VOLATILITY IN THE FLOWS OF INDIAN FOREIGN INVESTMENTS

(Pre– During–Post Global Meltdown and European Sovereign Debt Crisis Period)

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Abstract:

This paper is completely devoted to accomplish an important objective of the present study that is to analyze the volatility in the Indian Foreign Investments. For such analysis the **monthly volatility in the inflows of Indian foreign portfolio investments** showing net investment values in both debt and equity during different time phase (Pre- During- Post) of two major global financial crises (the US crisis and the European Sovereign Debt Crisis) were taken into consideration. Forcalculating the volatility, interday return has been calculated with the help of the Microsoft Excel Spreadsheet. The study revealed thatthere exist a high volatility in Equity at the post US crisis period, pre and during crisis stage showedlow volatility. On the other hand in Debt higher volatility was found at post crisis, then during and low at pre US crisis stage.For E.U crisis there exist a high volatility in both Equity and Debt at during period and low at pre crisis stage of EU crisis.

Key Words: Foreign Portfolio Investments(FPI's), Volatility, Global Financial Crisis

INTRODUCTION

One of the most well-known and prominent trait of present globalized world is the exponential growth in the foreign investments in the both developed and developing nations. Many comprehensive literatures focused on economies likely to reveal either through empirical and theoretical that Foreign Investments are necessary and vital for sustaining economic growth and development of any economy in this era of globalization. After opening up of the borders for capital movements, India have observed an enormous increase in its foreign Investments

comprising of both Foreign Direct Investments (FDI's) and Foreign Portfolio Investments (FPI's).Foreign Investments which provides supportive hands to the developing nations in accelerating their productivity, employment opportunities, innovations and developments, building strong intellectual infrastructures, capital market, money market and foreign exchange market. Apart from these it also help in constructing strong economic policies and programs. The most remarkable fact reelected in the number of Foreign Institutional Investors. (FII's) registered with SEBI that India has been the most favorable destination for the global investors to invest.

But in the recent years the global market for foreign investments has undergone with a drastic changes. This opening chapter presents the factual background of this phenomenon, the monthly and accounting year volatility in the flows of the Indian foreign investments (including FDI'S and FPI's) during the different time frame (Pre – During - Post) of the two major global financial crises: the US Meltdown and the European Sovereign Debt crisis.

RESEARCH METHODOLOGY

The study investigates the monthly volatility in the Indian foreign investments during the two major global financial crises (the US – Crisis and the European Sovereign Debt Crisis). The period of the study, research design, data base, statistical tools and the methods of analysis will be discussed in this section.

Period of Study

The period under this study is bracketed from year 2002 till year 2012 so as to empirically analyze the performance of FII's movements in India both in debt and equity before, during and after the two major world crises erupt during this period.

The study period is further sub- divided into smaller periods for focusing upon certain episodes of Indian foreign Investments (including Direct and Portfolio investments) that took place around the time.

Time Frame	Monthly Basis	
	US – Crisis	E.U- Crisis
Pre- Crisis Phase	January 2002 to July 2007	January 2002 to September 2010
During - Crisis Phase	August 2007 to August 2009	October 2010 to December 2012
Post - Crisis Phase	September 2009 to December 2012	

The Research Design

In the present study, **analytical research** is proposed to be developed to analyze the volatility in the Indian Foreign Investments during the different time frame (pre – during- post) of the two major financial crises: the Global Meltdown and the European Sovereign Debt Crisis Period.

The Data Base

Only the secondary data collection methods have been used in collecting the data for the study.Data collected for measuring the **monthly volatility in the inflows of Indian foreign portfolio investments** (from Jan 2002 to Dec 2012) showing net investment values in debt and equity were from **SEBI and NSDL.**

Statistical Tools

For the firstlevel statistical analysis, Microsoft Excel Spreadsheet had been used for processing the monthly data. Subsequently, applying the volatility formula by calculating interday returnshave been used to test data.

EMPIRICAL RESULTS

This section presents the results of the measurement of the volatility in the Indian Foreign Investments during the pre- during – post time period of two major global financial crises: the US Meltdown and European Sovereign Debt crisis. **Monthly volatility in the inflows of Indian foreign portfolio investments** (from Jan 2002 to Dec 2012) showing net investment values in debt and equity have been calculated over different observation periods.

To analyze the monthly volatility in the inflows of Indian foreign institutional investments during the different time period of the two major global financial crisis: the Global Meltdown and the European Sovereign Debt crisis.

Volatility is the important statistical tool for measuring the risk factor. It is basically used to measure the market risk attached to the individual security or an entire portfolio of the marketable instruments. The volatility of assets directs the variability of its returns. It can be interpreted as the higher the volatility, the riskier the security. In other words, higher volatility means that the price of the security can change dramatically over a short time period in both direction and that security's value can potentially be spread out over a larger range of values and vice a versa. One of the basic statistical methods for measuring the volatility can be the standard deviation or variance between returns from that same security or market index. Standard deviation is an important statistical method for measuring the dispersion of a set of data from its mean. It is calculated as the square root of variance by determining the variation between each data point relative to the mean. It can be interpreted as, if the data points are far away from the mean; there is higher deviation within the data set.

In Investments, when standard deviation is applied to the annual rate of return of an investment, it put emphasis on the historical volatility of that investment. It stated that greater the standard deviation of a security, the greater the variance between each price and the mean, indicating a larger price range.

Table 1

Monthly volatility in the net Indian foreign institutional investments both in equity and debt during the different time frame of the US crisis (Amount in Rs. Crore)

(January 2002 to December 2012)

U.S Crisis Calendar Year (Jan - Dec)	Monthly Volatility in Net Foreign Institutional Investment (Rs. Crore) - US crisis			
	Equity	Debt	Monthly Return in Equity	Monthly Return in Debt
Jan-02	423.3	276.1		
Feb-02	1966.3	370.5	3.645168911	0.341905107
March -02	391.4	-62.4	-0.800945939	-1.168421053
Apr-02	11.7	-124.6	-0.970107307	0.996794872
May-02	-56	102.2	-5.786324786	-1.820224719

Jun-02	-381.1	-484.9	5.805357143	-5.744618395
Jul-02	348.5	-110.1	-1.914458147	-0.772942875
Aug-02	204.3	-30.2	-0.413773314	-0.725703906
Sep-02	468.6	-146.2	1.293685756	3.841059603
Oct-02	-776.4	-98.7	-2.656850192	-0.324897401
Nov-02	601.8	135.9	-1.77511592	-2.376899696
Dec-02	427.2	220.7	-0.290129611	0.623988227
Jan-03	888.1	97.4	1.078885768	-0.558676937
Feb-03	378.8	49.5	-0.573471456	-0.491786448
March -03	411.7	551.1	0.086853221	10.13333333
Apr-03	430.2	562.3	0.044935633	0.02032299
May-03	1220.3	1839.9	1.836587634	2.272096746
Jun-03	2581.9	879.9	1.115791199	-0.521767487
Jul-03	2346.5	-185.6	-0.091173167	-1.210933061
Aug-03	2091.3	136.1	-0.108757724	-1.733297414
Sep-03	3851.1	324.3	0.841486157	1.38280676
Oct-03	6797.3	-74.7	0.765028174	-1.230342276
Nov-03	3300.6	293.5	-0.514424845	-4.929049531
Dec-03	6161	220.8	0.86663031	-0.24770017
Jan-04	3176.8	692.7	-0.484369421	2.137228261
Feb-04	2397.4	275.7	-0.245341224	-0.601992204
March -04	5604.6	839.9	1.337782598	2.046427276
Apr-04	7638.2	-918.6	0.362844806	-2.093701631
May-04	-3246.8	-299.4	-1.42507397	-0.674069236
Jun-04	516.3	-789.8	-1.15901811	1.637942552
Jul-04	913.5	-200.4	0.769320163	-0.746264877
Aug-04	2892.2	-371.5	2.166064587	0.853792415
Sep-04	2385.4	189.6	-0.175229929	-1.510363392
Oct-04	3263.1	-1235.2	0.367946676	-7.514767932
Nov-04	6740.7	1444.6	1.065735037	-2.169527202
Dec-04	6683.7	3455.9	-0.008456095	1.392288523
Jan-05	457	-773.7	-0.931624699	-1.223878006
Feb-05	8376.1	833.1	17.32844639	-2.076773943
March -05	7502	424.5	-0.104356443	-0.490457328
Apr-05	-654.2	-821.2	-1.087203412	-2.93451119
May-05	-1140.2	-245.5	0.742892082	-0.701047248
Jun-05	5328.5	-70.4	-5.673302929	-0.713238289
Jul-05	7934.1	-173.8	0.48899315	1.46875
Aug-05	5051	-430	-0.36338085	1.47410817
Sep-05	4646.7	-188.3	-0.080043556	-0.562093023
Oct-05	-3693.7	-933.4	-1.794908214	3.956983537

Nov-05	4038.8	-2164.4	-2.093429353	1.318834369
Dec-05	9335	-974.5	1.311330098	-0.549759749
Jan-06	3677.7	-921.5	-0.606031066	-0.054386865
Feb-06	7587.8	-151.5	1.063191669	-0.83559414
March -06	6688.6	-258.5	-0.118506023	0.706270627
Apr-06	522.1	248.6	-0.921941811	-1.961702128
May-06	-7354.1	706.8	-15.08561578	1.84312148
Jun-06	479.6	395.8	-1.065215322	-0.440011319
Jul-06	1144.9	152.1	1.387197665	-0.615715008
Aug-06	4642.8	804.5	3.055201328	4.289283366
Sep-06	5424.6	708.5	0.168389765	-0.119328776
Oct-06	8013.1	656.7	0.477178041	-0.073112209
Nov-06	9379.9	806.2	0.17057069	0.227653419
Dec-06	-3667.3	901.5	-1.390974317	0.118208881
Jan-07	492.1	-2173.9	-1.134185913	-3.411425402
Feb-07	7239.7	955.4	13.71184719	-1.439486637
March -07	-1081.9	1442.7	-1.149439894	0.510048147
Apr-07	6679.1	1042.1	-7.173491081	-0.277673806
May-07	3959.8	1360.1	-0.407135692	0.305153056
Jun-07	1643.1	-541.5	-0.585054801	-1.39813249
Jul-07	23872.4	-1263	13.52887834	1.332409972
Pre - US Crisis Volatility		**4.168900426**		**2.371465474**
Aug-07	-7770.5	608.5		
Sep-07	16132.5	2655.5	-3.076121228	3.36400986
Oct-07	20590.8	2499.5	0.276355184	-0.058745999
Nov-07	-5849.8	-469.2	-1.284097752	-1.187717544
Dec-07	5579.2	3311.8	-1.953742008	-8.058397272
Jan-08	-13035.6	1953.8	-3.336464009	-0.410048916
Feb-08	1733.1	2496.8	-1.132951303	0.277919951
March -08	-130.3	-879.8	-1.075183198	-1.352371035
Apr-08	1074.8	-1701.7	-9.248656946	0.934189589
May-08	-5011.5	-162.8	-5.662727949	-0.904330963
Jun-08	-10095.7	-998.7	1.014506635	5.134520885
Jul-08	-1836.8	3618.8	-0.818061155	-4.623510564
Aug-08	-1211.5	1257.8	-0.340429007	-0.652426219
Sep-08	-8278.4	3204.1	5.833182006	1.547384322
Oct-08	-15347	-1858.3	0.853860649	-1.579975656
Nov-08	-2598.1	4215.1	-0.830709585	-3.268255933
Dec-08	1750	626.5	-1.673569147	-0.851367702
Jan-09	-4245.3	802.5	-3.425885714	0.280925778
Feb-09	-2436.4	-687.8	-0.42609474	-1.857071651

March -09	530.2	-6420.4	-1.217616155	8.334690317
Apr-09	6508	2490.1	11.27461335	-1.387841879
May-09	20117.1	-2711.5	2.091133989	-2.088912092
Jun-09	3829.9	1068.2	-0.809619677	-1.393951687
Jul-09	11066.4	2115.4	1.889474921	0.98034076
Aug-09	4902.5	-379.1	-0.556992337	-1.179209606
Volatility During US Crisis		**3.775896796**		**3.129858939**
Sep-09	18344.3	2228.3		
Oct-09	9077.1	6895.4	-0.505181446	2.094466634
Nov-09	5497	684.4	-0.394410109	-0.900745424
Dec-09	10233.1	-1522.3	0.861579043	-3.224284044
Jan-10	-500.3	8913	-1.048890366	-6.854956316
Feb-10	1216.7	3146.1	-3.431940835	-0.647021205
March -10	19928	9509.6	15.37872935	2.02266298
Apr-10	9361.4	3031.9	-0.53023886	-0.681174813
May-10	-9436.7	2450.7	-2.008043669	-0.191694977
Jun-10	10508.3	740.5	-2.113556646	-0.697841433
Jul-10	16617.3	8106.5	0.58134998	9.947332883
Aug-10	11687.1	2998.8	-0.296690798	-0.630074631
Sep-10	24978.4	7689.5	1.137262452	1.564192344
Oct-10	28563	-4260.2	0.143507991	-1.55402822
Nov-10	18293	2917.3	-0.359556069	-1.684780057
Dec-10	2049.8	1164.4	-0.887946209	-0.600863812
Jan-11	-4813	10176.8	-3.348033955	7.739951907
Feb-11	-4585.6	1315.8	-0.047247039	-0.870705919
March -11	6897.6	-15.1	-2.50418702	-1.011475908
Apr-11	7213.4	-17.3	0.045784041	0.145695364
May-11	-6614.4	2338.4	-1.916960102	-136.1676301
Jun-11	4572.2	311.3	-1.691249395	-0.866874786
Jul-11	8030.2	2622.8	0.756309873	7.425313203
Aug-11	-10833.7	2931.1	-2.349119574	0.117546134
Sep-11	-158.5	-1707.6	-0.985369726	-1.582579919
Oct-11	1677.3	1401.5	-11.58233438	-1.820742563
Nov-11	-4197.8	934.9	-3.502712693	-0.332929005
Dec-11	98	21774.4	-1.023345562	22.29061932
Jan-12	10357.7	15971	104.6908163	-0.266523991
Feb-12	25212	10015.7	1.434131129	-0.372882099
March -12	8381	-6588.5	-0.667578931	-1.657817227
Apr-12	-1109	-3787.7	-1.132323112	-0.425104348
May-12	-347.3	3569.2	-0.686834986	-1.942313277
Jun-12	-501.3	1681.8	0.443420674	-0.528801972

Jul-12	10272.7	3391.5	-21.49212049	1.016589369
Aug-12	10803.9	264.8	0.051709872	-0.921922453
Sep-12	19261.3	622.5	0.782809911	1.350830816
Oct-12	11364	7851.4	-0.41000867	11.61269076
Nov-12	9577.1	292.1	-0.157242168	-0.962796444
Dec-12	25087.7	1704.2	1.619550803	4.834303321
Post US Crisis Volatility		**17.59873466**		**22.5219271**

Table 1 depicts the results for the **monthly volatility in the net foreign institutional investments in India during the different time frame of US crisis.** It results that volatility in the **Pre - US crisis** period in **Equity** is 4.168900426 and in **Debt** is 2.371465474. **During US crisis** period the volatility found to be 3.775896796 in **Equity** and 3.129858939 in **Debt**. **Post crisis** period the volatility found to be 17.59873466 in **Equity** and 22.5219271 in **Debt**. Thus, suggesting that there is a high volatility in Equity at the post US crisis period, then at pre – crisis stage and low volatility at during stage. On the other hand in Debt higher volatility was found at post crisis, then during and low at pre crisis stage of US crisis.

Table 2

Monthly volatility in the net Indian foreign institutional investments both in equity and debt during the different time frame of time of the European Sovereign Debt crisis (Amount in Rs. Crore)

(January 2002 to December 2012)

E.U Crisis Calendar Year (Jan - Dec)	Monthly Volatility in Net Foreign Institutional Investment (Rs. Crore) - EU Crisis			
	Equity	**Debt**	**Monthly Return in Equity**	**Monthly Return in Debt**
Jan-02	423.3	276.1		
Feb-02	1966.3	370.5	3.645168911	0.341905107
March -02	391.4	-62.4	-0.800945939	-1.168421053
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Oct-04	3263.1	-1235.2	0.367946676	-7.514767932
Nov-04	6740.7	1444.6	1.065735037	-2.169527202
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Jan-05	457	-773.7	-0.931624699	-1.223878006
Feb-05	8376.1	833.1	17.32844639	-2.076773943
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Apr-05	-654.2	-821.2	-1.087203412	-2.93451119
May-05	-1140.2	-245.5	0.742892082	-0.701047248
Jun-05	5328.5	-70.4	-5.673302929	-0.713238289
Jul-05	7934.1	-173.8	0.48899315	1.46875
Aug-05	5051	-430	-0.36338085	1.47410817
Sep-05	4646.7	-188.3	-0.080043556	-0.562093023
Oct-05	-3693.7	-933.4	-1.794908214	3.956983537
Nov-05	4038.8	-2164.4	-2.093429353	1.318834369
Dec-05	9335	-974.5	1.311330098	-0.549759749
Jan-06	3677.7	-921.5	-0.606031066	-0.054386865
Feb-06	7587.8	-151.5	1.063191669	-0.83559414

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March -06	6688.6	-258.5	-0.118506023	0.706270627
Apr-06	522.1	248.6	-0.921941811	-1.961702128
May-06	-7354.1	706.8	-15.08561578	1.84312148
Jun-06	479.6	395.8	-1.065215322	-0.440011319
Jul-06	1144.9	152.1	1.387197665	-0.615715008
Aug-06	4642.8	804.5	3.055201328	4.289283366
Sep-06	5424.6	708.5	0.168389765	-0.119328776
Oct-06	8013.1	656.7	0.477178041	-0.073112209
Nov-06	9379.9	806.2	0.17057069	0.227653419
Dec-06	-3667.3	901.5	-1.390974317	0.118208881
Jan-07	492.1	-2173.9	-1.134185913	-3.411425402
Feb-07	7239.7	955.4	13.71184719	-1.439486637
March -07	-1081.9	1442.7	-1.149439894	0.510048147
Apr-07	6679.1	1042.1	-7.173491081	-0.277673806
May-07	3959.8	1360.1	-0.407135692	0.305153056
Jun-07	1643.1	-541.5	-0.585054801	-1.39813249
Jul-07	23872.4	-1263	13.52887834	1.332409972
Aug-07	-7770.5	608.5	-1.325501416	-1.48178939
Sep-07	16132.5	2655.5	-3.076121228	3.36400986
Oct-07	20590.8	2499.5	0.276355184	-0.058745999
Nov-07	-5849.8	-469.2	-1.284097752	-1.187717544
Dec-07	5579.2	3311.8	-1.953742008	-8.058397272
Jan-08	-13035.6	1953.8	-3.336464009	-0.410048916
Feb-08	1733.1	2496.8	-1.132951303	0.277919951
March -08	-130.3	-879.8	-1.075183198	-1.352371035
Apr-08	1074.8	-1701.7	-9.248656946	0.934189589
May-08	-5011.5	-162.8	-5.662727949	-0.904330963
Jun-08	-10095.7	-998.7	1.014506635	5.134520885
Jul-08	-1836.8	3618.8	-0.818061155	-4.623510564
Aug-08	-1211.5	1257.8	-0.340429007	-0.652426219
Sep-08	-8278.4	3204.1	5.833182006	1.547384322
Oct-08	-15347	-1858.3	0.853860649	-1.579975656
Nov-08	-2598.1	4215.1	-0.830709585	-3.268255933
Dec-08	1750	626.5	-1.673569147	-0.851367702
Jan-09	-4245.3	802.5	-3.425885714	0.280925778
Feb-09	-2436.4	-687.8	-0.42609474	-1.857071651
March -09	530.2	-6420.4	-1.217616155	8.334690317
Apr-09	6508	2490.1	11.27461335	-1.387841879
May-09	20117.1	-2711.5	2.091133989	-2.088912092
Jun-09	3829.9	1068.2	-0.809619677	-1.393951687
Jul-09	11066.4	2115.4	1.889474921	0.98034076

Aug-09	4902.5	-379.1	-0.556992337	-1.179209606
Sep-09	18344.3	2228.3	2.741825599	-6.877868636
Oct-09	9077.1	6895.4	-0.505181446	2.094466634
Nov-09	5497	684.4	-0.394410109	-0.900745424
Dec-09	10233.1	-1522.3	0.861579043	-3.224284044
Jan-10	-500.3	8913	-1.048890366	-6.854956316
Feb-10	1216.7	3146.1	-3.431940835	-0.647021205
March -10	19928	9509.6	15.37872935	2.02266298
Apr-10	9361.4	3031.9	-0.53023886	-0.681174813
May-10	-9436.7	2450.7	-2.008043669	-0.191694977
Jun-10	10508.3	740.5	-2.113556646	-0.697841433
Jul-10	16617.3	8106.5	0.58134998	9.947332883
Aug-10	11687.1	2998.8	-0.296690798	-0.630074631
Sep-10	24978.4	7689.5	1.137262452	1.564192344
Pre - EU Crisis Volatility			4.108026159	2.801563463
Oct-10	28563	-4260.2		
Nov-10	18293	2917.3	-0.359556069	-1.684780057
Dec-10	2049.8	1164.4	-0.887946209	-0.600863812
Jan-11	-4813	10176.8	-3.348033955	7.739951907
Feb-11	-4585.6	1315.8	-0.047247039	-0.870705919
March -11	6897.6	-15.1	-2.50418702	-1.011475908
Apr-11	7213.4	-17.3	0.045784041	0.145695364
May-11	-6614.4	2338.4	-1.916960102	-136.1676301
Jun-11	4572.2	311.3	-1.691249395	-0.866874786
Jul-11	8030.2	2622.8	0.756309873	7.425313203
Aug-11	-10833.7	2931.1	-2.349119574	0.117546134
Sep-11	-158.5	-1707.6	-0.985369726	-1.582579919
Oct-11	1677.3	1401.5	-11.58233438	-1.820742563
Nov-11	-4197.8	934.9	-3.502712693	-0.332929005
Dec-11	98	21774.4	-1.023345562	22.29061932
Jan-12	10357.7	15971	104.6908163	-0.266523991
Feb-12	25212	10015.7	1.434131129	-0.372882099
March -12	8381	-6588.5	-0.667578931	-1.657817227
Apr-12	-1109	-3787.7	-1.132323112	-0.425104348
May-12	-347.3	3569.2	-0.686834986	-1.942313277
Jun-12	-501.3	1681.8	0.443420674	-0.528801972
Jul-12	10272.7	3391.5	-21.49212049	1.016589369
Aug-12	10803.9	264.8	0.051709872	-0.921922453
Sep-12	19261.3	622.5	0.782809911	1.350830816
Oct-12	11364	7851.4	-0.41000867	11.61269076
Nov-12	9577.1	292.1	-0.157242168	-0.962796444

Dec-12	25087.7	1704.2	1.619550803	4.834303321
Volatility During EU Crisis			**21.44084089**	**27.55694552**

Table 2depicts the results for the **monthly volatility in the net foreign institutional investments in India during the different time frame of E.U crisis**. It results that volatility in the **Pre – E.U crisis** period in **Equity** is 4.108026159 and in **Debt** is 2.801563463. **During E.U crisis** period the volatility found to be 21.44084089 in **Equity** and 27.55694552 in **Debt**. Thus, suggesting that there is a high volatility in both Equity and Debt at during period of the EU crisis and low at pre crisis stage of EU crisis.

CONCLUSION

The results for the monthly volatility in the net foreign institutional investments in India during the different time frame of US crisis shows that there is a high volatility in Equity at the post US crisis period, then at pre – crisis stage and low volatility at during stage. On the other hand in Debt higher volatility was found at post crisis, then during and low at pre crisis stage of US crisis. And on the other hand the result for E.U crisis shows that there is a high volatility in both Equity and Debt at during period of the EU crisis and low at pre crisis stage of EU crisis.

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