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"ANALYSIS OF FISCAL AND MONETARY POLICYMIX IN INDIAN ECONOMY"

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ABSTRACT

The present study examines the macroeconomics literature developments in monetary policy and fiscal policy implications. This paper attempt to examine the effectsof fiscal and monetary policy during post reform period in India and reviews monetary policy aggregates in India for inflation targeting and fiscal prudence with output targeting. The study used quarterly time series data from 1994 to 2016 for Monetary policy rule and 1994 to 2013 for fiscal policy rule. The study incorporated non-linear econometric model Markov Regime Switching for identifying effectiveness of policies. Itanalyzes the complementarity between fiscal and monetary policy in India and empirical investigation incorporates to know the coordination between monetary and fiscal policy during reform period. The study found that the importance of monetary policy has improvedduring post reform period and monetary policy in India has been targeting inflation and exchange rate while fiscal policy has been focused on output and employment.

KEYWORDS: *Monetarism, Keynesianism, Monetary Policy, Fiscal Policy, Markov Regime Switching, Fiscal & Monetary Policy Mix.*

1. INTRODUCTION:

The Monetary and Fiscal policies are the two important measures to lead an economy in an optimum direction, monetary policy measures are taken by RBI in India, and fiscal policy implemented by Government of India and both have approximate similar objectives while their ultimate vision is economic & human welfare of the country.The history of modern macroeconomics starts in 1936, with the publication of Keynes's "General Theory of Employment, Interest and Money." Keynes's contribution was synthesized with classical economics in the IS-LM model by John Hicks (1937) and Alvin Hansen (1949). The period from early 1940s to the early 1970s can be called the golden age of macroeconomics. Among the major developments were the development of the theories of consumption, investment, money demand and portfolio choice; the development of growth theory; and the development of large macro-econometric models. The main debate during the 1960s was between Keynesians and monetarists. Keynesians believed developments in macroeconomic theory allowed for better control of the economy. Monetarists, led by Milton Friedman, were more skeptical of the ability of governments to help stabilize the economy.

The literature regarding monetary policy from neoclassical economists

shows that monetary policy stressed more in developed countries while fiscal policy has been stressed more in developing economy, changing economic policies and new trade regimes across the world caused to rise of optimum combination of fiscal and monetary policy in many countries. The macroeconomic dynamics and new trade policies have been changing due to uncertain business cycles, fiscal policy is still dominant in developing countries like India even though economic reforms since 1991, simultaneously monetary policy is also taking major role in Indian economy especially inflation target oriented monetary policy.

2. IMPORTANCE OF THE STUDY

Monetarism and Keynesianism are two dominant schools of thought in explaining the macro behavior of economies. They have important significance from the point of view of policy formulations because the supporters of these schools of thought are to be found among the persons responsible for farming the economic policies of Governments of the different countries and as such the economic policies are greatly influenced by these schools of thought. The objective of the present study is to examine how far these viewpoints have relevance for a developing economy like India. The study is mainly divided into two parts. The first part presents the main ingredients and assumptions of monetarism and Keynesianism. The second part deals with the relevance of the policy mix of these two schools in the Indian condition.In 2004, the economists Finn Kyd-land of Carnegie-Mellon University and Edward Prescott of Arizona State University were awarded the Nobel Prize in economics for a fascinating contribution to the "Rules-Versus-Discretion" debate. Kydland and Prescott (1977) argued that monetary policy makers face a time inconsistency problem. However, in the recent years especially in 2007, subprime crisis in USA and subsequent effect on global economic recession raised the concern and relevance of Keynesian fiscal policy implications.

In case of India, there is need to address the coordination between fiscal and monetary policy which would help to off-set macroeconomic imbalances in the economy. Since independence of India (Ahluwalia et.al pp. 275), the government determines the goals of monetary policy, after obtaining parliamentary endorsement and the RBI has independence regarding use of monetary instruments to meet those goals. Hence, fiscal policy has been ruling over monetary policy. An IMF survey (Ahluwalia et.al pp. 276) of the eighty-eight constitutions of different countries worldwide showed that there are some safe guards for the central bank in thirty constitutions; therefore, there is need of research regarding rules and regulations for fiscal responsibility and independent monetary policy.

3. DEFINITIONS OF MONETARY POLICY AND FISCAL POLICY

According to US Federal Reserve Bank, Monetary policy is a term used to refer to the actions of central banks to achieve macroeconomic policy objectives such as price stability, full employment, and stable economic growth. Fiscal policy is a broad term used to refer to the tax and spending policies of the federal government.

Professor Leeper (1991) has defined active and passive monetary and fiscal policies as follows:

- Passive fiscal policy is one in which the authority raises or reduces taxes to balance the budget inter-temporally.
- Active fiscal policy is one in which the tax and spending levels are determined independent of inter-temporal budget consideration.
- Active monetary policy is one that pursues its inflation target independent of fiscal policies.
- Passive monetary policy is one that sets interest rates to accommodate fiscal policies.

In case of an active fiscal policy and a passive monetary policy, when the economy faces an expansionary fiscal shock that raises the price level, money growth passively increases as well because the monetary authority is forced to accommodate these shocks. But in case both the authorities are active, then the expansionary pressures created by the fiscal authority are contained to some extent by the monetary policies. According to Concise Encyclopedia of Economics fiscal policy is the use of government revenue collection (mainly taxes) and expenditure (spending) to influence the economy.

4. LITERATURE REVIEW

There are number of studies, research, workshops and reports etc. evaluated the fiscal and monetary policies in India since Independence. However, there are limited studies regarding policy mix. Following are some of the previous studies on fiscal and monetary policies.

The dynamic macroeconomic scenarios in the world has become a challenging task for economists to choose different policies in different combination. Therefore, choosing a right model for measuring fiscal policy and monetary policy effectiveness in different economies has been becoming major challenge for economists. The existing various theoretical methods and econometrics models for measuring monetary and fiscal policy to off-set macroeconomic dynamics has been a debatable issue among economists especially after the USA subprime crisis in 2007. Therefore, the following literature discussed on methodologies and their credibility for policy implications.

Woodford (2008) expressed that DSGE models are commonly used by central banks today, and have strongly influenced policy makers like Ben Bernanke. However, he argues that what is learned from DSGE models is not so different from traditional Keynesian analysis:

"'It is true that the modeling efforts of many policy institutions can reasonably be seen as an evolutionary development within the macroeconomic modeling program of the postwar Keynesians; thus, if one expected, with the early New Classicals, that adoption of the new tools would require building anew from the ground up, one might conclude that the new tools have not been put to use. But in fact, they have been use, only not with such radical consequences as had once been expected".

The perception regarding implications of DSGE model for policy analysis, Buiter (2009) argued that the "DSGE models were rely excessively on an assumption of complete markets, and were unable to describe the highly nonlinear dynamics of economic fluctuations, making training in 'state-of-the-art' macroeconomic modeling "a privately and socially costly waste of time and resources".

The recent debate on DSGE model and its effectiveness, Blanchard (2016) opinioned that "DSGE models can fulfill an important need in macroeconomics, that of offering a core structure around which to build and organize discussions".

The VAR model is most acceptable econometrics model for fiscal and monetary policy but it can't be applied in case of series are in non-linear state. In case of non-linearity in the series the most acceptable non-linear econometrics models for monetary and fiscal policies is Markov Regime Switching Regression Model. The literature review explores Regime Switching Model was the earliest nonlinear model to explain the monetary and fiscal policy analysis. It is traced back to Goldfeld and Quandt (1973) paper on regime switching regression, later Hamilton (1989) used the same method as an alternative for nonlinear regression analysis for US GNP growth rate. Markov switching process applied by Engel and Hamilton (1990) for dollar exchange rate, Ang and Bekart (2002) used for interest rate, Hardy (2001) applied for long term stock returns. However, Davig et al (2006) developed macroeconomic model based on DSGE framework to complement both monetary and fiscal policy analysis. The following literature elaborates fiscal and monetary policy in the context of Indian economy.

Virmani (2004) attempted to formulate a monetary policy reaction function for India during post reform period. The study examined the two-important monetary policy reaction function rules such as the Taylor type rule with interest rate as the target variable and the McCallum rule with nominal income target. The study finds that the McCallum rule better suits than Taylor rule for the conduct of monetary policy in India.

Singh and Kalirajan (2006) examined the policy reaction function of the reserve bank of India during post reform period. The authors attempted to know the policy stance of RBI during monetary transmission regimes through econometric modeling. The results of monetary reaction function showed that monetary policy instruments CRR, CMR, and yield on government securities were increased when inflation and output gap rise and when real exchange rate falls. The findings in this study revealed that there is no evidence of RBI involvement in controlling the exchange rate depreciation in the short run. It also found that it is too difficult for RBI to implement output and price control simultaneously. Therefore, the study suggested for RBI to take more price stability policy measures than output.

Singh (2010) examined the monetary policy behavior in India in the framework of Taylor-type rules. The

study attempted to link with theory and reality of Taylor rule for monetary policy in India. It applied the Taylor rule at Indian monetary policy context with inflation and output gap as base model and it discussed the relative weights for constructing monetary policy reaction function. After constructing Taylor type monetary policy rule the study used structural vector autoregression (SVAR) to assess the dynamic interaction of inflation rate, output gap and monetary policy in India during 1951-2009 period. The results showed that the monetary policy appeared more responsive to the output gap than to the inflation gap during the period 1950-51 to 1987-88, there is a shift in policy response during the period 1988-89 to 2008-09 with relatively strong reaction to inflation gap than to the output gap. Arora (2011) examined the monetary and fiscal policy interaction in India during 1950 to 2008 by classifying pre and post reform period as bench mark. The study suggested that monetary policy to be given more autonomy by the government and that fiscal policy to concentrate on debt sustainability and it advised monetary policy better to be more aggressive in lowering inflation in India.

Hutchison et.al (2013) examined the monetary policy implications in India during post reform period. The study used quarterly data from 1987 to 2008 and used 1996 as bench mark where there were lot reforms in banking and financial sector. To investigate the monetary policy regime in India, the author used a Markov switching model to estimate a time-varying Taylor-type rule for the Reserve Bank of India. The empirical results showed that the output gap systemically played an important role, as did inflation, in determining policy actions. The study also found that the RBI followed two distinct monetary regimes, that was Hawk and Dove, that is more importance between inflation and output respectively. The results identified that India followed its own direction in the conduct of monetary policy specifically for inflation target along with forex management compared to quasi-inflation targeting seen in many emerging markets.

Kumawat and Bhanumurthy (2016) examined the monetary policy implications in India during post reform period. The study covered monthly data from 1996 to 2015 (April, 1996-July, 2015) and attempted to model the monetary policy response function for India. The non-linear model such as the regime-switching behaviour in the framework of Smooth Transition Regression (STR) was used for monetary policy modelling. These results were encompassed in the plots based on rolling regression which proved regime-shift and it was also supported by tests for smooth-transition regime-switching which was earlier developed by Terasvirta (1994). The authors suggested for more sophisticated models for encompassing regime-switching between inflation and exchange rate in India.

5. DATA AND METHODOLOGY

Scope of the Study & Data Sources: The annual time series covered since 1993 to 2016. The data are collected from secondary sources especially RBI (Reserve Bank of India), CSO Government of India, Indian Budgetary documents, Planning Commission- Government of India, SEBI, and various Economic Surveys etc. The time series data for fiscal policy analysis is taken between 1999 first quarter (1999Q1) to fourth quarter 2015 (2015Q4) from "Monthly Abstract of Statistics," Ministry of Statistics and Programme Implementation, Government of India (www.mospi.nic.in) and Comptroller and Auditor General of India (www.cga.gov.in). The time series of monetary policy has taken between third quarter 1993 to fourth quarter 2015 (1993Q3-2015Q4) from RBI Hand Book of Statistics-2016 (www.rbi.org.in), Ministry of Statistics and Programme Implementation, Government of India. The international comparison of macro data is taken from world bank data base and OECD.

Variables: For monetary policy rule call money rate is the dependent variable and the inflation, M3 (Broad Money Supply), exchange rate, output gap are independent variables. All monetary policy rule variables are quarterly from second quarter 1994 to fourth quarter 2015 (1994Q2-2015Q4). The exchange rate and M3 (Broad Money Supply) are quarterly average and log transformed and X-12 ARIMA method used to depersonalize. After removing seasonal influence in the series of exchange rate and M3 are non-stationary and stationary after first difference. The inflation and output-gap are not transformed to log due to negative values while inflation and output gap are stationary. The output gap is derived from removing seasonal influence from X12-ARIMA and its trend removed from Hodrick–Prescott filter (also known as Hodrick–Prescott decomposition and in short H-P filter). The output gap variable is used in both fiscal policy and monetary policy rules. After deseasonalizing and detrending data of monetary policy variables are used for analysis. For fiscal policy rule,

dependent variable is tax revenue and the independent variables are output gap, outstanding debt, total expenditure. The total tax revenue, total outstanding debt, total expenditure (All are Central government) and output gap are quarterly data from second quarter 1994 to fourth quarter 2015 (1994Q2-2015Q4). Except output gap which has negative values, all other fiscal policy variables are transformed to log then removed seasonality from the data series through X-12 ARIMA deseasonalizing method. Total expenditure and output gap variables are become stationary after removing seasonal influence, while total outstanding debt became stationary at first difference. The total tax revenue series became stationary after detrending from Hodrick–Prescott filter (H-P filter) and at first difference. Then all fiscal policy variables used for analysis.

Model: The present study used non-linearity test such as BDS test (after the initials of W. A. Brock, W. Dechert and J. Scheinkman) and results also supported incorporating non-linear time series econometrics model and the literature on fiscal and monetary policy Arora (2011), Hutchison (2013), Kumawat and Bhanumurthy (2016) showed the Markov Regime Switching Model is the acceptable model for fiscal and monetary policy in India. The present study used Markov Regime Switching model for identifying active and passive policy mix analysis in post reform period in India. Along these econometric tools, Taylor rule (1993) regarding monetary policy used as base for monetary policy rule in India. The original Markov switching model focuses on the mean behavior of variables. This model and its variants have been widely applied to analyze economic and financial time series; see e.g., Hamilton (1988, 1989), Engel and Hamilton (1990), Lam (1990), Garcia and Perron (1996), Goodwin (1993), Diebold, Lee and Weinbach (1994), Engel (1994), Filardo (1994), Ghysels (1994), Sola and Driffill (1994), Kim and Yoo (1995), Schaller and van Norden (1997), and Kim and Nelson (1998), among many others.

6. EMPIRICAL RESULTS AND DISCUSSIONS

6.1 Fiscal Policy Rule

Tax Revenue= $\alpha + \beta_1$Output Gap + β_2Public Debt + Expenditure + e_t

Where:

Tax Revenue = Lump sum tax collection of the central government

Output Gap = Calculated using Hodrick-Prescott filter on IIP (Index of industrial production)

Public Debt = Central Government's incurred debt at the end of each quarter

Expenditure = Total expenditure of the central government

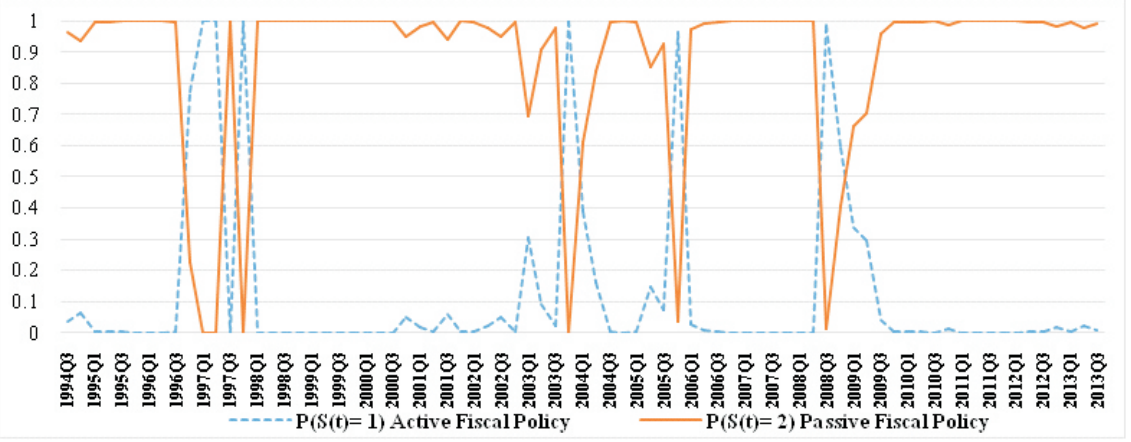
The output gap is an economic measure of the difference between the actual output of an economy and its potential output. Potential output is the maximum amount of goods and services an economy can turn out when it is most efficient-that is, at full capacity. Often, potential output is referred to as the production capacity of the economy. ¬Potential gross domestic product, or potential GDP, is a measurement of what a country's gross domestic product would be if it were operating at full employment and utilizing all its resources. This amount is generally higher than the actual gross domestic product, or GDP, of a country. As a result, the separation between a country's potential GDP and its real GDP is known as the output gap. The output gap is caused by the fact that most economies suffer from certain inefficiencies, such as inflation, unemployment, and government regulations, which hamper production levels.

Table 1:Markov switching, Fiscal Policy 2005Q1-2015Q4

Variable	Regime 1 (Active)	Regime 2 (Active)
Constant	0.415426***	-0.035355*
Output Gap	6.476154***	-2.312743***
Debt_1	-0.157853**	0.159885**
EXP	0.893107***	1.161455***

Note: **** denotes significance at 1%, ** at 5% and * at 10% significance level.Debt_1 denotes one lag period of debt incurred by central government, EXP denotes total central government expenditure.

Figure 1 Filtered Regime Probabilities



6.2 Monetary Policy Rule

$CMR = \alpha + \beta_1 Inflation + \beta_2 Output\ Gap + \beta_3 Exchange\ Rate + \beta_4 M_3 + e_t$

where,

CMR = Average Interbank call money rate

Inflation = WPI (Wholesale price index) year on year inflation

Output Gap = Calculated using Hodrick-Prescott filter on IIP (Index of industrial production)

M3 = Broad Money Supply end of each quarter

Exchange Rate = Quarterly average of exchange rate (Rs Vs US $)

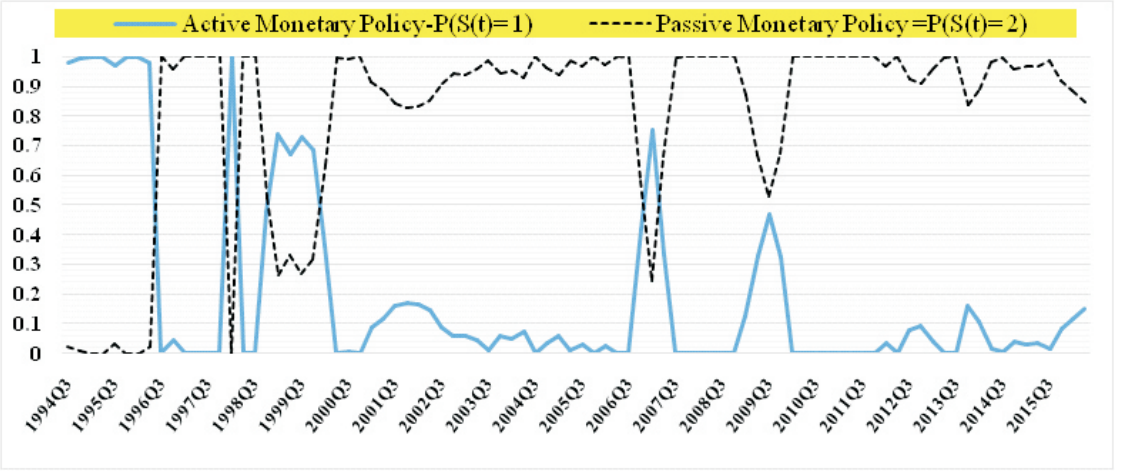
The linear time series econometrics model Markov regime switching model used for monetary and fiscal policy coordination in India during reform period. The Markov regimes are classified into two regimes: Firstly, active monetary policy if the probability of model results equal to one and Secondly, passive monetary policy if the probability of model results equal to zero. The data illustrated in the table 1 shows the Markov regime switching model results and figure 1 shows the Markov regime switching probability state results. Except M3 (Broad Money) all variables are significant at 1% level in regime one that is active monetary policy. However, except M3 and inflation rate all variables are significant at 1% level in regime two that is fiscal policy. Therefore, the monetary policy main target during reform period was on inflation. The money supply (M3) has not influenced by interest rate in India while output and inflation rate have been major targeted variable from RBI and specifically inflation target which is active in regime one only.

Table 2: Markov switching, Monetary policy rule 1994Q2-2015Q4

Variables	Regime 1	Regime 2
Constant	4.050092*	7.7326***
Inflation	0.563067***	-0.004396
Output Gap	105.3671***	21.62922***
Exchange Rate	135.7273***	23.60671***
Broad Money (M3)	50.4088	-34.56708

Note: *** denotes significance at 1%, ** at 5% and * at 10% significance level

Figure 2 Filtered Regime Probabilities



6.3 Monetary Policy and Fiscal Policy Coordination

Leeper (1991) classified the policy mix as active monetary and active fiscal policy and passive monetary and passive fiscal policy, active monetary and passive fiscal policy and passive monetary and active fiscal policy, active monetary and fiscal policy, passive monetary and fiscal policy. The regime probabilities data illustrated in the figure 4 shows that the monetary policy was active during 1994Q3 to 1996Q2, 1999Q1 to 2001Q1, 2001Q1 to 2005Q4, 2007Q1-Q3, 2009Q1-Q4 and moderate influence during 2012Q3-Q4, 2014Q1-Q2 and 2015Q1-Q3. The regime probabilities data illustrated in the figure 1 shows that the fiscal policy was active during 1996Q4 to 1997Q4, 2003Q3 to 2004Q1, 2005Q3 to 2005Q4, 2008Q3 to 2008Q4 and moderate influence during 2003Q1 and 2005Q2. The fiscal and monetary policy were active during 1998Q1 and 2008Q3 to 2009Q3 whereas both monetary and fiscal policies were passive during 2003Q4, 2005Q4 and2008Q3. However, monetary policy has been active during first quarter 2009 to third quarter 2013.

Figure 5: Filtered Regime Probabilities

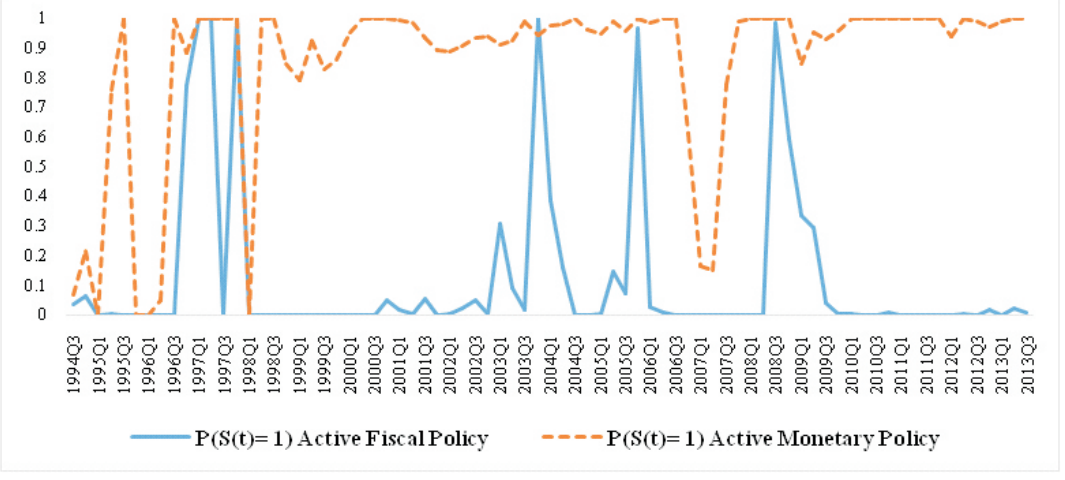
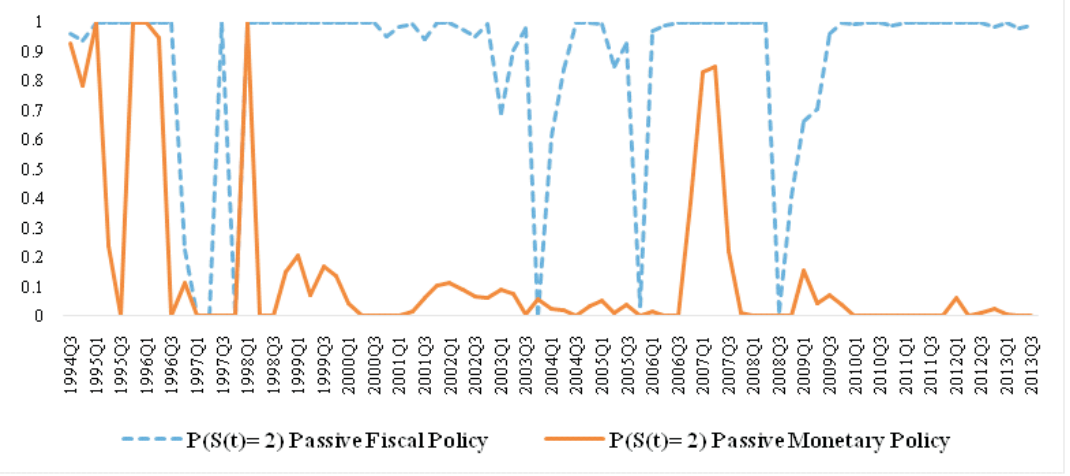


Figure 6 Filtered Regime Probabilities



7. RESEARCH FINDINGS AND POLICY IMPLICATIONS

The growth trajectory of India with comparison to advanced & developing countries and at world level has been much more stable and marching ahead among emerging developing nations. The economic performance of Indian economy during post reform period is commendable where industry and service sector are the major growth driven forces.The saving investment gap has widened after 2006 and reached highest 5.1% at the end march 2014, that is gross domestic savings was higher than gross domestic capital formation which was due domestic saving mobilization. Saving-investment gap negative during 2005 and 2015 due to FII inflow.Average Import cover of reserves in month is 10 months which is stable in short run than long run.External debt servicing ratio has been decreased from 35.3% in 1991 to 7.6% in 2016 while external debt to GDP has decreased to 23.7% from 28.7% in the same period.India current account deficit has been negative during reform period except 2001 to 2005 which should be corrected through long run & medium term trade policies.There is direct correlation relation among monetary aggregates such as money supply (M3) growth, real GDP growth rate, fiscal deficit and inflation (WPI Annual Average) growth rate during post reform period.FRBM act 2003 has played significant role in fiscal consolidation in India up to 2007 and later fiscal deficit has been increased continuously due to global economic shock. Therefore, government need to take long term macro policies to off-set external shocks.The share of internal debt out of total debt has been increasing over the period while central govt & state govt borrowing gap has been widening after 2005.After introduction of Repo and Reverse repo rates by RBI in 2001, the bank rate fixed at 6% up to march 26, 2012 and it increased to 9.5% in 27/04/2012 and reached 10.25% in mid-2013 due to growing inflation and repo-reverse repo rates were more volatile due to global business cycle influence.

The Markov Regime Switching model results show that: the empirical results prove that Monetary policy has been focusing on inflation target and fiscal policy on output and employment target and each are coordinating well but still fiscal policy need to be addressed debt sustainability along with output and employment.The monetary policy was active during 1994Q3 to 1996Q2, 1999Q1 to 2001Q1, 2001Q1 to 2005Q4, 2007Q1-Q3, 2009Q1-Q4 and moderate influence during 2012Q3-Q4, 2014Q1-Q2 and 2015Q1-Q3.The fiscal policy was active during 1996Q4 to 1997Q4, 2003Q3 to 2004Q1, 2005Q3 to 2005Q4, 2008Q3 to 2008Q4 and moderate influence during 2003Q1 and 2005Q2.

8. CONCLUSION

The present study critically examines the macroeconomics literature developments in recent past and attempted to address macroeconomic instability in the Indian economy during post economic reform period which are mainly influenced from fiscal and monetary policy, the study overviews the Keynesianism and Monetarism approach from short term and long term approach for macroeconomicstability, conventional IS-LM

model approach used to define optimum policy, the gist of the study address the need of optimum policy that is fiscal and monetary policy should go hand in hand which helps to stabilize the macroeconomic instability more effectively and efficiently than policy paradigm of any one policy dominance on the economy and there is lack of coordination between fiscal and monetary policy in India even after economic reforms since 1991, though this study evaluates fiscal and monetary policy implications in India since independence with special reference to post economic reform period.The study has certain limitation with respect to capture all factors which influence fiscal and monetary policy from both inside and outside the country due to non-monetized sectors and shadow economy in India.

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Appendix - I

Markov Regime Switching Model for Monetary Policy

Dependent Variable: R
Method: Switching Regression (Markov Switching)
Date: 10/02/16 Time: 13:23
Sample (adjusted): 1994Q3 2016Q2
Included observations: 88 after adjustments
Number of states: 2
Initial probabilities obtained from ergodic solution
Ordinary standard errors & covariance using numeric Hessian
Random search: 25 starting values with 10 iterations using 1 standard deviation (rng=kn, seed=1271432134)
Convergence achieved after 27 iterations

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Regime 1				
C	4.050092	2.327417	1.740166	0.0818
WPI	0.563067	0.155960	3.610317	0.0003
YG	105.3671	22.59698	4.662883	0.0000
DLEX_SA	135.7273	17.26359	7.862057	0.0000
DLM3_SA	50.40880	47.38448	1.063825	0.2874
Regime 2				
C	7.732600	0.806704	9.585422	0.0000
WPI	-0.004396	0.067235	-0.065380	0.9479
YG	21.62922	9.067037	2.385478	0.0171
DLEX_SA	23.60671	6.983598	3.380307	0.0007
DLM3_SA	-34.56708	23.30638	-1.483160	0.1380
Common				
LOG(SIGMA)	0.388816	0.100573	3.866008	0.0001
Transition Matrix Parameters				
P11-C	0.921599	0.725648	1.270035	0.2041
P21-C	-2.458192	0.757327	-3.245881	0.0012

Mean dependent var	7.475215	S.D. dependent var	3.098205
S.E. of regression	2.392045	Sum squared resid	440.5845
Durbin-Watson stat	1.729508	Log likelihood	-175.4386
Akaike info criterion	4.282696	Schwarz criterion	4.648666
Hannan-Quinn criter.	4.430136		

Equation: UNTITLED
Date: 10/02/16 Time: 13:26
Transition summary: Constant Markov transition probabilities and expected durations
Sample (adjusted): 1994Q3 2016Q2
Included observations: 88 after adjustments

Constant transition probabilities:
P(i, k) = P(s(t) = k | s(t-1) = i)
(row = i / column = j)

	1	2
1	0.715368	0.284632
2	0.078842	0.921158

Constant expected durations:

	1	2
	3.513305	12.68367

Markov Regime Switching Model for Fiscal Policy

Dependent Variable: TAX
Method: Switching Regression (Markov Switching)
Date: 10/28/16 Time: 09:24
Sample (adjusted): 1994Q3 2013Q3
Included observations: 77 after adjustments
Number of states: 2
Initial probabilities obtained from ergodic solution
Ordinary standard errors & covariance using numeric Hessian
Random search: 25 starting values with 10 iterations using 1 standard deviation (rng=kn, seed=886772782)
Convergence achieved after 7 iterations

	Regime 1			
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.415426	0.063453	6.546979	0
OG	6.476154	2.544265	2.545393	0.0109
ZDEBT	-0.157853	0.073264	-2.154588	0.0312
EXPENDITURE	0.893107	0.230427	3.875879	0.0001
	Regime 2			
C	-0.035355	0.019094	-1.851622	0.0641
OG	-2.312743	0.779626	-2.966479	0.003
ZDEBT	0.159885	0.069868	2.288379	0.0221
EXPENDITURE	1.161455	0.118827	9.774311	0
	Common			
LOG(SIGMA)	-1.986332	0.094125	-21.10309	0
	Transition Matrix Parameters			
P11-C	-0.342759	1.003832	-0.34145	0.7328
P21-C	-2.393354	0.52421	-4.56564	0
Mean dependent var	0.000854	S.D. dependent var		0.295633
S.E. of regression	0.244544	Sum squared resid		4.066514
Durbin-Watson stat	2.41923	Log likelihood		24.33316
Akaike info criterion	-0.346316	Schwarz criterion		-0.011487
Hannan-Quinn criter.	-0.212387			

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