Analyzing Fiscal and Monetary Interaction in India – An Alternative Model

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Abstract

Monetary policies among EMDE (Emerging Market and Developing Economies) in general have been subservient to fiscal policy - with latter seen as having important redistribution functions.

A popular belief is that RBI has been at the receiving end of the fiscal profligacy of the Government.

Regression analysis using the popular Federal Bank of St. Louis nested model found that the Government expenditure (supporting Keynesian) have had a larger influence than that of money supply (supporting monetarism) in influencing Nominal GDP growth. A 1 percent increase in M3 growth decreased nominal GDP growth by 0.38 percent – over a period of 4 years. And a 1 percent increase in Government expenditure increased nominal GDP growth by 1.05 percent – over the same time span.

Fiscal policy is leading the overall macroeconomic policy stance. While in paper, it has set rules for containing deficit, it has found ways to circumvent them. Post-crisis it has got away with breach of targets – with the FRBM act giving it the leeway to breach targets, for reasons of national security, calamities and other exceptional circumstances.

This perhaps lends credence towards devising a credible signaling mechanism for better coordination between the monetary and fiscal authorities. And with the monetary authority now increasingly targeting inflation, while that of the Government remaining concerned over real GDP growth, it is important the two components of Nominal GDP –inflation and real GDP growth - move in tandem to a jointly agreed policy stance (by both the monetary and fiscal authorities). Perhaps, RBI should relook its nominal anchor.

Keywords: St. Louis, fiscal policy, monetary policy, GDP growth, Keynesian, Monetarism

Introduction

The monetary policy has come a long way from the period of high fiscal dominance that existing in the 80s. The fiscal deficit to GDP ratio had shot up from 3.8 percent in the 70s to an average of 6.7 percent in the 80s. The fiscal deterioration limited the central bank autonomy – as these deficits were monetized through issuance of ad hoc treasury bills.

And in 1991-92, financial sector reforms were unleashed by the Government marking the second phase of fiscal-monetary interaction. These reforms gave space for development of market-based

instruments to finance debt of the government. Monetization of deficits reduced during the period helping reduce the extent of fiscal dominance.

The third phase witnessed a regime shift with the enactment of FRBM (Fiscal Responsibility and Budget Management) Act, 2003. It helped keep fiscal deficit under control while adhering to a time frame for reducing deficit. This had an impact of reducing the fiscal dominance. With the global financial crisis roiling financial markets worldwide in 2008-09, there were initial periods of coordinated effort by both the fiscal and monetary authorities to provide stimulus and prop up the economy. However, it also had bouts of unilateral decisions as to timing of the exit for stimulus, while the FRBM targets were given a short-shrift.

Unpleasant arithmetic

In a seminal 1981 paper titled 'Some unpleasant monetarist arithmetic', Sargent and Wallance point out that even if inflation might be a monetary phenomenon in the short run, it remains a fiscal phenomenon in the long-run. This follows from the government budget constraints and the limits to public debt that can be held by the private sector. Together, these ensure that in the long-run, the growth of money stock is governed by the fiscal deficit where fiscal authorities lead the course of policy action for the monetary authorities to follow.

OMO and Reserve Money

The case seems to be no different for India where higher fiscal deficit is arguably forcing the central bank to monetize it – albeit indirectly. While technically, ad hoc treasury bills have been phased out and subscription to primary issuances stopped, RBI has also been creating reserve money via open market operations in the secondary market through purchase of government securities. These actions might not been in sync with its monetary policy stance.

In this paper, we would be investigating the relative influence of monetary and fiscal policy on nominal GDP in India. In effect, the study will check the efficacy of monetarism as against that of Keynesian. This paper empirically tests the assumption of fiscal dominance through a regression model.

Review of Literature

A 2011 study by Raj, Khundrakpam and Das found that even after elimination of automatic monetization of fiscal deficit in 1997 and prohibiting RBI from buying government securities under FRBM Act from 2006, fiscal policy continues to substantially influence the conduct of monetary policy. While monetary policy reacts in a counter-cyclical manner to shocks in inflation and output, fiscal policy reactions were found to be pro-cyclical.

Zoli's 2005 paper analyzing how fiscal policy affects monetary policies in emerging economies found mixed

results. It found that fiscal dominance regime was prevalent in Argentina and Brazil during the 1990s and early 2000s, and for the rest of the nations, the results were mixed. Fiscal influence on monetary policy actions has been stronger by way of influencing sovereign spreads and exchange rates than through changes in real primary balances.

While the above two papers adopted Vector Auto Regression (VAR) model, none incorporated the St. Louis nested model for its analysis. The Anderson – Jordan (1968) St. Louis equation is a product of the Federal Reserve of St. Louis, a pro-monetary school bank. However, it provides an alternate way to look at fiscal-monetary interactions.

Objective

The various objectives of the study are as follows:

- Empirically examine the extent of influence of fiscal and monetary policies on the nominal GDP in India

- Find out if there is evidence of fiscal or monetary dominance

Hypothesis

1   Fiscal policy actions have had a higher influence than that of monetary actions on the nominal GDP in India

2   Keynesian macroeconomic framework scores over monetarism in case of Indian economy

Alternate Hypothesis

1   Monetary policy actions play an equal if not larger role in influencing the Nominal GDP of India.

2   Monetarism have an equal if not larger role in determining the growth of the Indian economy as against that of Keynesian

Method

A) To determine whether changes in nominal GDP can be explained by changes in the money supply (supporting monetarism) or by changes in government expenditure (supporting Keynesian), the popular Federal Bank of St. Louis nested model was constructed.

$$Y_t = constant + \sum_{i=0}^{4} \beta_i M_{t-1} + \sum_{i=0}^{4} \lambda_i E_{t-1} + u_{3t}$$

Where Yt = rate of growth in nominal GDP at time t

Mt = rate of growth in money supply at time t

E = rate of growth in full or high employment government expenditure at time t

While annual percentage change in nominal GDP was the dependent variable, annual percentage changes in M3

(money supply) and government expenditure were the independent variables used in the nested regression model. Plan and non-plan expenditure in a year were totaled to arrive at the government expenditure figures.

To check for presence of non-stationarity, Augmented Dickey-Fuller unit root tests (with constant model) were conducted on annual data. After first differencing all the variables, none had unit root at 5 percent significance levels. A distributed lag model with lag of upto four years for each of the independent variable was constructed for the time period 1996-2016.

Results

Table #1
Regression Model

OLS, using observations 1996-2016 (T = 21)
Dependent variable: ld_Ngdp_gr

	Coefficient	Std. Error	z	p-value	
Const	−0.00580294	0.0400123	−0.1450	0.8873	
ld_M3_grw	0.543607	0.234223	2.3209	0.0405	**
ld_M3_grw_1	0.647718	0.244874	2.6451	0.0228	**
ld_M3_grw_3	−0.837246	0.242634	−3.4507	0.0054	***
ld_M3_grw_4	−0.73195	0.247601	−2.9562	0.0131	**
ld_gov_exp_grw	0.156833	0.0763633	2.0538	0.0646	*
ld_gov_exp_grw_1	0.188148	0.071556	2.6294	0.0234	**
ld_gov_exp_grw_2	0.228703	0.0822698	2.7799	0.0179	**
ld_gov_exp_grw_3	0.372875	0.0865131	4.31	0.0012	***
ld_gov_exp_grw_4	0.107606	0.0624669	1.7226	0.1129	

Mean dependent var	−0.032680	S.D. dependent var	0.233085
Sum squared resid	0.327649	S.E. of regression	0.172587
R-squared	0.698456	Adjusted R-squared	0.451739
F(9, 11)	2.830996	P-value(F)	0.053594
Log-likelihood	13.8858	Akaike criterion	−7.771593
Schwarz criterion	2.673631	Hannan-Quinn	−5.504712
rho	0.428548	Durbin-Watson	1.136372

*** indicates that the regression coefficient is significant at 1 percent levels, ** indicates it is significant at 5 percent and * at 10 percent levels

Table #2
Regression Model

RESET test for specification -
Null hypothesis: specification is adequate
Test statistic: $F_{(2, 9)} = 0.032928$
with p-value = $P(F_{(2, 9)} > 0.032928) = 0.967724$
Test for normality of residual -
Null hypothesis: error is normally distributed
Test statistic: Chi-square(2) = 0.833875
with p-value = 0.659062
CUSUM test for parameter stability -
Null hypothesis: no change in parameters
Test statistic: Harvey-Collier $t_{(10)}$ = -0.000173841
with p-value = $P(t_{(10)} > -0.000173841) = 0.999865$

The regression analysis done using ordinary least square method found that the regression coefficients were significant for contemporaneous as well as for lags upto 4 years for both the independent variables excepting the two-year lag of M3 growth. The fourth lag of government expenditure was not significant at 10 percent; albeit it has been included in the model with p-value of 0.11. A 1 percent increase in M3 growth decreased Nominal GDP growth by 0.38 percent – over a period of 4 years. And a 1 percent increase in Government expenditure increased Nominal GDP growth by 1.05 percent – over a period of 4 years.

While fiscal and monetary policies both influenced nominal GDP in India, Government expenditure have had a larger influence than that of M3 growth, as found from the regression analysis. There was evidence of fiscal dominance in macroeconomic policy making. Therefore, we don't reject the following hypotheses; Fiscal policy actions have had a higher influence than that of monetary actions on the nominal GDP in India and that Keynesian macroeconomic framework scores over monetarism in case of Indian economy.

The regression model explained about 45 percent (adjusted R2) of the variations in the dependent variable nominal GDP. While the Ramsey RESET test indicated that specification was adequate at 5 percent significance levels, the normality test of residuals indicated that they were normally distributed. There were no problems of autocorrelation or multicollinearity as indicated by tests conducted.

Discussion

Globally, it is not that the monetary and fiscal policy making weren't synchronized before. Before the advent of the Great Recession in 2007, the phase of Great Moderation since the 1990s saw greater synchronization of monetary and fiscal policy stance – which was pro-cyclical. While fiscal policies were expansionary, monetary policies were accommodative – supported by lower interest rate.

However, what caught the policy makers worldwide unaware was the built up of financial imbalances – that emanated from under pricing of risks by 2007. With the onslaught of the financial crisis, the belief among academics and central banks that by achieving price and output stability - financial stability could be ensured got squashed. In fact, what became clear was that it requires a greater policy coordination to ensure undesirable macroeconomic outcome of asset bubbles are avoided.

The formation of FSDC (Financial Stability and Development Council) in 2010 in India – with the heads of the financial sector regulatory authorities - SEBI, IRDA, RBI and PFRDA– as its members and the union finance minister as its chairman – was a move justifying the importance of policy coordination among domestic regulators. Post-crisis, in fact, there is greater recognition of financial interconnectedness at the global level too. Through various forums such as G-20, Financial Stability Board (FSB), Bank for International Settlements (BIS) and IMF, there is an effort to steer coordinated policy actions globally for stronger, sustainable as well as balanced growth.

The findings of the regression analysis indicate that fiscal policies have a larger influence on nominal GDP growth than that of the monetary policies. This perhaps lends credence towards devising a credible signaling mechanism for better coordination between the monetary and fiscal authorities. And with the monetary authority now getting increasingly targeting inflation, while that of the government remaining concerned over real GDP growth, it is important the two components of Nominal GDP –inflation and real GDP growth - move in tandem to a jointly agreed policy stance (by both the monetary and fiscal authorities). Perhaps, RBI should relook its nominal anchor.

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Appendix:

Table #3

Unit Root Tests (with constant) FY '1996- 2016

Augmented Dickey Fuller test for H0:I(1) against H1:I(0)	
Variable	**Test statistic**
d_M3_grw	-7.49801 (1)
d_Ngdp_gr	-4.92266(1)
d_gov_exp_grw	-5.13598(1)

* Indicates the null hypothesis of presence of unit root was not rejected at 5% significance levels

Note: Figures in parentheses indicate the order of augmentation required to obtain stationarity.

Data Source: RBI