



Fiscal dominance in India: an empirical estimation

Anshuman Kamila¹

Accepted: 12 May 2022 / Published online: 9 June 2022

© The Author(s) under exclusive licence to Editorial Office, Indian Economic Review 2022

Abstract

Theoretical works have pointed at the potentially damaging impacts of fiscal dominance, i.e. fiscal authority's profligacy being accommodated by the monetary authority. Recent scholarship have highlighted to the contrary the arguably positive effects of such accommodation under certain circumstances. Ergo, a surgical snipping of the cord of joint working of monetary and fiscal policy for all times is not advisable. This paper examined fiscal dominance in the Indian context by measuring the impact of Centre's primary fiscal balance on real interest rates and real GDP growth rate in the Vector Error Correction Model (VECM) framework. It was observed that an improvement in fiscal balance had a positive impact on real interest rate prior to 2003, and in the subsequent periods it turned negative. With regard to the impact of primary fiscal balance on real growth rate, it was observed that the period of 1978–2003 remained a period of dominant fiscal presence and an improvement in fiscal balance—i.e. a reduction in fiscal deficit—had a positive growth effect. In the period following 2003, there was no evidence of fiscal dominance in the Indian economy.

Keywords VECM · Cholesky impulse response · Fiscal dominance · FRBM

JEL Classification E52 · E62 · H62

1 Introduction

Fiscal dominance is the term used to refer to a practice characterised by the incidence of fiscal authority's profligacy being accommodated by the monetary authority. In other words, the monetary authority fine-tunes the supply of money in line with the chosen expenditure plan of the fiscal authority. It may also manifest itself in a situation where an elevated level of government debt renders monetary policy ineffective, or wherein the focus of the monetary authority is upon keeping the government solvent, thereby diluting its emphasis on economic targets such as inflation,

✉ Anshuman Kamila
kamila.anshuman@gmail.com

¹ Economic Division, Department of Economic Affairs, Ministry of Finance, New Delhi, India

employment and growth. In any of the events, the efficacy of monetary authority in attaining its professed objectives gets compromised, with potentially perilous impacts on overall macro-economy. A study of episodes of fiscal dominance is merited to draw lessons as to the factors leading up to them and those that contribute to their severity of macroeconomic impact. This needs to be complemented with a study that investigates the occurrence of fiscal dominance in India. Finally, policy lessons will be in the offing given the pervasive pernicious impact of the COVID 19 pandemic on public finances across the globe.

For the case of India, over the period of 1978–2019 (the exhaustive period for which data is available), an analysis is carried out to check the impact of Centre's primary fiscal balance on real interest rates and real GDP growth rate in the VECM framework. It is found that a positive impulse to fiscal balance used to have a positive impact on real interest rate prior to 2003, and in the subsequent periods it has turned negative. With regard to the impact of primary fiscal balance on real growth rate, it is noticed that whereas the period of 1978–2003 was a period of dominant fiscal presence where an improvement in fiscal balance—i.e. a reduction in fiscal deficit—is associated with a positive growth effect, in the period following 2003, there is no evidence of fiscal dominance in the Indian economy. The exigency that the COVID pandemic poses is a fit case for a 'measured and calibrated' coordination between fiscal and monetary offices to offset the financing challenges associated with implementing mitigation and revival measures in the Indian economy.

2 Literature review

There has been in existence a rich corpus of literature on the theme of fiscal dominance. The most celebrated results on the subject flow from the works of Sargent and Wallace (namely, the well-known 'unpleasant monetarist arithmetic', that postulates that given fiscal dominance, monetary authority may or may not achieve low inflation on its own and low inflation in the immediate term may ultimately lead to high inflation in future), the Reinhart conjecture (which states that central banks exert downward pressure on long term interest rates while tolerating high inflation in a bid to liquidate sovereign debts), the fiscal theory of price level (suggesting that price level is primarily determined by government debt and fiscal policy, and monetary policy plays an indirect role) and most recently the modern monetary theory. But before that, a general discussion on the real life experience is in order.

2.1 General remarks on fiscal dominance in practice

In the conventional scheme of macro-economic management, fiscal policy determines the existence and magnitude of a deficit—depending on the need to provide boost to the aggregate demand in the economy—whereas monetary policy is tasked with maintaining price stability—which is construed to be conducive for long term growth. Often, though, monetary policy could become the handmaiden of fiscal

policy at the expense of its primary objective. The associated poor outcomes of such an arrangement engendered the notion of independence of monetary authorities.

In practice this independence is not so watertight, particularly in developing economy contexts. First, there is the matter of imperfect capital markets to be contended with, implying that capital markets by themselves may be unable to finance the entire fiscal deficit because of limited availability of instruments of desirable maturities. Second, the institution of central bank independence may still be in fetal state of evolution. Third, in several cases the central bank is the financial agent of the government. Persistent deficit spending—brought about by decisions on fiscal deficits without accounting for anticipated revenues—eggs central banks on to adopt a more restrictive regime of rates than they would choose for attaining their inflation targeting objective. Such higher than needed interest rates dampens internal demand (through the interest rate sensitivity of consumption and investment) as well as external demand (owing to appreciation in the local currency). Poor coordination—or in this case the dominance of fiscal over the monetary pillar—leads to lower than warranted growth rate (Coates and Rivera 2004).

2.2 Remarks on fiscal dominance in India

Recent scholarship in India suggests that the remit of impact of fiscal dominance over central banking is way more expansive than has been theoretically suggested (Acharya 2020). A brief recounting is perhaps instructive here:

- Pressures on fiscal arithmetic impinge upon application of prudential regulatory norms for financial stability. The Reserve Bank of India (RBI) working in tandem with its mandate of financial stability would prescribe higher capital norms for banks. Given the predominant ownership of public sector banks (PSBs) by the government, there are calls from within the government to exercise regulatory forbearance—without which government would have to recapitalise PSBs—which applies *in rem*, so fiscal deficit concerns set the pace of progress towards achieving desirable level of financial stability.
- Similar arguments also hold for timely disclosure of defaults. It is reported that there has been resistance from within the government to release of information on one-day defaults to markets: the consequent fallout on ratings of PSBs would necessitate recapitalisation, exacerbating the fiscal position.
- The imperative to reduce fiscal deficit also gives rise to calls for RBI's "excess reserves" to be transferred to the government, instead of adding to the robustness of RBI's balance sheet. This has potentially pernicious impact on RBI's ability to deal with severe stress scenarios.

Against the backdrop of the foregoing discussion, it may be noted that theoretical models have focused on the implication of fiscal dominance on price stability in general and inflation control in particular, and the efficacy of monetary authorities to achieve these laudable goals.

2.3 Theoretical models of fiscal dominance

Let us now briefly consider some theoretical insights on fiscal dominance from eminent literature. The first one is the unpleasant monetarist arithmetic as expounded by Sargent and Wallace (1981).

2.3.1 Unpleasant monetarist arithmetic

The principal takeaway from the model is that fiscal profligacy (in other words, when the fiscal authority determines its expenditures to be beyond its revenues without regard to the stance of the monetary authority) leads to loss of control over inflation by the monetary authority. This is premised on the understanding that under such a scenario of ‘fiscal dominance’, there is ebbing demand in the market for government bonds; so investors have to be compensated with a higher rate of interest than rate of growth of the economy. The implication of the model is when the fiscal authority’s deficits have to be accommodated by the monetary authority by orchestrating a higher rate of interest on bonds for filling the revenue-expenditure gap, an inflation targeting monetary authority fails to control inflation in the long run.

A modification of the money demand function of the baseline model is possible such that money demand also depends on the expected rate of inflation. In such a case, the current level of prices becomes a function on anticipated future levels of money supply, not just on the current level. Thus, in addition to giving up control on inflation in the longer run, a fiscally dominated monetary authority concedes a higher rate of inflation even in the short to medium run.

2.3.2 Fiscal dominance under Reinhart conjecture

Apart from the above very celebrated theoretical contribution, another seminal contribution to the theme comprises a discussion of fiscal dominance over monetary policy through the Reinhart conjecture. It differs from the foregoing framework in two principal ways: (1) it explicitly brings into the discussion the role of interest rate management through sovereign asset purchase (as opposed to the modulation of money supply previously), which is germane in the context of quantitative easing being followed in more contemporary times; (2) it suggests that even while playing to the fiscal gallery, a monetary authority must respect certain canons of macroeconomic monetary management, namely a limit on the rate of rise in inflation. Drawing upon Dufrénot et al. (2018), we try to briefly capture the essence of the model.

As was the case in the previous model we discussed, the fiscal authority moves first, choosing the value of primary balance and therefore the level of debt. The central bank notices the changes occurring in the debt ratio and zeroes in on the inflation rate that leads to stabilising such changes to a sustainable level of debt. Taking cognisance of such target, the private sector forms their expectation of future inflation, which goes on to impact current inflation mediated through the supply and demand channels.

Let us now try and get a grip on the actions of the central bank. As is popular in literature and in tune with rational expectations framework, the central bank is

presumed to minimise a quadratic loss function that penalises any deviation of real output from potential output and actual inflation from the targeted level.

Now whereas fiscal deficits raise debt ratio and inflation and growth both have a dampening effect, the same instrument of asset purchases can be used to move the relevant factor impacting debt ratio in the sustainable direction. In case of a scenario whereby fiscal policy leads to unsustainable primary deficit, the debt ratio may still be kept on a sustainable path by constraining the real interest rate to the negative territory. This may be achieved by an appropriate level of asset purchases. The main insight of the discussion is that a fiscally dominated central bank needs to make its quantitative easing policy potent enough but limits the rate of rise in inflation over time.

2.3.3 Fiscal theory of price level (FTPL)

This genre of models posits that it government debt and fiscal policy *suo motu* that determines price level and monetary policy plays a passive or indirect role in this process. To motivate this thought, the discussion in Farmer and Zabczyk (2019) is germane. (The FTPL owes its origins to a bunch of papers which explored various dimensions of the core idea, notable among these papers are Leeper (1991), Woodford (1995) and Cochrane (2001).)

Because of the privileged role ascribed to government in FTPL, it is not that the future value of surpluses are attuned to be in sync with the realised value of price level; rather, the value of price level gets determined as a function of the specific path of primary surpluses that is picked by the fiscal authority. All other values of price level in the equation that links the current real value of debt outstanding as the present value of all future surpluses are infeasible since they would lead to government debt becoming eventually explosive. Of course, monetary policy has a role to play in pegging the inflation after period 0—in that the evolution of nominal liabilities of the government is contingent upon nominal interest rate which flows from the stance of monetary policy (Bassetto (2008)).

2.4 Potentially beneficial impacts of monetary accommodation of fiscal policy

As against the forerunning strands of literature on the pernicious impacts of monetary authority kow-towing to the fiscal authority, there are thoughts that run counter to this current. Notably, Blanchard (2019) recounts some of these thoughts, which are germane to be reiterated here. Briefly, he asserts that while high public debt (or, equivalently, a high fiscal deficit in a year) is perceived as fundamentally destructive, in a scenario where interest rates are depressed below the growth rate in the economy (as did happen in wake of the easy monetary conditions prevalent in the opening decade of this millennium) higher debt does not inexorably lead to high taxes in future—such that monetary accommodation helps to avoid the fiscal costs associated with high debt. In such a case, the government can simply roll over the debt, issue new debt to pay for the interest costs. The debt rises at the rate of the interest rate while output rises at a higher rate, leading to a decline in debt-to-GDP

ratio over time. Therefore, monetary accommodation helps to avoid the fiscal costs of high public debt. In extension to this, a higher debt—while normally leading to a reduction in future potential output by crowding out capital accumulation—would be associated with a rise in future consumption.

In a similar vein, Bouis et al. (2013) discussed how expansionary monetary policy between late 2007 and early 2009, non-conventional policies pursued thereafter along with forward guidance on interest rates enabled the optimal application of fiscal stimulus, ultimately helping to support economic growth. Echoing this thought, Chakraborty (2021) wrote that the experience of rebound by economies post the global financial crisis shows the optimal coupling of fiscal expansionism and monetary accommodation led to quicker rebound, vis-a-vis only excess liquidity creation which has limitations in lifting economic activity from an abyss. Likewise, Rajan (2020) explains how direct financing of government deficit by the Central banks in times of depressed demand in the economy can help focus on getting the economy up and running without spillovers on inflation or erosion of fiscal credibility. Thus, the impact of monetary accommodation of fiscal policy on economic outcomes varies across contexts and constellation of parameters.

2.5 Empirical studies

We shall review the host of empirical works on the subject under two themes: first, we look at the alternative ways in which fiscal dominance has been tested (i.e. various empirical strategies), and then we discuss the various findings made, with specific reference to developing countries—given the similarity of developmental context with India.

2.5.1 Alternative empirical strategies

Resende (2007) developed a theoretical framework wherein the price level depends not only on the money stock, but on the proportion of outstanding government debt that is backed by currency issued by the central bank. A key implication of the model is that there would be a co-integrating relationship between nominal value of consumption, the outstanding central government debt and the money stock, with the co-integrating factor on the outstanding government debt giving a rough estimate of the degree of fiscal dominance. Put in terms of a regression equation where M_t is the money stock, B_t is the outstanding level of government debt and C_t is the level of nominal private consumption, we have

$$M_t = \alpha_0 + \alpha_1 C_t + \alpha_2 B_t + e_t \quad (1)$$

with a lower absolute value of α_2 implying greater degree of fiscal dominance (i.e. $1 - |\alpha_2|$ would give the stock of outstanding government debt backed by currency; higher this value greater the fiscal dominance). An essential prerequisite for this is that the variables in the above equation need to be non-stationary and a co-integrating relationship be established between the variables considered. The study is

carried out for 18 industrialised countries and 20 developing economies for varying time frames, roughly bound by 1948 and 2005.

Ahmed et al. (2020) adopted the approach of modifying the policy reaction function of the monetary authority (which has been alluded to in a previous section) in line with the famed Taylor rules, and included sovereign debt-related measures in addition to the quotidian variables and usual controls. Specifically, the monetary authority’s reaction function is given as follows:

$$I_{i,t} = \mu_i + \rho_{i,t-1} + \alpha(y_{i,t} - y_{i,t}^*) + \beta\pi_{i,t} + \gamma X_{i,t} + \epsilon_{i,t}, \tag{2}$$

where $I_{i,t}$ refers to the interest rate set by the monetary authority in country i in time t , y is the real output and y^* is the potential output, $\pi_{i,t}$ is the actual level of inflation in country i in time t and X contains all relevant control variables such as real exchange rate and international reserves in addition to debt-related measures such as public debt to GDP ratio, foreign currency-denominated public debt to GDP ratio and currency composition of public debt. They consider data for 29 countries—a mix of advanced and developing countries—for the period 2000 to 2017 at a quarterly frequency.

Sabaté et al. (2019) adopted a methodology that seeks to investigate whether government deficits drove money creation (seigniorage). They do so by inferring the dynamic essence of financing of deficits by monetary authorities by applying panel co-integration between the series of public budget balance (b) and the series of variation in the monetary base (dmb). Formally, the equation estimated is as follows:

$$dmb_{it} = \mu_i + \sum_{j=1}^p \beta_{1ij} dmb_{i,t-j} + \sum_{k=0}^p \beta_{2ij} b_{i,t-k} + \xi_{it}. \tag{3}$$

They apply the above specification to a 17 country sample for the period 1870–1938.

Bajo-Rubio et al. (2014) bifurcate the empirical approaches to discovering fiscal dominance into—the *backward looking approach*, wherein a rise in lagged level of debt would result in a greater primary surplus in the present, and the *forward looking approach*, wherein a larger primary surplus in the present would reflect in a reduction in future level of debt. Accordingly, the two approaches they advocate are as follows: first is co-integrating relationship between primary surplus (surplus being denoted by s) and the lagged level of debt (debt being denoted by b), where both are taken as ratios to GDP:

$$s_t = \alpha + \beta b_{t-1} + v_t, \tag{4}$$

where v_t is an error term; here, an estimated $\beta \leq 0$ would imply prevalence of fiscal dominance. The second approach being a co-integrating relationship between aggregate expenditures and revenues of the government as a share of GDP:

$$rev_t = \alpha' + \beta' exp_t + u_t, \tag{5}$$

where u_t is an error term; here, an estimated $\beta' \leq 1$ would imply the incidence of fiscal dominance. They adopt the equations for the case of Spain for the period 1850–2000.

2.5.2 Findings involving developing economies

Given that we will be examining the prevalence (or otherwise) of fiscal dominance in India, we undertake now a brief review of the findings pertaining to the phenomenon in developing peers of India. This is to ensure we compare economies that are similar in their developmental status.

Anecdotal evidence has been offered narrating the prevalence of fiscal dominance in certain ‘populist governance regimes’, notably Argentina during 2003–2017, Peru of the later half of 1980s and 2002 onwards in Venezuela—with pernicious repercussions on macroeconomic soundness in these economies (Edwards 2019).

The case of fiscal dominance in China has been dealt with, by means of graphical analysis, in Li et al. (2020). The People’s Bank of China (PBOC) was founded after the establishment of the People’s Republic of China (PRC) in 1949, and for the initial period till 1977 it served as a monetary authority as well as a banking institution affiliated to the fiscal authorities. The reforms of 1978 saw much fiscal devolution to the subsidiary levels of government and *de jure* independence to the PBOC in its monetary operations; albeit fiscal authorities continued to exercise restraint on the unfettered independence of PBOC, with deficits often being financed by printing of money. The law of PBOC enacted in 1995 was a landmark legislation that ushered China formally into a phase of monetary independence of fiscal constraints; there having been instituted statutory prohibition against monetisation of deficit by PBOC. As a result, PBOC was free to pursue its mandate of macroeconomic stability without undue pressures from the fiscal authorities. This has had salubrious implications for levels of fiscal deficit as well as growth rate of money supply. The paper notes, however, in passing, that money creation dictated by fiscal reasons continues to be significant in the PRC—a *de facto* regime of fiscal dominance amidst a *de jure* safeguards against it.

Relying on an exploration of how markets respond to an economy’s fiscal stance through the responses of real interest rates and growth to primary surpluses and various impulses and responses postulated in existing works on the subject, Gruben and Welch (2010) study the incidence of fiscal dominance in a set of 9 Latin American countries (viz. Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Peru, Uruguay, Venezuela) for a period that stretches from 1995Q1 to 2004Q1 at the best. They rely on two workhorses—Granger causality tests and Vector Error Correction (VEC) models. The summary of their findings on Granger causality tests are as follows:

Postulated relationship in Granger causality	Evidence discovered for countries in sample
Primary fiscal balance to GDP ratio causes real interest rate	Brazil, Colombia, Ecuador, Peru, Uruguay
Primary fiscal balance to GDP ratio causes real growth	Brazil, Uruguay, Venezuela
Real growth causes primary fiscal balance to GDP ratio	Brazil, Chile
Real (domestic) interest rate causes real exchange rate	–
Real (domestic) interest rate causes real growth	Brazil, Colombia, Uruguay, Venezuela

Further, the authors argue that VEC models are useful to test the ability of several variables to influence one variable at once, taking into account direct and indirect influences and also offer the direction of the influence (unlike the Granger causality equations). Their VEC formulations show results consistent with occurrence of fiscal dominance—in that, Ecuador, Peru and Brazil show that primary fiscal balance has a positive influence on real growth and a negative effect on real (domestic) interest rate and negative relationships flowing from real (domestic) interest rate to real growth rate. This is verified through Cholesky impulse-response decomposition, a variant of the broader VEC models.

The case of fiscal vs monetary dominance in Brazil during the period 1991–2000 is explored in Tanner and Ramos (2003). They first consider whether the primary deficit (PDEF) responds to changes in liabilities (the real operational deficit (ODEF_t = change in liabilities between *t* and *t* – 1)) to infer the occurrence of fiscal dominance:

$$\Delta PDEF_t = k + bODEF_t + e_t, \tag{6}$$

where concluding fiscal dominance would be tantamount to rejecting the $H_0 : b < 0$ (They explain that $b < 0$ may occur under both fiscal and monetary dominance, whereas it is rejected only when fiscal dominance takes place). They discover varying results for varying time periods. However, recognising the shortcoming of this approach that it cannot distinguish between a monetary dominant regime (where primary deficits adjust ex post to liabilities) and fiscal dominant regime with operation of the FTPL (where liabilities adjust ex ante to primary deficits), the authors prefer another specification for their investigation: a vector auto-regression framework (VAR), as follows:

$$\mathbf{X}_t = \mathbf{a}_0 + \mathbf{a}_1\mathbf{X}_{t-1} + \mathbf{a}_2\mathbf{X}_{t-2} + \dots + \mathbf{w}_t \tag{7}$$

where $\mathbf{X} = [\Delta PDEF, ODEF]$ and they check for relationships of time series ‘precedence’ running in both directions. In considering relationships that run from current operational deficit (ODEF_t) to future primary deficit ($\Delta PDEF_{t+i}$), a positive or non-existent relationship would indicate occurrence of fiscal dominant regime. Alternatively, in relationships that run from the current primary deficit ($\Delta PDEF_t$) to future operational deficit (ODEF_{t+i}), fiscal dominance would be implied by a non-existent relationship. Again, the conclusions derived are time-dependent and vary across periods.

Drawing inspiration from the above, Trenovski and Tashevskva (2015) investigate the incidence of fiscal dominance in Macedonia. They consider data for the period 2000–2011 and run the following equations:

$$CABCG_t = \alpha_0 + \sum_{j=1} \alpha_j CABCG_{t-j} + \sum_{j=1} \beta_j D_{t-j} + \epsilon_t, \tag{8}$$

and similarly,

$$D_t = \gamma_0 + \sum_{j=1} \delta_j \text{CABCG}_{t-j} + \sum_{j=1} \gamma_j D_{t-j} + \mu_t, \quad (9)$$

where CABCG_t is the cyclically adjusted balance of the central government and D_t is the level of public sector liabilities, both taken as ratios of GDP. [For robustness check they also consider primary budget balance of the central government as share of GDP.] Their results show that the impact of the variables considered, upon each other are minute and short-lived; the conclusion being that in setting of discretionary fiscal policy not much weightage is given to public debt level. That is, for the period considered, Macedonia is shown to exhibit fiscal policy domination over monetary policy.

3 Methodology

The discussion thus far indicates that fiscal dominance does not have a uniform definition and can encompass a wide variety of occurrences, each of which is characterised by the unintended spillover of fiscal action on other variables or avenues. Particularly in the case of developing countries, it has been noticed how fiscal policy operations create ripples in other financial markets and hurt the economic outcomes more than helping them. With this in mind, we begin our quest for investigating the presence or otherwise of fiscal dominance in India. The developing economy context of our country of interest requires us to focus on techniques and approaches that model fiscal dominance in contexts where fiscal sector may have a Leviathan presence, and hence any action in the sector has wide-reaching implications on other sectors. For purposes of our study, we consider the methodology followed by Gruben and Welch (2010). Their basic arguments are premised on obtaining a Granger causality between coupled relationships between real interest rate, growth rate of real GDP and fiscal balance. Subsequently, they go on to establish a co-integrating relationship between these variables in the context of the set of Latin American countries considered, through a VEC model followed by Cholesky impulse response functions.

In the equation considered for a long term relationship between the variables, we require that

$$v_t \equiv \text{BAL}_t - \alpha_0 - \alpha_1 \text{GROWTH}_t - \alpha_2 \text{REALRATE}_t, \quad (10)$$

is $I(0)$, where the variables considered in the equation are defined in the next section. The VEC model equivalent of the above checks whether deviations from long-run equilibrium of the relationship close over time.

They proceed to claim that while a one-standard deviation impulse to fiscal balance being associated with a negative response in real interest rate and a one-standard deviation impulse to real interest rate being associated with a negative response in growth rate of real GDP may occur under monetary or fiscal dominance, finding a positive association between fiscal balance and growth rate of real GDP—signifying thereby that positive impulse to fiscal balance is directly leading to rising

consumption, a case of perverse Keynesian fiscal policy—is confirmatory evidence of fiscal dominance. We follow the same flow of investigation for the Indian case.

4 Data

We consider three variables for our study. Unlike the luxury of availability of quarterly data for the Latin American countries considered in the cited study, we rely on annual data for India for the period 1978–2019. The choice is driven by the fact that this period covers the policy regime in India when there used to be automatic monetisation of the deficit (till 1997) and the subsequent reforms whereupon no such monetisation was resorted to, with legislative sanctity to the prohibition with the Fiscal Responsibility and Budget Management (FRBM) Act of 2003. We have considered the longest possible time duration for which comparable time-series data is available from credible sources. We give a brief overview of the data considered:

1. Fiscal balance (BAL) which is essentially the gross primary fiscal deficit of the Central government taken as a share of GDP, with a negative sign to maintain consistency with the definition of this indicator in Gruben and Welch (2010). This data is taken from RBI's *Database on Indian Economy*.
2. Real interest rate (REALIRATE) is the lending interest rate adjusted for inflation as measured by the GDP deflator. This is sourced from the IMF. Whereas IMF data is not comparable across countries, considering the time series data for a particular country is not fraught with any compatibility issues.
3. Growth rate of real GDP (GROWTH) is the annual percentage growth rate of GDP at market prices based on constant local currency, in this case the ₹. As stated by IMF from where this data is sourced, GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

The descriptive statistics for the variables under study are as under (Table 1):

Table 1 Descriptive statistics

	BAL	GROWTH	REALIRATE
Mean	− 1.98	5.82	5.86
Median	− 1.63	6.06	6.05
Maximum	0.88	9.63	10.77
Minimum	− 5.28	− 5.24	− 1.98
Std. Dev.	1.57	2.54	2.64
Skewness	− 0.31	− 2.01	− 0.93
Kurtosis	2.04	9.69	4.14
Observations	42	42	42

5 Results

Our primary concerns are regarding two nuggets of conventional wisdom about fiscal dominance: (a) fiscal surplus changes drive real interest rates, with the latter impacting growth; and, (b) fiscal surplus changes affect growth working through consumption. We test these through the usual tools of inquiry, namely the Granger causality and the co-integrating VECM models followed by impulse response functions. In reporting our findings we often hark back to the results obtained for Latin American countries in Gruben and Welch (2010); while arguably this is not strictly comparable given the difference in time period under study and in the extant institutional structures, it helps to bring out the significance of findings in the Indian context by providing a yardstick for comparison.

5.1 Granger-causality results

We begin by first examining the results from Granger causality tests. We first determine that the variables are all stationary in their level forms (through the Levin, Lin and Chu test (statistic = -4.277 , prob = 0), Im, Pesaran and Shin W statistic (statistic = -5.38 , prob = 0), Augmented Dickey Fuller test based on Fisher χ^2 (statistic = 41.84, prob = 0) and Phillips Perron test based on Fisher χ^2 (statistic = 42.41, prob = 0)). Having so determined, we proceed with the Granger causality tests. We report below the F statistic and p -value of the Granger causality tests. We first present results for the entire sample, and then that for the two sub periods 1978–2003 and 2004–2019 (Table 2).

Fiscal dominance literature requires that we should expect fiscal balance to more strongly Granger-cause real interest rate than the other way around. For the Latin American countries, the first unidirectional relationship was found to hold good for Brazil, Colombia, Ecuador, Peru and Uruguay. For India, this relationship has not been significant in the entire period taken as a whole and the period 1978–2003, but in the latter part of the duration we see a significant relationship. This is interesting because this has happened in the post-FRBM period, which is a period which has been bereft of monetary acquiescence to fiscal activism. Nevertheless, a premature

Table 2 Granger causality results

	1978–2019		1978–2003		2004–2019	
	F stat	P value	F stat	P value	F stat	P value
GROWTH does not cause BAL	2.217	0.124	0.253	0.779	8.639*	0.006
BAL does not cause GROWTH	0.901	0.415	0.219	0.805	0.444	0.652
REALIRATE does not cause BAL	1.283	0.289	0.845	0.445	1.274	0.318
BAL does not cause REALIRATE	1.224	0.306	1.265	0.305	5.694*	0.020
REALIRATE does not cause GROWTH	1.119	0.338	0.374	0.693	1.529	0.259
GROWTH does not cause REALIRATE	1.462	0.245	0.151	0.861	1.019	0.393

*Refers to results that are statistically significant at 5 or 10% levels

conclusion at this stage is unwarranted, and we establish firmer conclusions later upon detailed analyses. The relationship in the opposite direction has not been discovered for Latin American countries at all, just as the case for India.

The second relationship we investigate is that between fiscal balance and growth. While (anecdotally observed) fiscally dominated Brazil has shown this relationship from fiscal balance to growth alongside Uruguay and Venezuela, India has not shown any significant relationship in the period under consideration. In the opposite street, to see if growth causes fiscal balance through an impact on tax revenues, while Brazil and Chile show this result India has shown a significant result only in the post FRBM period. This may signify the policy emphasis on conducting counter-cyclical fiscal policy, with expansion during downturns and curtailment during booms; but as earlier, we avoid deriving firm conclusions at this stage.

Third, in checking if real interest rate Granger-causes growth, Brazil, Colombia, Uruguay and Venezuela show significant relationship; the opposite relationship being demonstrated in case of Colombia, Peru, and Uruguay. India does not exhibit any significant relationship in this regard.

Overall, we see that Granger causality tests that offered evidence of fiscal dominance in the case of Latin American countries do not yield very emphatic results in case of India. The case of fiscal balance Granger-causing real interest rate is particularly striking in that we observed a significant relationship for the 2004–2019 period for India, this being one of the conditions of fiscal dominance. Given the weaknesses inherent in a Granger causality framework, it would be more appropriate to consider the Indian data set and subject it to more sophisticated analytical models. We now proceed to fit VEC models, along the same lines as considered by Gruben and Welch (2010).

5.2 Vector error correction results

The Granger causality tests focus on one variable's ability to predict another, while we often require a host of variables to jointly predict a variable all at once. Additionally, VEC models are superior to the Granger causality tests because they take cognisance of direct and indirect influences that one variable may have on another and long term (co-integrating) relationships and short term deviations (errors) from them. Another benefit in VEC models is that the relationships they reveal are signed.

We establish the existence of a co-integrating relationship. For this, we applied Johansen test for the data under consideration and found the null hypothesis of no co-integration to be rejected, establishing the validity of the VEC modelling. [Trace Statistic for null hypothesis of "No cointegrating equation" is 46.73 with prob = 0.0002.] There is evidence of at most one co-integration equation in our case. Considering the conceptual backing for the simultaneous relationship between the three variables we consider, we derive our findings from such an equation. In our VEC model, we restrict it to two lags because of lack of degrees of freedom. Following Gruben and Welch (2010), we confine our interpretation to impulse responses derived from the two-lag VEC models.

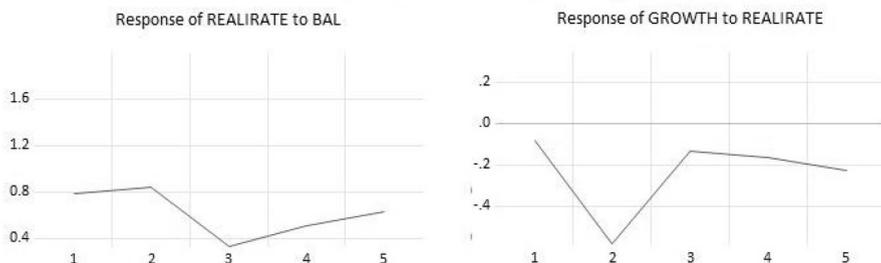
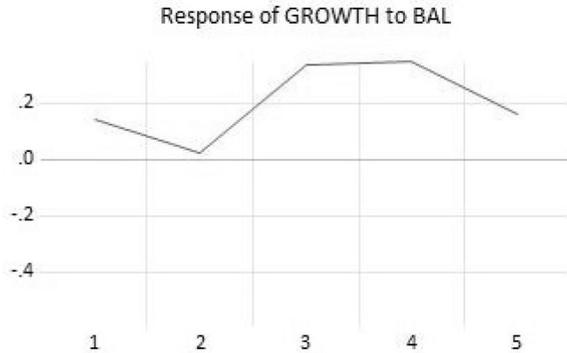


Fig. 1 Impulse response results

We now focus on the results of impulse response analysis, specifically those pertinent to fiscal dominance. Namely, response of real interest rate to a positive shock to fiscal balance and the response of growth to a positive shock in fiscal balance. We take impulse responses for 5 years (to put this in perspective, Gruben and Welch (2010) undertook analysis for 10 quarters). We notice that a positive impulse to India's fiscal balance is associated with a **positive** response in the real interest rate. Compared to Latin American experience, India this way falls among the 2 exceptions that do not show any fiscal dominance; while the impact over time of a positive impulse to fiscal balance is associated with negative responses varying between 2 and 4 standard deviations in case of Brazil (the impugned case of fiscal dominance in the Latin American basket), in the Indian case the response is positive instead and hovers between 0.4 and 0.8 standard deviations. The response of growth to a one standard deviation impulse to real interest rate in the case of India is negative, consistent with the experience of Latin American countries and in sync with both monetary as well as fiscal dominance (Fig. 1).

As noted by Gruben and Welch (2010), notwithstanding the above findings, a direct connection between fiscal balance and growth of the positive nature—meaning thereby that a reduction in fiscal deficit causes an overall increase in GDP growth—would mean that impulses to fiscal balance are associated with rising consumption leading to increase in growth rates, a confirmation of fiscal dominance. In

Fig. 2 Impulse response results



line with the results discovered for Brazil, Ecuador, Mexico, Peru and Chile, we find strong positive fiscal balance impulse-growth response relation for India (Fig. 2).

So far, we have found certain inconsistent results. While an improvement in fiscal balance is found to increase the real interest rates, it is also seen to hike the growth rates. A reduction in fiscal deficit can possibly lead to a hike in real interest rate. Let us recall that the real interest rate is the nominal interest rate netted of the inflation rate. A reduction in fiscal deficit essentially means a reduced demand for the financial savings in the market for funds; this would either leave the nominal interest rates unchanged because the fiscal sector is not large enough or may actually depress the nominal interest rates. A reduction in fiscal deficit is most likely to be associated with a fall in inflation, since the roll back of fiscal expenditure (and thereby the rollback of the associated multiplier effect) causes a fall in demand in the economy (This is borne out in the Indian case in Fig. 3, which charts the scatter between primary deficit and annual inflation for the time period we are studying). There may be two cases—*one*, when the fiscal sector does not have a substantial presence in the economy, in which case the nominal interest rates remain unchanged, while inflation is reduced; or, *two* when the fiscal sector indeed is large enough and rollback of its expenditures leads to a fall in nominal interest rate but that is eclipsed by an even larger fall in inflation. In both cases, the real interest rate would rise with an improvement in fiscal balance.

The other finding of reduction in fiscal deficit leading to an increase in growth rate is a particularly stark one, given that it signals hyper crowding-out associated with fiscally dominant countries. In fact, this constitutes the crux of the claims made by Acharya (2020) when he states that in the Indian context when there is a rise in government debt there is a comparable decline in corporate debt and a concomitant increase in banks' holding of government debt (leading to less lending to other sectors of the Indian economy). As a result of this, an increase in fiscal deficit is arguably leading to 'crowding out' of other forms of economic activity. The possibility of monetary policy accommodation offsetting some of these perilous effects of increased fiscal deficit is ruled out by showing how monetary policy transmission in India itself gets impaired on account of high government debt or fiscal deficit. Ergo, this seems to be one of the explanations of the results obtained for India. To gain

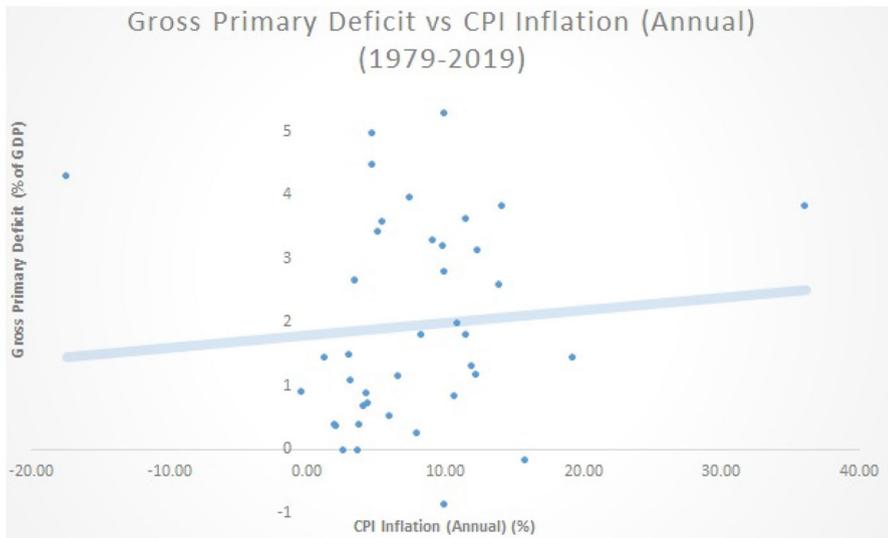


Fig. 3 Gross primary deficit vs CPI inflation in India

Table 3 Impulse responses disaggregated by time frame

Accumulated responses	REALIRATE to BAL	
Period	1978–2003	2004–2019
1	1.035256	0.762409
2	1.359233	2.317691
3	1.524168	1.854152
4	2.230044	1.235181
5	2.797154	0.391948
	GROWTH to REALIRATE	
1	0.110835	0.274898
2	– 1.044965	0.14902
3	– 0.868632	0.488311
4	– 0.649816	0.541051
5	– 0.327392	0.71866
	GROWTH to BAL	
1	0.668604	– 2.104355
2	1.368975	– 3.652994
3	1.805271	– 4.646886
4	3.060982	– 6.41409
5	3.741485	– 9.122697

deeper insights, we slice up the period of our analysis into two (as we did earlier) and repeat the steps of impulse response calculations as above.

For ease of comparison and immediate visual appeal, we present results in a tabular fashion instead of our earlier method of graphical analysis. The results are shown in Table 3.

Let us now begin comparing our findings for the two time periods. In the first, whereas an impulse to fiscal balance had a consistently positive impact on the real interest rate, this has changed in the subsequent period, where beyond 2 periods the impact has turned negative. This is more reasonable to expect, since an improvement in fiscal balance (equivalently, a fall in fiscal deficit) should indeed allow space for the real interest rates to cool down, since government's drawing on the pool of financial savings in the country eases up with a fall in fiscal deficit. The findings on impact of real interest rate on growth are somewhat counter-intuitive for the latest period, in that the impact of an increase in real interest rate is found to have a positive impact on growth; those for the first period are also a bit surprising because apart from depressing growth in the second period there is a hike in growth rate in every other period under study.

The results of impact of fiscal balance on growth are most revealing of the changing dynamics of fiscal Keynesianism in the Indian economy. While the first period is seen as a period of dominant fiscal presence where an improvement in fiscal balance—i.e. a reduction in fiscal deficit—is associated with a positive growth effect (the case of perverse results of Keynesian fiscal policy), the paradigm has changed after the enacted of the FRBM Act in 2003. We see therefore that in the period following 2003, there is no evidence of fiscal dominance in the Indian economy. Thus, the institutionalisation of fiscal prudence and clean separation between monetary and fiscal players that the FRBM Act envisaged has been successful in eliminating the malady of fiscal dominance from the Indian economy, at least in the traditional manner of our modelling of this phenomenon.

It is relevant to mention here that the foregoing discussion focuses exclusively on the phenomenon of fiscal dominance taking the fiscal variables at the Central government level. Because the FRBM Act catered exclusively to the federal level of fiscal performance, it is only in fitness of things to restrict the discussion to Central government level.

Allusion to the germane discussion in Acharya (2020) in this regard is merited. He argues that even in the recent periods, namely post 2000, it is noticed that government borrowing has been in the range of 67–85% of GDP, which has its impact on multiple financial markets. To start with, a rise in government borrowing has an immediate pernicious impact on future profitability of corporate investment, causing a reduction in that. Second, the safety and stability coupled with the fungibility of government bonds causes many market players to expand their holding of government bonds upon an increase in fiscal deficit, which has knock-on effects on corporates trying to raise money for their commercial operations. Indeed, some indicative evidence of the above phenomenon does exist in the case of India, as captured in Acharya (2020). All these arguments notwithstanding, our findings suggest that a reduction in fiscal deficit has an upward pressure on real interest rates in the economy and a depressing impact on the growth rate. The government has sizeable

presence in the economy as well as financial markets and its role is not as dominant as has been heuristically argued earlier. Particularly, there is no evidence of a perverse impact of Keynesian fiscal activism in the economy.

That said, it is imperative to emphasise that these findings do not offer any information on the other arguments adduced by Acharya (2020) with regard to the operation of fiscal dominance in India, some of which have been recounted earlier in this discussion. These remain relevant topics for further research.

In contemporary times when the COVID pandemic is stalking the global economy and unleashing its diabolic menace on economic activity all across, it is perhaps instructive to consider the implication of the foregoing discussion. Extant literature has already borne out the pitfalls inherent in a purely monetary response to an economic stalling (Stiglitz and Hamid 2020) and the merit in fiscal-monetary coordination. Chakraborty (2021) opines perceptively that fiscal expansionism is wholly justifiable if it can catalyse public investment and reduce the output gap. Mishra (2021) elaborates how the Union Budget 2021–2022 comprises a cap-ex stimulus that brings in a multiplier-accelerator interface to set in motion an investment-income-consumption spiral in the economy, even while committing to a moderate fiscal consolidation plan allowing the glide path of fiscal deficit to reach 4.5% in 2026. The foregoing discussion sets to rest any alarm bells regarding the unintended spill-over effects of fiscal expansionism undertaken in the Budget 2021–2022.

6 Conclusion

Much ink has been spilt to argue the potentially dangerous impacts of the monetary authority being subjugated to the whims and fancies of the fiscal authority. This is particularly relevant to the case of developing economies, where the institutional maturity that cements the independence of the monetary authority vis-à-vis the fiscal authority may be in an infantile stage of development. In India in particular, many have argued that multi-faceted fiscal dominance is a lived reality, which hamstring the efficacy of essential fiscal activism. While this may have been true in the past, the study of the more recent period—as clear from our study—shows no evidence of the harm that fiscal activism theoretically brings in an economy. Our study is based on assessing the impact of fiscal balance on real interest rate and on growth rate of real GDP. A simple accounting through the Granger causality lens reveals that India exhibits a mixed set of findings, with no firm conclusion on incidence of fiscal dominance being possible from these findings. In the Cholesky impulse response framework, we find no evidence for fiscal dominance in case of India when checking if (i) changes in fiscal balance have any impact whatsoever on real interest rates, and (ii) real interest changes have any impact on growth rate; while looking for the impact of fiscal balance on growth rate, while there was a dampening effect of fiscal expansion on growth rate in the pre-FRBM period, the effect has reversed in the post-FRBM era. That said, it is imperative that this outcome has been the result of steady efforts to surgically separate out the symbiotic relationship between fiscal and monetary pillars in India, and there is need to continue to guard the gains achieved so far and

pursue them even further. The exigency that the COVID pandemic poses is a fit case for a ‘measured and calibrated’ coordination between fiscal and monetary offices to offset the financing challenges associated with implementing mitigation and revival measures in the Indian economy. In a more general sense, given the abiding relevance of state’s role in Indian economy, an obsession with reducing the size of the fiscal sector merits a closer look, given that re-prioritising expenditures towards avenues of merit goods, physical and human capital formation and efficiency improvement is thoroughly merited.

Acknowledgements A. Kamila is thankful to Prof. Mausumi Das, Prof. Arup Mitra and Prof. Pravakar Sahoo for their guidance in developing this idea. An earlier version of this paper was selected for presentation at the NIPFP-IIPF International Conference on ‘Papers in Public Finance’ on 29 June 2021 and comments and remarks received therein have helped refine the earlier version of this paper. The author is grateful to Prof. Pinaki Chakraborty and Prof. Lekha Chakraborty of the NIPFP and an anonymous referee for their valuable guidance in fine-tuning the contents of this paper to its current form. Views expressed are purely personal and do not necessarily reflect the official position of the institution(s) the author is affiliated with. Usual disclaimers apply.

Funding None.

Declarations

Conflict of interest The authors have not disclosed any competing interests.

References

- Acharya, V. (2020). *Quest for restoring financial stability in India*. SAGE Publications India.
- Ahmed, R., Aizenman, J. & Jinjara, Y. (2020). Inflation and exchange rate targeting challenges under fiscal dominance. *NBER Working Paper 25996*.
- Bajo-Rubio, O., Díaz-Roldán, C., & Esteve, V. (2014). Deficit sustainability and monetary versus fiscal dominance: The case of Spain, 1850–2000. *Journal of Policy Modeling*, 36, 924–937.
- Bassetto, M. (2008). Fiscal theory of the price level. In Lawrence Blume & Steven Durlauf (Eds.), *The New Palgrave: A Dictionary of Economics, 2nd edition, 2008*. London: Macmillan.
- Blanchard, O. (2019). Public debt and low interest rates. *PIIE Working Paper 19-4*, Washington DC.
- Bouis, R., Rawdanowicz, L., Renne, J.-P., Watanabe, S., & Christensen, A. K. (2013). The effectiveness of monetary policy since the onset of the financial crisis. *OECD Economics Department Working Papers, No.1081*, OECD Publishing.
- Chakraborty, L. (2021). Macroeconomic framework of union budget 2021–22: Reconsidering the fiscal rules. *NIPFP Working Paper No 328*, 03 March 2021.
- Coates, K., & Rivera, E. (2004). Fiscal dominance and foreign debt: Five decades of Latin American experience. *Money Affairs*, 17(2), 83–103.
- Cochrane, J. H. (2001). Long term debt and optimal policy in the fiscal theory of the price level. *Econometrica*, 69(1), 69–116.
- Dufrénot, G., Jawadi, F., & Khayat, G. A. (2018). A model of fiscal dominance under the ‘Reinhart Conjecture’. *Journal of Economic Dynamics & Control*, 93, 332–345.
- Edwards, S. (2019). Monetary policy, fiscal dominance, contracts and populism. *Cato Journal*, 39(1), 33–50.
- Farmer, R. E. A., & Zabczyk, P. (2019). A requiem for the fiscal theory of the price level. *IMF Working Paper WP/19/219*.
- Gruben, W. C., & Welch, J. H. (2010). Is tighter fiscal policy expansionary under fiscal dominance: Hypercrowding out in Latin America. *Contemporary Economic Policy*, 28(2), 171–181.

- Leeper, E. (1991). Equilibria under 'active' and 'passive' monetary policies. *Journal of Monetary Economics*, 27(1), 129–147.
- Li, L., Tan, H., & Zhang, H. (2020). Government finance and money creation in China: An MMT perspective. *The Chinese Economy*, 53(4), 329–341.
- Mishra, R. (2021). The 'right way' towards a \$5-trillion economy. *Hindu Business Line*, 11 March 2021.
- Rajan, R. (2020). Monetization: Neither game changer nor catastrophe in abnormal times. *LinkedIn Blog Post*, 08 May 2020.
- Resende, C. (2007). Cross-country estimates of the degree of fiscal dominance and central bank independence. *Bank of Canada Working Paper 2007-36*.
- Sabaté, M., Fillat, C., & Escario, R. (2019). Budget deficits and money creation: Exploring their relation before Bretton Woods. *Explorations in Economic History*, 72, 38–56.
- Sargent, T. J., & Wallace, N. (1981). Some unpleasant monetarist arithmetic. *Quarterly Review of Federal Reserve Bank of Minneapolis*, 5(3), 1–17.
- Stiglitz, J. & Hamid, R. (2020). Which economic stimulus works? *Project Syndicate*, 8 June 2020.
- Tanner, E., & Ramos, A. M. (2003). Fiscal sustainability and monetary versus fiscal dominance: Evidence from Brazil, 1991–2000. *Applied Economics*, 35, 859–873.
- Trenovski, B., & Tashevskva, B. (2015). Fiscal or monetary dominance in a small, open economy with fixed exchange rate—The case of the Republic of Macedonia. *Zbornik radova Ekonomskog fakulteta u Rijeci*, 33(1), 125–145.
- Woodford, M. (1995). Price level determinacy without control of a monetary aggregate. *Carnegie-Rochester Conference Series on Public Policy*, 43, 1–46.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.