

AN EMPIRICAL STUDY ON CURRENCY INFLUENCE OF EXTERNAL BORROWINGS AND ITS EFFECT ON INDIAN FOREIGN RESERVES (2007 TO 2013)

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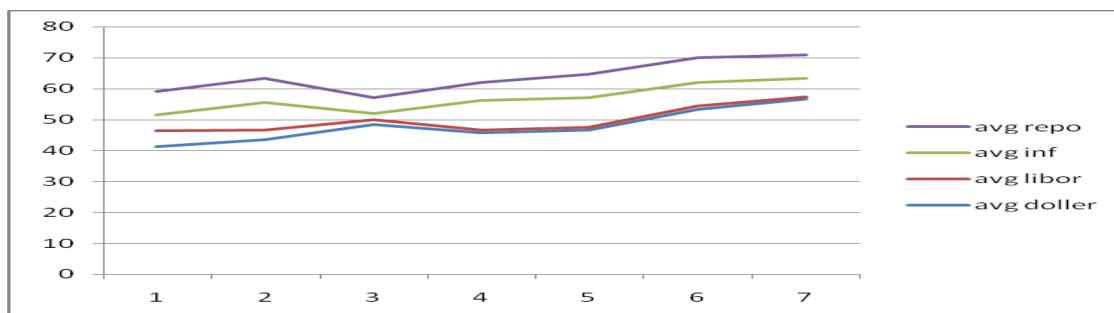
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ABSTRACT

This paper focus on Indian foreign reserves is influenced by the ECB and FCCB from the period of 2007-20013.Rupee vs. dollar got depreciated by approximately 37% which affected the Indian companies which were utilized ECB and FCCB options. With the proximity matrix the flows of ECB and FCCB were not influence the foreign reserves were Euclidean distance has shown dissimilarity with the flows of ECB and FCCB to Indian foreign reserves. This article also analyzes with granger causality test and it has been proven that ECB and FCCB flows were not caused by rupee depreciation with the dollar and euro. Augmented dick puller test has been applied and we have found no sign that rupee did not gain a strength with ECB and FCCB capital inflows from 2007-2013.Linear regression on PIMCO and INDIAN bond index has been applied the analysis has shown that R is less than 0.60 which shows that the momentum of Indian bond index found different directions with PIMCO in spite of excellent performance of Indian bond index than the PIMCO bond index. This paper is advantage for the researches to how wanted to analyze on currency effect on external inflows into India.

INTRODUCTION:

In INDIA due to the tighter monetary policies the interest are high on Debt it is very difficult for the corporate firms to raise the funds in home country. So, to hedge this interest the corporate companies are raising the fund through the FCCB and ECB. Because the interest rate in the global market are come down drastically from the past five years. But due to the rupee depreciation the corporate companies have to pay the excess amount which is a huge burden for the corporate firms.



years	avg dollar	avg libor	avg inf	avg repo
2007	41.3485	5.1265	4.9964	7.625
2008	43.5049	3.1151	8.84	7.916667

2009	48.4049	1.5733	1.9591	5.083333
2010	45.7262	0.9237	9.5936	5.625
2011	46.6723	0.8348	9.6465	7.535714
2012	53.4368	1.0094	7.474	8
2013	56.6579	0.703	5.947	7.55

From the above table shows that rupee got depreciated with the weakness which is existing globally. The LIBOR rate were stronger in the year 2007 but this rate were collapsed along with the Indian currency in spite of global weakness Indian repo rate wear more stable than the global rate because the average inflation is below 7 % during the 2007-2013. Hence Indian currency got depreciated because bad external factors effects than the internal factors influence.

1 st year	2nd	3 rd	4 th	5 th	6 th	7 th	Total Interest
11829020626							11829020626
11829020626	5238612736						17067633362
11829020626	5238612736	1706644443					18774277805
11829020626	5238612736	1706644443	1682475612				20456753417
11829020626	5238612736	1706644443	1682475612	2464890284			22921643701
11829020626	5238612736	1706644443	1682475612	2464890284	2420069558		25341713259
11829020626	5238612736	1706644443	1682475612	2464890284	2420069558	1890996624	27232709883
							1.43624E+11

A type of convertible bond issued in a currency different than the issuer's domestic currency. In other words, the money being raised by the issuing company is in the form of a foreign currency. A convertible bond is a mix between a debt and equity instrument. It acts like a bond by making regular coupon and principal payments, but these bonds also give the bondholder the option to convert the bond into stock.

These bonds assume great importance for multinational corporations and in the current business scenario of globalization, where companies are constantly dealing in foreign currencies. FCCBs are quasi-debt instruments and tradable on the stock exchange. Investors are hedge-fund arbitrators or foreign nationals. Thus, from the company's perspective, FCCBs appeared to be a cheaper source of borrowing with low interest expense on the books. They were raised to meet capital expenditure requirements and expansion plans at very competitive rates.

OBJECTIVES OF THE STUDY:

1. To find the effect of Rupee depreciation against the dollar on FCCB.
2. To find the effect of Rupee depreciation against the euro on ECB.
3. To find the cause and effect on foreign reserves with ECB and FCCB.
4. To compare the performance measure of Indian bond index with global bond index

LITERATURE REVIEW

BHATNAGAR, MS DEEPA: The liberalization of the Indian financial markets has made it possible for the corporate sector to tap the international capital markets to raise money. However, there are still restrictions on external commercial borrowings. Some of these restrictions amount to extra cost on borrowing. Companies which have considerable presence in the international market place have another way of raising money abroad, which is by holding foreign currency accounts through which income from exports is channeled. Use of foreign currency non-resident (FCNR) accounts to raise funds abroad is discussed here.

HIMANSHU YADAV: The paper studies the External Commercial Borrowing policy being followed by the Government of India in order to let the Indian entities access the foreign funds. The law governing foreign exchange is Foreign Exchange Management Act, 1999 but no express mention of the ECB instruments is there, though they involve foreign funds. The paper establishes the source of law for ECB and the relevant provisions of the act from where the RBI (Regulator of ECB) derives its powers for the same. An analytical approach has been made to gauge the aspects of the latest ECB policy (2012) as RBI tends to amend it from time to time via FEMA notifications and A.P.(DIR) and Master Policy circulars. The provisions of law and that of policy have been consolidated to present a framework for the investors where they can categorically relate their proposed ECB to the mode of a rising the same within the framework of the extant guidelines.

KIRAN GAYABHAU DAREKAR: In this project, titled “External commercial borrowings & buyers credit options for long term & short term borrowing requirement for MNC’s” The aim is to analyze whether ECB for long term and BC for short term borrowing for the MNC’s, is best option, with detailed look on procedure for application, guidelines, compliances, Indian government policy, rules and regulations placed at present. This project study will enable finance manager to understand the options viz, ECB and BC, and make use of the same if its feet in for his organization and Save borrowing /interest cost. The study explains ways in which both these options can be of assistance in long-range planning, budgeting and borrowing cost management to strengthen Financial performance and help avoid financial difficulties.

K.V. Bhanu Murthy, Manoj Kumar Sinha, Phool Chand, Ashis Taru Deb: External Commercial Borrowing has become a major source of financing growth in India. It is competing with FDI as a source of capital inflows. The policy framework and phenomenon of ECBs is very complex. It is very challenging to model behavior of ECB. Therefore, its trends and determinants are very complex to measure. This paper studies the trends in ECBs during 2004-2012 in India. A macro-micro model is estimated for finding out the determinants of ECB. Amongst the macro-economic variables money supply mildly influences ECB positively. Foreign exchange reserves are not significant in determining ECBs. Also foreign exchange rate has a positive and large coefficient but is not significant. The impact of both these variables may be ambiguous due to a simultaneity problem. Hedging positively influences ECBs but is not significant. The most important micro-economic variables are net cost of borrowing which is significant and negative and production of domestic capital goods which is significant and positive. While there is a decline due to global financial crisis, ECBs recovery after 2009.

UMANATH KUMARASAMY: A central bank of the country that controls foreign exchange reserves by implementing the policies and procedures, which results in the valuations of currency. In a supply and demand on exchange rates the valuation activities prompt involuntarily, due to the supply and demand of the foreign currencies are adjusted by bought and sold. External Commercial Borrowings (ECB) also not exempted from that, objectively study attempt to prove it. By using the various statistical tools, the research found and strongly believes that both the

time series, Fx Reserves and External Commercial Borrowings had mutual relationship during the elected study period.

DR.KAMMILI KAMALAKARA RAO& PROF S KASTURI RANGAN: The interest rates in the international markets and the domestic markets in India vary significantly. Several companies have tapped the international capital markets for their debt program to take advantage of the significantly low cost of funds. But the exchange rate fluctuations play an important role in determining if the advantage of low cost funds available in the international market is really low when we consider the exchange rate. This paper analyzes the interest paid by the companies which have gone to international markets for borrowing and companies which have not done so. The paper concludes that there is an interest rate differential between these two categories of companies.

EMPHARICAL STUDY:

1. EXTERNAL COMMERCIAL BORROWINGS ECB
2. FOREIGN CURRENCY CONVERTIBLE BONDS FCCB
3. FOREIGN-EXCHANGE RESERVES FOREX RESERVE
4. LONDON INTERBANK OFFERED RATE - LIBOR'
5. GLOBAL BOND INDEX
6. INDIAN BOND INDEX
7. DOLLAR
8. EURO
9. REPO RATE

SCOPE OF THE STUDY:

The analysis has been emphasis to find the effect of currency depreciation on Indian commercial barrowing i.e (ECB and FCCB) .The analysis has been Carrie forwarded based on the calendar year in this analysis main focus is to identify the impact of currency effect on borrowings and borrowings effects on foreign reserves.

RESEARCH METHODOLOGY

TOOLS USED:

AUGMENTED DICKEY–FULLER TEST

In statistics and econometrics, an augmented Dickey–Fuller test (ADF) is a test for a unit root in a time series sample. It is an augmented version of the Dickey–Fuller test for a larger and more complicated set of time series models. The augmented Dickey–Fuller (ADF) statistic, used in the test, is a negative number. The more negative it is, the stronger the rejection of the hypothesis that there is a unit roots at some level of confidence.

The testing procedure for the ADF test is the same as for the Dickey–Fuller test but it is applied to the model

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t,$$

Where α is a constant, β the coefficient on a time trend and p the lag order of the autoregressive process? Imposing the constraints $\alpha = 0$ and $\beta = 0$ corresponds to modeling a random walk and using the constraint $\beta = 0$ corresponds to modeling a random walk with a drift.

AUTOREGRESSIVE MODEL (AR)

An autoregressive model (AR) is also known in the filter design industry as an infinite impulse response filter (IIR) or an all pole filter, and is sometimes known as a maximum entropy model in physics applications. There is "memory" or feedback and therefore the system can generate internal dynamics.

The definition that will be used here is as follows

$$x_t = \sum_{i=1}^N a_i x_{t-i} + \varepsilon_t$$

where a_i are the auto regression coefficients, x_t is the series under investigation, and N is the order (length) of the filter which is generally very much less than the length of the series. The noise term or residue, epsilon in the above, is almost always assumed to be Gaussian white noise.

Verbally, the current term of the series can be estimated by a linear weighted sum of previous terms in the series. The weights are the auto regression coefficients. The problem in AR analysis is to derive the "best" values for a_i given a series x_t . The majority of methods assume the series x_t is linear and stationary. By convention the the series x_t is assumed to be zero mean, if not this is simply another term a_0 in front of the summation in the equation above.

GRANGER CAUSALITY TEST

Let y and x be stationary time series. To test the null hypothesis that x does not Granger-cause y , one first finds the proper lagged values of y to include in a univariate auto regression of y :

$$y_t = a_0 + a_1 y_{t-1} + a_2 y_{t-2} + \dots + a_m y_{t-m} + \text{residual}_t.$$

Next, the auto regression is augmented by including lagged values of x :

$$y_t = a_0 + a_1 y_{t-1} + a_2 y_{t-2} + \dots + a_m y_{t-m} + b_1 x_{t-1} + \dots + b_q x_{t-q} + \text{residual}_t.$$

One retains in this regression all lagged values of x that are individually significant according to their t-statistics, provided that collectively they add explanatory power to the regression according to an F-test (whose null hypothesis is no explanatory power jointly added by the x 's).

In the notation of the above augmented regression, p is the shortest, and q is the longest, lag length for which the lagged value of x is significant.

MAR RATIO:

A measurement of returns adjusted for risk that can be used to compare the performance of commodity trading advisors, hedge funds and trading strategies. The MAR Ratio is calculated by dividing the compound annual growth rate (CAGR) of a fund or strategy since inception by its biggest drawdown. The higher the ratio, the better the risk-adjusted returns. The MAR Ratio gets its name from the Managed Accounts Report newsletter, which developed this metric.

$$\text{MAR} = (\text{Compound ROR}) / (\text{Max DD})$$

DATA ANALYSIS:

GRANGER CAUSALITY TEST ON ECB

Pair wise Granger Causality Tests			
Null Hypothesis:	Obs	F-Statistic	Prob.
Y does not Granger Cause X	12	0.95188	0.4309
X does not Granger Cause Y		3.42420	0.0918

x= Rupee vs. Dollar Y= FCCB

INTERPRETATION:

The above analysis shows that ‘F’ statistic value is more than the probability values which indicate that Rupee Vs dollar not effected the FCCB flows during the analysis period i.e (2007-2013) the granger causality test had given result that currency fluctuation with dollar did not cause the FCCB.

GRANGER CAUSALITY TEST ON FCCB

Pairwise Granger Causality Tests			
Null Hypothesis:	Obs	F-Statistic	Prob.
Z does not Granger Cause X	12	5.24222	0.0406
X does not Granger Cause Z		0.57979	0.5848

x=rupee vs. Euro z= ECB

INTERPRETATION:

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AUGMENTED DICKY FULLER TEST ON ECB

Null Hypothesis: Z has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic based on SIC, MAXLAG=1)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-0.738787	0.7435
Test critical values:	1% level		-5.604618	
	5% level		-3.694851	
	10% level		-2.982813	
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Z(-1)	-0.624921	0.845874	-0.738787	0.5370
D(Z(-1))	-0.280570	0.319329	-0.878624	0.4723
C	181782.5	239003.8	0.760584	0.5263
R-squared	0.766166	Mean dependent var		3535.400
Adjusted R-squared	0.532332	S.D. dependent var		34575.32
		Durbin-Watson stat		1.830608

INTERPRETATION:

ADF has been apply between rupee vs. dollar to FCCB flows and it has been found that 'T' statistics value is less than the probability values which shows that FCCB value got effected. When currency is depreciating hence we can say that Indian companies which opted FCCB incurred loss on the payment of FCCB interest as well as principle.

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Linear Regression analysis on PIMCO vs. Indian Composite Index

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	IBX(composite) ^a	.	Enter

a. All requested variables entered.

b. Dependent Variable: PIMCO

Model Summary^b

Model	R	R Square	Adjusted Square	Std. Error of the Estimate
1	.163 ^a	.026	-.055	15.31979

a. Predictors: (Constant), IBX(composite)

b. Dependent Variable: PIMCO

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76.656	1	76.656	.327	.578 ^a
	Residual	2816.351	12	234.696		
	Total	2893.006	13			

a. Predictors: (Constant), IBX(composite)

b. Dependent Variable: PIMCO

Coefficients ^a

Model	Un standardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	203.377	147.481		1.379	.193
VAR00002	-.697	1.219	-.163	-.572	.578

a. Dependent Variable: PIMCO

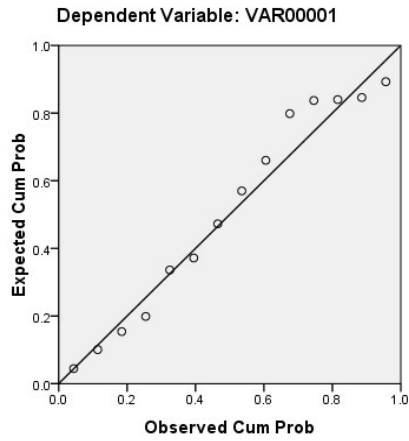
Residuals Statistics ^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	112.8613	122.1342	1.1912E2	2.42829	14
Residual	-2.60383E1	19.01415	.00000	14.71878	14
Std. Predicted Value	-2.579	1.240	.000	1.000	14
Std. Residual	-1.700	1.241	.000	.961	14

a. Dependent Variable: PIMCO

Charts

Normal P-P Plot of Regression Standardized Residual



Proximities

INDIAN FOREIGN RESERVES WITH ECB & FCCB

Case Processing Summary

Cases					
Valid		Missing		Total	
N	Percent	N	Percent	N	Percent
2	87.5%	3	12.5%	24	100.0%

Euclidean Distance																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	18	19	20	21	22	23	24
1	.000	5.557	17.322	11.085	10.676	20.063	21.832	28.131	32.255	37.457	38.097	42.630	44.000	40.175	1.991E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.920E5
2	5.557	.000	12.378	5.540	5.745	14.944	16.283	22.833	26.999	31.964	32.789	37.473	39.022	34.820	1.991E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
3	17.322	12.378	.000	7.863	11.818	13.702	9.676	18.096	21.978	24.224	26.816	32.221	32.688	28.341	1.991E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
4	11.085	5.540	7.863	.000	4.212	10.673	10.851	17.965	22.164	26.648	27.820	32.730	34.032	29.763	1.991E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
5	10.676	5.745	11.818	4.212	.000	9.387	12.003	17.491	21.591	27.077	27.450	31.956	33.675	29.555	1.991E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
6	20.063	14.944	13.702	10.673	9.387	.000	6.358	8.223	12.236	18.249	18.121	22.571	24.329	20.274	1.991E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
7	21.832	16.283	9.676	10.851	12.003	6.358	.000	8.421	12.379	15.842	17.547	22.801	23.636	19.297	1.991E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
8	28.131	22.833	18.096	17.965	17.491	8.223	8.421	.000	4.200	10.301	9.967	14.771	16.199	12.069	1.991E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
9	32.255	26.999	21.978	22.164	21.591	12.236	12.379	4.200	.000	7.641	5.900	10.575	12.093	8.119	1.991E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
10	37.457	31.964	24.224	26.648	27.077	18.249	15.842	10.301	7.641	.000	5.233	10.060	8.992	5.108	1.990E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
11	38.097	32.789	26.816	27.820	27.450	18.121	17.547	9.967	5.900	5.233	.000	5.533	6.234	2.314	1.990E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5
12	42.630	37.473	32.221	32.730	31.964	22.571	22.801	14.771	10.575	10.060	5.533	.000	3.631	4.982	1.990E5	3.854E9	2.518E5	2.668E9	3.047E5	5.130E9	2.919E5

13	44.328	39.022	32.688	34.032	33.675	24.329	23.636	16.199	12.093	8.992	6.234	3.631	.000	4.353	1.990E5	3.854E9	2.518E5	2.668E9	3.047E5	5.130E9	2.919E5		
14	40.175	34.820	28.341	29.763	29.555	20.274	19.297	12.069	8.119	5.108	2.314	4.982	4.353	.000	1.990E5	3.854E9	2.519E5	2.668E9	3.047E5	5.130E9	2.919E5		
18	1.991E5	1.991E5	1.991E5	1.991E5	1.991E5	1.991E5	1.991E5	1.991E5	1.991E5	1.990E5	1.990E5	1.990E5	1.990E5	1.990E5	.000	3.854E9	5.281E4	2.668E9	1.056E5	5.130E9	9.287E4		
19	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	3.854E9	.000	3.854E9	1.187E9	3.854E9	1.276E9	3.854E9		
20	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	2.519E5	5.281E4	3.854E9	.000	2.668E9	5.283E4	5.130E9	4.006E4
21	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	2.668E9	1.187E9	2.668E9	.000	2.668E9	2.462E9	2.668E9	
22	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	3.047E5	1.056E5	3.854E9	5.283E4	2.668E9	.000	5.130E9	1.277E4
23	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	5.130E9	1.276E9	5.130E9	2.462E9	5.130E9	.000	5.130E9	
24	2.920E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	2.919E5	9.287E4	3.854E9	4.006E4	2.668E9	1.277E4	5.130E9	.000

This is a dissimilarity matrix

* Define Variable Properties.

*VAR00001.

VARIABLE LABELS VAR00001 'Foreign Reserves vs. ECB and FCCB'.EXECUTE

PERFORMANCE MEASURE OF INDIAN BOND INDEX AND PIMCO USING MAR RATIO

years	avg India bond index	returns		YEARS	PIMCO	returns
2007	119			2007	97	
2008	120	0.8		2008	106	9.3
2009	127	5.8		2009	110	3.8
2010	121	-4.7		2010	119	8.2
2011	117	-3.3		2011	129	8.4
2012	119	1.7		2012	135	4.7
2013	123	3.4		2013	137	1.5
		3.7				35.8
Mar ratio	5.337931		mar ratio	2.349462		

Note: has the analysis is more than 3 years the mar ratio is used for measuring the performance.

INTERPRETAION:

The above table depicts performance measure picture between PIMCO global bond index and INDIAN composite index it has been observe that during 7 years period Indian bond market performed well than the global bond market has mar ratio value is more to the Indian bond index than the global bond index.

LIMITATIONS OF THE STUDY:

1. Effect of external commercial borrowing on Indian foreign reserves has been calculated with granger causality test for this analysis I have not consider other economic factors.
2. For European interest rate we have consider LIBOR rate.
3. For Indian interest rate we have consider INDAIN REPO RATE.
4. For global bond benchmark PIMCO index has been consider.
5. All the daily values have been average yearly.

FINDINGS OF THE STUDY:

- From the study it is found that the currency fluctuation with dollar did not cause the FCCB
- From the study it is found that the currency fluctuation with euro did not cause the ECB
- From the study it is found that the Indian companies which opted FCCB incurred loss on the payment of interest as well as principal.
- From the study it is found that the Indian companies which opted ECB incurred loss on the payment of interest as well as principal.
- From the study it is find that Indian bond market performed well than the global bond market i.e., PIMCO

CONCLUSION:

I conclude the analysis on currency fluctuation effects on ECB and FCCB which resulted any effect on Indian foreign reserves with my analysis it has been observed that Indian companies were seriously effects which depended on external borrowings due to currency depreciation with dollar vs. euro the analysis has been done from 2007-2013 and it has been found that FCCB and ECB were not influenced by the currency fluctuations when companies were going to raise funds during the analysis period we have not consider any other flows on Indian foreign reserves except ECB and FCCB there might be heavy pressure from FDI and FII on Indian reserves which may force for the outlay of Indian reserves we have applied ADF and proximity matrix on Indian foreign reserves with ECB and FCCB there is a further scope to do research on external flows effect to Indian foreign reserve .hence there is a need to improve this analysis with better measurement tools to find the exacts cause.

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