Macroeconomic Effects of Fiscal Consolidation Shocks in Indian Economy

A Thesis Submitted to the University of Hyderabad
For the Degree of

Doctor of Philosophy

By

ISHFAQ AHMAD KHOJA

(Reg. No. 16SEPH11)

School of Economics
University of Hyderabad
Telangana Hyderabad (500046)
INDIA

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DECLARATION

I **ISHFAQ AHMAD KHOJA** hereby declare that the research embodied in the present thesis entitled **"Macroeconomic Effects of Fiscal Consolidation Shocks in Indian Economy"** is an original research work carried out by me under supervision of Professor N. A. Khan, School of Economics for the award of Doctor of Philosophy from University of Hyderabad.

I hereby also declare to the best of my knowledge that no part of this thesis is earlier submitted for the award of any research degree or diploma in full or partial fulfilment in any other University

Date: **ISHFAQ AHMAD KHOJA**

Place: Hyderabad **(Reg. No. 16SEPH11)**

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CERTIFICATE

This is to certify that the thesis entitled **"Macroeconomic Effects of Fiscal Consolidation Shocks in Indian Economy"** submitted by **ISHFAQ AHMAD KHOJA** bearing Enrolment Number: **16SEPH11** in partial fulfilment of the requirements for award of **Doctor of Philosophy** in the School of Economics is bonafide work carried out by him under our supervision and guidance.

The thesis is free from plagiarism and has not been submitted previously in part or full to this or any other university or institution for award of any degree or diploma.

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Prof. N A Khan
(Supervisor)

Prof. N. K. Sharma
Dean School of Economics

Contents

Chapter — III

Monetary versus Fiscal Policy: Does Monetary Policy effect the Macroeconomic Impacts of Fiscal Shocks in India?

Chapter—IV

Fiscal Consolidation and Economic Growth: Do Composition of Fiscal Shocks Matter?

Chapter—V

Fiscal Consolidation Shocks and their Impacts on Social Sector Spending in Indian Economy

Chapter—VI: Summary and Concluding Remarks

List of Tables

List of Figures

Chapter—I
Introduction to the Study

1.1: Introduction

The government and its role have evolved over time and can be traced back to the intellectual efforts of Mercantilists. However, their views regarding the role and importance of government were confined only to the regulation of trade for the national welfare. They in a sense were advocates of nationalism and hence the real hard-core essence of the economic thinking could not flourish in their writings. Their main thrust was to enhance national power through wealth and wealth creation was taken to mean the accumulation of gold[1]. However, this view of government was severely criticized by the classical school of thought. They advocated for a regulatory role to the government and stressed the efficiency of markets to stabilize the economy. The chief architect of this school of thought was the Scottish born economist Adam Smith who later on assumed the title of father of economics. They developed their theories on various premises like the existence of full employment, wage-price flexibility, supply creates its own demand, etc. For the next more than half a century, these principles governed the discourse of economies and occupied the driver's seat especially in the West[2].

This paradigm came to be tested at the hands of depression of thirties when the general economic activity contracted and the unemployment became the cureless disease. The market stabilization that was advocated by Classical school of thought proved falsified and the world economic order sought a practical bailout framework. This led to the emergence of what later came to be known as the Keynesian revolution. Keynes, though an embryo of classical school of thought refined his fore-fathers along many lines. The basic questions that Keynes raised, against classical hegemony include, do we always have full employment, does full wage-price flexibility exist, do markets possess inherent stability, can we rely on the long run with certainty, etc. This multidimensional intellectual attack was to change the discourse of economic research for the most part of the next century. The Keynes held that we cannot and should not attach excessive

[1] This practice of treating gold as national wealth and thus power is referred to as, "*Midas Fallacy*". This was the basic premise that came under severe attack from the classical school of thought (refer to E. S. Reinert & S. A. Reinert, 2005).

[2] For more deeper and comprehensive understanding of the mercantilist-classical dichotomy and the lines of attack by the classical school on bullionism refer to Thomas M. Humphrey (1999).

confidence to markets as they are governed by what he terms as "*Animal Spirit*" and held that the markets do not possess the long-run tendency to stabilize in face of shocks[3].

To overcome this inherently unstable nature of markets, Keynes advocated role to government at least as a stabilizing agency. However, over time the institution of government was attached with increased importance and functions along different dimensions. The study governing the conduct of government and its functions are termed as public sector economics[4]. This legitimization of government role in economic activity led to the emergence of what came to be known as the welfare state. This led to a phenomenal increase in the functions of government that can be broadly encompassed in five categories viz., the allocation; the distribution; the stabilization and the coordination (see Musgrave and Musgrave 1989). Over time it has been observed that the provision of certain goods and services is either under-provided or exhibit a skewed provision thus give rise to what is termed as market failure. These are popularly known as public goods and they exhibit the peculiar properties of non-rivalry and non-excludability[5]. The government intervention for the provision of these commodities has been found to be effective and efficient. Moreover, the markets could not ensure a balanced distribution of resources and may breed acute inequality as markets believe in the survival of the fittest. To overcome such a scenario the governments assume different welfare functions to uplift the poor and needy.

As evident from the crises of the thirties, the markets do not possess the self-stabilization character as advocated by the classical school of thought. The government over time has developed two main instruments of stabilization in the form of monetary and fiscal policies. The governments from time to time make optimal use of these instruments to infuse stability in the level of economic activity and employment of an

[3] The term was coined by J. M. Keynes and it refers to psychological tendency for action by economic agents to undertake more investment and consumption. Since markets are driven by the Animal spirit and Animal spirit is a psychological tendency, so it does not pay to assume that markets are inherently automatic stabilizers in the face of shocks.

[4] However one should never equate the study of public sector economics with that of government function in entirety. This study mainly includes the activities of different layers of government mainly from the fiscal and welfare point of view (for more insights refer to J.R. Gupta 2011).

[5] Non-rivalry may be defined as a situation where the consumption of a good or service by multiple economic agents does not reduce the quantity available for the successive consumers. Non-excludability is defined as a scenario wherein we cannot exclude potential users from using a commodity at affordable costs.

economy. Further, government acts as a coordinator in the economic affairs of an economy that markets cannot undertake at its own. All these and many more areas of advance have led to the emergence of the modern-day welfare state with a broad focus of improving the welfare of general masses. It is the human welfare that has become a measuring rod of efficiency for any activity undertaken by the government. Higher the welfare orientation of activity higher is the social desirability of such activity on part of the government to undertake more[6]. This has led to the emergence of what is commonly known as welfare economics with a prime motive to analyze the performance of the government in terms of its ability to achieve certain desirable goals, the goal of human welfare.

This welfare orientation of the government introduces the readers to the question of financing government expenditures for the provision of these goods and services. There are twin economic theorems explicitly dealing with the issue of financing of public goods. The one led by continental writers like Mazzola, Pataleoni, Wagner, and Lindahl who stress the *Benefit Principle Approach*. The other led by Anglo-Saxon writers include Pigou, Mill, Dalton and Samuelson who stress *Ability to Pay Approach*[7]. The benefit to pay approach broadly rests on the market principle wherein the consumers pay according to their satisfaction. While the Ability to Pay Approach stresses the potential of the consumers to finance the provision of publicly provided goods and services. However, such a deeper and micro-level analysis of government financing is out of the scope of the present exercise. Thus the study will mainly concentrate on the aggregate fiscal space of the government that is broadly enshrined in the fiscal policy of the government. The fiscal policy of any governing institution is regulated by twin streams of revenues and expenditures. Since modern states are governed by different levels of government spending, thus it becomes imperative to understand the apportionment of revenues and expenditures, especially so in federations (Musgrave and Musgrave 1989).

There are multiple sources of revenues accruing to government and can be broadly divided into tax and non-tax revenue. The further disaggregation, in case of tax

[6] This line of reasoning stems from Benthaminian utilitarianism that was later on developed and applied to the economic sphere by JS Mill, Hare, Braybrooke, Singer and Musgrave and Musgrave (1989).

[7] For more and deeper insights the readers are requested to refer to, "*Public Economics in India: Theory and Practice*" by J R Gupta 2011.

revenues, maybe along the lines of direct and indirect taxes. In the case of former, the burden of impact and incidence are born by the same person while as in the case of latter the impact and incidence of a tax are on different persons. The non-tax revenue mainly accrues in the form of returns on earlier loans or investments, dividends from the public sector undertakings, borrowings both domestic and foreign. These revenues are utilized by the governments to expedite along different functions. However, at times the revenues of the government from these sources report inadequacy and under such circumstances, the governments resort to borrowings. The modern governments can borrow from two alternative sources i.e. either from domestic sources like financial markets or from international financial institutions like IMF etc.

The expenditure by the government determines the size, strength, and impact of government spending in the total economic activity. These public expenditures have significantly grown over time, all through the globe, and may well exhibit the behaviour enshrined under the Wagner and Wiseman-Peacock Hypothesis[8]. These government expenditures are broadly divided into developmental and non-developmental expenditures. Although this segregation does not imply water-tight demarcation but the former is commonly expected to yield in terms of returns over time though with a shorter gestation period while as latter is usually expected either not to contribute to the state exchequer directly or the contribution may start after long gestation periods.

The above-cited instruments in the form of tax revenue, non-tax revenue, expenditures, borrowings, and debt constitute what is termed as fiscal policy. Fiscal policy may be defined as, "changes in government expenditure and taxation designed to influence the pattern and level of economic activity" (Harvey and Johnson 1971). G. K. Shah (1971) defines fiscal policy as "*any decision to change the level, composition, and timing of government expenditure or to vary the burden, structure or frequency of the tax payments*". The deliberate use of fiscal instruments and the prominence of fiscal policy is an outcome of Keynesian contributions to fight the depression of the 1930's. The emergence of fiscal policy as an instrument of stabilization was mainly on three accounts viz., firstly apparent ineffectiveness of monetary policy to tackle unemployment during

[8] Adolph Wagner, the German Economist, writing in 1880's advanced his "*Law of Rising Public Expenditure*" which states the increasing tendency of government expenditure over time owing mainly to increase in functions. Latter on the law was established by Wiseman and Peacock in case of UK.

the great depression, secondly the explicit Keynesian emphasis on the demand management as against the Says Law of market and finally the increasing importance attached to taxation and government expenditure in an economy (R Gupta 2011). The role and importance of fiscal policy over time has undergone significant changes. The classical school of thought did never attach any importance to fiscal policy as according to them the government is a necessary evil. They held the belief that markets breed optimum resource allocation and any interference on part of the government may lead to inefficiency as it means a departure from the state of bliss. On the other hand, the Keynesian school took a complete U-turn and established the prominence of fiscal instruments. Over time this debate has been attributed to monetarists and Keynesians along the lines of the relative efficiency of monetary and fiscal policy instruments.

Over the past few decades, public spending and public borrowings have assumed significant importance so far as the instruments of fiscal policy are concerned. Under the title of the welfare state, governments all over the globe have increased their levels of spending. The governments usually spend in civil and military affairs, capital expenditures on social works, welfare spending like subsidies, transfers and social safety nets. These expenditures need to be financed either by state's own revenues or by borrowings from other sources. However, over time, global economies in general and developing economies, in particular, have relied on the latter source of finance. The accumulation of such borrowings over time has resulted in unsustainable levels of public debt. Although debts are usually undertaken with a social or economic motive of increasing general welfare but we may at times end up defeating purposes.[9] Under certain specific circumstances, this national debt may fuel more poverty and unequal distribution of wealth (Lerner 1948).

The classical school strictly prohibited the use of deficit financing as according to them it may fuel extravagance and irresponsibility on part of the government. Moreover, the other possible threats emanating from the use of deficit financing include rising levels of inflation, crowding-out and interest burden. Apart from the above-mentioned issues, there may be other preferential changes that may take place in an

[9] This implies that the level of debt increases to very high levels leading to excessive interest burden where-in it may shoot up to a level where we need additional debt only to finance the interest payments.

economy. There may be a general possibility for general consumption to increase[10]. Moreover, the rising debt levels mean more liquidity and hence more inflationary tendencies, if partially financed by printing new currency.

In the face of the above-cited peculiarities, there has been a stress on the disciplinary measures to attain the sustainable levels of public debt. Accordingly, we find many treaties and acts undertaken by different governments aimed at infusing more fiscal stability. The first such act or treaty that we came across is the Australian Loan Council established in 1923 with a prime motive to govern the state debt and avoid competition among states against each other for capital funds[11]. Another discussed treaty along the similar lines was "*Maastricht Treaty*" singed in 1992 between the member countries of the European Union. Although the prime concern of the treaty was not the fiscal policy and public debts. But an important principle of the treaty mandated the signatories to maintain their deficits within reasonable limits[12]. Similarly, many other methods and policies were designed in other parts of the world with a primary motive to contain the public deficit scenarios. These policies with a primary intent to target the level of debt and deficits in an economy are commonly known in the literature as Fiscal Consolidation policies. These policies were primarily tasked to reduce the affluence in government spending with a view to increase the spending in other important areas like education, health, sanitation, and research. Over time these policies were questioned at least along two important lines namely the impact of these policies on the state of debt (Fiscal Effects) and impact on economic indicators like the growth rate of income (Economic effects)[13].

1.2: Theoretical Background

There has been a surge in the literature assessing both fiscal and economic effects of consolidation plans, theoretically as well as empirically. Theoretically, there are three alternative theories that may be taken aid of concerning the debate about the economic

[10]This may be because the government may raise certain part of its debt through bonds held by the general public in the form of wealth. The consumption of such agents may increase more than the increase in their income given the increased level of wealth (see Gupta 2011).

[11]It is a state ministerial council that coordinates public sector borrowings comprising the commonwealth of Australia, states, and self-governing territories.

[12]The treaty made it obligatory on the members to maintain manageable levels of debt 60 percent of GDP and yearly fiscal deficits not more than 3 percent.

[13]This distinction between fiscal and economic effects has been directly taken from N Gruber 2013.

effects of consolidation policies. In the following section, we will be briefly detailing the main crux of these theories i.e. "*Keynesian theory, Ricardian Equivalence theory, and Non-Keynesian Theory*".

1.2.1: Keynesian theory

This may be described as the first comprehensive theory analyzing the implications of fiscal adjustments to macroeconomic indicators. Prior to the Keynesian general theory (1936), the classical school emphasised complete inefficiency of fiscal policy under the assumptions of price flexibility with vertical supply cure (Yadav et al., 2012). However, the Keynes emphasised the sticky prices and effective demand as against the classical premises to establish a role for fiscal policy. The basic premise of the theory rests on the analytical framework of national income identity as defined by Keynes. The national output (Y) consists of private-sector spending (C), private capital formation taken as private investment (I), government consumption of goods and services (G) besides net exports (X-M) in case of open economy:

$$\boldsymbol{Y = C + I + G + (X-M)} \quad \textbf{……1.1}$$

Since in Keynesian theory economic effects are usually measured from the demand side, so the above specification is a representation of aggregate demand. Under the *ceteris paribus* assumption, an increase in any of the right-hand side components means an increase in national output per se. Thus an increase in government spending means higher income and vice-versa. Similarly, a reduction in the prevailing tax rates may lead to an increase both in ***C*** and ***I*** and may lead to an increase in national product. These policies are known as expansionary fiscal policies or stimulant measures. A consolidation program is always the opposite of what has been mentioned above. Thus an exogenous reduction in government activity in the above specification or a shock to disposable income via tax rates will bring about a decline in national output, at least in the above framework (Briotti 2005). The magnitude of the decline, according to Keynes will depend on the value of fiscal multipliers besides the magnitude of contraction. The Keynesian theory holds that the value of multiplier being always greater than one, thus a shock to government spending may decrease the national output more than proportionally. This is because shocks to effective demand produce ripple effects via

marginal propensity to consume. The multiplier under the Keynesian framework can be derived as:

$$\mathbf{Y= C_0 + C_1 (Y-T) + I + G + NX\ldots\ldots\ldots\ldots\ 1.2}$$

$$\mathbf{Y= 1/(1-c) * (C_0 – C_1T + I + G + NX)\ldots\ldots\ldots\ 1.3}$$

The **(1/1-c)** represents the power of multiplier that can be seen to depend on MPC. The higher the value of multiplier the higher will be the effect of fiscal tightening on the national output. Moreover, the above identity highlights the relative desirability of tax increase rather than a reduction in spending as the optimal way to consolidate. This is because of the fact that an increase in tax rates may be partially offset by higher MPC values and thus implying lower long term pains. Though over time there have been many refinements and extensions to the Keynesian stand the basic premise about the effects of consolidation remains intact. Keynes theory favoured higher growth rates implying higher income rather than reducing spending as an instrument to maintain fiscal prudence.

1.2.2: Ricardian Equivalence theory

The next line of theoretical reasoning with relevance to the literature on budget consolidation is the Ricardian Equivalence theorem. The concept was coined by David Ricardo during 19th century but the credit for a more modernized version goes to Robert Barro in 1974. The basic proposition states, "*the irrelevance of the governments financing decisions vis-à-vis tax and debt*" (Barro, 1974). The theory is a bit more dynamic and utilized the instrument of expectations to fortify its reasoning. The theory holds that it is immaterial to choose between the present tax payments or the expected future tax burden as decided by the level of debts. The theory assumes the forward-looking and rational economic agents with significant information that current fiscal expansion will lead to higher levels of deficits and hence debt that will be financed by higher future tax rates (Yadav et al., 2012). The basic analytical framework describing the above theorem is as:

$$\mathbf{W = \alpha\ (P_1) + (1/(1+p))\ \alpha\ (P_2)\ldots\ldots\ldots\ldots\ldots\ 1.4}$$

$$\mathbf{P = (1-t_1)* Y_1 + (1-t_2)* Y_2 * (1+r)^{-1}\ldots\ldots\ldots\ 1.5}$$

Where **W** represents the wealth influenced by the level and patterns of consumption both present $\mathbf{P_1}$ and future $\mathbf{P_2}$ discounted by time preference *p*. Accordingly, $\mathbf{Y_1}$ and $\mathbf{Y_2}$ represent the current and future expected levels of national income and t_1 and t_2 represent the current and future tax rates where $t_2 > t_1$. The theory states that a higher current debt rather than higher current taxation will generate expectations among economic agents about higher future tax rates and hence higher private savings. "*Increasing tax rates reduces aggregate demand by higher savings in the public sector and growing debts decrease aggregate demand by higher savings in the private sector via worsening expectations*" (Gruber 2013). Thus according to the Ricardian Equivalence theory, fiscal stimuli or shocks should have no further economic effect as changing economic expectations alter economic behaviour according to fiscal stance. However, it is imperative to mention that, "*for Ricardian Equivalence property to be met, a number of crucial assumptions must be satisfied*" (Briotti 2005).

1.2.3: Non-Keynesian Theory

This theory may not fit the standard definition of a theory like the previous two because of an incoherent structure with multidimensional approaches and varying results. The literature, supporting non-Keynesian effects, started growing from 1980 onwards with some studies stressing demand-side and yet others focusing supply-side channels. Despite the heterogeneous nature of these studies, they arrive at the same conclusion that budget consolidation need not necessarily have negative effects. In fact, at times under certain conditions, they may lead to positive economic effects even under short run[14]. These studies propounded many explanations for their results some from demand-side yet others from the supply side. The first such channel of transmission used by these studies is the famous Crowding-out debate. This effect states that a reduction in government spending under *ceteris paribus* assumption may lead to positive effects on other macroeconomic indicators like investment. Thus a shock to government spending may be countered by a stimulus to the private sector with least effects on economic indicators. However for such a theory to have non-Keynesian effects the crowding out needs to be strong enough, which empirically proved is not the case, hence requiring complementary help from other channels of transmission (Gruber 2013).

[14] This was mainly because of these novel but contrary findings to that of Keynesian wisdom that they were clubbed as a theory with non-Keynesian effects.

Another line of defence extensively quoted under these studies is the interest rate channel. A reduced government spending means less monetary demand on part of the government and hence lower interest rates. This, in turn, implies lower interest payments burden and hence more resources that may be used for social sector spending and thus accelerating growth. However, this approach is again quite sensitive to the interaction between aggregate demand and rate of interest. Another emerging line of defence is the channel of expectations of economic agents. A consolidation that relies heavily on tax and expenditure cuts may have non-Keynesian impacts especially, "*if it generates the expectations of less dramatic and disruptive tax increase tomorrow*" (Blanchard et al., 2002). Such a policy stance is true especially under an unsustainable fiscal scenario where the private households are expecting tax raise coupled with expenditure reductions. These expectations lead to lower lifetime disposable income and thus reduce private household consumption and investment. This may reduce the aggregate demand in the economy and may have adverse effects on growth rather than direct budget consolidation. Thus a timely application of consolidation design may reduce the future needs of such disciplinary actions and hence may reduce the long term pains and thus boosting the economy over time.

Another line of defence advocated by these studies is the foreign demand for goods and services. Consolidation may have effects like reduced inflation rates as quoted above under a reduced monetary demand. This implies that the domestic goods and services became cheaper in international markets and hence can boost the exports of an economy thus growth. Another important foreign factor is the external economic environment having a profound effect on national economic scenario irrespective of the domestic policies. A consolidation program under a booming international economic scenario may well provide a stimulus to offset the negatives of a fiscal shock. To conclude it is imperative to acknowledge the fact that a single transmission channel is not strong enough to counter GDP lost induced by reduced government spending. However, if two or more of these circumstances prevail at a time, then there may arise strong chances of a consolidation having expansionary effects rather than the conventional Keynesian outcomes. Moreover, this is a debate in the continuum as there is continuous emergence of literature supporting all the theories, though under an alternative set of assumptions and methodologies.

1.3: Fiscal scenario of the Indian economy

India inherited a perished economy on the eve of independence stagnating with multidimensional poverty, malnutrition, famine, inequality and sluggish growth. Accordingly, the government assumed wide responsibilities and increased its domain both intensively and extensively. This necessitated the fiscal policy assume twin roles of improving the growth performance of the economy besides ensuring social justice. However, if a fiscal policy is not used discreetly it is likely to create a fiscal mess as it has happened in India (Puri and Misra 2013). Thus a deliberate set of policies was pursued to provide increased government attention to sectors like health, education, poverty alleviation, social safety nets and unemployment[15]. This led to a phenomenal expansion in government expenditure over time. These trends in public expenditure with a limited scope of corresponding revenues forced authorities to proceed for borrowings and led to an acute accumulation of public debt. Initially, the policymakers and economists held a belief that debt is necessary to boost the capital base of the economy. Thus we see rising levels of debt on the capital account with current account exhibiting a more conservative picture till early 1980 (Krueger et al., 2002). This led to an accelerated increase in the overall government deficit scenario with all the indicators approaching an unsustainable level.

This liberal fiscal stance assumed a deteriorating trend over the 1980's and by 1990-91 has almost led to a fiscal crisis in the economy. The fiscal deficit as a proportion of national income rose from 5.7 percent in 1980-81 to around 8 percent in 1990-91. Similarly, revenue deficit rose from 1.4 percent to 3.3 percent and primary deficits increasing from 3.7 to 4.2 percent during the reference period. To overcome this scenario the government was left with no option other than to go for drastic structural reforms with a multidimensional approach. These reforms, known as LPG reforms, open up the Indian economy to the global economic scenario with more focus on the neo-liberal framework. The reforms targeted these unsustainable levels of debt on many fronts like increased growth rates, increased revenue collection besides increased capital inflows.

Indian fiscal policy can be categorized under four categories, since LPG reforms of 1990-91. "*Fiscal correction through fiscal contraction 1990-91 to 1996-97,*

[15] Various safety nets were introduced by the government like PDS (1944), ICDS (1975) and MDM (1995). Though PDS was operational since 1944 following the Bengal Famine but the main fillip came in 1965 with the creation of Food Corporation of India.

increasing fiscal imbalance 1997-98 to 1999-00, fiscal correction without fiscal contraction 2001-02 to 2007-08 and global financial crises-induced fiscal expansion from 2008-09 onwards" (Chakraborty and Dash 2013). There was a clear improvement in the debt scenario of the economy with the combined fiscal deficit in the economy slashed to 6 percent by 1996-97. However, this was not a sustainable success story as the scenario again experienced an aggravation with fiscal deficit shooting to a level of 10 percent in 2002-03. "*This level of fiscal deficits was qualitatively much different than that of 1990-91 with higher debt-GDP ratio besides higher interest payments to revenue receipts ratio coupled with the increased share of revenue deficit in total deficit basket*" (Rangarajan and Srivastava 2005). The burden of debt increased from 61.7 percent in 1990-91 to 76 percent in 2002-03. This aggravation was mainly because of two important factors i.e. reduction in tax rates that adversely reduced tax revenues and a continuous increase in the non-developmental expenditures due to casual approach by the government (Puri and Misra 2013).

This development set the stage for the third and fourth phase wherein the government was forced again to introduce checks and balances in the fiscal health of the economy. This led to the emergence of rule-based fiscal control by institutionalizing the deficit financing behaviour of the government. The central legislature came out with fiscal responsibility and budgetary management (FRBM act 2003-04) primarily designed to maintain a certain level of sovereign debt in the economy[16]. The era of rule-based fiscal control experienced impressive success with fiscal deficits declining to 2.5 percent of GDP by 2007-08 and with revenue deficit gravitating below one percent. Since the states have also introduced their state fiscal responsibility acts, though, at different times, there was a significant improvement in the state finances as well. The state performance was attributed mainly to three factors viz., higher own tax revenue generation, increased central shares and reduced welfare spending coupled with reduced interest burden (Chakraborty et al., 2013). The economy was again caught under a stress created by the financial crises of 2008 commonly known as the sub-prime crises[17]. Although the Indian

[16]The act was primarily mandated to eliminate revenue deficits by March 2008 and reduce fiscal deficits below the manageable limits of 3 percent of GDP. The main objectives were to introduce transparent fiscal management, to introduce more equitable and manageable distribution of resources and to infuse long term fiscal stability for the Indian economy.

[17]This crises started with a fall in US house prices and resulted into a multidimensional impact on US economy with its lightening transmission soon engulfed the global economy.

economy did not suffer like many developed economies of the world, yet two transmission channels did contribute to the slowdown in the Indian economy. The recession in developed economies led to a decline in the demand for Indian exports and financial volatility triggered a massive capital flight of portfolio investments by foreign institutional investors (Mundle et al., 2011). The fiscal deficits as a proportion of national abruptly rose to 6.5 percent during 2008-09 and maintained a level above 5.5 percent till 2012-13.

Throughout these episodes of persistent fiscal indiscipline, the government has come up with alternative prescriptions to restore fiscal prudence. These deliberate policies pursued by the government from time to time, also known as consolidation strategies, had multiple effects on other macroeconomic indicators. There has been a plethora of studies assessing the impact of budget consolidation on the growth rate of national income, on general price level, on general interest level in the economy besides its impacts on social and welfare spending. The current study is an addition along similar line pertaining to the Indian economy from 1990-91 onwards. The study will be divided into four main chapters assessing different dimensions of consolidation policies and their impact on the Indian economy[18].

1.4: Organisation of the study

The study will be divided into four main chapters assessing the need, importance, and role of fiscal policy with special reference to consolidation designs, apart from the introduction and conclusion to the study.

1.4.1: Chapter—II

The second chapter will be analyzing the macroeconomic effects of consolidation shocks in Indian economy under alternative economic scenarios. More precisely the chapter will try to highlight the impact of consolidation shocks (shock in the level of deficits) on the macroeconomic aggregates namely Growth, household spending (both consumption and investment), level of inflation, interest rate, exchange rate and BOP situation. The effects of fiscal shocks have been analysed under the alternative external

[18] It needs to be mentioned that the consolidation has been taken to mean a reduction in government spending, wherever mentioned. The tax financed consolidation has been broadly kept out of the ambit of the work except for a limited reference in the Chapter-IV.

economic scenarios prevalent. Three different scenarios have been assumed as No shock, Fiscal shock and Fiscal shock accompanying external economic shock. The fiscal shock will constitute a sustained 15 percent shock to the fiscal deficit over the reference period in order to make it come well below the 3 percent level. The external aggravation in the world economy (especially in the backdrop of US withdrawal from Iran nuclear deal and its possible sanctions on Indian oil imports and US-China trade war and its possible impact through the export channel) will be captured through appropriate shocks to export and import functions. The import function has been given a 4 percent shock and the export function has been given a shock of 5.5 percent[19]. The outcome of both the scenarios will be evaluated and compared with the base scenario i.e. No shock scenario.

1.4.2: Chapter—III

The chapter will examine the monetary-fiscal interaction in the Indian economy and the impacts of consolidation policies under alternative monetary regimes. This will be in the backdrop of a surge in the interplay of monetary and fiscal policy interactions both in developed and developing economies especially post-financial crises of 2008. More precisely the chapter second will try to address the following questions:

1. What is the type of interaction between monetary and fiscal policies i.e. whether fiscal policy dominates or its monetary dominance?
2. Which policy is more effective as a tool of economic stabilisation - monetary or fiscal policy?
3. How alternative monetary policy regimes influence the effects of fiscal shocks on the macroeconomic indicators mainly growth rate of output.

1.4.3: Chapter—IV

This chapter will empirically estimate the effects of the composition of a consolidation plan on its success or failure. Since there has been ample empirical evidence suggesting a profound impact of the composition of consolidation on the

[19]The shocks have been calculated under various possible scenarios. The POL constitutes around 23 percent of total imports (with around 25 percent from Iran) and hence an assumed shock of 50 percent besides other adjustments culminates into 4.46 percent shock to total import bill. Similarly, the exports because of POL constitute around 11.94 and a 50 percent decline will lead to a 3.5 percent decline with an overall decline to the tune of 5.5 percent (along with other impacts like reduction in exports to US and China).

success or failure of an adjustment especially for developed nations. We will be testing the impact of both front-loaded and back-loaded consolidation designs and their relevance for the Indian economy. Under this scheme, the main thrust will be the capital expenditure financed vs. government spending financed consolidation designs. More specifically the chapter-IV will try to address the following two questions:

1. What is the impact of back-loaded fiscal consolidation on the growth rate of income?
2. Is there a difference between sources of financing deficits i.e. relative desirability of internal and external sources of financing budget deficits?

1.4.4: Chapter—V

Chapter V will be analysing the possible impacts of budget consolidation on social and welfare spending. This section will highlight the existing social sector scenario of Indian economy and will try to find if there exists a possibility on part of the government to curtail its welfare spending to maintain its fiscal equation. The chapter will try to highlight the effects of both income and fiscal shocks via direct and indirect channels on the level of social and welfare spending. More precisely the study will focus on the impact of fiscal consolidation in the spending on education and health besides welfare and sanitation. This is because India being a developing society exhibits a wide range of poverty and deprivation that cannot be left unaddressed at the mercy of market forces.

1.5: Contribution

The estimation and analysis of the above-specified series of objectives have made certain contributions to the literature to both fiscal and monetary policy analysis pertaining to Indian economy, though with an explicit focus in favor of former. Some of the main literary contributions following from the study include:

At the outset, in chapter-II, the thesis provides a comprehensive and eclectic theoretical macro-econometric model for India. The causal structure of the model is simultaneous in nature developed for policy simulations. The model takes into consideration both demand and supply-side factors. The simplicity of the model is a deliberate attempt, in order to whip out black box causal effect relationships and make

them transparent, as it happens in large scale macro models. The study adds to the literature on Indian economy from many perspectives, though one seeks the special mention. The study is the first of its kind for the Indian economy, to our knowledge, that explicitly tries to capture the external uncertainty and its impacts on the Indian economy. Although there have been many scholarly exercises aimed at assessing the impact of consolidation shocks (reduced government spending) on the macroeconomic indicators but none of them has an explicit focus on the external shocks (Mundle et. al 2011 and Tapsoba 2013). Some of the conclusions of the study were in consonance with the existing literature while others were at variance. The study found that under normal economic conditions and in the short run there are signs of Keynesian impacts of fiscal shocks. But in case of medium and long run the effects fiscal shocks seem to be expansionary under the assumption of strong crowding-out effect. However as the external instability via the channels of import and export functions are incorporated the results show a marketed change. The study found that a consolidation path followed under an uncertain and fragile external economic scenario may prove to be a disaster for the whole economy and loses in terms of output will be severe.

In terms of relative effectiveness as in chapter—III, the study quoted mixed results. For instance, both fiscal and monetary policy shocks are found to negatively affect the GDP in short-run. However, the impact of a fiscal shock though substantial is short-lived as compared to the monetary shock that is prolonged. This implies though monetary policy enjoys an advantage over that of fiscal policy, but the impact of fiscal policy has not waned away. These findings corroborate the earlier findings by R. Khundrakpam & Das (2011), RBI report (2013) and S. Arora (2018). In terms of effectiveness, the study found that fiscal policy may be a better tool for economic stabilization in the short-run but in medium and long-run it may harm growth. However, the monetary policy performs better in terms of interest rate and inflation. The similar findings have been quoted by R. Khundrakrakpam et al., (2011).

So far as the question of the effects of consolidation policies on growth rate of income in the short run is concerned, the study found that consolidation measures are recessionary in nature. However, in the long run, the consolidation measures are found to have non-Keynesian effects. Similar results were arrived at by K. Clinton et al., (2011)

and N. Pashourtidou et al., (2014). The consolidation programs pursued under alternative monetary stances yield different results depending upon the monetary regime. A consolidation program pursued under a contractionary monetary policy has substantial costs in terms of output forgone. While as a fiscal prudence plan pursued under an expansionary monetary policy stimulates economic growth even in short-run. Thus instead of having a sole thrust on fiscal policy as an economic stabilization measure and a tool to fiscal prudence, there should be more focus on a balanced and judicious mixture of both the policy instruments in case of Indian economy.

So far as the question regarding the impacts of the composition of a consolidation effort on its relative success or failure is concerned the study, in chapter—IV, we found that composition of expenditure can have a significant impact on the success or failure of a consolidation program. More productive and judicious use of over-all public expenditure is pre-requisite for boosting the long-run growth rate. However, the consolidation achieved by slashing down the general expenditure of the government may trigger a possible decline in economic growth and is in complete contrast with the established literature. The above analogy does not pertain to all types of government expenditures. A better and integrated targeting of expenditures like subsidies and transfer payments may enhance the growth rate of income. The study could not document the support for the negative impacts of front-loaded fiscal consolidation funded mainly by tax and non-tax revenue increases. Rather under both the empirical exercises the increase in both tax and non-tax revenue was found to be growth augmenting. Moreover, this is the first such study in the case of Indian economy trying to analyze the efficiency of different ingredients of a fiscal shock and their relative importance on economic growth.

The chapter—V followed from the previous three chapters with the basic premise of assessing the possible impacts of consolidation shocks on social and welfare spending in the Indian economy. More specifically the chapter tried to analyze the debt dependence of social sector spending and tried to highlight the possible scenario post-financial shock. The results extend the support to the earlier findings regarding the potential impact of deficit financing on welfare spending. The deficit spending is found to positively contribute to the spending on education and scientific research and is in line with the existing literature. The study also documented a substantial dependence of social and

welfare spending on the growth rate of income. Thus a fiscal shock will transmit a negative shock to social and welfare commitments both directly (through a shock to deficit financing) and indirectly (through a deficit induced decline in national output).

Chapter –--II
Fiscal Consolidation and its Macroeconomic Impacts: A Simulation Approach under External Economic Instability

2.1: Introduction

The Fiscal stimuli as a tool to mitigate the impacts of the business cycle, at least in short-run, have been in use especially post treaties by Keynes. The frequency and magnitude of such stimulus, however, vary across developed and developing countries with latter having more welfare commitments. The fiscal stimulus entails certain costs in terms of higher debt burden, higher interest burden besides crowding out and inflation in case of scarce resources (Clinton et al., 2011). These costs, besides many more, necessitate the need for fiscal consolidation to intact fiscal prudence and pave way for fiscal space of the government. However, a consolidation program is always associated with costs in terms of both fiscal and economic sacrifices (Gruber 2011). Moreover, all the consolidation strategies adopted from time to time were not successful in terms of their anticipated objectives. Thus there does not exist much unanimity among the researchers about the effects of fiscal consolidation on the macro-economic indicators of an economy. The severity of the disagreement was magnified following the fatal attack on the Keynesian premise that fiscal consolidation has the potential to contract the growth rate of income, at least in short-run[20].

The Keynesian school of thought, as we knew it, attached primary importance to the institution of government as a stabilizing agency to regulate the economy especially in face of economic shocks. This stand advocated by the Keynes was mainly on account of his belief about the inability of the markets and private agents to fight the depressions. These tendencies of the private economic agents that follow what is termed as "*Animal Spirit*" may well lead to the magnification of crises rather than the stabilization[21]. Thus the government was mandated to creep in to help the market forces and to work in

[20] This analogy mainly followed from the analytical framework of the celebrated Keynesian national income identity where the government expenditure explicitly assumes the role of determining the level of national income.

[21] Animal spirit as used by Keynes simply refers to human behaviour that can be measured by consumer confidence or trust. This consumer confidence varies directly with the changes in the economic environment *per-se.* Thus a depression will bread further pessimism and a prosperity leads to further optimism, *Ceteris-paribus*.

complementarity with the private sector to fight the possible downswings[22]. However, the government in order to perform its functions need to raise resources to expedite. These resources either come through the channel of revenue in the form of taxes or through the channel of borrowings. Given the insignificance of own revenue, the government has to search for possible creditors who can finance government spending. These borrowings, however, come with a multitude of costs like interest burden in case of the foreign source and both interest burden and crowding-out in case of domestic. These borrowings always have the potential to defeat the purpose especially so if the rate of return from these borrowings is not sufficient enough to cover the interest burden they fuel.

This was the case mainly from 1970 to 1980 all through the globe when the unsustainable debt levels led to the fear of fiscal insolvency among policymakers (Musgrave and Musgrave 1959). This burden of heavy public debts with the possibility of undermining the effectiveness and relevance of fiscal policy led to the debate about the consolidation of government finances. As cited above the consolidation strategies assumed importance given the influence of such policies on different sectors of the economy. However, the main debate that assumed centre stage was the possible effects of consolidation policies on the level of national income. In fact, it was a debate between the Keynesian and non-Keynesian schools of thought followed by the different analogy and governed by different sets of assumptions (see N. Gruber 2013; Laxton et al., 2010; O. Blanchard et al., 2002). The Keynesian economists hold that government assumes a significant influence on the quality and quantity of economic activity[23]. Thus a shock to the government spending may well culminate into a down-swing which if left unaddressed may turn into a complete recession. On the other side of the debate the non-Keynesians hold that government spending is just an alternative to the private spending and the government expenditures are usually financed by the crowding-out of private investment. They contend that this crowding out of private investment may well prove

[22] This government mandate was extended especially for two reasons viz., either if the market fails to provide the goods and services or if the provision is socially not desirable.

[23] In case of Indian economy, as of 2017-18, the government expenditure constitutes about 16 percent of the total GNP. If all the channels are added up it may go up to the mark of 23 percent (calculated by author from RBI data set).

detrimental to the long-run economic growth. Moreover, they question the government as an institution on the parameters of efficiency and desirability both private and social.

The initial attack on the Keynesian wisdom about the contractionary effects of fiscal tightening came in the form of two case studies related to Denmark (1983-1986) and Ireland (1987-1989). These countries experienced a substantial expansion of their economic activity during and after these consolidation programs and were well at odds with the Keynesian reasoning. This led to a phenomenal increase in the literature with an explicit focus on evaluating the impacts of consolidation shocks on national output with many finding positive effects. However, there is yet any unanimity to be arrived as the number of studies documenting non-Keynesian effects are almost at par with the studies that concluded with the traditional findings. The main lines of reasoning among these studies, though different, are the values of fiscal multipliers, effects of expectation and the compositional consideration that may give rise to differential outcomes.

The opponents like Araujo et al., (2012) held that the consolidation design based on spending cuts with an accommodative monetary stance may have non-Keynesian effects on the growth rate of income. Similarly F. Giavazzi et al., (1995), in their seminal on non-Keynesian effects of fiscal shocks found evidence for positive effects via the channels of interest rate, asset values and more importantly via private-sector expectations. Yet in another effort, S. Gupta et al., (2005) tried to find the impact of consolidation shocks on the national output of an economy. The author concluded that the fiscal consolidation and their expected effects are significantly influenced by the composition of such programs. The other studies extending their support either partially or fully include the seminal by Alesina et al., (1998) for Italy; Dornbusch (1989) for Ireland; Hauptmeier et al., (2007) for Sweden, Canada, and Finland; McDermott et al., (1996) for OECD, etc. These studies apart from extending support to non-Keynesian results of fiscal shocks also stress the patterns, composition, and persistence of such programs.

The other camp to the debate, while extending some serious and more valid blows to the anti-Keynesian school, arrive with more resilient defence for their parental ideology. The study by Nicoletta et al., (2014) for Cyprus economy found, "*that the fiscal consolidation followed irrespective of the channel will lead to a fall in national*

income driven by the negative responses of investment, private consumption, and employment". Similarly, Aarle et al., (2003) using the celebrated consumption function by Giavazzi et al., (2005) could not find support for the non-Keynesians effects of consolidation measures for EU over the reference period. Extending further support to the Keynesian stand, Berkmen (2011) tried to highlight the similar concern wherein the potential impact of fiscal consolidation was evaluated using the Japanese economy. The study documented short-run pains of consolidation mainly on account of increase in consumption tax and consequent reduction in spending. However, there are long-run gains because of less distortionary taxes, improved confidence, better private investment, etc.

The above inheritance has been continued even in the case of studies related to the Indian economy. We came across multiple studies evaluating the impact of fiscal contraction on the growth rate of national output of India. There are studies that extend support to the Keynesian framework besides there being alternative studies extending support to the non-Keynesian doctrine, though under certain specifications. In his seminal on the Indian economy, Mundle et al., (2011) have tried to find the consolidation path for the Indian economy in consonance with a high growth rate. The study documented the finding that it is possible for the Indian economy to achieve the desired growth rates while its march on the consolidation path. The results were arrived at under the assumed scenario of higher crowding-in of private investment and better buoyancy of tax revenue. In similar reasoning, Bhanumurthy et al., (2015) tried to find if it is possible to target debt in Indian economy while maintaining a healthy growth rate of income. The authors concluded with the finding that it is quite possible that the government can keep its level of debt well within the manageable limits while experiencing healthy growth rates especially on account of rising capital expenditures and rising direct transfers.

The other group exhibiting their presence have made many significant and relevant scholarly additions to the Keynesian school of thought. Sanhita (2012) had tried to evaluate the need, relevance, and effectiveness of consolidation measures for the Indian economy especially post-financial crises of 2008. The author had documented that the piecemeal nature of reforms coupled with excessive revenue expenditure are the main

culprits of fiscal failure. Moreover, the study documented the role of improvement in the relation between centre and state fiscal relations for more integration into a consolidation design. Taking aid from multi-region Dynamic Stochastic General Equilibrium (DSGE), Tapsoba (2013) had tried to quantify the macro-economic effects of three alternative adjustment scenarios for India: growth-friendly, social-friendly and a benchmark case. The study found that "*the short-run growth cost is highest for government investment and consumption and lowest for transfers. However, in the long run, consolidating via public investment is most costly, while lower transfers yield significant output gains besides substantial debt reduction*".

However, this was not the sole debate concerning the fiscal consolidation programs as the much more important was the fact that not all of the programs were successful in terms of the anticipated results. So apart from the Keynesian vs. non-Keynesian debate, the literature experienced a proliferation analyzing the success or failure of a consolidation design. Over time the scholarship took to deeper levels analyzing the possible determinants of success of a consolidation plan both in terms of fiscal and economic effects. Besides the composition of a consolidation design, "*the political factors were found to be significant determinants of the relative success or failure of fiscal consolidation"* (Alesina and Perotti 1996). McDermott and Westcott (1996) found that the relative mix of consolidation between spending reduction and revenue increase has a favourable impact on success or failure of a fiscal contraction.

The current study is an addition to the already existing literature analyzing the impacts of consolidation policies on the key macro-economic indicators in case of Indian economy. For almost last one and a half-decade, the Indian authorities have tried very hard to contain their galloping debt position, but seem to have achieved least success due to various reasons (Tapsoba, 2013)[24]. The shock of global melting down, political commitments and fiscal multipliers may take substantial blame of the pie (Corsetti et al., 2010; Baum et al. 2012; Blanchard and Leigh 2013). Consolidating fiscal scenario of the Indian economy is an unavoidable and inescapable challenge to boost the private sector performance, reduce effluence in expenditures, reduce the future interest burden and

[24] Except the year of 2007-08, the fiscal deficit of the union government has never been below 3 percent of GDP from 1990 onwards.

prepare for some more fiscal disturbances that may require more stimuli. However, decisions to go for fiscal consolidation are dynamic and need to be executed with extra care and precaution as it involves trade-offs at various levels of economic activity. Several studies show that fiscal adjustments are expected to yield better results in a supportive environment than otherwise (Baunsgaard et al. 2012; Mundle et.al 2011). The composition, credibility, persistence are yet other areas to be under consideration while marching for a consolidating path.

Given the above-cited literature regarding the need, importance, and effectiveness of consolidation strategies, the present study tried to highlight the impact of fiscal shocks on different macroeconomic indicators under alternative economic scenarios. The key macro-economic indicators included are output, consumption, investment, inflation, interest rate, exchange rate and balance of payment situation. Three different scenarios have been assumed as No shock, Fiscal shock and Fiscal shock accompanying external economic slack. The fiscal shock will constitute a sustained 15 percent shock to the fiscal deficit over the reference period in order to make it come well below the 3 percent level. The external aggravation in the world economy will be capture through appropriate shocks to export and import functions. The import function has been given a 4 percent shock and the export function has been given a shock of 5.5 percent[25]. The outcome of both the scenarios will be evaluated and compared with the base scenario i.e. No shock scenario.

2.2: Literature Survey

There is an acute imbalance in the literature available for the Indian economy and that available for other countries or group of countries. We will present a precise review of the studies concerning the issue in a chronology starting with the studies showing positive impacts of consolidation followed by studies showing otherwise. Thus the first section will include all the studies concerning both India and other economies of the

[25] The shocks have been calculated under various possible scenarios. The POL constitutes around 23 percent of total imports (with around 25 percent from Iran) and hence an assumed shock of 50 percent besides other adjustments culminates into 4.46 percent shock to total import bill. Similarly, the exports because of POL constitute around 11.94 and a 50 percent decline will lead to a 3.5 percent decline with an overall decline to the tune of 5.5 percent (along with other impacts like reduction in exports to US and China).

world with the general conclusion of non-Keynesian effects. The second section will include all the studies concerning India and other economies with the conclusions favouring Keynesian conclusions. The main focus of the review has been on methodology and the results arrived at.

2.2.1: Studies with non-Keynesian effects

In the camp of supporters, F. Giavazzi et al., (1995), in their seminal on non-Keynesian effects of fiscal policy changes have tried to empirically validate their earlier findings for Danish and Swedish economy. The authors have analyzed 19 OECD countries during the period of the 1990's to document the support for their earlier anti-Keynesian findings. The authors were able to draw broad support for their finding that the fiscal consolidation if implemented properly can have non-Keynesian effects via the channels of interest rate, asset values and more importantly via private-sector expectations. But the authors further contended that for the fiscal policies to have non-Keynesian effects they should have two attributes of voluminous and persistent. Moreover, such results are not present only via the channels of public consumption rather can equally penetrate via the channels of taxes and transfers. Thus as against the celebrated Keynesian laws of least austerity, the authors established the further scope for the austerity to actually work for the national good.

Robert Perotti et al., (1996) tried to highlight the impact of the composition of consolidation on macroeconomic aggregates. The author found that the consolidation aimed at by the cuts in social security and wage bill component of government is more persistent than the one aimed through the labour-tax increase and the capital spending cuts. The paper challenged the conventional wisdom of consolidation and demand nexus; rather they cited the cases of high fiscal consolidation leading to high private consumption. They also hold that consolidation usually is accompanied by higher growth and lesser unemployment depending on the composition of consolidation.

A. Zaghini (2001) tried to analyze the association between fiscal contractions, permanent improvement in public finances and short-run economic performance . He tried to analyze the effect of characteristics of fiscal consolidation on the macro-economic indicator. The feature of composition, magnitude, and persistence are focussed in the current study. The authors highlighted two important facts. The study found that the adjustments that relied heavily on primary expenditure cuts were more successful.

The second finding of importance and relevance for the developing economies was the measures that were adopted for persistently long periods of time were more successful. So the main ingredients of success for the fiscal consolidation were the elements of composition and persistence. On the other hand, the measures that heavily depended on the tax side of the policy were mostly welcomed by the failure. The successful shocks were to persistently seen to keep for a period of around three years while those of failures kept mainly for one or one and a half years.

In his seminal on the Indian economy, Mundle et al., (2011) tried to find the consolidation path for the Indian economy in consonance with a high growth rate. Using the NIPFP-modified general equilibrium model of Tinbergen tradition, covering the time period from 1991-92 up to 2008-09, the authors have found that it is possible for the Indian economy to achieve the desired growth rates while its march on a consolidation path. The model has been estimated under two potential scenarios for the external economy viz., *Pessimistic* and *Optimistic* growth performance besides the volatility of international crude prices. The strategy highlighted by authors is to slash down revenue deficit by 2014-15 while maintaining 6 percent fiscal deficit both for States and Union. Though the results experience a certain magnitude of fluctuation once evaluated under alternative scenarios of the external sector, but the broad conclusion of the work holds in either of the scenarios.

Clinton et al., (2010) in a review attempt tried to evaluate the efficacy of consolidation shocks using IMF's modified global dynamic general equilibrium model (GIMF). The paper, in essence, emphasis the evident trade-off between short-run pains and long-run gains of fiscal slashing. The possible negative impacts may arise due to negative multiplier effects as a result of lower overall spending or as a result of higher tax rates. However, the stimulus may emerge from the reduced global interest level besides a reduction in tax distortions accompanying reduced level of deficits. Both pains and gains can be measured in terms of output gained or loss leading to similar results. However, the magnitude of pains and pleasure may depend upon a multitude of factors like lack of initial credibility of fiscal policy. Secondly, if the consolidation program carries a design of reduced essential public investment and increased tax levels, there may be a substantial reduction or no gains at all from a consolidation program.

Araujo et.al (2012) have analyzed consolidation framework along two dimensions of infusing fiscal stability and to evaluate the impacts of different monetary stances for consolidation measures. Applying dynamic stochastic general equilibrium (DGSE) modelling under different generated simulations covering the period from 1995 to 2011, the authors have tried to assess the possible impact of fiscal consolidation on the Brazilian economy. The authors document the important role that fiscal consolidation has played in the growth trajectory of the Brazilian economy. Though with different magnitudes and intensity both public revenue and government spending has the potential to yield the desired outcomes. However, in the case of accommodative monetary policy, the results markedly show a difference for the impacts of consolidation measures on the inflation scenario of the country. Moreover, the better scenario was the spending cuts followed under an accommodative monetary stance in the economy.

Antonio et al., (2012) in a study have tried to assess the impacts of fiscal policy on the macro-economic indicators. They tried to find out the effects on GDP via private spending (both consumption and investment) channels following an initial change in fiscal policy. The effect of budgetary policy on asset prices has also been versed upon. The fiscal policy has been disaggregated into two streams of spending shocks and revenue shocks. The spending shocks have been found to exhibit positive but small influence on GDP, varied impacts on private consumption and investment, enhancing influence on housing prices, negative but quick influence on stock prices and positively associated with the general price level. However, government revenue shocks have a positive association with both GDP and Investment, direct effect on stock prices but the varied influence on housing prices, no determined price effect but exhibiting varied effects on the rate of interest. The authors further penned down that the government adjusts its fiscal imbalance in response to debt development.

Following the recursive nature of economic slowdowns and the fiscal stimulus thereupon, an intense intellectual debate is going on over the possible consequences of both fiscal shocks and stimulus. Axing around the same line of reasoning, A. Afonso et al., (2012) had tried to investigate macroeconomic impacts of fiscal policy for a group of four countries (US, UK, Germany, and Italy). Using Bayesian structural vector auto-regression (B-SVAR) covering different scenarios over the time period from 1970 to 2007, the authors have made some interesting conclusions. Under the base scenario of

zero feedback from government debt; both government spending and revenue shocks were found to have similar outcomes, though with a bit of difference in magnitudes. However once the debt feedback is taken into consideration, both GDP and interest rates became more responsive and the impact of policy changes became more persistent. The authors finally concluded that the debt level acts as a stabilising factor for the primary budget balance that works through different transmission channels.

In a similar attempt, Huixin et al., (2013) tried to find the impact of consolidation strategies in an uncertain framework using the expectations of economic agents. The authors tried their analysis on the already build-up model of Alesina and Ardagna (2010) for OECD countries over the time period 1970-2007. The composition, duration, monetary policy stance, and expectations all were found to be significant determinants of success or failure of consolidation plans. The three main findings of the study are, "*firstly restrictive economic conditions are required to generate expansionary fiscal consolidations in the medium term. Second, the possibility of observing 'expansionary' fiscal consolidations is driven by the favourable resolution of uncertainty associated with undesirable types of consolidation, either in terms of their composition or timing. Thus the government needs to actively work towards this end to make it sure that the desired results are arrived at. Third, the inflationary consequences of alternative financial instruments and the monetary policy response to inflation are very important in determining the outcomes. In other words, the tax-based and spending-based consolidations are fundamentally different depending upon the nature of the economy*". Thus the final conclusion that the authors arrived at is that expansionary fiscal policies are unlikely to accompany ongoing consolidation efforts.

Alesina et al., (2014) had tried to estimate the response of Macroeconomic indicators to changes in fiscal policy. The study has been conducted for 17 OECD countries covering the time period of 1978 up to 2009 using narrative analysis. The study tried to evaluate the relative feasibility of tax-based or spending-based fiscal consolidation in terms of their potential impacts on national income. The authors documented the finding that the tax-based consolidations are found to create prolonged recessionary scenarios while the expenditure-based efforts induce long term growth. The authors have utilized the movement and behaviour of private investment to analyze the

above-cited results wherein the confidence of investors assumes a greater role. This investor's confidence is seen to be less responsive to the expenditure channel rather than the tax channel wherein the shock lasts for many periods ahead. However, the authors further concluded that the results were not seen to be sensitive to monetary stance nor they show sensitivity to the cyclical fluctuations.

2.2.2: Studies with Keynesian effects

Aarle et al., (2003) have tried to analyze the episodes of fiscal consolidation in the EU during their transition to EMU covering the time period from 1990-98. Using the celebrated consumption function by Giavazzi and Pagano (1996); "*they have tried to find support for the non-linear relationship between fiscal adjustments and private consumptions. The tests have been performed using the initial conditions, persistence, and largeness, their combined effects, the successfulness of fiscal adjustments and special requirements as demanded under the treaty of Maastricht"*. For the robustness of results, the authors have also conducted the sensitivity analysis covering non-EU countries and for a different time period. However, in all the cases the authors could not develop strong and significant support for the non-linearity in effects of fiscal adjustments. Though, some favourable evidence for non-linear effects are found for government consumption and private spending. Thus the study could not find support for the non-Keynesians effects of consolidation measures for EU over the reference period.

Sanhita (2012) has tried to evaluate the need, relevance, and effectiveness of consolidation measures for the Indian economy especially post-financial crises of 2008. Using the basic regression model with its usual OLS form, covering the time period from 1980-81 up to 2008-09, the author has tried to find out whether the hypothesis of crowding out stands relevant. Moreover, the authors have tried to estimate the impact of election cycles on being either fiscally prudent or vice-versa. The author had documented that the piecemeal nature of reforms coupled with excessive revenue expenditure is the main culprit of fiscal failure. Post-FRBM the scenario saw a bit of improvement but it was mainly from the side of the states especially by curtailing their social sector spending. The author further contends that the capital expenditure is quite low and needs to be augmented given its role in the growth rate. However, the author could not document enough support for the election cycle as a determinant of fiscal imbalance. The

novel aspect that the author highlighted to regulate the fiscal discipline is to re-look into the fiscal relations between the centre and state governments.

Taking aid from multi-region Dynamic Stochastic General Equilibrium (DSGE) model, Tapsoba (2013) had tried to quantify the macro-economic effects of three alternative scenarios for India: growth-friendly, social-friendly and a benchmark case. The study concluded that "*the short-run growth costs are highest for government investment and consumption and lowest for transfers. However, in the long run, consolidating via public investment is most costly, while lower transfers yield significant output gains besides substantial debt reduction. This validates the finding that the long term benefits of fiscal consolidation are substantial despite short term losses*". However, a consolidation accompanied by public investment and social spending is found to have better medium-term gains besides paving way for substantial long term expansion.

Pashourtidou et al., (2014) has tried to assess the potential impact of fiscal consolidation policies on the macroeconomic indicators of the Cyprus economy. The authors have employed the recently developed Factor-Augmented Vector Autoregression, to highlight the effects of consolidation policies on key economic indicators like growth, inflation, private spending, investment, and interest rate. The aid has been taken from quarterly data covering the time period between $1995Q_1$ to $2013Q_2$. Both the spending and income-based consolidation scenarios have been evaluated, besides the simultaneous shocks to both the government spending and revenue streams. The authors found that the fiscal consolidation followed irrespective of the channel will lead to a fall in national income driven by the negative responses of investment, private consumption, and employment. As a result of the contractionary effect on the aggregate economic activity the inflation decelerates. However, the consolidation based on expenditure reduction results in a large contraction in output than via the channel of revenue increases, especially in the medium term. Although such a finding is in sharp contrast with the already existing literature the authors have advocated a multitude of possible explanations. However, the short term results are in consonance with certain well-established studies regarding the EU, Germany, UK, and USA.

The debate for checking deficits dates long back to the writings of Austrians. The Austrians believe in real austerity rather than the nominal one as suggested by both

Keynesians and the IMF. Mark Thornton (2013) sketched down the real austerity while discussing its implications for the free market. As against the belief and convention, the real austerity is not completely against the deficits but it implies timely rechecking of deficits. The author cites the examples of certain European countries like Latvia who follow strict austerity and enjoy the highest growth rates throughout Europe. The author holds that real austerity may be difficult but not severe. It may have short term losses but it always has the long term gains. The author holds that the main burden of the austerity has to be borne by the government sector in the form of wage and other benefit cuts. The real austerity works better with tax cuts as claimed by the author.

Fiscal consolidations do exhibit influence on the distributional and social aspect is long recognized. Using the data for OECD countries over a time period of 17 years ranging from 1978-2009, concerning the main events of fiscal consolidation, the authors Laurence Ball et al., (2013) has tried to analyze the distributional effects of the fiscal consolidation. The authors have found that over time the fiscal consolidation policies have led to an increase in inequality. The share of the wage income has declined over the reference period. These shocks have also contributed heavily to the levels of unemployment in these economies. The authors hold that the fiscal measures carried out by the government should be evaluated in terms of social desirability also. The benefits to be gained from the consolidation should be discounted for the magnitude of inequality created therein. So the authors hold that such aspects of the concept should be given consideration and they, in the long run, possess the potential to halt the growth rates promised by the consolidation path. So while going for these long term targets the policymakers should always keep this in mind that the only objective is not to reduce deficits but social justice is the essential requirement.

Analyzing the conditions of quality and environment for the success of consolidation measures there has been a well-documented arena of research. Extending the same line of literature Hagen et al., (2001) have tried to find the importance of the quality and environment for the success of consolidation measures for the OECD economies from 1960 to 1990. The authors found that both the quality and environmental conditions were found to have profound effects on the success of the consolidation measures. Under the quality of consolidation, the authors have sketched the relative importance of the expenditure and revenue financed consolidation. The authors hold that

consolidation is more successful when the government tackles politically sensitive expenditures like wages, subsidies, and transfers. The economic environment in both domestic and international economic arenas also exhibits a dominant effect on the success of fiscal consolidation measures. The authors have also tried to highlight the role of the Maastricht treaty for achieving the consolidation during 1990. However, the empirical evidence does not show a strong Maastricht effect inducing government for the stringent measures for consolidation.

Stressing the concern for the escalated debt position of governments especially post-financial crash, there have been diverse debates about possible initiation of fiscal consolidation to overcome the scenario. In the same line of decadency, Cogan et al., (2013) has attempted a fiscal consolidation strategy for the US economy. The authors have employed structural macro-economic models to estimate the impacts of fiscal tightening with wage-price rigidities. The authors estimated a path wherein both government's spending and transfers are slashed to contain public spending. Given the forward-looking nature of economic agents, the authors found that even in the short run the consolidation may lead to expansionary effects; contrary to many studies. The authors cite three possible reasons for such an outcome viz., firstly lower public spending means lower taxes and higher personal disposable income and hence higher private demand. Second lower taxes imply lower distortions implying incentives that stimulate both output and employment. The third possible explanation given works via reduced exchange rate following reduced spending and reduced deficits which may further stimulate exports and hence national income. Finally, the article cites the credibility of consolidation efforts as the dominant channel helping in yielding expansionary results post fiscal shock and hence the success of the fiscal policy.

Following the record level of debt attainment by the Japanese economy, the need for intervention via the channels of consolidation and reforms increased. Berkmen (2011) tried to highlight the similar concern wherein the potential impacts of consolidation shocks are evaluated using the Japanese economy. The author took the aid of the IMF's modified Global Integrated Monetary and Fiscal (IMF-GIMF) model. The paper texted the short-run pains of consolidation consumption taxes and consequent reduction in expenditures. However, there are long-run gains especially watered by less distortionary taxes, improved confidence, better private investment, etc. The study further found a

substantial role for the structural reforms to mitigate the short-run losses of consolidation path. This may act as a supply-side stimulus to counter the demand side shock for the Japanese economy. The author gives due importance to the external economic scenario in determining the total impact of fiscal slashing. However, they attached a dominant role to the domestic policy as compared to the purely exogenous external environment**.**

2.3: Data description and Methodology

The data employed for the current study constitute a set of nineteen variables divided into control and target variable[26]. The annual data pertaining to the variables has been put to use from 1980-81 up to 2016-17. The prime lending rate has been used as a proxy to reflect the policy rate as it is the most possible suitable rate reflecting the monetary sector responses.[27] GDP deflator has been used as an index for inflation given its neutrality towards the weight and composition of different indexes. It is a better and comprehensive indicator of over-all inflationary movements in the economy. Given the prominence of the US dollar in Indian trade index, the exchange has been taken as the rupee value of the dollar. The data for almost all of the variables has been taken from Reserve Bank of India (RBI) besides Economic and Political weekly research foundation along with the ministry of statistics and program implementation (MOSPI).

The methodology has been bifurcated into two parts. The first part presents the estimation of individual equations representing different sectors of the economy. The second part consists of the estimation of the general equilibrium model and analyzing the effects of different policy simulations. The model used in our current study is a Keynesian origin-Tinbergen modified model trying to capture the interactions in an economy[28]. The model will be covering four blocks of the economy, though in a limited manner.

[26] Model has been estimated for the variables; GDP, house-hold spending, government spending, total investment, total government spending, government employment, BOP deficit, Exchange rate, interest rate, inflation rate, Exports, Imports, Total revenue, Total expenditure, FD, PD and RD.

[27] The prime lending rate is "*the average rate of interest charged on loans by five major lending institutions namely IDBI, IFCI, ICICI, IRBI and SFCs*".

[28] For deeper insights and analysis regarding the model and its composition refer to Mundle et al., (2011).

2.3.1: Macroeconomic Block

The aggregate demand in the economy in period "*t*" *(Y_t)* is given as:

$$Y_t \equiv C_t + I_t^p + I_t^g + G_{ct} + (X_t - M_t) \quad \ldots\ldots\ldots\ldots\ldots 2.1$$

Where C_t, I_t^p, I_t^g, G_{ct} represent Private and government consumption and investment functions, X_t is the total of exports both visible and invisible and M_t is the total imports included both visible and invisible. However, the final estimation has been carried following certain aggregations.

2.3.2: Household Block

The household block is to be represented by two variables i.e. Private consumption and private investment. The nominal consumption of the household (C_t) is given by:

$$C_t = \delta + \theta Y_t + \gamma C_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2.2$$

Here the variables expediting the normal notations will represent the national income and the auto-regressive term capturing the past movement of the variable itself with the restriction that neither the intercept nor the marginal propensity to consume (MPC) will be equal to zero ($\gamma, \delta \neq 0$).

The investment function is assumed to be the function of the level of income, rate of interest and the past level of investment adjusted for depreciation with the following specification

$$I_t^p = \delta + \partial Y_t + \alpha r_t + I_{t-1}^p + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots 2.3$$

Although, the business conditions prevailing in the economy may have an impact on the saving behaviour of private economic units, but for the sake of simplicity the element of business expectations have been assumed constant. Rest of the specifications will be the same.

2.3.3: Government Block

The government block like household block has been segregated into two channels of investment and current nominal consumption, besides government employment. However, for the sake of better understanding and effective analysis, the combined streams are also estimated under the heading of government total spending. The total government investment is given by:

$$I_t^g = \delta + Y_t + I_{t-1}^g + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots 2.4$$

Where I_t^g will be representing the total investment by the government in the time period "*t*". The right-hand side will be representing the level of national product in the economy besides the past levels of investment undertaken by the government.

Government consumption expenditure is assumed to follow the following specification:

$$C_{gt} = \delta + Y_t + FD_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots.. 2.5$$

Here the consumption pattern of the government will be taken to be dependent on the level of income besides the deficit financing potential of the government. However, the consumption is also heavily decided by the level of both tax and non-tax revenues accruing to the government. The revenue stream of the government is assumed to be identically a function of capital receipts and revenue receipts.

$$TR_t \equiv f(CR_t, RR_t) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2.6$$

The revenue receipts may be further segregated and may show a complete dependence on the tax buoyancy that is a policy variable under the discretion of government[29].

The fiscal burden of the government captured through fiscal deficit has been hypothesized to have the specification given by

$$FD_t = \delta + GTS_t + FD_{t-1} + \mu_t \ldots\ldots\ldots\ldots\ldots 2.7$$

Though the fiscal deficit is a resultant of the government's total spending; but it is arrived at via the identities of primary deficit and revenue deficit in a given time period.

The combination of both the government nominal consumption expenditure and its nominal investment has been estimated under the combined heading of government total spending with the following specification:

$$GTS_t \equiv GINV_t + GCE_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots.... 2.8$$

[29] The tax buoyancy is a policy parameter and is partially a determinant of total tax revenue besides tax elasticity which represents the autonomous component of tax revenue. However, the debate is out of the scope of the current study.

Besides government total spending, we have estimated another identity of relevance for the current study as total investment with the following specification:

$$Tinv_t \equiv Ginv_t + Pinv_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2.9$$

The employability potential of the government is assumed to exhibit the following specification:

$$Gem_t = \delta + FD_t + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots 2.10$$

Although the real potential of the government to provide employment to masses may mainly depend upon national income but the burden and its fiscal implications are better captured by fiscal deficit via the channel of revenue deficit.

2.3.4: Monetary Block

The variables of interest in this block for our study will be the rate of interest, the level of inflation and the rupee-dollar exchange rate given the managed float exchange rate system. The interest rate (Primary Lending Rate) will be the outcome of the policy variables like Bank rate and deficit financing of the authority and will be following the order as:

$$PLR_t = \delta + BR_t + FD_t + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots 2.11$$

The rate of exchange is expected to follow the mechanism as:

$$Exch_t = \delta + GDP_t + Exch_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots 2.12$$

The nominal income is expected to assert the pressure via the channel of imports. Though the situation in BOP is also quite relevant for the said variable but for the time being that is excluded given more regulated behaviour of the variable in the hands of RBI.

The next in line will be the level of inflation in the economy. The inflation level captured for the current study will be GDP deflator and is assumed to have the following specification:

$$GDPd_t = \delta + IM_t + M_{3t} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots 2.13$$

The inflation has been taken as a monetary phenomenon with its dependence on the broad money. Further imports have been taken into account to reflect the excessive dependence on POL in face of rising global crude prices[30].

2.3.5: External Block

This sectoral presentation will be captured via the channels of total exports, imports and the resultant balance of payment deficit. Although net of exports is the usual practice but the specification is used to serve the purposes under different scenarios is a deliberate attempt. The exports of the economy are assumed to follow the structure as:

$$EX_t = \delta + M_t + TINV_t + \varepsilon_t \text{ ……..…….. 2.14}$$

The exports are assumed to have a significant dependence on the imports (M_t) given the amount of petroleum product exports in the export basket of the economy. Moreover, exports have been hypothesised to depend on the investment which will reflect both the government and private initiatives to boost exports.

The imports are expected to be of the following specification:

$$M_t = \delta + Y_t + EX_t + M_{t-1} + \varepsilon_t \text{ ……..…… 2.15}$$

The income is expected to have a strong influence on the imports of the economy given a growing nature and increased demand for gems and jewellery. Exports induced by imports are also expected to influence import function besides its past behaviour.

The balance of payment is taken with the following specification

$$BOP_t = \delta + M_t + EX_t + \varepsilon_t \text{ ……..……. 2.16}$$

Although the impact of imports and exports can be easily incorporated in the macro-economic scenario but the BOP needs to be examined as a separate identity given the increasing integration of the Indian economy.

The second part of the model consists of the estimation of a general equilibrium model for the economy and utilizing the same for the policy simulations. Before estimating the simulations, the model has been validated for the reference period under

[30] Though the POL imports have shown a mild reduction in past few years but have yet been consistently higher than 23 percent of the total import bill.

deterministic-static specification to capture the in-sample predictive power[31]. Further, the impact of consolidation shocks has been estimated for three time periods i.e. immediate impact, short-term and long-term impacts. The model has been evaluated using the criteria of root mean square error (RMSE) and mean absolute percentage error (MAPE)[32]. Finally, the model has been used to document the impact of external shocks on the target variables like national income, consumption, investment, interest rate, etc. Two alternative policy simulations have been generated viz., a consistent policy shock to the fiscal deficit of the government to bring it well below 3 percent. Another simulation constituted shocks to the external economy via the channels of import and export functions. This scenario has been estimated given the uncertainty looming the world economy under the US exit from Iran nuclear deal (JCOPA) and the ongoing US-China trade war and its possible impact on exports of India[33].

2.4: Econometric estimation and analysis

The first part of the model concerns the estimation of the above-specified equations and identities. We have estimated the above framework with the help of ordinary least squares technique (OLS). The detailed description of equations and identities used in the simultaneous equations model along with their analysis are texted below. The sample size is 37 ranging from 1980-81 up to 2016-17 for all the functions.

The private consumption has been assumed to be positively dependent on the national income apart from its own past value with the following specification.

$$PCE = 0.035 + 0.225*(Y) + 0.760*(PCE-1) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 2.17$$

(0.03) (0.05) (0.06)

The figures in the parenthesis represent the standard error of estimates. The explained variation of the model is almost 100 percent with an Adj. R^2 of 0.99 and the DW statistic is with a satisfactory value 1.92.

[31] As a custom it is always found plausible to use the deterministic specification for the in-sample forecast and stochastic specification for the out-sample specification.

[32] Both these tests study the deviations between the actual values of the series and those of calculated values and in a way summarise the best fit of the model.

[33] JCOPA stands for, "*Joint Comprehensive Plan of action and was signed between Iran and five permanent members of UN Security Council plus Germany regulating Iran's nuclear enrichment capabilities*".

The government consumption expenditure has been hypothesized to depend positively on the national income and the deficit financing of the central government.

$$GCE = -0.132 + 0.769*(Y) + 0.094*(FD) + 0.698*AR(1) \ldots\ldots\ldots 2.18$$

(0.23) (0.07) (0.09) (0.15)

The explained variation of the model is quite satisfactory with an adjusted R^2 of 0.99 and a healthy Durbin-Watson statistics of 1.63 implying low chances of autocorrelation.

The nominal private investment had been assumed to depend positively on national income and its past lagged values with the following functional form.

$$PINV = -1.40 + 0.58*(Y) + 0.04*(r) + 0.717*(PINV\text{-}1) \ldots\ldots\ldots\ldots 2.19$$

(0.61) (0.25) (0.00) (0.15)

The ESS of the model is almost 100 percent with an adjusted R^2 of 0.99 with a DW statistic of about 1.74 and is in line with the standard economic theory.

The government investment function has been hypothesized to depend positively on the national income besides the auto-regressive term of itself with the following specification.

$$GINV = -1.115 + 1.073*(Y) + 0.744*AR\ (1) \ldots\ldots\ldots\ldots\ldots 2.20$$

(0.34) (0.07) (0.12)

The variables determine almost 100 percent variation in the dependent variable with an Adj. R^2 of 0.99 and Durbin-Watson statistics of 1.93.

The nominal GDP of the government has been assumed to positively depend on private consumption expenditure, government total spending, exports and the past values of GDP with the following functional form.

$$GDP = 0.178 + 0.167*(PCE) + 0.118*(GTS) + 0.042*(Exp) + 0.664*(GDP\text{-}1) \ldots. 2.21$$

(0.07) (0.09) (0.11) (0.04) (0.09)

The explained variation of the model is almost 100 percent with an Adj. R^2 of 0.99 and the Durbin-Watson coefficient is almost 1.75 implying the least possibility of autocorrelation.

The public sector organized employment has been assumed to depend positively on the deficit financing behaviour of the central government with the following form.

$$GEM = 1.166 + 0.028*(FD) + 0.955*AR(1) \ldots\ldots\ldots\ldots 2.22$$

(0.03) (0.01) (0.06)

The model explains almost 89 percent of the variation with an Adj. R^2 of 0.89 and a Durbin-Watson value of about 1.14.

The total investment in the economy has been assumed to depend positively on government investment and the private investment as:

$$TINV = 0.259 + 0.643*(GINV) + 0.364*(PINV) + 0.887* AR(1) \ldots\ldots 2.23$$

(0.04) (0.01) (0.00) (0.30)

The model, as usual, explains the 100 percent variation with an adjusted R^2 of 0.99 and a Durbin Watson statistic of 1.84.

The government total spending in the economy has been hypothesised to depend positively on the level of national income and the deficit spending behaviour of the central government with the following specification:

$$GTS = 0.828*(Y) + 0.082*(FD) + 0.742* AR(1) \ldots\ldots\ldots\ldots 2.24$$

(0.01) (0.02) (0.10)

The explanatory power of the model is almost 100 percent with an adjusted R^2 of 0.99 and the Durbin-Watson statistics is almost 1.90.

The total budgetary expenditure of the central government has been assumed to depend positively on government total spending and public sector employment.

$$TE = 0.337 + 0.089*(GTS) + 0.587*(GEM) + 0.792* AR(1) \ldots\ldots\ldots\ldots 2.25$$

(0.25) (0.02) (0.22) (0.13)

The model is with an explanatory power of about 96 percent with an adjusted R^2 of 0.96 and a DW statistic of around 2.44.

The total revenue (both tax and non-tax) of the union government has been assumed to depend positively on revenue receipts and capital receipts with the following specification:

$$TR = 0.282 + 0.639 *(RR) + 0.361*(CR) + 0.012* AR(1) \ldots\ldots\ldots\ldots 2.26$$

(0.00) (0.00) (0.00) (0.13)

The model has a better R square with a significant explanatory power with an Adj. R^2 of 0.99 and the corresponding Durbin-Watson statistic is almost 1.97. All the signs are in the expected direction and are in consonance with the existing economic theory.

The revenue deficit has been assumed to be the function of deficit financing behaviour of the government with the following functional form.

$$RD = -1.284 + 1.312*(FD) + 0.586*AR(1)\ldots\ldots\ldots\ldots\ldots 2.27$$

(0.48) (0.15) (0.17)

The model has all the coefficients in expected signs with an explanatory power of around 97 percent bearing an Adjusted R^2 of 0.97 and a DW coefficient of around 2.11.

The primary deficit has been hypothesized to depend on government total spending besides its own past lagged values.

$$PD = -1.046 + 0.523*(GTS) + 0.550*(PD\text{-}1)\ldots\ldots\ldots\ldots\ldots 2.28$$

(0.99) (0.28) (0.14)

The model has a comparatively lower explanatory power of around 50 percent with an adjusted R^2 of 0.50 and a DW statistic of 1.80.

The fiscal deficit has been assumed to depend on government total spending besides its own past lagged values as:

$$FD = -1.391 + 0.622*(GTS) + 0.636*(FD\text{-}1) \ldots\ldots\ldots\ldots\ldots 2.29$$

(0.51) (0.20) (0.11)

The cited specification has a better explanatory power with an adjusted R^2 of .97 and a DW coefficient of around 2.01.

Export function has been assumed to depend on imports besides the total investment function with the notational representation as:

$$Exp = -0.854 + 0.538*(IMPTS) + 0.631*(TINV) + 0.589*AR(1)\ldots\ldots 2.30$$

(0.31) (0.15) (0.22) (0.16)

The model explains almost 100 percent variation with an adjusted R^2 of 0.99 besides better Durbin Watson statistic of about 2.18.

Imports have been hypothesized to depend positively on the level of national income besides exports and the past lagged values of import function itself with the following form:

$$IMPTS = 0.035*(Y) + 0.547*(Exp) + 0.422*(IMPTS)\ldots\ldots\ldots\ldots\ldots 2.31$$

(0.01) (0.12) (0.13)

The RHS of the above equations explains almost 100 percent variation in the LHS with an adjusted R^2 of 0.99 and displays a resilient behaviour toward autocorrelation with a DW coefficient of about 1.58.

The balance of payment deficit has been assumed to depend positively on imports and negatively on exports besides the lagged values of the variable itself.

$$BOP = -1.410 + 7.988*(IMPTS) - 6.985*(Exp) - 0.003*(BOP\text{-}1) \ldots\ldots 2.32$$

(0.14) (0.45) (0.43) (0.05)

The model explains almost 97 percent of the variation with an adjusted R^2 of 0.97 and a Durbin-Watson statistics of 1.84.

Exchange rate of Indian rupee with the US dollar has been assumed to depend positively on national income due to its strong influence on imports of the economy with the following form:

$$USD = 0.595*(Y) + 0.999*AR(1) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2.33$$

(0.31) (0.00)

The specification has an explanatory power of 98 percent with an adjusted R^2 of .98 and a DW statistic of about 1.30.

The inflationary tendency (captured through GDP deflator) has been hypothesized to negatively depend upon imports and positively on the broad money aggregate of RBI.

$$INF = 1.450 - 0.301*(IMPTS) + 0.159*(M_3) \ldots\ldots\ldots\ldots 2.34$$

(0.08) (0.07) (0.05)

The model has an explanatory power of about 60 percent with an adj. R^2 of 0.60 and a Durbin Watson coefficient of about 1.23.

The interest rate (Prime lending rate) has been assumed to depend positively on the bank rate of the RBI besides the deficit financing potential of the Union government with the following specification:

$$PLR = 1.032*(BR) + 1.302*(FD) + 0.684*AR\ (1) \ldots\ldots\ldots\ldots\ldots 2.35$$

(0.11) (0.33) (0.13)

The model functions with an explanatory power of 71 percent bearing an Adjusted R^2 of 0.72 and a Durbin-Watson statistic of about 1.97.

From the above estimations, few points seem to be in line for a brief explanation. All the models seem to perform better on the index of adjusted R^2 as the value for a majority of models is around 99 percent. This implies better goodness of fit. Moreover, all the Durbin-Watson statistics are in line with econometric literature and signal out that

the models do not counter the problems of auto-correlation[34]. Simulation Error Statistics of some Key Variables.

Table 2. 1: Simulation Error Statistics of some Key Variables

	Dynamic Simulations		Static Simulations	
Variable	**RMSPE**	**MAPE**	**RMSPE**	**MAPE**
BOP	0.28	0.23	0.18	0.14
EXPORTS	0.04	0.03	0.04	0.03
FD	0.08	0.05	0.00	0.00
GCE	0.02	0.01	0.02	0.01
GDP	0.01	0.01	0.01	0.01
GEM	0.01	0.01	0.01	0.01
GINV	0.03	0.02	0.03	0.02
GTS	0.02	0.01	0.02	0.01
IMPORTS	0.05	0.04	0.05	0.04
LD	0.03	0.03	0.03	0.02
PCE	0.01	0.01	0.00	0.00
PD	0.39	0.26	0.39	0.26
PINV	0.03	0.02	0.03	0.02
PLR	1.18	0.90	1.19	0.91
RD	0.19	0.12	0.19	0.12
TE	0.01	0.01	0.01	0.01
TINV	0.02	0.02	0.02	0.02
TR	0.00	0.00	0.01	0.00
USD	0.03	0.02	0.03	0.02

Note: RMPSE= Root Mean Square Percentage Error calculated by the author from the model.
MAPE= Mean Average Percentage Error calculated by the author from the model.
Source: Authors Calculation

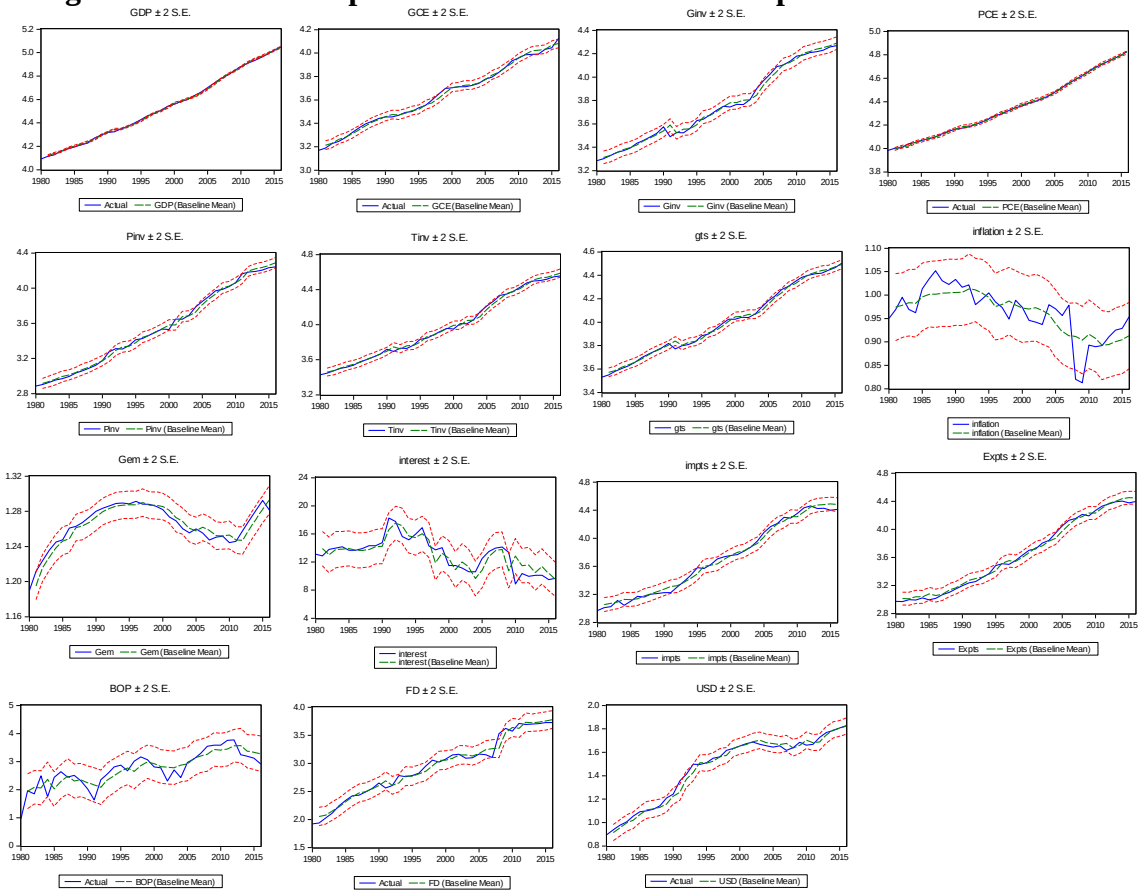
After estimation of the individual equations representing different sectors, they have been used to estimate the general equilibrium model using deterministic-dynamic and static approaches. However, before the estimation of the general equilibrium, the model needs to be tested for its predictive power and forecasting performance. In order to test the empirical accuracy of the full model in describing the historical data and later on policy analysis we carry out two sets of simulation exercises performed using software package E-views. The first one validates the predictive accuracy of the model while the second one delineates the policy simulation's potential of the model. The model is assessed for both with-in sample and out of sample predictive performance.

[34] The band limits of D-W test are 0 and 4; where 0 implies positive auto-correlation and 4 implies negative auto-correlation. A rule of thumb is that it should be greater than 1 and less than 3.

Conventional simulation error statistics such as RMSPE and MAP are used for evaluation of with-in sample performance of model while stochastic simulations are used for out sample performance.

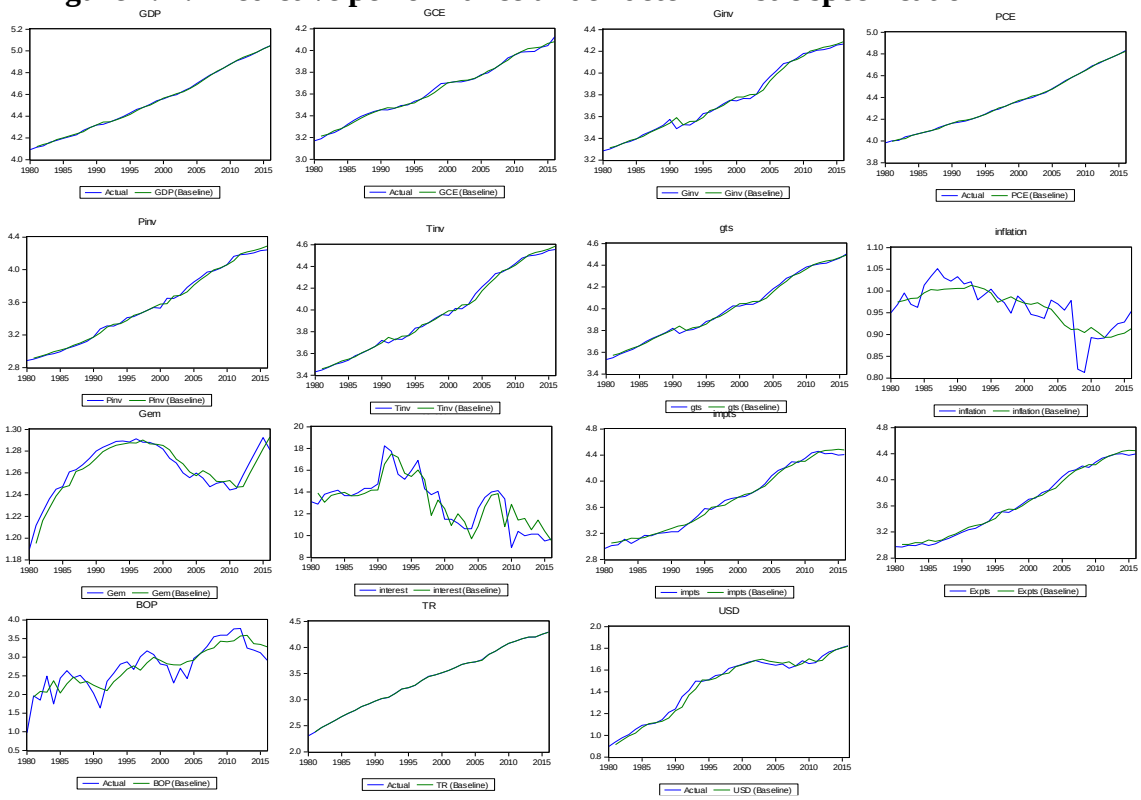
As can be seen from Table 2.1 and figures 2a and 2b, the model is expected to perform quite well. Except for the variable of inflation, all other variables exhibit a better fit where the actual and policy simulated series are found to move in a convergent manner. Further, the 2 sigma limit confidence intervals display a valid and satisfactory performance of the models. :

Figure 2. 1: Predictive performance under stochastic specification



Source: Estimated and Presented by Author using E-views version 10.

Figure 2. 2: Predictive performance under deterministic specification



Source: Estimated and Presented by Author using E-views version 10.

For almost all the variables under both the static and dynamic simulations, the error statistics have maintained well within the cited ranges. The figures above present both dynamic and static solutions with stochastic simulations along with actual values of key variables capturing, though not all, but majority reasonably well. The out-of-sample performance of the model has been evaluated through stochastic specification. After the predictive performance and diagnostic tests of our model, we have finally started evaluating the impact of consolidation shocks on macroeconomic indicators (Both in-sample and out-sample).

The in-sample estimation has been carried with the prime objective to estimate the potential impact of consolidation policies on principle macro-economic indicators like income, consumption, investment, etc. To analyze the impact of fiscal shocks two alternative adjustments have been performed viz., a sustained shock of 30 percent to gross fiscal deficit and a stimulus of 10 percent (assuming a 50 percent resource diversion) to private investment[35]. The results yield a different picture for the Indian

[35] The stimulus has been created to account for the crowding-in effect of reduced public spending. However, the magnitude of this crowding effect is an empirical question and yet a controversial debate.

economy as against most of the literature already existing (see Mundle et al. 2011; Tapsoba 2013). As can be seen from the table below the national income initially experience a decline but show the signs of convergence in the long-run as the shock dies out. The public expenditure shows a drastic decline initially but shows signs of returning in the long run. This may be partially because of increased fiscal space due to reduced spending and partially due to better tax receipts owing to better private sector growth rates. Private spending, however, does not show any convergence and exhibits the nature of Hysteresis even in the long run.

The total investment in the economy shows a recession on impact but exhibit a tendency to return back in the long run. The decline in the total investment function even in the face of increasing private sector investment may well highlight the dominance of the government sector in the key sectors of the economy like infrastructure etc. This may also be explained by the fact that we have assumed only 50 percent crowding-out effect[36]. The rate of interest shows the signs of decline and is well in consonance with the documented literature[37]. The economy is initially expected to experience inflationary pressures but is showing the signs of dying down in the long-run. This may be the outcome of increased credit creation by banks following a reduction in lending rate in the economy. The rupee is expected to strengthen itself against the US dollar and may be explained due to better private sector business expectations leading to better capital inflows. On impact, both exports and imports are expected to decline thereby improving the BOP position of the economy. However, in the long-run, there are signs of increased volatility.

Some studies support the thesis while others report ambiguity. Even within the supporters, there is no consensus regarding the magnitude of such an effect.

[36] As we increase the magnitude of the crowding-out effect the results start showing divergence from the case cited above. In the case of complete crowding-out, the economy may experience a boom rather than a recession.

[37] According to literature; lower deficits imply lower borrowings from banks which in-turn implies more credit and hence lower rates to absorb more resources.

Table 2. 2: Impact of Consolidation policies on Macroeconomic Indicators

Variables	Impact	Short-run	Long-run
GDP	-0.700*	-0.800	-0.700
GCE	-1.100	-1.000	-0.800
PCE	-0.500	-0.600	-0.600
Tinv	-0.800	-1.000	-0.900
Pinv	0.310	-0.160	-0.090
Ginv	-0.800	-1.000	-0.900
Interest	-0.600	-0.600	-0.400
Inflation	1.000	1.700	1.500
Exchange Rate	-1.900	-2.000	-1.500
Exports	-1.480	-1.530	-1.320
Imports	-1.160	-1.310	-1.230
BOP	-0.790	-1.080	-1.210

Note: (Impact = 1991-92; Short-Run = 1991-1996; Long Run = 1980-2016). *: All the coefficients have been estimated as a deviation between the policy scenario and the corresponding base scenario.
Source: Authors Calculation

After the estimation of the in-sample effects of fiscal shocks on the macroeconomic indicators, we have tried to estimate the out-sample forecasts for the same using stochastic simulations. Three alternative scenarios have been assumed and the policy simulations have been generated ranging from a hypothetical scenario to more realistic situations adjusted for both internal and external economic scenarios. The first scenario also termed as the base scenario will assume the current state of the economy without any change in policy variables. This scenario will be addressed as the base scenario. The second scenario will try to capture the shock in the form of reduced fiscal deficits of the government. The third scenario will try to analyze the impact of fiscal contraction coupled with the possible slack in the external economy owing to JCOPA withdrawal by US and US-China trade war.

2.4.1: Scenario—I

This is also addressed as the baseline scenario in the current study. The scenario assumes the current trend in all the macroeconomic indicators of the economy and then portrays a path of possible movement of economic indicators over the reference period. The base scenario gives us highly optimistic performances where-in almost all of the variables seem to be following a healthy growth trajectory. The movement of different variables of interest are presented in the table as:

Table 2. 3: Response of Macroeconomic Indicators under Base Scenario

Year	GDP	GTS	PCE	Pinv	Tinv	Expt	Impt.	Exch.	Inter.	Infl.
2018-19	7.2	7.2	7.2	9.6	9.6	12.2	12.2	74.1	10.8	7.4
2019-20	7.2	7.2	4.7	12.2	7.2	12.2	9.6	77.6	10.6	7.2
2020-21	7.2	4.7	7.2	9.6	9.6	12.2	12.2	79.4	10.4	7.2
2021-22	7.2	7.2	7.2	12.2	9.6	12.2	12.2	83.2	10.2	7.1

Source: Authors Calculations

Under this scenario, the economy is expected to grow at a rate of around more than 7 percent. Government total spending coupled with private sector spending is going to maintain their status quo. Exports and imports are expected to grow at the same rate but the deviation between them interims of their absolute amount is to remain unchanged. The rupee is expected to depreciate more in order to maintain the BOP statement of the economy. The lending rate is expected to come down implying more impetus to the construction and manufacturing sectors. Moreover, the deflator based inflation is going to decelerate over time. However, this is a naïve scenario almost next to impossible given the internal and external scenarios in the economy.

2.4.2: Scenario—II

Under scenario II we are going to give shocks to the debt-to-GDP ratio via the channel of fiscal deficit. A sustained shock to the magnitude of 15 percent was applied to the fiscal deficit of the government to make sure that the variable achieves a level well below the mandated level of 3 percent limit. The rest of the variables have been assumed to follow the given trajectory without any fluctuations. The results achieved under such a scenario are presented as:

Table 2. 4: Response of Macroeconomic Indicators to Fiscal Shocks

Year	GDP	GTS	PCE	Pinv	Tinv	Expt	Impt	Exch	Inter	Infl
2018-19	7.2	2.3	4.7	9.6	4.7	9.6	4.7	74.1	11.3	7.2
2019-20	7.2	4.7	7.2	9.6	7.2	9.6	7.2	77.6	11.2	7.1
2020-21	4.7	2.3	7.2	12.2	7.2	12.2	7.2	79.4	11.1	6.8
2021-22	7.2	4.7	4.7	9.6	4.7	9.6	4.7	81.3	11.0	6.6

Source: Authors Calculation

The scenario under fiscal consolidation gives mixed outcome in terms of its impact on different economic indicators. The growth rate of the economy does not

experience much decline rather seems to maintain the level and is in line with earlier findings for the Indian economy (Mundle et. al 2011 and Tapsoba 2013). Though there is a decline in government over-all spending but the private sector has almost displayed an inert behaviour to fiscal shock. This coupled with improving export scenario may be the possible reasons for strong growth maintained by the Indian economy. The impetus to the exports may be partially explained by the continuous depreciation of the currency, though comparatively better than the base scenario. The interest rate besides inflation level is seen to experience a decline thus further augmenting investor's confidence. The broad conclusion out of the above table that can be taken home is that it is possible for the Indian economy to proceed for fiscal consolidation while maintaining healthy growth scenarios.

2.4.3: Scenario—III

The scenario third has tried to capture the actual dynamics in the form of changing circumstances both internal and external. The economy needs to be internally sound and fiscally viable to maintain sustained growth and development. On the external front there two main changes taking place: The first one is the US withdrawal of Iran Nuclear deal (JCOPA) and its possible impact on the oil imports of India[38]. The second is the US-China trade war and its impact on Indian economy via the channel of exports. The impact of the first scenario will be captured through import function and the impact of second will be captured through the export function[39]. So in total, we are trying to examine the impact of fiscal shock coupled with an unstable external economy via the channels of Fiscal deficit, imports, and exports. The macro-economic outcomes under these situations are displayed as:

[38] The Indian currently imports around 25 percent of its oil from Iran besides Iraq, Saudi Arabia, and UAE. The oil imports to India from Iran are under certain preferential conditions like rational pricing rather than dollar-denominated pricing. Its withdrawal may mean higher current account deficits.

[39] The US accounts for 95 percent of exports to North America as a region while as China accounts for around 15 percent of total exports to South East Asia. Together the USA and China account for around 20 percent of total exports of India to the external world as on 2016-17.

Table 2. 5: Impact of Fiscal Shock Coupled with External Instability

Year	GDP	GTS	PCE	Pinv	Tinv	Exch.	Inter.	Infl.
2018-19	4.7	2.3	4.7	7.2	4.7	72.4	10.6	4.7
2019-20	2.3	0.0	4.7	9.6	7.2	75.9	10.3	2.3
2020-21	4.7	2.3	4.7	4.7	2.3	77.6	10.0	4.7
2021-22	2.3	0.0	2.3	7.2	4.7	79.4	9.70	2.3

Source: Authors Calculation

Under this scenario, we can see a complete reversal in almost all of the variables as compared to the initial two scenarios. We can see that the GDP growth is experiencing a complete slack and the economy is almost in a recession like scenario. The government spending is stagnating owing to both fiscal shock and low fiscal space forced upon by lower growth rates. The private sector, though a bit healthy, but is quite unsatisfactory when evaluated with earlier two scenarios. Though interest rate and inflationary tendencies are seen to be dipping downwards but they are no more than an indication of a recession. The overall conclusion that can be taken from this scenario is that a consolidation path followed under an unstable external economic scenario may prove to be a disaster for the whole economy. Instead of improving the fiscal position of the economy, such shocks may completely destabilize the economy and may further aggravate the debt problem.

2.5: Conclusion

The prime focus of this chapter is to evaluate the impact of consolidation shocks on the key economic indicators like growth rate, investment, consumption, interest level, inflation, and exchange rate. We have tried to assess the above objective under alternative scenarios using the general equilibrium modelling technique. The model has been deliberately kept as simple as possible.

The model has been estimated employing the time series data ranging from 1980-81 up to 2016-17. The whole structure consists of 19 equations comprising of two identities and 17 stochastic equations. The individual equations representing different sectors of the economy have been estimated using standard OLS technique. Most of the parameters were found to be in consonance with the standard economic theory with expected and significant signs. Before preceding for the policy simulations, the model

has been evaluated for with-in sample predictive power using conventional simulation error statistic measures i.e. RMSPE and MAPE. With satisfactory track performance, the model has been estimated to analyze the impact of fiscal consolidation (Both in-sample and out-sample) under different scenarios on the key economic indicators.

The two adjustments have been incorporated via the channel of fiscal deficit reduction coupled with the crowding-in effect of private investment. The results arrived at were in variance with the already existing literature (though inadequate) for Indian economy (See Tapsoba 2013). The fiscal consolidation led to a reduction in the national income via the channels of Public consumption and public investment at least in the short run. The tightening shows the potential of producing more destabilizing pressure on the balance of payment situation. Thus the study extends support to the conventional Keynesian economic effects of fiscal consolidation at least in the short run in the case of Indian economy.

The out-sample forecast has been performed under three different scenarios ranging from a more hypothetical to more realistic scenarios. The first scenario or alternatively called as base scenario has tried to analyze the impact of fiscal consolidation on the economy assuming the current scenario without any instability. Under such a scenario the economy was found to perform very well on all the fronts with promising growth rates, strong private sector, improving external trade and declining inflationary and interest tendencies. However, the thing to worry about under this scenario is the exchange rate which is seen to deteriorate continuously. Under the second scenario with a fiscal consolidation assuming ceteris paribus the outcome seems almost promising. The growth rate does not experience much decline owing to strong private sector performance coupled with external support especially via the channel of improved exports. Though the exchange rate depreciates but shows a better trajectory than the scenario I. Both inflationary and interest tendencies seem to be in line with healthy economic development. These findings are in consonance with the already existing literature for the Indian economy and hence extend the support for non-Keynesian effects of fiscal shocks.

The performance under scenario second seems to be a complete reversal of the earlier two cases. Under this scenario, the fiscal consolidation has been coupled with external instability. The external instability has been captured through the channels of

import and export functions with their relative dominance. Under such circumstances, all the indicators show a recessionary tendency. The growth rate slacks to quite low with substantial slack in the private sector. The exchange rate almost off-shoots to a very high level. The interest and inflation levels show a declining trend but are more of a recessionary nature. The economy seems to be on the verge of a deep depression when the fiscal consolidation is adjusted for an external shock.

The study concludes with a mixed set of results so far as the impact of fiscal consolidation on the macro-economic indicators are concerned. The study partially extends the support to the existing literature regarding the positive long term effects of fiscal consolidation. However, when it comes to accommodating for the shocks to the external economy, the results of the study are a bit at variance with those of already undertaken especially Mundle et al., (2011). This study concludes a more recessionary scenario in almost all of the economic indicators with a stagnant growth rate, especially in the short run. Moreover, the final results of a consolidation program owe an acute dependence on the crowding-in/out effect besides the external and internal economic stability.

Chapter –– III
Monetary versus Fiscal Policy: Does Monetary Policy effect the Macroeconomic Impacts of Fiscal Shocks in India?

3.1: Introduction

The governments all over the globe formulate multiple macroeconomic policies and implement them through different institutional arrangements. "*Though the structure and composition of these policies may be at variance with each other the final objective is usually the same i.e. improving the material welfare of the citizens*" (Arby et al., 2010). The most common goal of these policies is to attain higher levels of economic advancement coupled with higher employment besides a stable level of the inflation rate[40]. Over time and especially post Keynesian revolution there has been an explicit thrust on two main policy instruments to achieve these objectives. The one is related to monetary conditions in the economy and the second is related to fiscal policy rule usually represented by changes in the budgetary position of the government. "*The prime focus of the monetary policy is price stability while as the main objective of the fiscal policy is inclined towards higher growth and employment, even at cost of high inflation*" (Hanif et al., 2010). This leads to the area of conflict between two policies and there may raise the risk of direct confrontation between the two. This necessitates some sort of coordination between two policy instruments and exchange of information in order to better pursue the desired targets in an integrated manner. However, "*this cooperation about the targets of inflation and output create a monetary-fiscal symbiosis[41], yielding the ideal outcome despite disagreement about the relative weight of the two objectives*" (Dixit & Lambertini 2001).

The coordination should not be taken to mean the encroachment of autonomy of the two alternative institutions governing these policies rather it helps their effective operation. On the other hand, a non-cooperative behaviour by any of the two players renders both the policies ineffective and adversely undermines the credibility of both

[40] The final aim of any economic policy is to attain increase in human welfare but in terms of well-being and welfare. However over time human welfare has been loosely taken as a synonymous to economic material welfare. Thus the two terms will be used interchangeably through-out.

[41] This theory holds that, "*in case of a centralised monetary policy and a decentralised fiscal policy, if policy makers agree about the ideal levels of output and inflation then this ideal can be attained even despite disagreements and non-cooperation between monetary and fiscal policy*".

monetary and fiscal institutions. “The fiscal policy connotes the use of taxation or government spending to regulate the aggregate economic activity. Thus the main instruments that comprise the fiscal policy include government revenues and expenditures and the consequent levels of sovereign debt. In similar parlance, the monetary policy refers to the central bank's control of credit in the economy to achieve the desired objectives” (P. Hilbers 2005). The main instruments that constitute monetary policy include different types of interest rates like prime lending rates, the repo rate, credit supply, exchange rate, etc. Though these policies are pursued by two different authorities but yet their independence is far from reality. Since both the policies have at least one target variable in common there is always a risk of confrontation between the two. So there arises a need to consistently pursue the policies aiming at the coordination between the two policies with a balance in relative weight.

There has been a consistent proliferation of literature assessing the interaction of monetary and fiscal policy and their relative efficiency and effectiveness in case of both developed and developing economies (Van Aarle et al., 2003; T. Davig et al., 2011; F. Arby et al., 2010; E. Ismail Cevik et al., 2014; P. Foresti, 2018). This has experienced further surge due to global melting of 2008 following the financial crash of the US economy and its lightening transmission to other integrated economies across the globe. Due to the global melting of 2008, economies both developed and developing stressed economic stabilization rather than debt stabilization by pursuing active and expansionary monetary and fiscal policies (Ismail Cevik et al., 2014)[42]. For instance, following the global melting the US Federal Reserve rapidly reduced the federal fund reserve by around 500 base points and sterilized funds worth 900 billion dollars under the American Recovery and Reinvestment Act. This offshoot the US federal deficits to the whooping levels of 10 percent and the overall debt from 40 to 90 percent (T. Davig et al., 2011). Such an aggressive and unified monetary and fiscal intervention to stimulate the economy is a distinctive hallmark of the modern-day policy response. These stimulant

[42] The post shock response of 2008 melting down was different from earlier global economic shocks like oil price shock of 1970’s and the consequent responses by the governments all through the globe. In response to earlier shocks the governments heavily stressed the need for a particular policy instrument to fight depression or recession like excessive use of monetary policy to fight the oil price shock of 1970’s. However post global financial crises we experienced a more integrated and balanced use of both the policy instruments.

efforts are usually justified to spur employment generation by augmenting the aggregated demand, at least in short-run under the Keynesian framework. These policies are pursued, as quoted early, precisely with the objective of economic stabilization in the face of macroeconomic shocks. However, there have been questions raised along different dimensions of both the policy instruments jointly as well as individually.

The very first line of argument that attach importance concerns the effectiveness of fiscal and monetary policy instruments as tools of economic stabilization. In case of fiscal policy, there is not much consensus in the literature about the counter-cyclical or expansionary economic effects of an active fiscal rule. For instance, the non-Ricardian proponents suggest that an expansionary fiscal stance financed by deficits and debt enhance Income and hence demand. On the other hand, the IS-LM doctrine suggests that fiscal stimulus with-out an accommodative monetary rule increases aggregate demand that in-turn leads to an increase in the general level of interest and hence crowds out private investment. However, "*from the empirical perspective, the effects seem to be sensitive to econometric and statistical methodology and thus the final effects are inconclusive*" (E. I. Cevik et al., 2014). Similarly, there are doubts raised in the literature about the efficiency of a monetary policy rule to effectively stabilize the level of inflation, especially in face of a non-cooperative fiscal policy. Though, the monetarist school of thought contends that the price stability in an economy is purely a monetary phenomenon but the Fiscal Theory of Price level (FTPL) hold otherwise[43]. It is only when fiscal policy is passive that the monetary policy enjoys absolute authority on price stability in an economy.

These findings led to the notion that complete independence and autonomy of both fiscal and monetary policy is a theoretical proposition but a practical myth. Therefore, given the prominence of fiscal policy, the monetary policy need not and should not be separated from the fiscal policy rule adopted by the government to achieve either price stability or economic growth (E. Lima et al., 2012). Since Oil price shock of

[43] The Fiscal Price Theory (FTPL) advocates that, "*price stability not only require an appropriate monetary policy but also an appropriate fiscal policy*" (for a detailed description refer to E. I. Cevik, S. Dibooglu & A. M Kutan 2014).

the 1970s and the consequent stagflation, monetary policy has received a great deal of attention from both economists and policymakers. However post-global financial melting there has been a shift of focus from monetary to fiscal policies, if not biased but at least balanced (J. J. Reade, 2011). Thus instead of using monetary and fiscal policy tools individually in an independent manner, it pays to use both in a cooperative and accommodating manner rather than competing. However this coordination should not be used as a means to put monetary policy subordinate to fiscal policy and there should not be an institutional overlap as has been the recent trend, especially post-financial melting of 2008. Such subordination will not only compromise on the principles of efficiency but will also undermine the legitimacy of monetary institutions in an economy with an undesired departure from the golden rule of price stability especially due to forced debt monetization (M. Franta et al., 2018).

3.2: Channels of Transmission

Both fiscal and monetary policies, as quoted above, are interdependent and need to cooperate with one another in an accommodative manner. This cooperation is necessitated by the influence of fiscal policy on the monetary policy of the government through different channels. However, there is no consensus in the literature about the types of channels and their relative dominance. Broadly these channels are classified into direct as well as indirect channels of transmission[44]. As pointed out by Sargent and Wallace (1981), in a fiscal dominant regime a fiscal expansion may eventually require monetization and hence will lead to inflation. Thus an expansionary fiscal policy results in a forced expansionary monetary policy, though under certain assumptions. This inflation fuelling will cause a real appreciation of the currency and hence potentially pose a balance of payment crises (P. Hilbers, 2005). "*Thus a decline in monetary assets with a prime focus to contain the inflationary pressures may, in fact, lead to an increase in the inflationary tendencies mainly because bond finances then replaces the monetary finances and leads to an increase in debt to GDP ratio. This scenario will give rise to a*

[44] Different studies have categorized the channels of transmission under different headings. For instance, Paul Hilbers (2005) categorizes transmission channels into direct and indirect. On the other hand, Edda Zoli (2005) categorized these transmission channels into three heading through inflation, exchange rate and level of interest rate in an economy.

situation where-in tighter the monetary policy, higher will be the inflation" (E. Zoli, 2005).

The second prominent channel of transmission from fiscal policy to monetary rule is effects on interest rates and sovereign spread. There is a broad agreement in the literature about the effects of fiscal policy on the level of interest rate in an economy. It is usually contended that higher fiscal deficits and debt levels are associated with higher intermediate and long term interest rates (E. Zoli, 2005). Thus an expansionary fiscal policy financed mainly by new deficits consumes up the funds from the economy meant for the private sector. This crowding out reduces the funds for the private sector and hence increasing the price per unit of finance thereby leading to a rise in the level of the interest rate. Another line of transmission between fiscal and monetary policy rule is through the exchange rate channel. Theoretically, the effects of fiscal policy on the exchange rate are influenced by the associated changes in capital account convertibility and the type of exchange rate system. Under low capital mobility with a flexible exchange rate system, the exchange rate is expected to depreciate and vice-versa. This is mainly because a fiscal expansion boosts the import of cheap goods and services and hence current account deficits. In developing economies with higher capital mobility and the probability of higher defaults, fiscal expansion is expected to cause currency pressures[45].

Another important channel of transmission from fiscal policy to monetary policy is via the channel of indirect taxation. Suppose the government introduces an expansionary fiscal stance and tries to raise the resources from additional indirect taxation of goods and services. This will lead to a rise in general price level and thereby inducing a wage-price spiral and hence a permanent increase in the level of inflation, a worry for monetary authority. In addition to the channels specified above, there are certain channels based on perceptions and expectations. Large deficits and hence large borrowings may well trigger a confidence loss into the financial system of an economy. Such a loss of confidence may act as a destabilizing factor on the effectiveness of bond

[45] For more deeper insights and analysis of pass-through from fiscal policy to monetary policy to refer to Edda Zoli (2005) pp. 2 to 5

and foreign exchange markets and hence pose long term challenges to the monetary authority of an economy.

3.3: Fiscal-Monetary Interaction in the Indian context

The monetary and fiscal policies are the two main tools of economic stabilization in both developed and developing economies. As documented in the literature, "*for achieving an optimal mix of desired objectives of growth and price stability both the policies need to complement each other, though the level of complementarity may vary depending upon the level of economic and financial advance*" (J. Raj et al., 2011). In India like any other emerging economy, it is contended that there is almost a complete fiscal dominance and the monetary policy acts as merely a servant to the fiscal requirements. Under such an institutional arrangement the issue of cooperation does not assume importance as the coordination assumes relevance only when the two institutions have some independent authority. However, irrespective of the institutional autonomy the two policies will interact with the institutional framework governing nature. The monetary-fiscal interaction in India stems from the RBI act of 1934 as it stipulates RBI to be the managing body of public debt. Overtime fiscal policy assumed prominence mainly on account of raising resources for the five-year plans. During the 2nd plan onwards the government accelerated the borrowings from RBI and hence assumed a permanent source of debt financer to the government[46]. From the time of independence till the balance of payment problem in 1990-91, the fiscal policy in Indian economy used to dominate (A. Goyal, 2002). However, due to the bad debt scenario of the economy, the policymakers started giving due attention to the monetary management besides its partial autonomy. By 1997 the ad-hoc treasury bills were phased out and by the enactment of FRBM, the RBI was prohibited to monetize the government debt (J. Raj et al., 2011).

In a developing economy like India large physical infrastructure requirements to be provided by public investment, assume crucial importance. On the other hand, the backwardness of these emerging market economies confines the scope of monetary

[46] The main instrument used to monetize the government debt by the RBI was the ad-hoc treasury bills. Although these instruments were to be used for only short-run periods but they were replaced with new ones at the time of maturity and hence sterilizing more resources (Refer to J. Raj et al., 2011).

policy to the organized sector only (Goyal, 2018). However, there is a dire need of constraints on both fiscal and monetary policy to enhance efficiency and minimize the distortions. The fiscal policy rules need to be stricter than monetary policy in order to avoid the effects of democratic populism and hence compromise on long-run growth. Earlier the monetary policy acted as an accommodative channel used to facilitate and finance the large deficits for government plans. However, there has been a global change in the nature of both fiscal and monetary policy with a thrust on rule-based instruments (A. Goyal, 2018). Such rules and regulations fortify and strengthen the institutions that raise concerns about the long-run consequences of short-run actions. However, it is to be born in the mind that just as fiscal dominance creates problems and breeds inefficiency so does a dominant and unchecked monetary policy (A. Goyal, 2018; S. Yadav et al., 2012). Although various initiatives have been undertaken to minimize the fiscal dominance like phasing out of the instrument of treasury bills and prohibiting government to borrow from RBI (under FRBM), but its influence on monetary policy cannot be eliminated. This continued unidirectional influence from fiscal policy to monetary policy may be mainly attributed to the high levels of deficits. Even though, if these deficits are not monetized they still have the inherent potential to influence the conduct of monetary policy via aggregate demand and channel of expectations as outlined earlier.

The current study is an addition to the literature encompassing the interaction between monetary and fiscal policy for Indian economy. However, the current study will differ from the existing literature at least in two dimensions. Firstly the usual practice in the Indian economy has been to analyze the pass-through from fiscal policy to monetary policy. Thus it has been usual practice to assess the effects of fiscal policy on the working of monetary policy rather than the inverse. However, the current study will try to find the effects of monetary policy on the working and performance of the fiscal policy. Secondly, we will try to highlight the effects of consolidation shocks on the macroeconomic indicators under alternative monetary stance, assuming the complete autonomy of both the institutions[47]. Thus the prime objectives of the study will be:

[47] We need to impose the assumption of complete autonomy in order to make sure that there does not arise the problem of endogeneity once we proceed to econometric estimations. This will imply that there is

1. What is the type of interaction between monetary and fiscal policies i.e. whether fiscal policy dominates or its monetary dominance?
2. Which policy is more effective as a tool of economic stabilisation?
3. How monetary policy regimes affect the impact of fiscal shocks on the macroeconomic indicators especially growth rate of output.

The rest of the chapter will be structured as: section II will cover review of literature; section III will cover data and methodology; section IV will encompass the econometric and statistical estimation and will be followed by section V citing the conclusions of the study.

3.4: Literature Review

3.4.1: Review on Monetary-Fiscal interaction: Global Context

There has been a prolonged debate going on among researchers about both fiscal and economic effects of fiscal consolidation programs pursued by economies all over the globe. However, there is no unanimity in the literature about the effects of these fiscal shocks on macroeconomic aggregates (O. Blanchard et al., 2002; C. Favero et al., 2007; N. Pashourtidou et al., 2014). Similarly, a vast pool of literature exists about the interaction between monetary and fiscal policies in both developed and developing economies. Here we will provide a brief revisit of literature under two heading confined to the Indian economy and the studies related to other economies both developed and emerging.

In his seminal on "*Equilibria under active and passive fiscal and monetary policies*," E. M. Leeper (1991) has tried to assess the interaction between active and passive policy stances before reaching a point of balance. The analysis defines an active monetary authority the one who does not pay any attention to the level of government deficits. Such an authority or regime is free to set the variable they may seem to fit the situation. On the other hand, a passive authority cannot ignore the fiscal position of the government and hence cannot act independently. The study quoted many but naval findings under a representative model of monetary and fiscal policy dominance. The

no influence of government on the conduct of monetary policy and vice-versa. Thus it will rule out the aprori behaviour of government to exert influence on the RBI.

study used the model to characterize the equilibrium implied under various financing schemes. The study derives rules governing the determination of fiscal behaviour determining how monetary shocks affect the prices and thus inflation. The study quoted that the prices are mainly indeterminate when the nominal interest rate is pegged. In another scholarly contribution Blanchard et al., (2002) tried to characterize the dynamic effects of fiscal shocks on the US growth rate of income. The study used the structural vector autoregression technique (SVAR) and event study approach. The study concluded that positive spending shocks were found to be growth augmenting while positive tax shocks were found to be growth depressing. However, both the shocks were found to exert a strong negative effect on total investment spending and were well in consonance with the existing literature.

There has been considerable debate about the interaction of monetary and fiscal policies in both advanced and emerging economies. In a similar addition B. V. Aarle et al., (2003) have tried to examine the monetary and fiscal policy transmission in case of Euro-area. To execute the prime focus of the study structural VAR models based on quarterly data from 1981q1 to 2000q4 are put to use. The authors have estimated the results pertaining to the aggregate EMU countries in a panel. Later these results have been put to comparison with those of the United States and Japan. The study quoted four main results following from their empirical analysis. For the whole Euro area, the estimated adjustments to various structural shocks were found to be compatible with those of the United States and Japan. Across different EMU countries, "*similar dynamic adjustments were found to take place following supply and demand shocks. Further significant differences in the adjustments were induced by monetary and fiscal policy innovations. Finally, considerable cross-country differences were found in the interdependence between policy instruments*". Although the initial findings are well in line with the literature and are not to worry. However the last two are potential threats to stability as the innovation in both monetary and fiscal policies could produce divergent adjustments to output, prices and fiscal balances.

In the case of developing economies, there are certain peculiarities that limit the scope of an analysis carried out for an advanced economy. One of the similar distinctions is the dominance of fiscal policy due to democratic populism and huge physical

infrastructural deficiencies. With such a background E. Zoli (2005) carried out an analysis trying to highlight the process of how fiscal policy affects monetary policy in an emerging economy. The study quoted a regime of fiscal dominance in the case of Argentina and Brazil during the 1990's and 2000's. However, in the case of other emerging economies, a mixture of results was recorded. Moreover, in case of the selected emerging markets, it was found that monetary policy does not exhibit a significant influence on fiscal balances. Contrary to this the fiscal policy was found to exhibit a strong influence on the working of monetary policy via the channels of both interest rates and exchange rate. In an economic and monetary union (EMU) the monetary autonomy is lost by an individual country. Under such a scenario the economy is left only with the fiscal policy as a tool to stabilize over time.

In a seminal on monetary-fiscal interaction, P. Hilbers (2005) tried to examine why central banks need to worry about government budgets. In a theoretical debate, the study tried to highlight the inescapable monetary-fiscal dependence, though both the institutions should enjoy complete autonomy. The author quoted that there exists both a direct and indirect relationship between the conduct of monetary and fiscal policy. So for a better and effective outcome, it pays for both the policy variables to cooperate and need to accommodate each other.

In a seminal C. Favero et al., (2007) have tried to estimate the effects of fiscal policy shocks to the level of deficits and debt for the US economy. A fiscal shock is characterized as a shift in tax policy or a change in government spending. The study has tried to keep debt feedback intact rather than omitting the variable as has been the standard practice. The study has used quarterly data from 1960q1 to 2005q4. The study has questioned the validity of standard VAR models as they are unable to take account of feedback relationships, hence they cannot take care of possible endogeneity. The study quoted that an exogenous increase in government spending has expansionary effects and an exogenous increase in tax revenue is contractionary.

Using standard game theory behaviour of Stackelberg leadership model, J. Libich et al., (2007) have tried to analyze the monetary-fiscal interactions with varying degrees of commitment. The study allows policies to be committed or rigid for different time periods. The study found that the policy equilibrium can occur with higher chances in a

monetary union due to the prevalence of the free-riding problem. Such a scenario can prevail even under monetary dominance wherein monetary policy may be acting as a leader for prolonged periods than fiscal policy. Moreover, the study found that an appropriate monetary policy may not only help central banks of fiscal pressures but may also infuse discipline. The study found that a strict monetary stance may reduce the level of debt and deficits and hence moving the economy towards policy equilibrium (passive fiscal & active monetary policy). The study quoted that in the case of economies like the United States, Japan, Europe, etc. There should be an explicit focus to a numerical inflation targeting and such targeting can improve the medium to long term efficiency of both policies.

In a methodological contribution to the interactions between fiscal and monetary policies, M. Dungey et al., (2009) tried to identify both monetary and fiscal policy in a structurally adjusted vector autoregressive model (SVAR). The study has analyzed the case of New-Zealand as sample and the quarterly data set spanning from the time period 1983q2 to 2006q4 has been put to use. "*The merits and strength of three alternative identification methods were exploited within a single modelling framework. The existing conventional short-run coefficients were used to identify non-fiscal shocks. Sign restrictions were put to use in order to segregate government expenditure and taxation shocks. The cointegration analysis was used to account for long-run permanent and transitory shocks with both stationary and non-stationary data*". The study found that the magnitude of fiscal policy shocks has been larger than those of monetary policy shocks on the growth rate of income. Moreover, taxation and debt shocks were found to be significant and substantial than expenditure shocks. However, an interesting finding was that most of the variables respond to the shocks of their past values more significantly than the shocks in policy variables. The monetary policy was found to mainly respond to inflationary shocks. The fiscal policy in New Zealand was found to have both countercyclical and pro-cyclical elements.

The stabilization policies pursued by the government in an economy differ significantly depending on the prevailing economic conditions both domestic and external. With a similar intent, D. Leigh et al., (2009) has tried to analyze the fiscal and monetary policy behaviour during economic downswings. Using quarterly data the study

focused on the cyclical behaviour of both monetary and fiscal policy instruments in G7 countries. The study has employed the standard VAR modelling to contextualize the findings of the study. The analysis confirms that the monetary policy has been broadly consistent and timely besides highly countercyclical during economic recessions across a variety of measures. However, the assessment of fiscal policy was found to be something at slight variance with that of conventional wisdom. Although discretionary fiscal policies have been mostly inconsistent in timing and pro-cyclical in continental European countries and Japan but in case of Anglo-Saxon the case has been diametrically opposite to what has been observed earlier. The study found both fiscal and monetary policies exhibiting an easing bias with more easing during the downturn than tightening during upturns.

Similarly, A. Mountford et al., (2009) have tried to assess the effects of fiscal policy shocks on the macroeconomic aggregates. The study has employed vector auto-regression modelling (VAR) and used quarterly data set for US economy spanning over the time period from 1955 to 2000. The authors have used sign restrictions instead of time restrictions to identify government revenue as well as spending shocks. "*The authors have constructed three alternative scenarios of deficit-spending, deficit-financed tax cuts, and a balanced budget spending expansion. The study found that deficit spending scenario stimulates the economy for the first four quarters but only weakly compared to that of the deficit-financed tax cut. Both the spending scenarios were found to have crowding-out effects*". The study found that it pays the government to undergo deficit-financed tax cuts to stimulate growth, though the study does not endorse them.

The need and importance of monetary-fiscal coordination have increased for emerging market economies especially in the face of shocks like the financial shock of 2008. Under such a framework M. F. Arby et al., (2010) had tried to assess the monetary and fiscal coordination in case of Pakistan. The study has employed time-series data from 1964-65 up to 2008-09 and has utilized the multiple estimation techniques like cointegration, single equation residual based on Phillips-Ouliaris, etc. The study found that the conduct of monetary policy has been broadly independent of fiscal influences in Pakistan. The study has analyzed movement of different policy variables under four scenario viz., (a) "*high growth and high inflation*", (b) "*high growth and low inflation*",

(c) "*low growth and high inflation*" and (d) "*low growth and low inflation*". The analysis documented that it was observed that both the policies coordinated only for 12 years. Even the creation of special boards and committees could not help develop coordination between the two to maximize the efficiency of the two policy variables. One of the interesting findings was that during military rules there was enhanced cooperation between the two and hence a better economic scenario has prevailed.

In their study, Davig & Leeper (2011) tried to highlight the effects of fiscal shocks under alternative fiscal-monetary scenarios followed in the US. The studies that assume active monetary and passive fiscal policies usually recorded that government consumption crowds out private consumption. This study has estimated Markov-switching policy rules for the United States and documented monetary and fiscal policies usually fluctuate between active and passive rules. The study found that an increase in government spending of $1 raises output by $0.80 when monetary policy is active. However, a similar expansion may increase output by $1.80 when the monetary policy is passive. This translates into a decrease in consumption to the tune of $0.20 under the active monetary policy but an increase to the tune of $0.80 in case of passive fiscal policy.

Asserting the post-recession crises and the resultant deficit and debt built-ups, the sustenance monetary-fiscal interactions assume key importance. Following the reasoning, J. Reade (2011) tried to model out the fiscal and monetary interdependence in the US economy. The study has utilized the quarterly data ranging from time period 1982q1 up to 2010q2 using the multivariate cointegration VAR methods to investigate the policy interaction. "*The analysis found that monetary policymaking is heavily forward-looking and exhibit an active and dominant nature as it does not respond to its reaction function and policy rule. On the other hand, the fiscal policy was found to be passive exhibiting obedience to its past behaviour besides maintaining debt sustainability. Moreover, the fiscal policy was found to be more potent in the short run as compared to the long-run*". Thus the study recommended that the fiscal stimuli are effective in the short run and they should be phased out in the long run. Moreover, both the policies were found to be complementing each other and hence moving in opposite directions.

In a similar attempt E. Lima et al., (2012) analyzed the dynamic effects of fiscal policy on the Brazilian economy besides interaction between monetary and fiscal policies. The study has utilized the monthly data set for nine variables spanning over the time period from 2000m1 to 2008m6. The study has employed structural VAR models identified by two alternative methodologies. The first method used sign restrictions on impulse response and the second method combines sign restrictions with restrictions on the contemporaneous causal relationship among variables. The analysis found that in response to positive fiscal shocks, there is a substantial and long-lasting decline in the inflationary tendencies, though a short-run decline in economic activity. However, the study could not document significant support for the responses of the exchange rate to fiscal innovations. In the case of fiscal-monetary interaction, the study quoted mixed results. The study found that inflation need not be purely a monetary phenomenon and thus recognized the role of fiscal policy in the inflation dynamics. On the other hand, there were indications of monetary policy playing a role to contain the debt scenario of the government before it takes to unsustainable levels. The study tried to test the relevance of Ricardian and Fiscal Theory of Price Level (FTPL) and found the support in favour of Ricardian theory i.e. monetary dominance in case of the Brazilian economy. The study further tried and tested the hypothesis of "*tighter monetary policy leads to higher inflation*". However, the study could not develop evidence about the thesis that tighter monetary policy is pro-inflationary.

In the case of emerging European economies E. I. Cevik et al., (2014) have tried to highlight the monetary-fiscal interaction given the importance attached to the integration of two as tools of economic stabilization. The analysis used the quarterly data from 1995Q1 up to 2010Q4 by using a Markov regime-switching model. The manuscript has used Taylor rule (1993) as a basis for monetary policy and for the fiscal policy they used the framework proposed by Davig and Leeper (2007). The central banks were found to follow both active and passive monetary policy rules. Moreover, the passive monetary policy was found to be more persistent and have higher duration than the active one, except Poland. In all the economies, except Slovenia and the Slovak Republic, the output stabilization was found to have priority than inflation targeting under the passive monetary rule. "*Except for the Slovak Republic and Poland who follow an active fiscal regime, the fiscal policy seems to have alternated between active and passive fiscal*

regimes. Moreover, active fiscal policy is more persistent in Estonia, Hungary, Poland, and Slovenia". The analysis holds that the financial crisis has induced all the EMU economies to follow the active fiscal regime.

In a cross-country analysis of Germany, US, and Italy, M. Kliem et al., (2016) had tried to assess the monetary-fiscal policy interactions and their possible impacts on fiscal inflation. The study has utilized the time-varying VAR modelling on the data set covering the time period from 1965 up to 1999. The study found that the interaction between fiscal and monetary policy determines the relationship between inflation and fiscal stance at lower frequencies. For disaggregated and in-depth analysis the study has utilized the dynamic stochastic general equilibrium approach (DSGE). The study found that changes in low-frequency relationships in Italy and the US are because of the systematic part of the economy rather than volatilities of the structural shocks. The study quoted that low-frequency relationship between fiscal deficits over debt and inflation might be empirically helpful in choosing the best policy option. The study further corroborated the models and theories that allow fiscal policy to play a major role in the determination of the general price level in an economy.

G. D. Silva et al., (2017) in a panel of 113 advanced and emerging market economies have tried to analyze the conduct of monetary and fiscal policy for both pre and post-global melting of 2008. The study has used time-series data from 2001-2012 and has utilized the system generalized method of moment technique with a dynamic panel specification. The study made certain interesting findings, some in consonance and yet others at variance with the standard literature. The monetary policy was found to be counter-cyclical only for advanced economies in the time period prior to a financial shock. However, the fiscal policy was found to behave in a pro-cyclical manner only in the pre-financial crises period. Moreover, the interest smoothing was found to be an important policy variable in the conduct of monetary policy. Post crises period was a response-less span especially in case of developed economies for the output gaps. This was partly attributed to the zero lower bound on interest rates and hence moving to unconventional monetary policy measures. The study could not find any significant association between the output gap and government spending especially for the post melting period, thus implying almost no consolidation of fiscal indiscipline.

P. Foresti (2018) tried to reinvestigate the accumulated literature on the interaction between the two by applying the concept of symbiosis[48]. The study found that though the symbiosis is theoretically appealing but its practical application can hold only under certain assumptions. Thus such a tool may have a very limited role to play in a monetary union like EMU where targets of the central bank and the individual governments differ on a wide scale, besides political and economic heterogeneity among individual economies. In a monetary union, the degree of commitment to rule and the level of coordination besides other considerations assume importance for the policy mix and the final outcome thereupon. However, in case of EMU, the commitment and the discretion are usually at variance than what may be a warranted stance mainly due to rigidities than the flexibility in the design of policies. In case of coordination, it is horizontal coordination that assumes importance than the vertical coordination. The former may help reduce the asymmetry of information and hence enhance the efficiency of policy prescription. Such coordination supports a common fiscal authority as is the case with the common monetary authority.

In a panel study Michal Franta et al., (2018) tried to highlight the interaction of monetary and fiscal policies in a group of six developed economies viz.,., Australia, Canada, Japan, Switzerland, UK, and the US. The study has used the technique of time-varying parameter vector autoregression (TVP-VAR) with the sign, magnitude, and contemporaneous restrictions identification. The study has utilized the quarterly data set of all the concerned economies ranging from the first quarter of 1980 up to the second quarter of 2008. Such an approach has an explicit advantage that it can capture changes in policy variables that are gradual in nature and do differ across time and policy, unlike conventional approaches. The study has made two main contributions i.e. one governing the macroeconomic arena and the other one governing the econometric and methodological contributions. The study quoted time and space varying results in case of all the economies. "*In these countries, the central banks have started monetary offsetting that is raising interest rates in response to debt-financed government spending. The methodological contribution enunciates combining the VAR featuring the TVP with*

[48] Symbiosis implies if two individuals have attained same preferences and utility function then it is not necessary that they need to cooperate in order to achieve the targets. Thus under such an arrangement, the institutional differences do not pose any serious challenge (see Dixit and Lambertini, 2001; P. Foresti, 2018).

an identification scheme based on a mix of the sign, magnitude, and contemporaneous restrictions".

3.4.2: Review on Fiscal-Monetary interaction: Indian Context

The importance and effectiveness of coordinated monetary-fiscal regime and its relevance for an emerging economy have been long recognized in the literature. Different strategies and policies have been pursued from time to time to ensure cooperation between the policy mixes. In a distinguished seminal on Indian economy, Goyal (2002) tried to analyze the need for rules to coordinate monetary and fiscal policies. In the case of fiscal policy, the study pleads for fiscal rules like FRBM and others to direct its direction. However, such a rule should be back-loaded I.e., funded mainly by slashing unnecessary expenditures rather than compromising on capital expenditures. Such a policy stance may help the Indian economy to maintain the interest rates around the world rates and may possibly act as a check on the inflationary pressures. All these may translate into a healthy long-run economic growth for the economy. Moreover, the study held that fiscal policies need to be stricter than monetary policies so that these policies may not be misused for competitive populism of the democratic governments. Such regulations can help stabilize exchange rates which can further the objectives of stabilizing the prices, stimulating the exports and preventing a currency crisis.

In continuation of the debate J. Raj et al., (2011) tried to empirically analyze the monetary and fiscal policy interactions in the Indian economy. The study as usual practice has employed the quarterly data set from the time period 2000Q2 to 2010Q1. The study holds that in order to reduce the fiscal dominance in the economy and to make scope for the efficient working of monetary policy, the government has partially eliminated the treasury bills and has forced the RBI not to finance government via open market operations under FRBM. However, given all these policy-related changes there has been significant evidence of fiscal policy dominance in case of Indian economy. Moreover, the reaction of two policies to shocks in inflation and output is usually in opposite directions. The study found that "*the monetary policy is countercyclical in nature while fiscal policy is essentially pro-cyclical in nature; the impact of active fiscal policy on output is highly short-lived, while as there is a significant negative impact in the medium term*".

In another scholarly addition S. Yadav et al., (2012) tried to highlight the effects of fiscal policy shocks on the macroeconomic aggregates in case of Indian economy. The analysis has used a quarterly data set ranging from 1997Q1 to 2009Q2. The paper has adopted a structurally adjusted Vector autoregressive model (SVAR) to estimate the effects of shocks. The fiscal policy has been represented by shocks to government spending and tax revenue. The recursive scheme used in the study has been based on Cholesky decomposition. The study quoted variable results by analyzing the behaviour of impulse response functions. A shock to tax revenue was found to have a significant impact on the level of national income as against the government's spending shocks. Moreover, private consumption behaviour was found to be more sensitive to the shocks in tax variables compared to the shocks in government spending. Further, the analysis found that an increase in short-run expansionary fiscal stance follows the Keynesian behaviour while as in the case of the long run no conclusive finding could be arrived at.

Both monetary and fiscal policy has different targets of price stability and debt sustainability, though the same goal of economic stabilization. Though they are controlled by two different institutions but yet they share common areas. Highlighting these areas of interaction N. Sethi (2017) had tried to empirically examine the interdependence of the two policies. The study has utilized a data series of five years from 2010-2015 using vector error correction models. Alternatively, the study has employed the behaviour of game theory to highlight policy implications. The study found that fiscal policy responses in a potent and healthy manner for shocks in the monetary policy. However, the reverse was not found to be working through the proper channel. In an attempt to make a case for the relative dominance of the policies A. Goyal (2018) tried to evaluate the relative importance and shortcomings of a dominant policy rule. Since both, the policies influence the objectives of other policies in a potent manner therefore there arises a need for cooperation. In the case of emerging economies, the scenario is such that the influence of fiscal policy is on cost-push inflation while the effect of monetary policy is on demand-pull. Moreover, the effects of democratic populism may breed inefficiencies at times.

Both monetary and fiscal policy instruments carry the potential to influence the macroeconomic indicators like the growth rate of income, consumption, etc. In a similar

analysis, S. Arora (2017) had tried to estimate the effects of monetary and fiscal policy on the selected macro-economic indicators of the Indian economy. The prime instruments of fiscal policy include debt-financed government spending and tax rebate while the main instrument of monetary policy is the rate of interest. The study has employed the structurally identified VAR model with quarterly data set ranging from 1990Q1 to 2011Q4. The study documented variable and time-varying response of monetary policy to changes in tax and spending shocks. In case of tax shock, the monetary policy in the Indian economy was found to respond by reducing interest rates and thereby absorbing the fiscal stimulus. However, the study could not document any support of accommodative monetary policy behaviour in the face of spending shock. Moreover, the study quoted fiscal dominance over the reference period as the monetary shocks were found to be accompanied by fiscal expansions. The study found interest rate to be the best tool to stimulate output while the tax rebate seems to be the best strategy for stimulating output gap.

3.5: Data and Methodology

3.5.1: Data Description

The data set utilized in the study constitute a group of seven variables including real national income (GDP), private consumption expenditure (PCE), private investment (PINV), inflation (deflator), gross fiscal deficit (GFD), total government expenditure (TGE) and interest rate (PLR). The data set used follows the quarterly frequency from 1990 first quarter to 2018 third quarter[49]. The fiscal variables used in the study include changes in gross fiscal deficit (GFD) and variations in total government expenditure. The monetary policy will be represented by Prime Lending rate (PLR) as it is the most suitable rate representing the influences of monetary policy shocks on the lending behaviour of financial institutions[50]. This is mainly on account of two reasons namely with the passage of time credit channel as an instrument of pass-through, especially in case of emerging economies has assumed importance and the lending rates can help

[49] All the variables have been converted to quarterly frequency using the trend and cyclical variations captured in the data set.

[50] Moreover the prime lending rate is the best approximation of repo rate used as a short term or overnight indicator of changes in the monetary stance of the RBI.

better capture the crowding-in/out dynamics more comprehensively (Mishra et al., 2012; Das 2015; Mishra et al., 2016 & Kapur 2018)

The series of gross domestic product (GDP) has been taken in real terms at the latest base of 2011-12. Moreover, the series has been deseasonalized using the Census X13 method. As a representative and wider measure of inflation, the study has used GDP deflator to represent the inflationary tendencies in the economy[51]. The private sector responses will be captured by analyzing the behaviour of private consumption expenditure and private investment. Although the usual practice in the literature is to analyze the total investment but we have kept a deliberate focus on private component only so that its responsiveness to interest rate changes and crowding out/in can be better analyzed. To capture the fiscal policy stance of the government we have used changes in gross fiscal deficit (GFD) as the representative as has been the standard procedure followed in the literature. Moreover, under certain limited cases, the government fiscal policy undergoes a change but the level of deficits remains the same[52]. To account for such a scenario we have used the total government expenditure as an endogenous variable. The data set for all of our endogenous variables has been obtained from the handbook of statistics, Reserve Bank of India (RBI). We have used E-view 9 and E-view 10 to estimate our model.

3.5.2: Methodology

The prime focus of the study is to analyze the effects of fiscal consolidation on macro-economic aggregates (GDP) under alternative monetary stances. The usual practice in the literature has been the employment of Vector Autoregressive (VAR) approach as it helps to analyze the impact of different types of random shocks on the variables in the model. Moreover, such a technique does not apply the restrictions of endogenous versus exogenous and treats all the variables of the model as endogenous. However, the basic VAR technique has limitations as it does not take care of structural and contemporary relations unless some identification restrictions are assumed to follow

[51] Although the usual trend in the literature is to use either whole sale price index (WPI) or consumer price index (CPI) but we have chosen in favour of GDP deflator atleast for two reasons. Firstly both WPI and CPI possess the sector bias and are highly responsive to the weights chosen. To overcome these short comings we have employed deflator to capture the holistic inflationary scenario.

[52] If under an expansionary fiscal policy the growth rate of income exhibit Keynesian behaviour then the fiscal deficits will show a decline rather than an increase leading to biased results.

(Bhat et al., 2018)[53]. To overcome such limitations the VAR models are adjusted to accommodate the structural adjustments in the economic relations. The structurally adjusted VAR models have many advantages like it possesses a better fit, it is almost order independent and more importantly, it can incorporate theoretical insights to improve the validity and predictive power of analysis. It helps to estimate the net impact of random shocks on the endogenous variables in the model and its use in the empirical literature has experienced an exponential growth rate (S. Yadav et al., 2012 & S. Arora, 2018).

As SVAR serves our cause of concern, therefore we employed the technique to empirically assess the dynamic impacts of consolidation policies pursued by the government on the macroeconomic indicators like the growth rate of income (GDP), Inflation, private-sector consumption, and investment, etc. under alternative monetary stance. The empirical specification of SVAR has been described below.

An unrestricted VAR model as used by S. Arora (2018) is given as:

$$X_t = A(l)e_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.1$$

Where '*X'* is a vector of stationary endogenous variables, *A(l)* is a polynomial of lag length I and e_t is a vector of reduced-form innovations with var-covar matrix $E(e_t e_t')= \sum$.

Alternatively, the above VAR (p) model may be further specified as:

$$AX_t = A_1X_{t-1} + A_2X_{t-2} + A_3X_{t-3} + \ldots\ldots\ldots\ldots + A_pX_{t-p} + e_t \ldots\ldots 3.2$$

Where, as above, *X* is an (n x n) vector of endogenous variables (in our case PLR, PINV, PCE, Deflator, GFD, TE, GDP). Similarly, *A* is the (n x n) coefficient matrix of endogenous variables that are used to capture dynamic interaction between *k* variables in the model. e_t is an (n x 1) matrix of random but structural errors assumed to be normally distributed with zero mean and normalized diagonal variance-covariance matrix = Ω and *p* is the lag length of the model[54]. The residual coefficients (e_t) in both

[53] These restrictions are usually employed to accord the economic logic to the relations discovered by data analysis. This is because the data itself does not speak the economic language and at times may lead to inappropriate results.

[54] However here is a point in line that the VAR models are highly sensitive to the lag order and if adequate precautions are not taken we may land into fallacies. Moreover, a proper lag order helps to trace out the long run impact of variables among themselves. In case of more lags than the optimum level, we may

the specifications are more likely to be associated and thus posing a challenge to identify the effect of a shock properly.

Thus *(Ut)* is assumed to have a linear association with the structural shocks of the order, $U_t = Be_t$, where *B* is an (n x n) matrix of structural coefficients representing the effects of structural shocks that are serially and contemporaneously uncorrelated with var-covar matrix $E(U_t U'_t)$ = D, with further normalization of diagonal elements being equal to 1. The basic objectives behind SVAR to orthogonalize the residuals so that the effects of innovations can be segregated out. We may rewrite the equation (2) as follows.

$$AX_T = A_1X_{t-1} + A_2X_{t-2} + \ldots\ldots\ldots + A_PX_{t-p} + Be_t \ldots\ldots\ldots\ldots\ldots\ldots 3.3$$

The model specified in equation 3 must be identified so that it can carry economic theory and it should be interpretable. However, the above model has a limitation that it cannot be directly observed and estimated to derive true values of e_t and A_p. Thus we must derive a reduced-form version of equation 3. To obtain the required specification we must pre-multiply equation 3 by A^{-1} as:

$$X_T = \hat{A_1}X_{t-1} + \hat{A_2}X_{t-2} + \ldots\ldots\ldots\ldots + \hat{A_p}X_{t-p} + U_t \ \ldots\ldots\ldots 3.4$$

Where $A^{\wedge} = A^{-1} A$. Here U_t is the parameter of interest for the study as they are the reduced form VAR residuals uncorrelated with X_s and follow NIID $\sim$ (0, Sm), unlike the earlier. However, the reduced form model as given by equation (4) does not take into consideration contemporary relations among variables as only lagged terms figure on the RHS. Moreover, the problem of cross-correlations may arise among residuals, if current terms make an entry. In order to overcome the cited limitation we need to arrive at another synthesis following interaction of equation (3) and (4) as follows:

$$AU_t = Be_t$$

$$U_t = A^{-1}Be_t \ \ldots\ldots\ldots\ldots\ldots\ldots 3.5$$

Now the structural coefficients in equation (3) can be obtained and estimated from the reduced form version (4) using equation (5). As noted by Aarle et al., (2003), "*the SVAR models originated from monetary policy analysis where it has been used*

face the problems of multicolinearity and will be working with less degree of freedom thus posing a severe threat to the validity of the model.

extensively to study the transmission of real and monetary shocks". These models are found to be more relevant to analyse the dynamics of monetary and fiscal policies as it gives separate response of each variable to policy innovations. However these SVAR models need to be identified before their estimation and accordingly, the literature has mainly focused on two schemes of identification viz., short-run restrictions and long-run restrictions (Lima et al., 2012).

3.5.3: Short-run restrictions

As noted by Arora (2018), "*these restrictions impose normalization and exclusion conditions to orthogonalize the shocks or in other words, these restrictions are there to contain the contemporaneous behaviour of endogenous variables*". The most common method of imposing these restrictions is Cholesky Decomposition. They are also known by the names of triangular structure or recursive structure. However, these restrictions are criticized at least for one explicit limitation i.e. these restrictions impose an unrealistic assumption of the timing of the responses. Although there is another method of non-recursive system and it provides with theoretically better results. However, it is quite complicated and out of the scope of the present exercise.

3.5.4: Long-run restrictions

As quoted by Aarle et al., (2003), the pioneers of SVAR methodology Blanchard et al., (1989) and Blanchard and Perotti (2002) mainly concentrated on long-run identifying restrictions as such restrictions encompass more information about the behaviour of a variable. However, it is to be born in the mind that these restrictions can be employed only when I(1) variables exist in the data set. Although there is another alternative to impose restrictions base on expected theoretical signs as proposed by Faust (1998), Canova et al., (2002) and Uhlig (2005), but their analysis is out of the scope of the current study.

These restrictions are either imposed on parameter matrices A or matrix B or both. Moreover to avoid irrelevant restrictions and to ensure parsimonious property, exactly identified restrictions are used. However, there are a few considerations to be kept in mind while imposing restrictions. These include: the structural variance-covariance matrix is a diagonal matrix and normalized to an identity matrix I_k. Further, B is an identity matrix and A the lower triangular matrix with simultaneous relations

among the endogenous variable set. According to Breitung et al., (2004) when one of the matrices is assumed to be an identity matrix, then K(K-1)/2 additional restrictions are to be imposed on other matrices.

We have a set of seven endogenous variables represented by the vector as:

X_t = (PLR, PINV, PCE, GDP, TE, GFD, Inflation)

Therefore we need to impose 21 additional restrictions for the identification of the structural relations. All the restrictions that we will be imposing will follow a theoretical rationale. Following Blanchard et al., (1989), Blanchard and Perotti (2002), Gordon and Leeper (1994) and Bhat et al., (2018), the identifying restrictions on the interaction of variables follow given representation as:

Since the restrictions are sensitive to the ordering of variables, accordingly the row one indicated that the prime lending rate is assumed to be affected by only its past lagged values and does not correspond to any other variable of the model and hence highlighting the assumed exogenous nature of monetary policy shock.

$$A = \begin{vmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 & 0 & 0 \\ a_{41} & a_{42} & a_{43} & 1 & 0 & 0 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 & 0 & 0 \\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & 1 & 0 \\ a_{71} & a_{72} & a_{73} & a_{74} & a_{75} & a_{76} & 1 \end{vmatrix}$$

Row second is the private investment function which is affected by shocks to monetary policy reflected via changes in interest rate channels and its own lagged terms and does not respond to other endogenous variables (Franta et al., 2018). Private consumption expenditure as shown in the third row is assumed to be influenced by monetary shocks, private sector investment function besides its own past lagged values. Similarly, row fourth represents national output as represented by GDP and will exhibit dependence on private sector spending besides its past lagged values (P. Hilbers, 2005; F. Arby et al., 2010; S. Arora, 2018). Row fifth will highlight the dependence of the government total spending and is assumed to depend on growth rate of income driven by

private sector response besides its lagged values. Row sixth represents gross fiscal deficit and is expected to depend on monetary policy changes, private sector responses, national income besides its own past lagged values (Hilbers, 2005). Finally, the inflation as captured by GDP deflator is assumed to show dependence on all other variables including its past lagged values[55].

3.6: Econometric estimations and results

3.6.1: Unit root Analysis

Before we proceed for the formal estimation of the structurally identified VAR model of our interest, we need to make sure that we did not encounter the problems of non-stationarity. Almost all the variables i.e. PLR, PINV, PCE, Inflation, GFD, TE, GDP were found to be trend stationary with GDP exhibiting seasonality and hence adjusted by census X13 method[56]. Thus they were detrended before the estimation of the SVAR using Hodrick-Prescott Filter (1997). The lag length of the unit root tests was chosen based on Schwarz Information Criteria (SIC). The unit root results of the endogenous data set under Augmented Dickey-fuller (1979) and Phillips Perron test (1988) are reported in Table 1 below[57]. Reporting unit root test results

Table 3. 1: Reporting unit root test results

Variables	t-statistics		P-value		Deterministic
	ADF	PP	ADF	PP	
GDP	3.69	3.70	0.03	0.03	Trend & intercept
PLR	4.29	3.86	0.00	0.02	Trend & intercept
PCE	3.94	3.28	0.01	0.07	Trend & intercept
PINV	4.14	3.44	0.01	0.05	Trend & intercept
Inflation	4.30	3.77	0.00	0.02	Trend & intercept
TE	3.55	3.12	0.04	0.05	Trend & intercept
GFD	4.25	3.76	0.01	0.02	Trend & intercept

Note: All the t-statistics are in absolute values.
Source: Calculated by Author

Although we have mainly used Trend & Intercept specification but all the other specifications give the same results. Moreover, the series were deseasonalized (using

[55] In a recursive approach it has to be taken care of that we order variables according to their potential influence on other variable backed by economic theory. Thus the variables who have likelihood of being influenced by most of the variables and inversely cannot exert a significant influence on other variables have to be ordered last (For detailed analysis the readers are requested to refer to S. Yadav, V. Upadhyay & S. Sharma, 2012).

[56] The gross domestic product exhibited the presence of seasonality and the same as removed using the census X13 by E-views 10.

[57] Besides unit root diagnostics we have also tested for Autocorrelation and Heteroskedasticity and found that there does not exist problem of autocorrelation and residuals are homoscedastic implying constant variance.

census X13) before testing for unit root. The lag length was chosen based on SIC criteria as in S. Arora, (2018). As quoted in the table 1 above, since all the variables are of order zero i.e. I (0), the possibility of cointegration do not arise[58].

3.6.2: Results and analysis

The results of the study that follow directly from the estimation of the structurally identified VAR model as specified above are organized into three subsections. The first subsection will try to analyze macro-dynamics under alternative policy mix. The second subsection will examine the interaction dynamics under alternative policies and the third section will try to shed light on the policy implications.

The results are interpreted using impulse response functions and variance decomposition. All the impulse responses have been reported in percentage terms. However, the readers need to be careful while interpreting the results of IRF's. A shock to government deficits is to be interpreted as a 1 percent change in the levels while a shock to rate of interest is to be interpreted as 1 percentage point change. Moreover, a brief understanding of monetary-fiscal interaction and their interpretation may help readers to better understand the interaction dynamics. Muscatelli et al., (2004) defines the two policies to be substitutes if there exists a positive association between fiscal and monetary policy as represented in our study by changes in gross fiscal deficits and prime lending rate. In contrast, they are said to be complementing each other if there exists a negative correlation. However, Leeper (1991) categorise these policies as active and passive depending on their response to the levels of debt. For instance, when monetary policy targets inflation independent of the level of debt it is branded as active and vice-versa. Similarly, when the fiscal policy actions do not care about the level of debt it is termed as active or non-Ricardian and vice-versa (S. Arora, 2018).

3.6.3: A negative shock to gross fiscal deficit (Fiscal Consolidation)

We have employed structural impulse response functions to portray the response of variables to fiscal consolidation shocks. For each equation, a structural one standard unit shock is applied to gross fiscal deficit to analyze the movement of other endogenous variables up to a limit of 8 quarters. Figure 1 below portrays the dynamic responses of

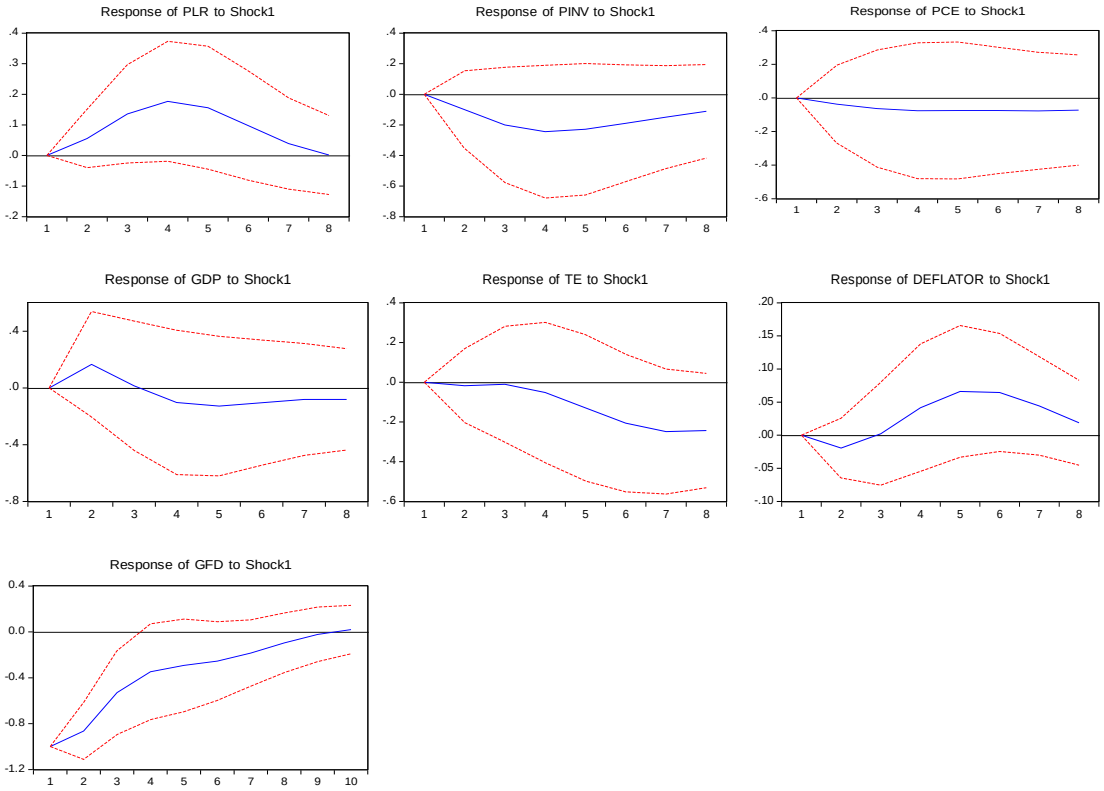
[58] The standard practice in the literature has been to make sure that we did not encounter the problem of cointegration among variables before estimating a VAR model, in which case VECM is the better technique. However, there have been some studies of late who reported that the presence or absence of cointegration does not significantly affect the results and thus analysis (refer to Arora, 2018).

macroeconomic indicators (PINV, PCE, GDP, Inflation, interest rate, and total government spending) to consolidation adjustments.

We observe a positive response of interest rate for a one-unit shock to fiscal deficits. This may be primarily because a consolidation shock will sterilize more financial resources in the economy and this may well lead to inflationary tendencies as it will boost up the level of investment in the economy. In order to maintain checks and balances, the monetary sector will respond with a tight monetary policy to maintain a healthy rate of inflation. Similar results were arrived at by Zoli 2005, Arby et al., 2010 and Arora, 2018. This active monetary intervention will exert pressure on the private investment in the economy that will experience a decline up to fourth quarter and will exhibit a tendency to revert back over time. Another possible reason for a steep decline in private sector investment will be reduced government spending implies less public investment in infrastructure like roads and energy implying lower crowding-in of private investment (Mundle et al., 2011).

Moreover, a shock to deficit spending is found to decelerate private sector consumption in short-run. This is because in a developing economy like India where the government spends huge deficits on subsidizing necessities of mass consumption. A shock to deficits may imply lower private-sector demand especially by lower middle and poor sections of the society (Jain et al., 2013). Driven by the combined behaviour of private sector investment and consumption demand, the growth rate of income experiences a mild increase in first quarter and thereafter experiences a steep decline with through-out. The first-quarter increase may be attributed to the lagged effect of consolidation shocks on the level of national output. This implies that there are short term pains associated with the consolidation policies in terms of output lost, although in the long-run it may reverse. These findings are well in consonance with the already existing literature (K. Clinton et al., 2011; P. Berkmen, 2011 & Pashourtidou et al., 2014).

Figure 3. 1: Response of Macroeconomic Indicators to Fiscal Consolidation Shocks only.



Source: Compiled and presented by Author using E-views 10

A consolidation shock in time period "*t*" is found to exert continues downward pressure on the government total expenditure and is in line with the standard economic theory (S. Arora, 2018). The inflation as represented by GDP deflator responds by initially experiencing a mild decline up to second quarter and thereby experiencing an upward trend up to fifth quarter. This is because the effect of fiscal consolidation on private sector investment via monetary tightening starts to die down during third quarter and hence may imply an impetus to economic activity thus inflation. As already mentioned, "*based on Muscatelli's (2004) classification, monetary and fiscal policies act as substitutes for first four quarters. From fifth quarter onwards they act like complements"*. In terms of Leeper (1991), *"the first four quarters exhibit both monetary and fiscal activism. However, the monetary policy turns passive from the fourth quarter onwards when fiscal policy refuses to surrender and stays active indicating fiscal dominance in the Indian economy"*. Similar results were arrived at by J. Raj et al., (2011) for Indian economy.

3.6.3: A consolidation shock under a contractionary monetary policy

The scenario second will analyze the time trajectory of endogenous variables in face of a consolidation shock accompanied by a contractionary monetary policy. Accordingly, a onetime one standard unit positive shock has been given to lending rate by banks and one standard unit negative shock is given to the level of fiscal deficits implying reduced government deficits. As can be seen from figure 2, the monetary sector initially responds by tightening its stance but under the combined influence the level of interest rate declines throughout. Although there is a continuous monetary easing but private investment continues to decline till 4th quarter and reflects the scenario of liquidity trap[59] (N. Sathi 2016). Moreover for the private sector to expand its investment undertakings, it may need public investment in many crucial areas so that government investment crowds-in the private investment (S. Mundle et al., 2011 & A. Goyal 2018). The private consumption experiences a decline owing to two main reasons namely reduced government subsidy and hence affordability of lower middle class and a possible substitution of current consumption by future consumption as induced by higher expected returns, though with a certain factor of risk (T. Davig & E. M. Leeper, 2011).

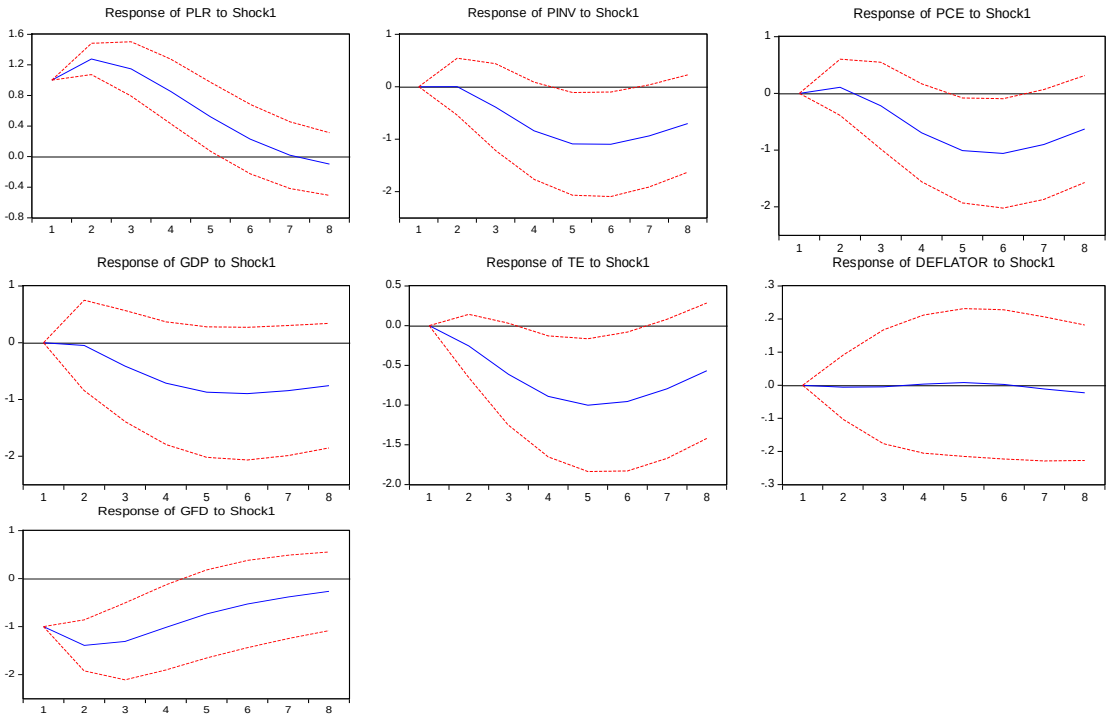
The response of gross domestic product as driven partly by private sector responses will experience a steep decline till the fifth quarter. Thereafter the trend will reverse and the shock will exhibit a tendency to die-out. However, there are certain points to be made before proceeding. As can be seen from figure 2 the decline in national output is not as steep as that of private investment and may be partly attributed to the slow decline of consumption component of the national income. Similarly, both private consumption and investment functions show a strong recovery after the shock dies out as compared to the national income. This is because the private sector constitutes only a proportion of the national income besides being dependent on government spending and external sector performance. Further, the decline in private sector performance and thereby a decline in the growth rate of income is more severe under Shock II when compared with Shock I. Although the fiscal consolidation is expected to depress the growth rate of income but in the face of a non-cooperative monetary regime, the scenario

[59] Put in other terms crowding out debate assumes importance only in face of scarce or limited resources when their demand is high. On the other hand, if the supply of funds is more than demand there does not arise the question of crowding out and its resultant negative impacts.

will be more recessionary. Similar results have been arrived at by J. Raj et al., (2011), N. Pashourtidou et al., (2014) and S. Arora (2018).

As against shock I, the inflationary tendencies are going to exhibit a more stable trajectory following the shocks. This is because a consolidation shock under *Ceteris-Paribus* may fuel the demand-pull inflation due to increased private sector investment. However, a contractionary monetary policy is going to play against as it will exert a negative impact on investments via the channel of interest rate, thus controlling the inflationary tendencies if any. The level of deficits initially experience a decline up to 4th quarter when the effect of shock seem to die out and thereafter experience a steep rise. Thus according to Muscatelli et al., (2004) rule the monetary and fiscal policies act as complementary to each other following the scheme of shocks. On the other hand under Leeper (1991) rule its monetary dominance in the first two quarters and thereafter the fiscal policy dominates. Reports the response of different macroeconomic indicators to consolidation shock under a contractionary monetary regime.

Figure 3. 2: Response of Macroeconomic Indicators to Contractionary Fiscal and Monetary shocks.

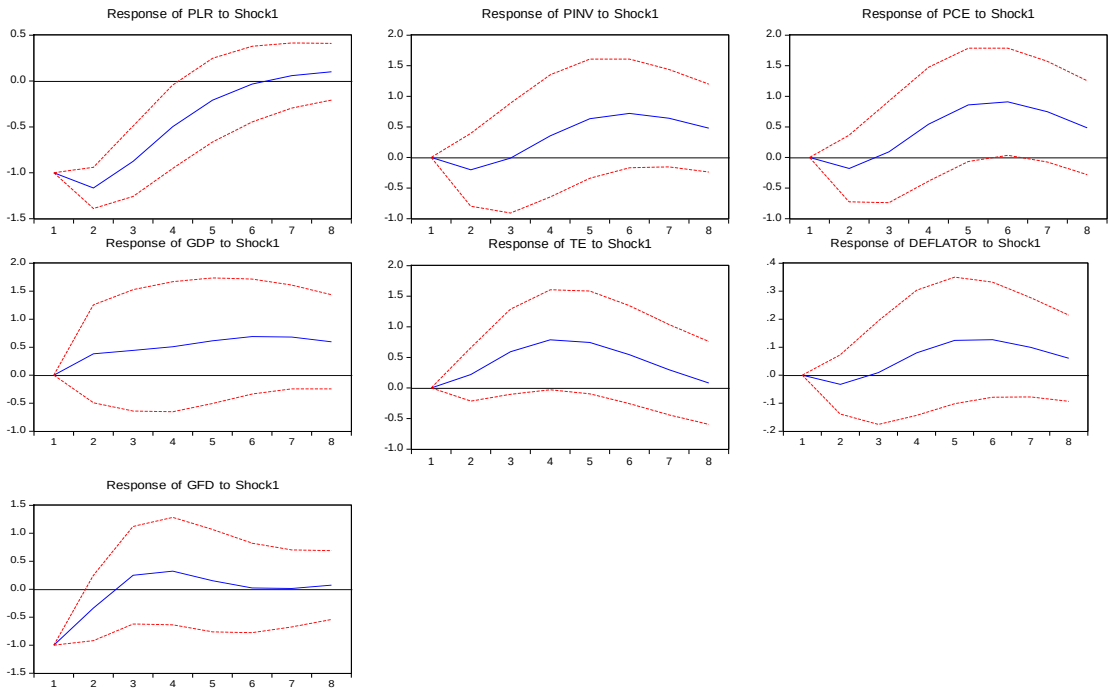


Source: Compiled and presented by Author using E-views 10

3.6.4: A consolidation shock under an expansionary monetary policy

As can be seen from figure 3 below, the monetary sector responds quickly to fiscal shock and thereby increasing the interest rate to keep a check on the private sector expansion and hence price stability. Private sector, as represented by investment and household consumption demand, exhibits optimism from 2nd quarter onwards till sixth quarter before turning back to their long-run trajectory. Similar results were arrived at by Sanchit Arora (2018) for Indian economy. Driven partly by private sector responses the national income as represented by GDP experiences a consistent and prolonged increase. Although in the short run as depicted in figure 1 the national output experienced a decline in the face of a spending shock by the government but in case of monetary sector adjustments there is evidence of expansionary effects. Thus the positive impact of monetary policy adjustments via the channel of demand seems to more than offset the negative effects of government spending shocks, with the strong positive overall impact on growth. Similar results were arrived at by O. Blanchard et al., (2002), Swati Yadav et al., (2012) and S. Arora (2018).

Figure 3.3: Response of Macroeconomic Indicators to Contractionary Fiscal and Expansionary Monetary Shocks.



Source: Compiled and presented by Author using E-views 10

The rate of inflation as depicted by deflator initially experiences a mild decline and thereafter experiences continuous increase till 5th quarter. As can be seen from figure

3, the inflationary movements exhibit a significant association with the movements in the private sector performance implying a demand-pull inflation. The fiscal shock does not seem to exert significant pressure on government spending and hence consequent deficits. The level of deficits experience an increase till the end of 2nd quarter before starting normalising mainly on account of strong economic growth. Under the current scheme of shocks, the monetary and fiscal policies act as complementary in the first two quarters and thereafter they act substitutes till 4th quarter before showing the signs of complementarity again (rule of Muscatelli et al., 2004).

3.7: Interaction Dynamics and Response of Macroeconomic Indicators

3.7.1: Interest Rate (PLR)

The fiscal shock is found to increase the level of interest rate in the economy with a mild increase on impact (0.06 percentage points). However it continues to rise and by the fourth quarter, it rises by 0.18 % points and then starts to decline and the effect of shock seems to die out by 8th quarter. In case of a monetary policy shock, the interest rate gallops upwards and records an increase to the tune of 1.28 percentage points on impact. However, the effect of the shock starts to decelerate and dies down by 7th quarter before turning negative (-0.10) in 8th quarter. In case of a monetary policy stimulant accompanied by fiscal policy shock the interest rate decreases to the tune of 1.17 % points on impact and thereafter starts to revert back and the impact of shock dies out in 6th quarter before turning positive in 8th quarter (0.10). As can be seen from Table 2, the response of monetary policy to shock-1 is almost an inverse replica of shock-3. However, the rate at which monetary sector responds is stringer in 3rd shock as compared to shock 1, implying more accommodative behaviour of monetary policy to fiscal shocks in Indian economy.

3.7.2: Private Investment

A 1 percent shock to fiscal deficit function decreases private investment by 0.10 percent on impact and by -0.24 percent in the fourth quarter and to -0.11 by 8th quarter. Similarly, a 1 percent negative shock to deficits accompanied by a simultaneous 1 % point positive shock to rate of interest exerts a negative impact to the magnitude of -0.80 by fourth quarter with the signs of recovery by the 8th quarter (-0.70).However in case of a negative shock to deficits and a negative shock to interest rate implying an

expansionary monetary policy, the private sector investment exhibit mixed responses. The PINV experiences a mild decline on impact (-0.20) and thereafter it experiences a continuous increase till 6th quarter and remains positive at the end of 8th quarter (0.48).This implies that the monetary policy via the channel of interest rate enjoys relative dominance on the private investment as against the fiscal policy in case of Indian economy.

3.7.3: Private Consumption

A 1 percent negative shock to fiscal deficits can be seen depressing the private sector consumption throughout. The consumption decreases on impact by -0.04 percent, by the fourth quarter it declines by -0.08 percent and by eighth quarter records a decline of -0.07 percent. However, once the fiscal shock is adjusted for a monetary shock in the form of a 1 % point positive shock to interest rate the PCE exhibit a mixed response. It increases on impact (0.10) then starts declining before starting reversal from 6th quarter onwards. As against this, when the fiscal shock is accommodated by a 1 % point monetary stimulus through the channel of interest rate, the private sector spending experiences a reversal of shock 2. On impact, PCE experiences a decline (-0.18) and then reverses back strongly (0.54 by 4th quarter & 0.48 by 8th quarter). This implies that it monetary dominance (via channel of interest rate induced income effect) rather than the fiscal dominance that dominates the private sector spending in the Indian economy, unlike conventional wisdom.

3.7.4: National Income (GDP)

As can be seen a consolidation shock without any adjustment from monetary sector results in a temporary increase to the tune of 0.17 percent on impact and thereafter it experiences a steep decline. GDP recedes to -0.10 by 4th quarter and further to -0.08 by 8th quarter and does not show the signs of dying down. This implies that there are short term pains of fiscal consolidation for the Indian economy and is well in consonance with the earlier literature. However, a shock in the form of fiscal consolidation accompanied by a contractionary monetary policy leads to even higher losses in terms of output forgone. On impact, GDP does not show much responsiveness but by fourth quarter it recedes by -0.70 and by 8th quarter to -0.80 percent. As against this, a contractionary fiscal policy pursued in association with an expansionary monetary policy portrays a better and healthy performance. The growth rate of national output expands

throughout with an improvement of 0.38 percent on impact, 0.51 by 4th and 0.60 by 8th quarter respectively. Thus these findings establish the dominant influence that monetary policy can play on national output via the channels like aggregate demand, better inflationary scenario besides a healthy level of the interest rate.

Table 3. 2: Response of Macroeconomic Indicators to different shocks

Macroeconomic Indicators	Impact of shock	Shock-I	Shock-II	Shock-III
PLR	Immediate	0.06	1.28	-1.17
	Four quarter	0.18	0.85	-0.50
	Eight quarters	0.00	-0.10	0.10
PINV	Immediate	-0.10	0.00	-0.20
	Four quarter	-0.24	-0.80	0.35
	Eight quarters	-0.11	-0.70	0.48
PCE	Immediate	-0.04	0.10	-0.18
	Four quarter	-0.08	-0.70	0.54
	Eight quarters	-0.07	-0.60	0.48
GDP	Immediate	0.17	0.00	0.38
	Four quarter	-0.10	-0.70	0.51
	Eight quarters	-0.08	-0.80	0.60
Total Expenditure	Immediate	-0.02	-0.26	0.22
	Four quarter	-0.05	-0.89	0.79
	Eight quarters	-0.24	-0.57	0.08
GFD	Immediate	-0.86	-1.4	-0.34
	Four quarter	-0.35	-1.0	0.32
	Eight quarters	-0.10	-0.3	0.07
Deflator	Immediate	-0.02	-0.01	-0.03
	Four quarter	0.04	0.00	0.08
	Eight quarters	0.02	-0.02	0.06

Source: Authors Calculations

3.7.5: Total Government Spending

A fiscal consolidation shock is found to reduce government spending by -0.02 percent on impact, -0.05 percent by the fourth quarter and -0.24 percent by the eighth quarter and do not show the sign of dying down. Thus a one-time shock to government deficits is found to have a prolonged effect on the future spending behaviours of the government. However, a deficit shock accompanied by a monetary shock is found to increase government spending throughout. This is because as the rate of interest increases, the cost of financing the private investment increases and thus may lead to a decrease in demand. This will force the government to increase its spending to control the recessionary scenario that may fuel the private sector pessimism. In case of an

expansionary monetary policy, the government spending experiences continues to increase and is attributed to a healthy growth performance of the economy.

Table 3. 3: Variance Decomposition Analysis

Variables	Horizon	Monetary shock (%)	Fiscal shock (%)
GDP	1	5.20	0.00
	4	15.43	1.97
	8	23.48	1.74
	12	24.22	2.80
P. Investment	1	1.38	0.00
	4	1.61	0.19
	8	7.35	0.31
	12	7.73	0.38
PCE	1	0.76	0.00
	4	1.46	0.67
	8	5.86	0.71
	12	6.21	0.71
Inflation	1	0.79	23.69
	4	0.73	23.61
	8	1.28	25.90
	12	1.26	25.94
Interest rate	1	100.00	0.00
	4	93.16	2.20
	8	83.93	4.57
	12	81.72	4.63
Fiscal deficits	1	0.076	82.37
	4	5.81	70.92
	8	6.76	63.36
	12	6.67	61.95
Total Government Spending	1	3.49	0.00
	4	12.64	2.05
	8	14.36	11.41
	12	14.11	12.49

Source: Authors Calculation

3.7.6: Gross Fiscal Deficit (GFD)

A 1 percent negative shock to fiscal deficits is found to depress the deficit function by -0.86 percent on impact, -0.35 by fourth quarter and -0.10 by 8th quarter. In case of a deficit shock accompanied by a contractionary monetary stance, the gross fiscal deficit declined by -1.40 percent on impact and continue to revert back (-1.0 and -0.3 by 4th and 8th quarters respectively). As against this under an expansionary monetary policy regime, the level of deficits rise steeply till 4th quarter and thereafter starts oscillating.

3.7.7: Inflation

A 1 percent shock to fiscal deficits can be seen to depress inflationary pressures on impact by -0.02 % points, by the fourth quarter it rises by 0.04 % points and thereafter starts reverting back. This is because of demand-pull inflation as the reduced crowding-out fuel-up the aggregate demand following an expansion in private sector investment. However, once the deficit shock is adjusted for a contractionary monetary stance, the inflationary tendencies seem to gravitate around its long-run position. Instead of a contractionary monetary policy, under an expansionary monetary regime accompanied by fiscal discipline, the inflationary tendencies experience an oscillating behaviour (Fig. III). The findings indicate that inflation need not be a purely monetary phenomenon in case of Indian economy as conventional wisdom may suggest, though monetary policy enjoys a slight dominance than fiscal policy.

3.8: Policy Implications

The results of our study discover various ways of interaction between monetary and fiscal policy in the Indian economy. Some of the policy implications that follow from the study include:

1. Both Monetary and Fiscal policies interact in a cooperative and competing manner depending upon the types and timing of shocks. For instance, in the face of deficit shock, monetary and fiscal policies act as substitutes for first four quarters. From fifth quarter onwards they act as complements. The similar results were arrived at by S. Arora (2018) and N. Sethi (2016) for their study on Indian economy.
2. So far as the question of dominance is concerned the study reported mixed results. For instance, both fiscal and monetary policy shocks are found to negatively affect the GDP in the short run. However, the impact of a fiscal shock though substantial is short-lived as compared to the monetary shock that is prolonged. Similarly, in the case of inflation both monetary and fiscal policies work in the opposite direction with monetary policy having a prolonged impact. These findings corroborate the earlier findings by R. Khundrakpam & Das (2011), RBI report (2013) and S. Arora (2018).

3. In terms of effectiveness, both contractionary fiscal and monetary policies lead to a decline in output growth. But the impact of the fiscal shock is short-lived as compared to a monetary shock. In case of both interest rate and inflation, the behaviour of monetary policy is prolonged and substantial than fiscal policy and in short-run they work in opposite directions for inflation and in the same direction for the interest rate. However, in the case of debt and deficits both work in the same direction in the short run but the influence of the fiscal policy is dominant. Thus it implies that the fiscal policy may be a better tool of economic stabilization in the short run but in long and medium run it may harm growth. The similar findings have been quoted by R. Khundrakrakpam et al., (2011) and S. Yadav et al., (2012).
4. So far as the question of the effects of fiscal consolidation policies on economic growth in the short run is concerned, the study found that fiscal consolidation measures lead to a decline in the growth rate of income. However, in the long run, the consolidation measures are found to have non-Keynesian effects. The resultants are in line with the existing literature K. Clinton et al., (2011), N. Pashourtidou et al., (2014) and S. Yadav et al., (2012).
5. The consolidation programs pursued under alternative monetary stances yield different results depending upon the monetary regime. A consolidation program pursued under a contractionary monetary policy has a significant negative impact on economic growth. On the other hand, a fiscal prudence plan pursued under an expansionary monetary policy stimulates the economic growth even in the short run. Thus instead of having a sole thrust on fiscal policy as a tool to economic stabilization and a measure of fiscal prudence, there should be more focus on a balanced and judicious mixture of both the policy instruments in case of Indian economy.

3.9: Conclusion

The integration of monetary and fiscal policy as tools to economic stabilization has assumed importance. Though the conduct of both the policies is governed by two different institutions but yet they are far from independent. Thus it pays to study the impact of exogenous shocks in an economy and the response of monetary and fiscal policy instruments. With a similar intent the current study has been undertaken with three

broad objectives viz., to analyse the monetary and fiscal policy interactions in Indian economy, to find out the relative effectiveness of monetary and fiscal policies to economic stabilisation and to assess the effects of fiscal consolidation on the macroeconomic indicators (especially growth) under alternative monetary regime.

The study analyses the interaction between monetary and fiscal policies using quarterly data for 1990Q1 to 2018Q3. The paper analyzed a set of seven endogenous variables i.e. GDP, Private Investment, Private Consumption, Inflation, Interest rate, Total government expenditure, and Gross fiscal deficit. The study has employed the vector autoregression model (VAR) modified for structural identifications SVAR. The study found that both Monetary and Fiscal policies interact in cooperative as well as competing manner depending upon the types and timing of shocks. The study found that although monetary policy enjoys a certain degree of superiority but the potential of fiscal policy has not waned away. These findings corroborate the earlier findings by R. Khundrakpam & Das (2011), RBI report (2013) and S. Arora (2018). In terms of effectiveness, the study found that the fiscal policy may be a better tool for economic stabilization in the short run but in long and medium run it may harm growth. However, the monetary policy performs better in terms of interest rate and inflation targeting. The similar findings have been quoted by R. Khundrakrakpam et al., (2011) and S. Yadav et al., (2012).

The fiscal consolidation shocks were found to have Keynesian results in the short run implying that consolidation policies pursued by the government reduce the short-run economic growth. A consolidation program aimed at infusing fiscal prudence was found to have different effects on economic growth depending on whether such a policy is undertaken in an expansionary or a contractionary monetary regime. A consolidation program followed under a contractionary monetary regime was found to have severe economic losses in terms of output forgone. However, a fiscal prudence program pursued under the expansionary monetary policy was found to have significant positive impacts on economic growth even in the short run. Thus instead of having a sole thrust on fiscal policy as an instrument of economic stabilization measure and a tool to fiscal prudence, there should be more focus on a balanced and judicious mixture of both the policy instruments in case of Indian economy.

Chapter---IV
Fiscal Consolidation and Economic Growth: Do Composition of Fiscal Shocks Matter?

4.1: Introduction

The aggravated debt scenarios and the resultant consolidation programmes are in a causal relationship operating throughout the global economies, where the former causes latter. However, all the episodes or programmes of consolidation that were undertaken from time to time were not successful in attaining the desired targets. "*In other words, not all fiscal consolidation shocks were able to achieve the anticipated fiscal results in terms of impact on the level of deficits and debt"* (see Gruber 2013). This led to the curiosity of research along the line of determining important and relevant factors affecting the success or failure of a consolidation design. As a result Giavazzi et al., (1990) undertook a monumental work to identify the factors that may have an influence on the final outcome of a consolidation programme. This led to the comprehensive studies during the decade of 1990's with the final consensus emerging that the composition of the consolidation is a significant and dominant determinant of the success or failure of a consolidation programme [60]. Over time the literature also started questioning the type of consolidation effort especially along the lines of the timing of such a programme, size and magnitude besides the length and composition (see F. Heylen et al., 2000; V. Hagen et al., 2001).

The key insights emerging from the research especially post 1990's attach primary importance to the quality of composition as the main determinant of success and/or failure of consolidation strategies. However, there is a very sound and vibrant debate going on regarding the relative contribution of different budgetary items besides the source of financing an adjustment effort (Alesina and Perotti, 1996; Alesina and Ardagna, 1998; Alesina et al. 1998; Perotti et al., 1998). Over time the debate seems to craft its direction along the dichotomous analysis between the spending financed vs. tax-funded consolidation design and their probability of success or failure. The literature has mainly focused on the spending backed fiscal consolidation given the wide support to

[60] The importance attached to the composition of consolidation designs opened up what was to be latter on described as the political economy of consolidation programmes. This was mainly because the latter studies established that the spending based consolidation seems more effective than revenue based (refer to Perotti et al., 1998).

the fact that the spending financed consolidation seems more effective and successful than tax-based consolidation design. This line of reasoning stems from the fact that the spending based consolidation designs are usually less distortionary as compared to the tax based consolidation efforts. The tax-based designs involve the sacrifices of incentive to work and save besides the possible crowding out of private investment for government financing. Moreover, the debate between the tax-financed and spending rooted fiscal strategies are taken aid of when it comes to the effects of consolidation plans both in short-run and in long-run.

There is a prolonged debate going on among the researchers and policymakers about the effects of spending based fiscal tightening vs. the revenue-based consolidation programmes. The studies concerning the industrial and economically advanced economies have mainly focused on the spending based consolidation designs mainly because of the back-loaded nature of consolidation episodes that were employed[61]. There is a long list of reasons documented by these studies rationalizing the need for spending financed consolidation designs. The three primary reasons common to these studies include: "*first lower government spending imply lower taxes which in turn mean higher house-hold income and hence higher consumption even in short-run, second the lowering of future tax rates means reducing distortions and provide incentives that stimulate employment with production and third lower government spending means lower debt and lower exchange rate and hence higher net exports"* (Cogan et al., 2013). On the other hand, a revenue induced especially tax-financed consolidation may prove to be counter-productive for at least three reasons. Firstly a higher tax burden implies lower incentive to work and save and hence lower production and growth. Secondly higher the rate of taxation, the higher will be the incidence of distortions implying inefficiency and hence a decline in economic activity. Third, a higher tax always implies the crowding out of resources meant for private sector which may dampen the private sector growth with a negative impact on overall growth (see Blanchard et al., 2002) [62].

[61] The front loaded adjustments here will stand for the discipline enshrined through improvement in tax revenue and back-loaded will imply slashing government spending especially in the form of wages and salaries to finance for a consolidation strategy

[62] Such a decline in growth rate of income can be more severe if the funds channeled from private sector are used for current consumption or for financing interest burden of government rather than investment.

There has been a vide support to the finding that consolidation based on the spending cuts on part of the government tend to be more successful. Alesina and Perotti writing as early as (1996) documented the finding that adjustments that rely primarily on spending cuts in government transfers and wage bills tend to be more effective than the ones that base on tax increase. Over time the finding got multidimensional support from a large number of studies, however mainly from industrial countries. Later on, Giavazzi and Pagano in the same year extended further support to the findings of Alesina et al., (1996). These studies grew in both volume and velocity over time and the additions to the earlier findings were extended under various alternative assumed scenarios. The other important scholarly confirmations were extended from Perotti et al., (1996); Blanchard and Perotti (2002); McDermott and Wescott (1996); S. Gupta et al., (2005). These studies arrive at these findings under the backing of economic effects as quoted in the above section pertaining to the anticipated effects of spending cuts vs. revenue increases on different economic indicators via alternative channels of transmission.

However, there are certain studies that could not extend support to the cited finding and hold that the spending financed design could be recessionary at least in short-run. They stress for a balanced mixture between spending based and revenue reformed designs of adjustment to be carried out. The initial study along the line, we came across, was undertaken by F. Heylen and G. Everaert (2000) for the OECD countries. The study could not document the support for the earlier finding that for a consolidation to be successful, it needs to be based on spending cuts by the government. Other study includes Hallet et al., (1996) that could not extend support to the earlier finding regarding consolidation and government spending. These studies mainly rely on two alternative lines of economic defence viz., firstly the magnitude of the negative Keynesian multipliers may be quite larger than what those studies recommend. Secondly in a dynamic economic setup, we live today, a shock to the demand by reducing government spending may not increase the private spending equally[63].

[63] Both these lines of defence stem from the Keynesian writings where in as the magnitude of fiscal multipliers increase, so do the economic impact of a shock to demand increases. Moreover it is not necessarily that the private sector may consume their additional resources given the psychological law of consumption.

Besides the importance of composition of consolidation designs, there are other emerging areas that may contribute to the likelihood of success or failure of a consolidation programme. They include the domestic economic conditions prevailing at the time of initiation of such a contractionary stance, the global economic outlook, the persistence in terms of continuity, size of such a programme and the possible impact of monetary stance pursued by the authorities. A consolidation stance that is pursued in strong domestic and external economic performance has a higher probability to end with a successful impact on the desired variables (see J. McDermot et al., 1996; Heylen et al., 2000; Hagen et al., 2001). Both persistence and the size of the consolidation designs were found to be positively correlated with the likelihood of success or failure of a consolidation path (Robert Perotti, 1996; A. Zaghini 2001). Moreover, many studies documented significant impact of monetary stance on the final outcome of a consolidation programme. A consolidation design based on spending reduction may have least short-run costs in case of an accommodative monetary stance (C. J. Erceg et al., 2013).

In case of Indian economy, however, we experience the lack of research from a multitude of aspects. Though there have been some studies but they mainly belong to the policy club of the economy with either limited scope or precise purpose. The individual and independent research which could have analyzed different aspects of consolidation strategies like their impact on economic, fiscal and spending indicators in Indian economy are almost absent. However, there is an increasing need and requirement of such studies to be taken care of given the persistent debt problem of India and the resultant adjustments pursued. The debt scenario of Indian economy has been deteriorating since the fuel price shock of 1970's and culminated into a full-fledged crisis during 1990's. Over the past 15 years or so, on an average, India's government deficits have been in excess of 5 percent every year (A. Tapsoba, 2013). This declining fiscal health of the economy forced upon the government to go for heavy liberalization on one hand and institutionalizing fiscal prudence on other hand[64]. Under the new scheme, the Reserve bank was prohibited to bail out the government and the government was forced to check its ways and means. Although some visible success was experienced during

[64]Although the final framework covering the institutional mechanism of debt sustainability came into force in 2003 in the form of FRBM, but the need and necessity for the same was long recognized.

2003-2008 but the situation changed thereafter following financial crises. High levels of fiscal deficit tend not only to cause acceleration in debt-GDP ratio but also adversely affects savings, investment, level of inflation and real interest rate in an economy (C. Rangarajan et al., 2005). The above-cited challenges in collaboration with many more led to the inevitable discourse for consolidation policies under different plans, though with varying intensity.

Although the consolidation has received prime importance in Indian planning for last one and a half-decade but it could not culminate into adequate attention from researchers, thus leading to a scantier literature. Moreover, the limited literature is mainly skewed towards analyzing the overall progress with least or no mention of composition and quality of adjustment effort. The initial comprehensive effort, we came across, assessing the debt and deficit scenario of Indian economy along with its sustainability and the fiscal policy stance has been from Rangarajan and Srivastava (2005). However, the main concern of study has been the long term analysis of debt along the lines of adjustment and sustainability. Similarly, Sanhita, (2012) tried to analyze the dynamics of fiscal consolidation in Indian economy. However, her study has mainly concentrated on the political aspect of the process along with some analysis of impact on election cycles on the levels of debt. In yet another alternative effort Tapsoba, (2013) has tried to evaluate the options and strategies for fiscal adjustment for Indian economy. Although the study has a comprehensive approach towards the understanding of the problem but its main thrust has been the overall effects of consolidation on the growth rate of income. In yet another seminal on the debt dynamics of Indian economy Bhanumurthy et al., (2015) have tried to investigate the possible path of targeting debts especially in face of expansionary fiscal stance with a possible reshuffle in the revenue and capital expenditures.

None of the cited studies have addressed the question of whether deficits that are financed from external sources have a differential impact than those financed from internal sources with almost no-mention of composition and quality. However, there has been ample empirical evidence suggesting a profound impact of composition of consolidation on the success or failure of an adjustment, especially for developed nations. The current study will be an addition to the already existing literature for Indian economy

analyzing the dynamics of fiscal consolidation and its transmission. More specifically the present work will address the following two questions:

- What is the impact of back-loaded fiscal consolidation on the growth rate of income?
- Is there a difference between sources of financing deficits i.e. relative desirability of internal and external sources of financing budget deficits?

This paper does not identify and restrict its coverage to certain well-defined episodes as has been done for developed societies like G. Everaert et al., 2000; J. Von Hagen et al., 2001. Instead, we will be analyzing the whole series of data pertaining to the variables of interest covering the time period from 1990-91 to 2017-18. The rest of the paper is structured as: Section II will be covering review of literature along different dimensions pertaining to different economies of the world both developed and developing; section III will be dealing with the description of the data used along with some descriptive statistics; the section IV will be dealing with econometric analysis along with some robustness tests. Finally, the study will be concluded by section V, contextualizing the main findings of the study along with some policy implications under the heading of conclusion to the study.

4.2: Literature Survey

4.2.1: Review of Literature- Global Perspective

The effects of fiscal policy, both economic and fiscal, in an economy have been the subject of an intense debate for the better part of the 20th century and continue to be so (see Norbert Gruber 2011). Although there is some unanimity among researchers related to the long-run effects of consolidation strategies but the short run assumes the status of continuous disagreement. Under short-run a voluminous amount of research has been generated especially for industrially advanced countries assessing the effects of consolidation shocks on economic growth besides other variables**.** In the first part of the survey we will be focusing on the general studies concentrating on the rest of the economies and the second part will be focusing on the studies specific to Indian economy.

In a seminal on fiscal adjustment in the OECD countries, Alesina and Perotti (1996) undertook a comprehensive study concerning the importance of composition in

fiscal adjustment for the success of a consolidation design. The study made multi-dimensional contributions to the area of fiscal consolidation especially along the disaggregated lines of composition and distributional effects of a contractionary fiscal stance. The study strongly disagrees with the aggregate models that disregard the composition and distributional dynamics of a policy change. Further, the study highlighted the distortive approach pursued under Maastricht treaty (1992) which mainly focuses on the arithmetic's of primary surpluses and deficits unconcerned about how these deficits are reduced. The study concluded with some novel but interesting conclusions, some in consonance and yet others in contrast to the existing literature. The study documented that even contractionary fiscal adjustments can be expansionary mainly on account of credibility and wealth effects. The study further documented the support for the fact that a consolidation design based mainly on the reduction in government spending especially wages and transfers will have better chances of success. The study concluded that any adjustment that avoids dealing with the problems of social security and welfare programmes are doomed to failure.

In contemporary with Alesina et al., (1996); McDermott and Wescott (1996) tried to empirically analyze the fiscal adjustments and their resultant effects both economic and fiscal. The study utilized the fiscal expansion and consolidation experience of twenty industrial countries covering the time period from 1970 to 1995. The study first tried to identify the episodes of fiscal consolidation and has then tried to study the post-consolidation performance of different economic indicators like growth rate of income, growth rate of employment, level of inflation in these economies, real interest rate and many others. The study has employed the technique of logistic probability regression model. The study concluded that fiscal tightening needs not to trigger an economic recession though in short-run we may experience some economic pains. However, in long-run the beneficial effects may appear mainly on account of reduced premiums on interest rates and boost to the investment spending coupled with an expectation of lower future tax liabilities. The study also documented support to the study by Alesina et al., (1996) that the consolidations concentrating on government spending may have non-Keynesian effects. However, the study concluded that the size and magnitude of the effort is a significant determinant of the success or failure of an adjustment effort is at variance with the findings of Alesina et al., (1996). The global economic environment

was found to influence the outcome of a consolidation plan can be neutralized if the composition of the effort is altered.

Heylen et al., (2000) have tried to test the alternative hypothesis that determines the success and failure of consolidation strategy. These hypotheses pertain to composition, size and persistence, gravity, external economic environment and the impact of devaluation. The paper has utilized the multivariate regression analysis to test for alternative hypothesis besides using cyclically adjusted data for government budget balance. The study confirms many of the earlier conclusions drawn from different studies but many did not stand proved. The main findings of the seminal are: success of programme depends much on the external economic conditions prevailing besides high growth rates with low levels of real interest rates, financed by cutting transfers and tax burdens, do not rely much on taxing house-holds and labour. However, the earlier stand of slashing down wage bill for successful consolidation is strongly rejected in the current study. Moreover, weak evidence was found for persistence of consolidation as a factor determining success. Further, the exchange rate devaluation has been found effective only if composition is healthy otherwise may prove to be harmful. Finally, no evidence was found for the hypothesis that consolidation will be successful in economies with critical debt levels.

The consolidation path being a multivariate policy needs a multidimensional approach for its desired ends to be achieved. In the long list of ingredients that determine the success or failure of a consolidation plan, Hagen et al., (2001) have tried to analyze the quality and economic conditions pertaining to a consolidation programme. The study documented further support for the quality of consolidation as an important ingredient determining the success of a plan. The study finds that it pays more if the politically sensitive expenditures like subsidies and transfers are put under discipline. Further, the study garnered the empirical support for the relevance of economic conditions (both preceding and ongoing) to the success of a consolidation strategy. The authors hold that the economic conditions prevailing both domestics and external turn out to be a significant determinant of whether to start a consolidation programme. Moreover, the economic conditions were found to be a dominant determinant of the composition of consolidation programme; whether tax-based or spending financed. However, the study

could not document the support for Maastricht effect inducing governments to adopt stringent austerity measures.

Utilizing the panel of 25 emerging economies, E. Baldacci et al., (2004) tried to investigate the political and economic determinants for the success of a consolidation design. The study tried to find an answer to the problem of why episodes of fiscal adjustments did not lead to a durable fiscal prudent position consistent with a non-increasing debt to GDP ratio covering the time period from 1980 up to 2001. The study has employed the technique of probabilistic regression analysis to contextualize the results of the study. The study documented the finding that the back-loaded fiscal adjustments are found to be more successful than the front-loaded in achieving sustainable fiscal scenario. However, the expenditure-based contractions are not in themselves sufficient and efficient enough to maintain healthy public finances. Moreover, a popular government with more power in a fiscally centralized economy that implements an adjustment programme is found to be more successful than others. Further, the study highlighted the fact that the IMF supported programmes on average turn out to have more success in moving towards sustainable fiscal positions. However, that need not be taken as these programmes induce complete sustainability among those member countries.

Gupta et al., (2005) tried to assess the impact of consolidation and reforms in composition of public expenditure on growth in low-income countries. The panel for the study constituted a total of 39 developing countries during the time period of 1990. The main areas addressed in the paper include: impact of fiscal shocks, expenditure composition and nature of financing on growth and are these results independent or interdependent of the initial fiscal scenario of the economy. The authors have tried to extend the empirical support for the findings of the study by analyzing basic regression and counter tested by generalized method of moments (GMM). The study documented support for the already established thesis in case of advanced economies that fiscal consolidation needs not be harmful both in long and short run. The authors found that the expenditure induced fiscal stance is more productive and successful than the one financed by tax increases. However, a general decline in government spending has been rejected and a selected targeting of non-developmental expenditure has been encouraged.

The reduction of public wage bill was not found harmful for the growth of these low-income countries. Moreover, the study found that the domestic financing of government spending is more harmful than external financing and accordingly the reduction of domestic factor was found to induce more growth. However, the effects of fiscal policy were found to be non-linear in nature with variable trajectory post stabilization of economies. The post stabilization results could be even depressing decided by many uncontrolled factors.

In a seminal backed by IMF research wing, Botman et al., (2006) had tried to assess the macroeconomic effects of different timing and composition of fiscal consolidation for English economy. The study has utilized a two-country version of the IMF's Global Fiscal Model calibrated to the British economy. The study documented the fact that it always pays the government to go for early adjustments given their significant positive benefits. Moreover the long term gains of stabilizing the fiscal scenario out-weigh the short term output losses. Reducing government spending and transfers were found to be quite successful when compared with rising of taxes to entail discipline. The study further documented that a reduction in the global savings could enforce early consolidation measures because reduced savings increase interest rates for small countries. Moreover, the tax reforms that are infused with an aim to encourage savings could extend additional support to consolidation designs that may enhance the long term gains of fiscal adjustments.

Christopher, J. Erceg at al., (2012) in a seminal on composition of consolidation path for a currency union has tried to investigate, "*how the effects of Tax based Vs. Expenditure based consolidation depend on the degree of monetary accommodation*". The consolidation based on spending cuts was found more effective than the one financed by tax hikes. The study concluded that the spending funded consolidation accompanied by an accommodative but sizable monetary support yield minimal costs on output. But the spending based discipline is found to require relatively large cuts in the policy rate to crowd-in private demand. However, the results documented in the study were time and region variant besides being influenced by other considerations. Similar results were arrived at by J. F. Cogan et al., (2012) in his study on US economy.

Ball et al., (2013) have tried to examine the distributional effects of fiscal adjustments in a group of 17 OECD countries covering the period from 1978-2009. The study has estimated the basic panel corrected standard error regression and analyzed the results with the help of impulse response functions. The study documented that over time these consolidation efforts have significantly led to an increase in inequality in almost all the countries. Both the wage income and the share of wages as a proportion of income have experienced a decline. Moreover, the study found that the post adjustment periods experience a significant rise in the unemployment levels of the economies. The study concluded with the recommendation that the government needs to take care of the design of a consolidation effort as the untargeted discourse may lead to long term pains.

4.2.2: Review of Literature- Indian Context

In a seminal on the Indian economy, Charan Singh (1999) tried to empirically investigate the relationship between the domestic debt and economic growth in case of Indian economy. The study has mainly focused on two alternative schools of thought viz., traditional school that holds negative impact and Ricardian equivalence that pledges neutrality. The study has employed multiple econometric techniques like Granger Causality and cointegration. The main motive for the government of India to go for deficit financing was to fuel the investment in the economy. However, the study documented that these resources have been mainly used for either political purposes or to finance the current spending. The study found that there exists wide support for the Ricardian equivalence theory in case of India.

Rangarajan et al., (2005) have tried to analyze the implications of deficits and the resultant debts for growth and stabilization given their adverse impacts on savings and investment besides growth rate. The study has also tried to find out the path to sustainable levels of debt and the stable fiscal policy rule. The study has employed the Domar sustainability analytics model to devise the sustainable levels of deficits and debts for a fiscal policy to attain sustenance. The study found that the debt and its dynamics have received tremendous attention from policymakers especially since 1990's but it in no way displayed an improvement in the debt position of the government. The study quoted that although we may have studies claiming the stability of deficit but the level at which they can be pegged pose a serious and practical challenge. Moreover, if the deficits are

high in magnitude then the government's tightening stance may at times backfire. The study recognized the importance of FRBM act in targeting the deficits in the economy but it questions the same from the alternative points of absence of a limit or precise target and no technique to deal with short term fluctuations. To conclude the study highlighted that to achieve higher growth rates, the general saving rate and investment rate must rise besides significant contributions from deficit financing.

Mundle et al., (2011) has tried to find the consolidation path for Indian economy in consistence with a high growth rate. Using the NIPFP-modified general equilibrium model of Tinbergen tradition, covering the time period from 1991-92 up to 2008-09, the authors have found that it is possible for Indian economy to achieve the desired growth rates while its march on consolidation path. The model has been estimated under two potential scenarios for the external economy viz., *Pessimistic* and *Optimistic* growth performance besides the volatility of international crude prices. The strategy highlighted by authors is to slash down revenue deficit by 2014-15 while maintaining 6 percent fiscal deficit both for states and union. This will translate into high public investment which will have a strong crowding-in effect and hence high growth. "*Thus on the fiscal side, the fiscal deficit ratio declines despite rising public expenditure because of the combined effect of the strong income multiplier for government capital expenditure and an estimated revenue buoyancy significantly greater than one"*. However, if the government expenditure is not diverted to the capital sector and is mainly devoted to government spending, the final outcome may show variance.

In a reassessment Prasad et al., (2016) has tried to examine the effects of public debt on economic growth in case of Indian economy since 1980-2011. The study has evaluated the need and requirement of Indian economy to strive hard to maintain lower and prudent levels of public debt. The study has employed the autoregressive distributed lag model ARDL and error correction mechanism to understand the long-run association between the variables at hand. The study has extended the production function approach by including the variables of total factor productivity and exports. The total factor productivity was estimated using the DEA analysis and examined its long-run and short-run effects. The results show that there exists a long-run association between total factor productivity, public debt and growth rate of income in Indian economy. All the variables

were found to be affecting the growth rate of income even in the short-run period. However, the study concluded with the remark that the government needs to find the agents for higher growth while normalising its debt burden.

4.3: Data description and Descriptive Analysis

4.3.1: Data

The study will be employing time series data for a set of thirteen variables (both fiscal and economic) covering the period from 1990-91 up to 2017-18[65]. The paper will be analyzing three alternative aspects of Indian fiscal stance in relation to their possible impact on the growth rate of income: fiscal policy stance as measured by changes in general government budgetary balance will be captured for present study by net fiscal deficit; the financing of budgetary deficits (domestic vs. foreign); and the composition of expenditure. The data has been extracted from multiple sources, which include Reserve Bank of India (RBI), Economic, and political weekly research wing (EPWrifts) and Center for Monitoring Indian Economy (CMIE).

4.3.2: Descriptive Analysis

The fiscal policy stance will be captured by the changes in net fiscal deficit incurred by the union government during the reference period. A positive change in the cited variable will be taken as an expansionary fiscal policy stance and a negative one will be treated as fiscal tightening. As reported in table 1, the average annual growth of net fiscal deficit has been around 14 percent implying that government, on average, has been pursuing expansionary fiscal stance[66]. These deficits need to be financed and the present study will concentrate on two alternative sources of financing namely domestic and foreign sources. The domestic will include all the components including market borrowings. However, the bailout packages and bringing down reserves to finance government debt by Reserve bank will not be included. The external source will comprise mainly loans acquired by government of Indian from international funding agencies like IMF, WB, etc. Over time the external finance has increased its pace against

[65] The variables include GDP per-capita, Private Consumption, Private Investment, Government expenditure, Interest Payments, Subsidies, Capital Expenditure, Tax Revenue, Non-tax Revenue, Grants in Aid, Net Fiscal Deficit, Internal borrowings and External borrowings.

[66] Although there has been fiscal tightening from the government from time to time, but the debt scenario of 1999-00, 2000-01 and post financial crises may have a significant impact on the average deficits of the union.

the internal but the absolute scenario or the income adjusted scenario may present a different picture. The composition of the fiscal adjustment will be captured using the variables of general expenditure of government, interest payments, grants and subsidies, tax revenue and non-tax revenue.

The general expenditure will mainly include the government expenditure on wages and salaries besides some miscellaneous expenditure on other goods and services. As can be seen from the table below, the general expenditure has been on a continuous rise with a stable mean annual growth rate of 13 percent. This may well be attributed to the Wagner (1865) and Peacock-Wiseman (1940) hypothesis governing the discourse of government expenditure over time[67]. The interest payments will be the total interest burden of the government including both accumulated and current finances. It is also exhibiting a stable growth rate over time and may be partially attributed to the consistent capital and technological imports for industrial expansion. Both grants and subsidies have experienced an upward movement over the reference period and may be attributed to welfare orientation of Indian state over time[68]. Both the tax and non-tax revenue have exhibited a continuous upward tilt though with considerable variability. The non-tax revenue has been found to be more instable over time than tax revenue and could have been a cause of concern.

Macroeconomic indicators have also been obtained from the Reserve Bank of India. Following the established procedure, the growth has been taken on the real income basis. The next in line is the personal disposable consumption expenditure by private sector and has been taken in real terms. It needs to be mentioned here that the disposable income is the post taxation income left with household. The per-capita real income has been utilized though with limited usage besides private sector investment. These variables have been mainly taken as control variables representing the private sector and external sector induced private sector momentum on the growth in the economy. From table 1 below it can be seen that these variables have exhibited high levels of consistent

[67]Wagner law also known as law of increasing state expenditure was propounded by Adolph Wagner (German Economist) and it states public expenditure continuous to grow constantly as income growth expands. This law was later on further validated by Peacock-Wiseman hypothesis for UK.

[68] However the mean of annual growth rates of variable could be a bit deceptive as the figures once adjusted to growth rates of Income show a bit satisfactory scenario.

behaviour as compared to the other variables. However private investment is found to be a volatile entity exhibiting substantial variation over time and may better reflect the impact of market volatility on the decisions to invest.

Table 4. 1: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Variance statistic
GDP	28	6.5	2.1	4.3
Per-capita (Y)	28	5.0	2.0	4.1
Private Consumption	28	6.2	2.0	4.1
Private Investment	28	15.0	15.3	233.2
General Expenditure	28	13.3	6.6	43.6
Interest payments	28	12.6	5.2	27.0
Subsidies	28	13.2	18.0	325.1
Capital expenditure	28	10.6	22.1	490.3
Tax Revenue	28	13.8	8.8	77.7
Non Tax Revenue	28	13.4	21.9	479.6
Grants in Aid	28	9.1	33.0	1087.4
Net Fiscal deficit	28	14.9	35.5	1263.3
Internal financing	28	7.3	13.2	176.2
External Financing	28	13.0	2.5	6.6

Note: the descriptive pertains to the data period ranging from 1990-91 to 2017-18.
Source: Authors calculations

4.3.3: Fiscal Stance and Real Income Growth: Bivariate Analysis

The next in line is the bivariate correlation analysis among the variables of interest to have some insights about the long term association between them. The simple correlation matrix reported in table 2 exhibit interesting insights about the association between targeting deficits, expenditure composition and growth rate of real national income with significant signs. Although many of the coefficients are not in line with the already established literature; but yet they do confirm the general economic theory. For instance, the composition of expenditure has been found to have a dominant impact on the growth; both higher general and capital expenditure were found to enhance growth rate of income. Though the conclusion for capital expenditure is in line with the earlier existing literature but the positive impact of general expenditure (mainly including wages and salaries) on growth rate is at odds with established premises (see S. Gupta et al., 2005; Christopher J. Erceg et al., 2013). The budget balance is found to be positively correlated with the growth rate of real income over the reference period and is in line

with the existing literature[69]. The acceleration in the growth rate of interest burden is found to damp down the growth rate of domestic product and is well in conformity with literature.

Table 4. 2: Bivariate Correlation Matrix

Variable	Real GDP (Absolute figures)	Observations	Real GDP (Growth rate)	Observations
Private Consumption	0.99*	39	0.77*	38
Private Investment	0.98*	39	0.23^	38
General Expenditure	0.98*	39	0.06^	38
Interest payments	0.98*	39	-0.30**	38
Subsidies	0.96*	39	0.04^	38
Capital expenditure	0.97*	39	0.08^	38
Tax Revenue	0.97*	39	0.27**	38
Non Tax Revenue	0.97*	39	-0.05^	38
Grants in Aid	0.64*	39	-0.17^	38
Net Fiscal deficit	0.97*	39	-0.06^	38
Internal financing	0.96*	39	-0.40*	38
External Financing	0.99*	39	-0.38*	38

Note: the above tabled bivariate correlation pertains to the time period from 1980-81 up to 2017-18.
* Significant at 1% or 5%. ; ** Significant at 10 %; ^ Significant at more than 10%
Source: Authors calculations

The next in line is the relative effects of tax revenue and non-tax revenue on the growth rate of income. The positive and unidirectional effects of tax revenue on growth are at variance with the existing literature for industrial countries and so is the relation of non-tax revenue (Heylen and Everaert 2000; E. Baldacci 2004; S. Guichard et al., 2007; A. Zaghini 2001). Given the amount of emphasis on the back-loaded fiscal adjustment in industrial countries; the current coefficients reveal a different story regarding Indian economy with a possible tilt towards front-loaded consolidation programmes. Moreover, both types of borrowings were found to be depressing agents for growth. However, the intensity and magnitude of the internal borrowings were found to be more severe. The above analysis pertaining to the correlation matrix encompasses the growth rate analysis rather than the absolute association[70].

Many of the above findings are in consistence with the existing empirical literature established for high-income countries but yet many are at large variance. The

[69] Although the term budget balance is no-where mentioned but it's taken as the inverse of net fiscal deficits which are displayed with a negative sign. An increase in NFD implies a decrease in Budget balance and vice-versa.

[70] It is quite possible that over the time increasing growth may increase the functions of the government and hence the increasing expenditures. Thus the absolute correlation being only directional in nature may not suffice to establish a causal relation.

composition of expenditure, the impact of both tax and non-tax revenue and the relative efficiency of borrowing both internal and external are at variance with the existing literature for developed nations. However, the above analysis is just a preliminary inspection carried out with the help of simple correlation and cannot be relied upon with certainty unless empirically supported by the hard-core regression analysis to be carried in the next section.

4.4: Econometric analysis

4.4.1: The Econometric Models

The relationship between fiscal stance and economic growth in the current study has been estimated by regressing the annual growth rates of real GDP on a set of regressors, including both fiscal and economic indicators with later also acting as control variables. Following Gupta et al., (2005), three alternative specifications of the relationships are used to contextualise the study. In all the three models the annual growth rates of both fiscal and control variables have been employed[71]. The first model has been specified in such a way as to allow us to capture the effect of composition of expenditure and source of financing (tax and non-tax) of a consolidation design on the real growth rate of income. However, the variables representing the debt scenario will be excluded in order to make sure that we do not encounter the possible perfect collinearity problem. The second model will be utilised to analyse the impact of budget balance via the channel of fiscal deficits on the growth rate of income. The third model will address the question pertaining to the financing of deficit (internal vs. external) and their resultant impacts on the growth rate of income. The models have been formulated with the following specification:

- **Model I: (Budget composition i.e. Revenue and Expenditure)**

$$Y_{it} = \alpha_t + \sum_{i=1}^{k} \beta_i G_{it} + \sum_{i=1}^{q} \beta_h X_{ht} + \mu_{it} \ldots\ldots\ldots 4.1$$

Where Y_{it} will be capturing the growth rate of real national income; G_{it} will be representing a vector of non-fiscal independent variables also acting as control variables and will constitute private sector consumption expenditure (including both household and firms), private sector investment (both household and corporations) besides initial

[71] For deeper insights and relevance of the model specifications as used in the above context refer to the work of Gupta et al., 2005, "*Fiscal Policy, expenditure composition and growth in low income countries.*"

levels of domestic product. The X_{ht} is a vector of independent fiscal variables aimed at capturing the effects of composition of budget. These variables mainly include general expenditure of government including mainly wages and salaries, interest burden on the previously accumulated debts, subsidies and transfers to the firm and general public, total tax and non-tax revenue of the union government and utilisation of grants. However, we could not incorporate the component of budget balance proxied by net fiscal deficit apprehending the possible collinearity among the regressors in the model.

- **Model II: (Fiscal Balance as represented by Net Fiscal Deficit)**

$$Y_{it} = \alpha_t + \sum_{i=1}^{k} \beta_i G_{it} + \sum_{i=1}^{q} \beta_f XBAL_{ft} + \mu_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots 4.2$$

Where; Y_{it} and G_{it} are defined as before to represent the growth rate of real income and a vector of control variable. However, $XBAL_{ft}$ will be the vector of independent fiscal regressors aimed at capturing the effects of budget balance i.e. fiscal deficits on the growth rate of income. The vector will include all the earlier mentioned variables except the representation from tax and non-tax revenue. However, it will continue to include the variable representing the general expenditure of the government though with more disaggregation. The budget balance will be captured by net fiscal deficits of the government.

- **Model III: (sources of debt financing both internal and external)**

$$Y_{it} = \alpha_t + \sum_{i=1}^{k} \beta_i G_{it} + \sum_{i=1}^{q} \beta_f XFIN_{ft} + \mu_{it} \quad \ldots\ldots\ldots\ldots 4.3$$

Where Y_{it} and G_{it} are defined as before. The $XFIN_{ft}$ will be vector of fiscal variables as before but with a slight modification as it will constitute variables capturing the financing of government deficits both internal and external. Since the main internal and external source of union government is borrowing so it will represent total borrowed liabilities of the government. However, these will not include the bail-out packages extended by RBI to government or the drawing-down of reserves. Thus the internal source will mainly constitute the market borrowings of the government and the external component will be represented by the borrowing from the international lenders like World Bank etc.

The above-specified models will be estimated employing simple ordinary least square regression analysis. However, the results will be later tested for robustness by performing a generalised method of moments (GMM) estimator. The main focus of the

GMM estimator will be to address the possible problems of endogeneity and serial correlations. This is mainly given the severity of inter-relation among regressors especially in the literature concerning the fiscal policy areas. The need, importance and efficiency of these estimators for the current study will be dealt at length in the sections ahead.

4.4.2: Regression Analysis

The models specified in the above context have been estimated using the growth rates of the variables. Before proceeding for the formal estimation of the models, we have to make sure that we did not encounter the possible unit root problem in the data given the time series nature of the analysis[72]. Though we performed alternative unit root tests to detect for the possible problem of non-stationarity but for the sake of convenience and simplicity we will be sketching down the results of only ADF test as follows[73]:

Table 4. 3: Unit root analysis using Augmented Dickey-fuller test

	Augmented Dickey-fuller test				
Variable	t-stat	1%	5%	10%	P-value
Capital Expenditure	10.73	4.33	3.58	3.22	0.00
GDP	3.34	4.33	3.58	3.22	0.08
General Expenditure	3.68	4.33	3.58	3.22	0.00
Grants in Aid	8.77	4.33	3.58	3.22	0.00
Interest payments	3.44	4.33	3.58	3.22	0.00
Non tax revenue	6.22	4.35	3.59	3.23	0.00
Private consumption	4.13	4.33	3.58	3.22	0.00
Private investment	7.57	4.33	3.58	3.22	0.00
Subsidies	4.06	4.33	3.58	3.22	0.00
Tax Revenue	4.53	4.33	3.58	3.22	0.00
Net Fiscal deficits	5.74	4.33	3.58	3.22	0.00
External Borrowings	9.06	4.33	3.58	3.22	0.00
Internal borrowings	5.01	4.33	3.58	3.22	0.00

Note: The T-statistics and critical values are absolute coefficients.
Source: Authors Calculation

As can be seen from the table above almost all of the variables under consideration are stationary at 1 percent except domestic product which is at 10 percent level of significance. The above estimates pertain to the only specification of the

[72] "*Unit root also known as unit root process or difference stationary process is a stochastic trend in a time series exhibiting systematic patterns that are unpredictable. In case of a unit root problem the normal OLS estimates are no more trustworthy for policy and forecast analysis*" (For more insights refer to Basic econometrics by Gujrati, edition 4, pp. 802-806).

[73] The other tests performed on the data include Phillips-Perron (1988) and Kwiatkowski-Phillips-Schmidt-Shin KPSS (1992).

augmented dickey fuller model which includes both intercept and trend. The other specifications though estimated have not been quoted due to their voluminous nature. After the assured results of our stationarity analysis we proceeded for the final econometric estimation of our cited models to execute the study. The study has employed the technique of basic ordinary least squares (OLS) and will be covering annual data from the period of 1990-91 to 2017-18. The results of the estimation have been quoted in the table 4.4 below:

Table 4. 4: Budget Composition and Economic Growth

	Model—I: Budget composition	**Model—II: Budget balance**	**Model—III: Budget financing**
	Real GDP growth rate	**Real GDP growth rate**	**Real GDP growth rate**
Private consumption	0.82* (7.67) [0.10]	0.80* (8.14) [0.09]	0.73* (7.51) [0.09]
Private investment	0.04* (2.19) [0.01]	0.04* (2.42) [0.01]	0.02** (1.71) [0.01]
General Expenditure	0.07** (1.87) [0.04]	0.08** (1.83) [0.04]	0.07** (1.94) [0.03]
Interest payments	-0.007*** (0.19) [0.04]	-0.005*** (0.13) [0.03]	-0.02*** (0.39) [0.05]
Subsidies	-0.01*** (0.87) [0.01]	-0.01*** (0.51) [0.02]	-0.01*** (0.99) [0.01]
Tax Revenue	0.001*** (0.04) [0.03]		
Non tax revenue	0.005 (0.49) [0.01]		0.007 (0.68) [0.01]
Grants in Aid	-0.005*** (0.70) [0.00]	-0.005*** (0.67) [0.00]	
Net Fiscal deficits		-0.004*** (0.39) [0.01]	
External Borrowings			-0.02** (1.20) [0.02]
Internal borrowings			0.08*** (1.27) [0.06]
Adjusted R^2	0.60	0.61	0.65
S.E of Regression	1.30	1.27	1.22
Durbin Watson	1.62	1.57	1.60
Number of observations	28	28	28

Note: () encompasses the t-statistic and [] encompasses the standard error of estimate. * Indicates that the coefficient is significant at 1%; ** at 5% level of significance & *** indicates at 10%.
Source: Authors Calculation

The empirical results quoted in the table above partially do confirm the existing literature and are partially found to be at variance with earlier studies. One of the interesting findings of the estimation is that the consolidation, in long run, need not be

harmful for Indian economy and is well in consonance with the earlier studies (see Easterly et al., 1994; S. Gupta et al., 2005; S. Mundle et al., 2011). It can be shown that an increase of 1 percent in the growth rate of fiscal deficits can decrease the growth rate of income by about a quarter (Model-II). This implies that there exists ample rationale on the part of the government to consolidate the budgetary position of the economy to enhance the sustenance of growth[74]. That is not the whole picture of the process as the channels used to arrive at fiscal prudence may have a say in the final outcome. We found that the composition of the consolidation can severely influence the outcome of a consolidation programme. As can be seen from the table above, the general expenditure mainly in the form of wages and salaries need not to depress the real growth rate in the Indian economy as it holds for advanced economies (see S. Gupta et al., 2005; Christopher J. Erceg et al., 2013; V. Hagen et al., 2001).

On average in all the three specifications the coefficient of the general expenditure has been in excess of .07 implying a substantial positive impact on the real income growth. A possible explanation may be the fact that Indian economy is better described as a consumer economy and its rising middle class is the main component of demand and hence growth. Yet another explanation may be drawn from the endogenous growth theory where-in the spending on education and health has the potential to determine the sustainability of growth in long run. Since wages and salaries constitute a major proportion of the government current expenditure, it may, on one hand, exert upward pressure on demand and may at the same time enhance the provisions for human capital. The next in line is the interest burden and direct transfers in the form of subsidies. Their growth is seen to continuously decelerate the growth rate of real income. For an economy like India, these areas may promise better returns if the policymakers can target such spending to consolidate the fiscal balance.

The behaviour of both tax and non-tax revenue is yet another area of contrast between the current study and the studies for industrial economies. Though not all, but a substantial amount of literature advocate against the use of front-loaded consolidation strategy especially financed by tax revenues (refer to, C. J. McDermott et al., 1996; E. Baldacci et al., 2004). As against that, in case of Indian economy and at least for this

[74] Although consolidating the fiscal scenario may be mandated by a multiplicity of considerations but the design need necessarily be pro-poor and pro-justice, in order to make it sure that the marginalized are not penalized by the policies of the polity.

study, both tax revenue and the non-tax revenue sources are found to have a positive impact on the growth rate of income (Model I & III). Thus the study could not derive support for the famous supply-side effects of taxation and its possible impacts on the long-run growth rate of income. However, the non-tax revenue is indicative of less distortionary nature with pro-growth potential as against the tax-revenue. But such policies need to be tackled with more caution as it may advocate more regressive taxation and thus targeting the marginal sections of the society.

Another dichotomous analysis pertains to the sources of deficit financing in an exclusive combination of internal and external sources. Though the initial bivariate correlation matrix depicted both the sources as harmful for the growth rate of real income but the regression analysis could not extend adequate support to that premise. As can be seen from table 4 under Model III, the internal borrowings are found to have a positive influence on growth. One possible reason could be that government, on average, may have better utilisation for the privately-owned financial resources. Thus a borrowing besides financing its interest burden may qualify for initiation under marginal efficiency principle. The other façade of the debate is the external source and is found to be in line with earlier findings that it may cost the growth rate of income. The external debt is always riskier adventure than the domestic for at least the reason of exchange rate shock[75].

4.4.3: Endogeneity diagnoses and robustness analysis

In a dynamic framework with multiple causation, it may be quite possible that the results pertaining to static analysis may not suffice. This may be due to a multitude of problems like endogeneity or reverse causality[76] etc. This section will be encompassing the main results of the robustness analysis pertaining to the econometric analysis presented above. A more common issue in the literature on fiscal policy and growth is the likely presence of endogeneity or reverse causality. There are strong reasons to believe that under certain specific circumstances the economic growth may itself have a significant impact on fiscal variables. For instance, even with fixed government expenditure, a slowdown in economic growth may imply higher budgetary deficits.

[75]Though the internal borrowing carries the potential of crowding out phenomenon but the transfer of resources may augment the long run growth if put to better uses.

[76]Although there exist a marked difference between endogeneity and reverse causality but for the current study we will be using both as same and may be used through-out the text as synonymous.

Besides the economic growth has a better possibility of being a significant determinant of the investment in the economy. Thus if the growth rate of GDP is a determinant of any of the independent regressors in the above specifications, the estimation techniques that do not account for this reverse causality will yield biased and inconsistent results. So to address the concern, we will be employing the generalised method of moments (GMM) to re-estimate the above models to make sure that whether the above empirical results stand the endogeneity tests[77].

There are many variables in the above specifications that may have a potential tendency to encounter the endogeneity problem. They include general expenditure be correlated with tax and non-tax revenue, both revenue and expenditure variables used in the above specifications may exhibit some association with fiscal deficits, etc. The results of the estimation under the alternative scheme are presented in table 5. This section is mainly attributed to the validation of our earlier results along very important dimension viz., to highlight whether the conclusions carried out of the above estimation process do stand valid once they are adjusted for the possible endogeneity problem. The results under the alternative scheme of methodology with different sets of assumptions do extend the support to the earlier drawn conclusions. The GMM estimation of the above-cited specification has been quoted in the table 5 below:

The results quoted in the table above broadly confirm the findings of the earlier analysis. The endogeneity adjusted estimation of the cited specifications upholds the earlier positive impacts of fiscal consolidation on growth rate of national income. However, certain minute differences were recorded between the two estimation processes. The magnitude of the private consumption in the later estimation under all the specifications has declined. Under all the three specifications, pertaining to later estimation, the private investment has turned to conventional insignificance zone[78]. Although the magnitude of the general consumption expenditure has declined in all the three specifications but the sign of the coefficient has been same. This extends further support to the already established finding that the consolidation established only by

[77]There are many merits of GMM method like it includes both the ordinary least squares technique along with two-stage least squares technique and is well suited to deal with the potential endogeneity issues (see J. Breitung et al., 1995).

[78]By insignificance zone here means it is no more acceptable fewer than 10 percent level of significance. However the coefficients are significant at higher levels like 11%, 15%, 17% etc., though not covered usually.

slashing down of general expenditure may backfire with a negative impact on the economic growth.

Table 4. 5: Fiscal stance, Budget Composition and Economic Growth- Controlling for Endogeneity

	Model—I: Budget composition	**Model—II: Budget balance**	**Model—III: Budget financing**
	Real GDP growth rate (GMM)	**Real GDP growth rate (GMM)**	**Real GDP growth rate (GMM)**
Private consumption	0.63* (4.6) [0.13]	0.59* (3.11) [0.18]	0.82* (4.37) [0.18]
Private investment	0.01*** (0.55) [0.02]	0.01*** (0.65) [0.02]	0.008*** (0.32) [0.02]
General Expenditure	0.12* (2.62) [0.04]	0.24** (2.02) [0.12]	0.10** (2.00) [0.05]
Interest payments	-0.04*** (1.48) [0.02]		-0.12*** (0.35) [0.33]
Subsidies			-0.01*** (0.49) [0.28]
Tax Revenue	0.08** (0.82) [0.10]		
Non tax revenue	0.001*** (0.20) [0.00]		
Grants in Aid		-0.005 (0.50) [0.01]	
Net Fiscal deficits		-0.03** (1.65) [0.01]	
External Borrowings			-0.03*** (0.39) [0.33]
Internal borrowings			0.14*** (0.49) [0.28]
Adjusted R^2	0.47	0.44	0.50
S.E. of Regression	1.50	1.54	1.46
Durbin Watson	1.59	1.66	1.24
Number of observations	28	28	28

Note: () comprise the absolute t-values; [] constitute the SE of estimates; * Indicates that the coefficient is significant at 1%; ** at 5% level of significance & *** indicates at 10.
Source: Authors Calculations

The coefficient and signs of interest burden has been almost uniform across all the specifications under the alternative estimation process. Equally so has been the case of subsidies, though estimated only under third specification, and have been in consonance with the earlier conclusions. Both tax and non-tax revenue exhibit the same directional impact though with a slight improvement in the magnitude of the tax revenue. The relative position of the grants in aid has been constant under both the processes of estimation. The variables representing the relative sources of deficit financing have almost exhibit the same directional relationship as under OLS.

However, there has been some improvement in the magnitude of internal borrowing accompanied by the decline in the relative effects of external sources. Thus the overall results have been same under the generalised method of moments (GMM) technique with more improvements and validity of the estimates. The above alternative but improvised empirical analysis could not generate support for the earlier empirical findings that spending financed consolidation can be expansionary as in case of industrial economies. The current study found the support for the counter-argument that it may be harmful for Indian economy to base its consolidation design on rampant slashing of general expenditure especially in the form of wages and salaries, expenditure on education and health, etc.

However, the study extended the support in favour of better targeting of subsidies, optimal management of foreign grants and better utilisation of external borrowings to infuse long-run fiscal discipline with least economic costs.

4.5: Conclusion and Policy Implications

The study has been conducted with the primary objective to analyse the role and relevance of composition of spending and the alternative modes of deficit financing for designing a consolidation programme. The study has employed annual time series data covering the period from 1990-91 to 2017-18. The data was tested for alternative diagnostic tests like unit root analysis before the formal estimation. The analysis has been empirically established utilising the services of ordinary least squares technique (OLS). To check for the possible reverse causality or endogeneity problems, the study has conducted robustness analysis utilising the generalised method of moment's technique (GMM).

The empirical evidence provided under the study suggests that fiscal consolidation need not be necessarily harmful to Indian economy, especially in long-run. Consistent with the existing literature for the industrial countries, the results portray a positive impact of fiscal tightening on the growth rate of domestic product. An increase of one percentage point in the growth rate of net fiscal deficit can lead to a reduction of about a quarter in the growth rate of national income. This implies that an increase in the budget balance to the tune of 2 to 4 percent may increase the growth rate of national income by ½ to 1 percentage points. The next in line is the relative importance of the composition of expenditure and its impact on growth. The study found that the

composition of expenditure can have a substantial impact on the success or failure of a consolidation programme. More productive and judicious use of over-all public expenditure is pre-requisite for boosting the long-run growth rate. However, the consolidation achieved by slashing down the general expenditure of the government may trigger a possible decline in the economic growth and is in complete contrast with the established literature.

The above analogy does not pertain to all types of government expenditures. A better and integrated targeting of expenditures like subsidies and transfer payments may enhance the growth rate of income. The study could not document the support for the negative impacts of front-loaded fiscal consolidation funded mainly by tax and non-tax revenue increases. Rather under both the empirical exercises the increase in the growth rate of both tax and non-tax revenue was found to be growth augmenting. These results brush aside the celebrated supply-side effects of tax increases on growth via the channel of incentives to work and invest. The composition of deficit financing has been found to be a key factor with a potential to influence the long-run economic growth rate. The results of the study pertaining to the cited variables were found again to be at variance with the earlier literary stand. Consolidation that was financed by foreign borrowings was found to be expansionary in nature while the one financed by domestic sources may be recessionary. The empirical estimates indicate that a one percentage point's increase in domestic borrowing may increase the growth rate of national income by about 14 percent of that increase. While as on the other hand a 1 percent increase in foreign borrowing may decrease the growth rate of real GDP by about 3 percent of that increase.

The final conclusions with some policy relevance emerging from the study indicate that the consolidation need not be contractionary in nature. However, the composition of the consolidation need not be financed heavily by slashing government spending. Rather a judicious mixture of both spending and revenue-based design may offer better returns. Moreover, the relative desirability of internal borrowings has been established over that of an external source.

Chapter—V
Fiscal Consolidation Shocks and their Impacts on Social Sector Spending in Indian Economy

5.1: Introduction

The recurring nature of business cycles and the resultant downswings in the economic activity has forced the governments to adhere to the interventionist fiscal stance. This interventionist approach has led to a debate about the need, sustenance and feasibility of such a policy. This institutional activism is questioned at least along three alternative dimensions: first pertains to the possible impact of an expansionary fiscal rule on the level of debt in an economy; the second line highlights the possible crowding out of private investment and the third pertains to the expansion of government activity beyond its defined boundaries and the possible inefficiencies that may creep in (Buchanan et al., 1980).

The first line of attack can be associated with general economic theory backed by almost all the schools of thought. The second one can be mainly attributed to the writings of the neo-classical school of thought and the last one is attributed to public choice theorists broadly an offshoot of neoclassical family. The public choice theorists strongly advocate against the excessive expansion of state activities fearing that the disputes may arise as the nature of the state changes from "*protective to productive institution*[79]*"*. Overtime the stand advocated by public choice theorists drew wide support mainly on account of rising and unsustainable levels of debt besides a competing discourse between government and private sector (Musgrave and Musgrave, 1989). On the other hand, the rising amount of studies quoting non-Keynesian effects even in short-run led to the popular support for the consolidation of public finances across the globe.

This contractionary fiscal stance to infuse more prudence and to evolve a sustainable consolidation design was institutionalized following the strong backing of international institutions like monetary fund and World Bank[80]. These consolidation

[79] There has been a week long debate between Musgrave and Buchanan held at university of Munich related to the role of state and the same has been summarized into a book.

[80] The SAP programmes were heavily criticized for their bias against the social sector spending and a pro-market sentiment at the cost of other sectors.

strategies were encouraged with a multitude of purposes like reduction of debt and the interest burden of the economies, the provision of congenial atmosphere to the private sector by reducing crowding-out, check on possible inflationary effects of rising debts and creating more fiscal space for developmental spending. However, overtime these consolidation designs were questioned along many important lines viz., the possible negative impact of these policies on growth, the chances of their success or failure in terms of their anticipated results and the impact on social spending following the hypothesis of *minimalist government*[81].

The former line of reasoning may better be attributed to the post-Keynesian researchers and the latter is attributed to the work by Musgrave (Musgrave 1989; Alesina et al., 1996). However, no unanimity has been quoted among researchers regarding the effects of fiscal adjustments on growth. Some hold for positive effects of such contractionary policies yet others pledge hold in favor of Keynesian effects over time (see Gupta et al., 2005). The consolidation designs structured on the slashing of government spending may have recessionary impacts on the growth rate of income, at least in short-run (Pashourtidou et al., 2014; Kumhof et al., 2011). Apart from the growth rate of income, such designs may have deep repercussions on the provision of public goods especially if markets fail to provide such goods or if the marginalized sections were unable to pay. The first two questions have been addressed in the earlier chapters of the thesis. The third question pertaining to the social and welfare spending constitute the basic essence of this chapter.

The under-provision or the under-utilization of these public goods especially in the form of education and health services may have a detrimental impact on the long-run growth rate, at least in endogenous growth models (Chamley, 1992; M. Romer 1990, 1994). This is because of the fact that the endogenous growth theory contends that human capital is the perfect substitute for the physical capital in the long run. A shock to human capital, in endogenous growth models, is treated at par with a shock to physical capital. Thus the governments, apart from the minimalist approach, need to focus on the areas, where either the market cannot operate or the operation may lead to unequal distribution

[81] The minimalist government is the term popularized by public choice theorists and holds that the primary or the minimal function of the government is the protection of life and liberty of citizens.

of goods[82]. However, the level and intensity of the government intervention may vary across countries given the initial level of economic advance. In an advanced society where the provision of merit goods is better managed and fully affordable under a well-defined market mechanism, the government can better assume the role of a regulator. The case for a developing society may not be so given the wide-spread inequality and under-provision of public services especially to the marginalized sections of the society. This may require government to undertake the roles like an agency to allocate and distribute besides stabilization. Thus "*the government, besides ensuring the protection from external aggression, internal strife and property rights, need to provide social and physical infrastructure for the upliftment of poor"* (Rao 2017).

India being a developing society exhibits a wide range of poverty and deprivation that cannot be left unaddressed at the mercy of market forces. In case of countries like India, the state needs to assume a much larger role than the minimalist that the public choice proponents would recommend (R. Gupta, 2011). The Indian economy is experiencing a surge in its working populace that needs to be converted to what is popularly known as demographic dividend[83]. However, this cannot be possible unless and until a significant government intervention is undertaken targeting the provision of education, health care and skill development. Such an intervention, on one hand, may augment the demand in short-run and on other hand may contribute to national capital stock in long-run especially in the form of human capital. But the analyses of general budgets highlight the fact that the allocation to essential services like health care and education are pretty low by international standards. The public expenditure as a percentage of national income in India has been quite high when compared to the limit of 25 percent prescribed by the United Nations Development Programme UNDP (S. M. Dev et al., 2002). Unfortunately same is not the case when it comes to expenditure on social and welfare services especially health and education. As of 2015-16 government spend 1.4 percent of GDP on health as against the international norm of 3 percent and is way below 1.7 percent by countries like Srilanka, Bangladesh, Egypt. Even basic

[82] The first is the case of perfect public goods where the market cannot operate because the excludability is not possible may be due to cost considerations. The second may be the case of merit goods where in the market may lead to distorted provisions and can affect the accessibility of a certain social group.

[83] The populace in the working age group constitute around 64 percent of the total population of the country and 130 million more are expected to be added by 2020 (see Rao 2017).

preventive health care such as water supply and sanitation has been absent implying that half of the population does not have access to safe drinking water and proper toilets (G. Rao 2017).

The scenario of spending on education has not been encouraging either and has gravitated from 3 to 3.5 percent for almost last decade. However, this is well below the international norm of 6 percent and even behind the countries falling in the same income group, implying the failure of government to provide goods and services of social value. According to UNDP social expenditure should constitute more than 40 percent of the total public expenditure. More than 50 percent of this social spending should be devoted to human development concerns and the proportion of national income attributed to human priority concerns should be more than 5 percent[84]. However, in case of Indian economy, none of the above targets have been ever achieved rather a more distorted performance has been documented (S. M. Dev et al., 2002).[85]

Similar is the case with other sectors like welfare of marginalized sections, safety nets for poor and upliftment of SC's and ST's. The already endangered social spending scenario, as cited above, may experience further aggravation in face of government commitment to consolidate the public finances of the state. This may be mainly so because of the two possible constraints of the public budget namely an ailing tax structure and a rising current spending by the government[86]. The lower revenue receipts and the rising burden of committed expenditures in terms of defence and other services imply rising drain of resources for current expenses. In turn that implies either no or low provision of resources for the welfare and developmental spending from the own receipts of government and hence more dependence on borrowings and deficits.

[84] There is a profound debate going on among researchers about the feasibility and applicability of these UNDP ratios to be applied in case of Indian economy. This is mainly due to the fact that these ratios pertain to an older set of data and are methodologically not consistent with the changes that have taken place in Indian economy over time. However the updated ratios for Indian economy do not exhibit any significant difference.

[85] For Indian economy the public expenditure has been always in excess of 25 percent, the social priority ratio has been around 20 percent, the social priority ratio has been around 34 percent and the human expenditure ratios has been 2.5 percent.

[86] The tax reforms in India have not been able to generate required revenue rather the tax GDP ratios have experienced a decline. Moreover the government current expenditures have always been in excess of the ways and means of the government to full-fill them (see Rao and Rao 2006).

In face of the above background, this chapter will be analyzing the possible impact of consolidation strategies adopted by the government on social and welfare spending. More precisely the study will focus on the impact of fiscal consolidation on the spending in education and health besides welfare and sanitation. The rest of the paper will be structured as section II will be covering literature survey; section III will encompass the research gap and relevance of the study; the section IV will be dealing with data and methodology; the section V will be covering econometric analysis; section VI will be citing the policy Implications followed by section VII encompassing conclusions to the study.

5.2: Literature Review

As documented earlier there has been a lot of focus on the analysis of fiscal consolidation along different lines like its impact on growth rate of income, consumption, investment besides the determinates of its success and failure. However there has not been much effort along the lines assessing the possible impact of fiscal adjustments on the social and welfare spending given their discretionary and long gestation nature. The case of Indian economy displays even more pathetic scenario with a scantier and skewed distribution of literature. Although over the time the area has received some impetus from both policy analysts and researchers but yet a lot needs to be done given the sensitivity and relevance of the subject matter. In the present study, we have reviewed literature mainly along the lines of methodology utilized and the results arrived at. The first section will be covering the general literature and the second section will be quoting the studies specific to Indian analysis.

5.2.1: Survey of Literature: Global Context

Recognizing the importance of human capital for sustained growth, S. Mundle (1998) has tried to assess the models of financing human development in the advanced Asian economies. The paper mainly analyses the public expenditure policies pursued by Asian giants and their successful financing of education and health care system. The study documented that over time these economies were able to maintain very reasonable levels of inflation by following targeted public spending. This led to two main positive contribution viz., an increased level of savings and hence investment and acceleration in the exports to the rest of economies. On one hand, such a policy does not

hit poor sections whose welfare plans work smoothly and on the other hand, the growth rate accelerated and was transformed into an equitable gain for all following certain policies. The study found that these advanced economies rather than spending too much on direct transfers in the form of safety nets preferred to go through the channels of spending on education and health. On one hand, it kept the fiscal discipline well into limits and on other hand, it make strides into the human capital with potential for long term sustained growth rate. The study further documented varied difference between these Asian tigers with the rest of the countries of the continent in terms of their spending behaviour on different stages of education. These countries excessively stressed the primary education and achieved the universal enrollment as early as 1960 when the situation in economies like India and Pakistan was about 42 and 33 percent primary enrollment.

Alain Mingat (1998) has tried to examine the main features of the educational policies followed over the last three decades by high performing East Asian economies. The study has contrasted the findings pertaining to the governance of education sector in East Asia with those of the rest of Asian countries like India, Pakistan, and Bangladesh etc. The study documented many interesting and relevant findings with significant policy implications for other countries of the region. These countries were found to have prioritized the primary education and have made significant expenditure for the same, which was absent in other countries of the region. However, beyond basic education, these economies have mainly treated education as private wealth and have imposed different fee structures mainly based on private principles of organization. This system has made it sure that the education system is quite accountable and produces high-quality output with strong future economic prospects. This private spending and efficiency-oriented management has, on one hand, made significant contributions to their human capital and on the other hand had kept their fiscal scenario intact.

The political nature of social spending has well attracted increasing attention from policymakers and researchers. In a seminal Kim et al., (2014) have tried to analyze the effects of fiscal consolidation and the welfare spending on the electoral outcomes. The basic aim of the paper is to examine how strategic fiscal policy decisions affect voting behaviour. The study has been executed in Gubernational elections in the United

States between 1978 and 2006. The study has utilized the technique of Probit modeling with alternative specifications to determine the effects of consolidation and quality of spending on the electoral outcomes. The study found that the voters do not show much sensitiveness towards the current deficits but if the overall debt of the state crosses certain dangerous marks the chances of reelection are decreased drastically. The study documented an interesting fact that voters did not like increase in welfare spending and does not act as an inducing agent for voter behaviour. Thus for a state government in the US for a chance to get back to the power need to consolidate the long term debt position rather than to be extravagant.

Hall et al., (2007) has tried to analyze the spending on health based on how agents value life in face of rising levels of income. The central concern that the study tried to address includes "*Is the growth of health spending a rational response to changing economic conditions especially the growth of income per person"*. Thus the study tried to estimate the trade-off between rising healths spending with those of non-health consumption given how citizens value their life. The study has taken aid of alternative preference techniques as used in standard economic literature. "*The study found that as people became saturated in non-health consumption, they value health the most and try to purchase additional years of life. The study quoted that health spending is predicted to rise to the level of 30 percent of GDP by 2050 as against the 15 percent in the current situation"*. The study further documented that these rising proportions attributed to the health may be partially explained by the fact that the value of life rises faster than the value of income earned. The study concluded with the finding that both historical and future increases in health spending are desirable.

Baldacci et al., (2008) have tried to assess the role of social spending and human capital in the growth rate of developing countries. The study has employed the panel data pertaining to 118 developing countries covering the time period from 1971 to 2000. Education and health being the two very essential ingredients of the Millennium Development goals achievement, the present study will mainly focus on these two parameters of social spending. The study has utilized the least squares dummy variables model to highlight the impact of social spending on social indicators and hence on economic growth. The study holds that a multidimensional policy intervention is needed

to move countries towards MDG's. The study documented a positive impact of social spending on the accumulation of human capital and thereby an increase in sustained growth rate of income. An increase in spending on education and health by 1 percent of GDP increases schooling by 3 more years with an increase of 0.6 in the child survival with a positive contribution to GDP to the tunes of 1.4 and 0.5 percent. However, these spending gains work with significant time lags both via direct and indirect channels. The study further quoted that the positive effects of both education and health are strongly influenced by the quality of governance. The paper documented significant differences in the returns to social spending with the highest positive returns in the poor countries.

Sutherland et al., (2012) have tried to assess the different dimensions of these consolidation designs like how much of consolidation, how fast we need to implement such designs and by what means should such programs be crafted. The study has mainly focused on the need to consolidate the already dangerous levels of debt in OECD countries to provide safety margins against future adverse shocks. The study documented that future spending pressures especially arising from health care and pension spending are going to accelerate. Apart from demographical factors, technological developments can be the important determinants of the supply of health care facilities. Thus more impetus to technological advance could be a factor to induce optimal utilization of scarce resources. The pension burden is yet another area of potential pressure for a consolidation process. To cater to the same the study documented that the countries need to undergo substantial structural reforms rather than increases in taxes. The countries need to invest in-advance for the creation of assets that can finance the burden rising out of these pension pressures. Moreover, the healthy and timely spending in education and health may yield higher future savings and investments and hence higher future growth rates. The study concluded that the consolidation for OECD group is indeed tough but the composition should not rely on slashing social sector spending.

Merola et al., (2013) have tried to assess the implications of social and welfare spending commitments on the sustainability of fiscal adjustments. The study has been conducted for a group of OECD countries and the projection period for the study ranges from 2012 to 2050. The study has employed the multi-sector dynamic stochastic general equilibrium model (DSGE) to analyze the pressures of pensions and health spending on fiscal adjustments. The final model consists of four alternative blocks representing the

economy viz., Supply-side block, government social spending block, government fiscal balance block and interest rate block. Three alternative scenarios have been created namely baseline scenario, pension spending scenario and health spending scenario. Under the base scenario, the economies that already have better fiscal scenario need not to go for further adjustments and hence not much tradeoff between fiscal adjustments and social spending. However, in case of fiscally irresponsible countries, the need of adjustment increases over time and may face hardships. Under the pension adjusted scenario when the aging-related spending is taken into consideration, debt and its service costs experience an increase in all countries. The countries with substantial amounts of pension as a proportion of their social spending need to undertake aggressive reforms to maintain fiscal prudence.

5.2.2: Survey of Literature: Indian Context

In his seminal on Indian economy, Anand et al., (1993) has tried to analyze the policy implications of developmental spending especially from the perspective of its effectiveness in fighting income poverty and improving social security. In fact, the study has tried to evaluate the capability approach to human development and found that this approach does not deny the importance of income growth but denies its relevance as an end. The study documented that the higher income countries are expected to spend more on human development. The average health has been found to be in positive association with that of the level of affluence of a society. The average life expectancy is expected to increase with the increase in public health besides reduction in income poverty. Moreover, the study has documented the case of Srilanka that has achieved tremendous success in the expansion of social services despite being economically a weak country. The study found that public services expansion, especially in the form of health and education, have a higher probability of improving welfare and life expectancy, though it may not be so effective to counter income poverty.

Analyzing the role of social capital for economic development in case of Indian economy, Chopra (2002) tried to assess the networking role of social capital in fostering growth and development over time in a sustainable trajectory. The study has tried to analyze the capability approach to human well-being and held that the provision of natural resources has better prospects of increasing livelihood and hence welfare. The

paper found that the access to adequate natural resources like land with better and modified property rights may fuel further social development. Moreover, the study extended the support to the fact that a better development of the natural resources may have better forward and backward linkages with prospects of sustained growth. Thus achieving development with a sustainable design requires the crafting of policies that uses the formal institutions in conjunction with non-market processes and institutions. Thus the social capital serves as interlink between the agents existing in the two separate sectors. The study drew wide support for the criticality of social capital as an input for the success of development imitative. However, the study betted for the distinction of this social capital into more disaggregated levels of formal and informal capital.

S. M. Dev et al., (2002) tried to examine the social sector spending in Indian economy in the decade of 1990's by analyzing both state and central budgets. This study has mainly focused on the areas of expenditures in education, health and the inter-state disparities addressed under different fiscal plans. The study has come up with some astonishing facts about the behaviour and level of social spending in case of Indian economy during 1990's. The study found that, on average, the share of social spending as a proportion of national income has not increased over the decade of 1990's when compared with the decade of 1980's. Moreover, the centre has performed better through the instrument of centrally sponsored schemes though mainly on account of withholding the state resources. The study documented a shift from the traditional ways of addressing rural poverty to more modern and pro-social ways of intervention with more access to social services like health, roads, drinking water, etc. The social sector expenditures in general and those pertaining to education and health, in general, were found to be quite low. The study concluded that the scenario especially post-economic reforms, has decelerated and the aim of reforms to create more space for government spending stands a failure.

Sharif et al., (2002) have tried to analyze the trends in the welfare and poverty alleviation expenditure programmes of both centre and states. The study has concentrated on the data pertaining to the concern post-1990-91. The study found that India has a very low level of social spending when compared to international norms and when compared with the developing countries of the region. The study attributed such a behaviour partly

to the excessive fiscal burden in the form of fiscal debt. This lower spending is fairly exhibited in the multidimensional poverty existential especially in rural India. There has been a huge surge in the policies trying to address the problems like poverty and raising human capital but with least success. Both education and health were found to have experienced an increase in the allocation of resources. But the scenario experienced a dramatic change once the figures were adjusted for the growth rate of income. Another noteworthy fact documented in the study includes the underutilization of resources by states both for the rural development and for the welfare of marginalized sections of the society. The states were found to be the main culprits always allotting lower than the allotted resources to the social and welfare spending and hence absorbing a rising pie for their own expenditures. Moreover, the limitations exercised post reforms on the public functions and more introduction of market mechanism has somehow aggravated the affordability of poor and marginalized.

Mukherjee (2007) tried to review the public expenditure on education along different perspectives. The study has legitimized the government intervention along three alternatives lines of equity in opportunity, welfare nature of modern state and the expected long term gains so far as the investment in education is concerned. The theoretical underpinning has been mainly derived from neoclassical growth theory. The study documented that it is imperative for the state to undergo certain interventionist programmes to augment the spending on health and education. The study documented certain important trends to be followed while deciding about such expenditures like fiscal prudence to accommodate such expenses, higher priority to primary education, significant role assigned to private sector etc. The study has analyzed certain institutional reforms aimed at evaluating the efficiency of such expanses. The study concluded with the finding that the efficiency and quality of public service delivery are important from the equity perspective. The study further documented that the system of binary provision of education with huge differences in quality may not be the optimal policy.

Assessing the effectiveness of fiscal rules, Chakraborty et al., (2013) tried to examine the impact of fiscal rule on fiscal balance and on the path of fiscal adjustment especially developmental spending. The study has mainly concentrated on the states of Indian union covering 14 states spanning the time period from 2000-2010. The study has

employed the panel data model with two way fixed specifications. The study found that the introduction of fiscal rules have been quite successful in controlling the increasing fiscal problems of Indian states besides intergovernmental transfers. The study found that the Indian states in order to maintain their prudent fiscal scenario have mainly relied on the reduction of developmental spending. One of the possible explanations extended by the study is on part of the rising levels of central transfers especially in the form of centrally sponsored schemes and thus incentivizing the states to check their spending on developmental projects. Moreover, the study found that the fiscal reforms have been largely revenue-driven via growth. Such a behaviour as exhibited by these states may have long term developmental implications.

Bhanumurthy et al., (2016) tried to highlight the importance of good governance for human development under a certain public expenditure plan. The study has been conducted analyzing the district level performance of Madhya Pradesh covering a panel set of 42 districts of the state. The study has utilized the simple ordinary least squares analysis to contextualize the results of the study. "*The role of governance has been measured in five dimensions viz., political, Legal and Judicial, Administrative, Economic and Social with a total of 22 indicators employed used to compute the governance index GI. The study has documented huge inter-district variations in terms of human development achievements*". The study found that the better-governed districts are the districts with high human development scenario and vice versa. Further, the public expenditure efficiency has seen an improvement with an improvement in the governance of the district. Thus the study recommends for the prioritization of the governance as an ingredient of public policy to enhance the success of development and welfare spending.

M. G. Rao, (2017) has tried to analyze different aspects of Indian public finances and their role with the changing dynamics of Indian society. Although the main concern of the study has not been the social and welfare spending but the study has discussed the same at length under one of the subheadings. As against the proposition of the minimalist nature advocated by the public choice theorists the study stresses the need for effective intervention of the government along different lines especially social and welfare spending. The study found that spending on social services and physical infrastructure are low by international standards. This may have negative effects on the growth rate

income especially in the face of rising needs following the advance of demographic dividend. The study found that the government has not been able to even fund the basic preventive health care services such as water supply etc. Similarly, the study quoted a very grim picture of spending on education with just 3.5 percent as against the international norm of 6 percent of national income. These low levels of public spending in education and health exhibit the inability of the government to provide adequate healthcare and educational infrastructure to its citizens. The study has documented the similar trends in the provision of physical infrastructure with a very poor capital spending scenario of the economy. The study concluded that in order to increase the resource allocation to such types of expenditures the economy needs to undergo substantial reforms along both the revenue generation and expenditure rationalization in certain areas.

5.3: Data description and descriptive analysis

5.3.1: Data

The study will be employing the annual time series data covering thirteen variables spanning over the time period from 1990-91 up to 2017-18. The variables will be consisting of both deficit indicators and indicators for social spending apart from national income[87]. The social sector spending will be covered under the heading of expenditure on education, Health, Welfare and over-all social spending. The variable representing the spending on education will be a combination of spending on education, art and culture along with spending on scientific services and research. The variable capturing spending on health will be a combination of three other sub-categories viz., spending on sanitation, water supply and other sanitation-related expenditure, spending on family health and welfare and spending on public health like drinking water. The vector representing the welfare will be a horizontal summation of five other variables like expenditure on housing, spending on urbanization, expenditure on labour and employment, expenditure on relief and natural calamities and other social security expenditures covering the welfare of marginalized sections of the society.

[87] The deficit variables will include gross fiscal deficit, revenue deficit and primary deficit. The social sector will be broadly categorized into three categories of spending on education, welfare and health. The national income will be used to capture the effects of pure economic scenario.

The indicators of the social and welfare spending will be the combined expenditure of both Centre and the state governments. Although social spending is mainly the constitutional domain of states but over time the union government has made a substantial presence mainly through the instruments of centrally sponsored schemes[88]. Moreover, under certain circumstances, the union government explicitly directs the regional units with specific directions regarding certain expenditures like education and welfare of marginalized, women and weaker sections. As can be seen from the table 1, the deficit indicators have experienced the highest growth rates over the reference period but with an acute variability. On the other hand, welfare spending has experienced continuous growth over time with much certainty and can be described as a welcome development. The data pertaining to the above-cited variables has been acquired from multiple sources. The chief source has been the economic and political weekly research foundation followed by Reserve Bank of India (RBI), Centre for Monitoring Indian Economy (CMIE) and Ministry of Statistics and Programme Implementation (MOSPI).

Table 5. 1: Descriptive Statistics

Variable	Observations	Mean	Stand. Deviation	Variance
GDP	28	6.5	2.1	4.3
Gross Fiscal Deficit	28	13.1	33.9	1152.3
Revenue deficit	28	22.0	75.1	5646.1
Primary Deficit	28	70.0	235.1	55257.1
Revenue receipts	28	13.4	8.7	76.4
Capital Receipts	28	13.0	23.7	562.0
Revenue Exp.	28	12.9	5.4	29.3
Capital Exp.	28	10.6	22.1	490.3
Education	28	13.7	5.9	34.9
Welfare	28	17.0	10.4	107.2
Health	28	13.5	5.4	29.3
Over-all Social	28	14.4	5.6	31.4

Note: the descriptive pertains to the data period ranging from 1990-91 to 2017-18.
Source: Authors calculations

5.3.2: Deficit Financing and Social Spending: Bivariate Correlation Analysis

The simple correlation matrix reported in table 2 exhibit interesting insights about the association between deficit financing and social spending with statistically significant

[88] Although there has been a drastic reduction in the centrally sponsored schemes and the spending through these channels but yet their role cannot be ruled out given their rolling on nature. This reduced influence of Centrally Sponsored Schemes (CSS) is mainly on account of the recommendations of the 14th finance commission.

and theoretically expected signs. Although few of them are not in consonance with the general economic literature but they are well in line with the economic behaviour exhibited by Indian economy over time. For instance; the growth rate of both national income and revenue receipts was found to be negatively associated with the growth rate of deficit financing but the growth rate of capital receipts were found to be debt augmenting. This may be because of the fact that as the capital receipts increase over time the government may be investing these receipts into more sophisticated technology thus prompting government for more deficits[89].

Table 5. 2: Bivariate Correlation Matrix

Variable	Fiscal deficit	Revenue Deficit	Primary Deficit
GDP	-0.010^	-0.370^	-0.300^
Revenue receipts	-0.621*	-0.543*	-0.126**
Capital Receipts	0.562*	0.516*	0.153^
Revenue Expenditure	0.750*	0.780*	0.250**
Capital Expenditure	-0.334**	-0.361**	-0.245^
Education	0.450*	0.430*	0.040**
Welfare	0.305*	0.350**	0.268^
Health	0.176**	0.153**	0.291^
Overall Social Spending	0.446*	0.459*	0.21^

Note: the above tabled bivariate correlation pertains to the time period from 1990-91 to 2017-18.
* Significant at 1% or 5%. ; ** Significant at 10 % ; ^ Significant at more than 10%
Source: Authors calculations

The behaviour of the primary deficit, though broadly in consonance with economic theory, has exhibited some special relations with other economic indicators like in our case with the growth rate of income. However, the main concern of the study is to analyse the association between social and welfare spending with that of deficit financing behaviour of the union of India. As can be seen from the table 2; all the coefficients of correlation analysis pertaining to the association between developmental spending with that of deficit financing were found to be well in line with the literature (P. Chakraborty et al., 2013; N. Mukherjee 2007). Since these expenditures mainly fall under the revenue budget of the government that may be the reason of the higher magnitude of coefficients pertaining to the revenue deficit than the overall gross fiscal

[89] Such a behaviour has long been recognized in Indian finances where the growth rate of capital expenditure has always been higher than the growth rate of capital receipts. This may be attributed to two possible reasons: one the need of technological up-gradation to keep pace with global environment and the other may be the developing nature of Indian economy and hence increasing needs of more technological advance.

deficit. However, the analysis is just a preliminary inspection carried out with the help of simple correlation and cannot be relied on with certainty unless empirically supported by the hard-core regression analysis to be carried in the next section.

5.4: Econometric analysis

5.4.1: The Econometric Models

The relationship between deficit financing and developmental spending in the current study has been estimated by regressing the annual growth rates of welfare spending on a set of regressors, including both fiscal and economic indicators. The Generalised method of moment's technique GMM has been employed to estimate the final models of the concern. This has been mainly done by keeping in view the possible endogeneity problem that the regression may encounter given the nature of the relationship among the variables. Although the common practice has been either to employ the normal Ordinary Least Squares or the Two-Stage Least Squares but some studies mainly vote for GMM (Gupta et al., 2005). The GMM has the beauty to encompass both the OLS and 2SLS methods of estimation and is in fact better described as the combination of the duo[90].

The GMM has been used especially to take care of possible endogeneity problem that we may encounter[91]. The problem of endogeneity is a very common issue especially in the literature on fiscal policy and growth. It may be quite possible that the level of economic growth may well determine the level of deficits in an economy. If this being the case then a regression analysis using debt indicators and level of national product as independent variables may exhibit a higher probability to encounter the problem of endogeneity. Under such a scenario the normal estimation techniques that did not account for this possible interrelation between variables may yield us biased estimates. To specifically address this issue we will be employing the GMM technique instrumenting for some desired regressors besides the lagged value of other regressors.

[90] Besides taking care of the possible endogeneity the method is better suited to the problem when we do not know the distribution of the dependent variable.

[91] Although there are well established tests to check for the possible problem of endogeneity but yet authors prefer to use GMM over OLS. This may be attributed to many reasons like the assumptions assumed by a diagnostic of endogeneity are seldom possessed by the data at large.

The study will be estimating four regression models with alterative specifications to contextualize the results pertaining to the effects of deficit financing on the social sector spending. In all the four models annual growth rates of the variables of concern have been utilized to estimate the required coefficients. The models have been estimated with the following specification:

- **Model I: (Spending on Education, Art and Culture)**

$$Ed_{it} = \alpha_t + \sum_{i=1}^{k} \beta_i G_{it} + \sum_{i=1}^{q} \beta_h X_{ht} + \mu_{it} \quad \text{.....5.1}$$

Where; Ed_{it} will be representing the growth rate of expenditure on education and scientific research. The G_{it} will be representing the vector of non-fiscal independent variables mainly the growth rate of national income. The X_{ht} will be a vector of fiscal independent variables mainly representing the deficit indicators. The vector will mainly include gross fiscal deficit, revenue deficit and primary deficit, though last with a limited application.

- **Model II: (Spending on Health and Sanitation)**

$$HS_{it} = \alpha_t + \sum_{i=1}^{k} \beta_i G_{it} + \sum_{i=1}^{q} \beta_h X_{ht} + \mu_{it} \quad \text{..... 5.2}$$

Where; HS_{it} will be representing the expenditure on community and social health. This will mainly comprise expenditure on sanitation, water supply, family health and welfare and spending on public works especially related to health and sanitation. The G_{it} will be representing the level of national income as before. The X_{ht} will be representing the deficit indicators of the government.

- **Model III: (Spending on community welfare)**

$$WH_{it} = \alpha_t + \sum_{i=1}^{k} \beta_i G_{it} + \sum_{i=1}^{q} \beta_h X_{ht} + \mu_{it} \quad \text{..... 5.3}$$

Where; WH_{it} will be representing the spending on the community welfare over the reference period. The community welfare will be a horizontal summation of expenditures on Housing, Urbanization, labour welfare and employment, relief disbursement in face of natural calamities and spending on social security of marginalized sections especially SC's and ST's. The G_{it} and X_{ht} will be representing national income and deficit indicators as before.

- **Model IV: (Overall social and welfare spending)**

$$SSS_{it} = \alpha_t + \sum_{i=1}^{k} \beta_i G_{it} + \sum_{i=1}^{q} \beta_h X_{ht} + \mu_{it} \quad \text{……..…….} \quad 5.4$$

Where; SSS_{it} will be the overall social spending by both centre and states on all the above three heads. The G_{it} and X_{ht} will be representing national income and deficit indicators as before.

5.4.2: Regression Analysis

The models specified in the above context have been estimated using the growth rates of the variables. However, before proceeding for the formal estimation of the models we have to make sure that we did not encounter the possible unit root problem in the data given the time series nature of the analysis. Though we performed alternative unit root tests to detect for the possible problem of non-stationarity but for the sake of convenience and simplicity we will be sketching down the results of only ADF test as follows[92]:

Table 5. 3: Unit root Analysis using Augmented Dickey-Fuller test

Variable	t-stat	1%	5%	10%	P-value
GDP	3.34	4.35	3.59	3.23	0.08
Gross Fiscal Deficit	5.38	4.35	3.59	3.23	0.00
Revenue deficit	5.39	4.35	3.59	3.23	0.00
Primary Deficit	5.14	4.35	3.59	3.23	0.01
Revenue receipts	6.60	4.35	3.59	3.23	0.00
Capital Receipts	4.69	4.35	3.59	3.23	0.00
Revenue Exp.	3.55	4.35	3.59	3.23	0.05
Capital Exp.	6.47	4.35	3.59	3.23	0.00
Education	3.26	4.35	3.59	3.23	0.09
Welfare	3.25	4.35	3.59	3.23	0.05
Health	3.62	4.35	3.59	3.23	0.04
Over-all Social	5.21	4.35	3.59	3.23	0.00

Note: The T-statistics and critical values are absolute coefficients.
Source: Authors Calculation

As can be seen from the table above almost majority of the variables under consideration are stationary at 1 percent except domestic product and education which are at 10 percent level of significance. However, the above estimates pertain to the only specification of the augmented dickey fuller model which includes both intercept and trend. The other specifications though estimated have not been quoted due to their voluminous nature. After the assured results of our stationarity analysis we proceeded

[92]The other tests performed on the data include Phillips-Perron (1988) and Kwiatkowski-Phillips-Schmidt-Shin KPSS (1992).

for the final econometric estimation of our cited models to execute the study. The study has employed the technique of generalised method of moments GMM instrumenting for the alternative variables depending upon the model specification. The results of the estimation have been quoted in the table 4 below:

Table 5. 4: Deficit Financing and Social Sector Spending

Variables	**Model I**	**Model II**	**Model III**	**Model IV**
	Education	Health	Welfare	Overall SSS
Constant	-1.63 (.57) [2.88]	5.31 (1.24) [4.26]	-5.89 (1.18) [4.97]	-2.45 (0.78) [3.10]
GDP	0.83** (1.84) [0.45]	0.89*** (1.84) [0.48]	1.45** (1.96) [0.73]	1.11** (2.59) [0.42]
RD				
GFD	0.13* (8.52) [0.01]	0.03** (2.62) [0.01]	0.15* (4.11) [0.03]	0.11* (7.04) [0.01]
PD				
RR	0.29* (3.06) [0.09]		0.56** (2.29) [0.24]	0.28** (2.65) [0.10]
Past values	0.32** (2.27) [0.13]	0.14 (0.81) [0.18]	0.21** (2.19) [0.09]	0.27** (2.22) [0.12]
Adjusted R^2	.50	0.21	0.44	0.55
S.E of Regression	4.19	5.16	8.53	3.79
Durbin Watson	1.99	1.90	1.90	1.86
Number of observations	27	27	27	27

Note: () encompasses the t-statistic and [] encompasses the standard error of estimate.* Indicates that the coefficient is significant at 1 %; ** indicate at 5% level of significance & ***indicates at 10%;
Source: Authors Calculation.

The empirical results reported in table 4 depict some interesting insights about the association between deficit financing and social spending in case of Indian economy. The results extend the support to the earlier findings regarding the potential impact of deficit financing on the welfare spending. The deficit spending is found to positively contribute to the spending on education and scientific research and is in line with the existing literature (K. Chopra 2002; S. Dev et al., 2002; A. Shariff et al., 2002; Mukherjee 2007). It can be seen that a 1 percent increase in the growth rate of gross fiscal deficit may increase the growth rate of spending on education by about 0.13 percent. Similarly, a 1 percent increase in the growth rate of deficits may increase the spending on health by 0.03 percent, on welfare by 0.15 percent and overall it may increase the spending by about 0.11 percent. Such a dependence of welfare spending on deficit financing may be attributed to a multiplicity of reasons.

The prime reason may be the sluggish growth rate of own revenue receipts of the government which could hardly full fill the committed expenditures of the government in the form of wages, salaries and other government maintenance[93]. The other reason may be the fact that the spending in the social infrastructure is of long gestation period and is expected to yield the return over a very long run. This may force the government to finance such spending by deficits rather than the current revenues given the severity of trade-off between current consumption and the future consumption that takes the form of savings. Moreover, the discretionary nature of such expenditures may constitute an additional factor determining the behaviour as exhibited above (P. Chakraborty et al., 2013; Rao 2017). Thus a shock to the level of deficits may have a profound impact on welfare spending especially so if the quality of shock is neglected. This may aggravate the already fragile social spending and may lead to the exposure of the poor and marginalised sections of the society. These shocks may magnify the crises in welfare spending via both direct and indirect channels. The direct channel will operate through reduced deficits and the resultant reduction in social spending. The indirect channel operates through the shocks to growth rate of income following consolidation shocks as has been quoted in table 4 above and corroborated by the first two chapters of the study.

5.5: Policy and Research Implications

As quoted already, Indian economy is performing quite low in terms of its spending on the poor and backward sections of the society. Any further slack on the resources meant for the marginalised sections may jeopardise the long term economic prospects. The main policy and research implications that follow from the above analysis include:

1. A consolidation design that is based on slashing of expenditures especially social sector spending will negatively impact the creation of human capital and hence raise questions on sustenance of long run economic growth of the economy. However this should not be taken as an incentive to step down from the path of consolidation and induce inefficiencies. The authorities need to sketch a fine

[93] Although a part of wages and salaries out of the general expenditure is attributed to both education and health sectors but the current study has almost excluded that component and is primarily focused on the infrastructure development in these sectors.

balance between both quality and quantity of consolidation in order to minimise the burden on welfare spending.

2. The government need to revise its back-loaded (spending financed) designs of consolidation and should give due consideration to the front loaded (revenue augmenting) designs. The authorities instead of curtailing the spending on education and health as is the case with even the current government should increase it both in absolute terms and national income adjusted.
3. Besides economic support there should be considerable support from the political institutions especially in the form of new legislations aimed at changing the nature of social spending from discretionary to compulsory.
4. Moreover there is enormous scope for the researchers to dwell deeper into dynamics of social and welfare spending. More disaggregated and intensive studies with the explicit focus on analysing the impact of government policies both economic and political will help policy makers to come up with policy prescriptions regarding both quality and quantity of government spending on social sector.

5.6: Conclusion

The study has been conducted with a primary purpose of analysing the possible impact of fiscal consolidation on the social and welfare spending on the poor and marginalised sections of the society. The study has employed the annual time series data covering the time period from 1990-91 up to 2017-18. The study has utilised the technique of bivariate correlation analysis to analyse the long term association between welfare spending and deficit financing. The same results were later on established under the hard-core regression technique, though under alternative specifications. The study has specified four alternative models and has been estimated through the technique of Generalised Method of Moments GMM.

The study documented a positive and significant dependence of social and welfare spending on the nature of deficit financing behaviour of the government. The spending on the welfare of poor and marginalised was found to be significantly dependent on level of deficits followed by spending on education and health. The 1 percent increase in the level of deficits was found to augment the spending on education by about 0.13 percent. Similarly, a 1 percent growth rate of deficit financing was found

to contribute to the expansion of health to the tune of 0.03 percent and to the welfare to the tune of 0.15 percent. The study also documented substantial dependence of spending on education and health on the growth rate of national income and revenue receipts of the government. This dependence of the social spending on deficit financing may display an endangered scenario in face of a consolidation effort targeted to normalise the level of debt in the economy. Such a policy design may lead to exposure of destitute and marginalised sections of the society to a further low. This may, on one hand, reduce the quality of human development and on the other hand, may endanger the long-run sustainability of economic growth.

As quoted already, Indian economy is performing quite low in terms of its spending on the poor and backward sections of the society. Any further slack on the resources meant for the marginalised sections may jeopardise the long term economic prospects. However, this should not mean that we need not to target the level of debt and deficit in the economy. Rather we should give appropriate attention to the quality of deficits rather than the quantity as has been the long practice in the Indian economy.

Chapter—VI
Summary and Concluding Remarks

6.1: Summary and Conclusion

The study is multi-objective analysis broadly encompassing the dynamics of fiscal consolidation in Indian economy. As quoted already the Indian economy started to experience high fiscal deficits especially post 1980's. This was mainly on account of increased industrialisation of the economy and the heavy capital infusion under the five-year plans. Due to limited resources in the form of taxation and other sources, the government has to resort to both internal and external borrowings. Moreover, the welfare orientation assumed by the government and the resultant increased spending on social and welfare services led to pilling up the financial pressures on the government. This led to an endangered fiscal scenario of the economy by 1990's. These unsustainable and rising levels of deficits and debt posed twin challenges for the government. Firstly the government has to bear a very high-interest burden and secondly the increased internal borrowings led to crowding out of private investment and thus compromising on private sector performance of the economy. Thus the issue of long-run fiscal sustenance coupled with the balance of payment crises in Indian economy led to the imposition of multidimensional structural reforms under IMF sponsored structural adjustment programme (SAP) in 1990's.

Besides scaling up privatization, liberalising the economy by deregulating its key sector and opening up the economy for global markets, the government started focusing on the debt mechanism of the economy. Thus government started following fiscal consolidation strategies to overcome its deteriorating fiscal health, though the formal rules and institutional set up was missing. The deliberate targeting of fiscal indiscipline and the consequent consolidation programmes were motivated mainly on twin accounts. Firstly to put checks and balances on the deficits and hence the generation of debt and secondly, there were many episodes that led to the non-Keynesian effects of fiscal shocks as against the conventional wisdom. This further filliped up the case for fiscal consolidation in case of Indian economy. The path of fiscal adjustments, as pursued in Indian economy, especially post 1990's, can be segregated into four different time periods: "*1. Fiscal correction through fiscal contraction from 1990-91 up to 1996-97; 2.*

Increasing fiscal imbalance from 1997-98 up to 1999-2000 primarily on account of pay revisions and falling tax revenues; 3. Fiscal correction without fiscal contraction from 2001-02 up to 2007-08 primarily on account of healthy economic performance and 4. Global financial crises-induced fiscal expansion 2008-09 onwards" (P. Chakraborty & B. B. Dash, 2013).

Consolidating fiscal scenario of Indian economy was an unavoidable and inescapable challenge to boost the private sector, reduce effluence in expenditures, reduce future interest burden and prepare for more fiscal challenges that may require more stimulus. However, decisions to go for fiscal consolidation are dynamic and need to be executed with extra care and precaution as it involves trade-offs at various levels. Several studies show that fiscal adjustments are expected to yield better results in a supportive environment than otherwise (Baunsgaard et al., 2012; Mundle et al., 2011). Accordingly, the current study was undertaken to analyse the effects of consolidation policies under alternative assumptions besides the conditions for its success and failure. The study also assesses the impacts both direct and indirect channels of a fiscal consolidation shock on the social and welfare spending in Indian economy. This is mainly because India being a developing economy with acute problems of poverty, inequality, deprivation, malnutrition etc. cannot be left at the mercy of market forces.

The thesis consists of four main chapters apart from an introductory chapter tasked with making a roadway to our area of interest. For almost the last one and a half-decade, the Indian authorities have tried very hard to contain their galloping debt position, but seem to have achieved least success due to various reasons (Tapsoba 2013). The chapter 2nd was undertaken to analyse the impacts of consolidation policies on the key macro-economic indicators in case of Indian economy, under an uncertain external economic environment. The key macro-economic indicators included are out-put (GDP), PCE, GCE, PINV, GINV, total investment, total government spending, government employment, BOP deficit, Exchange rate, interest rate, inflation rate, Exports, Imports, Total revenue, Total expenditure, FD, PD and RD. The data employed for the study constitute a set of nineteen variables divided into control variables and target variable. The annual data pertaining to the variables has been put to use from 1980-81 up to 2016-17.

The methodology has been bifurcated into two parts. The first part represents the estimation of individual equations representing different sectors of economy through the ordinary least squares technique (OLS). The second part consists of the estimation of general equilibrium model and analysing effects of different policy simulations. The model used in current study is a Keynesian origin-Tinbergen modified model trying to capture the interactions in an economy. The causal structure of model is simultaneous in nature developed for policy simulations. The complete model is based on four macro-economic identities i.e. -"national income identity, fiscal identity, monetary equilibrium and balance of payment identity". The model is thus segregated into five major blocks- Demand sector block, price sector block, fiscal sector block, monetary sector block and supply sector block. In order to ensure internal consistency in macroeconomic analysis, these are considered to be minimum requirements for the macroeconomic model (Easterly et al., 1994). We have tried to keep model as simple as possible with the purposes to whip out black box causal effect relationships and make them transparent, as it happen in large scale macro models. Thus assisting policymakers easily to see how policy shocks to exogenous variables are affecting the outcome variable.

The model consists of 19 equations (17 behavioural equations and 2 identities). The model has been estimated using annual data covering the time period 1980-81 up to 2016-17. The methodology has been bifurcated into two parts. The first part represents the estimation of individual equations representing different sectors of economy. The second part of the model consists of estimation of the general equilibrium model for the economy and utilising the same for the policy simulations. Before estimating the simulations, the model has been validated for the reference period under deterministic-static specification to capture the in-sample predictive power. Further, the impact of consolidation shocks has been estimated for three time periods i.e. immediate impact, short-term and long-term impacts. The model has been evaluated using RMSE and MAPE. Finally, the model has been used to document the impact of external shocks on the target variables like national income, consumption, investment, interest rate etc. Two alternative policy simulations have been generated viz., a consistent policy shock to fiscal deficit of the government to bring it well below 3 percent. Another simulation constituted shocks to external economy via the channels of import and export functions. This scenario has been estimated given the uncertainty looming the world economy

under the US exit from Iran nuclear deal (JCOPA) and the ongoing US-China trade war and its possible impact on exports of India.

The study concludes with two main policy implications i.e. firstly the fiscal consolidation shocks have Keynesian effects at least in short run and second under a healthy and supportive external economic environment it pays the Indian economy to go for fiscal prudence, while as in case of an uncertain and unstable global economic scenario, as is the case right now, a consolidation programme may lead to a recessionary economic scenario with acute short term pains for Indian economy.

In chapter third, the study has tried to analyse the impacts of fiscal consolidation on the macro-economic indicators of the economy under alternative monetary regimes. More specifically the study has tried to answer the following three questions:

- What is the type of interaction between monetary and fiscal policy in India? Put in other words the study tried to highlight whether it is fiscal or monetary policy dominance in case of Indian economy.
- The study tries to establish the relative effectiveness of monetary and fiscal policy as tools of economic stabilisation both in long-run and short run.
- To highlight the effects of fiscal policy shocks on macro-economic indicators under alternative monetary regimes.

The data set utilised in the study constitutes a set of seven variables including real national income (GDP), private consumption expenditure (PCE), private investment (PINV), inflation, gross fiscal deficit, total government expenditure and interest rate. The data set used follows the quarterly frequency from 1990 first quarter to 2018 third quarter. The usual practice in the literature has been the employment of Vector Autoregressive (VAR) approach as it helps to analyse the impact of different types of random shocks on the variables in the model. However, the basic VAR technique has limitations as it does not take care of structural and contemporary relations unless some identification restrictions are assumed to follow (J. A. Bhat et al., 2018). To overcome such limitations the VAR models are adjusted to accommodate the structural adjustments in the economic relations. As SVAR serves our cause of concern, therefore we employed the technique to empirically assess the dynamic impacts of consolidation policies pursued by government on the macroeconomic indicators like growth rate of income

(GDP), Inflation, private sector consumption and investment, etc. under alternative monetary stance. The study performed three alternative estimations i.e. impact of fiscal shocks on macro-economic indicators, impacts of fiscal shocks under contractionary monetary policy and impacts under expansionary monetary policy.

The study found that although monetary policy enjoys a certain degree of superiority but the potency of fiscal policy has not waned away. These findings corroborate the earlier findings by R. Khundrakpam & Das (2011), RBI report (2013) and S. Arora (2018). In terms of effectiveness, the study found that the fiscal policy may be a better tool for economic stabilisation in short-run but in long and medium run it may harm growth. However, the monetary policy performs better in terms of interest rate and inflation. The fiscal consolidation shocks were found to have Keynesian results in the short run implying that consolidation policies pursued by the government reduce the short-run economic growth. A consolidation programme followed under a contractionary monetary regime was found to have severe economic losses in terms of output forgone. However, a fiscal prudence programme pursued under expansionary monetary policy was found to have significant positive impacts on economic growth even in short-run. Thus instead of having a sole thrust on fiscal policy as an instrument of economic stabilisation measure and a tool to fiscal prudence, there should be more focus on a balanced and judicious mixture of both the policy instruments in case of Indian economy.

The chapter IV has been undertaken with a prime motive to analyse the effects of composition of consolidation shock on its failure or success. More specifically the chapter will address the following two questions:

- What is the impact of back-loaded fiscal consolidation on the growth rate of income?
- Is there a difference between sources of financing deficits i.e. relative desirability of internal and external sources of financing budget deficits?

This study does not identify and restrict its coverage to certain well-defined episodes as has been done for developed societies (G. Everaert et al., 2000; J. Von Hagen et al., 2001). Instead, we will be analyzing the whole series of data pertaining to the variables of interest covering the time period from 1990-91 up to 2017-18. The chapter

will be analyzing three alternative aspects of Indian fiscal stance in relation to their possible impact on the growth rate of income: fiscal policy stance as measured by changes in general government budgetary balance will be captured for present study by net fiscal deficit; the financing of budgetary deficits (domestic Vs foreign); and the composition of expenditure. The fiscal policy stance will be captured by the changes in net fiscal deficit incurred by the union government during the reference period. A positive change in the cited variable will be taken as an expansionary fiscal stance and a negative one will be treated as fiscal tightening. The econometric and statistical tools like bivariate correlation analysis, ordinary least squares technique of regression and generalized method of movement techniques have been put to use.

Three alternative models have been estimated using ordinary least squares technique (OLS). However, the results were later on tested for robustness by performing a generalised method of moments (GMM) estimator. The main focus of the GMM estimator will be to address the possible problems of endogeneity and serial correlations. The study found that consolidation need not be necessarily contractionary in nature. The study found that the composition of expenditure can have a substantial impact on the success or failure of a consolidation programme. More productive and judicious use of over-all public expenditure is pre-requisite for boosting the long-run growth rate. However, the consolidation achieved by slashing down the general expenditure of the government may trigger a possible decline in the economic growth and is in complete contrast with the established literature. The above analogy does not pertain to all types of government expenditures. A better and integrated targeting of expenditures like subsidies and transfer payments may enhance the growth rate of income. The study could not document the support for the negative impacts of front-loaded fiscal consolidation funded mainly by tax and non-tax revenue increases. Rather under both the empirical specifications the increase in the growth rate of both tax and non-tax revenue was found to be growth augmenting. These results brush aside the celebrated supply-side effects of tax increases on growth via the channel of incentives to work and invest.

In chapter five of the study, the prime focus has been to analyse the impact of fiscal consolidation shocks on social and welfare spending in Indian economy. The essence of the chapter followed from the fact that India is an emerging market economy

is plagued by deprivation, poverty, and inequality besides malnutrition. These problems pertaining to the economy cannot be left at the mercy of markets thus governments need to spend on the welfare of marginalised sections of the society. As of 2015-16 government spend 1.4 percent of GDP on health as against the international norm of 3 percent and is way below 1.7 percent by countries like Srilanka, Bangladesh, Egypt. Even basic preventive health care such as water supply and sanitation has been absent implying that half of the population does not have access to safe drinking water and proper toilets (G. Rao, 2017). The scenario of spending on education has not been encouraging either and has gravitated from 3 to 3.5 percent for almost last decade. However, this is well behind the international norm of 6 percent and even behind the countries falling in the same income level group, implying the failure of government to provide goods and services of social value. Similar is the case with other sectors like welfare of marginalized, safety nets for poor and upliftment of SC's and ST's.

In face of such a scenario with further consolidation shocks, it is quite possible that such a shock may adversely affect the social and welfare spending thus may negatively influence the creation of human capital and hence long-run sustenance of economic growth. The study has employed the annual time series data covering thirteen variables spanning over the time period from 1990-91 up to 2017-18. The variables will be consisting of both deficit indicators and indicators for social spending apart from national income. The deficit variables will include gross fiscal deficit, revenue deficit and primary deficit. The social sector will be broadly categorized into three categories of spending on education, welfare and health. The national income will be used to capture the effects of pure economic scenario.

Alternative regression models have been estimated using generalized method of moments (GMM). The study documented a positive and significant dependence of social and welfare spending on the nature of deficit financing behaviour of the government. The spending on welfare of poor and marginalised was found to be strongly dependent on the level of deficits followed by spending on education and health. The study also documented substantial dependence of spending on education and health on the growth rate of national income and revenue receipts of the government. This dependence of the social spending on deficit financing may display an endangered scenario in the face of a consolidation effort targeted to normalise the level of debt in the economy. The adverse

effects of a fiscal policy shock on the social sector spending will be transmitted via two channels. The direct channel will include the level of deficits incurred by government to finance its spending on social services. The indirect channel will be via a reduced growth rate of national output. As quoted in early chapters that a fiscal shock has the potential to depress the short economic growth. A lower short-run growth implies lower short-run spending on social and welfare spending and hence may culminate into a human capital shock.

6.2: Limitations and Scope for Further Research

Though the study attempted a comprehensive analysis of consolidation programmes and their impacts both economic and fiscal over time, but there are caveats present in the study and an investigation into these caveats may provide scope for future research. Some of the limitations are quoted as under.

In chapter second a more disaggregated analysis of different sectors with a high-frequency data may enrich the results that can have more policy relevance.

In chapter third, we could not dwell much upon the aspects of transmission of effects from fiscal to monetary policy. A more comprehensive study focusing upon the channels of transmission and their relative strength to transfer shocks from one sector to another may be an area of importance.

Similarly, in chapter four a more disaggregated analysis of government spending in the form of transfers subsidies, wage bill, spending on defence besides a categorisation between capital and revenue expenditures may be a potential area of interest.

Similarly, in chapter five an in-depth analysis of spending on different social sectors like spending on infrastructure, spending on beneficiary awareness, out of pocket health and education expenditures by poor households can be a further area of investigation.

Finally data deficiency through-out the study posed certain challenges. These challenges especially emanate from the frequency matters related to data on different variables.

References

Abdi, H., & Williams, L. J. (2010). Principal components analysis. *International Encyclopaedia of Education*, *2*(August), 374–377. https://doi.org/10.1016/B978-0-08-044894-7.01358-0

Abusaleh, S., Gosh, P., & Mondal, S. K. (2002). State Adjusted Public Expenditure on Social Sector and Poverty Alleviation Programmes. *Economic and Political Weekly*, *37*(8), 767–787.

Abusaleh, S., Prabir, G., & Mondal, S. K. (2002). State-adjusted public expenditure on social sector and poverty alleviation programmes. *Economic and Political Weekly*, *37*(8), 767–787.

Acharya, S. (2005). Thirty Years of Tax Reform in India. *Economic and Political Weekly*, *40*(20), 2061–2070.

Afonso, A., & Rault, C. (2010). What do we really know about fiscal sustainability in the EU? A panel data diagnostic. *Review of World Economics*, *145*(4), 731–755. https://doi.org/10.1007/s10290-009-0034-1

Afonso, A., & Sousa, R. M. (2012). The macroeconomic effects of fiscal policy. *Applied Economics*, *44*(34), 4439-4454.

Alain, M. (1998). The strategy used by high-performing Asian economies in education: Some lessons for developing countries. *World Development*, *26*(4), 695–715. Retrieved from http://www.sciencedirect.com/science/article/pii/S0305750X98000011

Alesina, A. and Ardagna, S. (1998) Tales of fiscal contractions, Economic Policy, 27, 487–545.

Alesina, A., & Perotti, R. (1996). Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects. *NBER Working Paper Series*, *01*(5730), 317–331.

Alesina, A., Perotti, R., Tavares, J., Obstfeld, M., & Eichengreen, B. (1998). The-Political-Economy-of-Fiscal-Adjustments-BPEA. *The Brooking Institution*, *01*, 197–266.

Alesina, Alberto; Favero, Carlo; Giavazzi, Francesco (2014): The output effect of fiscal consolidation plans, SAFE Working Paper Series, No. 76.

Alm, J., Bahl, R., & Murray, M. N. (1990). Tax Structure and Tax Compliance. *The Review of Economics and Statistics*, *72*(4), 603–613.

Anand, S., & Ravallion, M. (1993). Human Development in Poor Countries: On the Role of Private Incomes and Public Services. *Journal of Economic Perspectives*, *7*(1), 133–150. https://doi.org/10.1257/jep.7.1.133

Araujo, C. H., Azevedo, C., & Costa, S. (2012). Fiscal consolidation and macroeconomic challenges in Brazil. *BIS Papers chapters*, *67*, 91-102.

Arby, M. F., & Hanif, M. N. (2010). Monetary and Fiscal Policy Coordination-Pakistan's Experience. *State Bank of Pakistan Working Paper*, *06*(01), 6–25.

Arora, S. (2018). Monetary versus fiscal policy in India: an SVAR analysis. *Macroeconomics and Finance in Emerging Market Economies*, *11*(3), 250–274. https://doi.org/10.1080/17520843.2017.1297325

Bagchi, A. (1997). Tax reform in developing countries Agenda for the 1990's. *National Institute of Public Finance and Policy Working Paper*, (10), 44.

Bahal, G., Raissi, M., & Tulin, V. (1994). Crowding-Out or Crowding-In? Public and Private Investment in India. *International Monetary Fund Working Paper*, *61*(1), 1–17.

Bal, D. P., & Rath, B. N. (2014). Public debt and economic growth in India: A reassessment. *Economic Analysis and Policy*, *44*(3), 292–300. https://doi.org/10.1016/j.eap.2014.05.007

Baldacci, E., Clements, B., Gupta, S., & Cui, Q. (2008). Social Spending, Human Capital, and Growth in Developing Countries. *World Development*, *36*(8), 1317–1341. https://doi.org/10.1016/j.worlddev.2007.08.003

Ball, L. M., Furceri, D., Leigh, D., & Loungani, P. (2013). The Distributional Effects of Fiscal Consolidation. *International Monetary Fund Working Papers*, *13*(151). https://doi.org/10.5089/9781475551945.001

Barman, R. B. (2016). Rethinking Economics, Statistical System A Critique with India as a Case. *Economic and Political Weekly*, *LI* (28).

Barro, R. J. (1974). Are government bonds net wealth? *Journal of political economy*, *82*(6), 1095-1117.

Baum, A., Poplawski-Ribeiro, M., & Weber, A. (2012). Fiscal Multipliers and the State of the Economy. *International Monetary Fund Working Paper*, (286).

Berkmen, P. (2011). *The Impact of Fiscal Consolidation and Structural Reforms on Growth in Japan* (No. 11-13). International Monetary Fund.

Bhanumurthy, N. R., Bose, S., & Adhikari, P. D. (2015). Targeting Debt and Deficits in India : A Structural Macroeconometric Approach. *National Institute of Public Finance and Policy Working Paper*, (148), 1–50.

Bhanumurthy, N., Prasad, M., & Jain, R. (2016). Public Expenditure, Governance and Human Development : A Case Study of Madhya Pradesh. *National Institute of Public Finance and Policy Working Paper*, (171).

Bhat, J. A., Ganaie, A. A., & Sharma, N. K. (2018). Macroeconomic Response to Oil and Food Price Shocks: A Structural VAR Approach to the Indian Economy. *International Economic Journal*, *32*(1), 66-90.

Bi, H., Leeper, E. M., & Leith, C. (2013). Uncertain fiscal consolidations. *The Economic Journal*, *123*(566), F31-F63.

Bjørnland, H. C. (2000). VAR Models in Macroeconomic Research. *Statistics Norway Research Department*.

Blanchard, O. J., & Quah, D. (1989). The Dynamic Effects of Aggregate Demand and Supply Disturbances. *American Economic Review*, *79*(4), 655–673. https://doi.org/10.3386/w2737

Blanchard, O., & Perotti, R. (2002). An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output Author (s): Olivier Blanchard and Roberto Perotti Published by : Oxford University Press. *The Quarterly Journal of Economics*, *117*(4), 1329–1368.

Blanchard, O., & Leigh, D. (2013). Fiscal consolidation: At what speed? *Vox EU. Org*. *3*.

Botman, D. P. J., & Honjo, K. (2006). Options for Fiscal Consolidation in the United Kingdom. *International Monetary Fund Working Paper*, *06*(89). https://doi.org/10.5089/9781451863499.001

Breitung, J., Brüggemann, R., & Lütkepohl, H. (2004). Structural vector autoregressive modelling and impulse responses. *Applied time series econometrics*.

Briotti, G. (2005). Economic reactions to public finance consolidation: a survey of the literature. *ECB occasional paper*, (38).

Brennan, G., & Buchanan, J. M. (1980). *The power to tax: Analytic foundations of a fiscal constitution*. Cambridge University Press.

Burgert, M., Hruzova, R., Lisicky, M., & Monks, A. (2008). Composition Matters: Fiscal consolidation and economic growth in the Czech Republic. *European Commission*, *60*(1), 72–79. https://doi.org/10.2765/26445

Buti, M., FRANCO, D., & ONGENA, H. (1998). Fiscal discipline and flexibility in EMU: the implementation of the Stability and Growth Pact. *Oxford Review of Economic Policy*, *14*(3), 81–97. https://doi.org/10.1093/oxrep/14.3.81

Canova, F., and G. De Nicolo. 2002. Monetary disturbances matter for business *fl*uctuations in the G-7. *Journal of Monetary Economics*. 49, no. 6: 1131–1159. doi: 10.1016/S0304-3932(02)00145-9

Cevik, E. I., Dibooglu, S., & Kutan, A. M. (2014). Monetary and fiscal policy interactions: Evidence from emerging European economies. *Journal of Comparative Economics*, *42*(4), 1079–1091. https://doi.org/10.1016/j.jce.2014.05.001

Chakraborty, P. (2017). Too Late for the Battle on Federalism and Fiscal Autonomy. *National Institute of Public Finance and Policy Working Paper For*, (11).

Chakraborty, P., & Dash, B. B. (2013). Fiscal Reforms, Fiscal Rule and Development Spending : How Indian States have Performed ? *National Institute of Public Finance and Policy Working Paper*, (122).

Chamley, C. (1992). The welfare cost of taxation and endogenous growth. Working Paper series 92-46, Economic Series 15, Boston University.

Chopra, K. (2002). Social Capital and Development Processes. *Economic and Political Weekly*, *37*(28), 2911–2916.

Clements, B. J., Gupta, S., Baldacci, E., & Mulas-Granados, C. (2004). Front-Loaded or Back-Loaded Fiscal Adjustments: What Works in Emerging Market Economies? *IMF Working Papers*, *04*(157). https://doi.org/10.5089/9781451857528.001

Clinton, K., Kumhof, M., Laxton, D., & Mursula, S. (2011). Deficit reduction: Short-term pain for long-term gain. *European Economic Review*, *55*(1), 118-139.

Cogan, J. F., Taylor, J. B., Wieland, V., & Wolters, M. H. (2013). Fiscal consolidation strategy. *Journal of Economic Dynamics and Control*, *37*(2), 404–421. https://doi.org/10.1016/j.jedc.2012.10.004

Corsetti, G., Kuester, K., Meier, A., & Müller, G. J. (2010). Debt Consolidation and Fiscal Stabilization of Deep Recessions. *American Economic Review*, *100*(2), 41–45. https://doi.org/10.1257/aer.100.2.41

Cournède, B., Pina, Á., & Goujard, A. (2014). Reconciling fiscal consolidation with growth and equity. *OECD Journal: Economic Studies*, *2013*(1), 7–89. https://doi.org/10.1787/eco_studies-2013-5jzb44vzbkhd

Craigwell, R., Bynoe, D., & Lowe, S. (2012). The effectiveness of government expenditure on education and health care in the Caribbean. *International Journal of Development Issues*, *11*(1), 4–18. https://doi.org/10.1108/14468951211213831

Da Silva, C. G., & Vieira, F. V. (2017). Monetary and fiscal policy in advanced and developing countries: An analysis before and after the financial crisis. *Quarterly Review of Economics and Finance*, *63*, 13–20. https://doi.org/10.1016/j.qref.2016.04.013

Das, S. (2015). Monetary Policy in India : Transmission to Bank. *IMF Working Papers*, *15*(129).

Datar, M. K. (2003). Impact of Fiscal Deficit. *Economic and Political Weekly*, *38*(33), 3469–3470.

Davig, T., & Leeper, E. M. (2011). Monetary-fiscal policy interactions and fiscal stimulus. *European Economic Review*, *55*(2), 211–227. https://doi.org/10.1016/j.euroecorev.2010.04.004

Dixit, A., & Lambertini, L. (2001). Monetary–fiscal policy interactions and commitment versus discretion in a monetary union. *European Economic Review*, *45*(4-6), 977-987.

Dluhopolskyi, O. (2016). Fiscal Consolidation Effect in Theory and Practice. *Czech Journal of Social Sciences, Business and Economics*, *5*(4), 19–30.

Due, J. F. (1986). A Brief Summary of Excise and Sales Taxation in India. *National Institute of Public Finance and Policy*, *18*(2).

Dungey, M., & Fry, R. (2009). The identification of fiscal and monetary policy in a structural VAR. *Economic Modelling*, *26*(6), 1147-1160.

Easterly, W., & Rebelo, S. (1994). *Fiscal policy and economic growth: an empirical investigation* (No. 885). CEPR Discussion Papers.

Economic and Financial Affairs EMU. (2007). Public finances in European Monetary Union. *European Commission mission*, (3), 233–234.

Economic, Outlook Reprot. (2010). Fiscal Consolidation: Requirements, Timing, Instruments and Institutional Arrangements. In *OECD Economic Outlook*. https://doi.org/10.1787/eco_outlook-v2010-2-en

Erceg, C. J., & Lindé, J. (2013). Fiscal consolidation in a currency union: Spending cuts vs. tax hikes. *Journal of Economic Dynamics and Control*, *37*(2), 422–445. https://doi.org/10.1016/j.jedc.2012.09.012

Escudero, V., & Mourelo, E. L. (2012). Fiscal consolidation and employment growth. *World of Work Report*, *2012*(1), 59–80. https://doi.org/10.1002/wow3.5

Estevão, M. M., & Samaké, I. (2013). The Economic Effects of Fiscal Consolidation with Debt Feedback. *International Monetary Fund Working Papers*, *13*(136). https://doi.org/10.5089/9781484304488.001

Everaert, G., & Heylen, F. (2000). Succes and Failure of Fiscal Consolidation in the OECD: A multivariate Analysis. *Public Choice*, *96*(February), 317–330. https://doi.org/10.1023/A

Fatás, Antonio, & Mihov, I. (2012). Fiscal policy as a stabilization tool. The B.E Journal of Macroeconomics, Vol. 12, Issue 03 (14)

Faust, J. (1998). The Robustness of Identified VAR conclusions about Money. *Discussion Paper by Board of Governors of the Federal Reserve System Washington*, *02*(610).

Favero, C., & Giavazzi, F. (2007). *Debt and the effects of fiscal policy* (No. w12822). National Bureau of Economic Research.

Feldstein, M., & Eckstein, O. (1970). The Fundamental Determinants of the Interest Rates. *The Review of Economics and Statistics*, *52*(4), 363–375.

Foresti, P. (2018). Monetary and Fiscal Policies Interaction in Monetary Unions. *Journal of Economic Surveys*, *32*(1), 226–248. https://doi.org/10.1111/joes.12194

Franta, M., Libich, J., & Stehlík, P. (2018). Tracking monetary-fiscal interactions across time and space. *International Journal of Central Banking*, *14*(3), 167–227. https://doi.org/10.2139/ssrn.2294758

Gali, J., & PEROTTI, R. (2003). Fiscal policy and monetary integration in Europe. *Fiscal Policy in EMU*, *18*(37), 533–572.

Giavazzi, F. and Pagano, M. (1990) Can severe fiscal contractions be expansionary? Tales of two small European countries, in NBER Macroeconomics Annual 1990, MIT Press.

Giavazzi, F., Jappelli, T., Pagano, M., & Benedetti, M. (2005). *Searching for non-monotonic effects of fiscal policy: New evidence* (No. w11593). National Bureau of Economic Research.

Gordon, D. B., & Leeper, E. M. (1994). The dynamic impacts of monetary policy: An exercise in tentative identification. *Journal of Political Economy*, *102*(6), 1228–1247.

Goyal, A. (2002). Coordinating Monetary and Fiscal Policies : A Role for Rules ? Coordinating Monetary and Fiscal Policies : A Role for Rules ? In *India Development Report* (pp. 1–35).

Goyal, A. (2018). The Indian fiscal-monetary framework: Dominance or coordination? *International Journal of Development and Conflict*, *8*(1), 1–13. Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-85051868026&partnerID=40&md5=f934cadb55f777d3b88f6b73d82f14d3.

Gruber, Norbert (2013). *The role of social expenditures in budget consolidations - an analysis of the fiscal and macroeconomic effects.* Doctoral thesis, WU Vienna University of Economics and Business.

Guichard, S., Kennedy, M., Wurzel, E., & André, C. (2007). What Promotes Fiscal Consolidation?

Gupta, J. R., (2011). Public Economics in India: Theory and Practice 2nd edition. *Atlantic Publishers and distributors*, New Delhi (110002).

Gupta, S., Clemennts, B., Baldacci, E., & Mulas-Granados, C. (2005). Fiscal policy, expenditure composition, and growth in low-income countries. *Journal of International Money and Finance*, *24*(3), 441–463. https://doi.org/10.1016/j.jimonfin.2005.01.004

Gupta, S., Verhoeven, M., & Tiongson, E. R. (2002). The effectiveness of government spending on education and health care in developing and transition economies. *European Journal of Political Economy*, *18*(4), 717–737. https://doi.org/10.1016/S0176-2680(02)00116-7

Hall, R. E., & Jones, C. I. (2007). The Value of Life and the Rise in Health Spending. *The Quarterly Journal of Economics*, *122*(1), 39–72.

Hashimzade, N., Thornton, M., & Kilian, L. (2013). Structural vector autoregressions. In *Handbook of Research Methods and Applications in Empirical Macroeconomics* (pp. 515–554). https://doi.org/10.4337/9780857931023.00031

Hauptmeier, S., Heipertz, M., & Schuknecht, L. (2007). Expenditure Reform in Industrialised Countries: A Case-Study Approach. *Fiscal Studies*, *28*(3), 293-342.

Hilbers, P. (2005). Interaction of Monetary and Fiscal Policies: Why Central Bankers Worry about Government Budgets. *IMF Seminar on Current Development in Monetary and Financial Law. Washington*, *48*(9), 800–809.

Hughes Hallett, A., & McAdam, P. (1996). *Fiscal deficit reductions in line with the Maastricht criteria for monetary union: an empirical analysis* (No. 1351). CEPR Discussion Papers.

Humphrey, T. M. (1999). Mercantilists and classicals: insights from doctrinal history. *FRB Richmond Economic Quarterly*, *85*(2), 55-82.

Islam, I. (2016). Is There a Case for Front-Loaded Fiscal Consolidation in Azerbaijan? A Growth and Employment Perspective. *International Labour Organisation*, pp. 1–29.

Jafarov, E., & Gunnarsson, V. (2014). Government Spending on Health Care and Education in Croatia: Efficiency and Reform Options. *International Monetary Fund Working Papers*, *08*(136). https://doi.org/10.5089/9781451869958.001

Jain, R., & Kumar, P. (2013). Size of Government Expenditure Multipliers in India : A Structural VAR Analysis. *Reserve Bank of India Working Paper*, *07*(September).

Jha, R. (2014). Welfare schemes and social protection in India. *International Journal of Sociology and Social Policy*, *34*(3), 214–231. https://doi.org/10.1108/IJSSP-10-2013-0099

Kim, H., & Kwon, C. (2014). The Effects of Fiscal Consolidation and Welfare Composition of Spending on Electoral Outcomes: Evidence from US Gubernatorial Elections between 1978 and 2006. *New Political Economy*, *20*(2), 228–253. https://doi.org/10.1080/13563467.2014.923822

Kapur, M. (2018). Macroeconomic Policies and Transmission Dynamics in India. *Available at SSRN 3253802*.

Khundrakpam, J. K. (2012). Estimating Impacts of Monetary Policy on Aggregate Demand in India. *Munich Personal RePEc Archive*, (50902).

Kliem, M., Kriwoluzky, A., & Sarferaz, S. (2016). Monetary–fiscal policy interaction and fiscal inflation: A tale of three countries. *European Economic Review*, *88*, 158–184. https://doi.org/10.1016/j.euroecorev.2016.02.023

Krueger, A. O., & Krueger, A. O. (2002). A new approach to sovereign debt restructuring.

Kumar, S. (2009). *Fiscal and Monetary Policy During Downturns: Evidence from the G7", IMF*. WP/09/50.

Kumar Mohanty, R., & Bhanumurthy, N. R. (2018). Assessing Public Expenditure Efficiency at Indian States. *National Institute of Public Finance and Policy Working Paper*, (225). Retrieved from http://www.nipfp.org.in/publications/working-papers/1818/http://www.nipfp.org.in/publications/working-papers/1818/

Kumar, A., Nema, A., Hazarika, J., & Sachdeva, H. (2017). *Social Sector Expenditure of States Pre & Post Fourteenth Finance Commission* (pp. 1–10). pp. 1–10.

Langenus, G. (2006). Fiscal Sustainability Indicators and Policy Design in the Face of Ageing. *National Bank of Belgium Working Paper*, (102). https://doi.org/10.2139/ssrn.2005169

Laxton, D., Mursula, S., Kumhof, M., & Muir, D. (2010). The Global Integrated Monetary and Fiscal Model (GIMF): Theoretical Structure. *International Monetary Fund Working Paper*, *10*(34), 1. https://doi.org/10.5089/9781451962734.001

Leeper, E. M. (1991). Equilibria under 'active' and 'passive' monetary and fiscal policies. *Journal of Monetary Economics*, *27*(1), 129–147. Retrieved from http://www.sciencedirect.com/science/article/pii/030439329190007B

Lerner, A. P. (1948). The burden of the national debt. *Income, Employment, and PublicPolicy. NewYork: W. W. Norton*, 255-75.

Libich, J., Hughes Hallett, A., & Stehlík, P. (2007). Monetary and fiscal policy interaction with various degrees of commitment. *Finance a Uver - Czech Journal of Economics and Finance*, *64*(1), 2–29.

Lima, E. C. R., Maka, A., & Pumar, A. (2012). The Effects of Fiscal Policy and its Interactions with Monetary Policy in Brazil. *Revista EconomiA*, (November 2011). Retrieved from http://www.anpec.org.br/revista/vol13/vol13n1p149_180.pdf

Lindé, J., & Trabandt, M. (2018). Should we use Linearised Models to Calculate FIscal Multipliers? *Journal of Applied Econometrics*, *33*(7), 937–965. https://doi.org/10.2765/03139

Lütkepohl, H. (2011). Vector autoregressive models. In *Handbook of Research Methods and Applications in Empirical Macroeconomics* (pp. 139–164). https://doi.org/10.4337/9780857931023.00012

Mallick, A., & Sethi, N. (2016). Interaction between Monetary and Fiscal Policy: Empirical Evidence from India. *PRAGATI: Journal of Indian Economy*, *3*(2), 1-15.

Mendis, K. S. A., & Ichihashi, M. (2011). Impact of Governmnet Spending on Education and Health in Srilanka: A Provincial Level Analysis. *Hiroshima University, Graduate School for International Development and Cooperation (IDEC).*, *4*(8).

Merola, R., & Sutherland, D. (2013). Fiscal Consolidation and the Implications of Social Spending for Long-Term Fiscal Sustainability. *Review of Economics and Institutions*, *4*(3), 1–26. https://doi.org/10.5202/rei.v4i3.100

Michael Keen. (2013). Targeting, Cascading and Indirect Tax Design. *Interntional Monetary Fund Working Papers*, *13*(57). Retrieved from https://mail-attachment.googleusercontent.com/attachment/u/0/?ui=2&ik=6e4c751af2&view=att&th=15cac82ce5288507&attid=0.1&disp=inline&realattid=f_j3ymcq8u0&safe=1&zw&sadnir=2&saddbat=ANGjdJ9GBxvP9NUl6ufrA0PfM8V2e7s01HnnjcyNWldu5XSyNSCVm5AZ9BZI2mdBxURq3K1VVF

Mishra, P., & Montiel, P. (2012). How Effective Is Monetary Transmission in Low-Income Countries ? A Survey of the Empirical Evidence. *IMF Working Papers*, *12*(143).

Mishra, B. P., Montiel, P., & Sengupta, R. (2016). Monetary Transmission in Developing Countries : Evidence from India. *IMF Working Papers*, *16*(167).

Mohanty, A. R., & Mishra, B. R. (2016). Impact of Public Debt on Economic Growth: Evidence from Indian States. *Vilakshan: The XIMB Journal of Management*, *13*(2), 1–21 Retrieved from http://auth.rtu.lv/php/redirect.php?goto=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=121141170&site=eds-live

Mountford, A., & Uhlig, H. (2009). WHAT ARE THE EFFECTS OF FISCAL POLICY SHOCKS? *Journal of Applied Econometrics January-February 2015.Pdf*, *24*(1), 960–992. https://doi.org/10.1002/jae.1079

Mukherjee, A. (2007). *Public expenditure on education: A review of selected issues and evidence* (No. id: 856).

Mukherjee, S. (2015). Present State of Goods and Services Tax (GST) Reform in India. *National Institute of Public Finance and Policy Working Paper*, (154), 1–24.

Mukhopaehyay, H. (1992). Deficit Financing, Indirect Taxation and Exchange rate Adjustment: A Preliminary Exercise. *National Institute of Public Finance and Policy*, *08*.

Mundle, S. (1998). Financing human development: some lessons from advanced Asian countries. *World Development*, *26*(4), 659–672. https://doi.org/10.1016/S0305-750X(98)00004-7

Mundle, S., Bhanumurthy, N. R., & Das, S. (2011). Fiscal consolidation with high growth: A policy simulation model for India. *Economic Modelling*, *28*(6), 2657–2668. https://doi.org/10.1016/j.econmod.2011.08.001

Murthy, M. N. (1988). On Choice between Expenditure Tax and Taxes on Consumption and Capital Goods. *National Institute of Public Finance and Policy Working Paper*, *18*(November).

Musgrave, R. A., Musgrave, P. B., & Bird, R. M. (1989). *Public finance in theory and practice* (Vol. 5). New York: McGraw-Hill.

Muscatelli, V. A., Tirelli, P., & Trecroci, C. (2004). Fiscal and monetary policy interactions: Empirical evidence and optimal policy using a structural New-Keynesian model. *Journal of Macroeconomics*, *26*(2), 257-280.

Muthu, S. (2017). Does public investment crowd-out private investment in India. *Journal of Financial Economic Policy*, *9*(1), 50–69. https://doi.org/10.1108/JFEP-02-2016-0016

Naqvi, N. H., & Tsoukis, C. (2003). Does Public Investment Crowd Out Private Investment? Evidence on Investment And Growth In Asia, 1971-2000. *European Research Studies*, *VI* (Mm), 1–18.

OECD. (2015). Achieving prudent debt targets using fiscal rules. In *OECD Economics Department Policy Note*. Retrieved from http://www.oecd.org/eco/achieving-prudent-debt-targets-using-fiscal

Ortiz, I., Chai, J., & Cummins, M. (2011). Austerity Measures Threaten Children and Poor Households: Recent Evidence in Public Expenditures from 128 Developing Countries. *Social and Economic Policy Woring Paper*, (September). *Available at SSRN 1934510* https://doi.org/10.2139/ssrn.1934510

Ouliaris, S., Pagan, A. R., & Restrepo, J. (2016). Quantitative Macroeconomic Modeling with Structural Vector Autoregressions – An E-Views Implementation. In *Washington DC: IMF Institute for Capacity Development.*

Patra, M. D., Khundrakpam, J. K., & John, J. (2018). Non-Linear, Asymmetric and TimeVarying Exchange Rate Pass-Through: Recent Evidence from India. *RBI Working Paper Series: 02/2018*, *02*(March).

Pashourtidou, N., Savva, C. S., & Syrichas, N. (2014). The Effects of Fiscal Consolidation on Macroeconomic Indicators in Cyprus. *Cyprus Economic Policy Review*, *8*(1), 93–119.

Perotiri, B. R. (1996). Fiscal consolidation in Europe: Composition Matters. *American Economic Association*, *86*(2).

Perotiri, R. (1996). Fiscal Consolidation in Europe : Composition Matters. *The American Economic Review*, *86*(2).

Poplawski-Ribeiro, M., Villafuerte, M. M., Baunsgaard, M. T., & Richmond, C. J. (2012). *Fiscal frameworks for resource rich developing countries*. International Monetary Fund.

Premchand, A., & Chattopadhyay, S. (2002). Fiscal Adjustment and Expenditure Management. *NATIONAL INSTITUTE OF PUBLIC FINANCE AND POLICY*, (3), 1–53.

Puri, V. K., & Misra, S. K. (2014). *Indian economy-its development experience*. Himalaya Publishing House.

Qasim Waqar, A., Kemal Ali, M., & Siddique, O. (2015). Fiscal Consolidation and Economic Growth: A Case Study of Pakistan. *Pakistan Institute of Development Economics*, *1*(124).

Raj, J., Khundrakpam, J. K., & Das, D. (2011). An Empirical Analysis of Monetary and Fiscal Policy Interaction in India. *RBI Working Paper Series: 15/2011*, *4504*(September).

Rangarajan, C., & Srivastava, D. (2003). Dynamics of Debt Accumulation in India Impact of Primary Deficit, Growth and Interest Rate. *Economic And Political Weekly*, *38*(46), 4851–4858.

Rangarajan, C., & Srivastava, D. (2005). Fiscal Deficits and Government Debt Implications for Growth and Stabilisation. *Economic and Political Weekly*, *40*(27), 2919–2934.

Ranjan, R., & Nachane, D. M. (2004). Analysis of the Capital Account in India's Balance of Payments. *Economic and Political Weekly*, *39*(27), 3031–3044. https://doi.org/10.2307/4415234

Rannenberg, A., Schoder, C., & Strasky, J. (2015). The macroeconomic effects of the Euro Area's fiscal consolidation 2011-2013 : A Simulation-based approach. *Central Bank of Ireland Research Technical Paper*, *03*.

Rao, M. G. (1998). Accommodating public expenditure policies: the case of fast growing Asian economies. *World Development*, *26*(4), 673–694. https://doi.org/10.1016/S0305-750X(98)00005-9

Rao, M. G., & Rao, R. K. (2006, September). Trends and issues in tax policy and reform in India. In *India Policy Forum* (Vol. 2, No. 1, pp. 55-122). National Council of Applied Economic Research.

Rao, M. G. (2017). Public Finance in India in the Context of India's Development. *National Institute of Public Finance and Policy Working Paper*, (219).

RBI. 2013. Fiscal-monetary co-ordination in India: An Assessment. Publications, Reserve Bank of India

Reade, J. J. (2011). Modelling Monetary and Fiscal Policy in the US: A Cointegration Approach. *Department of Economics University of Birmingham Working Paper*, (02), 26 pages. https://doi.org/ftp://ftp.bham.ac.uk/pub/RePEc/pdf/11-02.pdf

Reinert, E., & Reinert, S. (2005). Mercantilism and economic development: Schumpeterian dynamics, institution building and international benchmarking. *Zed Books, London*, *10*(01), 8–37.

Report, OECD. (2011). Fiscal consolidation: Targets , Plans and Measures. *OECD Journal on Budgeting*, *11*(2). https://doi.org/http://dx.doi.org/10.1787/budget-11-5kg869h4w5f6

Romer, P. M. (1990). Endogenous technological change. *Journal of political Economy*, *98*(5, Part 2), S71-S102.

Rubio-Ramírez, J. F., Waggoner, D. F., & Zha, T. (2010). Structural vector autoregressions: Theory of identification and algorithms for inference. *Review of Economic Studies*, *77*(2), 665–696. https://doi.org/10.1111/j.1467-937X.2009.00578.x

Rusnok, J. (2010). The Interplay between Monetary Policy and Fiscal Policy Opening Remarks. *International Journal of Central Banking*, 3–6.

S Mahendra Dev, J. M. (2002). Social Sector Expenditures in the 1990s. *Economic & Political Weekly*, *37*(09), 853–866.

Saad, N. (2014). Tax Knowledge, Tax Complexity and Tax Compliance: Taxpayers' View. *Procedia - Social and Behavioral Sciences*, *109*(1), 1069–1075. https://doi.org/10.1016/j.sbspro.2013.12.590

Sargent, T. J., & Wallace, N. (1981). Rational expectations and the theory of economic policy. *Rational expectations and econometric practice*, *1*, 199-214.

Schwarzmüller, T., & Wolters, M. (2015). The Macroeconomic Effects of Fiscal Consolidation in Dynamic General Equilibrium. *Dynare Working Paper Series*, (43).

Sethi, N. (2017). Interaction between Monetary and Fiscal Policy: Empirical Evidence from India. *PRAGATI : Journal of Indian Economy*, *3*(2), 1–12. https://doi.org/10.17492/pragati.v3i2.7746

Shariff, A., Ghosh, P. K., & Mondal, S. K. (2002). *Indian public expenditures on social sector and poverty alleviation programmes during the 1990s*. London: Overseas Development Institute.

Sharma, J. V. M. (2003). Fiscal Management : A Review. *Economic and Political Weekly*, *38*(12/13), 1158–1170.

Singh, C. (1999). Domestic Debt and Economic Growth in Tanzania. *Economic And Political Weekly*, *34*(23), 1445–1453. https://doi.org/10.30560/jems.v1n1p207

Smith, L. (2002). A Tutorial on Principal Components Analysis. *Cornell University USA*, *51*(1), 52. Retrieved from http://users.ecs.soton.ac.uk/hbr03r/pa037042.pdf

Srinath, P., Kotasthane, P., Kher, D., & Chhajer, A. (2018). A Qualitative and Quantitative Analysis of Public Health Expenditure in India : 2005-06 to 2014-15. *The Takshashila Institution Working Paper Series*, *01*(July).

Stehn, S. J., & Leigh, D. (2009). Fiscal and Monetary Policy During Downturns: Evidence From the G7. *International Monetary Fund Working Paper*, *09*(50). https://doi.org/10.5089/9781451871982.001

Sucharita, Sanhita. (2012). Fiscal Consolidation in India. Working paper Institute of Economic Growth 314(12).

Sutherland, D., Hoeller, P., & Merola, R. (2012). Fiscal Consolidation: How Much, How Fast and by What Means? *OECD Economic Policy Papers*, (01), 1–31. https://doi.org/10.2139/ssrn.2060104

Thornton, M. (2002). Real Austerity. *The Monthly Publication of the Ludwig Von Mises Institute*, *31*(2), 1–3.

Tapsoba, S. J. (2013). Options and Strategies for Fiscal Consolidation in India. *IMF Working Papers*, *13*(127).

Tryfos, P. (1998). Methods for Business Analysis and Forecasting Chapter14 Factor analysis. In *Methods for Business Analysis and Forecasting* (p. 592). Retrieved from http://www.yorku.ca/ptryfos/methods.htm

Uhlig, H. (2005). What are the effects of monetary policy on output? Results from an agnostic identification procedure. *Journal of Monetary Economics*. 52, no. 2: 381–419. doi: 10.1016/j.jmoneco.2004.05.007

Van Aarle, B., Garretsen, H., & Gobbin, N. (2003). Monetary and fiscal policy transmission in the Euro-area: Evidence from a structural VAR analysis. *Journal of Economics and Business*, *55*(5–6), 609–638. https://doi.org/10.1016/S0148-6195(03)00056-0

Von Hagen, J., & Strauch, R. R. (2001). Fiscal consolidations: Quality, economic conditions, and success. *Public Choice*, *109*(3–4), 327–346. https://doi.org/10.1023/A:1013073005104

Westcott, R. F., & McDermott, C. J. (1996). An Empirical Analysis of Fiscal Adjustments. *International Monetary Fund Working Papers*, *43*(04), 725–753. https://doi.org/10.5089/9781451965957.001

Yadav, S., Upadhyay, V., & Sharma, S. (2012). Impact of Fiscal Policy Shocks on the Indian Economy. *Margin: The Journal of Applied Economic Research*, *6*(4), 415–444. https://doi.org/10.1177/0973801012462171

Zaghini, A. (2001). Fiscal adjustment and economic performing: A comparative study. *Applied Economics*, *33*(5), 613–624. https://doi.org/10.1080/00036840122700

Zoli, E. (2005). How Does Fiscal Policy Affect Monetary Policy in Emerging Market Countries? *Bank for International Settlements*, (174). https://doi.org/10.2139/ssrn.757632