Does the Status of Governance Practices Differentiate Countries in the Forex Market?

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Abstract

Liberalization of the Indian economy (in 1991) and many other economies contemporarily made the survival of isolated economies out of question. With the opening up of economic barriers, better governance practices flowed from good governed to relatively badly governed countries. Now, with increased industrialization and opening up of economies for trade and commerce, political boundaries of nations have been transgressed by businesses. However, this opportunity of making money abroad may also bring some inconvenience to the parent company as it might suffer losses or receive eroded profits when the foreign currency is converted to the local currency at prevailing rates (Pandey, 2010). There may be several other examples like this in real and hypothetical scenarios, and these need to be addressed with prudence. This topic does the same as it calls for attention towards these risks and precautions/remedies available for the same. Apart from the MNCs, there are people who enter into the currency markets for speculative gains. These traders do not require these foreign currencies, but they buy/sell them for making profits from the existing market situations. The proportion of these traders is much larger than those who need foreign currency to make payments, give wages, and so forth. The present paper intends to provide an econometric model for the traders in the currency market which could, up to a reasonable extent, anticipate the fluctuations in major globally transacted currency pairs. This would be handy for the traders and for large businesses running overseas (which have to deal in different currency regions) as they can accordingly decide whether to invest in a particular currency or not.

Keywords: **forex market, foreign exchange management and risk, fluctuation of currency value, risk and risk mitigation, econometric model, multivariate data analysis technique, currency pairs (majors), political economy**

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The foreign exchange market - more commonly known as forex - is the global market for trading currencies. It is a market in which participants are able to exchange and speculate on currencies (Investopedia, n.d.). It handles a huge volume of transactions 24 hours a day, 5 days a week. Daily exchanges average approximately $2 trillion (US dollars). Multinational companies, as their size of operation expands (CMIE Prowess, 2012), need to make payments in the country of operation in the local currency. In comparison, the United States stock markets, like the New York Stock Exchange and the NASDAQ handle only about $100 billion a day (only about 5% of the size of the daily forex market) (Yahoo Finance, n.d.).

The foreign exchange market was established in the early 1970s with the abolishment of fixed currency exchanges under President Nixon. Currencies became valued at 'floating' rates determined by supply and demand. The forex grew steadily throughout the 1970s, but it was the technological advances of the 80s that allowed forex to grow from trading levels of $70 billion a day to the current level of around $2 trillion [1]. Subsequent to the rise of the forex market, its subsidiaries like forex derivatives emerged and developed. Currency future, also known as FX future (National Stock Exchange of India Limited (NSE), 2009), is a futures contract to exchange one currency for another at a specified date in the future at a price (exchange rate) that is fixed on the purchase date.

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Incentives of Forex Trading

The expansion of businesses and opening economies has compelled international firms to master forex markets for several reasons, that is, risk hedging, profit making, and so forth. Trading in forex markets has its own perks, which unlike other markets, are available in forex exclusively. Some of them are listed below:

(1) No short selling restrictions [2],
(2) Liquidity [3],
(3) 24 by 7 flexi market [4],
(4) Up to 200 :1 leverage [5],
(5) No (or low) transaction costs [6],
(6) Multiple trading vehicles [7],
(7) Dynamic market [8],
(8) Easily trade long or short [9].

Functioning of the Forex Market

Currencies are always traded in pairs, for example, the US dollar against the Japanese yen, or the English pound against the euro. Every transaction involves selling one currency and buying another, so if investors believe the euro will gain against the dollar, they will sell dollars and buy euros. The huge potential for profit exists because there is always movement between currencies. Even small changes can result in substantial profits because of the large amount of money involved in each transaction. At the same time, risks can be minimized for the individual investor. There are safeguards built in to protect both the broker and the investor, and a number of software tools exist to minimize loss.

Risks Associated with Forex Trading

Despite the fact that forex is not risk-free, there are tools that can minimize a trader's risk, and with caution, the forex trader can learn how to trade profitably while minimizing losses. Risk in currency transactions are inevitable, and is subject to unexpected rate changes, volatile markets, and political events. The risks are enumerated as follows : a) exchange rate risk [10], b) margin risk [11], c) interest rate risk [12] (Dornbusch & Rudiger, 1994), d) credit risk [13], e) country risk [14].

The Causes or Factors Leading to Fluctuation in Currencies

Fluctuations in exchange rates are usually caused by actual monetary flows as well as by expectations of changes in monetary flows caused by changes in gross domestic product (GDP) growth, inflation (purchasing power parity theory), interest rates (interest rate parity, domestic Fisher effect, international Fisher effect), budget and trade deficits or surpluses, large cross-border M&A deals, and other macroeconomic conditions. The role of fiscal policy, in addition to monetary policy and its effects on the international terms of trade, on trade and current account balances, on domestic and foreign interest rates, stock markets, consumption, and investment also contributes to the exchange rate vacillation (Buiter, 1990). This paper is a fresh attempt to unravel the relationship between the real economic variables and the forex market (Kandil, 2004) in the Indian context.

The paper considers the annual data of several economic variables like the interest rate, inflation, stock exchange, foreign direct investment, foreign institutional investment in Indian markets between 1990 and 2010, and tries to reveal the relative influence of these variables on the sensitive fluctuation of the currency market. Compared to earlier similar attempts, this paper applies the modern multi regression model (SPSS 13.0) and compares the results. The findings show that certain variables like the interest rate, output, money supply, inflation

rate, and the exchange rate have a considerable influence in the currency exchange rate movement in the considered period, while the other variables have a very negligible impact on the forex market.

As mentioned earlier, the objective of the current study is to unravel the linkage between the currency exchange rate movement and the real economic events in the Indian context in the post reform-era using advanced techniques like multiple regression with the help of the statistical software SPSS 13.0. The period of the study was chosen as 1990 to 2010. This was the period when the economic reforms were making an impact on the economy. In an earlier study, Vani and Ray (2003) tried to capture the change in the relationship between macro-economic variables and stock prices over the years. The study used average yearly data for the period from 1971-2002 and the chosen macroeconomic variables were broad money supply (M3), interest rate (bank rate), industrial activity (index of industrial production), inflation (whole sale price index), fiscal deficit, and GDP.

A significant causal relationship was found between the macro economy and the currency fluctuation movements. The present study is more focused on the post-reform era as it considers the period from 1990 to 2010 and uses monthly average data for a larger number of variables from the real economy which should have a relationship with the forex market. The study does not assume any a-priori relationship between these variables. Regression is a suitable technique for this purpose. The study aims to reveal, with more precision, the major influencing variables of the currency exchange rate fluctuation in the post-reform era. Since it was difficult to find any benchmark interest rate for the entire time period under study, the benchmark interest rate issued by RBI was considered as the proxy for the interest rate (IR) prevailing in the economy. To account for inflation, consumer price index (CPI) with base year as 1990-01 was considered for the present study.

The Indian economy has some unique features since the Government has a very prominent role in the economy. To capture this in the model, the stability of the political system was considered as a macro variable affecting the exchange rate fluctuation (PS). To check the linkage with the market growth, the vacillation of the stock market was considered as another variable. The other factors affecting the exchange rate fluctuation are also included, namely GDP, business confidence, balance of trade, and stock market index. All the data is taken from the Handbook on Statistics (RBI), Economic Survey (Government of India), Trading Economics, and World Bank statistics.

Literature Review

There is some extant literature pertaining to this article. Froot and Klemperer (1989) investigated the pass-through from exchange rates to import prices when firms' future demands depended on current market shares. Foreign firms may either raise or lower their dollar export prices when the dollar appreciates temporarily (that is, the pass-through may be perverse) and import prices may be more sensitive to the expected future than to current exchange rates. They explored whether expected future exchange rates provided a clue to the puzzling recent behavior of U.S. import prices.

Kamin and Rogers (2000) attempted to determine whether a positive long-run effect of real depreciation on output was in their data. Based on the results of several VAR models, they concluded that even after sources of spurious correlation and reverse causation were controlled for, real devaluation led to high inflation and economic contraction in Mexico. They stated that a pro-growth policy based on a "super-competitive" (Van, 1989) exchange rate may be unduly risky.

Kandil, Berument, and Dincer (2007) examined the effects of exchange rate fluctuations on real output, the price level, and the real value of components of aggregate demand in Turkey. The theoretical model decomposed movements in the exchange rate into anticipated and unanticipated components. Unanticipated currency fluctuations help to determine aggregate demand through exports, imports, and the demand for domestic currency, and aggregate supply through the cost of imported intermediate goods and producers' forecasts of relative competitiveness. Anticipated exchange rate appreciation has significant adverse effects, contracting the growth of real output and the demand for investment and exports, while raising price inflation. Rogers and Wang (1995) studied the sources of fluctuation in output and inflation for Mexico, considering fiscal, real, money growth,

exchange rate, and asset market disturbances, which were identified using an estimable equilibrium model incorporating important features of high-inflation economies.

Rationale Behind the Paper

One of the most significant purposes for which the topic of this paper was chosen was to gain an insight into the world's largest market (Forex market) and to gain knowledge about the pitfalls existent in it. With its immense liquidity, the Forex market, on the one hand, is very lucrative to trade in, but there are other aspects of it that are present as well. The high risk that this market carries might discourage investors to trade in this market. The purpose of the paper is to come up with a reasonably fair model that would take certain macroeconomic factors into account to anticipate the vacillation of the exchange rate.

Methodology

The methodology relied upon in this paper is the multiple regression analysis as it was attempted to find out the statistical prediction capability of a model to predict the fluctuation of a currency pair (dependent variable) with respect to the macroeconomic factors (independent variables). This paper attempts to identify the effect of pertinent macroeconomic factors (assumed to influence the exchange rate) on the exchange rate. Since, this is the study of criterion (which get influenced) and predictor (which influence) variables, regression method (multivariate regression, as the number of independent variables is more than one in this paper) was chosen as the approach to proceed with this paper. Next, to account for whether the difference in the exchange rates of different countries is only a chance event or not, discriminant analysis [15] was conducted and the groups were found to be significantly different from each other. This led to the last section of the analysis, where the number of chosen variables were reduced by conducting factor analysis [16]. However, barring India, no other country's variables were adequately correlated to be eligible for factor analysis.

Analysis and Results

➲ **Analysis of the Results of SPSS INR/USD Regression Analysis:** The figures for the exchange rate fluctuation of currencies have been taken from Indexmundi.com (n.d.). Seven (7) variables were considered for analysis, that is, : **(a)** stock market index, **(b)** inflation rate, **(c)** interest rate (minimum guaranteed rate of return), **(d)** GDP (in billion USD), **(e)** balance of trade (in million), **(e)** business confidence, **(f)** political stability (standardized) ("List of countries by political instability index," n.d.).

The value of exchange rate acts as the criterion variable (dependent) and the remaining variables act as predictor (independent) variables. The table on descriptive statistics (Table 1) of the independent variables

Table 1. Descriptive Statistics

	Mean	Standard Deviation	*N* (No. of observation)
INR/USD	0.021	0.001	128
Political Stability (India)	-0.792	1.288	128
GDP India (in billion USD)	791.56	299.25	128
Business Confidence (India)	128.83	21.738	128
Interest Rate (India)	5.63%	1.79%	128
Balance of Trade (India)	-4424.95	3674.26	128
Stock Market (India)	9448.59	5954.83	128

Table 2. Correlations

		INR/USD	Political Stability (India)	GDP India (in billion USD)	Business Confidence (India)	Interest Rate (India)	Balance of Trade (India)	Stock Market (India)
Pearson	INR/USD	1						
Correlation	Political Stability (India)	-0.441	1					
	GDP India (in billion USD)	0.228	0.169	1				
	Business Confidence (India)	0.393	-0.153	0.632	1			
	Interest Rate (India)	0.162	0.191	-0.397	-0.292	1		
	Balance of Trade (India)	-0.314	-0.079	-0.885	-0.586	0.347	1	
	Stock Market (India)	0.403	0.139	0.904	0.722	-0.277	-0.841	1
Sig.	INR/USD	.						
(1 tailed)	Political Stability (India)	0.000	.					
	GDP India (in billion USD)	0.005	0.028	.				
	Business Confidence (India)	0.000	0.043	0.000	.			
	Interest Rate (India)	0.034	0.015	0.000	0.000	.		
	Balance of Trade (India)	0.000	0.187	0.000	0.000	0.000	.	
	Stock Market (India)	0.000	0.059	0.000	0.000	0.001	0.000	.
N (No. of	INR/USD	128	128	128	128	128	128	128
observations)	Political Stability (India)	128	128	128	128	128	128	128
	GDP India (in billion USD)	128	128	128	128	128	128	128
	Business Confidence (India)	128	128	128	128	128	128	128
	Interest Rate (India)	128	128	128	128	128	128	128
	Balance of Trade (India)	128	128	128	128	128	128	128
	Stock Market (India)	128	128	128	128	128	128	128

indicates the mean and standard deviation for each variable entered in the model for the whole sample studied. Accordingly, the average stock market index of India is 9448.59, a balance of trade of - 4424.95 million INR, interest rate (Trading Economics, n.d.) of 5.63%, business confidence of 128.83, GDP worth 791.56 billion USD, political stability of -0.7928, and an average monthly fluctuation of 0.021915 of INR v/s USD.

The Table 2 shows the correlation between the variables studied. None of the independent variables are correlated (the correlation is not more than 0.80 for each independent with the dependent variable) with the

Table 3. Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	INR/USD	Nil	Enter
	Political Stability (India)	Nil	Enter
	GDP India (in billion USD)	Nil	Enter
	Business Confidence (India)	Nil	Enter
	Interest Rate (India)	Nil	Enter
	Balance of Trade (India)	Nil	Enter
	Stock Market (India)	Nil	Enter

All requested variables entered

Table 4. Model Summary

Model	*R*	R^2	Adjusted R^2	Std. error of the estimate.
1	0.780	0.608	0.589	0.00084

Table 5. ANOVA

	Sum of Squares	Degree of freedom	Mean Square	*F* value	Sig.
Regression	0.000	6	0.000	31.304	0.000
Residual	0.000	121	0.000		
Total	0.000	127			

dependent variable (i.e. exchange rate values). The correlation table also helps us in finding the presence of multicollinearity amongst the predictors. Multicollinearity between predictors will make the regression coefficients untenable. Multicollinearity is said to exist if the correlation between two or more predictors is beyond .80. Fortunately, for the data set we have on hand, we do not sense any threat of multicollinearity.

The output shown in the Table 3 betokens that we have performed the standard multiple regression, whereby all the predictors are included in the model. It is noteworthy that for a multiple regression, we have several options. Apart from the standard method (also called the "enter method") wherein all the variables are submitted for inclusion in the model, in a step-wise multi regression method, we instruct the software to select only those predictors that significantly impact the criterion variable.

The Table 4 of the model summary contains the coefficients such as *R*, *R*-square, Adjusted *R*-square, and standard error of estimate. The *R* is the multiple correlation coefficient among six predictors, namely interest rate, inflation rate, stock market index, GDP, political stability, balance of trade, business confidence of the concerned country, and the dependent variable of exchange rate values. The *R* value of 0.780 indicates a strong correlation between the predictors and the criterion variable. The *R*-square value is the coefficient of multiple determinations representing the proportion of variation in the criterion variable that is accounted for by the predictor variables. In the investigation of the relationship between dependent and independent variables, 60.8% of the variation in the exchange rate is associated with variation in GDP, interest rate, inflation, stock market index, balance of trade, business confidence, and political stability. A minuscule difference between *R*-square and adjusted *R*-square value indicates the robustness of the regression results against the variation in sample size and number of predictors in the model.

The significance of the overall regression model is tested in the ANOVA summary table (Table 5) using a *F*-test. The appropriate degrees of freedom are *k*, and *n* - *k* -1, where *k* is the number of predictor variables and *n* is the number of sample studied. The multiple-regression model with the *F* - statistic of 31.304 for (7, 124) degrees of freedom is statistically significant at the 0.05 level. This implies that at least one of the predictor variables in the model has a significant linear impact on the criterion variable of exchange rate.

A hypothesis is considered - that all the variables used are independent and do not affect the criterion variable (exchange rate) in a significant manner.

- **H_0 = All factors do not affect the exchange rate (dependent variable).**
- **H_a =At least one of the independent variables affects the dependent variable significantly.**

It can be inferred from the Table 6 (*t* -table) that barring business confidence, all other variables affect the dependent variable significantly. Since all the independent variables except business confidence are affecting the dependent variable, the null hypothesis gets rejected. So, business confidence will be rooted out of the model. Thus, the model of INR/USD in the Indian context is as follows:

Table 6. Coefficients

Model		Unstandardized Co-efficients	Unstandardized Co-efficients	Standardized Co-efficients			Collinearity Statistics	
1		*B.*	Std. Error	Beta	*t*	Sig.	Tolerance	VIF
	Constant	0.019	0.001		25.09	0.000		
	Political Stability (India)	-0.001	0.000	-0.581	-8.93	0.000	0.764	1.308
	GDP India (in billion USD)	-1.8E-006	0.000	-0.412	-2.41	0.017	0.111	9.022
	Business Confidence (India)	-1.7E-006	0.000	-0.029	-0.32	0.747	0.408	2.450
	Interest Rate (India)	0.000	0.000	0.393	5.90	0.000	0.729	1.372
	Balance of trade (India)	-6.0E-008	0.000	-0.167	-1.31	0.190	0.202	4.959
	Stock Market (India)	1.87E-007	0.000	0.846	5.31	0.000	0.128	7.830

Dependent Variable is INR/USD

Table 7. Collinearity Diagnostics

					Variance Proportions					
Model	Dimension	Eigen Value	Condition Index	Constant	Political Stability (India)	GDP India (in billion USD)	Business Confidence (India)	Interest Rate (India)	Balance of trade (India)	Stock Market (India)
1	1	5.669	1.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
	2	0.787	2.68	0.58	0.58	0.00	0.00	0.00	0.01	0.00
	3	0.428	3.63	0.14	0.14	0.00	0.00	0.06	0.06	0.01
	4	0.056	10.03	0.01	0.01	0.01	0.02	0.26	0.26	0.14
	5	0.042	11.56	0.10	0.10	0.02	0.02	0.38	0.38	0.33
	6	0.012	21.61	0.17	0.17	0.64	0.34	0.08	0.08	0.03
	7	0.005	33.55	0.95	0.00	0.32	0.62	0.23	0.23	0.48

INR/USD= 0.019 - (0.001*political stability) – (1.8E-006*GDP India) - (1.7E-006*Business confidence) + (0*interest rate) – (6.0E-008*balance of trade) + (1.87E-007*Indian stock market)

The results of the coefficients column in the Table 6 indicate that the predictor variables such as the stock market index have a positive (favorable) impact on the criterion variable of share index, whereas other predictors, that is, political stability, GDP of the country, business confidence, and balance of trade have a negative impact on the criterion variable. Interest rate impact is neutral. Even here, the unstandardized coefficients are known as partial regression coefficients. A partial regression coefficient of -.001 for political stability means that a unit increase in political stability will influence the exchange rate value by -.001 point while holding the change in the other predictor constant. It is similar for other predictors such as that for GDP, business confidence, and so forth. A unit increase in their value has a significant impact on the exchange rate value. The standardized beta coefficients for the predictors reflect their relative importance in the regression model. The relative importance is based on the size of the beta coefficient, which in this case is 0.846 for the predictor of the Indian stock market.

The last column (colinearity diagnostics) of Table 7 reveals that there is no threat of multicollinearity amongst the predictors as the value of tolerance for each of the predicators is greater than 0.20, and the VIF is less than 5. Thus, the multicollinearity assumptions are satisfied in building this multi-regression model.

➲ **INR/YEN Regression Analysis:** Here, the same seven (7) variables have been considered for analysis and the process mentioned in the case of INR/USD has been replicated in this case as well to get the following model:

Table 8 . Group Statistics

				Valid *N* (listwise)	Valid *N* (listwise)
Code		**Mean**	**Std. Dev.**	**Unweighted**	**Weighted**
1	Stock Market (India)	9448.58	5954.83	128	128
	Balance of trade (India)	-4424.95	3674.26	128	128
	Interest Rate (India)	5.63	1.79	128	128
	Business Confidence (India)	128.83	21.73	128	128
	GDP India (in billion USD)	791.56	299.25	128	128
	Political Stability (India)	-0.79	1.28	128	128
	INR/USD	0.02	0.00	128	128
2	Stock Market (India)	11660.71	3770.91	128	128
	Balance of trade (India)	647.40	472.83	128	128
	Interest Rate (India)	0.27	0.17	128	128
	Business Confidence (India)	2.10	20.43	128	128
	GDP India (in billion USD)	4475.93	332.69	128	128
	Political Stability (India)	-15.56	172.55	128	128
	INR/USD	2.42	0.28	128	128
Total	Stock Market (India)	10554.65	5096.14	256	256
	Balance of trade (India)	-1888.77	3645.87	256	256
	Interest Rate (India)	2.95	2.97	256	256
	Business Confidence (India)	65.46	66.89	256	256
	GDP India (in billion USD)	2633.70	1872.61	256	256
	Political Stability (India)	-8.17	122.00	256	256
	INR/USD	1.22	1.22	256	256

INR/YEN = 4.940 + (2.01E-.005*political stability) – (.001*GDP Japan) + (0.604*interest rate) – (2.12E-005*balance of trade) + (2.58E-005*Japan stock market) - (0.06*inflation rate) + (0*Business confidence)

➲ **INR/GBP Regression Analysis:** Here, the same seven (7) variables have been considered for analysis and the process mentioned in the case of INR/USD and INR/YEN has been replicated in this case as well to get the following model:

INR/GBP = 0.013 - (1.3E-005*political stability) – (1.53E-006*GDP U.K.) + (0*interest rate) – (3.8E-007*balance of trade) - (7.3E-007*U.K. stock market) - (4.04E-005*inflation rate) + (1.58E-005*U.K. business confidence)

Discussion

After the results of the regression came out, they posed an interesting peculiarity- the degree of impact of the mentioned macroeconomic factors was different for different economies' exchange rates. The impact was less on India and U.K., while it was high on Japan and U.S. In order to analyze whether the groups significantly differed from each other statistically or was it simply a chance (probabilistic) event, discriminant analysis was applied. In order to proceed with this, India was selected as the representative of India and U.K. as both are affected by the same macroeconomic variables to a lesser extent. On the other hand, Japan was selected to be the representative of Japan and the U.S. as the impact of the independent variables was larger on these economies when compared to

Table 9. Tests of Equality of Group Means

	Wilk's Lambda	*F* value	Deg of Freedom 1	Deg of Freedom 2	Sig.
Stock Market (India)	0.953	12.60	1	254	0.000
Balance of trade (India)	0.514	239.96	1	254	0.000
Interest Rate (India)	0.183	1132.44	1	254	0.000
Business Confidence (India)	0.099	2309.92	1	254	0.000
GDP India (in billion USD)	0.028	8677.24	1	254	0.000
Political Stability (India)	0.996	0.938	1	254	0.334
INR/USD	0.027	9018.69	1	254	0.000

Table 10. Pooled Within-Groups Matrices

		Stock Market (India)	Balance of trade (India)	Interest Rate (India)	Business Confidence (India)	GDP India (In billion USD)	Political Stability (India)	INR/USD
Correlation	Stock Market (India)	1						
	Balance of trade (India)	-0.691	1					
	Interest Rate (India)	-0.217	0.340	1				
	Business Confidence (India)	0.598	-0.403	-0.189	1			
	GDP India (in billion USD)	0.570	-0.622	-0.252	0.116	1		
	Political Stability (India)	-0.053	-0.037	-0.013	0.051	0.258	1	
	INR/USD	0.183	0.046	0.025	0.349	-0.484	-0.365	1

India and the U.K.

The table on group statistics (Table 8) displays the mean and standard deviation values for each variable - group wise and for the total sample. In the present case, only two groups have been compared ; namely, highly influenced (H) and less influenced (L). Looking at the mean scores, a noticeable difference can be seen between the two groups for all the predictors in the model. Hence, hopefully, it was expected that all these predictors would distinguish the group in highly influenced and less influenced category.

The question of whether all these predictors would significantly distinguish the group in highly influenced and less influenced category is answered in the table of test of equality of group means. The SPSS software performs a separate univariate ANOVA by taking each predictor as the dependent variable and the groups 'H' and 'L' as the independent variables. That is why we see the *F*- statistics in the Table 9. If the *F* statistics corresponding to the predictor is significant, that is, if the level of significance, mentioned here as "Sig," is less than 0.05, then it can be interpreted that all these predictors are significantly contributing to the discriminant model in differentiating between the groups. In the present case, the table indicates that all the predictors are significantly differentiating the 'H' and the 'L' categories, and the level of significance is less than recommended 0.05 levels. Hence, it can be inferred that all the predictors are significantly differentiating between the 'H' and the 'L' category of groups.

The pooled within groups matrices (Table 10) is the average of separate covariance matrices for both groups that is used to identify the presence of any multicollinearity between the predictors. It, therefore, indicates that both the variables in that particular pair share a large amount of common shared variance and ,therefore, reflect the same attributes. Researchers should be extremely conscious as multicollinearity between the predictors will make the model less reliable.

Wilk's Lambda statistic (Table 11) in the present case is the ratio of within sum of squares to the total sum of squares when running one way ANOVA on the discriminant score *(D)* as the dependent variable and the highly influenced category as the independent variable (Zikmund, Babin, Carr, & Griffin, 2010). The value of Wilk's Lambda varies between 0 and 1. The closer the value to 0, the better it is. The Wilk's Lambda itself is tested for

Table 11. Wilk's Lambda

Test of function(s)	Wilk's Lambda	Chi-Square	Deg. of freedom	Sig.
1	0.003	1467.52	7	0.000

Table 12. Eigen Values

Function	Eigen Value	% of variance	Cumulative %	Canonical Correlation
1	349.15	100	100	0.999

statistical significance with the chi-squared transformed statistic, which in the present case is 1467.5 and is found to be significant.

Analyzing the Table 12, it can be seen that the canonical correlation of .999 is simple correlation between the cases, discriminant scores (*D*) and their corresponding category. To differentiate the two groups, an index was build that separates them on the basis of their measured characteristics.

$D = v_1X_1 + v_2X_2 + v_3X_3 + \text{constant}$

where,

$v_1, v_2 \ldots$ are the weights indicating the importance of each *X* in helping to distinguish the highly influenced group. The weights are derived so that the variation in *D* scores between the two groups is as large as possible, while the variation in *D* scores within the groups is as small as possible. This is known as Eigen value with 100% variance explained. The validity of discriminant analysis is determined by the percentage of cases it correctly identifies as belonging to their original groups as compared with the percentage of cases that would be expected by chance. To assist interpretation, the discriminant score for each group is calculated. The mean discriminant score for 'H' is 18.613 and for 'L,' it is -18.613, this mean discriminant score is also known as groups centroid. If a group's *D* score is closer to the mean score or 'H' than for 'L', we will classify it as 'H'.

➲ ***D* Score for First Group**

***D* = (9448.586*.0) + (-4424.95*.0) + {5.63*(-0.064)}+ {128.83*(-0.009)}+ (791.56*0.005) + (-0.79*.0) + (0.021*6.568) + (-19.16) which is equal to -16.59** (The symbol * denotes that, the variable is significant at 95% confidence interval.)

➲ ***D* Score for Second Group**

***D* = (11660.71*.0) + (647.4*.0) + {0.27*(-.064)}+ {2.1*(-.009)}+ (4475.98*.005) + {(-15.56*.0)}+ (2.42*6.568) + (-19.165) which is equal to 19.06.**

We can see that the mean discriminant scores of the highly influenced are similar in magnitude, as those of the less influenced. Furthermore, the two sets of scores are different from each other. As mentioned, the average discriminant score (known as group centroid) is -18.613 for the less influenced group and 18.613 for the highly influenced group. This indicates that the factors within the groups themselves are as much alike as possible on these generated scores, and the groups themselves are as different as possible. We need to compare only the discriminant scores (*D*) of the groups rather than comparing the groups for all variables.

Factor Analysis

KMO stands for the names of the statisticians Kaiser, Meyer, Olkin and is a measure of sampling adequacy. As a general guideline, a KMO measure of sampling adequacy of .50 or more is recommended. The Table 13 depicts the

Table 13. KMO and Bartlett's test

	KMO Measure of Sampling Adequacy	**0.758**
Bartlett's Test of Sphericity	Approx. Chi -Square	595.12
	Deg. of freedom	15
	Sig.	0.000

Table 14. Correlation Matrix

		Stock Market (India)	Balance of trade (India)	Interest Rate (India)	Business Confidence (India)	GDP India (in billion USD)	Political Stability (India)
Correlation	Stock Market (India)	1					
	Balance of trade (India)	-0.844	1				
	Interest Rate (India)	-0.296	0.372	1			
	Business Confidence (India)	0.726	-0.601	-0.329	1		
	GDP India (in billion USD)	0.905	-0.888	-0.423	0.647	1	
	Political Stability (India)	0.103	-0.035	0.241	-0.200	0.115	1

Table 15. Communalities

	Initial	Extraction
Stock Market (India)	1.000	0.915
Balance of trade (India)	1.000	0.850
Interest Rate (India)	1.000	0.533
Business Confidence (India)	1.000	0.677
GDP India (in billion USD)	1.000	0.928
Political Stability (India)	1.000	0.841

Bartlett's test of sphericity, which is a statistical measure that tests the statistical significance of the intercorrelation among the variables submitted for factor analysis. In other words, it verifies the null hypothesis that the variables are independent of each other. If a null hypothesis is accepted, then it would mean that the variables are independent, and therefore, there is no likelihood of any factor emerging. Indeed, this null hypothesis of independence of variables should be rejected to conform to the factor analysis's assumption that there exists significant correlation among the variables.

The Table 14 indicates that the selected variables - GDP India and stock market index- are strongly related as the correlation coefficients are more than 0.9. The communality table (Table 15) provides values of communalities, both initial and extraction. The initial communality of 1.0 for each variable suggests that all the variables are fully involved in the factor analysis solution. The extraction communality, on the other hand, provides the final communality, which is less than the initial ones and indicates the proportion of variance in the variable that is accounted for by the factors whose eigen values are more than 1. In Table 16, the total variance explained gives the amount of variance explained by each component after the initial and extraction part of the analysis. The total variance explained by all the variables combined is 100%, and components contribute to it proportionately. In the above case, the first variable contributes 57.37%, which is more than the recommended 50%. In the interest of scientific parsimony, it would seem that the first and the second factors are sufficient in the explanation of the dependent variable almost up to 80%. Thus, the six independent variables could be enveloped into two factors with almost 80% of the variance explained.

Table 16 . Total Variance Explained

	Initial Eigen Values	Initial Eigen Values	Initial Eigen Values	Extraction Sums of Squared Loadings	Extraction Sums of Squared Loadings	Extraction Sums of Squared Loadings	Rotation Sums of Squared Loadings	Rotation Sums of Squared Loadings	Rotation Sums of Squared Loadings
Component	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.519	58.65	58.65	3.519	58.65	58.65	3.443	57.37	57.37
2	1.225	20.41	79.07	1.225	20.41	79.07	1.302	21.69	79.07
3	0.697	11.62	90.69						
4	0.363	6.05	96.74						
5	0.124	2.06	98.81						
6	0.071	1.18	100						

Conclusion and Research Implications

The article combines India and U.K. into one group and Japan and USA into another, based on the analysis of data on the previously mentioned independent variables. The kind of corporate governance practices exercised in these countries could be an underlying factor for this peculiar behavior of the respective currencies in the forex market. Most of the recommendations of the Cadbury committee (U.K.) have been incorporated into the Indian practices; however, there are some differences between that of U.S. and Japanese governance practices, but certainly, they are different from the Indian ones, thus qualifying them for a separate category. Whereas, the corporate governance practices in the U.S., U.K., and to a certain extent, in India, are more inclined towards the shareholders, and in Japan, the corporate governance practices are inclined towards all the stakeholders. The participants of the forex market can club these currencies into different groups as shown in the present paper and can expect them to behave homogeneously if they fall into one category and heterogeneously otherwise.

Strategies of Risk Reduction for Forex Traders

Forex trading, without any doubt, can be tricky, particularly for the beginners, but there are ways to limit risk and financial exposure. Every forex trader should have (Easy Forex, n.d.) :

(1) A trading strategy,

(2) Knowledge of when to enter and exit the market,

(3) What kind of movements to expect,

(4) A reasonably fair expectation from the market (not expect to become Warren Buffet overnight).

(5) Enquire about the prospects of a currency diligently by studying the overall economic scenario.

(6) Always try to cover the position.

(7) Stop loss orders can be executed to limit losses.

(8) Use of currency derivatives [17] can be a good idea, if one is suspecting his/her instincts.

Even the most knowledgeable traders, however, cannot predict with absolute certainty how the market will behave. For this reason, every forex transaction should take advantage of available tools designed to minimize loss. Stop-loss orders are the most common ways of minimizing risk when placing an entry order.

A stop-loss order contains instructions to exit your position if the currency price reaches a certain point. If one takes a long position (expecting the price to rise), then one would place a stop loss order below the current market prices. If one takes a short position (expecting the price to fall), then one would place a stop loss order above the current market price. As an illustration, if one takes a short position on USD/CDN, it means he/she expects the

U.S. dollar to fall against the Canadian dollar. The quote is USD/CDN 1.2138/43 – he/she can sell US$1 for 1.2138 CDN dollars or sell 1.2143 CDN dollars for US$1. The order can be placed like this: Sell USD: 1 standard lot USD/CDN 1.2138 = $121,380 CDN Pip Value: 1 pip = $10 Stop- Loss: 1.2148.

Limitations of the Study and Scope for Further Research

This paper does not claim itself to be the sole and exhaustive repository of Forex knowledge. It touches few aspects of the Forex market with respect to countries having different types of corporate governance practices and its possible bearing on forex fluctuation, risk evaluation, and minimization. The paper considers the data for a period of 20 years only (on a monthly basis). The time period for the preparation of the paper report is limited. Future studies can extend the present study by including more fine tuned extensive data and employing more advanced software packages on many more currency pairs.

Notes

[1] The foreign exchange market, also referred to as the "Forex" or "FX" market is the largest financial market in the world, with a daily average turnover of US$1.9 trillion. The forex is made up of about 5,000 trading institutions such as international banks, central government banks (such as the U.S. Federal Reserve), and commercial companies and brokers for all types of foreign currency exchange. There is no centralized location for the forex. Major trading centers are located in New York, Tokyo, London, Hong Kong, Singapore, Paris, and Frankfurt, and all trading is by telephone or over the Internet. Businesses use the market to allow them to buy and sell products in foreign countries. However, most of the activity on the FOREX is from currency traders who use it to generate profits from small movements in the market. Even though there are many big players in the forex, it is now even accessible to the small investor, thanks to recent changes in regulations. Previously, there was a minimum transaction size and traders were required to meet strict financial requirements. "Foreign Exchange" is the simultaneous buying of one currency and selling of another. Currencies are traded in pairs, for example, Euro/US Dollar (EUR/USD) or US Dollar/Japanese Yen (USD/JPY). There are two reasons to buy and sell currencies. About 5% of daily turnover is from companies and governments that buy or sell products and services in a foreign country or must convert profits made in foreign currencies into their domestic currency. The other 95% is trading for profit, or speculation. For speculators, the best trading opportunities are with the most commonly traded (and , therefore , most liquid) currencies, called "the Majors." Today, more than 85% of all daily transactions involve trading of the Majors, which include the US Dollar, Japanese Yen, Euro, British Pound, Swiss Franc, Canadian Dollar, and the Australian Dollar. A true 24-hour market from Sunday 5:00 pm ET to Friday 5:00pm ET, Forex trading begins each day in Sydney, and moves around the globe as the business day begins in each financial center, first to Tokyo, London, and New York. Unlike any other financial market, investors can respond to currency fluctuations caused by economic, social, and political events at the time they occur - day or night. The FX market is considered an Over The Counter (OTC) or 'interbank/interdealer' market, due to the fact that transactions are conducted between two counterparts over the telephone or via an electronic network. Trading is not centralized on an exchange, as with the stock and futures markets.

[2] No short selling restrictions: Forex trading always involves buying one currency and selling another, so traders can easily trade in a rising or falling market. There is no Zero Uptick rule or any other restriction against shorting a currency.

[3] Liquidity: The sheer volume of forex helps to facilitates price stability in most market conditions. What's more, almost 85% of all currency transactions involve the 7 major currency pairs

[4] 24 By 7 Flexi Market: Forex is a true 24-hour market, open continuously from 5:00pm ET on Sunday to 5:00 pm on Friday. With three distinct trading sessions in the US, Europe, and Asia, one can trade on his own schedule and respond to breaking news.

[5] Up to 200:1 Leverage: With more buying power, you can increase your total return on investment with less cash outlay. Of course, increasing leverage increases risk. With $1,000 cash in a margin account that allows 200:1 leverage (.5%), you can trade up to $200,000 in notional value.

[6] No (or low) Transaction Costs: For most traders, the forex market also offers the benefit of no transaction costs. For the most part, forex brokers do not charge commissions (if they do, they are relatively small).

[7] Multiple Trading Vehicles: Forex trading can be done in a number of fashions. Many folks tend to think strictly of the spot market. While that is certainly the largest of the components, it is not the only one. The futures market has become a bit more attractive with the expansion of e-mini currency contracts.

[8] Dynamic Market: One of the biggest attractions to forex trading is that ther is just about always something moving. There are a number of primary currencies involved, each of which is continuously interacting with all the others.

[9] Easily trade long or short: Unlike the stock market, where there are restrictions imposed on selling short. In forex,there is nothing of the sort. It is just as easy to taking a short position as it is to take a long one.

[10] Exchange rate risk refers to the fluctuations in currency prices over a trading period. Prices can fall rapidly resulting in substantial losses unless stop loss orders are used when trading forex. Stop loss orders specify that the open position should be closed if currency prices pass a predetermined level.

[11] Margin risk refers to the risk from buying currencies on margin or credit. Many brokers offer a margin account, giving you a margin of 100:1, meaning one can buy $100 worth of a foreign currency with just $1 in his account. This means that both profits and losses can be magnified by 100X. Thus, you can both make and lose a lot of money very quickly.

[12] Interest rate risk can result from discrepancies between the interest rates in the two countries represented by the currency pair in a forex quote. This discrepancy can result in variations from the expected profit or loss of a particular forex transaction.

[13] Credit risk is the possibility that one party in a forex transaction may not honor their debt when the deal is closed. This may happen when a bank or financial institution declares insolvency.

[14] Country risk is associated with governments that may become involved in foreign exchange markets by limiting the flow of currency. There is more country risk associated with 'exotic' currencies than with major currencies that allow the free trading of their currency.

[15] Discriminant function analysis, a.k.a. discriminant analysis or DA, is used to classify cases into the values of a categorical dependent, usually a dichotomy.

[16] Factor analysis is used to uncover the latent structure (dimensions) of a set of variables. It reduces attribute space from a larger number of variables to a smaller number of factors and as such is a "non-dependent" procedure (that is, it does not assume a dependent variable is specified).

[17] There is a significant number of financial derivatives instruments directed at the hedging of a specific number of risks. Several situations may arise in which the agent is interested in eliminating his exposure to currency risk. It is assumed that the investor is expecting to receive a certain amount of foreign currency at a certain point in the future and he/she wishes to hedge his/her gain from any depreciation in the foreign exchange rate.

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