

Effects Of Monetary Policies On Asset Prices In India

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Abstract: *The saying goes, when United States (US) sneeze, the rest of the world catches a cold. Recent financial crisis has demonstrated that the monetary policies in US have spill over effects on rest of the world. To pull out the world economy from slowdown, many central banks have used unconventional monetary policies. US Fed and Indian central bank - Reserve Bank of India (RBI) had also used unconventional monetary policies. Those unconventional policies had affected the assets prices and capital inflows across the world. The objective of the study is to determine effect of US and RBI monetary policies on Indian assets prices. The time frame used for this study is from January 2000 to December 2014. The movement in asset prices has been studied after various monetary policy announcements by US Fed and RBI. It has been found that asset prices has fluctuated more during the unconventional policy actions and their effects lasted long. It has also been found that the spill over effect has reduced when the fundamental factors (like GDP growth, inflation, current account etc) of Indian economy were favourable for economy. The magnitude of fluctuation depends on surprise factor and market information factor available in monetary policy announcements.*

Keywords: *Monetary Policy, Asset Prices.*

I. Market movements 2008-14

World financial markets has dropped from \$ 51 trillion to \$ 22 trillion in between Oct'07 and Feb'09. This recession in US was the worst since the Great Depression. It has eroded 8.8 million jobs and caused erosion of \$19.2 trillion in household wealth.

During 2008-09, Indian stock markets witnessed an outflow of around US\$ 15 billion. FII outflows raised concerns about the pressures on India's BoP, which were manifested in the form of depreciating rupee and loss of reserves.

Policy responses - Globally

In majority of advanced economies, nominal interest rates were brought to nearly zero early in the global recession—and have been kept at that minimum level since (the so-called zero bound). Central banks which were unable to lower rates further, resorted to asset purchase programs that massively increased central bank balance sheets. The global economy would likely have suffered more had central banks not followed so-called unconventional monetary policies that relied on innovations widely dubbed quantitative easing (QE) to pump up the economy when traditional policies, such as cutting interest rates, were no longer feasible. The unconventional policy measures taken by US Fed are mentioned in Table 1.

Policy responses - Locally

In India also we have seen response from Central government as well as RBI in declaring fiscal and monetary policies respectively. During first half of 2008, inflation firmed up under the pressure of hardening international commodity and food prices, which necessitated an anti-inflationary policy response. In the second half, however, restoring orderly conditions in the market and subsequently supporting the growth momentum emerged as the key challenges .

Various policy rates were reduced to increase the Rupee liquidity in banking system. Few of them are mentioned below.

- a) Cash Reserve Ratio (CRR) was reduced by 400 basis points (from 9 percent in Aug-08 to 5 percent in Jan-09),
- b) Repo Rate by 425 basis points (from 9 percent in Aug-08 to 4.75 percent in may-09),
- c) Reverse Repo Rate by 275 basis point (from 6 percent in November-08 to 3.25 percent in April-09) and
- d) In October-08 RBI introduced special 14 days Term Repo facility to enable banks to meet their liquidity requirements of mutual funds.

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- e) Export credit refinance limit was raised from 15 percent of outstanding export credit to 50 percent and special refinance facilities for financial institutions (SIDBI/NHB/EXIM) were instituted.

Indian government had also announced several fiscal stimulus packages between Dec. 2008 and Feb. 2009 which included reduction in indirect taxes and sector specific measures. Apart from these measures, increase in government expenditure because of National Rural Employment Guarantee scheme, debt relief to farmers, expenditure on General Election(2009), payment of arrears and increment in salary after 6th Pay Commission and higher procurement prices around the crisis played a major role in sustaining demand especially in rural areas. Government increased its expenditure by 36 percent in third quarter of 2008-09.

Crucial questions

1. How does the changes in monetary policies affected Indian equity and bond markets?
2. Does the behaviour of asset prices changed depending on phase monetary policy - conventional vs. Unconventional?
3. Do the effects of sudden changes in monetary policy vary with the domestic economic conditions of country?

II. Literature review

IMF working by Chen, Filardo, Dong He, and Feng Zhu, (2015) examine the domestic and cross-border effects Federal Reserve's unconventional monetary policies. It has studied the spill over effect on India but in aggregation with other emerging markets. Neely (2010) finds that US QE lowered bond rates in the other advanced economies by 20-80 basis points and depreciated the US dollar by 4-11 percent. Several studies examine announcement effects of quantitative easing (QE) on asset prices. Most of these studies are confined to US and other advanced economies.

The study by Gilchrist, Yue, Zakrajsek (2014) concludes that "during the unconventional policy regime, yields on speculative-grade sovereign debt denominated in dollars move one-to-one with yields on comparable Treasury securities ". This study includes India also to study the effect of U.S Monetary Policy on Foreign Bond Yields.

III. Methodology

In this paper the data is analyzed for the period of Jan 2000 to December 2014. The closing values two equity indices - NIFTY and SENSEX has been used to analyze price movement of Indian equities, whereas closing value of S&P BSE India 10 Year Sovereign Bond Index (10Y Gsec) has been used to analyze debt price movements.

All the dates for US and RBI monetary policy announcements, from Jan'00 to Dec'14, has been used to calculate one day, 1 week, and 1 month returns and standard deviation for equity as well as debt indices.

Observations

Fed has started implementing unconventional monetary policies using three strategies. First, it started communicating the forward guidance to shape the market expectation about interest rates. Second, it started increasing the balance sheet and lastly it also started changing the composition of its balance sheet. Central banks had started increasing its balance sheet through quantitative easing and changing its composition through the targeted purchases of long-term bonds as a means of reducing the long-term interest rate.

There are two components of central bank's monetary policy announcements - surprise component and signal component. All policy announcements does not have same effect on asset prices. Some policy actions are perfectly anticipated by market participants, others not at all. If an announcement corresponds perfectly to what the market expected, it should have no effect on asset prices or portfolio allocations, because these will have been determined in advance based on the expected announcement. If policy announcement is not as per market expectations, it will have positive or negative surprise built into it. The asset prices fluctuates depending on per unit of surprise. This is called as Surprise component. Second component of policy announcement is Signal. It is also important because it can provide information about future policy intentions of the central bank relative to the level of policy rates. Both these components have immediate impact on equity and debt prices. This paper tries to quantify the price movement after each policy announcement by Fed and RBI.

Data crunching

1. Fed had started using unconventional monetary policies from late 2007 whereas RBI has started it in late 2008. Market events and responses from central banks has increased the volatility in equity in FY 08-09. The volatility in daily returns of NIFTY has touched its peak in FY08-09 with value of 2.6%. The average volatility for the observed period is 1.5%. Monthly volatility of SENSEX and 10 Year GSec has also increased during 2008-09. Chart 1 & Chart 2 shows the volatility year wise.

2. To gauge the effect of monetary policy announcements, NIFTY returns has been calculated for 1day, 1 week and 1 month after the policy announcements by Fed and RBI respectively. It has been found that 1 day median returns of NIFTY post RBI and Fed policy announcements are 0.2% whereas one week median returns post RBI policies announcements is 0.6% and it is 0.8% for Fed announcements. Further details are given in Table 2. Fed policies announced on 27 January'04 and 27 January'08 has seen maximum negative returns with value of -2.1%. In January 2008 the financial markets were under considerable stress and credit had tightened for many businesses. And hence Fed had lowered its target for Federal fund rate to 3% in its policy announcement of 27 Jan. This negative movements was because of both signal and surprise component.

3. U.S. 10-Year Yield Tops 2% when on 23 May 2013, Fed governor Bernanke said that Fed may taper bond buying program. Both debt and equity prices has witnessed more volatility during February to December in 2013. Though actual tapering has started in late 2013 and ended in 2014, the forward guidance by Fed has helped markets to prepare for change.

4. It has been found that the volatility in debt and equity indices had reduced when fundamental indicators of economy were in good shape. Volatility also get impacted by the market anticipation of macro fundamentals basis the data and guidance released various entities like Government of India, RBI, World Bank, IMF etc. Table 3 and Chart 3 shows how volatility had increased in FY08-09 because of poor fundamentals and uncertainty then prevailing in markets.

IV. Conclusion

After analyzing the data for 14 years it is found that we can distinguish these 14 years into two categories. 2000-2007 period belongs to more of conventional monetary policies whereas 2008-2014 period belongs to unconventional monetary policies.

US monetary policies have spill over effect on asset prices in India. Asset prices, both debt and equity, has witnessed more volatility during unconventional monetary policies.

Forward guidance given by Fed has helped to shape the market expectation about interest rates. Quantification of market reaction after policy announcements will help in doing scenario analysis, what if analysis while formulating portfolio allocation and risk management strategies.

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Annexure

Table 1: Federal Reserve “Unconventional” Policy Announcements

Date	Announcement
December 2007 to November 2008	Created various emergency liquidity facilities in response to the financial crisis.
October 6, 2008	Began paying interest on bank reserves.
November 25, 2008	Large scale asset purchases of up to \$100 billion of U.S. agency debt and \$500 billion of mortgage-backed securities (MBS).
December 16, 2008	Reduced federal funds rate to a range of 0% to 0.25%; anticipated “exceptionally low” federal funds rate would likely be maintained “for some time.”
March 18, 2009	Large scale asset purchases which, combined with Nov. 2008 announcement, totaled \$300 billion of U.S. Treasury securities, \$200 billion of U.S. agency debt (later revised to \$175 billion), \$1.25 trillion of MBS over about one year (popularly known as “quantitative easing”); anticipated “exceptionally low” federal funds rate would likely be maintained “for an extended period.”
August 10, 2010	Following completion of large scale asset purchases, maturing assets would be replaced with U.S. Treasury securities to prevent the balance sheet from shrinking.
November 3, 2010	Large scale asset purchases of \$600 billion of U.S. Treasury securities over eight months (popularly known as “QEII”).
August 9, 2011	Set a target date (mid-2013) for period Fed anticipated it would keep the federal funds rate at “exceptionally low levels”; the Fed subsequently moved back the target date incrementally to mid-2015.
September 21, 2011	Maturity Extension Program (popularly known as “Operation Twist”), under which Fed purchased \$400 billion long-term U.S. Treasury securities, and sold an equivalent amount of short-term Treasury securities over nine months. Began rolling over existing agency debt and MBS into new agency MBS (instead of U.S. Treasury securities).
January 25, 2012	Set “longer-run goal” of 2% inflation; public release of FOMC members forecast of “appropriate” federal funds target.
June 20, 2012	Extended and expanded the Maturity Extension Program to an additional \$267 billion of Treasury securities, through the end of 2012.
September 13, 2012	Announced large scale asset purchases of \$40 billion of Agency MBS per month for unspecified duration (popularly known as “QE3”).
December 12, 2012	Announced that the Fed would continue purchasing \$45 billion of Treasury securities per month after the expiration of the Maturity Extension Program; changed the threshold for ending “exceptionally low levels” of the federal funds rate from “at least through mid-2015” to “at least as long as the unemployment rate remains above 6-1/2 percent,” contingent on low inflation.
December 18, 2013	Announced that the Fed would begin to “taper off” its securities purchases, initially reducing monthly purchases by \$10 billion.

Source: Press releases, at <http://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>

Table 2: Nifty movement post policy announcements

FED_Policy_Effect	1D_Returns	1W_Returns	1M_Returns	RBI_Policy_Effect	1D_Returns	1W_Returns	1M_Returns
Mean	0.3%	0.6%	1.9%	Mean	0.1%	0.7%	2.8%
Median	0.2%	0.8%	2.9%	Median	0.2%	0.6%	2.5%
Max +ve	4.1%	11.2%	31.8%	Max +ve	4.9%	15.9%	35.9%
Policy Date	18-Sep-07	18-March-09	18-March-09	Policy Date	3-May-00	24-Oct-08	21-Apr-09
Max -ve	-2.2%	-13.5%	-29.2%	Max -Ve	-4.0%	-5.1%	-12.6%
Policy Date	27-Jan-04	10-May-06	16-Sep-08	Policy Date	31-July-07	25-Jan-11	29-Apr-08

Source: Author's calculations

Table 3: Macro indicators Vs. Volatility

Financial Year	FY00-01	FY01-02	FY02-03	FY03-04	FY04-05	FY05-06	FY06-07	FY07-08	FY08-09	FY09-10	FY10-11	FY11-12	FY12-13	FY13-14
Monthly Volatility in SENSEX in %	8.0	6.4	5.9	6.5	6.7	6.1	6.0	8.3	10.8	9.9	6.0	5.9	4.4	3.9
Monthly Volatility in S&P 10 Y Sovereign Bond Index in %	2.2	2.1	1.8	0.9	2.2	1.3	1.6	1.5	5.7	2.5	1.2	1.4	0.7	2.1
India's Real GDP Growth Rates Factor Cost (%)	4.15	5.4	3.9	8.0	7.1	9.5	9.6	9.3	6.7	8.6	8.9	6.7	4.5	4.6
Bank Credit growth (%)	23.2	15.3	23.7	15.3	30.9	37.0	28.1	22.3	17.5	16.9	21.5	17.0	14.1	14.1
Centre's Fiscal Deficit (% GDP)	-	-6.0	-5.7	-4.3	-3.9	-4.0	-3.3	-2.5	-6.0	-6.5	-4.8	-5.7	-4.9	-4.9
Inflation - WPI (Average) (%)	7.1	3.6	3.4	5.5	6.5	3.7	6.5	4.8	8.0	3.6	9.6	8.8	7.4	6.0
CPI (Average) (%)	3.7	4.3	4.1	3.8	3.9	4.2	6.8	6.2	9.1	12.3	10.5	8.4	10.2	9.2
CAD % to GDP	-0.6	0.7	1.2	2.3	-0.3	-1.2	-1.0	-1.3	-2.3	-2.8	-2.7	-4.2	-4.7	-2.7

Source: Data from Planning commission of India & author's calculations

Chart 1 Volatility in monthly returns - SENSEX & 10Y Gsec

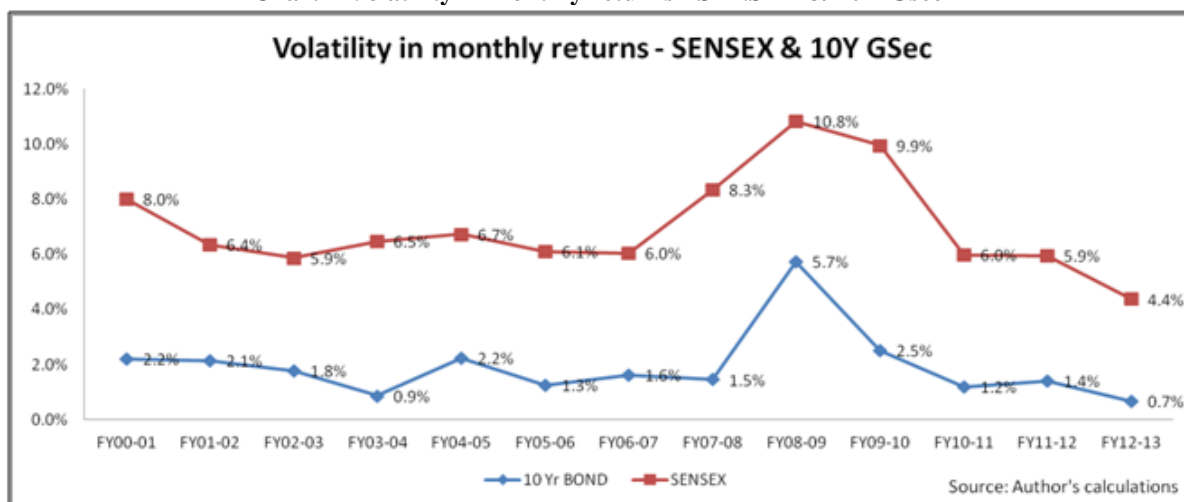


Chart 2 Daily returns' volatility – NIFTY

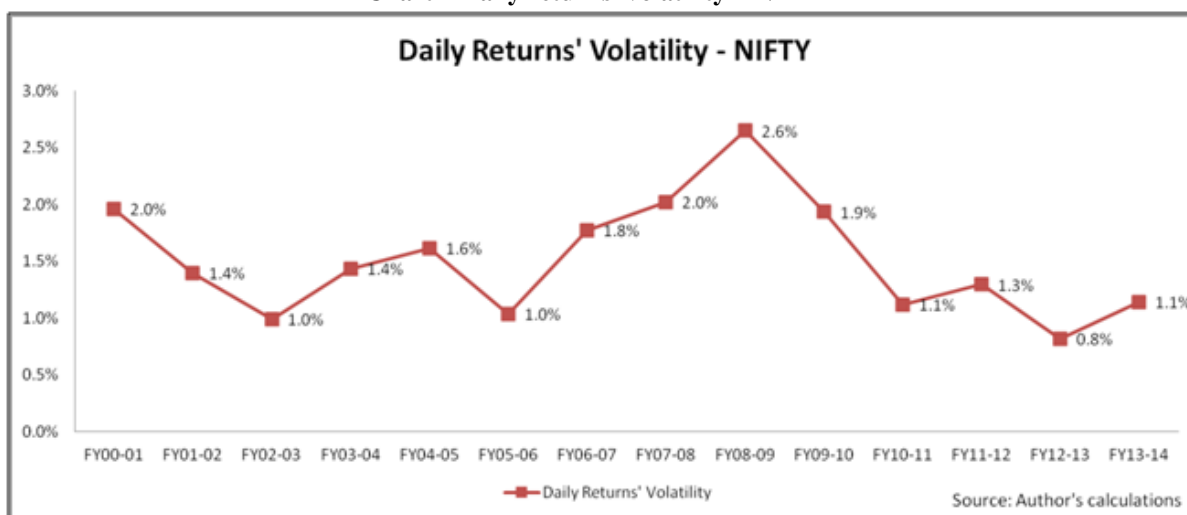
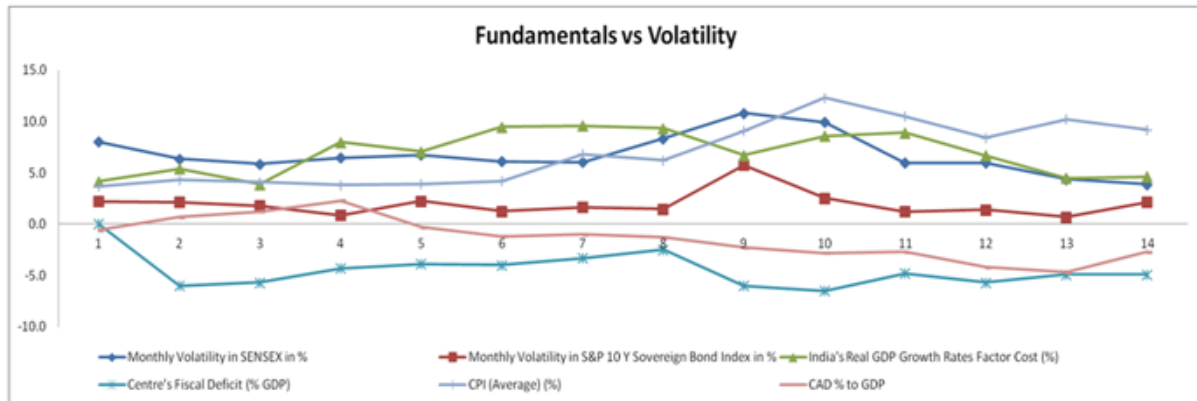


Chart 3 Macro Indicators and Volatility



Source: Data from Planning commission of India & author's calculations