic firms in the US market. The study had used the standard two factor model as the base and included small stock returns and relative stock growth. The study found that the even domestic firms with no or less international transaction are even affected by the foreign currency exchange rate movements. Firms which are small and a high market to book value, debt ratios and low asset turnover in a competitive industry are subject to high exposure from the foreign exchange rate movements. The results indicate the need for domestic firms to retake their stand on hedging and has a huge impact on the decision making of the firms (Aggarwal & Harper, 2010).

The paper 'Exchange rate exposure of developed and emerging markets' by Sukor tries to show the relationship of stock prices with the exchange rates in the emerging markets. The paper had studied the exchange rate exposure in the US and other developed markets. It had started from Adler and Dumas and continued to cite some of the important development paper and findings in this area. Then it tried to show evidence of these in the papers which focused on the analysis of foreign currency exposure in the emerging markets. The paper's findings were generally on a qualitative review that the exposure level of firms varies based on markets and countries and small market firms have a higher level of exposure. It also had found that the market exposure and firm exposure are different and firms dynamically adjust to the exchange rate changes. In the emerging market's firms

shows negative effect upon home currency depreciation (Sukor, 2014).

In the paper written by Helhel 'Foreign Exchange Rate Exposure and its Determinants on Performance of Manufacturing Firms in Turkey' had analysed the foreign currency rate risk exposure of 37 firms in Turkey's stock exchange Istanbul. The period of study was from 2005 to 2014 and the method used for determining the exposure was the regression model similar to the those of the other papers. In this paper, they had regressed the stock returns with the contemporaneous and lagged exchange rates changes. The paper had found that exposure of the firms can be explained by its export ratio and size of the assets and there is an inverse relationship. It had also found evidence showing exposure level of firms does not have a relationship with its size (Helhel, 2015).

Dhagat and G in the paper Measurement of Foreign Exchange Exposure for selected Indian Firms aimed to analyse the risk exposure in the Indian Market for non-financial firms. The study had also used the standard regression model for measurement of risk exposure. The study initially selected 150 firms and only 85 firms were selected for analysis and the study avoided financial firms as they have complex risk management strategies and techniques. The period of study was from 2000-2015. The study used only US Dollar exchange rate for analysing the exposure. It found that there is significant negative exposure for firms from the US Dollar exchange rate movement. It found that the size of the firms is one of the major and significant determinants in the foreign exchange risk exposure to firms (Dhagat & G, 2016).

From the above review of articles, we can infer that foreign currency risk exposure is significant to all firms irrespective of whether they are domestic or international or does hedging or not. It is an important macro-economic whose effects are not measured by firms apart from its normal accounting process. The standard model used in most of the paper for measuring risk exposure is the Alder and Dumas two factor model. Different researchers have shown different result due to various factors like time period, industry, market and so on. Thus, it can be inferred that the result is not constant over time and determinants of risk exposure also vary. Global firms face significant risk effect from their home currency movement in all operations. Hence, it is required is required to analyse the risk exposure to companies from time to time and perform better.

RESEARCH GAP AND CONTRIBUTION OF THE STUDY

Foreign currency risk exposure to the firm had been conducted in the past in the developed countries and found that firm's stock returns experience volatility due to fluctuation in the currency exchange rate movements. The studies pertaining to the Indian economy (Dhagat & G, 2016) had analysed the risk exposure on a macro basis and this study will focus on the micro level analysis of risk exposure of firms. The study conducts a firm level analysis of the foreign currency risk exposure by analysing the impact on stock returns by the foreign currency exchange rate fluctuations. One of the major novelties of the paper is the analysis of only large market capitalisation companies and the stock returns with the four most-traded currencies. Dhagat & G in their paper had taken into account only the US Dollar and this paper aims to find if the other currencies also affect the firm's stock returns.

RESEARCH METHODOLOGY

In order to analyse the foreign currency risk exposure of the large-cap Indian firms, the study has the BSE Sensex 30 companies. 'S&P BSE Sensex is a basket of 30 constituent stocks representing a sample of large, liquid and representative companies' (Anon., 2018). Aggarwal and Harper conducted a study of the domestic firm's foreign currency risk exposure and found that they are exposed to currency exchange risk due to competition from the foreign business, interest rate and other macro-economic factors related to exchange rate movements. So, it is highly relevant to the include both domestic and international firms with large capitalisation in the study. Alder and Dumas in their study had indicated that the firms usually hedge those transactions related to foreign currency which are easily identifiable as they can be measured. This paper aims to study foreign currency exchange risk which the firms do not analyse and are not hedged.

Study Period

The paper has measured the risk exposure of the firms from 2013-2018. During this period, Indian economy saw a drastic GDP growth from 1856.72 USD billion in 2013 to 2597.49 USD Billion in 2017 indicating that the economy is growing at an increasing rate (Anon., 2018). The recent years have been chosen in order to present current relevant results as the risk variables and determinants vary over time. A five-year period of analysis will provide risk exposure of companies on a medium term and the previous study of (Dhagat & G, 2016) have analysed the time periods before the current period of study.

Sample and Method of Data Collection

The sample of the firms is sourced from the S&P BSE Sensex 30 companies which contain a basket of well reputed, financially sound and large market capitalisation companies which operate both in Indian and domestic market. The data of the 30 companies were collected from the BSE website, an authentic source of information about the stock prices of the company. Out of the 30 companies, only 5 companies were selected for analysis. This is mainly due to the fact that if it cannot be said to have a significant impact on the stock prices then the company does not face any risk from currency fluctuations. It would be of little importance to interpret the results (Jay & Prasad, 1995).

Microsoft Office Excel was used to validate and fine tune the data for analysis purpose. The paper has taken the daily stock prices of the BSE Sensex 30 companies unlike the previous studies (Dhagat & G, 2016) which had taken monthly stock prices. This helps to determine the stock prices exact volatile movement match with the foreign currency exchange rate movement making the result more reliable. Stock returns and exchange rate data are not stationary at raw form and convert into log form in order to obtain stationarity. Market indices are included to the risk exposure measurement model in order to reduce noise in results (Bartov, et al., 1994). BSE Sensex 30 data was collected from BSE website.

The study uses the nominal exchange rates instead of effective exchange rates. A nominal exchange rate is the 'number of units of the domestic currency that can purchase a unit of a given foreign currency' (Anon., 2018). A decrease in the nominal exchange rate implies that the domestic has appreciated over the foreign country currency. The currencies exchange rate was collected from the RBI Database.

Most of the papers in this area of study had used a trade weighted exchange rate. But this paper does not include a trade weighted exchange rate due to the reason that the basket of securities will lack significance if the exchange rate's nature does not match with the other exchange rates in the basket, which represents a noteworthy issue. One of the ways suggested to overcome this is to include industry or firm exchange rate but it is difficult to determine the exchange rates which can be used. The firms usually hedge against the currencies in which they do their daily operations and transactions but they remain exposed to currency exchange rate movement of the competitors countries' currencies with which the companies compete (Dhagat & G, 2016).

The currencies used for analysis in the study are US Dollar, Japanese Yen, Great Britain Pound, Swiss Franc and Euro. US Dollar, Japanese Yen, Euro and Great Britain Pound exchange rates are being actively monitored by RBI as they have a significant effect in the Indian economy activities (Anon., 2018).

Measurement of the Foreign Exchange Exposure

Alder and Dumas were the first in their paper to propagate the idea of risk exposure of foreign currency risk exposure to companies and defined currency exchange rate risk exposure as the relationship between stock excess returns and movement of currency rates. The 'risk exposure is arbitrary in the sense that stock prices and exchange rates are jointly determined' (Sukor, 2014). Thus, the model to determine the exchange rate exposure is by regressing the stock returns on the currencies exchange rates. Risk exposure can be calculated by determining the coefficient of the exchange rates in the regression output results. Market return is used in the model in order to eliminate the market risk in the regression model which is consistent with the previous studies conducted in this area. Also, the introduction of market returns controls the correlation between the error terms which can the model inaccurate and taken into account both the micro and macroeconomic variables (Dhagat & G, 2016).

The equation can be written in mathematical terms as

$$R_{xi} = \alpha + \beta_1 R_{ci} + \beta_2 R_{mi} + R_e$$

Here R_{xi} is the stock returns, α is the coefficient, β_1 is the currency risk exposure coefficient, R_{ci} is the currency risk exchange rate, R_{mi} is the market return and R_e is the error term. The study has taken into account all the variables in nominal form and all the variables are taken in log form as it not stationary in raw form. Out of the four currencies, only the significant currencies were taken in the output as it does not have any effect in the model. Significant variables were decided in the p values. The model was estimated in the EViews 10 software using ordinary least square method.

DATA ANALYSIS AND INTERPRETATION

Out of the BSE 30 companies analysed, only five companies showed a significant output with R square greater than 35%. The five companies are HDFC, IndusInd Bank, Housing Development Finance Corporation and Tata Steel and L&T.

From the Table 1 we can tell that HDFC has a significant negative exposure towards US Dollar and is consistent with Dhagat and G (2016) paper findings. It shows that when a

Table 1: HDFC Risk Exposure Regression Output

Dependent Variable: Ln_HDFC			
Explanatory Variables:	*Intercept*	*Ln_USD*	*Sensex*
Coefficient (C)	25.08	(3.44)	0.97
T Stat	1.93	(2.72)	
R^2 = 0.48	Adjusted R^2 = 0.47	D-W stat = 2.1	F-Stat = 77.42

currency exchange rate depreciates then the stock returns of the companies would also fall and this effect can be seen in the everyday stock market happening. The 48% of the stock return movement could be explained by the independent variables, which is quite good. Durbin-Watson (D-W) statistics value that is 2.1 tells that there is no autocorrelation and value of F-stat 77.42 with 0.00 *p* value shows that the overall model is good. The Sensex is the market return and it is used to control the abnormal movement in the market.

Table 2: IndusInd Bank Risk Exposure Regression Output

Dependent Variable: Ln_IndusInd			
Explanatory Variables:	*Intercept*	*Ln_GBP*	*Sensex*
Coefficient (C)	(44.24)	(0.91)	1.06
T Stat	(2.18)	(0.46)	
R^2 = 0.38	Adjusted R^2 = 0.37	D-W stat = 2	F-Stat = 41.11

From the table 2 we can tell that IndusInd Bank has a significant negative exposure towards US Dollar. It shows that when a currency exchange rate depreciates then the stock returns of the companies would also fall. The 38% of the stock return movement could be explained by the independent variables, which is quite good. Durbin-Watson (D-W) statistics value that is 2 tells that there is no autocorrelation and value of F-stat 41.11 with 0.00 *p* value shows that the overall model is good. The Sensex is the market return and it is used to control the abnormal movement in the market.

Table 3: Housing Development Finance Corporation Risk Exposure Regression Output

Dependent Variable: Ln_Housing_development_ Corporation			
Explanatory Variables:	*Intercept*	*Ln_USD*	*Sensex*
Coefficient (C)	29.77	(6.46)	1.29
T Stat	3.7	(3.69)	
R^2 = 0.45	Adjusted R^2 = 0.45	D-W stat = 1.99	F-Stat = 150.32

From the Table 3 we can tell that Housing Development Finance Corporation has a negative exposure towards US Dollar and is in line with the previous results. The 45% of the stock return movement could be explained by the independent variables, which is quite good. D-W stat value 1.99 tells that there is no autocorrelation and value of F-stat 150.32 with 0.00 *p* value shows that the overall model is good. The Sensex is the market return and it is used to control the abnormal movement in the market.

Table 4: Tata Steel Risk Exposure Regression Output

Dependent Variable: Ln_Tata_Motors			
Explanatory Variables:	*Intercept*	*Ln_USD*	*Sensex*
Coefficient (C)	(96.62)	12.4	1.26
T Stat	(3.4)	4.48	
R^2 = 0.36	Adjusted R^2 = 0.36	D-W stat = 1.99	F-Stat = 51.63

From the Table 4 we can tell that Tata Motors has a significant positive exposure towards US Dollar. It shows that when a currency exchange rate depreciates then the stock returns of the companies would also fall. The

36% of the stock return movement could be explained by the independent variables, which is quite good. D-W stat value 1.99 tells that there is no autocorrelation and value of F-stat 51.63 with 0.00 *p* value shows that the overall model is good. The Sensex is the market return and it is used to control the abnormal movement in the market.

Table 5: L&T Risk Exposure Regression Output

Dependent Variable: Ln_Tata_Motors			
Explanatory Variables:	*Intercept*	*Ln_USD*	*Sensex*
Coefficient (C)	(26.53)	5.75	1.26
T Stat	(2.43)	2.43	
R2= 0.36	Adjusted R^2 = 0.36	D-W stat = 1.99	F-Stat = 94.63

From the Table 5 we can tell that Tata Motors has a significant positive exposure towards US Dollar. It shows that when a currency exchange rate depreciates then the stock returns of the companies would also fall. The 36% of the stock return movement could be explained by the independent variables, which is quite good. D-W stat value 1.99 tells that there is no autocorrelation and value of F-stat 94.63 with 0.00 *p* value shows that the overall model is good. The Sensex is the market return and it is used to control the abnormal movement in the market.

FINDINGS AND DISCUSSIONS

In light of the above studies, we can conclude large firms usually hedge their foreign currency risk exposure and so they have less impact on the stock prices. This evident form the fact that R square of 25 companies in the BSE Sensex 30 did not show any significance. Also, out of the rest 5 companies with significant R square, 2 companies (HDFC and Housing Development Financing Corporation) show significant negative exposure towards US exchange rates. Tata Steel and L&T showed significant positive exposure towards US Dollar. The other company showed negative risk exposure towards Great Britain Pound. (Dhagat & G, 2016) in their study had used only US Dollars in their study as it was the most traded currency by the Indian companies and around the world. This paper gives the empirical evidence that only US Dollar is affecting most of the Indian companies at present and this risk needs to be analysed by most of the firms. Also, it can be inferred that US Dollar showed both positive and negative exposure to stock returns. Other currencies may affect the Indian firms if the India economy expands more and at present does not pose any threat to the companies.

Though other currencies may not be significant to all firms, one firm had exposure from Great Britain Pound. This indicates that risk exposure varies from firm to firm due to various reasons like transactions, market, product, suppliers and so on with various extend effect (Sukor, 2014). Also, large firms usually do not experience exposure from currency risk as they undertake effective hedging against them (Helhel, 2015). But still few firms face them as all risk are not controllable. The previous study (Dhagat & G, 2016) had taken one lag for the variable and this study conducted a similar test. It was found that there is no significance difference between the lag values and normal data without lag and the risk exposure model does not show any significant effect. The robustness and usefulness of the model was checked using Root Mean Square Error (RMSE) and Theil inequality coefficient. RMSE of Tata Steel, IndusInd Bank, HDFC and Housing Development Finance Corporation is 1.8, 1.2, 0.8 and 1.1 and Theil inequality coefficient is 0.5, 0.4, 0.4 and 0.4 respectively. All RMSE values

lied below 3 and Theil inequality coefficient lied below 1. Thus, the result shows that the estimated models are fit for forecasting.

SUMMARY AND CONCLUSION

According to IBEF, India is emerging as one of the major economies in the world and will be among the three big power economies in the world in the next 15 years (Anon., 2018). The country is backed up by its population and strong reforms like demonestation, GST and other policies by the government in order to become a developed economy. Being one of the top emerging economies, all firms and people across the globe have an interest in the market for trade and Indian firms expanding globally, there is a need firm both domestically and internationally in order to hedge the direct and indirect risk exposure faced by them (Muller & Verschoor, 2007). Also, the global players are induced to enter the Indian market as it is having the second largest population in the world and present unlimited opportunities for growth of global players. This present risk exposure to all the firms in the Indian market. Due to the dynamic nature of the exchange rate market and a huge number of factors affecting the exchange rate movement, it is necessary for the firms to analyse them periodically and gain advantage from them. Analysing the major exchange rate movement will also help the firms to provide market information which may not be available from their normal routine analysis.

In order for firms to analyse the foreign exchange risk exposure, the firms need to first analyse the currencies and factor which determine the most. 'These exposures are managed by the firm using internal or external hedging techniques. The internal techniques are prepayment, leading and lagging, netting. The external hedging techniques are forwards, future, options and swaps' (Dhagat & G, 2016). These can prove to protect the stock price movement due to changes in the currency rates and prevent volatility and risk (Dosanjh, 2010).

FUTURE SCOPE

The findings show that the foreign currency risk exposure of firms is based individual firm specific basis and differs based on firms' market, competition, market, strategy and so on. So, the further scope is that the firms which similar or homogenous nature based on competition, market, strategies should be grouped and analysed. It needs to firm specific in-depth analysis to get the best results.

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Glossary

1. Ln_Tata_Motors: Log return of Tata Motors Stock
2. Ln_HDFC: Log return of HDFC Stock
3. Ln_IndusInd: Log return of IndusInd Bank Stock
4. Ln_Housing_development_Corporation: Log return of Housing Development Finance Corporation stock
5. Ln_USD: Log return of US Dollar
6. Ln_GBP: Log Return of Great Britain Pound