Impact Of Global Financial Crisis On Reserve Bank Of India (RBI) As A National Regulator

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BACKGROUND OF THE STUDY

The immediate result of tightening of the money and credit markets in October 2008 created demands on banks that were already expanding credit well beyond the resources raised from the public by way of deposits. Companies which were substituting overseas credit and capital market sources with bank funds started withdrawing funds parked with mutual funds and utilizing their undrawn limits with banks. Some of the companies that had issued commercial paper in the market- especially the real estate companies and the non banking companies found it difficult to roll over the maturing paper.The Commercial Paper and Certificates of Deposit markets became illiquid and mutual funds started facing severe redemption pressures.Hence, in the interest of maintaining financial stability, the RBI instituted a 14-day special repo facility for a notified amount of about $ 4 billion to alleviate liquidity stress faced by mutual funds, and banks were allowed temporary use of Statutory Liquidity Ratio (SLR) securities for collateral purposes for an additional 0.5 per cent of Net Demand and Time Liabilities exclusively for this. Subsequently, this facility was extended for Non Banking Finance Companies (NBFCs) and later to housing finance companies as well. The relaxation in the maintenance of the SLR was enhanced to the extent of up to 1.5 per cent of their NDTL. In order to curtail leveraging, commercial banks, all-India term lending and refinancing institutions were not allowed to lend against or buy back CDs held by mutual funds. This restriction was relaxed in the context of the drying up of liquidity for CDs and CPs. Considering the systemic importance of the NBFC sector, the Government, in consultation with the RBI announced the setting up of a special purpose vehicle (SPV) that could raise funds from the RBI against government-guaranteed bonds to meet the temporary liquidity.

The global economic outlook deteriorated sharply over the last quarter of 2008. In a sign of the ferocity of the down turn, the IMF marked down, yet again, its estimate for global growth in 2009 to a range of (-) 1.0 to (-) 0.5 per cent, the first global contraction in 60 years. With all the advanced economies - the United States, Europe and Japan - having firmly gone into recession, the contagion of the crisis from the financial sector to the real sector has been unforgiving and total. Evidence suggested that contractionary forces have been strong: demand slumped, production plunged, job losses were rampant and credit markets remained in seizure. Most worryingly, world trade - the main channel through which the downturn got transmitted on the way forward was projected to contract by 2.8 per cent in 2009, the fastest pace of shrinkage in the last 80 years.Governments and central banks across countries have responded to the crisis through big, aggressive and unconventional measures. There is a contentious debate on whether these measures are adequate and appropriate, and when, if at all, they will start to show results. There has also been a separate debate on how abandoning the rule book, driven by the tyranny of the short-term, is compromising medium-term sustainability. What is clearly beyond debate though is that this Great Recession of 2008/09 is going to be deeper and the recovery longer than earlier thought[1].

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[1] Speech delivered by Duvvuri Subbarao (RBI Governor) at the Confederation of Indian Industry's National Conference and Annual Session 2009 in New Delhi on March 26, 2009.

RESEARCH OBJECTIVE OF THE PAPER
✵ To examine the trend of macroeconomic factors in the recent past.
✵ To analyze the reform undertaken by the RBI to control money supply.
✵ To estimate the steps taken by RBI and its impact on sensex during recession.

LITERATURE REVIEW
MODERATION IN GROWTH
After clocking an average of 9.4 per cent during three successive years from 2005-06 to 2007-08, the growth rate of real GDP slowed down to 6.7 per cent (revised estimates) in 2008-09. Industrial production grew by 2.6 per cent as compared to 7.4 per cent in the previous year. In the half year ended March 2009, imports fell by 12.2 per cent and exports fell by 20.0 per cent. The trade deficit widened from $88.5 billion in 2007-08 to $119.1 billion.
Current account deficit increased from $17.0 billion in 2007-08 to $29.8 billion in 2008-09. Net capital inflows at US$ 9.1 billion (0.8 per cent of GDP) were much lower in 2008-09 as compared with US$ 108.0 billion (9.2 per cent of GDP) during the previous year mainly due to net outflows under portfolio investment, banking capital and short-term trade credit. As per the estimate made by the RBI in its Annual Policy announced on April 21, 2009, GDP is expected to grow by 6 per cent in 2009-10[2].

RBI'S RESPONSE AS A MONETARY AUTHORITY
Till August 2008, the RBI followed a tight monetary stance in view of the inflationary pressures arising from crude, commodity and food prices. In mid-September 2008, severe disruptions of international money markets, sharp declines in stock markets across the globe and extreme investor aversion brought pressures on the domestic money and forex markets. The RBI responded by selling dollars consistent with its policy objective of maintaining orderly conditions in the foreign exchange market. Simultaneously, it started addressing the liquidity pressures through a variety of measures. A second repo auction in the day under the Liquidity Adjustment Facility (LAF) was also re-introduced in September 2008. The repo rate was cut in stages from 9 per cent in October 2008 to the current rate of 4.75 per cent. The reverse repo rate was brought down from 6 per cent to 3.25 per cent. The cash reserve ratio, which was 9 per cent in October 2008, has been brought down to 5 per cent. To overcome the problem of availability of collateral of government securities for availing of LAF, a special refinance facility was introduced in October 2008 to enable banks to get refinance from the RBI against a declaration of having extended bona fide commercial loans, under a pre-existing provision of the RBI Act for a maximum period of 90 days. The statutory liquidity ratio requiring banks to keep 25 per cent of their liabilities in government securities was reduced to 24 per cent. These actions of the RBI since mid-September 2008 resulted in augmentation of actual/potential liquidity of nearly $50 billion[3].

FINANCIAL STABILITY OBJECTIVE - RBI'S RESPONSE
The immediate result of tightening of the money and credit markets in October 2008 created demands on banks that were already expanding credit well beyond the resources raised from the public by way of deposits. Companies which were substituting overseas credit and capital market sources with bank funds started withdrawing funds parked with mutual funds and utilizing their undrawn limits with banks. Some of the companies that had issued commercial paper in the market- especially the real estate companies and the non banking companies - found it difficult to roll over the maturing paper. The Commercial Paper and Certificates of Deposit markets became illiquid and mutual funds started facing severe redemption pressures. Hence, in the interest of maintaining financial stability, the RBI instituted a 14-day special repo facility for a notified amount[4] .The contagion of the crisis had spread to India through all the channels -the financial channel, the real channel, and importantly, as happens in all financial crises, the confidence channel.
Let us first look at the financial channel. India's financial markets - equity market, money market, forex market and credit market - had all come under pressure from a number of directions.
First, as a consequence of the global liquidity squeeze, Indian corporates found their overseas financing drying up,

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[2] BIS Review 88/2009 1 in 2008-09.

[3] Economist-09 March.

[4] RBI bulletin,june2009.

forcing corporates to shift their credit demand to the domestic banking sector. Also, in their search for substitute financing, corporates withdrew their investments in domestic money market mutual funds (MFs); consequently, non-banking financial companies (NBFCs), where the MFs had invested a significant portion of their funds came under redemption pressure. This substitution of overseas financing by domestic financing brought both money markets and credit markets under pressure.

Second, the forex market came under pressure because of reversal of capital flows as part of the global deleveraging process. Simultaneously, corporates were converting the funds raised locally into foreign currency to meet their external obligations. Both these factors put downward pressure on the rupee.

Third, the Reserve Bank's intervention in the forex market to manage the volatility in the rupee further added to liquidity tightening. Now let us turn to the real channel. Here, the transmission of the global cues to the domestic economy has been quite straightforward - through the slump in demand for exports. The United States, European Union and the Middle East, which account for three quarters of India's goods and services trade, are in a synchronized down turn. Services export growth also slowed down as the recession deepened and financial services firms - traditionally large users of outsourcing services- are restructured. Remittances from migrant workers also slowed down as the Middle East adjusted to lower crude prices and advanced economies went into a recession[5].

Beyond the financial and real channels of transmission as above, the crisis also spread through the confidence channel. In sharp contrast to global financial markets, which went into a seizure on account of a crisis of confidence, Indian financial markets continued to function in an orderly manner. Furthermore, our banks have continued to lend. However, the tightened global liquidity situation in the period immediately following the Lehman failure in mid-September 2008, coming as it did on top of a turn in the credit cycle, increased the risk aversion of the financial system and made some banks cautious about lending.

The purport of the above explanation is to show how, despite not being part of the global financial sector problem; India has been affected by the crisis through the adverse feedback loops between external shocks and domestic vulnerabilities.

METHODOLOGY
SAMPLE DESIGN
The researchers have adopted convenient sampling process for the research. A sample of monthly data of 14 months was collected from secondary sources for the period of March 2008 to May 2009. Sampling period had been decided keeping in mind the recessionary period as well the period for policy framework in terms of central budget,08-09.The nature of the sample considered was the monthly time series data.

SOURCE
During empirical research, data have been collected from secondary sources (RBI Bulletin June -09).

TEST
Both quantitative and qualitative analyses have been organized. Examining the objective,the researchers have adopted different Statistical instruments during their research. Primarily, the researchers have attempted to establish the relationship between Forex Reserve and Open Market operation by Reserve Bank of India. Pearson's correlation coefficient, regression analysis and autocorrelation[6] were used to establish the research objective.

FACTORS CONSIDERED DURING THE ANALYSIS
The reason for selecting the above two macroeconomic parameters as policy variable is , Open market operations are often used by Monetary authority as expansionary monitory policy to combat reduction in aggregate demand, which is inevitable during recession . Also, the reduction in Forex reserve in face of recession may hinder the growth stimulus.

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[5] Presentation by Ms Usha Throat, Deputy Governor of the Reserve Bank of India, at the 56th EXCOM Meeting and Fin Power CEO Forum organized by APRACA, Seoul, 29 June 2009.
[6] Ref annexure

A major objective was to examine the efficacy of open market operations and its impact on reduction of net Forex inflow during the period of study. The study also demands an analysis of the association between net inflows of foreign capital with the BOT position of the country during the same period. Considering its importance further, an attempt has been taken to probe whether the recent expansionary monetary policy adopted by RBI to enhance the BSE Sensex is paying off or not. The variables taken into consideration are change in M_3 Money Supply and BSE Sensex. During the process, the researchers have considered various other factors like GDP/GNP growth, inflation, exchange rate, FDI, FII net flow and forex reserve and its effect during recession for qualitative measurement. Further, an attempt has been taken to establish a relationship of those factors with SLR, CRR, CLR, MSS, Repo and reverse repo rate that are controlling the RBI credit policy.

HYPOTHESES

❀ **Firstly , establishing a relationship between Net Foreign Exchange Inflow with BOT.**
H0 : There exists significant association between Net Foreign Exchange Inflow with BOT.
H1 : There exists no significant association between Net Foreign Exchange Inflow with BOT.

❀ **Secondly, Whether Open Market Operation Contribute sufficiently in enhancing reduction in Forex Reserve.**
H0 : Open Market operation is independent of Forex Reserve.
H1 : Open Market operation is not independent of Forex Reserve.

❀ **Thirdly, Impact of Expansionary Monetary policy over BSE Sensex.**
H0 : Increase in M3 has no association with indicator of BSE sensex.
H1 : Increase in M3 has association with indicator of BSE sensex.

ANALYSIS
QUANTITATIVE

Ref To Table No 1[7]
Last seven months recorded a steady growth in M3 money supply. The main objective was to provide stimulus in the real sector, thereby breaking the bottleneck in demand caused by the recession. Assuming BSE Sensex indicator as an proxy of real sector growth, the impact can be understood from the correlation coefficient between increase in M3 and BSE indicator. Although the correlation coefficient is as high as 0.88[8] , showing a high degree of association between M3 money supply and BSE sensex indicator. But given the inadequacy of the sample, it can not be hypothesized that they follow a significant correlation at 5 % level.
The researchers attempted to address this problem by incorporating the concept of probable error. The probable error of correlation coefficient between BSE sensex indicator and M3 money supply is [9]0.0712.
Now, The correlation coefficient are greater than six times PE , so we can say it shows a significant value , hence a correlation exit.

QUALITATIVE

The contagion of the crisis spread to India through all the channels - the financial channel, the real channel, and importantly, as happens in all financial crises, the confidence channel. Let us first look at the financial channel. India's financial markets -equity market, money market, forex market and credit market - had all come under pressure from a number of directions.
1. First, as a consequence of the global liquidity squeeze, Indian corporates found their overseas financing drying up, forcing corporates to shift their credit demand to the domestic banking sector. Also, in their search for substitute financing, corporates withdrew their investments in domestic money market mutual funds (MFs); consequently, non-banking financial companies (NBFCs), where the MFs had invested a significant portion of their funds came under

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[7,8,9]Ref Annexure-2

redemption pressure. This substitution of overseas financing by domestic financing brought both money markets and credit markets under pressure.

2. Second, the forex market came under pressure because of reversal of capital flows as part of the global deleveraging process. Simultaneously, corporates were converting the funds raised locally into foreign currency to meet their external obligations. Both these factors put downward pressure on the rupee.

3. Third, the Reserve Bank's intervention in the forex market to manage the volatility in the rupee further added to liquidity tightening[10].

The ferocity with which the global crisis hit India dismayed many and this dismay stems from two analytical strands.

❋ The first analytic goes something like this. The Indian banking system has had no direct exposure to the sub-prime mortgage assets or to the failed institutions. It has very limited off-balance sheet activities or securitized assets. In fact, our banks continue to remain sound and healthy. So, the enigma is how can India be caught up in a crisis when it has nothing much to do with any of the maladies that are at the core of the crisis.

❋ The second reason for dismay is that India's recent growth has been driven predominantly by domestic consumption and domestic investment. External demand, as measured by merchandize exports, accounts for less than 15 per cent of our GDP. The question then is, even if there is a global downturn, why should India be affected when its reliance on external demand is so limited?

THE ANSWER TO THE ABOVE CAUSES OF DISMAY LIES IN GLOBALIZATION

First, India's integration into the world economy over the last decade has been remarkably rapid. Integration into the world implies more than just exports. Going by the common measure of globalization, India's two-way trade (merchandize exports plus imports), as a proportion of GDP, increased from 21.2 per cent in 1997-98, the year of the Asian crisis, to 34.7 per cent in 2007-08.

Second, India's financial integration with the world has been as deep as India's trade globalization, if not deeper. If we take an expanded measure of globalization, that is the ratio of total external transactions (gross current account flows plus gross capital flows) to GDP, this ratio has more than doubled from 46.8 per cent in 1997-98 to 117.4 per cent in 2007-08[11].

Importantly, the Indian corporate sector's access to external funding has markedly increased in the last five years. Some numbers will help illustrate the point. In the five-year period 2003-08, the share of corporate investment in India's GDP rose by 9 percentage points. Corporate savings financed a little more than half of this, but a significant portion of the balance financing came from external sources. While funds were available domestically, foreign funding was perceived to be less expensive than domestic financing. On the other hand, in a global market awash with liquidity and on the promise of India's growth potential, foreign investors and lenders were willing to take risks and finance investment in India. In the year 2007/08, for example, India received capital inflows amounting to over 9 per cent of the GDP as against a current account deficit in the balance of payments of just 1.5 per cent of GDP. These capital flows, in excess of the current account deficit, evidence the importance of external financing to the corporate and the depth of India's financial integration[12].

So, the reason India has been hit by the crisis, despite mitigating factors, is clearly India's rapid and growing integration into the global economy.

FINDINGS

Both the government and the Reserve Bank of India responded to the challenge in close coordination and consultation. The main plank of the government response was fiscal stimulus, while the Reserve Bank's action comprised monetary accommodation and counter cyclical regulatory measures.

1. Monetary Policy Response : The Reserve Bank's policy response was aimed at containing the contagion

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[10] RBI Bulletin-June 09

[11] RBI Bulletin-July-09

[12] Week,Sep08

from the outside - to keep the domestic money and credit markets functioning normally and see that the liquidity stress did not trigger solvency cascades. In particular, there were three main objectives: first, to maintain a comfortable rupee liquidity position; second, to augment foreign exchange liquidity; and third, to maintain a policy framework that would keep credit delivery on track so as to arrest the moderation in growth. This marked a reversal of Reserve Bank's policy stance from monetary tightening in response to heightened inflationary pressures of the previous period to monetary easing in response to easing inflationary pressures and moderation in growth in the current cycle. The measures to meet the above objectives came in several policy packages starting mid-September 2008, on occasion in response to unanticipated global developments, and at other times in anticipation of the impact of potential global developments in the Indian markets[13]. The policy packages included, like in the case of other central banks, both conventional and unconventional measures. On the conventional side, the policy interest rates were reduced aggressively and rapidly, the quantum of bank reserves impounded by the central bank were reduced and refinancing facilities for export credit were expanded and liberalized. Measures aimed at managing forex liquidity included an upward adjustment of the interest rate ceiling on the foreign currency deposits by non-resident Indians, substantially relaxing the external commercial borrowings (ECB) regime for corporates, and allowing non-banking financial companies and housing finance companies access to foreign borrowing[14].

The important among the many unconventional measures taken by the Reserve Bank of India were a rupee-dollar swap facility for Indian banks to give them comfort in managing their short-term foreign funding requirements, an exclusive refinance window as also a special purpose vehicle for supporting non-banking financial companies, and expanding the lendable resources available to apex finance institutions for refinancing credit extended to small industries, housing and exports. Reflecting the rapid turn of events that could impair assets down the line, the counter - cyclical regulatory measures introduced in 2006[15] were reversed.

2. Government's Fiscal Stimulus : Over the last five years, both the central and state governments in India have made serious efforts to reverse the fiscal excesses of the past. At the heart of these efforts was the Fiscal Responsibility and Budget Management (FRBM)[16] Act, which mandated a calibrated road map towards fiscal sustainability.

The depth and extraordinary impact of this crisis, however, clearly indicated the need for counter cyclical public spending. Accordingly, the central government invoked the emergency provisions of the FRBM Act to seek relaxation from the fiscal targets and launched two fiscal stimulus packages in December 2008 and January 2009. These fiscal stimulus packages, together amounting to about 3 per cent of GDP, included additional public spending, government guaranteed funds for infrastructure spending, cuts in indirect taxes, expanded guarantee cover for credit to micro and small enterprises, and additional support to exporters. These stimulus packages came on top of an already announced expanded safety-net for rural poor, a farm loan waiver package and salary increases for government staff, all of which too should stimulate demand.

CONCLUSION

On the basis of this analysis ,Expansionary monetary policy adopted by RBI can be considered to be a stimulant for real sector in the long run. But adhoc policy shift may not instantaneously improve the real sector as recession also has its impact on supply side. During the analysis, the role of net foreign investment inflow was considered as an explanatory variable in determining another recession heat parameter like BOT. The co- efficient of determination being 0.015 proves an insignificant association between the two variables. These have been further confirmed by the fact that p value > significance level 0.05 for the linear co efficient of FII. So we accept the null hypothesis that FIIs failed to make any significant change in BOT during the recessionary period.

A major thrust area of the study was to estimate whether Open market operation can be utilized as a policy instrument in reviving some of the macro growth indicators suffering from slum due to recession. RBI Forex reserve has been

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[13]NDTV- Excerpts From Mr. A Goswami- chief Editor.

[14]Speech Of Reserve Bank Governor Duvvuri Subbarao, India - Managing The Impact Of The Global Financial Crisis.

[15]Mr. Montek Singh Alluwalia, -(excerpts From Ex Planning Commission Chairman) Economic Times 19th Dec 2008.

[16]Fiscal Revenue Budget Management Act-data Abbreviation Note.

taken as a macro growth indicator as it directly bears the heat of recession and shows a declining trend in the last 14 months. Pearson's correlation coefficient between RBI Forex reserve and volume of Open market operation measured at -0.09 proves that a very poor degree of association exists between them as well as the negative sign implies that an improperly managed open market operation can add to further reduction of Forex reserve. Autocorrelation coefficient of open market operation stood at 0.262[17] with a one period (month) lag further justifies the fact that it can contribute insignificantly to the revival of macro growth indicator like Forex reserve. At 5 % level of significance, we accept the null hypothesis that open market operation has no association with forex reserve.

RECOMMENDATIONS

Consequently, consumption demand should hold up well.Because of India's mandated priority sector lending, institutional credit for agriculture has remained unaffected. The farm loan waiver package implemented by the Government should further insulate the agriculture sector from the crisis. Finally, over the years, India has built an extensive network of social safety- net programmes, including the flagship rural employment guarantee programme. These uniquely Indian versions of automatic stabilizers should protect the poor from the extreme impact of the global crisis.

RBI'S POLICY STANCE

Going forward, the Reserve Bank's policy stance will continue to be to maintain comfortable rupee and forex liquidity positions. There are indications that pressures on mutual funds have eased and that NBFCs too are making the necessary adjustments to balance their assets and liabilities. Despite the contraction in export demand, we will be able to manage our balance of payments. It is the Reserve Bank's expectation that commercial banks will take the signal from the policy rates reduction to adjust their deposit and lending rates in order to keep credit flowing to productive sectors. In particular, the special refinance windows opened by the Reserve Bank for the MSME (micro, small and medium enterprises) sector, housing sector and export sector should see credit flowing to these sectors. Also, the SPV set up for extending assistance to NBFCs[18] should ease the financing constraints of NBFCs. The government's fiscal stimulus should be able to supplement these efforts from both supply and demand sides[19].

In the back drop of world recession and its trickle down effect on India, The Ministry of Finance has opted for the biggest budget deficit in 16 years. Stocks tumbled nearly 6 percent, rupee fell by 1.4 percent and its is expected that fiscal deficit for the year ending March 2010 would increase to 6.8 percent of gross domestic product (GDP).So hefty borrowing plan may be the only stimulus the government can inject to boost up the real sector by creating demand. Given the dismal performance of the monetary variable in this analysis in the period of study and long term objective to strengthen infrastructure and agriculture, public debt may prove to be the only alternative in maintaining the growth momentum. Budget documents showed the government's gross market borrowing in the current fiscal year would total a record ₹ 4.51 trillion ($93.4 billion). Even if we consider the possibility of increase in cost of production due to this lump sum borrowing and interest burden if the source is external, it is obvious that GDP growth can be sustained to a significant level because of this overwhelming public expenditure. Supporting Domar's proposition, it is the productivity of debt what matters not the source. Thus, if this hefty public debt can be utilized productively for income generation, with world recovery of recession, fiscal deficit is expected to fall to 3% of GDP at the end of this financial year.

FUTURE IMPLICATIONS OF THE RESEARCH

Considering the sensex as a barometer of our national economy, the researchers have attempted to estimate a relationship between money supply in open market with BSE sensex, But somehow, the entire time frame considered as a recessionary period is not justified .So exhaustive analysis is missing in that area, In addition to that lot of variables control the RBI credit policy are not considered during the study.

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[17]Ref annexure-2.

[18]Ref annexure-1.

[19]India - Managing the Impact of the Global Financial Crisis1 By Duvvuri Subbarao.

LIMITATIONS

1. During research, a lot of macro indicators that control the supply of money in markets are not considered, so research depicts lack of analysis.

2. Further RBI credit policy measurement instrument like Repo rate, SLR, CRR,CLR, etc have not been highlighted in the research due to lack of data. No analysis has been done to establish their role in RBI policy.

3. The research shows inconsistent results due to unequal distribution of data in a few areas.

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2. India - Managing the Impact of the Global Financial Crisis1 By Duvvuri Subbarao.
3. NDTV-Excerpts from Mr. A Goswami-chief editor.

Annexure 1:Abbreviations

GDP- Gross domestic Product   **MSS**-Market Stabilization Scheme
GNP- Gross National Product   **FRBM**- Fiscal Responsibility Budget Management
FII- Foreign Institutional investment   **NBFC**- National Banking Finance Corporation
FDI- Foreign direct investment   **SPV**- Special Price Vehicle
PE- Probable Error

Annexure-4

PE value is less than six times compared to r, so its value is significant.

$$PE=0.6745(1-0.88^2)/5^{1/2}=0.6745(1-0.7744)/2.23=0.0712$$

Annexure 2: Correlation Coefficient Between BOT And Forex Reserve

Linear Regression					
Regression Statistics					
R	0.123081667				
R Square	0.015149097				
Adjusted R Square	-0.0743828				
Standard Error	16204.83782				
Total Number Of Cases	13				
BOT =- 40048.6907 + 0.9152 * FII					

Annexure 2: Correlation Coefficient Between BOT And Forex Reserve (Contd.)

ANOVA					
	d.f.	SS	MS	F	p-level
Regression	1	44432250.75	44432250.75	0.169203342	0.68872126
Residual	11	2888564456	262596768.7		
Total	12	2932996707			
	Coefficients	Standard Error	t Stat	p-level	
Intercept	-40048.6907	5455.464328	-7.341023284	0.00E+00	
FII	0.915157375	2.224801743	0.411343338	0.688721263	
Residuals					
Observation	Predicted Y	Residual	Standard Residuals		
1	-37423.1042	2416.104154	0.155727476		
2	-36713.8572	-10186.14281	-0.656537221		
3	-40614.2579	1126.25792	0.072591781		
4	-38442.5895	-12887.41053	-0.830644617		
5	-37375.516	-19046.48403	-1.227621281		
6	-38988.0233	-16988.97674	-1.095006793		
7	-43476.8702	-4739.129812	-0.305455674		
8	-39582.8756	-19910.12444	-1.283286324		
9	-38774.7916	8752.791596	0.564152062		
10	-38109.4722	13568.47218	0.874541736		
11	-39700.0157	28772.0157	1.854470291		
12	-39072.2177	18352.21774	1.182873071		
13	-35823.4091	10770.40906	0.694195493		

Annexure 3: Money Supply Growth In Policy Period (Ref Annexure - 2)

May 9,	2008
May 23,	2008
January	2009
February	2009
March	2009
April	2009
May 8,	2009
May 22,	2009

Correlation Coefficients Matrix(M3 and BSE indicator)			
Sample size	4	Critical Value(5%)	4.30265273
		4563513	9350.42
4563513	**Pearson Correlation Coefficient**	1	
	R Standard Error		
	t		
	Significance Level		
	Ho (5%)		
9350.42	**Pearson Correlation Coefficient**	0.886230544	1
	R Standard Error	0.107297711	
	t	2.705524589	
	Significance Level	0.113769456	
	Ho (5%)	accepted	
R			
Series vs. Series	R		
9350.42 vs. 4563513	0.886230544		

Correlation Coefficients Matrix (Foreign exchange & Open Market Operation)			
Sample size	14	Critical Value(5%)	2.17881283
		foreign exchange reserve	open market operation
Foreign Exchange Reserve	**Pearson Correlation Coefficient**	1	
	R Standard Error		
	t		
	Significance Level		
	Ho (5%)		
Open Market Operation	**Pearson Correlation Coefficient**	-0.098390744	1
	R Standard Error	0.082526605	
	t	-0.342497381	
	Significance Level	0.737900993	
	Ho (5%)	Accepted	
R			
Series vs. Series	R		
open market operation vs. foreign exchange reserve	-0.098390744		

Overall mean	10748.26857	Variance	252069727.8	Partial R Standard Error
Lag	Correlation	LCL	UCL	Standard Error
1	0.262735431	0.114773913	0.399292463	0.267261242
2	0.286781463	0.140360456	0.420927127	0.285113989
3	0.079805357	-0.073653447	0.229572307	0.30502307
4	-0.075737374	-0.22569164	0.077722739	0.306510874
5	-0.061710893	-0.212274438	0.09171463	0.30784471
6	-0.140330661	-0.286753569	0.012498985	0.308727063
7	-0.214096482	-0.355061173	-0.063612193	0.313250126

Regression Statistics	d.f.	SS	MS	F
R	0.098390744			
R Square	0.009680738			
Adjusted R Square	-0.072845867			
Standard Error	43188.77284			
Total Number Of Cases	14			
ANOVA				
Regression	1	218804493.8	218804493.8	0.117304456
Residual	12	22383241192	1865270099	
Total	13	22602045686		
	Coefficients	Standard Error	t Stat	p-level
Intercept	1279820.846	13938.98982	91.81589645	0.000
open market operation	-0.249002527	0.727020238	-0.342497381	0.737900993
Residuals				
Observation	Predicted Y	Residual	Standard Residuals	
1	1279849.633	-8777.633217	-0.211537622	
2	1279843.04	60099.96037	1.448386188	
3	1276104.08	64312.92006	1.549916914	
4	1278696.525	22250.47507	0.536227987	
5	1279847.885	13309.11478	0.320744604	
6	1279823.025	64237.97519	1.548110771	
7	1279796.578	-34352.57825	-0.827884071	
8	1279664.052	-45204.05163	-1.089400452	
9	1276931.012	-36770.01235	-0.886143313	
10	1279306.957	-60614.95711	-1.460797413	
11	1278378.818	-13789.81762	-0.33232936	
12	1266067.022	16523.97787	0.398221582	
13	1274745.435	-10697.435	-0.257804115	
14	1270968.938	-30527.93817	-0.735711699	