TOPIC: "A STUDY ON FORECASTING FOREIGN EXCHANGE RATES WITH REFERENCE TO SOME SELECTED CURRECIES AGAINST INR"

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ABSTRACT

The remote exchange showcase is considered as the champion among the most complex dynamic markets with the characteristics of high flightiness, nonlinearity and irregularity. Since the separate of Bretton wood framework in 1970s, the changes in the remote trade advertise are like never before. Rather than these some imperative components, for example, monetary development, exchange improvement, financing costs and swelling rates have noteworthy effect on the swapping scale change. These qualities likewise make it hard to foresee the outside trade rates**.**Along these lines anticipating of trade rates has turned out to be vital and challenge look into issue for both scholastic and mechanical groups. This study basically deals with the exchange rates of KWD/INR, JOD/INR, EUR/INR, CHF/INR, BHD/INR, USD/INR and OMR/INR on a monthly basis over the period from 2007 to 2017. The average return and the risk of the currencies were calculated and the relationship between each currency is calculatedthrough the methods of time series analysis and regression. For the expectation of the conversion standard the expansion rates of chose monetary forms are taken and count is finished by buy equality method. For checking the relationship between the economic factors with respect to currencies, inflation rates of seven currencies and Indian currency are taken. The study is mainly focusing for predicting a good forecasting technique for the currencies based upon the quantity of errors obtained from the fundamental forecasting techniques.

Keywords: forecasting, time series analysis,inflation rate, correlation, return, standard deviation, regression

INTRODUCTION

In the global economic market, currency is regarded as the most fundamental element for a country. In order to trade with a global scenario, a system of exchange rate between currencies is needed. This system is formally termed as currency exchange or foreign exchange. Exchange rate is the currency rate of a country represented in terms of another country. Because of exchange rates are the essential part for the monetary policy; most of the countries are considering currency markets as part for their economic strategies.

Conversion scale impacts exchange and capital streams crosswise over national limits, relative gainfulness of different ventures, genuine wages of specialists and, in the last examination, portion of assets inside and crosswise over nations. Prior to 1973 when the world was on a fixed exchange rate system, exchange rates were treated as policy parameters and the focus was on the impact of policy driven changes in them on a county's external position. Since cross border capital flows were not of great significance, the analysis was mostly confined to the relationships between exchange rates and the current account.Conversion scale figures are an imperative contribution to various corporate monetary choices.

FOREIGN EXCHANGE MARKET- It is viewed as that the production of highest quality level financial framework in 1875 was the imperative breakthrough in remote trade histories toward the start. Before this system countries used to pay gold and silver for their transactions or trading. But when the supply and demand where started affecting the metal values they removed this system and adopted gold standard monetary system. After the arrival of the world trade organization, most of the countries started adopting liberalized policies and started using floating exchange rate mechanism for the determination of their exchange rates with reference to other internationally traded countries.

A remote trade showcase which is an establishment where the trading of one nation's money with reference that of cash. It is actually build up of several other markets. For example if it is a trade between the US dollar and Japanese yen each constitutes a market.Forex markets are only remaining based upon the financial structure of a country and its trading. It is regarded as the oldest and original market in international trading. These will provide international liquidity and relative stability in the global market. It is a 24 hour over the counter and the exchanges are just with broadcast communications innovation. Currency markets are also classified into spot markets, interbank futures and option markets.

INDIAN FOREIGN EXCHANGE MARKET - Remote exchange showcase in India comprises of three portions. The principal comprises of exchanges between the save bank of India and the approved merchants. The approved merchants have been separated into various classes. All booked business banks, which incorporate open area banks, private division banks and outside banks working in India, have a place with class of ADs. All updated completely fledged cash correctors (FFMCs) and choosing local country stores (RRBs) and helpful stores have a place with class second of ADs. Select money related organizations, for example, EXIM bank have a place with classification third of ADs. Right now there are 86 categories, first sections are working in India out of which five are agreeable banks. All shipper exchanges in the outside trade showcase must be essentially embraced specifically through ADs. Notwithstanding, to give profundity and liquidity to the interbank section, ADs have been allowed to use the administrations of merchants of better value disclosure in their interbank exchanges.

The next portion is the interbank showcase in which the ADs manage each other and the third section comprises of exchanges amongst ADs and their corporate clients. The retail grandstand in real money notes and voyagers registers considers guest. In the retail segment, moreover, to the ADs, there are money changers, who are allowed to deal in remote financial structures.

The Indian market started acquiring some significance and components of a well working business segment e.g. dynamic market makers orchestrated to cite two way rates –only around 1985.even by then, two courses forward quotes were generally not open. In the interbank promote, forward quotes were given as close term swaps principally for ADs to change their positions in various fiscal structures.

The remote trade advertise in India has been experiencing quick changes since 1993.the RBI has loose various confinements on ADs holding of open positions, adjusts held abroad and their dealings with clients. The market has gained some profundity however it remains extensively skewed. For example, it is assessed that almost 30% of the trader business starts from the state bank of India and the remote banks represent a substantial piece of interbank business. Trade related transactions dominate and in the absence of capital mobility forward premiums or discounts are not closely related to interest rate differentials.

REVIEW OF LITERATURE:

Exchange rate fluctuations play a key role in determining economic policy. These fluctuations have repercussions on economic performances. It is basically the reliance regarding imports and specialization in fares that record for conversion scale changes on the monetary exhibitions of nations. In order to 22 stabilize the economy during these fluctuations, government may increase or decrease money supplies, which, in turn, can weaken or strengthen the price of the exchange rate. In principal models of swapping scale, macroeconomic factors, for example, loan costs, cash supplies, net residential items, exchange account adjusts, and ware costs have for quite some time been seen as the determinants of the balance conversion scale. The outside conversion standard in basic models is delegated an exceptionally fluid market where all data is open, and merchants in the piece of the overall industry similar desires with no data advantage over the other[1]

Trust in money is the best determinant of a conversion scale. Choices in view of expected future advancements may influence the money. A trade of money may be founded on any of four principle sorts to conversion standard frameworks: Complete settled trade rates Semi-settled trade rates Free-coasting trade rates Managed skimming trade rates[2]

Estimating strategies fall into three classes: quantitative models, qualitative models, and mechanical methodologies.. The qualitative methods of forecasting are called non-statistical or judgmental approaches to making forecasts. The qualitative are scarce. The techniques used in the technological approach combine the quantitative and qualitative approaches so that a long model is to respond to technologic to make a forecast.[3]

A relapse examination, which recognizes the pattern over a particular era, will not be impacted by cyclic examples or here and now slants that are an indistinguishable length from the

Time interim utilized as a part of the investigation. The time interval used in the regression analysis is Selected to be long (or multiples of other cycles) if the impact of short-term patterns is to be reduced. To emphasize the movement caused by other phenomena, the time interval should be less than one-half of those periods. In this way, a trend technique or forecasting model may be used to identify a seasonal or cyclic element.[4]

Meese and Rogoff tested the long-held thought that monetary basics decide money esteems. They found that a sporadic walk display was comparably as incredible at predicting exchange rates as models in light of basics. To put it plainly, their discoveries propose financial basics, similar to exchange adjusts, cash supply, national salary, other key factors, are of little use in anticipating trade rates between nations with generally comparable swelling rates.[5]

For the methodology in this example, Zhang and Berardi use weekly trading rate information. They combine neural systems teaches with different primary random weights with the same information.The neural system prepared with various beginning weights perhaps stayed with various essentials, each of which can have distinctive anticipating exhibitions. Outputs demonstrate that distinctive ways to deal with shaping troupes for time arrangement determining have very extraordinary consequences for anticipating comes about.

Neural system troupes made by just fluctuates the beginning arbitrary weights are not as equipped as the conventional irregular walk display. Hence, this technique for troupe anticipating may not be compelling for estimating trade rates. [6]

RESEARCH METHODOLOGY:

BACKGROUND OF THE STUDY: This project work explains in details of dynamics of the foreign exchange rate forecasting. Due to relatively highly unstable global scenario, the forecasting of exchange rates is highlysignificant. Time series analysis and purchase parity methods are highly rated for the prediction of the exchange rates. These research efforts on time series analysis, average return and regression method are considerable. This paper

includes the monthly rate of exchange of seven currencies against Indian rupees are taken for theanalysis. The analysis was done for a period of last ten year data. That is from 2007 to 2017 monthly data. The main goal for this study is to forecast least square method, regression method and Purchase Parity Paritymethod for forecasting of exchange rates and finding the relationship between the currencies with each other and also predicting the relationbetween the economical factors like inflation.

On the researchstudy several factors had the significant impact on the accuracy of time series and inflation rate. Alsorefers the integration of regression with other methods like ANOVAs and Standard Deviation. The average return and the risk of each currency is predicted and consolidated data was prepared. Basis on the master data the analysis is done for the several methods to find the minimum error in the predicted value through root mean square error. The accuracy of the predicted value is compared with the Mean Absolute Deviation.

NEED FOR THE STUDY

Precise expectation of trade rates of different universal monetary standards is fundamental as it includes tremendous money related assets that are exchanged through worldwide budgetary markets.Internal and external factors like political stability, economic growth of an economy affects the volatility of exchanges of a currency in the international markets. Hence, prediction of accurate exchange of a country's currency is herculean task.

Preceding the breaking down of Bretton Wood System, there was Fixed Exchange Rate framework; later a portion of the propelled nations like the United States and its exchanging accomplices began receiving Floating Exchange Rate System. With the arrival of World Trade Organization, most of the countries started adopting liberalized policies and started using floating exchange rate mechanism for the determination of their exchange rates with reference to other internationally traded currencies. The accurate forecasting of the exchange rate of a currency avoids uncertainty of trade investment and ensures international flow of capital from one country to another country and enhances the profits of the investors.

Earlier, theory of purchasing parity, theory of interest rate parity and balance theory of international payments methods were used to forecast the exchange rates. These models provided a set of simple and convenient methods for forecasting the exchange rates. These models were popular under fixed exchange rate system. Now floating exchange rate mechanism

has come into existence, this encouraged economist to develop new models on exchange rate forecasting.

STATEMENT OF THE PROBLEM

Exchange rate is the currency rate of a nation represented in terms of the money of scale of another country. The present objective of the study is to forecast the foreign trading rate of selected currencies like Kuwait Dinars, Jordanian Dinar, Euro Dollar, Swiss Francs, Bahrain Dinars, US Dollar and Oman Rial. All these selected countries' currencies exchange rates are forecasting and represented in terms of Indian Rupee. Forecasting the exchange rates are significant as these countries are important trading partners with India. Understanding and forecasting the exchange rates of these currencies not only benefits the investors of these countries but also the economic development of the nation. The present paper deals with the movement and prediction of foreign exchange rate in India for selected currencies from 2007 to 2017

SCOPE OF THE STUDY

The study "forecasting exchange rates with reference to some selected currencies" is mainly conducted to predict the best exchange rate forecasting method for the near future. For this research, seven currencies which are trading in the foreign exchange market are taken on a random basis. The data for the study will be collected from the company websites. The Indian rupees exchange rate is predicted against the seven currencies. The secondary data is collected for the last ten years from 2007 to 2017.

OBJECTIVES

- To understand the movement of exchange rates of selected currencies with reference to Indian Currency.
- To predict the movement of trading rates of selected currencies in the near future.
- To understand the nature of relationship among the exchange rates of selected currencies.
- To understand the risk and return characteristics of selected currency's exchange rates.
- To predict the exchange rates based on inflation between two countries.

HYPOTHESIS

H_0: There is no significance difference among the movement of the seven different currencies

H_1: There is a critical distinction among the development of the seven unique monetary forms.

SOURCES OF DATA

The present study is basically depends on the secondary data and it is collected from the below mentioned sources: RBI reports, journals, BSE and www.ozoforex.com

SAMPLING METHOD – Convenient sampling

It is a quantifiable technique for drawing operator data by picking test because of the straightforwardness of their picking units in light of their openness. The seven currencies against Indian rupee, which is selected for the study, are KWD, JOD, EUR, BHD, CHF, USD and OMR.

RESEARCH DESIGN - The methodology adopted for the study is conclusive research methodology. This study is based on large representative samples, statistical tests, analytical techniques and relationship among the exchange rates if the selected currencies. The outcome of the findings is used as the input for decision making.

TOOLS USED FOR ANALYSIS - The techniques used for the forecasting are Correlation, Standard Deviation, Time series analysis, ANOVA, Multiple Linear Regression and Purchase Power Parity theory.

LIMITATIONS OF THE STUDY

- The data collected is strictly based on secondary data
- The time period selected for the study is only 10 years
- The inflation rates of currencies are only available for 5 years

DATA ANALYSIS AND INTERPRETATION

TABLE 1:SHOWING AVERAGE MONTHLY RETURN AND STANDARD DEVIATION

	KWD/INR	JOD/INR	EUR/INR	CHF/INR	BHD/INR	USD/INR	OMR/INR
Average Monthly Return	0.37%	0.40%	0.26%	0.61%	0.38%	0.41%	0.41%
Monthly Standard Deviation	2.61%	2.71%	2.92%	3.03%	2.81%	2.71%	2.71%

INTERPRETATION - The table shows the average monthly return and the monthly standard deviation of the sevencurrencies. Mean average change in CHF is very high and also there is a high risk involved in it. Mean average change in EUR is very low.

TABLE SHOWING RELATIONSHIP BETWEEN CURRENCIES

	KWD/INR	***JOD/INR***	***EUR/INR***	***CHF/INR***	***BHD/INR***	***USD/INR***	***OMR/INR***
KWD/INR	1	0.91	0.50	0.44	0.83	0.91	0.90
JOD/INR	0.91	1.00	0.35	0.27	0.92	0.99	0.98
EUR/INR	0.50	0.35	1.00	0.68	0.26	0.36	0.34
CHF/INR	0.44	0.27	0.68	1.00	0.21	0.28	0.27
BHD/INR	0.83	0.92	0.26	0.21	1.00	0.91	0.91
USD/INR	0.91	0.99	0.36	0.28	0.91	1.00	0.98
OMR/INR	0.90	0.98	0.34	0.27	0.91	0.98	1

INTERPRETATION - The above table indicates the relationship between seven currencies. Here, JOD has a high relation with USD followed by OMR, BHD and KWD. BHD has strong relation in terms of the movements of other countries currencies like JOD,USD and OMR whereas with USD it is KWD, JOD, BHD and OMR. OMR has strong relation with all the countries currency except EUR and CHF. EUR and CHF currency movements is failed to identify based on other countries currencies because it has moderate/weak relation with respect to others.

ANOVA:

H_O: There is no significance difference among the movement of seven different currencies.

H_1: there is a significant difference among the movement of seven different currencies.

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*
Between Groups	0.000782	6	0.00013	0.1675	0.9853
Within Groups	0.653117	840	0.000778		
Total	0.653898	846			

From the above table it is showing that the F calculated value is 0.1675 which is not less than or equal to 0.05.Therefore null hypothesis is accepted. There is a similarity among the movements of the movement of seven currencies.

TIME SERIES ANALYSIS: Performance Metrics

Currency	Coefficient(a)	Slope (b)	RMSE	MAD
KWD/INR	186.80	0.057	10.73	26.92
JOD/INR	75.95	0.02	4.35	12.44
EUR/INR	68.81	0.02	5.32	6.71
CHF/INR	54.42	0.01	3.63	11.18
BHD/INR	143.29	0.04	8.47	23.52
USD/INR	53.57	0.01	3.06	8.82
OMR/INR	139.56	0.04	7.96	22.96

INTERPRETATION -

The least square equation for predicting the future value of the currency is: Y=a+bX

- KWD/INR=186.80+0.057 X
- JOD/INR = 75.95 + 0.02 X
- EUR/INR = 68.81 + 0.02 X
- CHF/INR = 54.42 + 0.01
- BHD/INR = 143.29 + 0.04 X
- BHD/INR = 53.57 + 0.01X
- BHD/INR = 139.56 + 0.04 X

With the help of above equations the investor can able to predict what is the future movement of the country's currencies with respect to INR and he can take the decision whether to buy or sell the currencies. The times series analysis is efficient in predicting the future currencies values of USD, CHF and JOD compared to others because the error is minimal.

MULTIPLE LINEAR REGRESSION METHOD -

SUMMARY OUTPUT

	KUWAIT	JORDON	GERMANY	SWISS	BEHRIAN	USA	OMAN
Multiple R	0.557155	0.794607	0.31	0.47	0.61	0.57	0.67
R Square	0.310422	0.631401	0.10	0.22	0.37	0.32	0.45
Adjusted R Square	0.287813	0.619316	0.07	0.20	0.35	0.30	0.43
Standard Error	10.42782	4.512205	5.29	4.17	10.97	4.33	10.17
Observations	64	64	64.00	64.00	64.00	64.00	64.00

RESIDUAL ERROR MATRIX:

	KUWAIT	JORDON	GERMANY	SWISS	BEHRIAN	USA	OMAN
Total Error	488.5017	209.6898	260.831	220.1992	546.4268	219.977	500.128
MAD	7.6328	3.276402	4.075484	3.440612	8.537918	3.43714	7.8145
Average Error	103.6423	19.40562	26.72253	16.60659	114.7978	17.86263	98.64678
RMSE	10.18049	4.40518	5.169384	4.075118	10.71437	4.226421	9.932108

Coefficient Matrix

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	188.13	9.47	19.86	0.00
Kuwait	879.43	316.67	2.78	0.01
India	-412.58	84.71	-4.87	0.00
Intercept	92.15	0.76	121.11	0.00
Jordan	-167.36	20.65	-8.11	0.00
India	-142.11	37.47	-3.79	0.00
Intercept	76.22	0.96	79.69	0.00
Germany	-124.43	74.32	-1.67	0.10
India	-52.74	46.07	-1.14	0.26
Intercept	66.12	0.71	92.51	0.00
Switzerland	105.98	102.39	1.04	0.30
India	-128.18	33.89	-3.78	0.00
Intercept	180.46	3.98	45.34	0.00

Bahrain	-477.63	135.32	-3.53	0.00
India	-514.30	91.19	-5.64	0.00
Intercept	65.36	1.11	59.08	0.00
USA	-217.02	73.95	-2.93	0.00
India	-119.17	36.89	-3.23	0.00
Intercept	170.14	2.01	84.60	0.00
Oman	-636.87	129.61	-4.91	0.00
India	-229.44	89.31	-2.57	0.01

REGRESSION EQUATION

- y=188.13 + (879.43 x1) + (412.58 x2)

Where x1 = Kuwait Inflation, X2 = Indian Inflation

- y=92.15+ (-167.36x1) + (-142.11x2)

Where x1 = Jordan Inflation, X2 = Indian Inflation

- y=76.22+ (-124.43x1) + (-124.43x2)

Where x1 = Germany Inflation, X2 = Indian Inflation

- y=66.12+ (105.98x1) + (-128.18x2)

Where x1 = Switzerland Inflation, X2 = Indian Inflation

- y=180.46+ (-477.63x1) + (-514.30x2)

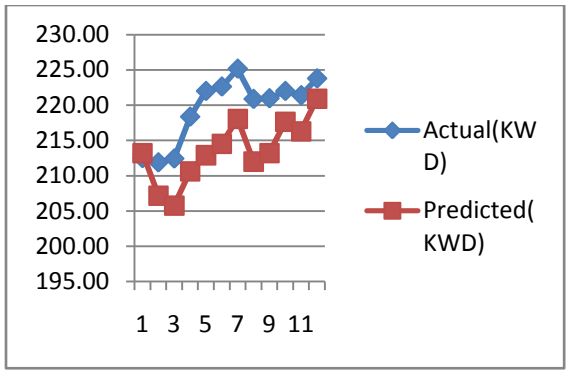
Where x1 = Bahrain Inflation, X2 = Indian Inflation

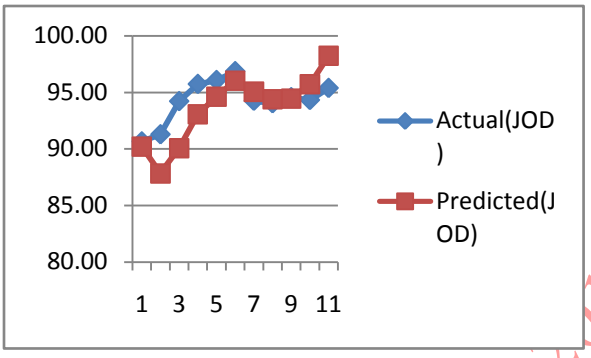
- y=65.36+ (-217.02x1) + -119.17x2)

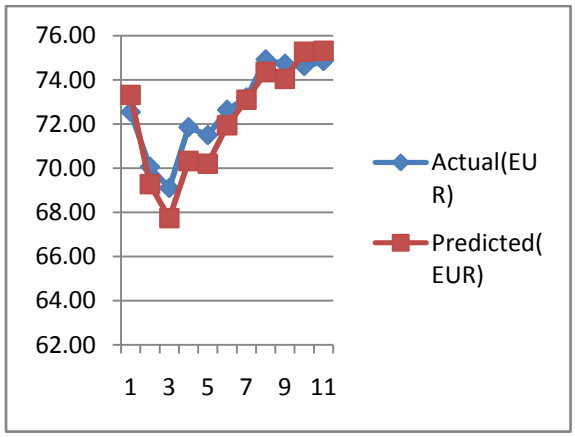
Where x1 = USA Inflation, X2 = Indian Inflation

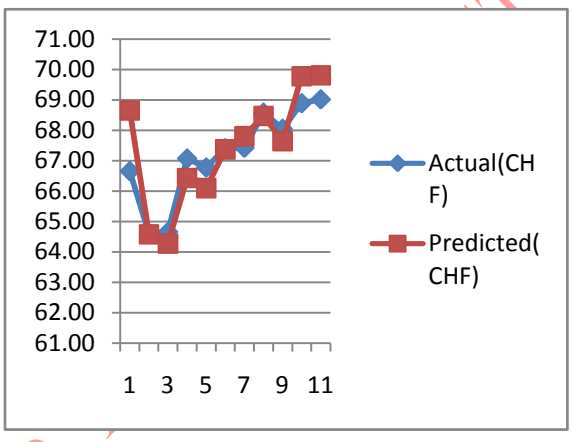
- y=170.14+ (-636.87x1) + (-229.44x2)

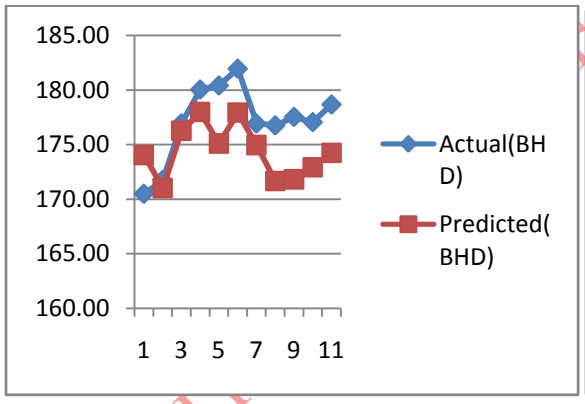
Where x1 =Oman Inflation, X2 = Indian Inflation

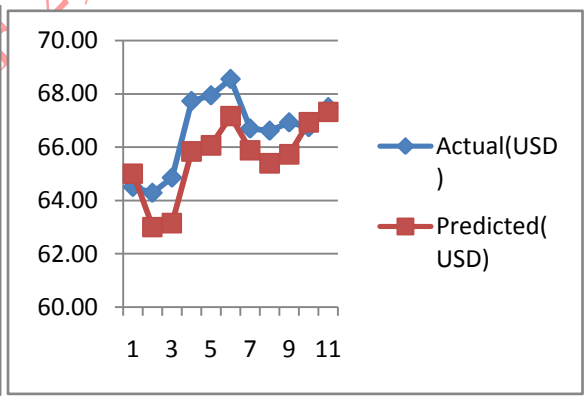


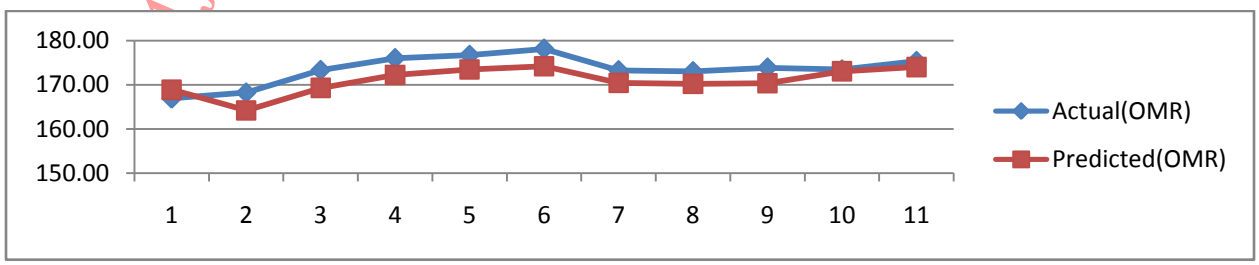












Actual and forecast values of seven different countries exchange rates with respect to INR

Interpretation – from the above analysis it is observed that compared to time series analysis multiple regressions is efficient in predicting the future exchange rate movements because the gap between the actual and forecasted value is minimal. This technique is efficient in predicting the exchange rates of JOR/INR, SWISS currency, USA/INR.

FINDINGS

- JOD exchange rate and USD exchange rate are highly correlated.
- Mean average change in CHF is very high and also there is a high risk involved in it.
- Mean average change in EUR is very low
- There is a low risk is involved in KWD
- JOD/INR, EUR/INR, CHF/INR and USD/INR shows less errors in regression method than other currencies.
- Prediction of USD/INR in parity method shows high accuracy

SUGGESTIONS

- Mean average change in CHF is very high but in future the risk is very low. So investing in CHF is profitable.
- Mean average change in EUR is very low. Its future risk is very high. So don't invest in EUR.
- USD/INR shows a less error in purchasing powerparty method. Hence it is the best forecasting method for USD/INR exchange rates
- There is a high error in KWD/INR in purchasing power party method. Therefore the prediction shows less accuracy and this method does not suit for this exchange rates
- The investors can consider multiple regression as a tool for decision making

CONCLUSION

Through this study, I tried to study what determines the exchange rate forecasting. Here, I had taken three methods to find the best forecasting method for the near future. For this study I had taken the seven currencies with are traded in the foreign exchange market and listed the exchange rates against Indian rupee. For checking the movement in exchange rates I had taken inflation rates of seven currencies as economic factor. This study examines the different aspect

of correlation of exchange rates. The study tells about the behavior of correlation and volatility to macroeconomic factors. News announcements about macroeconomic variables have a significant impact on both intraday volatility and correlation; however, the use of macroeconomic factors to improve volatility and correlation forecasts produces only mixed results.

So I have concluded with best forecasting methods for each currency and also noted that the economic factor had an impact on exchange rates. Mean average change in CHF is very high but in future the risk is very low. So investing in CHF is profitable. Mean average change in EUR is verylow. Its future risk is very high. So EUR is not good for investing.

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