ANALYSIS OF CAPITAL FLOWS: A CROSS-COUNTRY STUDY

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Abstract
The present paper tries to find out the factors affecting Net capital flow in top 40 countries in terms of net capital flow (UNCTAD 2014). We have used panel data for our analysis. We found that market capitalization positively and significantly affects net inflow of FII's to a particular country. Interest rate also positively and significantly affects net capital flows. So our analysis supports validity of Mundell- Fleming model. Inflation negatively affects Net capital flows as real return on assets get reduce because of inflation. Increase in the GDP growth positively and significantly affects net inflow of total capital. Individuals, firms and corporates invest more in a country where there is potential of increase in growth and expansion of market. So, if there is increase in GDP growth rate it attracts total foreign capital. Our result suggests that whenever there is increase in the GDP growth rate of USA then there is no effect of total capital flow. But whenever here is increase in the GDP growth rate of EU countries then there is net inflow of foreign capital.

Introduction
In the globalisation era, all countries are excessively interdependent on each other mostly led by the ever increasing financial flows among these countries. And because of this interdependence, any economic action in a particular country can affect the economic performance of other countries to a significant level, for instance the monetary policy of a particular country can affect the flow of capital in other countries. This interdependence has also increased the volatility in capital flows especially after global financial crisis (2008) and more recently euro zone crisis. The focus of our research to find out the determinants of capital flows to a particular country and how they are affected by economic policies of other countries and different types of crisis.

Objective/Testable Hypothesis
Capital flows has four components i.e. Foreign Direct Investment (FDI), Foreign Institutional Investments (FIIs), External Commercial Borrowings (ECBs) and Deposits of NRIs. There are many factors ranging from domestic interest rate, foreign interest rate, inflation, money supply, expected exchange rate, growth rate, foreign exchange reserve, stock market, OECD growth rate etc. that affects capital flows. Among them, interest rate differential (domestic interest rate minus world interest rate) has often been considered to be as one of the major determinant of capital flows to Emerging Market Economies (EMEs) and at times, it is felt that that changes in monetary policy measures (conditioned on inflation-growth objectives) could dampen or magnify the volume of capital flows into a country. In this context, it is generally assumed that countries with relatively higher interest rate as compared to others would attract larger capital flows.

To be specific, Our paper will seek to answer the following questions:
1. The paper seeks to determine whether changes in monetary policy have been a major determinant of Capital flows by studying the relationship between monetary policy changes and net foreign capital flows in the post liberalization period.
2. Apart from changes in monetary policy, what are the other important factors that determine foreign capital flows?
3. In the post liberalization period (1991 onwards), the world economy has seen many major economic crisis; 1997 Asian crisis; 2001 stock market crisis in US; 2008 financial crisis (also known as subprime crisis) and most recently Euro zone crises. So my paper will look whether the occurrence of these economic crisis have reduced or increased the effectiveness of monetary policy in affecting capital flows. In other words, whether these economic crisis have caused any change in the relationship between monetary policy and capital flows.

Literature Review
There are many factors that affect foreign capital flows to Emerging market Economies (EMEs). However, various literatures have differed in terms of their results while identifying factors explaining capital flows to EMEs. A.Shaghil and Z.Andrei (2013) in their study over capital flows to EMEs concluded that growth and interest rate differentials between EMEs and advanced economies and global risk appetite were the important determinants of net private capital inflows to EMEs. On the similar lines, Verma.R and Prakash.A (2011) studied the sensitivity of Capital flows to Interest rate Differentials for India in the post liberalization period and observed that one percentage point increase in interest rate differentials would lead to 0.05 percentage point increase cumulative gross capital inflows to India. Singh (2006) in his study on capital flows to India from 1950 onwards also found that the pace of interest rate differentials, followed by pace of domestic real activity and domestic market's credit conditions were the important factors determining long run demand for external commercial borrowing by

Indian corporate. The study further noted that there was co-movement between in the volatility of daily net FIIs and stock returns. Chakrabarthy (2006) also studied the capital inflows during post-liberalization. His results concluded that there was long run relationship between net foreign capital inflows, real exchange rate and interest rate differentials.

While analysing the causes of capital flows into the developing countries during the 1990s, it has been a common practice to classify the causal factors into two major categories, viz, the country specific or "pull" factor and the global or "push" factor. The country-specific factors include the rates of return in the domestic financial market relative to that in the industrial countries, credit ratings, degree of openness, performance of the economy and economic reform policies. Some of the global factors are decline in the rate of interest and slowdown in the economic activity in the developed countries. Chuhan, et al (1998) concluded that push and pull factors are equally important in explaining portfolio flows into Latin America, whereas in the case of East Asia, the pull factors are more important than the push factors. Culha (2006) also found general dominance of pull factors over push factors in determining foreign capital flows into Turkey. However, Taylor.P and Sarno Lucio (1997) while studying determinants of capital flows to developing counties concluded that both domestic (or pull) and global factors (or push) explain bond and equity flows to developing countries and represent significant long-run determinants of portfolio flows. To be more specific, Ralhan (2006) did the cross sectional study of 8 countries; Argentina, India, Australia, Indonesia, Chile, Columbia, Brazil and Mexico and concluded that most important factor affecting capital flows to these countries was their foreign exchange reserves and the other important factor was level of their gross domestic product. On the similar front, Ying, Yung-Hsiang and Yoonbai Kim (2001) also did the empirical analysis of capital flows for Korea and Mexico. Their empirical results revealed that foreign output shock accounted for more than 50 percent of the variation in capital flows for both countries. It suggested that capital flows in the two countries were very sensitive to business cycles in industrial countries. J. Gordon and P. Gupta (2003) studied portfolio flows into India and found that foreign institutional investments (FIIs) in India are affected by both domestic and external factors and qualitatively both have the equal importance. Important external factors were; external interest rate which adversely affected FII flows into India and the performance of emerging stocks which positively affected FII flows. Among domestic factors, credit rating downgrades, depreciation of rupee and lagged domestic stock market returns were found to affect net FII flows negatively. Similar results were obtained by Chakrabarti (2001) as well who also studied the determinants of FII Flows to India. He found that there was bidirectional causality between stock market return and FII flows, however, FII flows were more an effect than a cause of market returns in India.

Theoretical Framework

Portfolio balance models aim at explaining how an international investor takes the decision to allocate her portfolio across assets marketed in different countries. In these models the differential in the expected rates of return of two countries' bonds is equivalent to the nominal interest differential minus the expected change in the exchange rate. If the assets of two countries are perfectly substitutable, then this differential in the expected rates of return will be zero. In the finance literature this is known as *uncovered interest parity condition*. Following the framework of the portfolio balance models, net inflows of capital to a particular country can be written as a function of the uncovered interest differential.
Thus,

$$KF_{it} = f(I_{it} - I_t^* - e_{it}^e) \qquad \ldots\ldots\ldots\ldots(1)$$

Where, KF_{it} = net inflows of capital in country i in period t
I_{it} = domestic rate of interest in country i in period t
I_{it}^* = world rate of interest in period t, and
e_{it}^e = expected rate of change in the exchange rate in country i in period t.

Equation (1) implies that net capital flows to a country (KF) is dependent on nominal interest differentials ($I_{it} - I_t^*$) and expected depreciation of domestic currency against foreign currency (e_{it}^e). Nominal interest differential is often found to have positive relationship with net capital flows to a particular country; higher is nominal interest differential, greater will be expected return on domestic assets which would encourage foreign investors to invest in domestic assets and therefore there will be inflow foreign capital in the domestic economy. On the other hand, expected depreciation of domestic currency is likely to have inverse relationship with net capital flows. When domestic currency is expected to depreciate, there will be decline in expected rate of return on domestic assets in terms of domestic currency which will discourage investors to invest in domestic assets and hence capital will move out of domestic economy i.e. there will be capital outflow.

Let us assume that the agents are forward-looking or rational. Then the expected change in the exchange rate is an unbiased predictor of the actual change in the exchange rate. Therefore we can write,

$$e_{it}^e = e_{it}$$

Where e_{it}= actual change in the exchange rate from period t–1 to t.

Thus equation (1) can be written as:

$$KF_{it} = \quad + \quad (I_{it} - I_t^* - \ e_{it}) + \ _t \quad \ldots\ldots\ldots(2)$$

Net inflows of capital to a particular country also depend on a vector of fundamental determinants (Z_{it}), which include variables such as the rate of inflation, import of capital goods, industrial output, the current account balance, rates of return in the domestic financial market relative to that in the industrial countries, credit ratings, degree of openness, economic reform policies, decline in the rate of interest and slowdown in the economic activity in the developed countries, poor investment opportunities in industrial countries, budget balance and current account balance, foreign exchange reserves, level of gross domestic product, business cycles in industrial countries.

In totality, there are many factors that affect capital inflows to an economy. This paper therefore looks to determine the important factors affecting capital flows in India and whether **monetary policy actions** have any ramification for the capital flows to a particular country.

Data Collection
We have taken collected for top 40 countries (in terms of capital flow provided in UNTAD Report 2014) data from World Bank for period 1995 to 2014. Using these data we have compiled a panel data for our analysis. We have considered only top countries from Asia, Latin America and Africa.

Methodology
Based on the theoretical framework developed in the previous section, net capital flows to particular economy can be represented by following function:

Net Capital flows = f[interest rate differential, exchange rate, domestic growth rate (proxied by IIP), foreign exchange reserve, stock market return, current account balance, trade openness, fiscal deficit, foreign interest rate, foreign GDP (proxied by USIIP)]

Given above, my basic model would take the form:

$$(NetKF)_{it} = \beta_0 + \beta_1(i_i - i_{US})_t + \beta_2 IIP_{it} + \beta_3 SEindex_{it} + \beta_4 Exchangerate_{it} + \beta_5 fisdeficit_{it} + \beta_6 USIIP_{it}$$
$$+ \beta_7 CAbalance_{it} + \beta_8 Upenness_{it} + \beta_9 fgnreserve_{it} + \beta_{10} ROGoecd_{it} + \beta_{11} stockindex_{jt} + \varepsilon_{it}$$

Where,
NetKF = monthly net capital flows to a particular country
i_i = domestic interest rate
i_{US} = interest rate in US (3 months US T-Bill)
IIP = monthly Index of Industrial Production (IIP) for country i
SEindex = monthly average index/return for Stock Exchange of country i
Exchangerate = average exchange rate value at the end of month of country i
Fisdeficit = fiscal deficit of country i accruing to a particular month
USIIP = monthly Index of Industrial Production (IIP) for US
CAbalance = current account balance for the particular month of country i
Openness = ratio of (export +import) to GDP in a particular month of country i
Fgnreserve = foreign exchange reserve in a particular month of country i
ROGoced= rate of growth of OECD countries
EACstockexchange= Stock exchanges of other countries

Results
Determinants of Net Foreign institutional investment (FII's)
We have collected data for top 40 countries (in terms of capital flow provided in UNTAD Report 2014) data from world bank for period 1995 to 2014 . Using these data we have compiled a panel data for our analysis. We have considered only top countries from Asia, Latin America and Africa.

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We have checked using Hausman test whether the model has fixed effect or random effect. We found that the model has random effect. And after correcting autocorrelation and heteroscedasticity we found the following result:

Result I

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Random effects GLS regression          Number of obs     =      196
Group variable: countryid              Number of groups  =       17

R-sq:  within  = 0.2975                Obs per group: min =       3
       between = 0.1701                               avg =     11.5
       overall = 0.1739                               max =      16

                                       Wald chi2(8)      =    78.06
corr(u_i, X)   = 0 (assumed)           Prob > chi2       =   0.0000
```

(Std. Err. adjusted for 17 clusters in countryid)

ln_fii	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
marketcapitalization	.0129091	.0032814	3.93	0.000	.0064778	.0193405
interestratedifferential	.0293169	.012515	2.34	0.019	.004788	.0538458
inflationconsumerpricesannual	-.0408246	.007725	-5.28	0.000	-.0559653	-.0256839
exchange	-.000471	.0002414	-1.95	0.051	-.0009441	2.21e-06
lag indgrowth	.0377915	.0226187	1.67	0.095	-.0065403	.0821234
usagdp	.0424806	.0793495	0.54	0.592	-.1130415	.1980027
euqdp	.0238429	.0898346	0.27	0.791	-.1522298	.1999156
dummycrisis	.4085245	.4260577	0.96	0.338	-.4265332	1.243582
_cons	20.11204	.5857464	34.34	0.000	18.964	21.26008

sigma_u	1.5189934	
sigma_e	1.1028247	
rho	.65483169	(fraction of variance due to u_i)

Kernel density estimate

kernel = epanechnikov, bandwidth = 0.4219
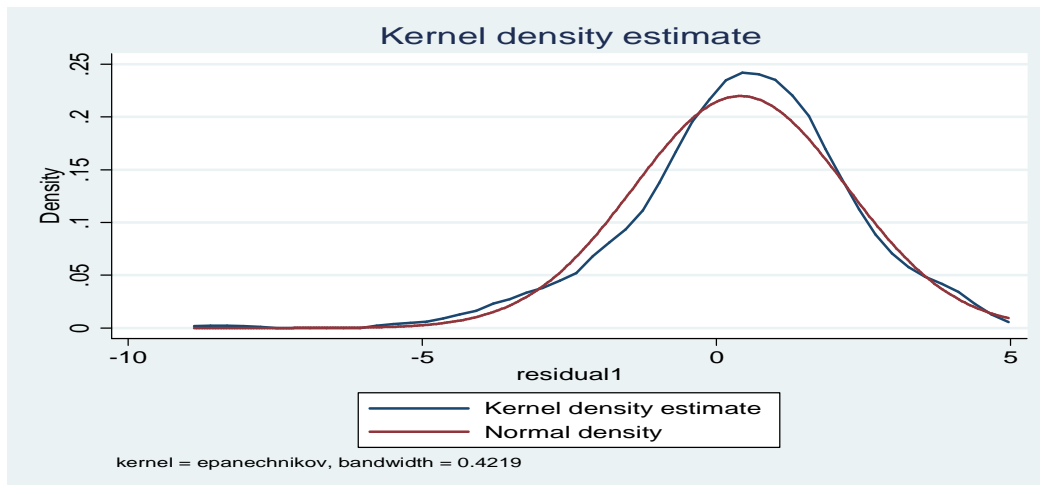
Results

1. Market capitalization is the ratio of total value of all equity to the GDP. Market capitalization is the indicator of the performance of stock markets. So, We have taken it as a proxy of the performance of stock market. From the above result it can be seen that Market capitalization positively and significantly affects net inflow of FII's to a particular country.

2. Mundell-Fleming model suggest that there will be inflow of capital if interest rate of a country will be higher than rest of the world. Most of the studies also found empirically that this is the case. But some studies suggest that interest rate differential does not significantly affect net FII's. But from the above result it can be seen that interest rate positively and significantly affects net FII's. So our analysis supports validity of Mundell- Fleming model.

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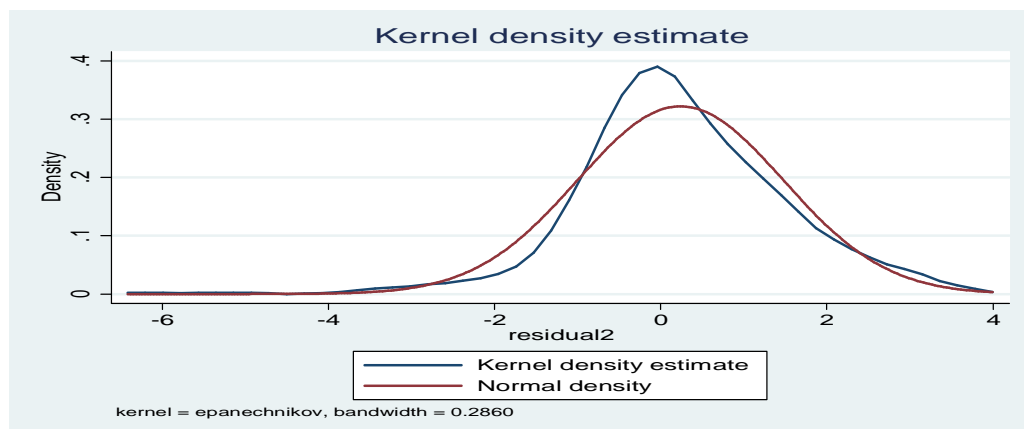*E- ISSN - 2349-6746*
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3. Inflation negatively affects Net FII's as real return on assets get reduce because of inflation. So, it negatively affects Net FII's. It can be seen from the above results that inflation negatively and significantly affects Net FII's. Using this result, we can say adherence and promotion of inflation targeting framework in most developing countries is the outcome of pressure of international portfolio investor to keep inflation at stable rate to protect their real return on investment.

4. Change in expected exchange rate (EX_t-EX_{t-1}) negatively affects Net FII's. If Exchange rate increases it means there is depreciation of domestic currency and because of depreciation the returns of capital flows will get reduce. The above result also suggests that depreciation of domestic currency negatively and significantly affects Net FII's.

5. Increase in industrial performance as measured by industrial growth rate positively and significantly affects Net FII's. Foreign investors attract from the industrial performance and willing to invest if there is improvement in industrial performance.

6. The above result suggests that increase in the GDP of USA and European Union does not significantly affect the net FII's in Asian and Latin American regions. Also global financial crisis doesn't significantly affect net FII's.

Result II
Determinants of Net Foreign Direct Investment (FDI)

Random effects GLS regression   Number of obs   =   276
Group variable: countryid   Number of groups =   18

R-sq: within = 0.3557   Obs per group: min =   3
        between = 0.1405   avg =   15.3
        overall = 0.2170   max =   17

                                        Wald chi2(8)   =   232.70
corr(u_i, X)   = 0 (assumed)   Prob > chi2   =   0.0000

                                        (Std. Err. adjusted for 18 clusters in countryid)

ln_fdi	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
marketcapitalization	.0053505	.001102	4.53	0.000	.0030338	.0076671
interestratedifferential	.009815	.0067302	1.46	0.145	.003376	.023006
inflationconsumerpriceannual	.0221357	.0050408	4.39	0.000	.0320154	.012256
exchange	.000428	.0003885	1.10	0.271	-.0003334	.0011894
lag_gdpgrowth	.0405663	.0157092	2.58	0.010	.0097768	.0713557
usagdp	-.1910773	.0494009	-3.86	0.000	-.2000737	-.0940000
eugdp	.2116267	.0463626	4.56	0.000	.1207577	.3024957
dummycrisis	.9835476	.1770078	5.55	0.000	.6364812	1.330614
_cons	22.24796	.2801956	79.40	0.000	21.69879	22.79713
sigma_u	.96900225					
sigma_e	.83210771					
rho	.57598736	(fraction of variance due to u_i)				

Kernel density estimate

kernel = epanechnikov, bandwidth = 0.2860

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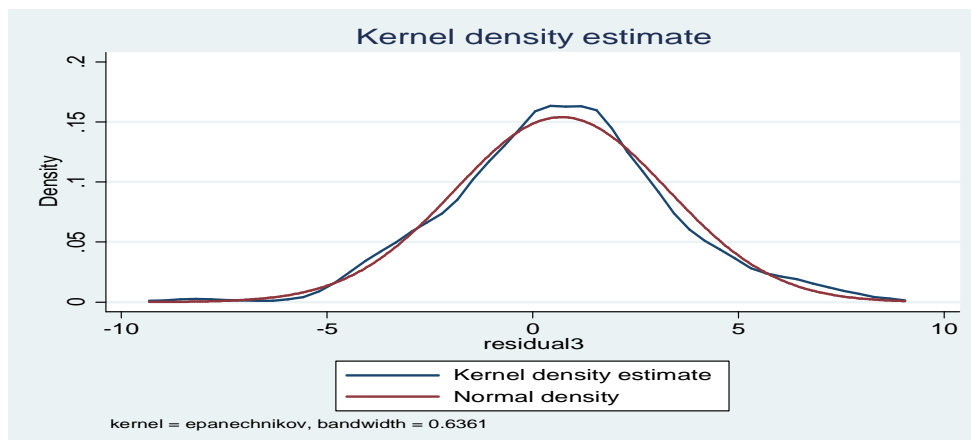*E- ISSN - 2349-6746*
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Results

1. I have found that market capitalization positively and significantly affects net FDI to a particular country.
2. Inflation negatively affects Net FDI as real return on assets get reduce because of inflation. So, it negatively affects Net FDI. It can be seen from the above results that inflation negatively and significantly affects Net FDI.
3. Increase in the GDP growth positively and significantly affects net inflow of FDI. Individuals, firms and corporates invest more in a country where there is potential of increase in growth and expansion of market. So, if there is increase in GDP growth rate it attracts foreign direct investment.
4. Global financial crisis in 2008 severely affected many developed countries especially USA and European countries. So, after global financial crisis there is movement of capital flow to developing countries. The above result also shows that there has increase in net FDI in Asian, African and Latin American countries.
5. From the above result it has been found that whenever there is increase in the GDP growth rate of USA then there is outflow of FDI from these countries. But whenever here is increase in the GDP growth rate of EU countries then there is net inflow of FDI.

Result III

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Random-effects GLS regression          Number of obs      =      194
Group variable: countryid              Number of groups   =       17

R-sq:  within  = 0.4398                 Obs per group: min =        3
       between = 0.2465                                avg =     11.4
       overall = 0.2369                                max =       16

                                        Wald chi2(8)       =   161.03
corr(u_i, X)   = 0 (assumed)            Prob > chi2        =   0.0000
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(Std. Err. adjusted for 17 clusters in countryid)

ln netkf	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
marketcapitalisation	.0183522	.0047275	2.81	0.000	.0087674	.0273369
interestratedifferential	.0415649	.0137200	3.03	0.002	.0146926	.0684771
inflationconsumerprizesannual	-.0733437	.008846	-8.35	0.000	-.0911816	-.0565058
exchange	-.0001219	.0006966	-0.17	0.861	-.0014877	.0012438
lag_gdpgrowth	.0864478	.0420375	2.06	0.040	.0040559	.1688397
usagdp	-.0975041	.0910261	-1.07	0.284	-.27504	.0808718
eugdp	.2317116	.1077215	2.15	0.031	.0205615	.4428621
dummycrisis	1.55315	.5787266	2.68	0.007	.4188668	2.687434
_cons	42.22434	.7509931	56.22	0.000	40.75242	43.69626
sigma_u	2.1275229					
sigma_e	1.4489677					
rho	.68329818	(fraction of variance due to u_i)				

Kernel density estimate

kernel = epanechnikov, bandwidth = 0.6361

Results

1. From the above result it can be seen that Market capitalization positively and significantly affects net inflow of FII's to a particular country.
2. From the above result it can be seen that interest rate positively and significantly affects net capital flows. So my analysis supports validity of Mundell- Fleming model.
3. Inflation negatively affects Net capital flows as real return on assets get reduce because of inflation. So, it negatively affects Net capital flows. It can be seen from the above results that inflation negatively and significantly affects Net capital flows.
4. Increase in the GDP growth positively and significantly affects net inflow of total capital. Individuals, firms and corporates invest more in a country where there is potential of increase in growth and expansion of market. So, if there is increase in GDP growth rate it attracts total foreign capital.
5. The above result also shows that there has increase in net flow of capital in Asian, African and Latin American countries.
6. From the above result it has been found that whenever there is increase in the GDP growth rate of USA then there is no effect of total capital flow. But whenever here is increase in the GDP growth rate of EU countries then there is net inflow of foreign capital.

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