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Research Report

on

Fiscal Deficit and Economic Growth Relationship in Karnataka

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Certificate

This report titled "*Fiscal Deficit and Economic Growth Relationship in Karnataka*" is a report on the study taken up at the Fiscal Policy Institute (FPI) in 2018-19.

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All opinion and conclusions expressed in this report are of the Research Consultant and usual disclaimer applies.


Sujit Kumar Chowdhury
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Abstract

The fiscal deficit and economic growth relationship is one of the highly debated issues under public finance empirics. However, there are minimal studies to assess this relationship at sub-national level in the Indian context. Theoretically, there are different views on the fiscal deficit and economic growth relationship. The present study analyses the relationship between fiscal deficit and economic growth in Karnataka for the time period 1990-91 to 2015-16. Vector error correction method is selected and used for the analysis based on the nature of the data.

Fiscal deficits are found to be having a significant positive relation with output growth in Karnataka. Other variables included in the model namely own tax revenue and gross fixed capital formation in the industrial sector are found to be significantly promoting growth. Karnataka is having a surplus in the revenue account and borrowed money is being used towards capital formation. The quality of deficit spending in Karnataka is in a much better position than the Central government. However, the capital outlay as a percentage of GSDP is on a downward trend in recent years and it needs to be reversed by the government. The study argues that the cap on fiscal deficit may be raised by 0.5% of GSDP as it meets the requirements suggested by the 14th Finance Commission. The study further claims that it does not create a troublesome situation if the cap is being raised given the condition that the fiscal deficit in its entirety is spent towards building infrastructure.

Executive Summary

High and persistent fiscal deficits are one of the major macroeconomic problems faced by the Indian economy. The problem of fiscal deficit was intensified in the early 90s for the Central government and in late 90s for the state governments. The Central government enacted the Fiscal Responsibility and Budget Management Act to put a cap on deficits. Following the Central government, many of the state governments enacted fiscal responsibility laws. The Central government incentivised the enactment of state specific fiscal responsibility laws by announcing many schemes like Fiscal Reforms Facility, Debt Swap Scheme and Debt Consolidation and Relief Facility. Karnataka's fiscal position is better among the 14 major states. All the fiscal indicators are within the stipulated fiscal responsibility legislation. There was a sharp increase in the deficits of several states in recent years with the implementation of the UDAY scheme.

This report aims at examining the relationship between fiscal deficit and economic growth in the state of Karnataka. Theoretically, there are three different perspectives. As per neo-classical theory, higher deficits retard economic growth, whereas Keynesian theory propounds that deficit spending is required to enhance growth given the under-utilised resources. Standing apart from these two mainstream views, Ricardian theory says that no relationship exists between deficit and growth. Even in the empirics, there are different results on the deficit-growth relation.

The time series econometric method is used for the analysis and the time period considered for the analysis is from 1990-91 to 2015-16. The variables included in the model are fiscal deficit, gross state domestic product, own tax revenue and gross fixed capital formation in the industrial sector. The variables included in the model are found to be having unit root and becomes stationary in the first difference. The variables are found to be cointegrated. Vector error correction method is selected and used for the analysis based on the nature of the data.

Fiscal deficit is found to be having a significant positive impact on economic growth in Karnataka. Own tax revenue and gross fixed capital formation of the industrial sector in Karnataka have been found to be having a positive impact on growth. Karnataka having a surplus on the revenue account spends its fiscal deficit amount towards capital formation. When compared with the Central government, the quality of deficit spending in Karnataka is much better. A matter of concern with Karnataka state finances is that development spending and capital outlay are on a downward trend

in the recent years. The results clearly state that quality of spending matters the most for achieving higher growth. As the results portray deficit spending towards capital formation enhances the growth, there is an urgent need to provide a momentum to capital outlay to foster the economic growth. Karnataka state has an opportunity to enhance the cap on fiscal deficit by 0.5% of GSDP as per the suggested requirements of the 14th Finance Commission. However, the government should make sure that the fiscal deficit in its entirety should be spent towards capital formation as per its existing trend.

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Fiscal Deficit and Economic Growth Relationship in Karnataka

The state of Karnataka among the Indian states is highly appreciated for its fiscal discipline. Since the enactment of the Karnataka Fiscal Responsibility Act (KFRA) in 2002, fiscal indicators of Karnataka are well within the prescribed limit. The state government consistently stands in the forefront in own tax revenue collection and the same is considerably high when compared to other states.

The fiscal policy of any nation deals with three important aspects, namely stability, growth and distribution. Maintaining macroeconomic stability, achieving higher economic growth and equitable distribution of income are the three major objectives of fiscal policy in India. This report deals with the growth effects of fiscal policy and in particular fiscal deficit's effect on economic growth in the state of Karnataka.

The report consists of five chapters. Chapter 1 provides a detailed discussion on Karnataka's fiscal indicators and growth level in comparison with 14 major states in India since 1990-91 to 2016-17. This chapter also elaborates the structural reforms that have taken place in the fiscal front of the state and its impact on deficit variables. The second chapter discusses different theoretical perspectives on fiscal deficit and the economic growth relationship and also critically examines available empirics in this regard. The third chapter elaborates upon the data and methodology used for the analysis and the results are discussed in the fourth chapter. The final chapter provides a conclusion to the report along with a few policy suggestions.

Chapter 1

Trends in Fiscal Indicators and Economic Growth

Fiscal policy deals with the taxation and expenditure decisions of the government. Fiscal policy consists of several components like tax policy, expenditure policy, investment and disinvestment strategies and debt management of the government (De, Supriyo, 2012). Tax, expenditure and debt position of Karnataka are elaborated below.

Table 1.1

Revenue Expenditure and Capital Outlay

(% of GSDP)

States	Revenue Expenditure		Capital Outlay		Interest Payments	
	2009-10	2015-16 (RE)	2009-10	2015-16 (RE)	2009-10	2015-16 (RE)
Andhra Pradesh	13.3	15.3	2.9	2.1	1.9	1.6
Bihar	17.9	24.6	4.2	6.4	2.1	1.7
Gujarat	11.2	10.1	1.9	2.6	2	1.6
Haryana	10.7	13.4	2.5	1.3	1.3	1.7
Karnataka	14.2	11.4	3.5	2.1	1.5	1.1
Kerala	12.5	13.9	0.9	1.1	2.3	1.8
Madhya Pradesh	16.6	20.3	3.7	3.2	2.1	1.6
Maharashtra	10	10.3	1.9	1.4	1.6	1.3
Odisha	15.1	18.9	2.2	4.9	1.9	1.2
Punjab	14.6	13	1.1	1.1	2.6	2.4
Rajasthan	13.9	16.6	2	3.5	2.7	1.8
Tamil Nadu	14.1	12.2	1.8	1.7	1.4	1.5
Uttar Pradesh	18.8	19.9	4.8	6.4	2.3	1.8
West Bengal	13.6	12.7	0.8	1.7	3.3	2.5

Source: RBI Database on Indian States, 2017

Table-1.1 depicts the level of revenue expenditure and capital outlay for 14 major states. In 2009-10, revenue expenditure was the highest for Uttar Pradesh followed by Bihar. In 2015-16, Bihar accounted for the highest revenue expenditure, i.e. 24.6% of GSDP. The same trend can be observed in capital outlay. In 2015-16, both Bihar and Uttar Pradesh have spent 6.4% of their respective GSDP towards capital formation. Kerala has spent only 1.1% of its GSDP towards capital formation, which stands as the lowest amongst the 14 major states. Karnataka state has significantly reduced its revenue expenditure from 14.2% of GSDP in 2009-10 to 11.4% of GSDP

in 2015-16. However, the nastiest part is, even the capital outlay has declined from 3.5% of GSDP to a mere 2.1% of GSDP in Karnataka. This is a matter of great concern for Karnataka, given the infrastructure inadequacies.

Expenditure is broadly classified under three different heads, namely revenue and capital expenditure, development and non-development expenditure and plan and non-plan expenditure.

Interest payments cover a major portion under revenue expenditure. Interest payments as percentage of GSDP are showing a declining trend for almost all the 14 major states (refer Table 1.1). Karnataka has the lowest interest payments-GSDP ratio among the major states accounting for 1.1% in 2015-16. West Bengal has the highest interest payments-GSDP ratio which is 2.5% of GSDP. This implies that nearly 20% of the total expenditure of West Bengal is towards interest payments.

The C. Rangarajan Committee on efficient management of public expenditure recommended that the Indian government do away with plan and non-plan classification of the expenditure and to follow the other two classifications. Development expenditure includes social sector spending and economic sector spending, whereas non-development expenditure includes general services expenditure like salaries and pensions, administrative expenditure, interest payments, spending on law and order etc. Table 1.2 provides the level of development expenditure and social service expenditure as a percentage of GSDP. Bihar tops in development expenditure followed by Madhya Pradesh in the year 2009-10. There is a drastic improvement in development spending for Rajasthan from 12% of GSDP to 21.3% of GSDP between 2009-10 and 2015-16. Bihar stands ahead of other states even under social service expenditure. Bihar, being one of the less developed states in India, gets higher grants from the Central government and hence its spending rate is higher when compared to other states. For Karnataka, both the development expenditure and social service expenditure have declined from 13% to 9.8% of GSDP and from 7.3% to 5.8% of GSDP respectively. This is a cautionary trend for the government and needs to be reversed in the coming years.

Table 1.2
Development Expenditure and Social Service Expenditure
(% of GSDP)

States	Development Expenditure		Social Service Expenditure	
	2009-10	2015-16	2009-10	2015-16
Andhra Pradesh	12	13.1	6.4	8.9
Bihar	16.1	22.7	10.2	15.8
Gujarat	9.3	9.3	5.4	5.8
Haryana	11	13.5	6.3	6.1
Karnataka	13	9.8	7.3	5.8
Kerala	7.6	7.8	5.2	5.5
Madhya Pradesh	15.2	18.2	8.1	11.4
Maharashtra	8.8	8	5.3	5.3
Odisha	11.8	18.1	7.7	11.2
Punjab	6.9	7.9	3.6	4.6
Rajasthan	12	21.3	8.5	10
Tamil Nadu	9.6	9.1	6.2	6.1
Uttar Pradesh	13.6	19.2	9.1	10.7
West Bengal	8.9	9.4	6.9	7.3

Source: RBI Database on Indian States, 2017

All the 14 major states except Karnataka, Maharashtra and Tamil Nadu have seen an increase in the development expenditure. On the revenue front, revenue receipts of state governments comprise three elements namely own revenue, transfers from the Central government and grants from the Central government. Own revenue consists of own tax and non-tax revenues. Own tax revenue is the better indicator of revenue buoyancy of the states. Details on states' own tax and non-tax revenue is provided in Table 1.3. Own tax to GSDP ratio was the highest for Andhra Pradesh in 2004-05 and 2009-10 accounting more than 12% of GSDP. The worst performing state in terms of revenue buoyancy is West Bengal. Karnataka's performance in own tax revenue collection is consistent as well as remarkable. Punjab was performing well on non-tax revenue collection in the years 2000-01 and 2004-05. Orissa stands first in non-tax revenue collection for the year 2015-16 amongst the 14 major states. Karnataka's performance on non-tax revenue collection is very poor. The Economic Survey of Karnataka 2016-17 argues that decline in the non-tax revenue collection is due to low recovery of costs (GoK, 2017). In many departments, the revision of user charges and fees etc have not taken place for many years and the tax base itself is very narrow and requires broadening of the tax base and hike in the existing rates.

Table 1.3**States' Own Tax and Non Tax Revenue**

(% of GSDP)

States	Own Tax Revenue				Non Tax Revenue			
	2000-01	2004-05	2009-10	2015-16	2000-01	2004-05	2009-10	2015-16
Andhra Pradesh	7.29	12.06	12.87	7.28	1.89	2.79	2.85	0.88
Bihar	5.14	4.29	4.97	6.72	1.42	0.54	1.03	0.52
Gujarat	8.14	6.37	6.20	6.12	3.01	1.52	1.26	1.15
Haryana	7.41	7.77	5.91	7.20	2.47	2.65	1.23	1.10
Karnataka	8.34	9.64	9.06	7.43	1.53	2.68	0.99	0.53
Kerala	8.08	7.51	7.60	7.17	0.91	0.69	0.80	1.60
Madhya Pradesh	7.12	6.88	7.59	7.52	2.17	3.95	2.80	1.78
Maharashtra	7.82	7.37	6.91	6.52	2.22	0.99	0.98	0.73
Odisha	5.03	5.38	5.51	6.35	1.59	1.74	1.97	2.63
Punjab	6.56	7.18	6.10	7.28	3.94	5.53	2.86	1.04
Rajasthan	6.43	6.59	6.17	6.79	2.05	1.68	1.72	1.76
Tamil Nadu	8.37	8.84	7.62	7.45	1.16	1.01	1.05	0.77
Uttar Pradesh	6.05	6.02	6.47	7.71	1.07	1.04	2.60	2.03
West Bengal	4.12	4.75	4.24	4.60	0.84	0.65	0.61	0.20

Source: RBI Database on Indian States, 2017

Fiscal deficit is one of the major problems for state governments since the mid-1990s. With the Pay Commission recommendation at the Central government level, many of the state governments formed their own state-level pay commissions and implemented its recommendation. This has resulted in the increase of both revenue deficits and fiscal deficits for almost all state governments. Interest payments is another important factor that contributed to higher deficits. Between 2000-01 and 2003-04, interest payments accounted for more than 2.5% of GDP for all the states, which has shown a decline over the years. The decline in interest rate was due to the many reforms taken up by the Central government on recommendations of the 11th and 12th Finance Commissions. Government of India formulated a Debt Swap Scheme (DSS) realising the mounting burden of interest payments on the states and to supplement their effort towards fiscal management. The scheme was in operation from 2002-03 to 2004-05. The scheme capitalised on the current low interest regime, to enable states to prepay expensive loans contracted from the government of India, with low coupon bearing small savings and open market loans. This scheme covered outstanding high cost loans with an interest rate of 13% and above. An amount of Rs. 1,06,076 crore was prepaid to the government of India by the states from small saving loans and open market

borrowings. The total debt swapped under DSS for Karnataka during 2002-03 to 2004-05 was Rs. 5642 crore.

Government of India enacted the Fiscal Responsibility and Budget Management (FRBM) Act in 2003. Following that, many state governments enacted rule-based fiscal correction mechanisms. Karnataka was the first among the states to enact Fiscal Responsibility Legislation (FRL) in the year 2002, even before the Central government. The Central government incentivised the state governments to enact fiscal responsibility legislations through several reforms. Major reforms in this regard are Fiscal Reforms Facility, Debt Swap Scheme and Debt Consolidation and Relief Facility. These reforms were taken up by the Central government based on the recommendations of 11th and 12th Finance Commissions.

Table 1.4 provides the level of deficits as a percentage of GSDP. In 2000-01, the fiscal and revenue deficit level was very high for almost all the states. Bihar had the highest fiscal deficit-GSDP ratio i.e. 8.53% and Gujarat had the highest revenue deficits in 2000-01. With the exception of Rajasthan, Haryana and Uttar Pradesh, the other states have limited their fiscal deficits to around 3% of their GSDP as on 2015-16. The state budget documents of Rajasthan indicate that a huge jump in fiscal deficit to around 10% of GSDP in 2015-16 is mainly due to borrowings under the Ujwal Discom Assurance Yojane (UDAY). Fiscal deficit as percentage of GSDP for Rajasthan by netting out debt under UDAY schemes accounts for 3.34% (GoR, 2017). Debt created under UDAY scheme is a one-time cost; however, interest costs will persist for years. UDAY was launched in 2015 by the Ministry of Power, Government of India. As per UDAY scheme, state governments have to bear 75% of the burden of debt.

The impact of fiscal rules can be clearly seen in the reduction of deficits over the years. Revenue deficits of the states got reduced considerably and many of the state governments experienced a surplus in the revenue account. In 2015-16, Gujarat, Karnataka, Madhya Pradesh, Orissa and West Bengal had a surplus in the revenue account. Karnataka has consistently managed its revenue account with the surplus.

Table 1.4
Deficit Indicators of 14 Major States

(% of GSDP)

States	Fiscal Deficit				Revenue Deficit			
	2000-01	2004-05	2009-10	2015-16	2000-01	2004-05	2009-10	2015-16
Andhra Pradesh	5.05	6.08	5.13	2.79	2.49	1.90	-0.45	0.68
Bihar	8.53	1.59	3.23	7.47	5.17	-1.39	-1.80	0.39
Gujarat	7.19	4.28	3.51	2.14	5.67	1.99	1.62	-0.35
Haryana	3.88	1.26	4.51	6.26	1.05	0.27	1.91	2.20
Karnataka	3.89	2.16	3.22	2.02	1.72	-0.98	-0.48	-0.10
Kerala	5.34	3.73	3.39	3.18	4.34	3.08	2.16	1.94
Madhya Pradesh	3.42	5.75	2.72	3.89	1.67	-1.52	-2.42	-0.08
Maharashtra	3.56	4.48	3.06	1.90	3.10	2.41	0.94	0.46
Odisha	7.68	1.76	1.39	2.91	4.45	0.67	-0.70	-2.00
Punjab	5.22	4.17	3.12	3.12	3.13	3.50	2.66	1.93
Rajasthan	5.23	4.81	3.87	10.01	3.19	1.68	1.79	0.78
Tamil Nadu	3.46	2.54	2.46	2.78	2.34	0.32	0.74	0.82
Uttar Pradesh	5.61	4.98	3.57	5.74	3.47	2.68	-1.35	-1.64
West Bengal	7.60	5.10	6.26	2.70	5.27	3.94	5.41	1.00

Source: RBI Database on Indian States, 2017

The ultimate effect of deficits are on the liabilities. Table 1.5 provides the outstanding liabilities of 14 major states. In 2001, Odisha had the highest liabilities as percentage of GSDP whereas it had the lowest in 2016. Odisha's liabilities declined from as high as 52% of GSDP in 2001 to 16.4% in 2016. With a revenue surplus and not much growth in the capital outlay, Odisha government, over the years, reduced its dependence on market borrowings to finance the state plan. Odisha government swapped high-cost loans in the past and prepaid and followed a buyback policy for high cost loans (NIPFP, 2016). By utilising the Debt Swap Scheme of the Central government and taking advantage of the low-cost interest regime, many state governments have achieved considerable reduction in their liabilities. Odisha followed by Karnataka had the lowest liabilities to GSDP ratio in 2016 with the highest being 35.3% of GSDP for Uttar Pradesh in the same year. There was an increase in the liabilities of many of the states in 2016 and 2017. UDAY scheme financing by the state governments has resulted in an increase of over 1.5% points of GDP in 2016 over 2015 and 0.7% of GDP in 2016 over 2017 (RBI, 2017a).

Table 1.5
Outstanding Liabilities of 14 Major States

(% of GSDP)

States	Outstanding Liabilities as on 31 st March			
	2001	2005	2010	2016
Andhra Pradesh	27.2	33.6	25.9	23
Bihar	49.5	55.5	36.5	27.9
Gujarat	35.8	35.1	28.6	22.5
Haryana	24.6	26	18.3	25.9
Karnataka	21.9	26.6	25	16.9
Kerala	33.4	36.6	32.5	27.2
Madhya Pradesh	26.4	39.5	29.8	22.8
Maharashtra	24.9	30	23.8	17.6
Odisha	51.5	47.6	28.1	16.4
Punjab	41.1	48.6	34.3	32.9
Rajasthan	39.6	46.9	34.5	31.1
Tamil Nadu	21.7	25.6	21.2	17.9
Uttar Pradesh	43.7	52.2	39.4	35.3
West Bengal	38.4	46.7	44	32.5

Source: RBI Database on Indian States, 2017

The above analysis indicates that fiscal indicators for many of the state governments are on the right path and in particular the state of Karnataka is doing astonishingly well in controlling its deficits. However, the impact of deficit on economic growth is an empirical question to be answered.

Chapter 2

Fiscal Deficit & Economic Growth Relation: Theoretical Perspective

The relationship between fiscal deficit and economic growth is one of the highly debated issues empirically which has a varied theoretical perspective¹. These theoretical debates can be classified under three major heads, namely neo-classical, Keynesian and Ricardian perspectives.

Neo-Classical Perspective

The neo-classical paradigm envisions farsighted individuals planning consumption over their life cycle (Bernheim, 1989). Deficits raise the total lifetime consumption and shift the tax burden to the subsequent generation. Increased consumption reduces the savings level and pushes the interest rate up to bring the capital market into balance. The high cost of borrowing crowds out private investment and reduces capital formation and consequently output growth in the long run. Higher external borrowing to fill the investment gap would adversely affect the exchange rate and trade account. A deficit in the trade account reduces the level of output. The neo-classical paradigm basically pronounces that fiscal deficit retards growth.

Keynesian Perspective

Under the Keynesian view, people are thought of as either myopic or liquidity constrained and they have a high propensity to consume. A reduction in tax or a rise in deficit spending would have an immediate and significant impact on the aggregate demand. Under the assumption of under-employment, national income rises with the multiplier effect. Deficit spending stimulates both consumption and national income. Appropriately timed deficit spending has beneficial consequences (Bernheim, 1989).

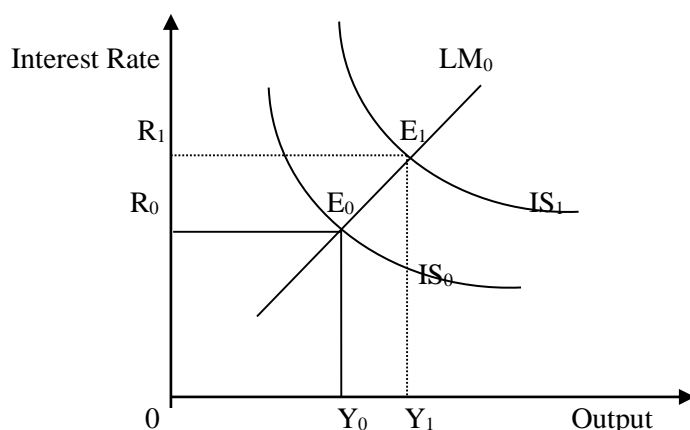
¹ There are two other important methods to measure deficit spending's impact on economic growth. They are fiscal multiplier approach and growth model approach. The textbook version of Keynesian multiplier says that if government expenditure (G) goes up by one unit, it translates to more than one unit increase in aggregate demand (Bose and Bhanumurthy, 2013). The initial round of spending stimulates further rounds of spending such that ultimately the effect on the output is multiplier times the original increase in spending. For an initial increase in government expenditure (ΔG) and Marginal Propensity to Consume (C), change in output (ΔY) is k times ΔG . Where k is fiscal multiplier and equals $k=1/1-c$. the value of fiscal multiplier accumulated effect on output through various rounds of spending.

Neo-classical growth model is another approach to assess government spending's impact on economic growth. Barro (1990) showed how government influences long-term growth using endogenous growth models. This model was extended by others like Lee (1992) and Devarajan et al. (1996) to measure the growth impact of different kinds of government expenditure.

The effect of budget deficits on output growth in a standard Keynesian model can be explained with the IS-LM framework. Under the IS-LM framework, IS curve represents the goods market and LM curve represents the money market and the intersection of these two curves determines the equilibrium in the system. Changes in the government spending activity affect the IS curve, that is the goods market and hence move the IS curve. Equilibrium in the economy occurs when demand equals supply in both the money market and goods market simultaneously. If the government raises the deficit either by spending more by keeping the tax level constant or reducing the taxes keeping the spending level constant, it affects the IS curve. Changes in deficit spending keep the LM curve unchanged as changes in taxes may not directly affect the demand and supply of money. Reducing the taxes raises the disposable income and the desired consumption (Dotsey, 1985). It shifts the IS curve towards the right, indicating an increase in the aggregate demand (refer Figure 2.1). The equilibrium is now at a higher point (E_1) with both high income and interest rates. Hence, in the Keynesian framework, deficit spending would be expansionary.

Figure 2.1

IS & LM Curve Framework



In the context of developing countries, many policy makers argued that deficit financing can be an effective tool to promote economic growth given the large amount of underutilised resources (Nelson & Singh, 1994).

Ricardian Perspective

A deficit financed present tax cut leads to higher future taxes that have the same present value as the initial cut. Holding fixed the path of government expenditure and non-tax, a cut in today's taxes must be matched by a corresponding increase in the present values of future taxes (Barro,

1989). The Ricardian equivalence theorem argues that decrease in government's savings due to deficits leads to an offsetting increase in desired private savings and hence national savings remains unaltered and it would not have any impact on growth. Assuming a closed economy, since the desired national savings do not change, the real interest rate does not have to rise to maintain the balance between desired national savings and investment demand and hence there is no effect on investment and growth. Even under the open economy, deficits do not cause external imbalance and lesser growth as private savings rise enough to match desired savings avoiding borrowing from abroad (Barro, 1989).

The three major paradigms have different perspectives on deficits' impact on economic growth. Neo-classical theory argues that deficits retard growth and Keynesian theory propounds that deficit spending is required to enhance growth given the under-utilised resources. Standing apart from these two mainstream views, Ricardian theory says no relationship exists between deficit and growth.

Empirical Review

There are not many empirical works to assess the deficits' impact on economic growth at sub national level in the Indian context. Rangarajan & Srivatsava (2005) argue that in order to achieve and sustain growth at a high level, the overall saving ratio and investment ratios need to increase and revenue deficits and fiscal deficits have to be managed to serve this purpose. At macro level by considering consolidated fiscal deficits of Central and state governments, Ramu & Gayithri (2016) have found that fiscal deficits adversely affect growth. They further analyse by taking the fiscal deficit composition and prove that if the fiscal deficit amount is used for capital formation, it promotes growth. In the consolidated finances, revenue deficit covers a major portion of fiscal deficit and only a meagre amount is left for capital formation purpose. In this context, the authors have argued that the quality of deficit spending is a matter of greater concern than the fiscal deficit in its entirety in India.

Sinha & Pant (2004) analysed the implications of deficit on the growth in select Indian states. The time period of the study was from 1980-81 to 2002-03, and further, disaggregated analysis was also conducted by taking the pre- and post-reform era separately. Fiscal deficits' impact on GSDP growth was found to be insignificant for Karnataka, however, having a negative sign. For Andhra Pradesh, Gujarat and Rajasthan, fiscal deficits' impact was found to be negative and significant.

By taking the relative GSDP growth of 16 major states, they found that the revenue deficit is having a significant inverse (negative) relation with GSDP growth.

In a state-specific study, Karnik (2002) used time series econometric method to measure the impact of deficits on growth. Taking time-series data on Maharashtra for the years from 1980-81 to 1996-97, the author found that both fiscal deficit and revenue deficit were having a significant negative relation with growth. The author further argued that running deficits for the purpose of pump-priming the economy is likely to be counter-productive. Even in the empirics, there are varied results on the relation between deficits and growth.

Chapter 3

Data, Variables and Methodology

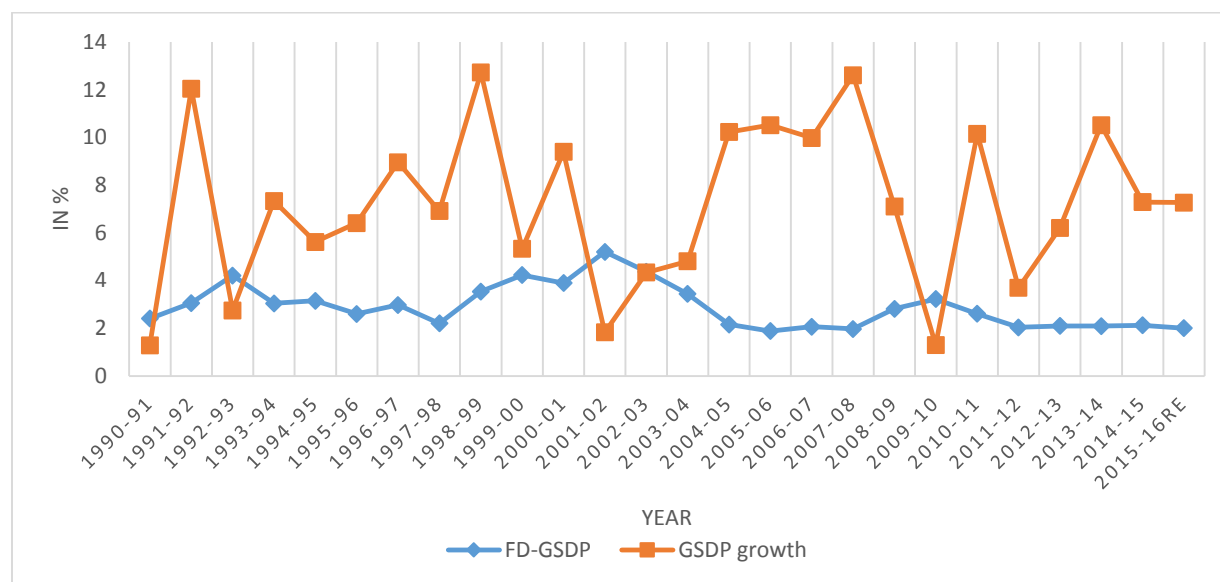
The central aim of this report is to assess the relationship between fiscal deficit and economic growth in Karnataka. The time period of the study is from 1990-91 to 2015-16. Variables included in the model are fiscal deficit, own tax revenue, gross fixed capital formation and gross state domestic product. All the data were collected from the RBI database on Indian states and RBI State Finances: A Study of Budgets, various issues. Trends in fiscal deficit-GSDP and GSDP growth rate are provided in Figure 3.1. On an average, GSDP of Karnataka has grown at the rate of 7% in the study period. Karnataka has foreseen higher growth except for a few years namely in 1992-93, the early 2000s and in 2009. Decline in industrial sector contribution and higher fiscal deficits are responsible for the reduction of GSDP in 1992-93. The fiscal deficit to GSDP ratio was 4.2% in 1992-93 and in the same year, GSDP growth was a mere 2.7%. With macroeconomic reforms at the national level, situations at the state level also improved. An improvement can be seen in declining fiscal deficit and increase in GSDP growth until 1998. In the late 1990s and early 2000s, the fiscal deficit situation got worsened and the GSDP growth too declined to a very low level of 1.82% in 2001-02. The fiscal deficit was the highest in the same year. The negative growth of the primary sector due to drought and bad monsoons resulted in a decline in the overall output growth in 2001-02 (GoI, 2007). GSDP growth improved considerably after 2003 and reached its highest point in 2008. The astonishing growth performance of Karnataka was primarily because of improvements in service sector contribution towards GSDP. The information technology sector was the significant contributor for high economic growth. There was a downturn in the GSDP growth after 2008 with the onset of the global financial crisis and consequent fall in demand, production and exports.

The fiscal deficit level peaked in the year 2001-02. Taking note of higher and persistent fiscal deficits, the government of Karnataka constitutionally enacted the fiscal responsibility law i.e. Karnataka Fiscal Responsibility (KFRA) Act in the year 2002 and it came into force from 2003. KFRA Act restricted excessive government deficit spending by capping the fiscal deficit to be 3% of GSDP and zero revenue deficit by 31st March 2006. The impact of KFRA can be clearly observed in Figure 3.1. The fiscal deficit as percentage of GSDP declined from 5.2% in 2001-02 to 1.88% in 2005-06 and revenue surplus was achieved within the laid-down target year.

The relationship between fiscal deficit and GSDP growth cannot be predicted clearly from Figure 3.1. In a few years, both the variables are moving in the same direction and this trend can be seen in the years 1991-92, 1996-97 to 1998-99, 2010-11 to 2012-13. In a few years, both the variables are moving in the opposite direction. If one lag of fiscal deficit is considered, then a positive relation between deficit and growth can be observed in many of the years. However, the magnitude of the relationship has to be calculated by econometric modelling.

Figure 3.1

Trends in Fiscal Deficit and Economic Growth in Karnataka (in %)



DSsource: RBI Database on Indian States, 2017

Note: FD: Fiscal Deficit, GSDP: Gross State Domestic Product at Factor Cost

Variables

GSDP: Gross State Domestic Product at factor cost is used for the analysis. Data was obtained from the RBI Database on Indian States, 2017. GSDP data is in 2011-12 real prices.

Fiscal Deficit: Fiscal deficit is the difference between total expenditure, revenue receipts and non-debt capital receipts. Data on fiscal deficit was collected from the RBI Database on Indian States, 2017. Fiscal deficit data has been converted into real terms using the GSDP deflator.

Own Tax Revenue: Own tax revenue indicates the own revenue efforts of the state government. Data on own tax revenue was collected from the RBI Database on Indian States, 2017. Own tax revenue data has been converted into real terms using the GSDP deflator. The impact of revenue

on output growth is an empirical question. Prevailing theories and empirics have different opinions on it. Typically, it is assumed that higher taxes retard growth. However, there are taxes which would be growth promotive also. The impact differs based on the nature of the taxes, like consumption-based tax and income-based tax. In terms of consumption taxation, its impact again depends on the elasticity of demand for that commodity.

GFCF: Gross Fixed Capital Formation from the industrial sector is considered in the model. Data on GFCF was collected from the RBI Database on Indian States, 2017 and it has been converted into real terms using the GSDP deflator. The expected sign of GFCF would be positive. Higher capital formation is expected to enhance the growth in the long run.

A summary of descriptive statistics of variables included in the model is provided in Table 3.1.

Table 3.1
Descriptive Statistics

Variables	Mean	Median	Max	Min	Std.Dev	Skewness	Kurtosis
Fiscal Deficit	81.05	72.34	161.46	25.02	39.49	0.42	1.99
Ln (FD)	4.27	4.28	5.08	3.21	0.52	-0.20	1.92
GSDP	36704.9	30818.7	76028.2	13808.1	18812	0.59	2.13
Ln (GSDP)	10.38	10.33	11.23	9.53	0.51	0.03	1.26
Own Tax Revenue	211.37	150.25	434.64	61.47	128.53	0.45	1.60
Ln (OTR)	5.16	5.01	6.07	4.11	0.63	0.09	1.45
GFCF	111742	58353	313352	7490	100737	0.67	1.91
Ln (GFCF)	11.1	10.97	12.65	8.92	1.13	-0.25	1.94

Checking for the stationarity of the variables is the first step in time series analysis. Variables need to be stationary because their mean, variance and serial correlation structure do not change over time and results will be the best descriptors of future behaviour. A variable having a unit root is treated as non-stationary. Unit root implies variables having some stochastic process and would cause problems in statistical inference. Hence, in the time series analysis, it is important to check whether the data under consideration are having unit root or not. To check for the presence of unit

root, the Phillips-Perron unit root test is used here. Phillips-Perron test is the extended model of Augmented Dickey Fuller unit root test. Results of the Phillips-Perron Unit root test are provided in Table 3.2. Unit root test results indicate that all the variables contain unit root and it becomes stationary in the first difference. Hence the variables considered in the model are $i(1)$ in nature.

As the data indicates all the variables are $i(1)$ in nature, it is important to check whether there exists a long run cointegration relation among the non-stationary data or not. In order to check the existence of cointegration, the Johansen cointegration method has been used here. Johansen cointegration method has two tests to check cointegration: They are λ_{trace} & λ_{max} . The λ_{trace} statistic tests the null hypothesis that the number of distinct cointegrating vectors is less than or equal to r against a general alternative of k cointegration relation, where k is the number of endogenous variables in the system. The λ_{max} statistic tests the null that the number of cointegrating vector is r against the alternative $r+1$ cointegrating vectors (Enders 2004, 352). The results obtained using Johansen's method are provided in Table 3.3.

Table 3.2

Phillips-Perron Unit Root Test

Variables	Level	First Difference
Ln (Fiscal Deficit)	-1.62	-4.96*
Ln (GSDP)	-0.04	-5.46*
Ln(OTR)	-0.74	-4.77*
Ln (GFCF)	-1.52	-4.34*

*significant at 1% level **Significant at 5% level

Table 3.3

Cointegration Test

Johansen Cointegration Test					
<i>Variables:</i> Ln(GSDP), Ln(FD), Ln(OTR), Ln(GFCF)					
<i>Lag Order:</i> 1 <i>Trend Assumption:</i> Linear Deterministic Trend					
Hypothesized No. of C-Eqns	Trace Stats	p-value		Max-Eigen Stats	p-value
None	78.43	0.00*		52.79	0.00*
At most 1	25.63	0.13		15.41	0.26
At most 2	10.22	0.26		9.65	0.23
Trace & Max-Eigen Value indicates 1 cointegration Equation at 0.05% Sig level					
*denotes rejection of hypothesis at 5% level					

The result indicates that there exists a cointegration relationship among the variables. Both λ_{trace} and λ_{max} tests confirm the existence of one cointegration relation. After confirming the existence of cointegration relation, we can proceed with the Vector Error Correction (VEC) model for estimating long-run and short-run relationship among the variables. The estimation procedure is elaborated below:

The long-run equation of the model-1 is in the following form:

$$\ln\text{GSDP}_t = \beta_{10} + \beta_{11} \ln\text{FD}_t + \beta_{12} \ln\text{OTR}_t + \beta_{13} \ln\text{GFCF}_t + e_t \dots\dots (1)$$

GSDP is normalised to be one in the long-term equation. If a variable is a part of cointegration equation with non-zero coefficient, it may thus be normalised to one (Lutkepohl & Kratzig, 2004). The next step is to test whether the obtained residuals are stationary at levels or not. If the residuals are stationary, then the variables are considered to be cointegrated. It has already been proven here with the help of the Johansen cointegration test that variables are cointegrated.

The next step is to estimate the error correction model and the equations are as follows:

$$\Delta\ln\text{GSDP}_t = \alpha_{10} + \alpha_{11}[\ln\text{GSDP}_{t-1} - b_{11} \ln\text{FD}_{t-1} - b_{12} \ln\text{OTR}_{t-1} - b_{13} \ln\text{GFCF}_{t-1}] + \gamma_{11} \Delta\ln\text{GSDP}_{t-i} + \gamma_{12} \Delta\ln\text{FD}_{t-i} + \gamma_{13} \Delta\ln\text{OTR}_{t-i} + \gamma_{14} \Delta\ln\text{GFCF}_{t-i} + \varepsilon_{1t} \dots\dots (2)$$

$$\Delta\ln\text{FD}_t = \alpha_{20} + \alpha_{21}[\ln\text{GSDP}_{t-1} - b_{21} \ln\text{FD}_{t-1} - b_{22} \ln\text{OTR}_{t-1} - b_{23} \ln\text{GFCF}_{t-1}] + \gamma_{21} \Delta\ln\text{GSDP}_{t-i} + \gamma_{22} \Delta\ln\text{FD}_{t-i} + \gamma_{23} \Delta\ln\text{OTR}_{t-i} + \gamma_{24} \Delta\ln\text{GFCF}_{t-i} + \varepsilon_{2t} \dots\dots (3)$$

$$\Delta\ln\text{OTR}_t = \alpha_{30} + \alpha_{31}[\ln\text{GSDP}_{t-1} - b_{31} \ln\text{FD}_{t-1} - b_{32} \ln\text{OTR}_{t-1} - b_{33} \ln\text{GFCF}_{t-1}] + \gamma_{31} \Delta\ln\text{GSDP}_{t-i} + \gamma_{32} \Delta\ln\text{FD}_{t-i} + \gamma_{33} \Delta\ln\text{OTR}_{t-i} + \gamma_{34} \Delta\ln\text{GFCF}_{t-i} + \varepsilon_{3t} \dots\dots (4)$$

$$\Delta\ln\text{GFCF}_t = \alpha_{40} + \alpha_{41}[\ln\text{GSDP}_{t-1} - b_{41} \ln\text{FD}_{t-1} - b_{42} \ln\text{OTR}_{t-1} - b_{43} \ln\text{GFCF}_{t-1}] + \gamma_{41} \Delta\ln\text{GSDP}_{t-i} + \gamma_{42} \Delta\ln\text{FD}_{t-i} + \gamma_{43} \Delta\ln\text{OTR}_{t-i} + \gamma_{44} \Delta\ln\text{GFCF}_{t-i} + \varepsilon_{4t} \dots\dots (5)$$

The coefficients α_{11} α_{21} α_{31} α_{41} indicate the speed of adjustment to equilibrium and its corresponding value in the bracket is the error correction term. These coefficients must be significantly different from zero if the variables are cointegrated and estimates of these coefficients must not be too large. The γ coefficients indicate the short-term relation.

Chapter 4

Fiscal Deficit and Economic Growth Relationship in Karnataka: Empirical Results

Vector error correction method has been used to analyse the relationship between fiscal deficit and economic growth in Karnataka. The reason behind choosing the vector error correction model has been explained in the previous chapter. The results of VEC model are provided in Table 4.1. R-squared value is 0.76 and R-bar squared is 0.55. Checking for serial correlation is one of the necessary steps in time series analysis. Advance LM test for serial correlation indicates that there is no serial correlation problem in residuals at different lags. There is no problem of heteroscedasticity and the residuals are found to be normal in shape. Dynamic stability test of the model indicates that autoregressive roots are within the unit root circle and hence the model is dynamically stable (refer Figure 4.1).

Results indicate that fiscal deficit has a significant positive relation with growth over the long term in Karnataka. The results are in line with the Keynesian perspective. Keynesian theory argues that an increase in spending by the government would result in a rise in the income and purchasing power of the people and consequently raises the aggregate demand in the economy. The empirical results obtained in this study are questionable as many of the studies have proved that the fiscal deficit adversely affects growth as far as Central government finances are concerned. Even certain studies at sub-national level like Karnik (2002) have found that the fiscal deficit adversely affects economic growth. The state finances of Karnataka, when compared to other major states and the Central government, as discussed in chapter 1, stand at a significantly better place. If the composition of the fiscal deficit at the Central government is considered, the revenue deficit component covers 58.02% of the gross fiscal deficit. It implies that out of borrowed money, nearly 58% is going towards current expenditure. The Golden Rule of public finance says that borrowed money should be used for capital formation and not for the current expenditure. A major portion of the fiscal deficit, which is supposed to be used for capital investments, is being used for current expenditure at Central government level. However, the picture is different at state government level. The trend of excessive revenue deficit has reduced over the years and many of the state governments are on the cushion of surplus revenue.

Karnataka being a pioneer state in managing its fiscal space has considerably reduced the quantum of fiscal deficit in ratio to GSDP as well as achieving revenue surplus. This implies that Karnataka

government is spending the fiscal deficit amount on capital formation which is expected to yield a better growth rate. As the quality of deficit spending in Karnataka is on the right track, its positive impact can be seen on output growth.

Table 4.1
Results

Long Term Results		
Dependent Variable:	Coefficients	t-value (Prob)
ln(GSDP)		
lnFD	0.35	5.14 (0.00)
lnOTR	0.28	5.52 (0.00)
lnGFCF	0.025	4.48 (0.00)
Trend	0.025	3.71 (0.00)
Constant	13.63	
Short Term Results		
ECM	-0.98	-4.01(0.00)
D09	-0.065	-3.73 (0.00)
Diagnostic Checks		
R-Squared: 0.76		R-Bar-Squared:0.55
<i>Serial Correlation LM test:</i>		
LM Stat (prob): Lag-1: 14.45 (0.56)		
Lag-2: 20.96 (0.17)		
<i>Heteroscedasticity Test: Chi-Sq (prob): 193.07 (0.42)</i>		
<i>Normality Test:</i>		
Skewness: Chi-sq (prob): 0.93 (0.91)		
Kurtosis : Chi-sq (prob): 2.42 (0.65)		
Jarque-Berra: JB (prob): 3.36 (0.90)		

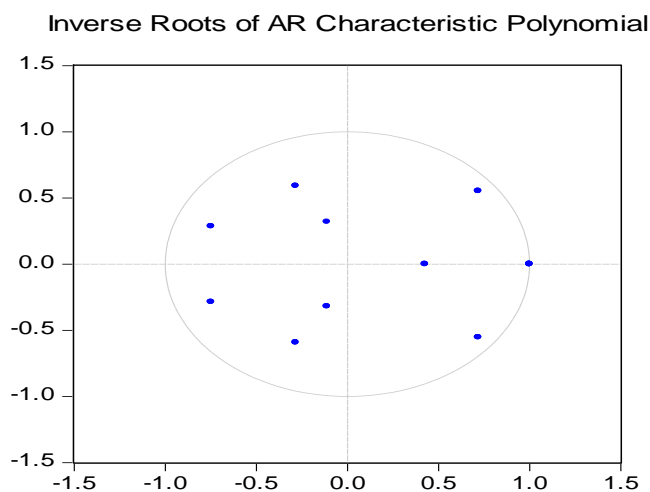
Own tax revenue is having a significant positive impact on GSDP growth. A 1% increase in own tax revenue results in the growth of GSDP by 0.28%. The government gets enough space to spend

more if the revenue is buoyant. Karnataka's tax buoyancy ratio is one of the highest among the 14 major states. However, with the implementation of Goods and Service Tax (GST), the tax calculations of the government may change. The own tax revenue of Karnataka mainly consists of consumption-based taxes like sales tax (now GST), excise revenue from liquor, motor vehicle tax, stamps and registration etc. The nature of elasticity of own tax revenues in Karnataka would have contributed to higher revenue collection as well as output growth through the government expenditure channel.

Variable GFCF is found to be having a significant positive relation with GSDP. As the data on total GFCF from all the sectors at state level, particularly for Karnataka, is not available, GFCF of industries has been considered for the analysis. One per cent increase in gross capital formation in the industrial sector is found to be having 0.02% increase in output. It implies that higher and consistent capital formation would significantly promote economic growth.

Figure 4.1

Dynamic Stability Test



In the short run, the error correction term is found to be significant and negative. The coefficient of error correction term indicates that nearly 90% of disequilibrium is corrected in a year. Negative and significant coefficient of error correction term once again confirms that the model is efficient and variables are cointegrated. A dummy variable to capture the effects of the 2009 global financial crisis is also used in the model and it is found to be significant.

The results indicate that the state finances of Karnataka are in better shape and continuing the same in the long term is required. However, the major concern is that the capital outlay to GSDP ratio

is almost stagnant at around 2% of GSDP in the study period and it is declining since 2009-10. In 2009-10, the capital outlay ratio was 3.5% of GSDP and it declined to 2.05% of GSDP in 2015-16. The present fiscal deficit position of Karnataka state is well within the KFRA limit. The 14th Finance Commission of India recommended that if a state government's debt-GSDP ratio is less than or equal to 25% of GSDP, then the state is permitted to have flexibility of 0.25% of GSDP above the present 3% fiscal deficit cap. A state can further avail flexibility of 0.25% of GSDP if interest payments are less than 10% of revenue receipts in the preceding year. Given these stipulations, Karnataka government is eligible to increase its fiscal deficit cap by 0.5%, that is up to 3.5% of GSDP. It does not create a troublesome situation if the cap is being raised, given the condition that the fiscal deficit in its entirety has to be spent on capital formation purpose.

Karnataka lags behind many other states as far as the availability of infrastructure is concerned. Per-capita availability of power in Karnataka in the year 2015-16 was 1000 kw/h per person, whereas in the same year, per-capita availability of power in Maharashtra was 1258 kw/h per person, 1715 kw/h per person in Gujarat, 1871 kw/h per person in Haryana, 1793 kw/h per person in Punjab and 1337 kw/h per person in Tamil Nadu. The GFCF in industrial sector was Rs. 200578 million in Karnataka for the year 2014-15 whereas it was Rs. 551993 million for Maharashtra. This implies that huge investments are required in the infrastructure sector in Karnataka. Higher spending by the state government in providing world class infrastructure would attract more private investments and foster economic growth.

Chapter 5

Conclusion & Policy Implications

Excessive fiscal deficits have become one of the major macroeconomic problems in the early 1990s for the Central government. In the late 1990s, the finances of state governments got worsened and many of the state governments were under fiscal distress. To control the deficits, beginning with Karnataka, other state governments have enacted fiscal responsibility laws to put a cap on excessive deficits. The analysis of trends in the fiscal indicators of 14 major states clearly indicated that state finances of Karnataka are in a better shape. The fiscal deficit and revenue deficit of Karnataka are well within the stipulated limits. With the fiscal responsibility laws, almost all the state governments were able to reduce the deficits.

The major objective of this report was to examine the relationship between fiscal deficit and economic growth in the state of Karnataka. Theoretically and empirically, there are different views on the deficit and economic growth relation. The time period considered for the analysis was from 1990-91 to 2015-16. The variables included for the analysis were fiscal deficit, gross state domestic product, own tax revenue and gross fixed capital formation in the industrial sector. With the checking of time series properties, it was found that variables are non-stationary and cointegrated. As the variables were first difference stationary and cointegrated, the vector error correction method was used for the analysis.

Fiscal deficits' impact on economic growth in Karnataka is found to be positive and significant. As Karnataka state is having a surplus on the revenue account, the entire fiscal deficit amount is spent towards capital formation. The quality of fiscal deficit spending in Karnataka is better than that of the Central government. The result clearly states that the quality of spending matters the most for achieving higher growth. The own tax revenue and gross fixed capital formation were found to be having a significant positive relation with the growth. The only matter of concern with Karnataka state finances is that development spending and capital outlay are on a downward trend in recent years. Further, capital outlay requires a momentum to foster economic growth. The result also imply that Karnataka government can enhance their deficit cap up to 3.5% and should make sure that the present trend of spending deficit money towards capital formation continues.

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