GOVERNMENT EXPENDITURE AND ECONOMIC GROWTH IN INDIA: 1970-71 TO 2007-08

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BY

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DECLARATION

This is to certify that the material included in the present study entitled "**Government Expenditure and Economic Development in India: 1970-71 to 2007-08**" is based on my original research work, done under the supervision of Prof. Dinesh V. Baloni, Department of Business Economics, Faculty of Commerce, M. S. University of Baroda, and tat no part of this work was submitted to any University or Institute for the award of any Degree. My indebtedness to other works has been duly acknowledged at the relevant places.

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Indian institutions/ Libraries:

American Studies Research Centre (ASRC), Hyderabad, British Council Library, Calcutta, Centre for Studies in Social sciences, Calcutta, Commercial Library, Calcutta, Department of Economics, Calcutta University, Indian institute of Management (Dr B. C. Roy Library), Calcutta, Indian Statistical Institute Library, Calcutta, National Institute of Public Finance and Policy (NIPFP), New Delhi, National Library, Calcutta

Foreign Institutions/ Libraries:

Homer D. Babbidge Library (University of Connecticut, Storss Campus, CT, USA), Robert H. Goddard Library (Clark University, Massachusetts, USA), John Widener Library (Harvard College Library Campus, Cambridge, Mass., USA)

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ABBREVIATIONS

ADB	--	Asian Development Bank
ADF	--	Augmented Dickey-Fuller (Test)
AR (1)	--	Autoregressive Transformation
ARDL	--	Autoregressive Distributed Lag
ASEAN	--	Association of Southeast Asian Nations
BRICS	--	Brazil, Russia, India, China and South Africa
CAD	--	Current Account Deficit
CLRM	--	Classical Linear Regression Model
CMIE	--	Centre for Monitoring the Indian Economy
CPI	--	Consumer Price Index
CSO	--	Central Statistical Organization
DGCIS	--	Directorate General of Commercial Intelligence and Statistics
DSGE	--	Dynamic Stochastic General Equilibrium
ECM	--	Error Correction Mechanism
EMEs	--	Emerging Market Economies
EU	--	European Union
FDI	--	Foreign Direct Investment
G-20	--	Group of Twenty
GCF	--	Gross Capital Formation
GDP	--	Gross Domestic Product
GFD	--	Gross Fiscal Deficit
IMF	--	International Monetary Fund
IPFStat	--	Indian Public Finance Statistics

LDC	--	Less Developed Country
NAS	--	National Accounts Statistics
NCAER	--	National Council for Applied Economic Research
NCEUS	--	National Commission for Employment in the Unorganized Sector
NIPFP	--	National Institute of Public Finance and Policy
NSSO	--	National Sample Survey Organization
OECD	--	Organization for Economic Co-operation and Development
OLS	--	Ordinary Least-Squares Regression
RBI	--	Reserve Bank of India
TSLS	--	Two Stage Least Squares Regression
UNDP	--	United Nations Development Programme
VAR	--	Vector Autoregression
WPI	--	Wholesale Price Index

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PART I

STUDYING GOVERNMENT EXPENDITURE

1

Introduction & Prologue

"*In the fifteen years immediately following World War II, unquestionably the most significant development in public economics was the emergence of "public expenditure theory." This development arose in the attempt to define a comprehensive theory of the state around the notion of "market failure." For public economics, this was a significant development because, until that time, analysis focused on the tax side of the budget*"....

Geoffrey Brennan (1998)

CHAPTER 1

Introduction and Prologue

The chapter is organized into the following major sections.

1.1 Background: The State and the Economy

- 1.1.1 The Present Study
- 1.1.2 Evolution of Public Expenditure Analysis

1.2 Time Period of Study

1.3 Objectives of the Present Study

1.4 Major Hypotheses

1.5 Data Source

1.6 Methodology (Tools and Variable Description)

1.7 Chapter Summary

References

1.1 Background: The State and the Economy

Presenting his now-famous Classic "Wings of Fire", former President of India Dr. APJ Abdul Kalam (APJ A. Kalam, 1999) had commented on the time as one when India's technological prowess, and its ability to translate its ambitious dreams into reality, were being seriously questioned. To quote, "…Economic and technological supremacy is equated with political power and world control….A few nations who have grown very strong technologically …have become the self-proclaimed leaders of the new world order. What does a country of one billion people, like India, do in such situation? We have no other option than to be technologically strong. But, can India be a leader in the field of technology? My answer is an emphatic "*Yes*"." [emphasis added] (Kalam, 1999 *p xi* Introduction).

That was in 1999, when India had been poised on the threshold of a giant take-off into the Millennial milestone of 2000, ushering in its wake a promise of unprecedented technological potential that would, it had been dreamed, change the fate of Indian people forever.

The present dissertation, on the other hand, is being offered for examination in 2013, which represents another watershed, if not on a similar epic scale. India, having made enviable economic strides while the global economy was in a state of extreme uncertainty, had been once again poised to emerge among the leaders in the economic forefront. And yet, our aims and aspirations of becoming an economic Super-power seem to have been severely challenged, due not only to external crises, but also in the light of current politico-economic realities of the nation itself. It is a time when the faith of the Indian populace in governance is being relentlessly tested, as events unfolding all around us will vouchsafe for. It is just the beginning of India's take-off point that marks the end-year of this Thesis, which has as its period

of study the span of years between 1970-71 and 2007-08. The justification of the time period of our choice is provided further on in a subsequent section.

1.1.1 The Present Study

This study analyzes the pattern and trend of central government expenditure in India over 1970-71 to 2007-08, seeking in particular to explore the factors underlying the process of government growth.

The Thesis revisits the implications of fiscal correction and consolidation for government expenditure trends and the economic consequences thereof, in the Indian context. It concerns itself primarily with the question as to how various forces in the macro-economy shape the process of government expenditure itself.

What led us to the focus of interest? This can be appreciated if we take a look at the circumstances that have been taking shape with regard to government presence the world over thus far, including the Global Financial Crisis that reached its pinnacle in 2008, the associated Fiscal Stimulus steps that became necessary to cope with the crisis, and the later, continuing impasse in the Euro-zone.

As the effects of the recently evidenced Global Financial Crisis begin weakening, and the renewed crisis situation keeps unfolding in the Euro-zone area, questions regarding the proper scope of government have once again assumed the hot seat the world over. The US presents a dramatic case in point, having marked the end of the huge fiscal stimuli regime in preparing to effect massive cutbacks in its budgetary outlays. Issues such as the proper scope of government have once again, therefore, become thrown open to intense debate and discussion.

The consequences of the growth in government share for the economy have been extensively researched (*Section 2.1 of the second chapter provides some actual data and an overview on the extent of government presence on a global basis)*. The lack of a consensus notwithstanding, at least two considerations have prompted vast research in the observed growth of government: first, the alleged "waste" involved in large government (the perceived "inefficiency" of the public sector), and secondly, the perceived economic effects of a large government.

When it comes to attempts at analyzing the causes of the observed pattern of government expenditure growth over time, however, one frequently encounters the absence of a clearly laid out theoretical background in existing empirical work. It is this lack that suggested to us the need, and the justification, for such a study in the Indian context.

A perusal of the existing literature suggests that premises relating to government growth have often been analyzed with inadequate consideration as to their applicability to the specific economic context under investigation. Secondly, a proliferation of studies seeking to explain or model government growth on the basis of one specific hypothesis, and the inevitable omitted variables bias resulting from such attempts, has frequently compounded the problem. Finally, while studies for developed world abound, lack of a similar analytical framework for a developing country context is very much evident.

The present analysis addresses various dimensions of government expenditure in the Indian economy, focusing on expenditure at the Central Government level over the period 1970-71 to 2007-08. The period spans the two pre-reforms decades to the subsequent 18 years culminating in the Global Financial Crisis that reached its peak in 2008.

The proposed work is an exercise in purely positive tradition and does not in any way attempt to offer normative positions or value judgment. It is also beyond the scope of the present study to address the complex, albeit challenging issues of efficiency of government.

1.1.2 Evolution of Public Expenditure Analysis

The fundamental question as to where the State should be ideally situated vis-à-vis the economy, and the respective roles to be accorded to the State and the Market has traversed almost a full-circle over the course of time. The limitations of the early Classical belief in the supremacy of free market and the price system in solving all economic problems ("Laissez-faire") were mercilessly exposed by the Great Depression of the 1930s, with the critique of the classical regime finding eloquent expression in John Maynard Keynes's writings. The period subsequent to 1930s saw a dominance of State-led development initiatives all over the world, with a host of countries going in for central role for State over the 1950s and 60s. The stagflation of the 1970s marks the next turning-point when Keynesian macroeconomics became discredited and the variously authored attacks on Keynesianism, followed by the famed Lucas Critique, became embodied in the so-called "Washington Consensus", the strand that began to dominate mainstream thinking around the 1980s.

"*The stylized version of (the ultimate victory of "policy ineffectiveness") begins with the collapse of the Keynesian consensus in the early 1970s, when the combination of high unemployment and high inflation combined to discredit the tools of Keynesian economics, (which) was said to have been based on the idea that by using monetary and fiscal policy, the government could steer the economy away from the extremes*

of recession and inflation. However, the appearance of inflation and recession together (stagflation) in the 1970s marked a combination that not only was out of the reach of traditional Keynesian policies but was argued to actually be caused by (them)"…."The response against Keynesian economics took many forms"… (and) … "By the 1990s, this anti-Keynesian counterrevolution seemed to have achieved complete victory with the award of several Nobel Memorial Prizes in economics to the movement's architects at the University of Chicago."— (Bateman et al. 2010 pp 2-3).

The "policy counterrevolution", then, envisaged a gradual drawing away of the State from the economy, only to act as facilitator for market forces to play to their "efficient best".

In the ultimate analysis, however, it probably needed the Global Crisis of 2008, if only to delineate a dramatic historical turning point that many saw as signaling a return to the Keynesian era, to underscore once again the limitations of the market economy left to its own workings. The financial crisis of 2008, originating in the US, shook the advanced capitalist regime and created ripples all over the increasingly interconnected world economy. The need for greater regulation and supervision of the markets was sorely felt. Huge fiscal stimulus packages were initiated by governments all over. There was thus a renewed call for greater government involvement in the economy the world over.

As Desai (2002) notes, "Questions about state functions started with critiques of Keynesian policies and spread to a general critique of the role of the state … …As a result notions of public and private have been rethought, though in many cases they have only been queried and not yet recast" (Desai 2002 p. 63).

The question as to how the “Public” and the “Private” are envisaged to be situated vis-à-vis each other brings us to an exploration of the emergence of thoughts on public finance over time. It must be noted, however, that all this introduction seeks to do is to place the present study into perspective within the theoretical tradition rather than provide a full historical account *per se*.

Desai (2002) has noted the historical existence of public goods preceding the emergence of the nation-states. In similar fashion, Jürgen Backhaus and Richard Wagner (Backhaus and Wagner 2004) too point out the fact that much before economics or political economy emerged as distinct academic areas, public finance was being actively pursued as a discipline.

The earliest systematic line of public finance thought was embodied in Cameralism, originating mainly in German and Austrian writings around the sixteenth century. Cameralism was represented by a body of scholars who were not only academics but were real life administrators and consultants in their own right. By this time, the contemporary Classical strand was developing in Britain under the influence of Adam Smith. In common with the latter, Cameralists, too, envisaged limits on the State’s powers to tax. The important difference, however, lay in the way the State was visualized vis-à-vis the economic order. While Smith saw the state as *intervening* into the economy, Cameralists located the State *within* society and the economic order, a difference that is termed by Backhaus and Wagner (2004) as “the first antinomy” running through public finance thought, viz., “(that) between conceptualizing the state as *intervening into* the economic order and the state as *participating within* the economic order” (Backhaus and Wagner 2004 p 3), [emphasis added].

For practical purposes, the “interventionist state” has largely been associated with the choice-theoretic framework while the “participative state” has been linked with the catallactic approach (Backhaus and Wagner 2004 p 3)

The above brings us to the process as to how the theory of public expenditure, which began from a secondary position, as it were, in origin to the discourses on taxation, found its place in public finance analysis. By 19th century, Cameralist thought had given way to its “closely related analytical cousin”, Staatswissenschaften, Adolf Wagner being the most prominent writer in this tradition (Backhaus and Wagner 2004). Wagner’s indictment of the Classical doctrine of laissez-faire found support in later writings.

A closely related aspect is the development of an objective analytical tradition in public finance literature as against the somewhat *normative* overtone of writings in public finance up to this time. Typically, relatively greater importance used to be accorded to the principles that should guide taxation, .the expenditure aspect having been relegated, so to speak, to a secondary position (Musgrave, *Classics* 1958). With explicit introduction of the public expenditure aspect in Wagner’s writings, an important step was marked towards the development of a *positive* approach as against the *normative* overtones pubic finance writings had assumed. This heralded the first time that expenditure was sought to be explained in terms of “observable economic criteria” (Musgrave 1958). And herein lies the real significance of Adolf Wagner’s contributions to the public finance researcher, rather than the seemingly tautological and simplistic prediction that is attributed to him and tested in a variety of contexts and on innumerable occasions without reference to the perspective that his premises reflect. As corroborated by Musgrave (1958), Ott et al (2006) and others, Wagner’s real contribution lay in pioneering the approach to depicting State activity

in terms of observable economic criteria rather than a set of normative propositions. His premise of “expanding state activity” is derived in the same manner.

Coming to relatively later developments, Samuelson’s Pure theory of Public Expenditure (1954) represents a landmark in the evolution of public finance thought. The closely allied discipline of public choice has been amply enriched by Buchanan and others (Buchanan 1977). Going beyond the constrained scope of mere economic factors, political economy elements began to be assimilated into the area cutting across the arguable limitations of strict economic concerns.

The above outline of the development of expenditure analysis within public finance thought provides a background for the analysis of the public finance scenario in the Indian economy, one that is of immediate concern to us. The present work takes up the various aspects of expenditure analysis in India, spanning the nearly four decades-long period from the immediate pre-reforms decade to the global financial crisis of 2008.

Evolution of Public Expenditure: The Indian Economy

In common with other newly independent nations, India began its planned industrialization under State aegis in 1950-51. Historically the nation was placed at a time when globally countries were recovering from the Post-War ravages. India’s planning models were essentially inspired by the Soviet Socialist ideals, with State accumulation envisaged to act as the development vehicle (Toye 1981). Government expenditure and public sector command in the core sectors of the economy was the cornerstone of development policy, which continued well into the 1960s and 1970s with Planning in full sway, interspersed by shocks of wars.

The first steps toward sporadic liberalization began in the 1980s. The gradual opening up and liberalization efforts were accompanied by rapid increase in public

expenditure, culminating in mounting external and internal imbalances which assumed deep crisis proportions with the Gulf War of 1990 and the associated oil & BOP Crisis. A new era in India's development story began with the launching of wide-ranging Structural Adjustment and macroeconomic stabilization programs. The fact that India has, nevertheless, continued to maintain relatively conservative fiscal and monetary positions, stood the economy in good stead in the recent crisis in comparison to many of its peers (Reddy 2010).

Since then, however, the economy has been besieged by a multitude of problems that include, at the time of going to print, an all-time record slide in the domestic currency, stemming from a wide array of factors including a yawning Current Account Deficit (CAD), and global investor panic sentiments. As former RBI Governor Dr D. Subbarao eloquently summed up, "India is currently caught in a classic 'impossible trinity' trilemma whereby we are having to forfeit some monetary policy discretion to address external sector concerns," (D. Subbarao as quoted by Reuters, July 30 2013). However, the unquestionable immediacy and instant urgency of such problems notwithstanding, these issues threaten to take us way beyond the proclaimed boundaries of the present Thesis work, to which we must return to confine our discussion to the chosen problem at hand.

1.2 Time Period of Study

The chosen time-period of the present study is the nearly 4 (four) decades long period of 1970-71 to 2007-08. Some explanation is clearly in order to explain the cut-off point which might strike some as being rather premature and abrupt.

As a justification, we first recall the centralized fiscal stance India adopted after the inception of planning in the 1950s and 1960s. The decade of the 1970s first marked a gradual drawing away from the “Principle of Good Budgeting”, as it were, that had been informing Indian budgetary policy upto then, viz. maintaining a revenue account surplus with which to finance capital expenditure (Chelliah 1973, Suraj B. Gupta 1981). This gradual departure was being unmistakably reflected in the continually dwindling balance in the revenue account of the Central Government, until in 1979-80, the Centre’s revenue budget finally turned into an irreversible deficit that was henceforth to persist and continue to widen dramatically. Hence, 1970-71 was deemed as a suitable starting point to capture this gradually evolving Budget philosophy.

Subsequently, the ensuing events during the 1980s led up to the critical imbalances of 1990 and the resulting policy response in the form of widespread economic reforms of 1991. The post-reforms decade of the 1990s and 2000s thus witnessed a paradigm shift in the policy regime. We decided to take the cut-off point as 2007-08, which marks the juncture of another decisive crisis point, this time the Global Financial Crisis that was to reach its pinnacle in 2008 and leave indelible impact on government finances the world over by necessitating huge fiscal stimulus packages both globally as well as for the Indian economy. The period of study is therefore chosen as if to capture the Indian public expenditure scenario under the shadow of the impending Global Crisis. Given the well-known fact that any policy changes/ announcements must take some adjustment lags to take effect, our decision to restrict our choice of the period up till 2008 can be appreciated.

1.3 Objectives of Study

The present study has the following objectives at its core:

i) To analyze the pattern and trend of Central Government Expenditure in India over the period of 1970-71 to 1989-90, and subsequently, from 1990-91 to 2008-09.

ii) The break-point is explained by the extensive economic reforms of 1990-91 including wide-ranging fiscal reforms, which can be presumably expected to have significantly affected the course of government expenditure in the post-Reforms era. Hence the separate treatment of these two sub-periods.

iii) To highlight the salient features of distinction (difference) in expenditure trends over these two periods, viz. 1970-71 to 1989-90 and 1990-91 to 2007-08.

iv) To study the consequences of such expenditure trends for the rest of the economy.

v) In view of the well-known fact that macroeconomic data pertaining to government expenditure and other significant economic series require explicit considerations of Time-series nature, the study proposes to apply Stationarity checks (Unit Root Tests) to investigate the time-series properties of Government Expenditure and relevant economic variables of interest in India over the period of study.

vi) To explore in detail the possible relationship between government expenditure and significant economic and institutional variables.

1.4 Major Hypotheses

The major hypotheses that this study proposes to examine are as follows:

i) There has been a significant shift in the trend and pattern of Central Government Expenditure in India over the period of 1970-71 to 1989-90, and from 1990-91 to 2007-08

ii) The salient features of distinction in expenditure trends over these two periods reflect a paradigm shift in the Government's policies and priorities.

iii) The observed expenditure trends have significant consequences for the rest of the economy.

iv) The Government expenditure mechanism in India bears significant relationship with important economic variables as well as political / institutional variables.

1.5 Data Source:

Secondary data on Central Government Expenditure from 1970-71 to 2007-08 have been reclassified and organized by the researcher as per the requirements of analysis in this study. In order to get data that are continuous, consistent and comparable over the study period, the following major sources were consulted:

1. Indian Public Finance Statistics (both print and online versions), Ministry of Finance, GOI, various years
2. National Accounts Statistics published by the CSO, various years
3. Statistical Abstracts, CSO, various years
4. Reserve Bank of India Database on Indian Economy
5. RBI Handbook of Statistics on Indian Economy

6. Economic Survey, Ministry of Finance, various years
7. Economic Intelligence Series published by Centre for Monitoring the Indian Economy (CMIE)
8. Macroeconomic Time-series Data published by EPW Research Foundation

1.6 Methodology:

The analytical techniques employed in the study are:

1. Tools of Descriptive Statistics to analyze pre- and post-reforms pattern of Central Government Expenditure
2. Trend and Ratio Analysis
3. Stationarity Test for checking the time-series properties of major macroeconomic variables, particularly relating to economic growth and government expenditure
4. Multiple Regression Analysis: in order to investigate the relationship between government expenditure and significant economic-structural as well as political-institutional variables at work in the economy.

1.7 Chapter Scheme of Thesis

The thesis is organized in three separate parts containing the chapters as appended in the following pages.

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PART I: STUDYING GOVERNMENT EXPENDITURE

CHAPTER 1

Introduction and Prologue

This chapter presents the background of the study and brings us the motivation behind the present study. An overview of the evolution of thought in public finance literature is presented in order to put the study in its proper perspective. The chapter also specifies the objectives and major hypotheses of the study. Data Source and methodology are indicated. Finally, a summary of the chapters is provided. This chapter comprises the following sections:

1.1 Background: The State and the Economy

1.2 Time Period of Study

1.3 Objectives of the Present Study

1.4 Major Hypotheses

1.5 Data Source

1.6 Methodology (Tools and Variable Description)

1.7 Chapter Summary

Chapter 2

Survey of Literature

The next chapter presents a survey of the literature relating to analysis of public expenditure from a theoretical as well as empirical perspective. Accordingly, this chapter discusses studies relating to the relevant theoretical issues as well as the empirical work that have been carried out at the international level and in the Indian context. This chapter, therefore, is organized according to the following scheme:

2.1 Growth of Public Expenditure: Revisiting Some Theoretical Issues

2.2 Studies at the International Level

2.3 Studies for Developing Countries

2.4 Studies Specific to India

2.5 Summing Up the Literature

Chapter 3

Methodological Issues

In analyzing government expenditure and its growth in India over our chosen period, the methodological issues we have encountered stem from two aspects: viz., first, defining and expressly elaborating on *what is being studied*, viz., explaining the various classification conventions followed in Indian public expenditure statistics. The second aspect relates to *how it is being studied,* viz. the analytical techniques that have been employed to carry out the study. This chapter, then, comprises the following sections:

PART II: ANALYSIS OF CENTRAL GOVERNMENT EXPENDITURE IN INDIA: 1970-71—2007-08

Chapter 4

Analysis of Central Government Expenditure: 1970-71 — 2007-08
Phase I: Classification & Growth of Central Government Expenditure

Our analysis of central government expenditure has been conducted in three phases.

First, the detailed classification of central government expenditure in India, as pertinent to the present analysis, has been discussed. An in-depth analysis of the growth of expenditure in the pre-reforms period (1970-71 to 1989-90), as well as in the subsequent period viz. 1990-91 to 2007-08 follows, and the salient features of distinction are compared and contrasted. Next, the composition of government expenditure has been examined in detail, followed by an analysis of the buoyancy and elasticity properties of its various components over our study period. Finally, the

study attempts to explore the government expenditure mechanism examining whether and how far it can be related to economic/ structural and political/ institutional variables of significance. The chapter organization is as follows:

4.1 Classification of Government Expenditure

4.2 Growth of Central Government Expenditure 1970-71 to 2007-08

CHAPTER 5

Analysis of Central Government Expenditure: 1970-71 — 2007-08
Phase II: Composition, Elasticity and Buoyancy of Central Government Expenditure

5.1 Composition of Central Government Expenditure 1970-71—2007-08

5.2 Elasticity and Buoyancy of Central Government Expenditure: A Brief Discussion

CHAPTER 6

Analysis of Central Government Expenditure: 1970-71 — 2007-08
Phase III: Analyzing the Central Government Expenditure Process

6.1 Introducing the Government Expenditure Mechanism

6.2 Analysing Government Growth: Brief Overview of the Empirical Literature

6.3 Factors in Government Growth: Variables and their Explanation

6.4 Measure of Government Expenditure and Explanatory Variables

6.5 Stationarity Considerations and Unit Roots

6.6 The Issue of Cointegration: A Brief Digression

6.7 Variable Transformation

6.8 The Proposed Model

6.9 Estimation

6.10 Results and Discussion

PART III: SUMMING UP AND EPILOGUE

Chapter 7

Summary of Findings and Concluding Remarks

In this chapter, the findings of the study are presented in summary form. The direction of further research is also indicated. The sections are:

7.1 Summary of Findings

7.2 Further Research

Epilogue

The story of India's economic journey is never told completely. As events in the economy continue to unfold well after the main findings of this Thesis have been presented, a few observations have been put in place to update the state of the economy in the Epilogue.

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Survey of Literature

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“There are at least two inescapable, onerous tasks that immediately befall those who agree to 'review a literature'. The first task is to decide on the scope of the literature to be reviewed - what work is relevant and what is not? Given scope, the second task is to classify the included work in ways that illuminate important similarities and differences”.

--- Larkey et al (1981)

CHAPTER 2

SURVEY OF LITERATURE

A brief review of the issues and some literature relevant to an analysis of the behavioiur of government expenditure is presented, specifically in a developing country context. The review of empirical literature is arranged logically into two major sections (**2.2** and **2.4**). Within each section, works occur in chronological order.

2.1 Introduction

2.1.1 Government and the Economy: Interactions

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2.1 INTRODUCTION

In our attempt to study the observed behavior of public expenditure in India, a perusal of the public finance literature shows the remarkable absence of a consensus on what constitutes a satisfactory theory for analyzing observed public expenditure size or the growth thereof, as commented upon by various researchers and authors. This lack of a well-formulated theoretical framework stands in contrast, for instance, with the issue of taxation which rests on a much more secure theoretical foundation. The problem becomes even more challenging when one seeks to apply analytical considerations to the government expenditure process in a developing country context.

The lack of a comprehensive enough theory of government growth has been commented on, for instance, by Musgrave (1958), Mundle and Rao (1997) and others. And, as late as in 2011, the very title of the article by Dick Durevall and Magnus Henrekson ("The Futile Quest for a Grand Explanation of Long-run Government Expenditure", Durevall and Henrekson 2011) bears eloquent testimony to the state of affairs still prevailing in the literature so far as our understanding of the process of government growth is concerned.

In mainstream economic theory, especially relating to the literature on endogenous income growth that has been commanding significant research attention over the last two decades, the typical manner of envisaging the government in usual empirical investigations is summarized thus by Robert Barro (1990) …"*(T)he hypothesized effects of government policy are easier to assess if the government's actions can be*

treated as exogenous. That is, the results are simple if governments randomize their actions and thereby generate useful experimental data," (Barro, 1990 p 120).

What Barro's remarks imply is that when the objective is to assess and analyze the presumed impact of government policy on the economy, analysis is made easier if government activity can be assumed to be exogenous. This assumption, in turn, allows one to treat government activity as being purely random, which can then yield "useful experimental data".

However, this approach is obviously not useful when it is the very nature of government sector behavior itself that is the object of enquiry, that is, when we turn to the converse problem as to how in fact the size and/ or growth of government itself is determined. And it is here that the lack of an agreed-upon theoretical framework, as noted in the opening paragraph, compounds the question. This is all the more the case when we want to study the same in a developing country setting with its unique political and social dynamics.

The present chapter attempts to present a summary overview of the available literature. The review of empirical works has been arranged logically into two major sections (**2.2** and **2.4**) and then in chronological order within each respective section. We begin by outlining the development of the discipline of empirical public economics and the evolution of public expenditure analysis (touched upon briefly in the Introductory Chapter). We then go on to survey the premises offered to explain observed public sector behavior (specifically, public expenditure), followed by an overview of significant empirical studies in the area. Finally, the problems encountered in similar analysis in a developing country context are discussed.

Government Growth: An Overview

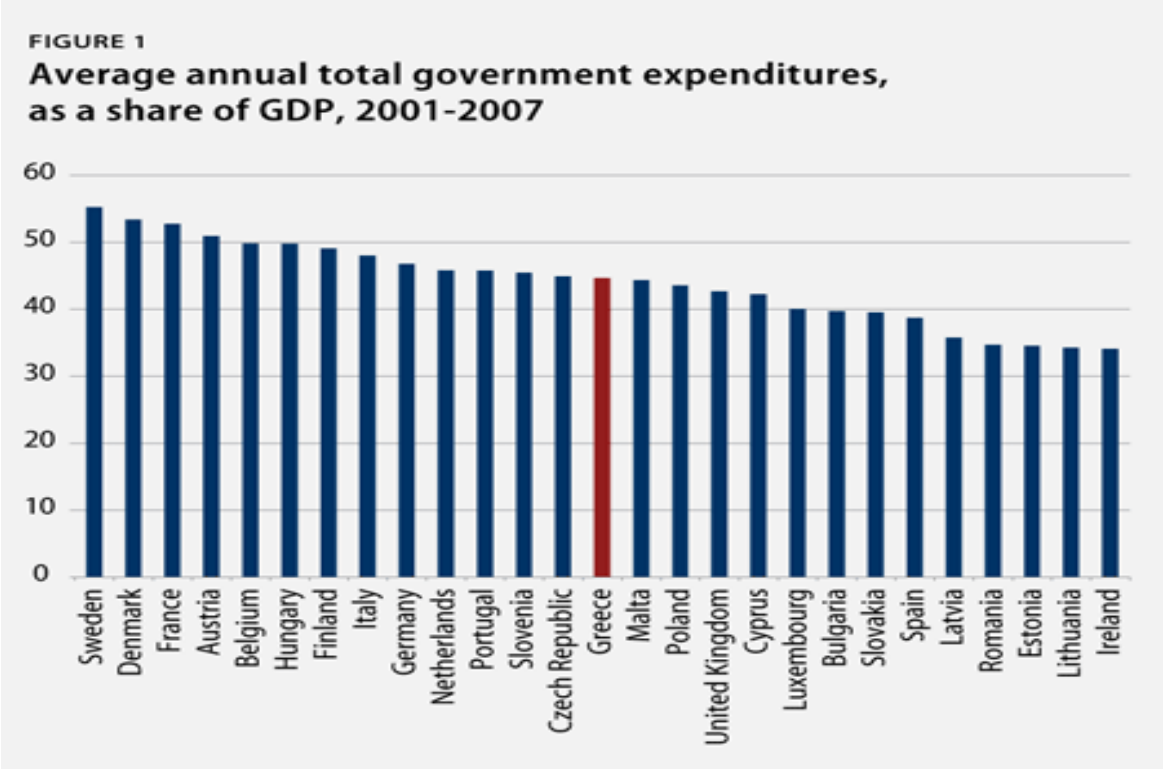
Public sector growth can be measured in terms of either the share of government revenue or expenditure in the economy. While seeking to garner some ideas about the development of the public sector, focusing on government expenditures (as ratios to gross domestic product) is a preferred method to ratios of government revenues to GDP, "because *expenditures* (including those financed by public borrowing) give a *better* indication of the amount of economic resources absorbed by and allocated through the public sector", [emphasis added], (Neck and Getzner 2007 p 49).

To recapitulate briefly the evidence on public expenditure growth, the share of government in the USA, UK and the Organization for Economic Co-operation and Development (OECD) has accelerated from around 30% in the 1970s to an average exceeding 50% in 1980s (OECD 2010). Even after reaching a plateau of sorts, government share has averaged around 45% **(**OECD 2010**)**. The European Union (EU), too (focusing on the period before the present crisis in the Eurozone struck), has seen similar patterns of growth, substantial if somewhat uneven (Borcherding 2001, OECD 2010).

A brief overview regarding the presence of government in the EU, for instance, is presented below, showing average government shares over the period 2001-2007 (Fig 2.1 below). Similar data, on a more detailed basis, has been also provided for the economy of the UK in Fig 2.2 below. Clearly, government presence has been significant even in the developed world like the European Union (Fig.2.1), or has consistently risen over time as the particularly long time-series for the UK (Fig 2.2) shows. One may mention here that the two dramatic spikes in public share-GDP

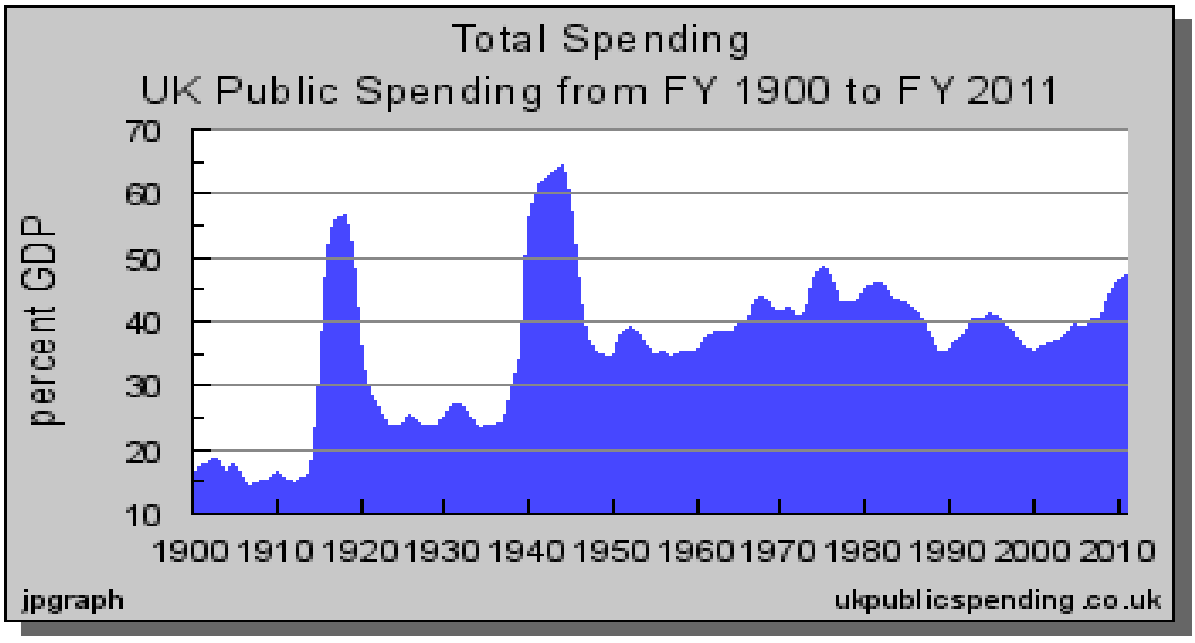
ratio in Fig 2.2 clearly reflect the effects of the two World Wars when government spending had to experience sharp rises.

Fig 2.1: **Government Share: The European Union 2001-2007**



Source: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php

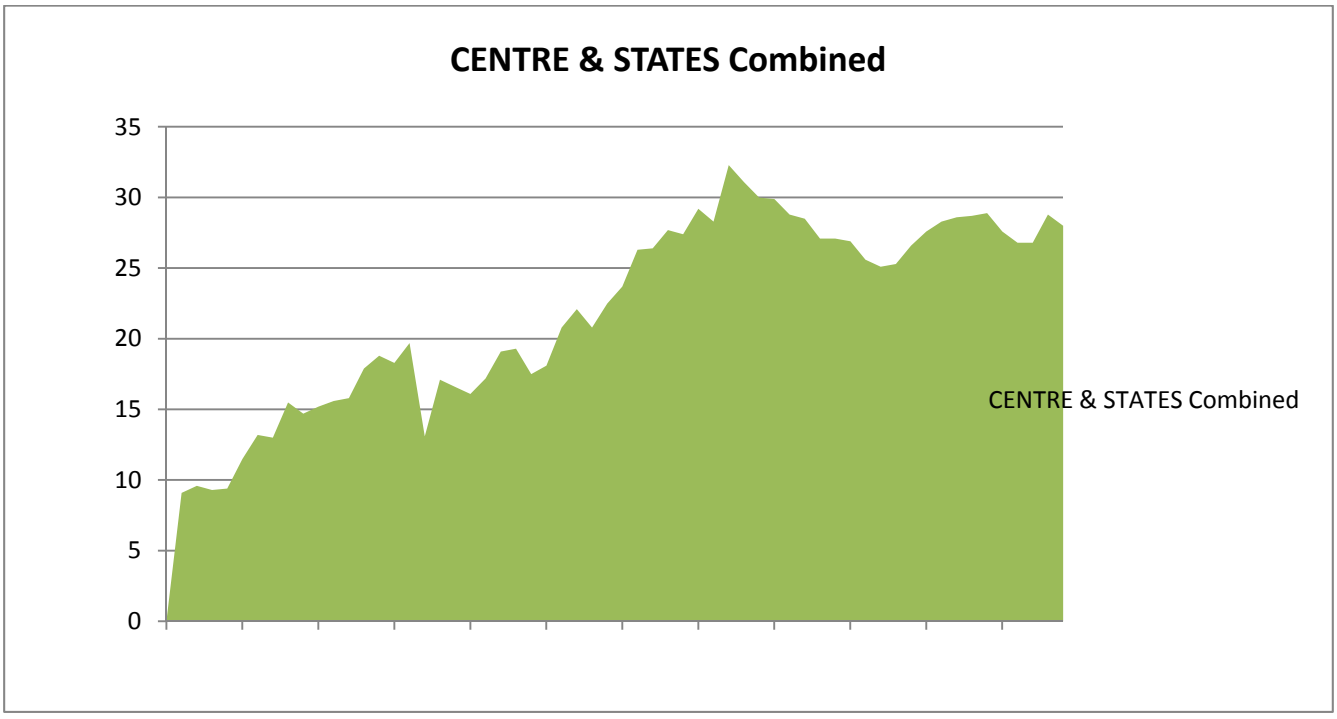
Fig 2.2: Government Share in United Kingdom



Source: www.ukpublicspending.co.uk (Accessed December 2010)

Having taken a brief look at the evidence on government presence in the developed world, we now turn to the Indian scenario, the focus of our present study. What has been the state-of-affairs regarding government expenditure in India since the inception of India's Planned Industrialization in the1950s, till recent times?

Fig 2.3 Combined Central and State Government Expenditure (share of GDP) India: 1950-2008



Source: Reserve Bank of India, Handbook of Statistics on the Indian Economy, 2012

Fig 2.3 above presents the combined share in GDP of Central and State government expenditure taken together in India over 1950-2008. Clearly, in spite of the presence of noticeable fluctuations (notably, a peaking of government expenditure around the year 1986-87 prior to the economic Reforms of 1991 that such growth necessitated, and a marked fall around 1996-97 in the post-Reforms period), the overall growth in government share has been massive indeed.

The substantial government presence in the economy as per the evidence borne out by the expenditure statistics above, is reinforced, moreover, when we recall the

important fact that much of the *actual* government presence in the economy is often not quantifiable or explicitly visible in terms of quantitative data, but takes the form of regulations and other indirect interventions.

The consequences of the observed growth in government spending for the economy have been extensively researched, with at least two considerations having prompted the vast research in such government growth. The first of these is the so-called "waste" involved in large government (the perceived "inefficiency" of the public sector). Secondly, the perceived economic effects of a large government have generated a large body of research.

Public expenditure analysis can follow a "positive" or descriptive approach where the observed level or pattern of public expenditure is sought to be analyzed. The alternative approach, often termed as normative or "prescriptive", concerns itself with the question as to *how* revenue-expenditure activity *ought* to be determined. Thus Samuelson's Pure Theory of Public Expenditure (1954) relates to the determination of optimal public expenditure level.

Rather than going into normative analysis or value judgment, the present review focuses more on the positive tradition. Issues such as whether government is too large (or too small), or what the ideal size of the public sector *should be*, is outside the scope of this review chapter. Concerns of efficiency relating to the public sector, addressed by a body of literature (for instance Afonso, Schuknecht and Tanzi 2003), relating it to such determinants as political regime (Adam et al, 2011) and other factors, are beyond the purview of this study. While compelling in their own right, these are research issues that merit separate surveys on the relevant literature, and are beyond the scope of the present Review.

2.1.1 GOVERNMENT AND THE ECONOMY: INTERACTIONS

In what follows, the two-way interaction between government expenditure and the economy, and the two related strands of research are indicated. Given the thrust of the present study, relatively *greater* emphasis is accorded to the question as to how the process of government expenditure is shaped (at least in part) from within the economy, with a multitude of influences at work suggested in the literature attempting to explain observed government expenditure behavior.

Conversely, research relating to government's impact on the economy is discussed in somewhat lesser detail in the subsequent section.

Regarding the ideal manner of situating the State vis-à-vis the economy, and the respective roles to be accorded to the State and the Market, we have already noted, earlier on, the almost full-circle journey through history economic thinking has undergone on this fundamental question. As Afxentious (1980) puts it: "Interest in government revenue and expenditure and more generally in public finance followed a discernible downward trend from the golden age of political economy until the advent of Keynesianism" (Afxentious, 1980, *p 116*]

The Classical tradition led by Adam Smith advocated the supremacy of free market and the price system in solving all economic problems. Laissez-faire was a fait accompli, as government, viewed as inefficient and diverting resources from productive private employment, was expected to keep expenditures at a minimum. Tax policy was to be geared towards maintaining a balanced budget. Deficits were generally viewed as undesirable. The ensuing "Keynesian Revolution" and the

subsequent continued epoch-changing paradigm shifts in the discipline have been discussed in detail in Section 2.2.1 below.

2.2 THE GROWTH OF GOVERNMENT EXPENDITURE

The ramifications of changes in government expenditure on the economy, amply documented in the literature are taken up in a later section (**2.4**). In the present context, instead, we take up the question as to how, *in turn*, various forces and the macro-economy shape the process of government expenditure itself.

The rationale for government intervention and the corresponding economic prescriptions are usually provided by failure of the market mechanism. However, the market failure argument is not sufficient when one seeks to explain the origins and growth of the public sector itself. In what follows, it is this aspect viz., the literature pertaining to the analysis of observed growth of government expenditure that is taken up.

As noted by various researchers, the tradition of analyzing the public sector in terms of observable economic criteria owes its origins to the writings of Adolf Wagner (1883, partly reprinted in Musgrave and Peacock 1958). It is to Wagner that we owe the first empirical formulation of a theory of public finance (Ott 2006).

The question as to how the “Public” and the “Private” are envisaged to be situated vis-à-vis each other brings us to an exploration of the emergence of thoughts on public finance over time. Rather than provide a full historical account *per se*, however, all this introduction seeks to do is to place the issue at hand in perspective within the theoretical tradition.

2.2.1 Evolution of Public Finance Thought

Desai (2002) has noted the historical existence of public goods preceding the emergence of the nation-states, along with Backhaus and Wagner (2004) who point out the fact of public finance being actively pursued as a discipline even before economics or political economy emerged as distinct academic fields of study,.

The earliest systematic line of public finance thought was embodied in Cameralism, originating mainly in German and Austrian writings around the sixteenth century. In common with the contemporary Classical strand developing in Britain under the influence of Adam Smith, Cameralists too envisaged limits on the State's powers to tax, with one important difference, viz., in the way the State was visualized vis-à-vis the economic order. While Smith saw the state as *intervening* into the economy, the latter located the State *within* society and the economic order, pointing to what Backhaus and Wagner (2004) term as "the first antinomy" running through public finance thought, viz., "(that) between conceptualizing the state as *intervening into* the economic order and the state as *participating within* the economic order" [emphasis added] (Backhaus and Wagner 2004 *p 3*).

Having located "the intervention-participation antinomy" in the formulations of the Cameralists and the British Classicals, Backhaus and Wagner (2004) then go on to indicate "the second antinomy", represented well in the writings of Francis Edgeworth (1897) and Knut Wicksell (1896), viz. that between "treating the state as some maximizing agent and treating the state as an institutional framework within which myriad individual agents interact" (Backhaus and Wagner 2004 *p 3*). In practice, the "interventionist state" has largely been associated with the choice-

theoretic framework, while the "participative state" has been linked with the catallactic approach (Backhaus and Wagner 2004 *p 3*).

By 19th century, Cameralist thought had given way to its "closely related analytical cousin", Staatswissenschaften, Adolf Wagner being the most prominent writer in this tradition.

Wagner and Staatswissenschaften: Evolution of Expenditure Analysis

The next phase in this development marks the emergence of the theory of expenditure, secondary so long in origin to the taxation discussions, to find its own place in public finance analysis.

Wagner's indictment of the Classical doctrine of laissez-faire found support in later writings. A closely related aspect is the development of an objective analytical tradition in public finance literature as against the somewhat *normative* overtone writings in public finance had assumed up to this time, writers having accorded relatively greater importance to the principles that *should* guide taxation. The expenditure aspect had been relegated, so to speak, to a secondary place (Musgrave 1958). With explicit introduction of the public expenditure aspect in Wagner's writings an important step was marked towards the development of a *Positive* approach. For the first time, public expenditure was sought to be explained in terms of observable economic criteria (Musgrave 1958). As corroborated by Musgrave (1958) and Attiat Ott (Ott et al., 2006), Wagner's real contribution lay in pioneering the approach to depicting State activity in terms of observable economic criteria rather than a set of normative positions. His premise of "expanding state activity" is derived in the same manner. It is to Wagner that we owe the first formal articulation of an empirical public finance tradition.

The next development in this thread was the analytical sophistication of the Marginalist tradition that was applied to public finance to conceptualize the distribution of tax burdens, and the allocation of government expenditure in the context of a balanced budget. However, the analytical improvement in classical thought tradition notwithstanding, such sophistications failed to contribute significantly to an understanding of the long-term behavior of government's fiscal decisions.

The later "Pure theory of Public expenditure" (Samuelson 1954) represented a landmark in the evolution of public finance thought. The closely allied discipline of public choice, amply enriched by writers like Buchanan paved the way of incorporating not only economic but political economy elements, cutting across the arguable limitations of strictly economic considerations.

Meanwhile, on the arena of policy debates on a macro level, the critique of the classical regime, whose death-knell had been sounded with the Great Depression of 1930s, found eloquent expression in the writings of John Maynard Keynes. The notion of balanced budgets was rendered "anachronistic", and the instruments of fiscal policy, including deficits, became designed to regulate the needs of the economy. Restated and re-interpreted by various economists in the tradition, Keynesianism was the dominant paradigm over the period subsequent to 1930s, inspiring a host of State-led development initiatives all over the world.

In subsequent developments, as Lord Desai (2002) notes, "Questions about state functions started with critiques of Keynesian policies and spread to a general critique of the role of the state … …As a result notions of public and private have been rethought, though in many cases they have only been queried and not yet recast" (Desai 2002 *p 63*).

Economic thinking for the three post-World War-II decades was thus dominated by Keynesian economics, one of its central ideas being that monetary and fiscal policy could be used to stabilize the economy and smoothen out the extremes of recession and inflation. The stagflation of the 1970s did much to harm its ascendancy, for the new phenomenon, “stagflation”, not only proved resistant to traditional Keynesian policies but was actually thought to be caused by them. “By 1990s, the anti-Keynesian counter-revolution seemed to reach its pinnacle” (Bateman et al 2010 *p iv).*

The “New Classical Macroeconomics” school of economic thought originated in the early 1970s in the work of economists centered at the Universities of Chicago and Minnesota. Richly contributed by Robert Lucas (1972, 1976), Thomas Sargent and Neil Wallace (1981), among others, the rational expectations premise at its foundation rendered all efforts at policy intervention ineffective. Government intervention was seen as essentially creating distortions. Taken together with the so-called “Washington Consensus,” the strand that began to dominate mainstream policy thinking around the 1980s, all this envisaged a gradual drawing away of the State from the economy, only to act as facilitator for market forces to play to their “efficient best”.

In the subsequent phase, in a seemingly cyclical turning of the tide, the events of the decade of 2000s brought in their wake the Global Crisis of 2008, delineating in turn a dramatic point of inflexion that many saw as signaling a return to the Keynesian era. The limitations of the market economy left to its own workings were again underscored. The need for greater regulation and supervision of the markets was sorely felt, with massive fiscal stimulus packages being initiated by governments all

over. There was thus a renewed call for greater government involvement in the economy the world over.

THEORIES OF GOVERNMENT GROWTH

Decisions regarding government expenditure can never be isolated from the political process and are subject to many pressures and constraints. Economic theory, therefore, can at best offer a partial explanation of government revenue-expenditure decisions. Granting the fact, various attempts have been made to explain the relationship between functional and economic categories of government expenditure and the variables thought likely to influence them. Among the various premises offered to explain observed growth in government, the following elements can be distinguished.

- A set of “Macro-Models”, as distinct from “Micro-Models”, have been proposed in the literature (Bailey 1995, Bain 1999)
- Theories of “the very long run” have been distinguished in the literature from theories in the Medium/ Short-run (Henrekson 1992 for an explicitly recognized distinction)
- In addition, a set of “demand-side” explanations have been distinguished from “Supply-side” factors contributing to government growth (Buchanan 1968)
- In an alternative characterization of the above, “Institutional” vis-à-vis “Structural” factors have been offered towards explanations for observed government size/ growth
- Finally, theories or explanations have typically focused on the growth in exhaustive expenditure, whereas the available data emphasizes the growth in

transfer payments (non-exhaustive expenditure). Hence explanations for the latter, too, have to be accounted for.

It has to be noted that these are not water-tight compartments of classifying / separating out explanations—rather there are considerable overlaps. That is, these ways of classifying the offered premises are merely alternative ways of characterizing the various premises that have been offered at various points in explaining observed government growth. Thus, the well-known Wagner's Law and the Peacock-Wiseman Displacement hypothesis, are both subsumed in the "Model"-based explanatory framework, although we will have occasion to refer to these two in separate contexts, too.

… "*While our knowledge of the sources of public expenditure growth still remains conjectural, two central themes have provided guidelines for organizing our thinking about the relative share of the public sector in the economy",* as (Diamond and Tait, 1988 *p1*) commented, referring to the two dominant premises viz., Wagner's Law of increasing state activity and the displacement effect that Peacock and Wiseman proposed.

MODELS OF PUBLIC EXPENDITURE GROWTH

As Bailey (1995) observes, any comprehensive economic theory of public expenditure growth has to explain the long-term growth of public spending share within the economy, as well as the shift from exhaustive to transfer payments. Instead of a single and comprehensive theory however, two broad groups of models have been indicated in the literature-- each attempting to analyse different aspects of government expenditure (Bailey 1995). These are, respectively, Macro-models and Micro-models of public expenditure.

Sandford (1994), Bain (1999) reiterate in this context the distinction, also corroborated earlier by Toye (1981) among others, that must be made between resource-using or “exhaustive” public expenditure (that is, public expenditure on goods and services and on domestic fixed capital formation), and transfer payments (alternatively termed “non-exhaustive” public expenditure), since some of the theories below are concerned only with resource-using expenditure. It is argued that the reasons for the growth of transfer payments might be quite different.

MACRO MODELS OF THE GROWTH OF RESOURCE-USING (EXHAUSTIVE) PUBLIC EXPENDITURE

Macro-models attempt to account for the *long-term growth* of General Government Expenditure. Among the theoretical constructs that have been identified, the following may be mentioned (the list is not exhaustive):

Organic state model associated with Wagner: Customarily the starting point in discussions of public sector growth, Wagner's law refers to the proposition ascribed to Adolph Wagner (1833), relating to increased government activity. Generally interpreted as hypothesizing an inevitable increase in the share of government expenditure in total output, Wagner did recognise some limits to this increase. His essential argument was that social progress and rising incomes would be accompanied by an inevitable expansion in government. The state would continue to grow as if making decisions on behalf of its citizens. The demand of the populace for certain services like education and health grow faster than national income, i.e., they have high income-elasticities of demand (Bain 1999). Finally, case for government intervention could also be made in instances of market failure.

- **Rostow and Musgrave** - the **Development model:**

Public expenditure is seen as a prerequisite of economic development. The public sector initially provides infrastructure – and as development proceeds, public sector investment shifts towards human capital.

- **Political constraints model: Peacock and Wiseman** Peacock and Wiseman (1967) suggested that the time pattern of actual public expenditure growth did not fit well with Wagner's law (Bain 1999). Governments were assumed to prefer more spending than less, but at the same time constrained by taxpayer resistance exercised through the democratic process. A given tolerable tax rate yields increasing tax revenues when applied to growing personal and corporate income and expenditure. This explains the rising trend of public expenditure. Increases in people's ideas of the "tolerable tax burden," and thereby public expenditure, would presumably go up during national crises like war (the displacement effect), with the time behaviour of public expenditure exhibiting a "Ratchet Effect."

Among other criticisms, Peacock and Wiseman's "displacement hypothesis" has been criticized as explaining the specific scenario pertaining to the U.K. economy, and providing insufficient insight into what actually constitutes a "crisis".

- **Leviathan model:** Political constraints on public expenditure growth are limited. The state seeks growth more to benefit those who work in the public sector than to promote the public interest. Hence the public sector becomes self-serving and grows like a leviathan.

Being essentially aggregative in nature, macro models, whether jointly or singly, can only explain the long-term rising trend of public expenditure. They provide insufficient explanation of the *changing composition* of public expenditure. This is a question which Micro-models, in turn, attempt to address.

MICRO MODELS OF PUBLIC EXPENDITURE GROWTH attempt to explain the *changes in particular components of* government expenditure over time, whether caused by increasing demand for individual services, or by changes in their cost structures.

Micro-models mostly have their origins in the public choice / voter optimization tradition, including models of the behaviour of voters, politicians and bureaucrats.

It must be noted that models classified under Macro-Models often have elements that can be characterized as micro-theories. Thus the Leviathan model has often been grouped with the latter class.

Baumol's cost disease theory, focussing on the supply side and often mentioned along with these theories, posits a comparative increase in productivity in the private sector over the course of development, while productivity in the public sector lags behind. The result is a growth of government spending relative to GDP (Baumol, 1967, 1996). Finally, the Leviathan theory holds governments to be controlled by self-interested politician-bureaucrats, who are unchecked by electoral constraints (Brennan and Buchanan, 1980).

Besides these, a large literature on political economy considers the role of voting, lobbying, legislative bargaining, and political constitutions for the size of government (see Acemoglu 2005 for an overview of this literature). Theories of government growth have also been characterized as belonging to either “citizen-over-state” or conversely, “state-over-citizen” models, a distinction discussed in detail by Garrett and Rhine (2006), among others.

EXPLANATIONS OF THE GROWTH OF TRANSFER PAYMENTS

With increasing affluence of societies, the growth of transfer payments has assumed phenomenal proportions. Theoretically, two views of the possible relationship between transfer payments and increasing affluence may be thought of, which are, interestingly, contradictory to each other (Bain 1999). Firstly, the need for transfers should conceivably go down as societies become more affluent, as with economic growth, government intervention in the income generation process can be envisaged to decline. At the same time, with increasing affluence, the responsibilities of the welfare state can be better performed with growing transfer payments. In actual practice, the large presence of the welfare state in Sweden, among the largest economies in the OECD, is a case in point. It has the highest level of social protection among the OECD (OECD 2011)

THEORIES OF THE "VERY LONG-RUN"

A related and important distinction one must make here is that between theories of government growth that attempt to explain growth over a very long period of time, from those that envisage a medium- or short-run time horizon. Henrekson (1992) brought out the critical distinction between "theories of the very long-run", from factors that contribute to government size over the shorter or medium-term, and analyzed these two categories separately from each other.

The first category is dominated by the two well-known general hypotheses of government expenditure, already indicated above, viz. Wagner's "law" and the Displacement Effect by Peacock and Wiseman. One principal point of departure between these two theories is the fact that Wagner's "law" concentrates on

government expenditure, without explicitly mentioning the importance of revenue as a constraint on government spending. The second premise, introduced by Alan T. Peacock and Jack Wiseman (1967), however, regards government expenditure as being closely determined by government revenue. Both Wagner's law and the displacement effect have seen extensive empirical investigation using an array of statistical tools, in order to identify the determinants of government revenue-expenditure decisions.

Wagner's "law"

Wagner envisaged mainly three potential ways state activity would expand relative to the national economy as “progressive economies industrialize”: (a) with growing complexity of economic life due to increasing industrialization, increase in population density and urbanization, greater demand would be made on the state to provide administrative and protective functions; (b) cultural and welfare expenditures, having income elasticities exceeding unity would call for increased expenditure. Finally, (c) with increasing industrialization, the growing concentration of market power and other forms of market failure would call forth greater state intervention and regulation.

Wagner himself did not put his ideas in a strict form, resulting in a wide variety of interpretations and various empirical formulations being applied to empirically test his premise. While he was, in fact, aware that revenue availability might pose a limit to expenditure, the question as to how this constraint could be reconciled with the inevitable expansion of state share, is also left unclear.

Wagner's law has been tested extensively, with a remarkable variety of results that are frequently dependent on the specific empirical formulation adopted. Both time-

series and cross-section studies have been conducted. The evident appeal of Wagner's premise presumably stems from the appeal of its central idea, that government share essentially reflects the stage of development.

Secondly, the post-war patterns of government growth all over the world seemed to bear strong evidence in favour of the phenomenon Wagner posited. As Sandford (1994) put it, Wagner's premise seemed to have stood the test of time rather well compared to many other similar premises in economic literature.

The remarkably prolific testing of Wagner's premise also throws up significant methodological issues. Empirical studies on Wagner's Law have kept evolving with increasingly newer econometric advances that parallelly occurred on the technical front.

Studies taking up the empirical testing of Wagner's law are too numerous for an exhaustive enumeration. A few general observations, however, are in order, and some representative noteworthy works are also highlighted.

First of all, both time-series and cross-section studies have been employed in testing Wagner's law. Cross-section studies have considered a wide array of developed and developing countries, often for country-groups, and studied the relationship in detail for disaggregated components of expenditure. Wagner's premise is, however, deemed to be more suitable for time-series analysis, since he seems to have been essentially hypothesizing the case of the national economy as it evolved over the course of development. Time-series studies are, therefore, closer to the original spirit of Wagner's Law (Toye 1981, Henrekson 1992, Peacock et al, 2000). The frequent attempts to extrapolate results of cross-section studies to draw time-series conclusions have been criticised by Morris Beck (1971), among others.

The initial preponderance of cross-section studies has been ascribed mainly to the difficulty of obtaining reliable and continuous time-series data at the time, particularly for developing economies. With increasing availability of statistics on national income and government expenditure, time-series studies were made possible.

The early studies attempting to test Wagner's law typically interpreted it in terms of the elasticity of public expenditure relative to national income. A number of versions were developed, where, depending on the measures of income and government expenditure employed (e.g., absolute level/ government share in income/ expenditure per capita, or government consumption expenditure), an income elasticity value for government expenditure exceeding unity (or in alternative formulations, exceeding zero), would be taken as support for Wagner's premise.

TABLE **2.1**: Alternative Specifications of Wagner's Law

Peacock-Wiseman version:	
$\text{Ln } G_t = \ln \alpha + \beta \ln Y_t + \varepsilon_t$	$\beta > 1$
Peacock-Wiseman share version:	
$\text{Ln } (G/Y)_t = \ln \alpha + v \ln Y_t + \varepsilon_t$	$v > 0$
Musgrave version:	
$\text{Ln } (G/Y)_t = \ln \alpha + \delta \ln (Y/P)_t + \varepsilon_t$	$\delta > 0$
Gupta version:	
$\text{Ln } (G/P)_t = \ln \alpha + \lambda \ln (Y/P)_t + \varepsilon_t$	$\lambda > 1$
Goffman version:	
$\text{Ln } G_t = \ln \alpha + \gamma \ln (Y/P)_t + \varepsilon_t$	$\gamma > 1$

Where, it can be demonstrated that the slope coefficients of the different versions are related in the manner: $\beta = 1 + v$, and $\lambda = 1 + \delta$

Source: (Ewing et al, 2006 in Ott and Cebula, 2006)

A number of versions of Wagner's Law have been proposed and employed in the empirical literature, and Table 2.1 above presents the different versions as identified in the literature according to Ewing et al, (2006).

From the above, it can be observed that depending on whether the law is stated in terms of real government spending, government share in GDP, or in per capita terms, the slope coefficient, i.e., the elasticity of the relevant measure of government w.r.t. income is expected to exceed unity (that is, $\beta>1$), or in the alternative formulation, $\delta> 0$, in order to find support for Wagner's premise.

Among contemporary empirical works, Gupta (1967) tested real values of government expenditure relative to income for U.S., U.K., Sweden, Canada, Germany. The estimated income elasticity was found to exceed unity. Musgrave (1969) tested Wagner's Law using the ratio of government spending relative to per capita income, with an estimate of elasticity exceeding zero that was interpreted as support for the Law. Goffman and Mahar (1971) employed a formulation similar to Musgrave (1969) for a sample of six Carribean countries over 1940-65 to find relatively mixed results. Support for Wagner's Law, using a similar specification, was also found by Bird (1971), for U.K, Germany, Sweden and Japan.

Among time-series studies, an early work by Cyril Enweze (1973) found total government expenditure as having positive income elasticity in thirteen out of fifteen selected developing countries. Elasticities were also found to be positive for most of the major functional categories of expenditure. Mahar and Rezende's (1975) work on Brazil considered the 50-year period from 1920-1969 and found all major categories of government expenditure as having grown faster (albeit in irregular fashion) compared to GNP.

Using the per capita measures, which require an elasticity estimate exceeding unity for support to Wagner's law, Ganti and Kolluri (1979) found support for the US economy. In a study by Gandhi (1971), evidence from cross-section studies suggested apparent support for Wagner's Law for a sample of both rich and poor countries. However, the law apparently failed to hold if only the poorer countries were taken into consideration.

In a test of Wagner's law for a pooled time series/cross section sample of 55 countries, the latter further classified into three groups according to per capita GDP, Abizadeh and Grey (1985) found support for the premise for the two richer groups but not for the poorer group.

Ram (1987) considered time-series and cross-section evidences for Wagner's Law for 115 countries. For the period 1950-80, while individual country time-series data showed some support for the premise, most of the inter-country cross-section results were too mixed to give any clear-cut results. The unqualified support reported by earlier studies was thus thrown open to question

The earlier studies can be stated as having the consensus conclusion that public sector size in high-income countries is larger than in the low-income ones, and also that the size of the public sector should be expected to significantly vary depending on both national ideological positions, as well as external influences (Afxentiou 1980).

From Elasticity to Causality

From the methodological aspect, the continuing efforts in empirical public finance work reveals to the researcher an instructive journey towards increasingly refined analytical techniques (Ott 2006). Thus it is only natural that theoretical developments

in the intellectually stimulating concepts of Causality should find ready adoption by researchers in public expenditure analysis.

Among the empirical studies that used Granger-causality test to find support for Wagner's law can be mentioned Yousefi and Abizadeh (1992), Ansari et al, (1997), Thornton (1999), and Chang (2002). Country-specific studies confirming Wagner's hypothesis include those by Khan (1990) for Pakistan, Gyles (1991) for the United Kingdom, Lin (1995) for Mexico, Singh (1996) for India.

Afxentious and Serletis (1991) used Granger-causality test for Canada over 1947-1986 and failed to find support for either Wagner's law or the reverse causation. For a sample of 30 U.S. states Yousefi and Abizadeh (1992) used data over 1950-1985 to test Wagner's Law. The majority of the states were found to support Wagner's Law.

The need to ground the statistical concept of causality on a firm footing so far as economic theory is concerned and the need for identifying the correct causal mechanism, received wide discussion (Alt and Chrystal 1977). With advances in time-series econometrics, a further shortcoming of existing studies became increasingly apparent (see Henrekson 1992, among others, for an eloquent exposition of this point). The usual practice of employing simple OLS regression to study Wagner's Law was found to suffer from the serious defect that the problem of non-stationarity typically associated with time-series macro-data was overlooked.

In the presence of non-stationarity or stochastic trends in the series, relationships estimated under classical assumptions run the danger of yielding spurious results. Ensuring the genuineness of estimated relationships therefore demands explicit consideration of the time-series properties of the variables involved. With the "Unit Roots" revolution, issues of stationarity (unit root) tests and explicit time-series

considerations such as cointegration techniques found increasing accommodation in the economics literature, which was in turn reflected in public expenditure analysis and specifically, investigations into Wagner's Law. Studies like Henrekson's exhaustive 1992 analysis of the Swedish economy, Bohl (1996), Payne and Ewing, 1996 and Chang (2002) are all examples of such methodological advance.

In a departure from the typical formalizations applied to test Wagner's law, a 1990 work by Holmes and Hutton applied the non-parametric approach to its testing, allowing the bypassing of the rigorous need of specification of a formal model.

Noting the potentially destabilizing impact of government budget deficits on the macro-economy, Afxentiou and Serletis (1996) examine how far it is really possible for governments within the expanded European Union to control expenditure on consumption and transfers. Except for a few cases, the authors find little evidence of expenditure convergence. Indeed, no evidence is found for a long-run equilibrium relationship between national income and government spending, suggesting the possibility for government expenditure harmonization within the EU given concerted political will.

In a telling commentary on the state of research in empirical public finance, Peacock and Scott (2000) pose a number of criticisms regarding the apparent research fascination for Wagner's law. Among others, they strongly criticize the practice of engaging in econometric sophistry for its own sake, and ascribing a causal dimension to Wagner's premise (*see Peacock et al, (2000) for an illuminating classification of works pertaining to empirical testing of Wagner's law*)

The Peacock-Wiseman Displacement Effect

An examination of the trend in government revenues and expenditures led Peacock and Wiseman (1967) to comment:

". . .*In settled times, notions about taxation are likely to be more influential than ideas about desirable increases in expenditure in deciding the size and rate of growth of the public sector. (The) persistent divergence between ideas about desirable public spending and ideas about the limits of taxation … may be narrowed by large-scale social disturbances, such as major wars. Such disturbances may create a displacement effect, shifting public revenues and expenditures to new levels. After the disturbance is over new ideas of tolerable tax levels emerge, and a new plateau of expenditure may be reached, with public expenditures again taking a broadly constant share of gross national product, though a different share from the former one",* Peacock and Wiseman (1967 *p xxxiv*)

Although not tested quite as prolifically as the Wagner premise, the Peacock-Wiseman hypothesis, too, has seen extensive investigation, in particular in the context of the two World Wars and the Great Depression that would apply to the experiences of a majority of the western world. A problem with the displacement effect, of course, is the central position accorded to the concept of social upheaval, since it is a concept that has been interpreted in a widely varied way by different researchers. Gupta's 1967 work construed the displacement effect exclusively with reference to the two world wars, while Bonin et al (1969) included the great depression as an additional displacement. Favorable results for the displacement hypothesis were reported by Andic and Veverka (1964), O'Donoghue and Tait (1968), and others. Authors including Musgrave and Mann, in turn, applied the "Displacement Effect" concept much more broadly to refer to any phenomenon affecting popular attitudes toward the public sector. "This freedom of interpretation

lessens the theoretical value of the displacement effect and reduces its empirical testing to an exercise in definition. Further to the disagreement over how to define a social upheaval, researchers arrive at conflicting results because they either use different data or consider different time periods or they hold different views as to whether a "displacement" is econometrically represented by a shift of the government expenditure function or by a change in its slope" (Afxentiou 1980 *p 120*).

Peacock and Wiseman (1961, 1967) stressed the importance of government revenue as a determinant of government expenditure, thus explicitly bringing in the supply side. At the same time, the concept of a "tolerable tax burden" on the tax-payers' side amply illustrates the significance of the demand side and the fact that the basis of budgetary decisions is political, rather than merely economic.

A significant point, so far as the present study is concerned, is voiced by Afxentiou (1980). Writing as he was specifically on the public revenue-expenditure in developing countries, he opines that the "close association of tax revenues and expenditures" is more a characteristic of the fiscal systems of developing countries, rather than developed ones. Conceding the argument would imply that perhaps, developing countries are more suitable than their developed counterparts for examining how far the displacement effect is valid. This appears to be a point that has been missed by the criticisms leveled against attempts to test the thesis in a developing country context.

Factors Influencing Government Growth in the Medium-term

From the above-mentioned “classical theories of the very long-run” (Henrekson 1992), we now turn to the attempts at empirically explaining government activity using a number of variables and typically employing regression analysis.

The pioneering study for U.S. by Fabricant (1952) can be mentioned first. Fabricant analyzes highly disaggregated data for the U.S. for the period since 1950. Per capita income, density of population and the degree of urbanization (measured by the percentage of population living in urban areas) are used to explain changes in per capita functional categories of total expenditures of US states and that of state and local government spending. 72 per cent of the variation in the former and between 29 per cent to 85 per cent of the variation in the latter, were explained. Income was found to be the major factor accounting for inter-state differences in government expenditure. As the author himself notes, however, the factors identified as influencing government growth are themselves highly correlated.

Fabricant’s study inspired a number of similar works. Fisher (1964) used economic, demographic, and sociopolitical variables to explain 65 per cent of the variation in per capita operating and capital outlay expenditures by various functions. Bahl and Saunders (1965) examined the determinants of changes in expenditures and using five explanatory variables, found federal aid as the most important variable.

Sharkansky (1967) found that the current level of state expenditures in U.S. is best explained by previous state government expenditures, the incorporation of previous expenditures as an explanatory variable of current expenditure later being criticized as not of much use in understanding the differences in spending among states.

Given today’s insight into time-series issues, however, the strong evidence in favour of autocorrelation in government expenditure series would have probably redeemed

this practice, although the problematic extension of an essentially time-series property to a cross-section context remains.

Factors in Government Growth: Alternative Characterizations

Efforts to synthesize diverse explanations in order to arrive at an eclectic and comprehensive understanding of the entire government growth process have continued to enrich the public finance literature, albeit with limited success till date.

Factors contributing to government growth over the medium-term are explicitly enumerated in among others, Henrekson (1992). Demand-side and supply-side factors are distinguished, with the vital argument that there is no reason why these factors together should combine into a state of equilibrium. That is, the crucial concern here is that government growth should be seen essentially as a disequilibrium process, a consideration that has been generally absent in the literature on government growth. Indeed, with this explicit introduction of the element of dynamic disequilibrium in the process of government growth, Henerekson's 1992 work stands out as being far more advanced in comparison to its contemporaries.

The chronological development in the literature of demand-side theories and supply-side theories is mentioned by Lane and Ersson (2002). "*The first attempts to account for the tremendous public sector growth in rich countries took the form of demand theories"….* Thus demand-side explanations were among the first attempts to explain the characteristic rapid growth of the public sector in advanced countries, the Wagner hypothesis foremost among them —while "*the second stage in the debate about public sector growth offered supply theories*" (Lane and Ersson 2002 p300).

Instead of a single comprehensive theory, therefore, we have a number of premises encompassing economic, social and political determinants. Borcherding (1985) and Borcherding et al., (2001) have developed a model for the U.S. economy giving a comprehensive presentation of government growth in a system of income determination. The relationship between income and growth is examined from a bidirectional basis, as otherwise, stated in isolation the so-called Wagnerian causation would overstate the income effect, while conversely, government expenditure feedback on income would be understated.

The foregoing discussion suggests the need for a comprehensive approach to the understanding of government growth process instead of a single theory. And yet, in attempting to formulate the various forces at work here, the analyst has to strike a fine balance between including too few variables (uni-causal or very few explanatory variables), which might result in high chances of omitted variables bias, specification errors and/ or generally unsatisfactory or inadequate specification. Inclusion of too many variables, on the other hand, might generate well-known problems of multi-collinearity and the chance of “eclecticism” authors are often accused of. The line between the “holistic” (as Henrekson terms it) and the “eclectic” (the latter not always used in a very complimentary sense), thus, is fine indeed.

Among attempts to formalize the Government expenditure mechanism in terms of relevant economic and institutional factors must be mentioned the generalized formulation developed by Hackl et al., (1993) for the Australian economy. The political economy side is incorporated into an attempt at integrating the formal representation of government growth. The model encompasses on one hand

structural economic variables and a body of political-institutional ones on the other. However, one does not find an explicit mention of time considerations here.

Cameron Shelton's 2007 paper details the respective demand-side and supply-side factors involved in government expenditure for a wide panel of developed and developing countries. Public expenditure is regressed on a variety of demographic, economic and structural variables at detailed levels of disaggregation to take care of the omitted variables bias. Shelton's methodology explicitly considers non-stationarity, where the time element is taken care of by taking the average of observations.

Thus, the process of government expenditure is envisaged as the outcome of various structural (/economic) as well as political (/institutional) factors that operate in the economy, and influence the government expenditure mechanism in various diverse ways. An analytical schema has been provided in the analysis chapter-6 representing the framework for capturing the various groups of explanatory factors at work in shaping the government expenditure process.

In their seminal 2000 article, Peacock and Scott object to applying a causal dimension to Wagner's law (Peacock et al., 2000), suggesting instead that it is essentially a correlation. The principal criticism is against subjecting the premise to needlessly intricate econometric manipulations that often contribute little to the real economic insights behind the premise in question. The reader is reminded that what Wagner had in mind is more a correlation than a causal relationship. Accepting Peacock et al's (2000) objection implies that beyond establishing correlation between public expenditure and income, it is presumably beyond the law's scope to provide us a sturdy enough explicit causal framework that could be applied to analyze public expenditure growth. The second shortcoming, from which none of the

existing studies are found to be free, is the omission of the public enterprises from the scope and definition of public sector employed in the different attempts to test Wagner's law. The criticism is best summarized in the authors' eloquent prose … "*Our series of criticisms of the testing of Wagner's 'law' point to a 'sin of omission', namely the lack of attention paid to the meaning of 'government activity' and a 'sin of commission' in the dangers arising from econometric 'over-kill' which has led to false precision in the formulation of the casual relation identified between government activity and various economic variables*" (Peacock and Scott 2000, *p 10*).

While Peacock et al (2000) argue the more inclusive concept of government as being more in line with the spirit of Wagner's premise, they also do recognize the problem of suitable aggregation one has to admittedly face in order to integrate public enterprises with the measure of government (which, however, can hardly provide an "excuse" for its omission altogether). They indicate guidelines as to how this could be achieved. Indeed, employing this widened definition, conclusions regarding government growth can be expected to be substantially altered.

STUDIES SPECIFIC TO DEVELOPING COUNTRY CONTEXT

Noting the ever-increasing proportion of national income being spent by governments throughout the twentieth century, Lindauer and Velenchik (1992) identify three issues in the context of the growth of such spending in developing countries: how such growth compares with that in industrial nations; what explains the growth in spending by developing country governments; and the potential impacts on economic growth. They report government expenditure as a share of GDP in low- and middle- income countries, on average, to be lower than comparable

shares in industrial market economies. This is, in fact, an observation that is still valid in today's world, as the recent OECD data (2010) bears out. Developing country expenditure was found in most cases to be growing. Lindauer et al (1992) find this growth to be explained by a host of factors, including "ideology, demographics, a positive income elasticity for public goods, the rising cost of public goods relative to private goods, and perhaps development theory and practice" (Lindauer et al., 1992 *p 59*). So far as the relationship between government expenditure and economic growth is concerned, however, the empirical evidence is not found to reveal significant correlation, and thus, although engendering vigorous ideological debates, the size of government expenditure itself as a significant determinant of growth rates is found to receive little support. This is despite the authors' finding that extrapolation of the empirical trends indicated that the shares of GDP spent by governments in developing countries should continue to rise in future, as has indeed been the case.

In a transition economy context, Doessel and Valadkhani's (2003) study of Iran may be mentioned here for its comprehensive formulation of government expenditure in terms of structural and institutional variables. The methodology employed is time-series econometrics employing cointegration and error correction.

EMPIRICAL STUDIES RELATING TO INDIA

Early analysis of government expenditure in India includes Gulati's (1961a, 1961 b, 1963) detailed examination of the components of central government expenditure.

Among early studies, K.N. Reddy (1969) analyzes public expenditure growth in the post-colonial Indian economy. Expenditure classifications and their trends are examined in meticulous detail. Both the Wagner premise and the Peacock-Wiseman thesis are taken up, and support for both is reported.

In their detailed study of the growth and impact of central government expenditure over 1950-51 to 1977-78, K. N. Reddy, J. V. M. Sarma and Narain Sinha (NIPFP 1984) have meticulously analysed the conceptual and methodological issues involved in analysis of government expenditure growth. The structure of government expenditure and its various functional and economic components are sought to be related to major macro-variables like national income, population and prices. The composition of central government expenditure is found to have undergone a marked shift with share of transfer payments and financial investments expanding over 1950-51 to 1977-78 and share of final outlays having gone down. The elasticity of per capita government expenditure and its functional components with respect to per capita GNP (current prices) were found to exceed unity.

The authors commented on the necessity of more comprehensive data on functional break-up of expenditure covering State Governments, thereby making it possible to extend the analysis both in terms of coverage and time period. Given the comparative ease and availability of Indian public finance statistics today, therefore, the research agenda indicated by the authors present significant guidelines to present researchers.

John Toye (Toye 1981), in his highly authoritative work on public expenditure in India over 1960-1970 gives valuable insights into interpreting Indian public finance statistics and firmly establishing how to relate expenditure to its true economic implications by proper classification of expenditure, presenting an illuminating commentary on the interpretation of Indian public finance statistics that remains instructive till today. It must be noted, however, that Toye considers it as misguided to ascribe to Wagner's law the tendency of the public sector to grow relative to the national economy observed in India and a few other similarly placed countries. In

explaining public sector expansion, one has to be sure of applying the correct theoretical premise, and not import into a developing country context causal associations that were originally posited with developed economies in mind. This forms the basis of Toye's critique of works like Reddy's (Reddy 1969) which reported evidence in favour of the Wagner premise and the Peacock-Wiseman Hypotheses for the Indian economy.

Among empirical testing of Wagner's Law in the Indian context mention can be made of Madhavachari (1982), Murthy (1983) and others. Murthy (1983) has attempted to establish the "endogeneity" of government consumption (i.e., the existence of a government consumption expenditure function). Assuming a Nerlove-type lagged consumption expenditure function reflecting an adjustment factor to capture the non-economic components, the author concludes in favour of a positive correlation between government consumption expenditure and national income over the period.

A study by Upender and Ramakrishna (1994) finds elasticity estimates 1960-91 supporting Wagner's Law for Total Public Expenditure, Public sector Development as well as Non-development Expenditure. Mohsin et al., (1994) note the limitation of the elasticity approach in failing to test the reverse causation from expenditure to income. They have employed the causality approach, modified by using cointegrating regression and error correction mechanism--- tools that allow for testing the possibility of reverse causation among the variables concerned.

In line with Holmes and Hutton's 1990 work, Lalvani's (1995) work applied the non-patametric method in case of India and found little support for the Wagner premise.

STUDYING GOVERNMENT GROWTH IN A DEVELOPING COUNTRY CONTEXT: SOME COMMENTS

Despite the methodological refinements of the works by Mohsin et al., (1994) and others, a general difficulty with these studies is the relative neglect of the theoretical background. The issue as to whether the suggested premises are applicable in a developing country context, seems to have been taken for granted, as it were-- an approach John Toye (1981) seems to have had in mind when he criticized prevailing attempts to study in developing country contexts premises that had been originally addressed to today's developed / industrialized countries. This forms the basis of Toye's critique of Reddy's early work in Indian public expenditure analysis.

One natural question that arises here is, whether one could be permitted to consider an economy industrializing in the post-1950s era to be analogous to the "progressive" states Wagner had in mind (that is, countries of 19th century Europe that had began their industrialization in Wagner's time).

A reconciliation can, indeed, be found in the commentary by Peacock et al (Peacock and Scott 2000). Given the time-frame relevant to Wagner's premise, the authors consider it as plausible that the premise would be more applicable to today's developing economies. In a later paper in Ott 2006, Ewing et al., (2006) have commented on and reinforced this aspect (Ewing et al in Ott 2006).

Further illumination on this aspect is obtained in Peacock and Scott (2000, p 9). While scathing in their criticism of the use of increasingly sophisticated techniques and intricacies in testing Wagner's Law and other similar premises and criticizing the attempts to subject what is essentially a correlational premise to uncalled-for econometric sophistry, Peacock et al., (2000) concede the point that Wagner's Law would have been presumably more suited to today's industrializing world.

The theme on which agreement is found between both Toye (1981) and Peacock et al., (2000) is, however, an issue that is less noticed in the general body of empirical literature. Nevertheless, the point is a significant one. This relates to the fundamental difficulty of ascribing a causal dimension to Wagner's Law. Toye (1981) voices his objection to efforts to apply the Wagner premise to developing countries like India on the argument that the process of government expansion, at least in the initial planning stages in such countries is just the opposite, with public expansion *leading* the growth in economy. Thus, Wagner had indeed correctly identified a correlation. However, as a careful reading of his works shows, it is not quite valid to deduce a causal dimension in the process. In a similar vein, Peacock et al., (2000) note, "..In fact, at times (Wagner) writes as if the chain of causation could be the opposite (…)…because a *prerequisite* of economic growth must be growth in infrastructure" (Peacock et al, 2000, p 9).

So far as the Wagner premise is concerned, therefore, one would be more correct to conceive of the analysis in terms of a cointegrating relationship and refrain from explicit causal inferences.

Apart from directly empirically observable criteria like income as well as other economic factors, attempts to explain government expenditure with greater realistic relevance have been made by incorporating important political/institutional factors. Thus, Lalvani (1995) examined the Political Budget Cycle hypothesis in the Indian context and found significant evidence in favor of the phenomenon. Interestingly, this result is contradicted by the findings of Rao et al. (1995) in their illuminating treatment of the uneven pattern of government expenditure observed in India between mid-70s and 1990-91, where the authors find no evidence for a political budget cycle. Rao et al., (1995) have sub-divided the overall period into three

phases respectively of rapid growth followed by moderate growth and a subsequent slowdown. One important finding of this paper is the critical role played by interest-group activity in shaping India's public expenditure pattern.

The concern over budget deficits in the mid-1980s generated a strand of literature known as the tax-spend debate, sometimes labeled the revenue-expenditure nexus. In the Indian context, Swati Raju's (2005) study of the tax-revenue cointegration for India finds strong cointegration between revenue and expenditure.

In a significant contribution to empirical public finance analysis in India, Rajaraman et al.. (NIPFP 2001), analyze Time series properties of public expenditure for selected states. As the study finds, time behavior of State Public Expenditure series are not uniform. The analytical implications of the results for the aggregate Public Sector therefore, need to be carefully considered.

The time behavior of revenue-expenditure are crucially linked with the issue of fiscal sustainability. Earlier studies (before 2000) that generally found the debt position of the GOI to be unsustainable did not usually consider the crucial issue of structural breaks in the data. The significance of suitably treating structural break considerations is brought home by the conflicting results regarding the fiscal sustainability of the Indian economy reported by subsequent studies. Paul Cashin and Niss Olekalns (2000), examine India's fiscal stance in the presence of explicitly incorporated structural breaks and conclude that India's persistent high deficits "have violated the basic intertemporal budget constraint of the government of India" (Cashin and Olekalns 2000). Studying the time series properties of the fiscal policies of Indian central governments stretching back to the early 1950s, the authors find no evidence of cointegration between government tax revenues on one hand and expenditures on the other.

A significant work by Jha and Sharma (2001, 2004) reported new findings regarding the sustainability of India's public debt, by explicitly permitting more than one endogenously determined structural breaks for government revenue and expenditure. As the authors elaborate, the sustainability of public debt is customarily studied by inspecting the unit root properties of public expenditure and public revenue, with most previous studies showing India's fiscal position to be unsustainable, with standard unit root tests typically indicating public revenue and expenditure to be non-stationary. However, using annual data on Central Government revenue and expenditure at current prices for the period 1872 to 1997, split up into two sub periods, the time series properties of the GOI's revenue and expenditure series were re-investigated. By explicitly allowing for endogenous structural breaks, the authors find both revenue and expenditure series (nominal as well as real) to be trend stationary with structural breaks, at least for the post-independence period and conclude that the view that the Indian public debt is unsustainable is not warranted. The fiscal situation however, admittedly continued to be far from comfortable given the alarming debt servicing requirements and the weightage of current expenditure in government's total expenditure exceeding 80%.

The above clearly brings out the crucial relevance of the time behavior of revenue-expenditure in drawing inferences regarding fiscal sustainability.

2.4 IMPACT OF GOVERNMENT ON THE ECONOMY: A BRIEF RECAPITULATION

The recent classic incorporating government spending in an endogenous income growth system remains, of course, Robert Barro's 1990 one, which has subsequently inspired the vast body of works in the endogenous growth literature. The typical

manner in which government actions are envisaged in this literature (Barro 1990) has already been noted above.

How are government activities believed to affect macroeconomic performance? Public expenditure in particular has the potential of affecting both private investment and the long-run rate of growth. Despite a rich body of related empirical research, however, the results of existing studies are quite contradictory for different types of public expenditure.

Studies investigating the productivity of public spending on infrastructure include Aschauer (1989), Shah (1988 and 1992), and Berndt and Hansson (1992), among others. Growth-enhancing role of an optimum mix of public spending was reported by Shah (1992). So far as sectoral allocation of public investment (i.e. on infrastructure, human resource development capital, defense capital, etc) and its implications for economic growth is concerned, Baffes and Shah (1993), examining the composition of public spending and its consequences for economic growth, found that a reprioritization of public spending policy away from military spending and towards human capital formation has a potentially growth-enhancing effect. On the other hand, authors like Kormendi and Meguire (1985) and Levine and Renelt (1992), find the opposite, namely that public expenditure reduces the rate of growth.

Among later studies, Barro (2009), Bergh and Henrekson (2011) and others are representative of the body of work where the overall consensus is that an increase in government expenditure will generally lead to crowding-out of private investment.

Evidence in favor of crowding out provides a strong argument for reduction in government expenditure. In addition, the potentially inflationary effect and consequently the perceived ‘destabilizing’ role of large government spending leads

to the natural question as to what determines how far governments can control their spending (Afxentiou and Serletis 1996 for a representative viewpoint).

In their study, Kandil and Morsy (IMF 2010) establish the result that the phenomenon of crowding-out may be more pronounced in a developed economy. The authors locate the problem in capacity constraints and a shortage of resources faced by the private sector in consequence of greater absorption by the public sector. Public investment has also been criticized as being “less efficient” than the private investment it displaces.

In developing economies, on the other hand, the presence of excess liquidity ensures a larger size of the government expenditure multiplier (Mukhopadhyay 2009).

The global financial crisis and the attendant Fiscal Stimulus has opened up renewed and vigorous debate regarding the true impact of government on the economy. Optimistic estimates of the multiplier effect (Romer and Bernstein 2009) have been challenged by more conservative estimates by Cwik and Wienland (2010) using a New Keynesian Dynamic Stochastic General Equilibrium (DSGE) framework.

What needs to be distinguished in this debate are the context and the timing of government expenditure. A second related aspect is the composition of such fiscal change. Thus Ghosh et al, (2009) find significant differences in implication between increases in capital vs. current spending, where it is increase in the latter that might prove counter-productive.

Coming next to the context of a developing country, conclusions regarding the income growth-government expenditure relationship need to be substantially

modified. Crowding-out is no longer an inevitable phenomenon, given the conditions specific to a developing economy.

Added to the above is the unique dimension of public expenditure policy in a developing economy context, viz. the role of the state in alleviating poverty and ensuring social justice.

Estimates of the government expenditure multiplier for the Indian economy and assessment of the impact of government expenditure on sectoral output has engaged research attention in India since a long time.

On the policy front, newly independent India embarked on the planning process since 1951 under government initiative at the macro-level. Development plans in the contemporary emerging economies, India among them, were based on the Harrod-Domar and Leontief Input-Output models, which provided the supply-side solutions that were then sought to be complemented with the demand-side on the basis of Keynesian tools of analysis (Nayak 2008).

The planning process envisaged state accumulation via public sector capital formation as the engine of growth (Toye 1981), and the government's expenditure policy reflected plan objectives. The 'expenditure budget was the vehicle and the framework in which the plan schemes were adjusted and acknowledged' (Premchand, 1966, cited in Chander et al 2004 *p 18*). The initial stress on efficient utilization of resources, rather than on reduction of aggregate expenditure, however, faced challenges with growing inflationary tendencies consequent upon the continued climb of non-developmental expenditure (Chander 2004).

Among early attempts to come up with rigorous estimates of government expenditure multipliers (as well as its various components) in the Indian context, one may mention works like Mathur (1963), Bhalla (1971), Paithankar (1973), Sarma and

Tulsidhar (1980) and Reddy et al (1984) that followed up on the tradition of input-output models compiled mainly under the aegis of the ISI and the CSO in course of the early years of planning.

Mathur (1963) used a 17-sector input-output table to estimate the total direct and indirect requirements for defence expenditure for the two years 1957-58 and 1958-59. The output-multiplier of defense expenditure was found to be 1.99. Using a 29 sector input-output matrix for India for 1959, Bhalla (1971) computed direct and "induced income multipliers", the latter being analogous to Keynesian consumption multipliers. Sarma and Tulsidhar (1980) attempted to estimate the impact of government expenditure on goods and services and wages and salary for 1971-72 along the approach by Paithankar (1973). The object was to construct a reliable government commodity expenditure vector. The output multiplier was estimated at 1.6 for the year 1971-72. Finally, employing an 89-sector commodity by industry matrix for 1977-78, with further aggregation to 20 larger sectors, Reddy et al, (1984) estimated the output multiplier of the central government purchase at 2.6 for 1977-78. The rather high value compared to the earlier estimates was ascribed to differences in measures of government expenditure employed and methods of computing the expenditure vector, as well as the different time periods under study.

The period subsequent to 1980s saw rapid increases in government expenditure in India, with concerns regarding a) the sustainability of the fiscal situation and b) the potential consequences of unchecked growth in expenditure for the economy. The sustainability issue, which was deemed as particularly alarming, is taken up in a later section. So far as the second issue, viz. the consequences of climbing government expenditure is concerned, however, while the potentially inflationary consequences were more or less agreed upon, the research findings relating to the possibility of

such expenditure crowding out private investment are far from unanimous in the Indian context.

Thus while Little and Joshi (1994) have found scant evidence of crowding out in India, Severn (1996) finds government expenditure on non-infrastructure head crowding out private investment spending. In a study of the short-run interactions between government and private investment over 1965 to 2005, Mitra (2006) finds evidence that increased government expenditure has in fact crowded out private investment, although the potentially productivity-enhancing effect of government infrastructure spending over the medium- and long-term is conceded. Again, in a corroboration of Kandil et al (2010) mentioned earlier, Lekha Chakraborty's (NIPFP, 2006) analysis finds no evidence of crowding-out in India, even when both real and financial crowding out, as identified in the theoretical literature, are considered. The former, relating to the displacement of private capital formation by increase in public investment occurs independently of the pattern of financing the fiscal deficit, while financial crowding out results principally through bond-financing of fiscal deficit. Employing the Vector Autoregression (VAR) methodology for the period 1970-71 to 2002-03, instead of real crowding-out, public and private investment were found to be complementary.

What the overall research evidence suggests is that crowding out is more likely when aggregate demand is sought to be revived through raising public consumption. On the other hand, when public infrastructure expenditure increases, a "crowding-in" of private investment has been found to result.

Reiterating the circumstances where public investment may crowd out private sector, Mukhopadhyay et al (2009) reports crowding-out as more likely when competition for loanable funds causes interest rates to go up, reinforced by a dearth of domestic

savings in relation to investment. This explains the relatively lower likelihood of crowding-out in India, since savings in the Indian economy have typically exceeded investment.

Coming to compositional change in government expenditure and the manner in which it affects the economy, Ghosh et al, (2009) find significant differences between increase in capital spending vis-à-vis current spending—from the point of their respective economic implications. Increase in current spending is found to have deleterious effects on the economy. Rather than the expenditure increase *per se*, therefore, it is rather the mode of financing that is more important in determining the eventual impact on growth.

The foregoing discussion brings out the inherent flaws of the unqualified advocacy in favour of cutting back government expenditure in the Indian context. The much-debated program of fiscal correction adopted in India in 1991, based on the general IMF-World Bank prescription of fiscal deficit reduction, has caused serious concern, as the brunt of such "correction" was borne by both public expenditure on capital account and social-sector related expenditure (Balakrishnan (1997), Nayyar (1993), among others).

SUMMING UP: CONTEXT OF THE PRESENT STUDY

In this review, we set out seeking answers to the question as to how public finance literature has attempted to address the task of explaining observed growth in public sector expenditure. The second question was whether, and if so how, such a study should be "different" when we are considering a developing country context. Given the all too real practical problems involved in studying the actual process of

government revenue-expenditure in a country like India, with its frequent instances of populism and inefficiencies, it clearly requires a good deal of faith in the discipline to contemplate such study within the framework of economic analysis.

The problems of encompassing the developed as well as developing countries in a general framework of analysis of the public sector are, again, summarized by Afxentiou (1980), who contemplates the extreme difficulties of combining the heterogeneity in economic structures between the two groups of countries, where the typical developed country is characterized by the presence of “a vigorous private sector” that “promptly responds to incentives and is the primary force in economic growth” side-by-side with developing countries that have typically suffered from a “backward private sector” that, having failed to generate growth in a self-sustained manner has made it imperative for the government to directly involve itself in the development process. So, these constitute some significant obstacles that must be tackled satisfactorily if the hopes of building a “general theory of the public sector” are to materialize (Afxentiou 1980, Diamond and Tait 1988, Lindauer et al., 1992).

We have come a long way sisnce the above words were written in the 1980s and the early 1990s. The Indian economic scenario, for one, has undergone significant structural changes and change in economic climate. Given the scenario, the present review can be seen as a tentative and modest attempt to continue in the tradition pioneered by Reddy (1967, 1984), Toye (1981) and other later authors towards developing an analytical framework for studying government growth in an emerging economy, perhaps expanding the dialogue across disciplines.

As the present review of literature brings out, there is an agreed-upon absence of a single comprehensive theory of government growth in the literature on government

sector growth, which has only served to add to the challenges of such an undertaking.

To summarize the discussion above, some of the problems with earlier and other studies can be enumerated as, firstly, the lack of often a clearly laid out theoretical background. Secondly, as a natural fallout, premises have often been analyzed straightaway without consideration or explanation as to their applicability to the context being studied. Thirdly, as pointed out by Henrekson (1992), a proliferation of unicausal models and the consequent omitted variables bias has compounded the problem.

Alongside the lack of methodologically appropriate studies, however, one frequently encounters works that are methodologically sophisticated, and yet, the applicability or appropriateness of the applied intricate tools to the economic context at hand gets neglected often (Peacock et al., 2000).

Finally, while studies for developed world abound, lack of a similar analytical framework for a developing country context is very much evident.

Clearly, a satisfactory study of observed government growth has to be a holistic one where the diverse contributing factors are taken into account. The need is to develop a study that is comprehensive enough in explaining the observed growth and pattern of government expenditure and all its compositional changes. In addition, the time span should ideally be one that can do justice to the trends seen over both pre-reform years as well as post—under the shadow of the Global Financial Crisis. We felt the need for such a study after a meticulous study of the available literature.

Besides the usually studied broad-brush theories, those that Henrkeson (1992) characterized as “classical theories of the very long-run”—we felt the need of explicitly studying some of the demand- and supply-side factors contributing to the

shape of government behavior over the medium and shorter term. Our chosen period of nearly four decades permits adequate analysis of these factors and the underlying trends.

Being situated very much in the post "Unit Roots Revolution" era, we have also felt it necessary, given our time span, to pay careful attention to the considerations of stationarity issues as indicated in the literature. The literature on structural break has also been studied in detail. The natural expectation is that we should find evidences of structural breaks in our relevant time series given the significant policy regime shift and changes in economic environment over the chosen period. Upto now, only a handful of studies have gone into this consideration, in particular in the context of Indian public expenditure analysis. Our analysis therefore is felt to have the potential to contribute to the public finance literature pertaining to developing country context.

Finally, a note on the limits of economic analysis seems in place. Economics literature, public finance theory included, typically concerns itself with "rational", "maximizing" behavior on the part of individual(s). Slemrod and McCaffery (2004) express their challenge of that basic assumption, as also the second underlying premise of "consumer sovereignty", that together form the basis of neo-classical analysis.

Slemrod et al. (2004) take up the task of expanding the limits to conventional Public Finance theory incorporating elements of behavioral economics for developing what is hopefully a more realistic tool of analysis.

"…To the extent behavioral economics rests on empirically verifiable (and verified) understandings about how real people think, choose, decide, and act in real-life settings, public finance models that aim for real-world relevance ought to take behavioral insights into account. This does not mean a wholesale abrogation of

traditional public finance, or an abandonment of consumer sovereignty principles. As in all marriages, there will be give and take; the whole will be different from—and at least potentially better than—the sum of the parts" (Slemrod and McCaffery, 2004 *p 2*).

The above agenda has apparently more relevance to tax-compliance/ government efforts to affect specific-consumption patterns/ saving behavior etc. through (tax) incentives etc. However, as limits to economic agents' rationality become increasingly clear and practical outcomes seem to increasingly point towards the need for coming up with more realistic assumptions regarding economic behavior, coupled with the often apparent short-sighted policies, research findings relating to behavioural economics will continue to become more and more important, and the field of behavioural public finance no exception. The latter is still in a very much fledgling state, however. Research in the area will therefore have to await further empirical advances in the field.

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3

Methodological Issues

"Empirical testing of hypotheses in economics particularly over the past ten years has undergone a great deal of change. (…) Given the complexities of empirical research as well as its limitations, there is a constant need to continue the search for a bigger and better toolbox to further our understanding of the economics and politics of the public sector"

--Ott and Cebula, (2006, Preface and Introduction)

CHAPTER 3

METHODOLOGICAL ISSUES

As chronicled by various commentators, the methodological revolutions in the discipline of economics, public economics not excepted, have been no less than the revolutions in human history, albeit sans the tears, sweat and bloodshed the latter has inevitably involved. This chapter discusses some issues relating to the researcher's and economist's "tool-box" at disposal, in other words, methodological issues and the specific aspects pertaining to the study at hand.

In analyzing government expenditure in India over our chosen period, the methodological concerns we have encountered stem from two aspects. First, defining and expressly elaborating on *what is being studied*, viz., explaining the concepts being used and various classification conventions followed in Indian public expenditure statistics. The second aspect relates to *how it is being studied,* viz. the analytical techniques that have been employed to carry out the study. This chapter, then, comprises the following sections:

3.1 Government Expenditure and National Income: Appropriate Concepts and Measurement Issues

3.2 Classification of Government Expenditure in India: A Note

3.3 Analyzing Nominal vs. Real Growth: The Issue of Deflators

3.4 Analyzing Time Series Macro Data: Some Methodological Considerations

3.1 Government Expenditure and National Income: Appropriate Concepts and Measurement Issues

We begin this chapter by first discussing the conceptual and measurement problems and issues that arise when researching the aspect of government expenditure.

Revisiting the question as to why we are focusing on government expenditures, and not revenues instead, the justification, reiterated earlier in the Introductory Chapter, is reinforced by the following excerpt from Neck & Getzner (2007) … **"**To obtain a picture of the development of the public sector, we concentrate on ratios of government *expenditures* to gross domestic product. This is *superior to* a ratio of government *revenues to* GDP, because expenditures (including those financed by public borrowing) give a better indication of the amount of economic resources absorbed by and allocated through the public sector**" (**Neck & Getzner 2007, emphasis added).

At the outset of analyzing government expenditure, the precise scope and terms being studied need to be clarified. Here we must explicitly define the ideas of government expenditure and national income magnitudes that are being studied.

By government expenditure, here we are referring to central government expenditure. The justification of looking at central level, and not of that of the whole public sector as a whole or excluding State governments, is a pertinent question that we address first.

First of all, in the Federal set-up of the Indian fiscal structure, it is the budgetary imbalances at the central government level that caused widespread concern starting in the mid 1980-s and leading subsequently to the 1991 economic reforms, culminating in a policy package embracing fundamental corrective measures,

including on the fiscal front, that were to have far-reaching consequences for the economy. The contemporary mounting government expenditures at the Central level, therefore, demand separate study and analysis.

Secondly, state finances in India are much too heterogeneous to club them together for analysis leading to meaningful insights. The considerable heterogeneity among states so far as leading indicators of public finance dimensions are concerned provides strong justifications in favour of our decision to focus on the Central Government.

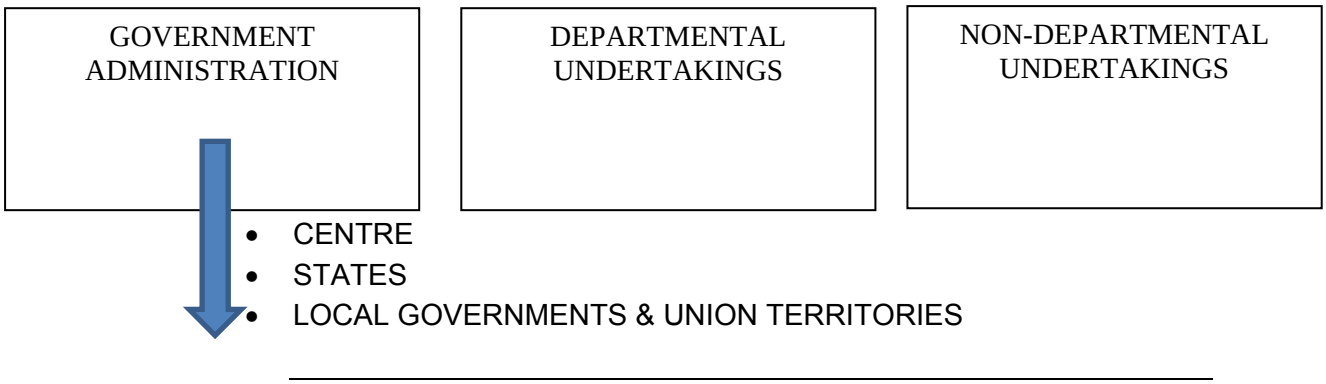
The third point relates to the Centre's inherent importance in the Indian Union fiscal structure. The tendency towards fiscal centralization has been variously sought to be addressed and resolved by the successive Finance Commissions (13 till date), and as the RBI data on Central and States' combined Finances indicates, the percentage share of Central Expenditure in combined Finances, despite marked fluctuations, shows a gradual declining tendency over our study period 1970-71 to 2007-08, implying an unmistakable trend towards decentralization even if rather slow and uneven[i], Even so, however, the Centre's own share has averaged above 50% throughout, excepting the period between 2004-2007, again climbing up subsequently during the Global Financial Crisis years. Given the Centre's importance in the overall Federal finances, thus, ascribing separate analytical role to the Centre, as this study proposes to do, assumes significance. These considerations led us to the decision to pay separate attention to Central Finances and reserve an analysis of State finances for further research.

The final justification comes from the results of a 2001 (Rangarajan et al, NIPFP) study analyzing the heterogeneous nature of time properties where three Indian states were considered. The time properties of public expenditure across even this

limited number of states were found to be non-uniform across states. Such a finding suggested to us the advisability of treating Central government expenditure separately in its own right.

Next we come to the exact scope of our analysis, that is, the entity we refer to as government expenditure. A useful representation of the federal tiered system of government and its administrative components is presented in Fig 3.1.

Fig 3.1: GOVERNMENT STRUCTURE: THE FEDERAL GOVERNMENT OF INDIA



Source: Based on Reddy (1972), Bhattacharya (1984)

The public sector in India includes government administration (ADM), Departmental Undertakings (DU) and Non-departmental Undertakings (NDU). Government administration covers the central, state, and the local governments, and the union territories. The revenue and expenditure of government administration are covered by the Union and State Annual Financial Statements through the budgetary process (Bhattacharya 1984, Reddy 1972, Reddy et al 1984). The Union Budget in India is presented for the Central Administration while budgets for Railways etc. are presented separately.

In treating government expenditure therefore, there is a need to distinguish between these entities.

In our analysis, we have followed the classification as per the Indian Public Finance Statistics and Economic and Functional Classification of Central Budgets as brought out by the Ministry of Finance, and for some further details, the National Accounts of India. In the definitions and classifications adopted in our study, therefore, the guidelines are those as provided by the Ministry of Finance and CSO.

National Income

Coming next to the concept of National Income, an extensive debate exists on which concept is most suitable to analysis of government expenditure (Peacock and Wiseman 1969, Goffman 1971, among others). Very briefly, the argument is this. National income by definition includes only final expenditure (by government, domestic households and business and foreigners) on current domestic production of goods and services. On the other hand, government expenditure comprises not only final expenditure (government final consumption and gross capital formation), but a sizeable extent of transfer payments as well. So, there is a conceptual problem involved in trying to normalize government expenditure figures by deflating with national income.

The second problem is the choice of the National Income concept itself. As is well-known, GDP (alternatively, GNP), may be measured both at factor cost which excludes all taxes/ subsidies, or can be valued at market price which includes the

taxes and subsidies imposed by government. The choice between GDP valued at factors cost / market price is therefore another conceptual issue facing the researcher.

Given the present analytical problems at hand, we have followed the practice adopted and advised by Bird (1971) and employed the concept of GDP factor cost.

3.2 Classification of Government Expenditure in India: A Note

Our analysis of public sector expenditure emerged out of our main discussion on budgetary imbalances in India that became more pronounced at the Central Government level over the 1980s.

At the outset, it must be mentioned that the practice of repeated reclassifications adopted in Union Budgets of India, and the frequent changes in definitions and conventions typically used to place the researcher in Indian public expenditure in an unenviable and difficult position, where attempts to carry out Time-series analysis would pose an uphill task of deciphering the data over reasonably long period of time and collating data that is consistent, comparable and comprehensive enough. While we do still have a long way to go in providing researchers and scholars comprehensive and consistent data in desirable format, the fortunate present availability of databases from the Ministry of Finance, RBI etc. (both electronic and print) has lessened this difficulty to a great extent, although the problem of

differences in conventions and assumptions followed among leading authoritative data sources, and hence the problem of discrepancies, continues to remain.

In our analysis, we have relied mainly upon data from the Indian Public Finance Statistics (Ministry of Finance, GOI) and the National Accounts Statistics published by the CSO. Database provided by the RBI, Statistical Abstracts of India, as well as various Budget Documents of the Ministry of Finance, have also been consulted extensively wherever necessary. Before elaborating on the data sources and their rationale, we first note certain basic classification conventions adopted in Indian Budgets.

CUSTOMARY BASIS OF CLASSIFICATION IN BUDGETS OF THE GOI:

Concerning government expenditure, the classification conventions in extensive use are:

- "**Administrative**", which is the essential scheme along which Budgets are presented, and represent mainly Purpose-wise or Functional Heads.
- **Functional:** An allied categorization deriving from the above whereby budgetary items are shown, again, along essentially along purpose-specific categories.
- "**Economic**", derived from the Economic-cum-Functional Classification of Government Budget provided along with the Budget Documents, where items relate to the diverse economic aspects of government expenditure such as

Government Consumption Expenditure, Capital Formation by the Government and so on..

The distinction is significant for a number of reasons. Of particular interest to us in the immediate context are the implications of such alternative classifications so far as deriving real magnitudes for government expenditure is concerned.

India has long followed the tradition of presenting its Union budgets in respectively Revenue and Capital accounts, the basic rationale being the necessity of indicating the potential asset\ liability implications of any budgetary transaction. A balance on the combined revenue and capital accounts, the "budget deficit" was always reported, and the balance on the revenue account shown separately. A plausible explanation for the practice may be found in an early Planning Commission (1968) comment on the attention given by Indian Policy makers to the potentially inflationary implications of budgetary actions (S.B. Gupta, 1981)[ii].

Notwithstanding slight definitional problems, the soundness of having a distinction between these two types of accounts becomes evident when we look at budgetary data through the 1970s onwards. Going by the trend in finances, India conventionally focused on the so-called "Principle of Good Budgeting"-- that is, attempting to maintain a revenue account surplus that can be used to finance the capital budget. Prior to 1979, India appears to have conventionally focused on the so-called "Principle of Good Budgeting"-- that is, attempting to maintain a revenue account

surplus that can be used to finance the capital budget. However, since 1979-80 the typically surplus revenue account in the Central Budget (barring one or two outliers in the particularly 'bad' years of 1971-72 and 1973-74), turned into a persistent deficit that was to grow subsequently at a phenomenal rate. The deficit in States' revenue account was to emerge rather later. The consequences of a widening revenue account deficit have been discussed at length in the literature.

Budgetary magnitudes are simultaneously presented into alternative categories like Plan vs. Non-Plan, or "Development" vs. "Non-Development". Commentators sometimes also refer to "Productive" as against "Non-Productive" resource use, although definitions are relatively hazy. Finally, since not all government transactions fall within the purview of the Budget, additional comprehensive information is obtained from the National Accounts Statistics brought out by the Central Statistical Organization.

NAS also yields additional information on government current account vs. capital account transactions, and government consumption expenditure vis-a-vis. capital formation.

RESOURCE USE: ALTERNATIVE CLASSIFICATION: A NOTE

An early work on Indian Public Finances by the British author John Toye (1981) suggested that the only economically meaningful way of looking at expenditure was whether the resource use in question is "*exhaustive*" as against *"non-exhaustive"*.

That is, whether it involves final resource use: (examples being Final Consumption or Capital Formation), or whether it amounts to transfer of purchasing power from one sector to another (transfer payments that may be capital \ current in nature).

Such a classification was deemed to be economically significant and hence more useful than accounting distinctions like the revenue (current) account vs. capital account.

Using the available NAS data, as also data from the Ministry of Finance (Economic Surveys, various years and the Economic Classification of Central Government Budgets, various years) to derive the economic categorization of Central Government Budget, we were able to follow to some extent the detailed guideline provided by Toye (1981) into identifying and reclassifying data into “exhaustive” or “non-exhaustive” categories from the budgetary magnitudes.

BUDGETARY CLASSIFICATIONS: FUNCTIONAL VS. ECONOMIC HEADS: THEIR RESPECTIVE SIGNIFICANCES:

Functional Classification relates to purpose-specific heads, e.g., Social Services, General Administration, Defense, Interest Payments and so on. The same expenditure item may usually comprise both revenue account and capital account components.

The functional categorization is the basis of customary budgetary classifications like Developmental and Non-Developmental or Plan-Non-Plan, which are all relating to specific purpose categories.

Functional classification helps us to understand the government's policy stance in terms of expenditure commitments to a specific purpose. However, they tell us little about the economic impact of such expenditure on the rest of the economy, for which one has to turn to the **Economic Classification**.

Economic Classification of budgetary items indicates the economic nature of a particular transaction. Transactions may fall in the category of final transactions or Transfers. Due to some ambiguities in definitions, the customary revenue-capital distinction made in Indian budgets is not exactly analogous to the current-capital distinction. for an insight into the economic implication a reconciliation between the two sets of accounts is found in the **Economic-cum-Functional Classification** of Union Budgets.

Expenditure items as presented into alternative categories like Plan vs. Non-Plan, or "Development" vs. "Non-Development" basically indicate the government's commitment or policy stance towards specific purposes. Commentators sometimes also refer to "Productive" as against "Non-Productive" resource use, although definitions are relatively hazy. Finally, since not all government transactions fall within the purview of the Budget, additional comprehensive information is obtained from the National Accounts Statistics brought out by the Central Statistical Organization.

So far as the functional aspect is concerned, we have adopted the Indian Public Finance Statistics brought out by the Ministry of Finance as this series was found to be relatively complete, consistent and comprehensive for our purpose, although this too needed substantial effort on our part to reclassify and interpret the variously grouped data for deriving meaningful and comparative time-series database.

Regarding economic classification, the data published by the CSO (National Accounts Statistics, current and constant price) was employed. The constant price data available at various base years were all suitably transformed and converted into 2004-05, the latest available series upto date, by this researcher.

DATA SOURCE

Analyzing long-term (secular) change in public sector activity requires continuous and comparable data on public expenditure and revenue. Budgetary definitions in India, as also classification of items, have changed from year to year, and the main sources that we found useful at the time were:

a) CSO - NAS documents

b) Indian Public Finance Statistics made available by the Ministry of Finance, Government of India—various years being carefully compiled for consistent, continuous and comparable database suitable for the purpose of this researcher.

c) RBI Reports on Currency and Finance for various years, and Ministry of Finance Publications.

3.3 Measuring Real Government Expenditure: The Issue of Deflators

While on the issue of converting nominal expenditure values to real, reference must be made to the classification of government expenditure in budgets, as done along i) Economic lines, and ii) along functional lines.

Economic classification can indicate the economic impact of the government expenditure various components has on the macro-economy. Here the typical classification is, first between government final expenditure on one hand, and transfers on the other. The former comprises government consumption expenditure, in its turn distinguished into a wages and salary component, and a final expenditure on goods and services component. Then there is gross capital formation by the government. Transfer payments in turn comprise of various capital and current transfers that represent, not final expenditure on goods and services, but a transfer of purchasing power from the government to the rest of the economy.

So far as Functional classification is concerned, here we have basically the specific functions/ purposes behind the expenditure. The fundamental revenue and capital distinction account being there, the respective categories are then subdivided as shown in Table 1.

Why is this detailed note necessary? This is because, when we are seeking to look at real expenditure growth and trends, we have to look at data that has been

corrected for inflation/ price change effects. However, government expenditure data is typically presented in current price figures, not constant price, so that a set of suitable deflators has to be applied to render them into real values.

Obviously then, we have to tackle the issue of deflating expenditure separately when the functional categories are concerned.

So far as empirical work goes, a number of works may be cited for their adoption of the practice of deflation. Chronologically, the first work that we can mention is by Reddy, Sarma and Singh (NIPFP 1984) who have adopted the following detailed method. Expenditure is distinguished into the following components:

1. Expenditure on Wages and salaries
2. Government final purchase of consumption goods and services
3. Gross capital formation by government
4. Current transfers, e.g. interest payments
5. Capital transfers , e.g. grants given to assist capital formation
6. Net financial investments and loans to the rest of the economy

Having distinguished these categories, then, the authors apply the following deflators to each category as follows (on next page):

Expenditure Category	Deflator Applied
Expenditure on Wages and salaries	Deflator for Compensation of employees of government administration (CSO data)
Expenditure on goods and services	Index constructed by the Directorate General of Supplies and Disposals (DGSD)
Gross Capital Formation	Implicit price deflator for GFCF in public sector derived from CSO estimates
Current Transfers	Implicit GDP deflator
Capital Transfers	Index applied to capital formation as above
Financial investments and loans to The rest of the economy	Implicit GDP deflator

(Based on: Reddy et al. (1984) pp 12-13)

Similar practice has been followed by Joshi (1994) among others, who for her study spanning 1950-51 to 1989-90, has more or less adopted Reddy et al.'s set of deflators

Sarma and Bhanoji Rao (1992) have studied in detail the trends in government expenditure over , adopting the deflators that are more or less along the same lines as Reddy et al (1984) above.

In the international context, Gemmell (1999) has used separate deflator for Government Consumption Expenditure and Gross Capital Formation, while for transfers, the author has argued for using the Consumer Price Index as it is essentially a transfer to the household sector.

Clearly, in all of this, the focus is on the **economic** classification of expenditure. However, the problem becomes more complex when we turn to the **functional** classification of expenditure, where similar data on constant price series is rarely available (unlike the Australian government finances database, for example, where government expenditure data is presented in terms of both current and constant prices).

What, then, has been the practice in the case of functional categories? Although Reddy et al (1984) have used a constant price series for functional categories as well, we could not find explicit documentation of the source, or method, of deriving the constant price data they report. A similar problem is encountered in Sarma and Rao's 1992 study which, while clearly delineating the choice of deflators in the context of economic expenditure categories, does not make explicit mention of the method of deflating functional ones. Joshi (1994) unequivocally states the absence of constant price series so far as functional data is concerned, and goes on to analyze expenditure trends in case of the latter in nominal terms.

Finally, Rao et al (1995), in their analysis of the uneven pattern of government expenditure in India, have applied the WPI in deriving real expenditure values. They explain that the choice of the deflator is very much dependent on the nature of the query itself. Thus, if the object is to investigate the size then WPI is suitable, while in case of an analysis of the growth of government the CPI will be the preferred deflator (Rao 1995 pp).

In view of the various considerations noted above, the present study has treated the problem of deriving real series respectively for **economic** and **functional** categories, in two separate parts.

So far as the economic category is concerned, the following practice has been adopted:

Series	**Deflator based on**
Government Consumption Expenditure	constant price data by the NAS
Gross Capital Formation by Government	Deflator applied to public sector capital formation
Transfer Payments:	
Current Transfers	Consumer Price Index
Capital Transfers	Deflator applied to public sector capital formation
Loans and Advances	Deflator applied to public sector capital formation as these loans are

generally mostly given for capital formation purposes.

The above, to recapitulate, is the detailed account of deflation procedure adopted for the economic categories of government expenditure.

What about functional categories? For reasons that have been already discussed above, the Wholesale Price Index (WPI) has been applied as deflator for functional categories of expenditure following Rao et al (1995).

3.4 Analyzing Time Series Macro Data: Some Methodological Considerations

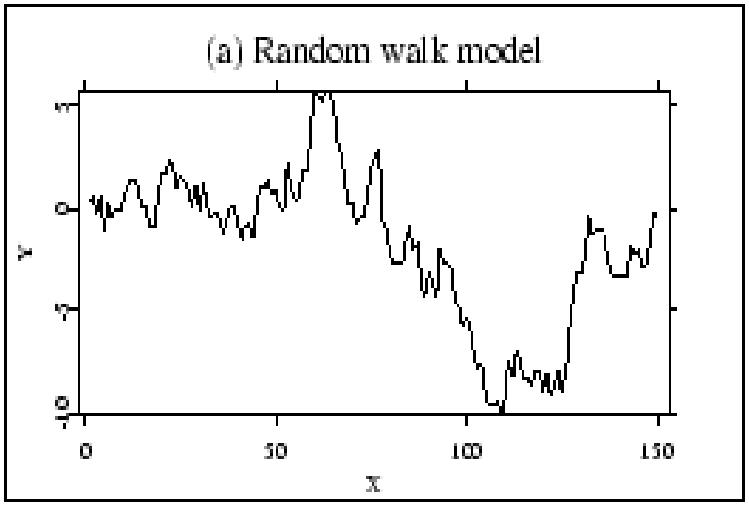
The final issue that is relevant to our discussion on methodological concerns is that of explicitly recognizing and analyzing the time dimension involved in our analysis. Time-series data on Government expenditure, like almost all other macro-economic variables, involve characteristics that demand explicit time-series considerations for a valid and complete analysis. By now too well-known to merit discussion at elaborate length, these aspects however require us to devote some attention, albeit very briefly, to issues in Time-Series Econometrics, specifically, the problems of Non-stationarity and “Spurious Regression”, and analytical concepts such as Unit Roots and Cointegration techniques.

The relevant conceptual and methodological issues are first discussed below, followed by explicit incorporation of the above issues in the analysis where relevant. The approach adopted here is an intuitive one rather than overtly technical.

As has become common knowledge for over the last 30 years in econometric analysis, most macro-economic time series data like GDP, income, interest rates, consumption and investment expenditures, including government revenue and expenditure variables, are non-stationary in nature. The first concept involved here is

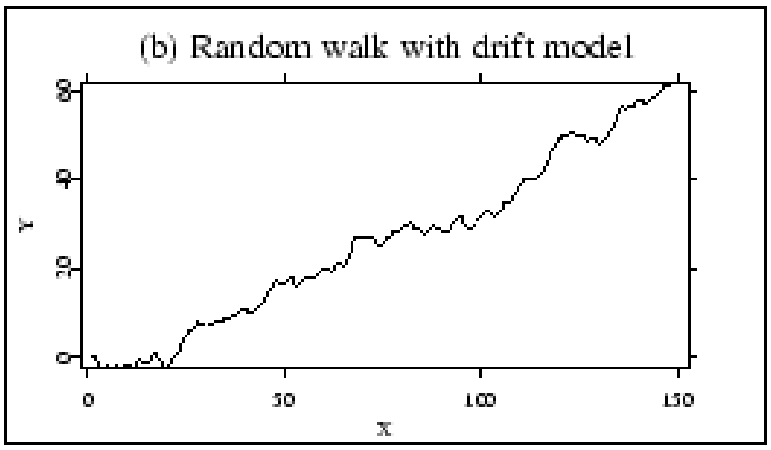
that of “Non-stationarity” and the resulting violation of the fundamental assumptions on which the Classical Linear Regression Model (CLRM) analysis is based, including constancy of mean, absence of heteroscedasticity, absence of serial correlation between errors, to mention only some of the assumptions that are violated when data are no longer stationary. Application of the CLRM in such cases would therefore be prone to yield misleading results, a problem famously termed by Clive Granger as “Spurious Regression” (Granger and Newbold 1979) in their treatise on time series. We follow an intuitive approach here to discuss the issues involved.

Fig 3.2: Interest rate (Quarterly)



Source: Adapted from Gujarati (1995)

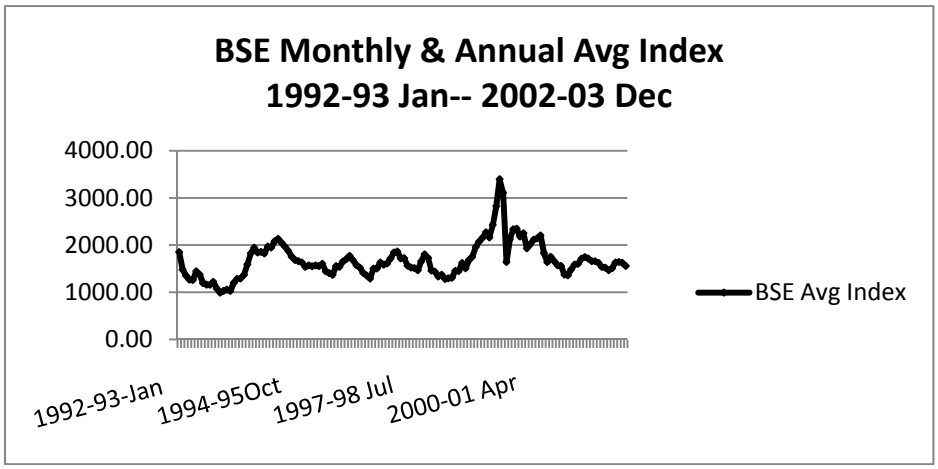
Fig 3.3: GDP Data (1965-2005)



Source: Adapted from Gujarati (1995)

Figures **3.2** and **3.3**, represent, respectively, the quarterly interest rates and the annual GDP series over specified periods of time. Both the series presented above expectedly show fluctuations over time. We also present a third time series, showing similarly noticeable fluctuations over time.

Fig 3.4: A "Stationary Time Series"



Source: Based on RBI (2012) Data on Monthly and Annual Averages of BSE National Index (Base : 1983-84 = 100)

What is the essential difference between the first two series, and the third series presented above showing the monthly and annual averages of the BSE National Index between the years 1992-93 and 2002-03? Notably, the series in Fig 3.4, while having continual fluctuations, appears to do so around a mean value that is not varying over time. In other words, this particular series is varying over time *around a time-invariant mean*.

However, such is not the case with our first set of series on interest rates and GDP. Figs 3.2 and 3.3, both, in contrast to Fig. 3.4, show that the mean of each series is definitely shifting over time, that is, the mean itself (and, as we shall discuss later, the variance also) is *not time-invariant*, thus violating a very basic assumption of CLRM.

This qualitative and visually obvious difference between the two sets of series above brings us to the first intuitive definition of "(Non)-Stationarity", a conceptual issue that is going to be of crucial significance to us in the subsequent phase of our analysis, where we are interested in capturing, and to a plausible extent, formalize, the observed behaviour of government expenditure over time in terms of the plausible economic and institutional factors operating in the economy.

Methods of addressing the problem of Non-stationarity are exemplified in Nelson and Plosser's seminal 1981 work on US GDP series. The usual practice, prior to the famous "Unit Roots" revolution of early 1990s, had been to de-trend time-series data, a practice that was later realized to result in loss of valuable information (Bhaskara Rao 1995, Maddala and Kim 1998).

A related concern, where time trend was agreed to be present, was realized to be of vital importance, viz., the necessity to distinguish between trend that is deterministic vis-à-vis stochastic. If the time trend is deterministic, usual practices of de-trending would be sufficient. However, in case trend was stochastic, ordinary practices would not be adequate enough.

Determining whether trend is deterministic or random, is a separate technical issue in its own right. For our present purposes, as Perron (1989), Nelsson and Plosser (1981), Clive Granger and others have elaborated, most macroeconomic data in fact display stochastic trends, so that explicit consideration of time-series nature are mandatory.

A non-stationary series needs to be checked for stationarity in order to apply the methods of linear regression—as otherwise it might give spurious regression (Clive Granger 1992). Spurious regression means there is in fact no relationship between the variables but both appear to move together simply because of the presence of

the time factor. If that is the case, then the time factor must be suitably treated in order to uncover the genuine relationship, or absence thereof, between the two (or more) variables in question. In other words, non-stationary data must be rendered into stationary, as a first step.

The most frequently employed check for determining whether data is stationary or not is the Unit Roots test[iii], so-called since the information is contained in the value of unity of ρ in the autoregressive process:

$$Y_t = \rho Y_{t-1} + \varepsilon_t \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad 1)$$

If ρ=1, any disturbance to the series gets transmitted and does not die down but persists. This is when we say that Y_t has a unit root, and we say that the series Y is non-stationary. Unfortunately, the usual t-statistic for testing the unity of value of ρ under the violated CLRM assumptions, does not follow the usual t-distribution. It is now the τ, also called the Dickey-Fuller Test following Dickey and Fuller who computed the values of the t-statistics under these special circumstances.

Note that for sufficiently large distributions, τ asymptotically approaches the t-distribution and hence when the sample is sufficiently large the DF test can be approximated by the usual t-distribution.

To recapitulate, then, the test for Stationarity, also called the Unit Root Test, is also goes by the name Dickey-Fuller (DF) Test. Note that in more advanced contexts, the efficacy of the DF and the ADF tests as adequate tests of Unit Roots/ Stationarity has been extensively contested and the power of the test found to be low. Alternative tests have been suggested (Maddala and Kim, 1998). For the present context

however, we restrict ourselves to the DF test for Unit Roots noting its popularity, universality and ease of interpretation.

Augmented Dickey-Fuller (ADF) Test:

A closely related test is the ADF, usually employed more frequently, when there is presence of serial autocorrelation. The change from the DF is the presence of an extra term in the denominator. The presence of serial autocorrelation can be detected by looking at the DW Durbin-Watson ***d-statistic*** which as standard practice is reported in DF tests.

NON-STATIONARITY, UNIT ROOTS AND COINTEGRATION: THE PROBLEM OF SPURIOUS REGRESSION:

In economics, our concern is with establishing/ exploring relationships between economic variables. Explaining one variable with another with regression is done and certain assumptions like linearity etc. maintained.

When two or more economic series are non-stationary, however, we have what Clive Granger (1992) termed as the problem of spurious regression. How to establish or ascertain the genuineness of the estimated regression when the various variables involved are non-stationary?

Cointegration allows us the way to establish relationships between non-stationary variables. To understand this, we define cointegration first.

Definition:

Integrated Series/ Order of Integration:

Suppose X_t is a non-stationary time-series which becomes stationary on differencing once. We then say X_t is "Integrated of order 1".

In general, if a stochastic process becomes stationary on being differenced "**d"** times, we say that it is integrated of order d. In notational terms,

$$X_t \sim I(d)$$

Cointegrated Time Series:

If for two non-stationary time-series $X_t \sim I(d)$ and $Y_t \sim I(d)$, a vector can be found such that the linear combination Z_t of X_t and Y_t is stationary (in other words, $Z_t \sim I(0)$), then X_t and Y_t aree said to be cointegrated.

In notational terms, if, for two time series

$X_t \sim I(d)$, and $Y_t \sim I(d)$, non-zero constants β_1, β_2 can be found such that

$$\beta_1 X_t + \beta_2 Y_t = Z_t \sim I(0), \qquad \beta_1, \beta_2 \neq 0,$$

then Xt and Yt are cointegrated.

It can be shown that for any two unique cointegrated time series Xt and Yt, the cointegrating vector is unique (Perron 1991, Maddala and Kim 1998).

Most applications of cointegration methods treat the case where both series are I (1).

The general definition of co-integration (for the I(1) case) is as follows:

Definition: A vector of I(1) variables y_t is said to be cointegrated if there exist at vector β_i such that $\beta_i' y_t$ is trend stationary. If there exist r such linearly independent vectors β_i, i = 1,...,r, then y_t is said to be cointegrated with cointegrating rank r. The matrix B = (β_1, β_2, … β_r) is called the cointegrating matrix.

Note that $\beta' y_t$ is an r-dimensional vector of trend-stationary variables.

Economic Implication of Cointegration

Why is the issue of cointegration important? This is because, it allows us to conceptualise a long-run relationship between economic variables even when they are not allowing the usual Classical regression methods. Presence of cointegration ensures that even when variables/ series are appearing to diverge away from each other over time, they are, in fact, moving together which is not simply generated because of the time factor.

While essentially a statistical concept, cointegration does have economic implications which have been amply elaborated by, among others, B. Bhaskara Rao (1995), Maddala and Kim (1998) and others who have discussed at length the economic interpretation of cointegrating vectors.

Relevance to Present Study

Having discussed very briefly some of the fundamental methodological issues at stake, it is now time to relate these to the analysis at hand. Our analysis of central government expenditure not only seeks to study the pattern, changing composition and underlying trends of government expenditure and its variously distinguished components., but also envisages the interrelationship between government expenditure and its various dimensions on one hand, with national income magnitudes and other significant economic (structural) and institutional variables of the economy on the other.

The above discussion of some essential points, it is hoped, should help towards an appreciation of the rationale behind the successive analytical steps that need to be undertaken for carrying out our study.

ENDNOTES

[1] As per the IMF (2009), there are at least four alternative ways in which (de)-centralization can be measured, including the Centre's share in total revenues, and the Centre's share in total expenditure—all the indicators thus defined *not necessarily* implying identical results. In our present context, we have decided to use the indicator of of the share of Central Expenditure in the Total as more relevant.

[2] To provide a necessary elaboration, in the initial definition of the budget deficit, it had been customary to associate the deficit with an increase in money supply, and hence, inflation. Subsequent modifications and improvements in the various concepts of deficits led to the concept of the "monetized deficit" i.e., the addition to net RBI credit to the government which is in actual fact a better measure (though still an approximation), of the monetary impact. For illuminating discussions on these issues refer to Suraj B. Gupta (1981), *Monetary Planning for India*, Oxford and RBI (1985), *Report on the Working of the Monetary System in India.*

[3] Stationarity checks and Unit Root tests are quite frequently used synonymously in most empirical work. However, more powerful and satisfactory tests exist for Stationarity checks. For an extensive discussion on the various checks for Stationarity, Unit Root tests and their limitations, as well as the alternative proposed tests, see Maddala and Kim (1998).

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ENDNOTES

[i] As per the IMF (2009), there are at least four alternative ways in which (de)-centralization can be measured, including the Centre's share in total revenues, and the Centre's share in total expenditure—all the indicators thus defined *not necessarily* implying identical results. In our present context, we have decided to use the indicator of of the share of Central Expenditure in the Total as more relevant.

[ii] To provide a necessary elaboration, in the initial definition of the budget deficit, it had been customary to associate the deficit with an increase in money supply, and hence, inflation. Subsequent modifications and improvements in the various concepts of deficits led to the concept of the "monetized deficit" i.e., the addition to net RBI credit to the government which is in actual fact a better measure (though still an approximation), of the monetary impact. For illuminating discussions on these issues refer to Suraj B. Gupta (1981), *Monetary Planning for India*, Oxford and RBI (1985), *Report on the Working of the Monetary System in India*.

[iii] Stationarity checks and Unit Root tests are quite frequently used synonymously in most empirical work. However, more powerful and satisfactory tests exist for Stationarity checks. For an extensive discussion on the various checks for Stationarity, Unit Root tests and their limitations, as well as the alternative proposed tests, see Maddala and Kim (1998).

PART II

ANALYSIS OF CENTRAL GOVERNMENT EXPENDITURE IN INDIA: 1970-71— 2007-08

4

Analysis of Central Government Expenditure 1970-71 — 2007-08

Phase I

"There are two separate parts of (the) institutional stage of a positive theory of public finance. ... The second part of a theory of institutional choice, as an integral part of a positive theory of public finance, is essentially empirical. Perceptive observations of real-world fiscal structures are needed, and the analyst must try to isolate the central elements in such structures that serve best to explain and predict. Conceptually, models of real-world institutions can be tested; hypotheses can be refuted, and, in turn, different hypotheses can be suggested. Painstaking accumulation of the record of historical experience, careful presentation of descriptive detail, and comparative analysis: these are all necessary"

-- James M. Buchanan (1968):

CHAPTER 4

Analysis of Central Government Expenditure: 1970-71 — 2007-08

Phase I: Classification & Growth of Central Government Expenditure

The chapter is organized into the following major sections.

4.1 CLASSIFICATION OF GOVERNMENT EXPENDITURE

While undertaking the detailed analysis of Central Government Expenditure envisaged in the present study, certain preliminary conceptual and analytical aspects need to be set down at the outset. The first such important aspect is the conventions underlying the classification of Central Government Expenditure as adopted in Indian budgetary parlance, an aspect that has already been discussed in detail in the Methodology Chapter (Chapter 3) and will be touched upon here only briefly as needed for immediate analytical purposes.

Why is the issue of expenditure classification significant? To cite only a few reasons:

- In the first place, understanding the various expenditure classifications in practice helps us to adopt a systematic study towards the pattern of government expenditure and its growth.
- Secondly, composition and pattern of government expenditure indicate the pattern in which the economy's resources are being mobilized and used by the government sector—and the trends discernible therein.
- Such expenditure classifications are important indicators of the government's liability implications as a result of its own actions.
- Studying the classification convention of items helps in assessing the critical aspect of the impact of various items of expenditure on the rest of the economy.

In the subsequent discussion, we briefly consider these aspects in turn.

4.1.1 Classification of Government Expenditure in Union Budgets

- FROM ADMINISTRATIVE ASPECT

As already mentioned in the Methodology Section, Union budgets in India have always been presented in respectively revenue and capital accounts. The budgetary classification adopted and presented are essentially along administrative lines, where the classification is basically a functional, or purpose-wise one, showing the expenditure under various administrative heads.

In India, the separate presentation of revenue and capital account transactions resulted in reporting separate revenue and capital account balances (surplus/ deficit), and an overall deficit ("budgetary deficit") used always to be reported. This distinction between the revenue and the capital accounts is absent, for instance, in the US budget presentation.

As Chelliah (1973) and Gupta (1981) among others, have pointed out, the purpose of the explicit distinction between revenue and capital account transactions is presumably to assess the liability implications, as well as the potential monetary impact, of government's budgetary operations. This apparently balance-sheet approach to categorizing expenditure has the important fallout that the asset-liability implications of government budgetary operations become evident when we look at the respective categories. While not exactly analogous to the current-capital distinction (Chelliah 1973), the Budgetary Document entitled **Economic Classification of Central Government Budget** provides a reconciliation between the respective classifications (Ministry of Finance, GOI, Budget Documents of various years).

From an administrative point of view, budgetary expenditure items have been presented according to the following further classifications within each of revenue and capital accounts:

- Plan and Non-Plan Expenditure
- Development and Non-Development Expenditure

Note that both these classification conventions are essentially along functional lines.

The long followed convention of characterizing government expenditure into Plan vs. Non-Plan categories has recently been criticized by the High Level Committee on Efficient Management of Public Expenditure (Planning Commission 2011). The classification, initiated in the early Planning years has been deemed as having lost relevance, resulting in a false distinction and compulsions to report escalated estimates of Plan expenditure on new projects and schemes. On the other hand, it discriminates against the much-needed components of maintenance of the old and continuing projects that are included in the so-called “Non-Plan” category. The Committee argued for a removal of the Plan- Non-Plan distinction. However, this classification has continued to remain up to the latest 2012-13 budget.

In this part of the analysis, so far as administrative classification is concerned, we have focussed along the Development—Non-Development lines. The respective weightages, as well as and growth patterns in the various components have been analyzed in detail. Weightage of various budgetary items, as well as their respective growth rates decade-wise, and for the entire study period, have been estimated for a detailed understanding of the observed budgetary trends.

Finally, for understanding the economic impact of a specific expenditure type, it is necessary to refer to what is known as the ***economic*** classification of budgetary expenditure. The **Economic Classification of Central Government Budget** provides a disaggregation of government expenditure into its economic components, viz., distinguishing final outlays comprising government consumption and capital formation, from transfer payments, and loans and financial investments.

Hence, apart from the classification conventions noted above, it is also useful to briefly discuss the Economic and Functional Classification of the Union Budget typically presented along with the Budget. This presents the following important classifications:

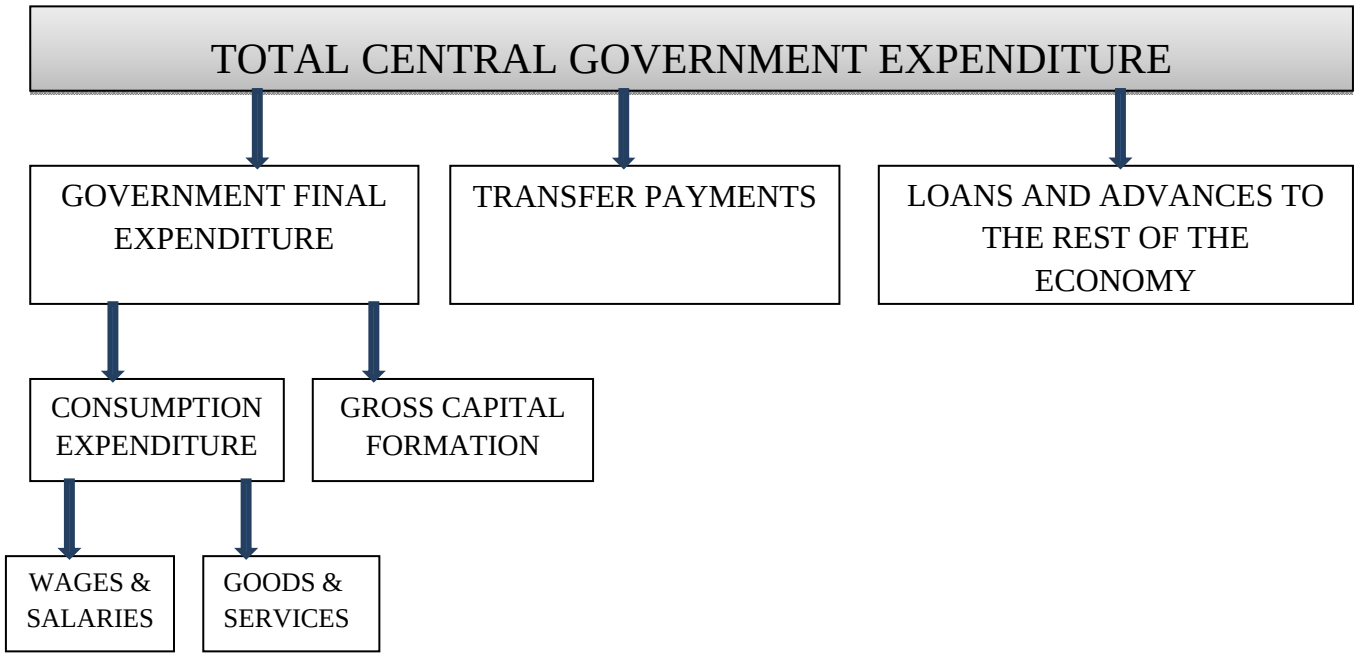
- **ECONOMIC CLASSIFICATION OF CENTRAL GOVERNMENT EXPENDITURE**
- **ECONOMIC-CUM-FUNCTIONAL CLASSIFICATION**

ECONOMIC CLASSIFICATION

In the present study, we have paid particular attention to government budgetary magnitudes that are economically meaningful. On one hand, we need to pay attention to the economic impact of the government's budgetary operations. However, the converse problem that is of crucial importance in the present analysis is the manner in which various government expenditure categories are in turn, influenced by the host of economic and institutional forces operating in the economy. Accordingly, the economic categories of government expenditure are of major analytical significance in this study.

From an economic aspect, government expenditure can be classified into the following categories as in Fig **4.1** below.

Fig 4.1: ECONOMIC CLASSIFICATION OF CENTRAL GOVERNMENT EXPENDITURE



Source: Economic and Functional Classification of Central Government Budget, various years,Budget Documents, GOI, various years.

The economic classification of the Central Government Budget is presented in a set of six (6) accounts, presented in table **4.1** below, which are in turn extremely useful and indispensable in deriving a number of economically meaningful magnitudes from budgetary items. This carries considerable economic significance since budgetary entities, as already mentioned, are often merely of an administrative nature without clear economic significance.

One additional point needs to be noted here. Although there is separate presentation of the accounts of Government Administration and Departmental Undertakings respectively so far as Current Account Transactions are concerned (Bhattacharya 1984, Reddy et al. 1984, Ministry of Finance various years), their Capital accounts are presented as combined together (Accounts III to VI below).

TABLE 4.1

ECONOMIC CLASSIFICATION OF CENTRAL GOVERNMENT EXPENDITURE

ACCOUNT I: Transactions in commodities and services and transfers: Current Account of Government Administration

ACCOUNT II: Transactions in commodities and services and transfers: Current Account of Departmental Commercial Undertakings

ACCOUNT III: Transactions in commodities and services and transfers: Capital Account of Government Administration and Departmental Commercial Undertakings

ACCOUNT IV: Changes in Financial Assets: Capital Account of Government Administration and Departmental Commercial Undertakings

ACCOUNT V: Changes in Financial Liabilities: Capital Account of Government Administration and Departmental Commercial Undertakings

ACCOUNT VI: Cash and Capital Reconciliation Account of Government Administration and Departmental Commercial Undertakings

To demonstrate the usefulness and significance of the above economic classification, we have depicted below a few examples as to how economically significant magnitudes can be derived from the Central Budget using the system of accounts as referred to above:

- **Income Generation by the Central Government**
- **Consumption Expenditure of the Central Government**
- **Saving of the Government**

I. Income Generation by the Central Government

	(Rs. crore)
	2007-08 *Accounts*
1. Wages and salaries paid by Government Administration (vide item 1.1 in Acct. 1)	**52837**
2. Net output of departmental commercial undertakings	**44698**
(a) Wages and salaries (including wages and salaries component of repairs and maintenance operations)	25519
(b) Interest	5086
(c) Profits transferred to administration and retained plus excess of depreciation provision over renewals and replacements	14093
3. Wages and salaries component of Government outlays on construction*	**11069**
4. Total (1+2+3)	**108603**

** One-third of the total expenditure on construction shown in Account 3.*

Source: An Economic Classification of Central Government Budget 2009-10

II. Consumption Expenditure of the Central Government: Although not provided directly in the Budget, Account I referred to in the above allows us to derive this element:

Account 1. Transactions in commodities and services and transfers: Current Account of Government Administration

	(Rs. Crores) **2007-08** ***Actuals***
1. Consumption expenditure	**131396.0**
1.1 Wages and Salaries	52836.7
1.2 Commodities and Services	78559.3

Source: An Economic Classification of Central Government Budget 2009-10

III. Central Government's Net Savings	*(Rs. crore)* 2007-08 *Accounts*
1. Savings of Government Administration (vide item 5.1 in Acct. 3)	**-5280**
2. Net profits of departmental commercial undertakings (i)+(ii)	**14240**
(i) Transferred to Government Administration (vide item 7 in Acct.2)	962
(ii) Retained (vide item 8 in Acct.2)	13278
3. Depreciation provision of departmental commercial undertakings(vide item 5.3 in Acct.3)	**5677**
4. Gross savings by Government (1+2(ii)+3)	**13674**
5. Expenditure on renewals and replacement of departmental commercial undertakings (vide item 1.1(b) and 1.2(b) in Acct. 3)	**5824**
6. Net savings by the Government (4-5)	**7850**

Source: An Economic Classification of Central Government Budget 2009-10

Reconciliation

Apart from the above, the Economic Classification Document also incorporates a statement providing reconciliation between the magnitudes of current revenues, and revenue as well as capital expenditures as occurring in the Budget, with those mentioned in Accounts 1 and 3 of the Classification (the reader is requested to refer to the *Economic Classification of Central Government Budget, GOI,* for any Budget year for detailed treatment of this part).

Overall, then, the usefulness of the Economic Classification of government expenditure is to i) classify government expenditure in such manner that relates

directly to the economic implications of expenditure for the rest of the economy (Fig 4.2 above), as well as ii) yield various important magnitudes of crucial economic significance, a few examples having been discussed in the above. In a subsequent section of our analysis we have taken up in detail the economic categorization of central government expenditure and the observed patterns thereof.

- **ECONOMIC-CUM-FUNCTIONAL CLASSIFICATION**

Finally, the Economic-cum-Functional Classification presented along with the Union Budget affords us an idea as to the economic significance of the various functional heads presented in the Budget.

To reiterate, the composition of government expenditure at the central level can be studied in terms of the plan-non-plan distinction/ development- non-development classification, or revenue vs. capital classifications, each further classified into functional categories. From an economic point of view, the distinction between exhaustive (final expenditure) vs. non-exhaustive (transfers) has also been argued by Toye (1981) and others as analytically the most meaningful classification.

To sum up the discussion above, then, we may note the following points:

- Budgetary classifications are basically what may be termed "administrative" in nature, where the focus is on the administrative aspects of items of expenditure.
- Although basically an accounting definition, the practice of presenting the budget in revenue vs. capital accounts is in addition a step, albeit a rudimentary one, towards capturing the debt or asset-liability position of the government.

- Divisions like “Development vs. Non-Development”, or “Plan vs. Non-Plan” expenditure, essentially along functional (purpose-wise) lines, are again, administrative in nature.
- The Economic-cum-Functional Classification of the Central Budget, presented alongside with the annual budget, presents the budgetary magnitudes classified along economic dimensions and their respective functional classifications. It also illustrates how to “reconcile” the budgetary revenue-capital magnitudes into the more precisely defined current-capital components.
- The economic classification is also provided in detail by the NAS (CSO)

4.1.2 Rationale of the Classification Adopted in the Present Analysis

In our discussion on the growth and composition of central government expenditure, we adopt the following method:

1. We first present the account in terms of revenue vs. capital accounts of expenditure, since these are the primary administratively defined categories.
2. Next, we take up the Development-Non-Development expenditure, again administratively defined as mentioned above.
3. The above classifications, moreover, are essentially along **functional** (purpose-specific) lines, where we discuss, within each of the categories, the major individual items (/ item groups), focussing on their respective patterns of growths, and weightage in the relevant category for the overall period, as well as the pre-Reforms and post-Reforms periods.

4. This is essential to capture the items whose behaviour has largely determined the overall pattern of central government expenditure observed over our study period.
5. Having discussed fully the growth and general as well as detailed trends in the functional aspects of expenditure, the next chapter (Chapter 5 of present study) then takes up detailed study of how the changing growth patterns observed for the various items of government expenditure have been leading to changes in the composition of expenditure, overall and at more disaggregated components level.
6. Finally, Chapter 6 takes up the **economic** categories of expenditure, the rationale being that it is this latter classification that is the most significant from the point of view of the relevance to the rest of the economy and its economic impact. It is here that we present an attempt at formalizing the process of government expenditure over our study period, in terms of a number of economic and institutional variables.

4.2 GROWTH OF CENTRAL GOVERNMENT EXPENDITURE 1970-71 TO 2007-08

In this section, the pattern of growth in central government expenditure, as well its various components as observed over our study period, is discussed in a systematic manner.

4.2.1 Growth in Nominal terms (current price):

The growth of government expenditure, and in particular at the central government level, has been phenomenal. After India adopted planned industrialization under State command in 1950-51, the initial thrust on government control at the "Commanding Heights" of the economy and the accompanying extreme fiscal

conservatism characterizing the 1950s and 1960s began to be relaxed, gradually if almost imperceptibly, in the 1970s itself. The slow but sure tendency towards toward liberalization, begun sporadically in the 1980s, finally gained momentum from 1990s onwards.

Over the nearly 4 decades long period under study from 1970-71 to 2007-08, central government expenditure in nominal terms has grown from Rs. 4564.52 crores in 1970-71 to Rs. 21032 crores at the turn of the 1980s. Total Central Government expenditure stood at Rs. 97484 Crores in 1990-91, and had grown to Rs.675620 Crores in nominal terms by 2007-08 (Actuals). Table 4.2 below gives the corresponding absolute magnitudes and the respective continuous compound rates of growth in central government expenditure from 1970-71 to 2007-08 (current price data).

TABLE 4.2

CENTRAL GOVERNMENT EXPENDITURE AND ITS GROWTH (NOMINAL)

YEAR	TOTAL EXPENDITURE (TE) Rs. Crores (at current price)	CONTINUOUS COMPUND GROWTH RATES		
		1970-71 to 2007-08	PRE-REFORMS (1971 to 1990)	POST REFORMS (1991 to 2008)
1970-71	4564.52		15.52	
1980-81	21032.95			
1990-91	97484.5	13.24		
2000-01	301432.36			
2007-08	675620.8			10.52

Data Source: APPENDIX TABLE AI.1

As the data highlights, while the overall (compound) growth rate in government expenditure for the entire period 1970-71 to 2007-08 has been around 13.24%, that for the pre-reform period viz. 1971 to 1990 exceeded 15.5%, followed by a more modest rate of 10.5% in the post-reform segment of 1991-2008. Clearly,

pre-reform average growth rate is higher than the overall growth rate, whereas post-reforms, the average growth rate is lower than the overall average..

TABLE 4.3

CENTRAL GOVERNMENT EXPENDITURE

DECADEWISE GROWTH (% AVERAGE)

Year	Decadal average growth (%) in Total Expenditure
1971-1980	14.51
1981-1990	17.82
1991-2000	12.59
2001-2008	11.67

Source: APPENDIX TABLE AI.1

In TABLE 4.3 above, we look in greater detail at the individual decade-wise growth within the broad periods discussed above, also attempting to discern the factors underlying the observed growth pattern. Clearly, while expenditure growth in the two decades prior to the 1991 economic reforms (14.5% during 1971-1980 and 17.82% during 1981-1990) typically exceeded that subsequent to 1991, this growth was most rapid (nearly 18% on average) in the decade 1981-1990 immediately preceding the reforms. Indeed, this rapid acceleration in government expenditure had been one of the principal-most factors necessitating the widespread fiscal reforms in 1991. Post-reforms, the average growth rate of expenditure dropped down to 12.6% in 1991-2000, followed by a further lowering to around 11.7% over 2001-2008.

TABLE 4.4
CENTRAL GOVERNMENT EXPENDITURE: ANNUAL AVERAGE GROWTH (1970-71 to 2007-08)

PRE-REFORMS

YEAR	% ANNUAL GROWTH
1971-72	21.72
1972-73	16.72
1973-74	3.34
1974-75	24.51
1975-76	25.74
1976-77	12.61
1977-78	6.57
1978-79	23.52
1979-80	10.36
1980-81	22.56
1981-82	11.49
1982-83	18.66
1983-84	17.83
1984-85	24.42
1985-86	20.97
1986-87	20.48
1987-88	7.66
1988-89	15.98
1989-90	18.17

POST-REFORMS

YEAR	% ANNUAL GROWTH
1990-91	11.13
1991-92	7.15
1992-93	13.60
1993-94	16.01
1994-95	11.10
1995-96	10.46
1996-97	11.29
1997-98	8.81
1998-99	20.96
1999-00	15.42
2000-01	5.54
2001-02	10.72
2002-03	6.81
2003-04	-2.14
2004-05	11.92
2005-06	20.75
2006-07	13.79
2007-08	25.94

Source: APPENDIX TABLE AI.1

The much lower subsequent growth rate in expenditure clearly reflects the fiscal management compulsions of the 1990-91 reforms, and the later requirements of the FRBMA (Fiscal Responsibility and Budgetary Management Act) that came into effect in 2003.

To comprehend the growth patterns as well as the underlying factors in greater detail, however, we need to look at the year-wise pattern, presented in Table 4.4 above, clearly bringing out the year-to-year fluctuations.

The fluctuating growth in the decade of 1970s is explained by the facts, first of all, of the massive expenditure growth necessitated in 1971 and 1972, being the two war years. Expenditure growth, though sharply reigned in during 1973, again picked up after the 1973 world oil shock and the accompanying BOP crises. The pick-up in expenditure growth in the latter part of the decade is entirely attributable to a continually growing revenue expenditure which were to soon begin outstripping revenue receipts, gradually shrinking the surplus in the revenue account which the Central Government had succeeded in maintaining till then, and ultimately resulting in the emergence of a revenue deficit in 1979-80, that was to persist and increasingly widen during subsequent decades. A detailed examination of the pattern of revenue expenditure has been undertaken in a subsequent section dealing with compositional change in government expenditure.

The decade of 1980s opened with an annual expenditure growth rate exceeding 20%, which was indeed to remain the typically dominant pattern of this decade barring a few exceptions. The decade of 1980s marked the sporadic beginning of tentative attempts at liberalization (Little and Joshi 1994, Mundle and Rao 1997 among others). As the economy took the first hesitant steps towards liberalization, a gradual tendency towards loosening of the tight and conservative fiscal stance of the 1960s began to be visible. The 1980s, particularly the latter years were to witness increasing acceleration in government expenditure, and by 1989-90, with government expenditure levels, particularly revenue expenditure having reached hitherto unprecedented levels, there were serious concerns over mounting government indebtedness and fiscal unsustainability. All indicators of budgetary imbalance had reached uncomfortably high magnitudes. In 1980s, the principal factor leading mounting government expenditure was Interest payments which alone

were commanding nearly 1/5th of total expenditure and close to 1/3rdof revenue expenditure.

With an already unstable internal fiscal situation, matters came to a head with two external triggers, the Gulf War of 1989-90 and the associated oil and critical BOP crisis, sending an already precariously poised Indian economy over the precipice into serious macroeconomic instability and critical imbalances on the external and internal front.

In the well-known aftermath of the crisis, the so-called "Fund-Bank" advocated widespread reform measures that India embraced in 1991. A paradigm shift in India's fiscal conduct marked an essential part and parcel of the reform program, with an emphasis on short-term expenditure containment, a fact that is reflected in marked lowering in expenditure growth in the immediate post-1991 years (climbing down from 15.98% and 18.17% in the consecutive years 1988-89 and 1989-90, to respectively 11.13% and 7.15% in 1990-91 and 1991-92, as TABLE 4.4 above shows). Unfortunately however, as noted by many concerned commentators (Nayyar 1993, Guhan 1995, Balakrishnan 1997 among them), this visible expenditure containment came at the cost of axing crucial capital development expenditure with revenue expenditure continuing to grow unabated, as the detailed scrutiny undertaken in subsequent sections would presently show.

As expected, then, expenditure growth did become lower in the immediate post-1991 decade, occasional slippages on the fiscal front notwithstanding. The sudden upsurge around 1998-99 (from an average rate of approximately 10.41% over the four-year span 1993-94 to 1997-98, to a sudden jump to 20.96% in 1997-98), was to a large extent attributable to the Asian Crisis, although the crisis admittedly had

relatively modest impact on India's resilient economy compared to the "Asian Tigers" which were much more seriously affected. In 2003, the landmark Fiscal Responsibility and Budgetary Management Act (FRBMA 2003) came into effect, showing an almost immediate and dramatic impact on expenditure which actually declined in nominal terms during 2003-04 (a *negative* growth of 2.14%, as in TABLE 4.4 above).

Indeed, as a further decomposition of the period 2001-2008 shows, the relative success in curbing expenditure growth would probably have continued for some time, had it not been for the impending Global Financial Crisis that was to reach its pinnacle in 2008 in the US, shaking the entire interconnected global economy to its very core. As the global recessionary tremors already began to make their impact felt in the Indian economy too, immense pressure was created on the government to take measures for sustaining a positive and stimulated economy, rather than press harder for fiscal consolidation. Indeed, this was a compulsion that had already made itself felt from 2005 onwards with consequent unavoidable growth in expenditure, from a growth rate of 20.75% in 2005-06 to 25.94% in 2007-08.

4.2.2 Economic (and Political) Realities Shaping Expenditure Growth--Brief Overview

Finally, no analysis of the growth and behaviour of government expenditure in India over the chosen study period can be complete without at least an attempt to comprehend the contemporary political regime changes and frequent changes in the power-holding at the Centre that, naturally and quite often, influenced policies and priorities to a great deal, as demanded principally by political expediency and pragmatism.

To trace a very brief chronological understanding of the various dimensions of such change, the period 1970s to 1990s was on the whole characterized by relative political instability, with frequent changes in the political regime holding power at the Centre, compared to the relatively stable (politically speaking) post-1991 scenario. 1976 had been the heydays of emergency, with the subsequent Janata Dal sweep of the elections in the subsequent anti-Indira, indeed anti-Emergency, backlash. All these have been amply reflected in budgetary, especially expenditure magnitudes.

A broad chronological pointer is thus needed to the various political regimes in power at the Centre in the overall period and the understandable shifts in policies and priorities that took place alongside each such change (*Frankel (2011), Little and Joshi (2001)*. In table 4.5 below, we have attempted to present a chronological overview of the political and economic significant landmarks in India's development journey. It is also pertinent to note here, along with the various regimes and turns of fortunes that the various political parties have faced at the throne of Indian polity, allegations of misuse / abuse of political power and of public funds has continued to rock the Indian political scene increasingly as media and public opinion have gained greater and stronger voice.

TABLE 4.5 INDIA: POLITICAL REGIMES AT THE CENTRE & ECONOMIC ENVIRONMENT: A TIMELINE

PRIME MINISTER (PM)	PERIOD /YEAR IN OFFICE	PM'S PARTY (GOVERNING ALLIANCE)	MAJOR POLITICAL & ECONOMIC EVENTS DURING PERIOD IN OFFICE
Jawaharlal Nehru	1947 - 1964	Indian National Congress	Indo-Pakistan War of 1947; created Planning Commission of India and initiated Five-year plan to increase government investment in agriculture and industry; launched programmes to build irrigation canals, dams and spread the use of fertilizers to increase agricultural production; oversaw widespread poverty and unemployment, even with improvements in agriculture and infrastructure; took active welfare policies targeting the socially-vulnerable; pioneered the policy of non-alignment and co-founded the Non-Aligned Movement; Sino-Indian War.
Gulzarilal Nanda	1964	Indian National Congress	Served as caretaker Prime Minister until the election of Lal Bahadur Shastri
Lal Bahadur Shastri	1964 - 1966	Indian National Congress	Indo-Pakistani War of 1965; pushed for Green Revolution in India and Operation Flood; The National Dairy Development Board was formed.
Gulzarilal Nanda		Indian National Congress	Served as caretaker Prime Minister once again, until Indira Gandhi was chosen as the new leader.
Indira Gandhi	1966 - 1977	Indian National Congress	Nationalized banks; won the Indo-Pakistani War of 1971, which resulted in the formation of Bangladesh; signed the Shimla Agreement; tested the first nuclear weapon with Smiling Buddha; initiated Green Revolution in India; imposed state of emergency 1975-1977.
Morarji Desai	1977 - 1979	Janata Party	Improved relations with Pakistan, China and the United States; softened its relationship with the Soviet Union; launched Sixth Five-Year Plan, aiming to boost agricultural production and rural industries; the plan proved unsuccessful leading to resurging inflation, fuel shortages, unemployment and poverty; tendered his resignation as a result of loss of support from within Party
Charan Singh	1979 - 1980	Janata Party (Secular) with Indian National Congress	Lost support of Congress, which led to his resignation without even a single session of Lok Sabha
Indira Gandhi	1980 - 1984	Indian National Congress	Operation Blue Star, which subsequently led to her assassination

TABLE 4.5 INDIA: POLITICAL REGIMES AT THE CENTRE & ECONOMIC ENVIRONMENT: A TIMELINE *(Contd.)*

Rajiv Gandhi	1984 - 1989		1984 anti-Sikh riots; significantly reduced License Raj; expanded telecommunications in India; signed the Indo-Sri Lanka Peace Accord; Faced serious allegations of corruption at highest level with the Bofors scandal
V P Singh	1989 -1990	Janata Dal (National Front)	
Chandra Sekhar	1990 - 1991	Samajwadi Janata Party with Indian National Congress	Resigned due to accusations of espionage. Subsequent withdrawal of Congress' support; Assassination of Rajiv Gandhi
P V Narasimha Rao	1991 - 1996	Indian National Congress	Initiated Economic liberalisation in India; SEBI Act 1992; formation of National Stock Exchange of India; 1993 Bombay bombings; introduced TADA; Demolition of Babri Masjid
Atal Behari Bajpai	1996	Bharatiya Janata Party	Hung parliament. Was in power for only 13 days, after BJP could not gather enough support from other parties to form a majority.
H D Deve Gowda	1996 - 1997	Janata Dal (United Front)	Hung parliament. After a failed attempt of forming a BJP government, Congress refused to form a government and instead supported a minority United Front coalition led by Janata Dal. First visit by a Chinese head of state to India.
Inder Kumar Gujral	1997 - 1998	Janata Dal (United Front)	Fodder scam; Jain Commission
Atal Behari Bajpai	1998 - 2004	Bharatiya Janata Party (National Democratic Alliance)	Pokhran nuclear tests; Kargil War; National Highway Development Project; Pradhan Mantri Gram Sadak Yojana; POTA; Sarva Shiksha Abhiyan;
Dr Manmohon Singh	2004 - Till Date	Indian National Congress (United Progressive Alliance)	Indo-US civilian nuclear agreement; won the 2008 Lok Sabha vote of confidence; US $ 1 Trillion Economy milestone reached; Economic crisis of 2008; National Rural Employment Guarantee Act; Right to Information Act; National Rural Health Mission;

To sum up, then, we can recall Frankel's incisive comments in the preface to her treatise on India's political economy … "The major issues confronting India in the new century both resonate with, and depart from, [the central questions facing it at Independence]. Significant gains have been made in reducing absolute poverty, but the "two economies" (…) persist. Liberalization with a "human face", that is, economic reforms which address the needs of the majority of the population in the rural sector, have yet to be fully recognized as an urgent necessity both to build a competitive economy and a strong nation-state." (Frankel 2011 pp xiv).

Thus, we have witnessed the emergence of two "India"-s ….one, the elite, the privileged who have the advantages of education, both academic as well as political….and the vast sea of faceless "masses", who often indeed have decided the electoral fate at the Centre but are, yet, to benefit in any meaningful sense from the progress the nation has made in recent years. The challenge is to bridge the chasm, to take all together in the march towards the prosperity of what still bears the proud mantle of the world's largest democracy, and the crown of thorns such a responsibility inevitably carries in its wake.

4.2.3 Growth of Central Government Expenditure 1970-71 to 2007-08 (real terms)—the Issue of Deflators

We now move on to the analytical issue of growth in government expenditure in ***real*** terms, as against growth in mere absolute terms. The latter camouflages the growth in money value due to the effect of inflation alone and hence would overstate the extent of growth. One must therefore look at the growth in real term to understand the actual extent. The other way of viewing the absolute money values in perspective is

"normalizing" the former with respect to GDP, a standard practice adopted in the literature. All of these aspects have been elaborated in subsequent sections.

If absolute figures overstate the real extent of growth, why, then, look at absolute figures at all? The simplest, and most obvious, answer of course is that government revenue-expenditure data in India is typically presented in current price terms. Indeed, this is the customary practice in most countries (except for examples like Australian government expenditure data which is also made available in constant prices). At a more fundamental level, however, money values give us an idea in monetary terms as to the volume of resources in the economy being commanded by the government sector at any point of time.

TABLE 4.6

Growth of Central Government Expenditure 1970-71 to 2007-08

(Constant prices, based on WPI 2004-05=100)

<table>
<tr><td rowspan="3">YEAR</td><td rowspan="3">TOTAL REAL EXPENDITURE Rs. Cr. (WPI 2004-05=100)</td><td colspan="3">Continuous Compound Growth Rates (2004-05 Price)</td></tr>
<tr><td>1970-71 to 2007-08</td><td>1970-71 to 1990-91</td><td>1990-91 to 2007-08</td></tr>
<tr><td>OVERALL</td><td>PRE-REFORMS</td><td>POST-REFORMS</td></tr>
<tr><td>1970-71</td><td>60059.0</td><td rowspan="5">5.91</td><td rowspan="2">7.57</td><td></td></tr>
<tr><td>1980-81</td><td>106766.2</td><td rowspan="4"></td></tr>
<tr><td>1990-91</td><td>247423.0</td><td rowspan="3">4.78</td></tr>
<tr><td>2000-01</td><td>362734.0</td></tr>
<tr><td>2007-08</td><td>579435.0</td></tr>
</table>

Source: Appendix Table AI.1

Table 4.6 above presents the corresponding real average rates of growth in terms of the Wholesale Price Index (base year 2004-05) as the deflator to derive real from nominal values. In the ensuing overview of the real growth in government expenditure, the

contentious issue suitably deflating government expenditure (discussed in detail in the methodology chapter above), has been briefly recapitulated.

As evident from table 4.6, even though the growth rates are much less dramatic when translated into real terms, the same pattern as before emerges so far as the respective trends in overall, pre-reforms, and post-reforms periods are concerned. To elaborate, the overall rate of growth for the entire study period (19710-71 to 2007-08) is 5.9%, while that for the pre-reforms period (1970-71 to 1989-90) is a much higher rate of above 7.5%, followed by a relatively lower growth rate of 4.78% in the post-reforms period (1990-91-2007-08).

Discussing the real growth in central government expenditure over the period subsequent to 1960s, Mundle and Rao (1997) identify four well-defined periods with distinct rates and patterns of growth. The first phase, between 1960 and 1975, showed a steady rate of growth, albeit with considerable government presence. The second period was between 1975 and 1985, showing gradual acceleration of the growth rate in government expenditure, which was curbed to some extent over 1985-1987. The phase 1987-1990 represents a period of unprecedented growth in government expenditure, particularly at the Central level, while the period 1991-1995 showed some reigning in of the expenditure growth (Mundle and Rao 1997).

Rao et al (2005) adopted an approach based on the Wholesale Price Index (WPI) as deflator, to derive real levels of government expenditure, commenting at length on the suitability of the relevant deflator measure. In their study primarily upon the uneven pattern of growth over the period 1975-76 to 2002-03, they noted the presence of

significant kinks in the uneven expenditure pattern. Among their crucial findings are: 1) the apparent absence of evidence for a "Political Budget Cycle Hypothesis", contradicting findings by Lalvani (1995) and others who have found support for it in India, and 2) the significant role played by interest groups in shaping Central Government expenditure pattern.

Looking at Real Growth: The Issue of Deflators—A Brief Review

While seeking to understand real expenditure growth and trends, we have to look at data that has been corrected for inflation/ price change effects. However, government expenditure data is typically presented in current price figures, not constant price, so that a set of suitable deflators has to be applied to render them into real values.

The problem encountered here is that, In India, while constant price figures are made available by the CSO and other government publications only for the economic category of expenditure, such presentation is not available so far as the functional categories are concerned. Obviously then, we have to tackle the issue of deflating expenditure separately when the functional categories are concerned.

In the Methodology chapter (Section **3.3**), we have already discussed at length the deflation practices adopted in standard empirical works, both internationally and in the Indian context. Here we recapitulate the fact that given the various considerations noted earlier, the present study has treated the problem of deriving real series respectively for ***economic*** and ***functional*** categories using ***two*** distinct methods. So far as functional categories are concerned, the WPI deflator (base year 2004-05) has been applied as

the more preferred index, following Rao et al (2005). The series thus obtained by deflation has been provided in Appendix I below.

So far as economic categories are concerned, separate indices have been used to deflate the individual series involved in the analysis. The details have been provided in section **3.3** of the Methodology chapter and reiterated in the analytical Chapter 6 below.

4.2.4 Choice of base year in the present analysis

By definition**,** a base year is used as a benchmark for measuring economic data. The criteria of choosing a base year are that it should be a "normal" year, viz. one without significant economic fluctuations, namely in variables of macroeconomic importance such as output, trade and inflation. Reliable price data should also be available for the selected year, which should be as recent as possible.

Starting with the year 1960-61, In India, the base years adopted in successive Official Statistics purposes have been 1970-71, 1980-81, 1993-94, 1999-2000, and till most recently, 2004-05, the year that we have taken as base year for our present analysis. The National Statistical Commission (NSC), under C. Rangarajan, has recommended updating of the base year every five years. Accordingly, Officials in the Ministry of Statistics and Programme Implementation are of the opinion that the base year of 2004-05, being already six years past, needs to be updated quickly (Mishra 2010).

As the famous economist and former NSC Chairman Tendulkar opined, "… 2004-05 was a year when change was beginning to happen". Granting the fact, the criteria that went behind our decision to accept 2004-05 as base year for the present analysis were as follows:

- ⇒ Base year should be neither too dated. Nor should it be too far removed from either of the end-points of the series of interest, so as to make comparisons and analysis *meaningful.* This is a condition that is eminently met by the base year 2004-05 for our chosen period of study viz. 1970-71 to 2007-08.
- ⇒ The economic circumstances during the year should be relatively stable, a condition that is fulfilled by the year 2004-05.
- ⇒ Data for base year series should obviously be already made obtainable or possible to compute, a condition that is fulfilled by the year 2004-05
- ⇒ In order to be a candidate for base year, the year should be reasonably stable also from the point of view of major policy regime change etc. 2004-05 has been a reasonably stable year in so far as the political stability aspect is concerned.

Updating the Base Year: Some Relevant Remarks

At this point, taking the discussion a little further ahead from the confines of our chosen period of study (1970-71 to 2007-08), some relevant contemporary issues regarding the necessity of further updating the base year may be noted here. Mishra (2010) reports some differences of opinion as expressed among eminent economists like (the late) Suresh Tendulkar and N. R. Bhanumurthy, respectively. Tendulkar, former chairman of NSC, the apex body on core statistics, supported 2009-10 as the new base year, while accepting that it was a "difficult year". With the economic growth rates more or less similar across the two years (6.9%) in 2004—05, the current official base year, and 7.4% in 2009-10, Tendulkar expressed his preference for the latter year since that is the more recent one.

On the other hand, Bhanumurthy (NIPFP) opines 2009-10 be rather unsuitable as a reference year as "all economic indicators had been volatile in the year (2009-10)…. 2010-11 (would) be a more stabilizing year from the cost and price point of view. Hence, the Ministry of Statistics should plan for a consumption expenditure survey in this year to make it the base year," (Bhanumurthy as cited in Mishra 2010).

4.2.5 Growth in Major Components of Central Government Expenditure

CENTRAL GOVERNMENT EXPENDITURE (1970-71 to 2007-08): REVENUE vs. CAPITAL ACCOUNTS

Table 4.7 below presents the respective continuous compound growth rates of revenue, capital as against total expenditure, both at current as well as constant price, over the study period 1970-71 to 2007-08.

TABLE 4.7

REVENUE & CAPITAL EXPENDITURE

CONTINUOUS COMPOUND GROWTH 1970-2008

	At Current Price			At Constant 2004-05 Price		
	1970-71 to 2007-08	1970-71 to 1990-91	1990-91 to 2007-08	1970-71 to 2007-08	1970-71 to 1990-91	1990-91 to 2007-08
CATEGORY	OVERALL	PRE-REFORMS	POST-REFORMS	OVERALL	PRE-REFORMS	POST-REFORMS
1	2	3	4	5	6	7
Revenue Exp.	14.34	15.79	11.88	6.95	7.83	6.13
Capital Exp.	9.40	14.97	4.12	1.98	7.02	-1.62
Total Exp.	13.24	15.52	10.52	5.91	7.57	4.78

Source: Appendix Table A I.1

The various dimensions of the changes are presented below in terms of the growth observed in total, revenue and capital and their respective development and non-development components, in nominal as well as real terms over our period of study (1970-71 to 2007-08).

TABLE 4.8
GROWTH OF CENTRAL GOVERNMENT EXPENDITURE 1970-71 TO 2007-08
(CONTINUOUS COMPOUND RATE)

	At Current Price			At Constant 2004-05 Price		
	1970-71 to 2007-08	1970-71 to 1990-91	1990-91 to 2007-08	1970-71 to 2007-08	1970-71 to 1990-91	1990-91 to 2007-08
	OVERALL	PRE-REFORMS	POST-REFORMS	OVERALL	PRE-REFORMS	POST-REFORMS
1	2	3	4	5	6	7
Revenue Exp.	14.34	15.79	11.88	6.95	7.83	6.13
Capital Exp.	9.40	14.97	4.12	1.98	7.02	-1.62
Total Exp.	13.24	15.52	10.52	5.91	7.57	4.78
Revenue Development	14.81	17.82	12.27	7.41	9.87	6.54
Revenue Non-Development	14.13	14.82	11.61	6.74	6.86	5.87
Capital Development	8.68	13.72	9.95	5.22	5.76	4.22
Capital Non-Development	15.59	17.45	10.25	8.20	9.49	4.51
Total Development	13.26	16.39	11.92	5.87	8.44	6.19
Total Non-Development	14.24	15.03	11.42	6.84	7.08	5.69

Source: APPENDIX TABLE AI.1 and AI.2

Paying particular attention to the pattern of real growth, the above constant price figures show that, overall, real total expenditure grew by 5.91% over 1970-71 to 2007-08. Pre-reforms, i.e., over 1970-71 to 1989-90, its growth was 7.57%, which dropped down

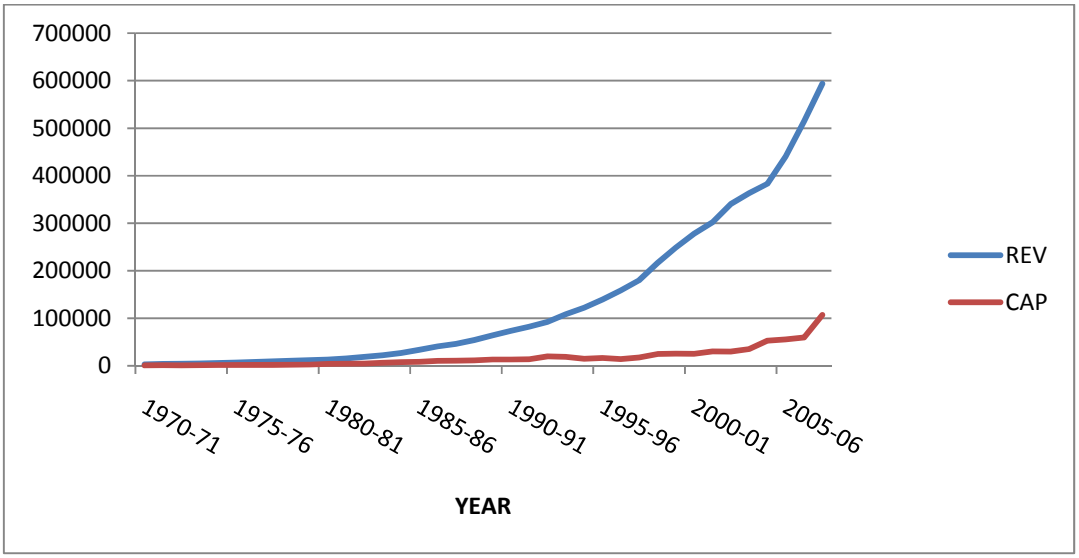
noticeably to 4.78% post-reforms (1990-91 to 2007-08). Among its major divisions, the by far faster growing component, both for pre-reforms and the post-reforms period, has been revenue expenditure, which grew by 6.95% overall (1970-71 to 2007-08). Pre-reforms (1970-71 to 1989-90) revenue expenditure had grown at 7.83%, followed by a slower rate of 6.13 post-reforms (1990-91 to 2007-08). Overall growth in capital expenditure (1.98% for the entire period 1970-71 to 2007-08) has been much slower in comparison, showing remarkable and dramatic contrast between the pre-reforms and post-reforms periods. While pre-reforms (1971-70 to 1989-90) growth in capital expenditure (7.02%) almost matched revenue expenditure in this segment, post-Reforms, that is, during 1990-91 to 2007-08, overall capital expenditure growth rate turned ***negative*** in real terms, dropping down to (-)1.62%.

The trends and patterns just discussed are brought out clearly by Figures 4.2 and 4.3 on the respective nominal and real patterns of growth in government expenditure and its major divisions, as follows.

Similar overview on the pattern of Development vs. Non-Development expenditure throughout the study period, as also the respective sub-categories, viz. revenue development vs. revenue non-development, and capital development vs. capital non-developmental expenditure, are presented later on in this section.

Fig. 4.2 GROWTH IN CENTRAL GOVERNMENT EXPENDITURE 1970-71-2007-08

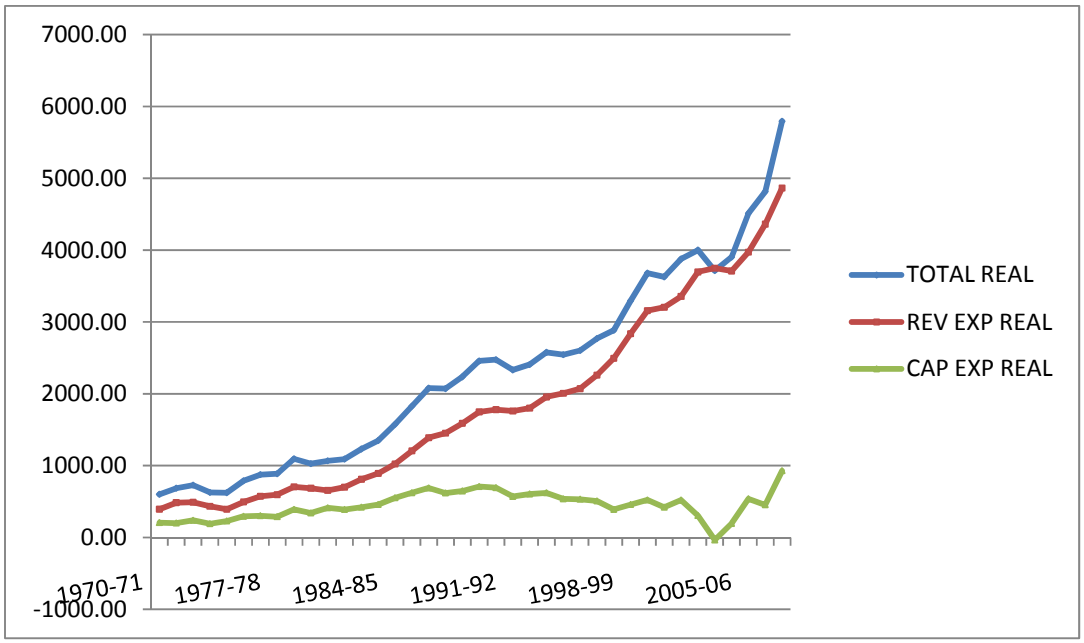
(NOMINAL VALUES) *(Rs. Crore)*



Data Source: APPENDIX TABLE AI.1

Fig. 4.3 GROWTH IN REAL CENTRAL GOVERNMENT EXPENDITURE 1970-71-2007-08

(TOTAL, REVENUE AND CAPITAL) *(Rs. Crore)*



Data Source: APPENDIX TABLE AI.1

Figures 4.2 and 4.3 bring out the following salient points.

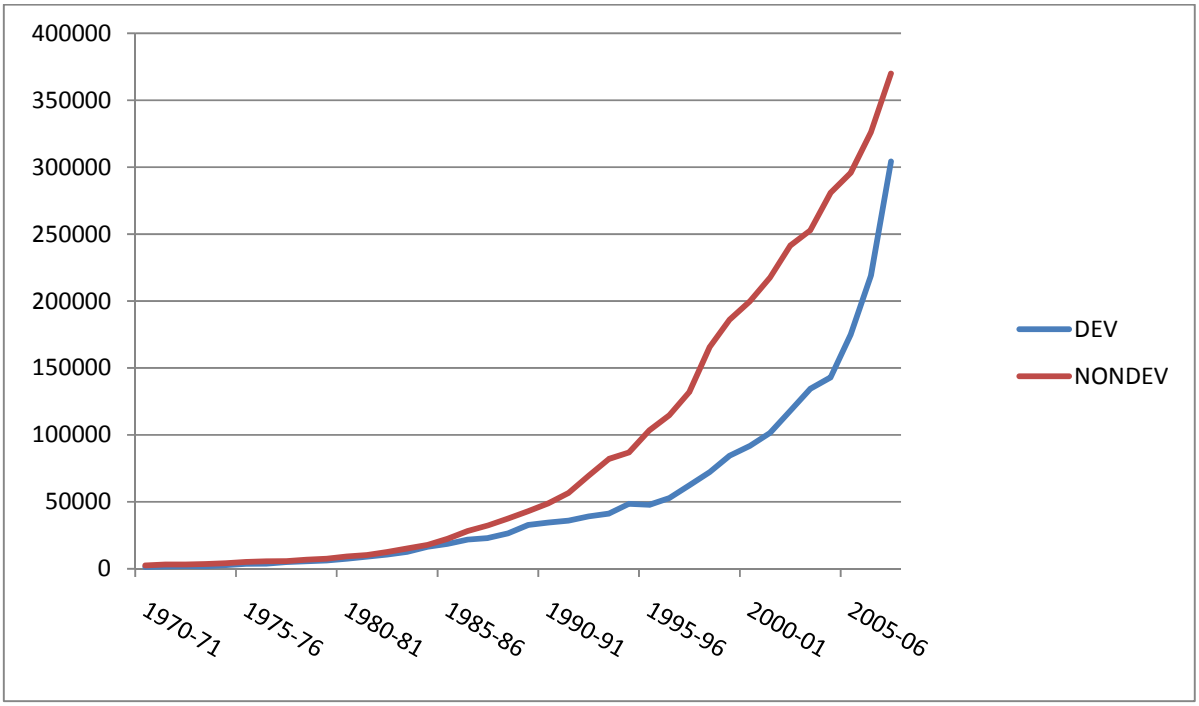
i. The pattern of real growth, as against nominal, has been distinctly different, although the underlying overall trends have remained the same in both cases. In both cases, total expenditure has been completely dominated by the revenue component.

ii. It is strikingly evident that the growth rate of revenue expenditure, both in current and constant price terms, has been all through outstripping that of capital as well as total expenditure, both components exhibiting a deceleration from the pre-reform period.

iii. Specifically, at current prices, the overall growth rate of revenue expenditure during 1971-70 to 2007-08 was 14.34% as against 13.24% for total expenditure and 9.40% for capital expenditure. On further breaking up, revenue expenditure growth in the pre-reform period (1970-71 to 1990) was as high as 15.79%, with capital expenditure growth at a somewhat lower rate of 14.97% and total expenditure growing at 15.52 %, all in current price terms. Post-reforms, i.e. over 1991 to 2007-08, however, revenue expenditure growth rate came down to 11.88%, at least till 2008.

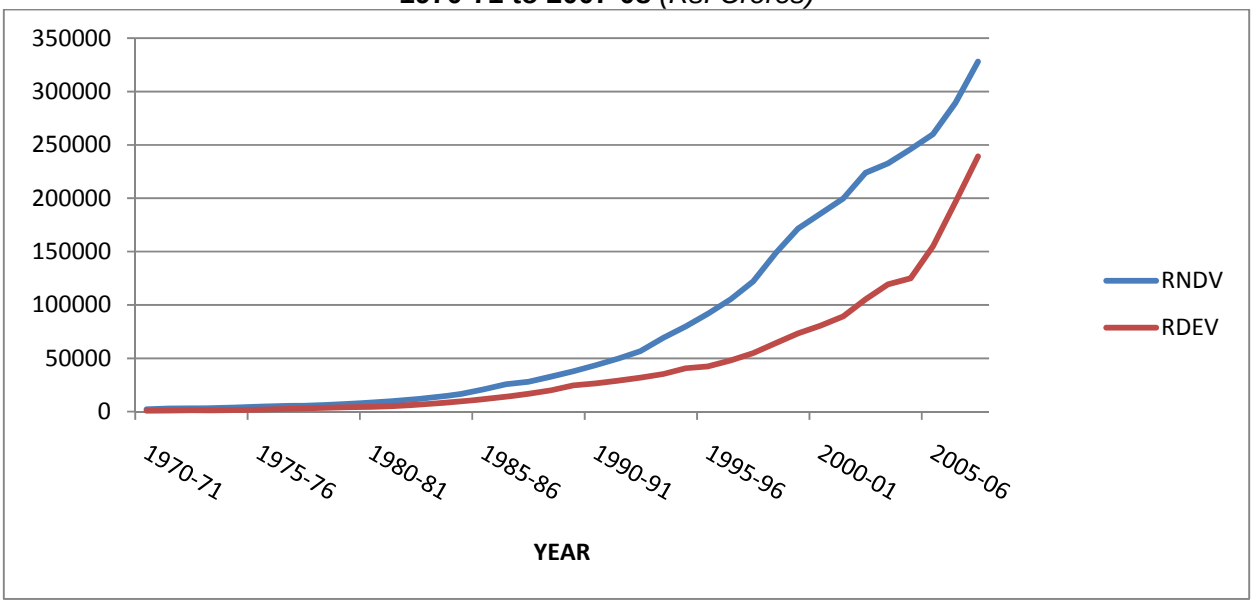
iv. The growth in capital expenditure, in real terms, has been remarkably erratic all through the study period.

Fig. 4.4 Development and Non-Development Expenditure of the Central Government 1970-71 to 2007-08 *(Rs. Crores)*



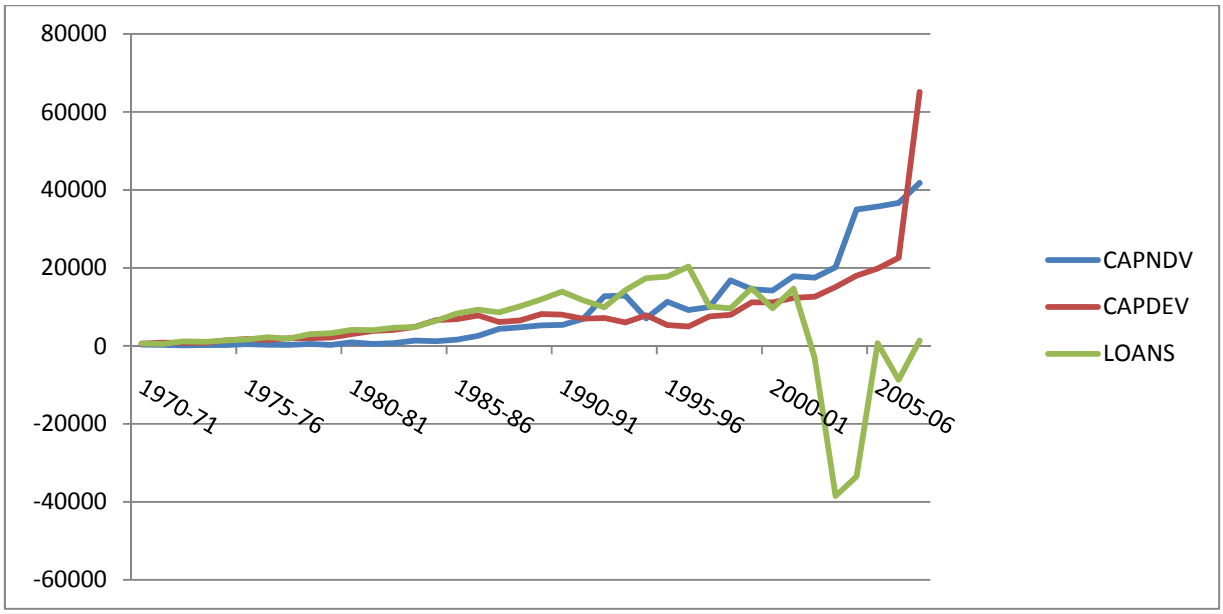
Data Source: APPENDIX TABLE AI.2

Fig. 4.5 Revenue Development and Non-Development Expenditure 1970-71 to 2007-08 *(Rs. Crores)*



Data Source: APPENDIX TABLE AI.2

Fig. 4.6 Capital Development and Non-Development Expenditure & Loans & Advances 1970-71 to 2007-08 *(Rs. Crores)*



Data Source: APPENDIX TABLE AI.2

TABLE 4.9: GROWTH OF CENTRAL GOVERNMENT EXPENDITURE

	At Current Price				At Constant 2004-05 price			
	1970-71 to 1979-80	1980-81 to 1989-90	1990-91 to 1999-00	2000-01 to 2007-08	1970-71 to 1979-80	1980-81 to 1989-90	1990-91 to 1999-00	2000-01 to 2007-08
1	2	3	4	5	6	7	8	9
Revenue Exp.	14.47	17.87	13.53	6.67	5.96	11.52	6.06	5.10
Capital Exp.	**15.61**	**13.46**	**3.28**	**11.91**	**7.10**	**7.10**	**-4.18**	**7.35**
Total Exp.	14.77	16.40	11.79	9.98	6.26	10.04	4.32	5.41
Revenue Development	18.41	19.01	11.12	14.01	9.91	12.65	3.64	9.43
Revenue Non-Dev	12.53	17.16	15.29	6.97	4.02	10.81	7.81	2.40
Capital Development	**14.92**	**9.72**	**1.95**	**19.48**	**6.41**	**3.37**	**-5.51**	**14.91**
Capital Non-Development	**4.10**	**25.88**	**8.13**	**14.88**	**-4.41**	**19.52**	**0.66**	**10.31**
Loan	**19.34**	**12.85**	**0.21**	**-33.50**	**10.83**	**6.49**	**-7.25**	**-37.84**

Source: APPENDIX TABLE AI.1 and AI.2

The decade-wise break-up of the respective growths in various components has been presented in TABLE **4.9** above. The Post-reforms, that is, during 1990-91 to 2007-08, overall capital expenditure growth rate ***in real terms***, dropped down markedly. The remarkable trends in capital expenditure, as brought out also in the figures above, indicate that this component needs to be studied more closely, and in the sub-section below we take a somewhat more detailed look at the growth pattern and behaviour of capital expenditure,

REAL CAPITAL EXPENDITURE: TRENDS PRE-& POST-REFORMS: A BRIEF LOOK

The behavioural pattern of capital expenditure has been particularly intriguing over the entire span of our study period, viz. both pre-Reforms, as well as post-reforms, up to 2007-08. To better comprehend the observed trend, we discuss, first, the composition of capital expenditure as it occurs in the budgetary data.

From the budgetary presentation, the convention followed is as below:

Capital Expenditure = Capital Non-Developmental Expenditure + Capital Developmental Expenditure + Loans and Advances to the Rest of the Economy .....…… . (1)

.

It is vitally necessary to remember the above distinction, viz. between what may be termed "Capital Outlay", consisting of Capital (Developmental + Non-Developmental expenditure), as against the component of Loans and advances. One major reason is that frequent extreme fluctuations in the latter have caused the overall total to give sometimes misleading impression about what is happening to capital expenditure itself.

In Table 4.10 below, we have presented the actual budgetary data for selected years between 1990-91 and the period 2001-02 to 2007-08, to clearly bring out the relationship between expenditure items that constitute the capital account of the central government. It will be immediately obvious, from Table 4.11 below, as to how, total capital expenditure ***inclusive of*** Loans and Advances component can indeed appear to be falling or even, turning ***negative***, overall, even when the respective capital development and non-development expenditure items are themselves growing, as evident for the consecutive years 2002-03, 2003-04 and 2004-05. As the patterns of real growth in table 4.8 earlier show, on further breaking down of the pattern decade-wise, we see that capital expenditure growth in real terms in the immediate post-reforms decade had dropped down to as low as -4.18%, while subsequently, between 200-01 to 2007-08, it again picked up to 7.35%.

With this necessary elaboration in place, we now commence to continue on our depiction of the behaviour of expenditure categories over our study period.

TABLE 4.10: CAPITAL ACCOUNT EXPENDITURE OF THE CENTRAL GOVERNMENT *incl.* LOANS AND ADVANCES

(Rs. Crores)

	1990-91	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
A. NON-DEVELOPMENT EXPENDITURE	**5364.08**	**14218.80**	**17854.91**	**17514.08**	**20170.27**	**34999.72**	**35771.11**	**36690.69**	**41819.00**
B. DEVELOPMENT EXPENDITURE	**8023.24**	**11154.83**	**12316.28**	**12598.85**	**15120.46**	**18013.97**	**19848.24**	**22602.49**	**65122.14**
C. LOANS & ADVANCES	**13939.80**	**9662.09**	**14667.09**	**-2978.69**	**-38497.01**	**-33494.08**	**691.40**	**-8672.22**	**1385.55**
1. To States and UTs (net)	9869.08	8798.47	10526.23	-2072.24	-35729.63	-34931.53	-3144.64	-10368.26	-1584.19
a)Gross	14521.70	20489.96	24528.42	28230.69	25448.89	24805.70	5654.08	4969.83	6706.04
i)Developmental	13864.70	17347.93	20552.77	24131.61	23377.69	23118.50	5004.08	4969.83	6706.04
ii)Non-Developmental	657.00	3142.03	3975.65	4099.08	2071.20	1687.20	650.00	0.00	0.00
b) Repayments	4652.62	11691.49	14002.19	30302.93	61178.52	59737.23	8798.72	15338.09	8290.23
2. To Others	4070.72	863.62	4140.86	-906.45	-2767.38	1437.45	3836.04	1696.04	2969.74
a)Gross	6186.68	5971.38	10872.04	7535.82	5881.51	5939.76	6838.68	5049.15	5070.56
i)Developmental	4418.46	5228.72	10204.21	6624.31	5338.32	5459.83	6647.20	5131.26	5175.50
ii)Non-Developmental	1768.22	742.66	667.83	911.51	543.19	479.93	191.48	-82.11	-104.94
b) Repayments	2115.96	5107.76	6731.18	8442.27	8648.89	4502.31	3002.64	3353.11	2100.82
3. Total (Net)	13939.80	9662.09	14667.09	-2978.69	-38497.01	-33494.08	691.40	-8672.22	1385.55
a)Gross	20708.38	26461.34	35400.46	35766.51	31330.40	30745.46	12492.76	10018.98	11776.60
i)Developmental	18283.16	22576.65	30756.98	30755.92	28716.01	28578.33	11651.28	10101.09	11881.54
ii)Non-Developmental	2425.22	3884.69	4643.48	5010.59	2614.39	2167.13	841.48	-82.11	-104.94
b) Repayments	6768.58	16799.25	20733.37	38745.20	69827.41	64239.54	11801.36	18691.20	10391.05
TOTAL (A+B+C)	**27327.12**	**35035.72**	**44838.28**	**27134.24**	**-3206.28**	**19519.61**	**56310.75**	**50620.96**	**108326.69**

Source: Indian Public Finance Statistics, Ministry of Finance, GOI, 2008-09 and 2009-10

Table 4.11: Capital Receipts of the Central Government (Selected Years)

(Rs crore, Actuals)

	1990-91	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
4. Capital receipts (a+b+c)	**31971**	**132987**	**161004**	**182414**	**207490**	**193261**	**163144**
(a) Recovery of loans*	5712	12046	16403	34191	67265	60862	12000
(b) other receipts (mainly PSU disinvestment)	0	2125	3646	3151	16953	4424	0
(c) Borrowings & other Liabilities$	26259	118816	140955	145072	123272	127975	151144

*Includes receipts from States on account of debt swap scheme for 2002-03, 2003-04 and 2004-05.
$ Includes repayment to National Small Savings Fund.

Source: Based on Economic Survey 2006-07

A careful and detailed scrutiny along the individual decade-long periods brings out more clearly the intriguing growth pattern of capital expenditure. As the data shows, the respective growth rates of capital expenditure over the two pre-reforms decades were 7.10% for both 1970-71 to 1979-80 and 1980-81 to 1989-90, while in the post-reforms decades, the growth rate of total capital expenditure seemingly dropped down a negative -4.18%, while it went up to 7.35% over the last segment viz., 2000-01 to 2007-08. Taking a closer look at the remarkably dramatic fluctuations, and recalling that total capital expenditure comprises capital development plus non-development expenditure, as well as loans and advances (net) — a detailed breakdown of these constituent items reveals considerable divergence between growth in nominal and real terms.

While in nominal terms, the growth in capital development expenditure over the pre-reforms decades 1970-71 to 1979-80 and 1981-80 to 1989-90 stood at 14.92% and 9.72% respectively, the real growth rates for these two decades were respectively 6.41% (1970-71 to 1979-80) and 3.37% (1980-81 to 1989-90). On the other hand, the growth rates in capital non-development expenditure were respectively 4.10% (1970-71 to 1979-80) and 25.88 % (1980-81 to 1989-90) in nominal terms, while in real terms it grew at respectively -4.41% over 1970-71 to 1979-80 and 19.52% over the decade 1980-81 to 1989-90.

Post-reforms, in turn, the growth rate of capital development expenditure over 1990-91 to 1999-00 fell to 1.95% in nominal terms, while in real terms, it actually turned negative (-5.51%) over the same period. Hence, in the immediate post-reforms period there was an actual fall in capital development expenditure in real terms, a fall-out of the pattern of expenditure compression that was viewed with widespread concern by the contemporary commentators (Guhan 1995, Balakrishnan 1997,

Mundle and Rao 1997). A period of recovery followed over 2000-01 to 2007-08, with capital development expenditure growing at above 19% in nominal terms and 14.91% in real terms.

For capital non-development expenditure, the immediate post-reforms (1990-91 to 1989-90) rates of growth were 8.13% in nominal terms as against a mere 0.66% in real terms, while over the next period 2000-01 to 2007-08, the growth in capital non-development expenditure was 14.88% (nominal) and 10.31% (real terms).

Loans and Advances

We now take up the highly dramatic fluctuations shown by the component of "Loans & Advances" given the remarkably erratic changes observed in this component overall, so much so that the figure for overall capital expenditure apparently shows a negative value for the year in 2003-04 (Rs. (-)**-3206.28 crores),** as in table **4.10** above, which also contains the detailed data for central loans and advances (Gross Loans as well as Repayment details) for the period 2002-2007. Over this period, recovery of loans, as shown in the capital receipts account (table 4.10 above) often exceeded the loans given out by the Centre (reported in capital expenditure account). The detailed accounting situation for these years have been presented in tables 4.9 and 4.10, respectively, for 2001-02 to 2004-05-- the period over which Net loans and advances have frequently shown high negative values, that is, repayment of loans to the Centre having exceeded loans given out by the latter.

A little elaboration on this aspect is necessary at this point. Operative from 2002-03 to 2004-05, GOI formulated a Debt Swap Scheme realising the mounting burden of interest payments on the states, and to supplement their efforts towards fiscal

management. The scheme capitalized on the current low interest regime, to enable States to prepay expensive loans contracted from GOI, with low coupon bearing small savings and open market loans. It covered outstanding high cost loans with interest rate of 13% and above. An amount of Rs 106076 crore was prepaid to GOI by the States from small savings loans and open market borrowings.

According to the Economic Survey of 2005-06 …"Given the committed nature of public expenditure, which provides very little head room for compression in the short run, and the need for resources to fulfill the NCMP objectives, the strategy for achieving the targets set under the FRBMA and the rules made thereunder was primarily revenue-led. The Budget for 2005-06 continuing with this revenue led strategy estimated a growth of 16.7 per cent in revenue receipts over 2004-05 (RE), composed primarily of a 20.9 per cent growth in gross tax revenue. The sharp decline in capital receipts projected was mainly on account of the discontinuance of the debt swap scheme." (*Economic Survey 2005-06* p 25)

Hence, as the Survey further points out, …"A straightforward comparison of the total expenditure in the … three years (2002-2005) is misleading because of the large unbudgeted non-plan expenditure on capital account, which was in the nature of a balancing item corresponding to the debt swap prepayment proceeds shown against capital receipts under the head 'recovery of loans'. Adjusting for this entry, total expenditure as a proportion of GDP, works out to 16.3 per cent, 15.5 per cent and 14.9 per cent for 2002-03, 2003-04 and 2004-05, respectively. With similar adjustment, capital expenditure as a proportion of GDP for the same period works out to 2.5 per cent, 2.3 per cent and 2.6 per cent, respectively. As a proportion of GDP, total expenditure of the Central Government was budgeted at 14.6 per cent of

GDP in 2005-06. Capital expenditure was budgeted at 1.9 per cent of GDP in 2005-06, the decline reflecting the impact of the discontinuance of State-loan-intermediation by the Central Government". (*Survey 2005-06*, p 31).

Overall, therefore, given that the weightage of revenue vis-à-vis capital expenditure in total expenditure has ranged between nearly 70: 30 in the decade of 1970s to as high as 90: 10 in the decades of 2000, the growth of total expenditure over our study period (1970-71 to 2007-08) has been completely dominated by the component of revenue expenditure which has been commanding the lion's share consistently. Since it is the capital component of expenditure, on the other hand, that leads to the lasting creation of assets while revenue expenditure by definition involves no future returns, such expenditure trend has been justifiably viewed with consternation.

As pointed out already in this chapter, expenditure items in India have undergone frequent changes in classifications and definitions. Thus, so far as our study period is concerned, the classification convention in vogue from 1986-87 onwards had been revised at least twice previously, that is, up to 1973-74 and later from 1974-75 onwards (*Indian Public Finance Statistics, Ministry of Finance, various years*). Careful scrutiny of data reveals not all items thus reclassified have been significant in magnitude, and some have ceased to be relevant in the latter budgets. Accordingly, we have decided to adopt an overall consistent classification practice, regrouping components taking care not to leave out any item, and yet paying attention to having a data series that is reasonably manageable and amenable to meaningful analysis. The specific components that have over time emerged as of being major significance have been studied in detail.

For purely illustrative purposes, a detailed overview of the above classification conventions and definitions is presented below showcasing the classification adopted from 1986-87 onwards to recent years.

REVENUE EXPENDITURE OF THE CENTRAL GOVERNMENT:
(1986-87 to 2007-08)

a (NON-DEVELOPMENT EXPENDITURE)	**b (DEVELOPMENTAL EXPENDITURE)**
a_1 (Interest Payments) **a_2 (Defence Services, Net)@** **a_3 (Organs of State)** **a_4 (Fiscal Services)*** **a_5 (Administrative Services)**** **a_6 (Pension & Other Retirement Benefits)** **a_7 (Tech. & Eco. Cooperation with other countries)** **a_8 (Assignments to Local Bodies)** **a_9 (Loss/Subsidy on Vegetable Oils)** **a_10 (Subsidy on Controlled Cloth)** **a_11 (Subsidy to Food Corporation of India)** **a_12 (Grants to States for Natural Calamities)***** **a_13 (Grants to Union Territories, Non-Plan)** **a_14 (Social Security & Welfare)** **a_15 (Others)********	**b_1 (Social & Community Services)** **b_2 (General Economic Services)** **b_3 (Agriculture & Allied Services)*** **b_4 (Industry & Minerals)*** **b_5 (Fertilizer Subsidy)** **b_6 (Power Irrgn and Flood Control)** **b_7 (Transport & Communication)** **b_8 (Public Works)** **b_9 (Grants to States/U.T.s)**
-	
c (Self Balancing Items)	
d (Statutory Grants to States)	
e (Adjustment on Accounts of differences in figures)	

f (Total Expenditure = a+ b+ c+ d+ e)

Source: Based on Indian Public Finance Statistics, Ministry of Finance, GOI, various years

A similar overview of the breakdown of Capital account expenditure is presented below:

CAPITAL EXPENDITURE OF CENTRAL GOVRNMENT:
ILLUSTRATIVE CLASSIFICATION: 1986-87 onwards

a **(NON DEVELOPMENTAL)**		b **(DEVELOPMENTAL EXPENDITURE)**
a_1 (Defence Services)		**b_1 (Railways)-**
a_2 (Border Roads)		**b_2 (Posts & Telegraphs)**
a_3 (Fiscal Services)		**b_3 (Social & Community Services)**
a_4 (Others)*-		**b_4_ (General Economic Services)**
		b_5 (Agriculture & Allied Services)
		b_6 (Industry & Minerals)
		b_7 (Power,Irrigation & Fllod Control
		b_8 (Transport & Communications)
		b_9 (Public Works)
c_1 (Loans & Advances to States & UTs, Net)		
c_2 (Loans to Others, Net Disbursement)		
c_3 (Total Loans & Advances, Net)		
d (Total = a+b+c_3)		

Source: As Above

Of the basic functional components of the various budgetary heads, the actual statistics shows a selected few heads as being numerically significant. Accordingly, our analysis in this part focusses on those items or item-groups that are shown by the data as having significant weightages in the relevant broad category over the study period.

To briefly summarize the expenditure structure discussed above:

We have,

Total Expenditure = Revenue Expenditure + Capital Expenditure ..... (2)

Where,

Revenue Expenditure = (Revenue Non-Developmental + Revenue Developmental Expenditure) + Statutory Grants to States ..... (3)

However, it must be noted that the item “Statutory Grants” (in relation ii) above) is by definition determined by Constitutional provisions (specifically, Article 275, as revealed in the detailed classification structure on page 3 above). That is, the Centre’s own budgetary decisions have little or no power to impact this component. For our analytical purposes in the present context, therefore, we treat the component of Statutory grants separately from the rest of revenue expenditure items. That is, in our working definition,

Revenue expenditure = Expenditure as per Budget – Statutory Grants

= (Revenue Development + Revenue Non-development expenditure) ..... (4)

Where we study the item of Statutory grants separately.

Similarly,

Capital Expenditure = (Capital Non-Developmental + Capital Developmental Expenditure) + Loans and Advances (Net of Repayments)..... (5),

as already mentioned in an earlier section above.

Hence, Capital expenditure, viz. (Capital Development + Capital Non-Development Expenditure) is treated separately from the component of “Loans and Advances”, the latter having shown a remarkably fluctuating pattern over our study period that merits separate attention and scrutiny.

So that, we have:

Total Expenditure = Developmental Expenditure (Revenue + Capital) + Non-Developmental Expenditure (Revenue + Capital) + Statutory Grants (Revenue Account) + Loans and Advances (Capital Account) ..... 6)

As brought out by the accompanying tables, the broad components of expenditure have been grouped into the respective developmental and non-developmental categories under both revenue and capital expenditure.

Instead of treating each and every item whose weightages in the relevant categories are frequently very small, we have taken care to combine the parts of the similar items whose combined weightage at least come up to not less than 5%, in order that our analysis and conclusions are meaningful, and some extent of insight can be gained into the overall trends.

Having indicated the broad trends and growth patterns in expenditure, our task is now to go into somewhat more detailed look at the respective growth patterns of expenditure components, as already studied for total, revenue and capital expenditure. The respective trends for the overall study period, as well as both Pre- and Post-Reforms are examined, using the continuous compound growth rates in significant expenditure categories. As before, compound rates of growth are discussed both in terms of current price as well as constant price (2004-05 prices) data. The implications of the findings and results are discussed in detail.

Trend in major Items of Expenditure

Table **4.12** gives a detailed analysis of the respective growths of major functional categories over Pre-and Post-reforms, as well as entire study period of 1970-71 to 2007-08. Continuous compound growth rates in significant expenditure categories have been computed, both using current price as well as constant price ***(base 2004-05)*** to bring out the distinction between nominal and real growth patterns clearly.

TABLE 4.12

GROWTH IN FUNCTIONAL COMPONENTS

CENTRAL GOVERNMENT EXPENDITURE

	At Current Price			At Constant 2004-05 Price		
	1970-71 to 2007-08	1970-71 to 1990-91	1990-91 to 2007-08	1970-71 to 2007-08	1970-71 to 1990-91	1990-91 to 2007-08
	OVERALL	PRE-REFORMS	POST-REFORMS	OVERALL	PRE-REFORMS	POST-REFORMS
1	2	3	4	5	6	7
Interest	16.65	18.17	11.44	9.25	10.22	5.70
Defence	11.92	13.34	10.79	4.52	5.38	5.05
Social Services	13.99	15.76	13.26	6.59	7.81	7.53
Economic Services	8.96	19.52	6.63	1.61	11.57	0.79
Subsidies	17.71	25.09	12.87	10.32	17.13	7.14
Pension	23.07	21.11	14.53	15.68	13.12	8.79
Grants	12.90	15.35	10.34	5.51	7.40	4.61
Loan	10.13	15.41	-0.64	2.23	7.45	-7.48

Source: APPENDIX TABLE AI.4

The above data has been presented in a decade-wise pattern in the table 4.13 following immediately below.

TABLE 4.13

CENTRAL GOVERNMENT EXPENDITURE

DECADE-WISE GROWTH IN FUNCTIONAL COMPONENTS

	At Current Price				At Constant 2004-05 price			
	1970-71 to 1979-80	1980-81 to 1989-90	1990-91 to 1999-00	2000-01 to 2007-08	1970-71 to 1979-80	1980-81 to 1989-90	1990-91 to 1999-00	2000-01 to 2007-08
1	2	3	4	5	6	7	8	9
Interest	14.31	21.33	15.60	6.37	5.79	14.98	8.12	1.81
Defence	10.28	16.61	12.61	8.59	1.77	10.25	5.13	4.02
Social Services	18.17	16.83	15.17	15.81	9.66	10.47	7.70	11.24
Economics Services	28.73	15.96	-22.77	46.94	20.23	9.61	-30.12	42.43
Subsidies	39.97	23.31	10.65	11.86	31.46	16.96	3.18	7.29
Pension	15.43	21.91	19.78	9.59	6.92	15.56	12.31	5.02
Grants	12.41	14.00	8.75	14.55	3.90	7.64	1.27	9.98
Loan	19.34	12.85	0.21	-33.50	10.83	6.49	-7.25	-37.84

Source: APPENDIX TABLE AI.4

From the above tables, clearly, by far the fastest growing item among the functional categories are subsidies. This is followed by the rapid growth in “Economic Services”, although, as we would subsequently see, the weightage of this latter item in expenditure has not been substantial. On the other hand, clearly, from the constituent items, interest payments have been claiming the lion’s share in revenue expenditure, posting as high as 35.0% of the total revenue expenditure, and a staggering 53.02%, that is, claiming more than half of, the revenue non-development expenditure component in the post-reforms period.

As the above table shows, subsidies as a whole grew at a compound rate of over 17% in real terms over the pre-reforms era (1970-71 to 1989-90), with a subsequent reduction in the real rate of growth to 7.14% in the post-reforms decades (1990-91 to 2007-08). On further decomposition decade-wise, the pre-reform decade of 1970-71 to 1979-80 showed subsidies growing by as much as 31.46%, while the in immediate post-reforms decade (1990-91 to 1999-2000) subsidy growth slowed down to a mere 3.14% in real terms, followed by a moderate 7.14% in real terms in the period 2000-01 to 2007-08.

Coming to defence expenditure, the overall rate of growth in defence in nominal terms has been 11.92% as against a much lower real rate of 4.52% between 1970-71 and 2007-08. Of the total period, the growth was faster in the pre-reforms (1970-71 to 1989-90) period with a nominal rate of 13.34% and real growth of 5.38%. Post-reforms, i.e., between 1990-91 and 2007-08, the growth rate dipped down to 10.79% (nominal) and 5.05% (real terms), respectively.

The most remarkable aspect in the changing composition of revenue expenditure is that of interest payments, which has grown from a Pre-Reforms average weightage of nearly 21% to 35% in the Post-Reforms period. If we look at the details for the individual decadal weightages, the respective weightages of interest payments were, respectively, around 18.5% over 1971-1980, followed by 23.45% in the 1980s. it reached a peak weightage of 35.75% in the 1990s, from which the weightage has marginally climbed down to 34% in the eight year period of 2001 to 2008.

Interest payments, being obligations incurred by governments in previous periods, represent the liabilities which no government can afford to default from or evade. They constitute the claim of households and the rest of the private sector on the government sector, and are thus representing that part of the expenditure which is obligatory and committed. That is, the component of interest payments is one which allows little or no room for manoeuvring any escape in the form of expenditure reduction.

Thus, the detailed examination of growth in various major groups of central government expenditure and their respective components points to the urgent need for measures geared at expenditure management, and at the same time, the seeming impossibility of any hopes of rapid success in curbing expenditure or channelling its growth along apparently socially desired directions. These conclusions can be better appreciated when we have examined the details of expenditure composition and the shifts it has been undergoing throughout our study period, which we undertake in the next chapter.

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5

Analysis of Central Government Expenditure 1970-71 — 2007-08

Phase II

"Analysis of public expenditure is handicapped by the absence of an integrated theory of public expenditure other than the theory of public goods and a shopping list of other forms of market failure. Under the circumstances, applied public expenditure analysis has usually combined a macroeconomic assessment of the level of public expenditure with an assessment of the allocation of public expenditure (…) India's experience with public expenditure allocation in general, and especially the redistributive programmes, underlines the pre-eminent role of political economy rather than rational economic calculation in determining the allocation of public expenditure."

--- [*emphasis added*] Mundle and Rao (1997, p 220)

CHAPTER 5

Analysis of Central Government Expenditure: 1970-71 — 2007-08

Phase II: Composition, Elasticity and Buoyancy Properties of Central Government Expenditure

The present chapter, second among the three chapters comprising the Analysis Section of this Thesis, consists of the following two major sections.

5.1 Composition of Central Government Expenditure 1970-71—2007-08

5.2 Elasticity and Buoyancy of Central Government Expenditure: A Brief Discussion

References

5.1 COMPOSITION OF CENTRAL GOVERNMENT EXPENDITURE 1970-71—2007-08

In the previous chapter, (chapter 4), we have examined in detail the respective trends and patterns of growth in overall central government expenditure, as well as its variously defined components, over both pre-Reform and post-Reform periods. The varying rates of growth in all components, both in nominal and real terms, suggest that such growth should also have been accompanied by inevitable changes in expenditure composition as well over our study period.

It is to the aspect of detailed expenditure composition, and the changes it has undergone over the period of study, that is now the focus of our analysis. Later on, we also study the elasticity and buoyancy characteristics of the various components of government expenditure over our chosen time span.

The starting point in this part of our analysis is presenting the broad components of expenditure as grouped into the respective developmental and non-developmental categories under both revenue and capital expenditure.

As already explained, instead of treating each and every item whose weightages in the relevant categories are frequently very small, we have taken care to combine the parts of the similar items whose combined weightage at least come up to not less than 5%, in order that our analysis and conclusions are meaningful, and some extent of insight can be gained into the overall trends.

Relative Shares of major Items of Expenditure

In this section, the changing composition of Total, Revenue and Capital expenditure have been sought to be captured by studying in detail the share of major expenditure items in the respective categories. Study has been done for the entire period 1970-

71 to 2007-08, as well as for each of the distinct decades, and sub-Period-wise for both Pre- and Post-Reforms.

Table **5.1** below gives the decade-wise as well as Pre- and Post-reforms evidence as to how the respective shares of the components revenue as well as capital expenditure have shifted as proportion of total expenditure. In addition, the behaviour of the respective developmental and non-developmental components under each head has also been brought out in detail, for both pre- and post-reforms periods, as well as for the individual decades.

Figures **5.1** and **5.2** show the relative movements and hence changes in the major expenditure composition, over the study period of 1970-71 to 2007-08.

Table **5.3,** similarly, highlights the respective shares of Developmental and Non-Developmental components as far as Total expenditure is concerned.

One important point to note in this regard is that since the figure for Total Expenditure (Revenue and Capital Account combined) also includes the sizeable component of Loans and Advances, as separate from either Development or Non-Development components, hence the percentage figures will naturally ***not*** be adding up to 100%, a point that has noted in Table 5.3 as well.

TABLE 5.1
SHARES OF MAJOR EXPENDITURE GROUPS
(% OF RESPECTIVE TOTALS)

PERIOD	YEAR	RE /TE	RE /TE	CAPEX /TE	CAPEX /TE	RDEV /RE	RDEV /RE	RNDV /RE	RNDV /RE	CDEV /CAPEX	CDEV /CAPEX	CNDV /CAPEX	CNDV /CAPEX
Pre-Reforms	1970-71 to 1979-80	66.28	66.52	33.72	33.48	30.10	33.27	69.90	66.73	80.36	77.49	19.64	22.51
	1980-81 to 1989-90	66.77		33.23		36.44		63.56		74.62		25.38	
Post-Reforms	1990-91 to 1999-00	79.67	84.58	20.33	15.42	33.22	34.05	66.78	65.95	43.27	41.85	56.73	58.15
	2000-01 to 2007-08	90.73		9.27		35.09		64.91		40.09		59.91	

Source: APPENDIX TABLE AI.1 and AI.2

Where:

TE: TOTAL EXPENDITURE

RE: REVENUE EXPENDITURE

CAPEX: CAPITAL EXPENDITURE

RDEV: REVENUE DEVELOPMENTAL EXPENDITURE

RNDV: REVENUE NON-DEVELOPMENTAL EXPENDITURE

CDEV: CAPITAL DEVELOPMENT EXPENDITURE

CNDV: CAPITAL NON- DEVELOPMENT EXPENDITURE

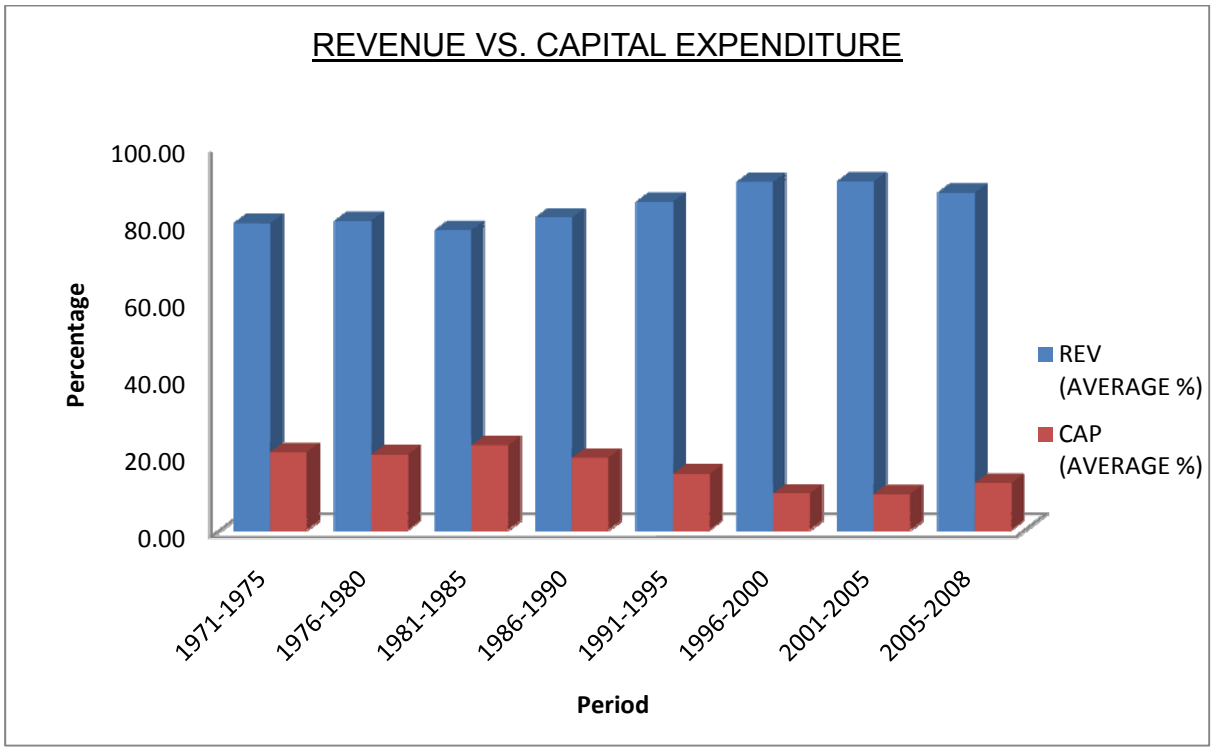
TABLE 5.2
REVENUE vs. CAPITAL EXPENDITURE

PERIOD	REV (AVERAGE %)	CAP (AVERAGE %)
1971-1975	79.78	20.22
1976-1980	80.37	19.63
1981-1985	77.99	22.01
1986-1990	81.26	18.74
1991-1995	85.35	14.65
1996-2000	90.52	9.48
2001-2005	90.68	9.32
2005-2008	87.73	12.27

Source: Based on APPENDIX TABLE AI.1

Fig 5.1 RELATIVE DISTRIBUTION OF REVENUE AND CAPITAL EXPENDITURE

1970-71—2007-08 (5-YEAR AVG.)



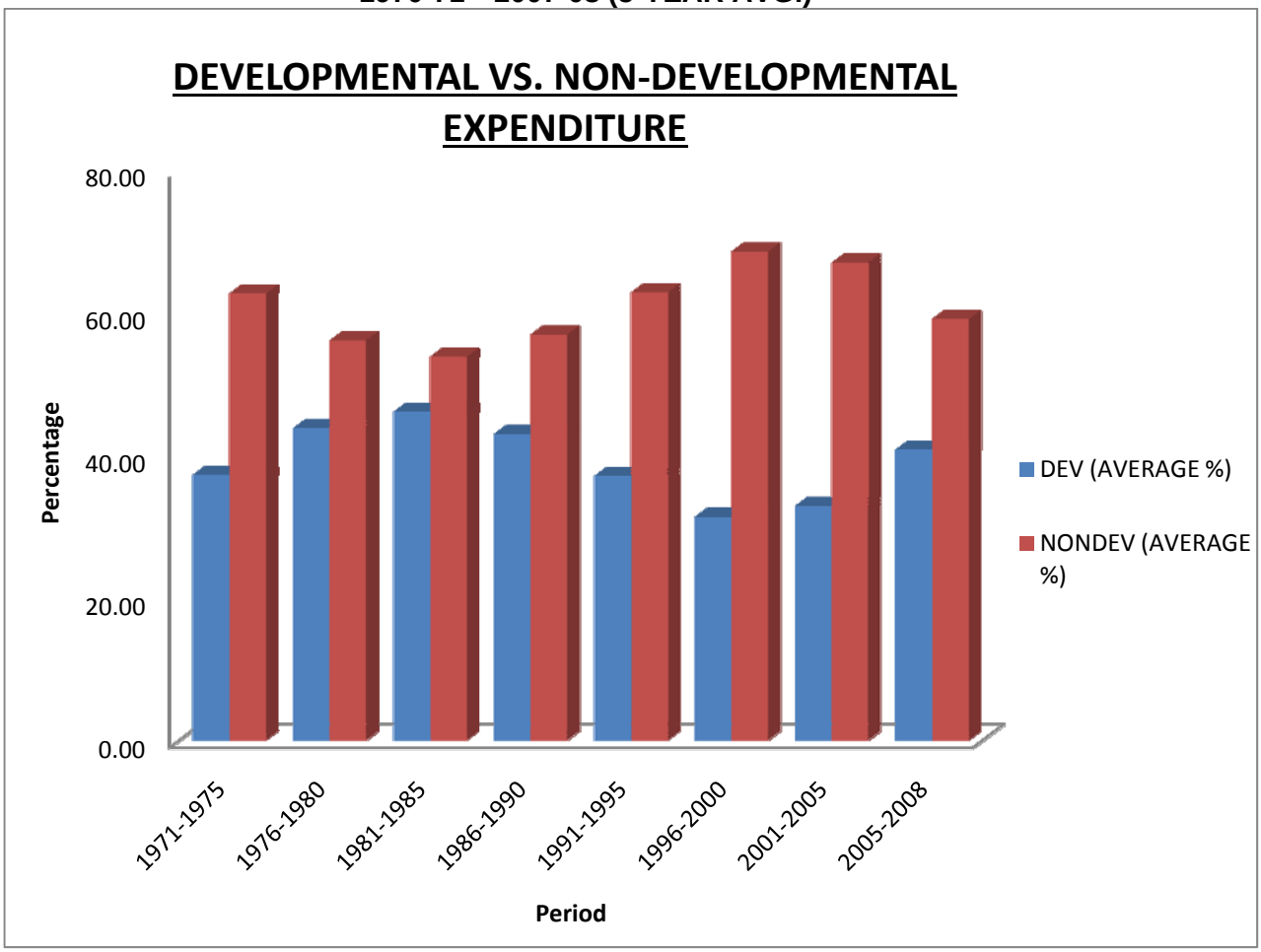
Source: Based on Table 5.2 above

TABLE 5.3
DEVELOPMENT vs. NON-DEVELOPMENTAL EXPENDITURE

PERIOD	DEV (AVERAGE %)	NONDEV (AVERAGE %)
1971-1975	37.26	62.74
1976-1980	43.84	56.16
1981-1985	46.13	53.87
1986-1990	43.02	56.98
1991-1995	37.11	62.89
1996-2000	31.36	68.64
2001-2005	32.92	67.08
2005-2008	40.83	59.17

Source: APPENDIX TABLE AI.2

Fig 5.2 RELATIVE DISTRIBUTION OF DEVELOPMENT AND NON-DEVELOPMENT EXPENDITURE 1970-71—2007-08 (5-YEAR AVG.)



Source: Table 5.3

The following conclusions can be drawn from the various data and charts presented above.

So far as the weightage of revenue vis-a-via capital expenditure goes, revenue expenditure has all throughout outpaced capital in total expenditure. In the pre-reforms period, revenue expenditure typically averaged around 65% to-70% in the total, against the nearly 30% posted by capital expenditure. Post-reforms, however, capital expenditure has clearly borne the brunt of the entire adjustment process, declining to below 20% of the total in the first decade post-reforms, and thereafter declining even further to around 10% of total expenditure in the period 2001-2008, while revenue expenditure has continued to climb inexorably.

Regarding the relative distribution of Developmental vs. Non-Developmental expenditure, again, the weightage as well as growth rate of Non-Developmental component has clearly outstripped developmental expenditure. The implications of such pattern will be clear when we come to the detailed break-up of the respective components into their major sub-categories for a more detailed scrutiny of individual item shares.

As for Development vs. Non-developmental expenditure categories, among each of revenue as well as capital expenditure, the inexorable shift of emphasis from developmental towards non-developmental expenditure is very much noticeable, although the shift towards the non-developmental component is more dramatically evident in case of capital expenditure all through our study period.

The following conclusions can be drawn from the data presented above.

So far as the weightage of revenue vis-a-via capital expenditure goes, revenue expenditure has all throughout outpaced capital in total expenditure. In the pre-

reforms period, revenue expenditure typically averaged around 65% to-70% in the total, against the nearly 30% posted by capital expenditure. Post-reforms, however, capital expenditure has clearly borne the brunt of the entire adjustment process, declining to below 20% of the total in the first decade post-reforms, and thereafter declining even further to around 10% of total expenditure in the period 2001-2008, while revenue expenditure has continued to climb inexorably.

TABLE 5.4: DEVELOPMENT AND NON-DEVELOPMENT EXPENDITURE

% SHARES IN TOTAL EXPENDITURE (PRE- & POST-REFORMS)

YEAR	TDEV /TE DECADAL	TDEV /TE PRE-REFORMS	TNDV /TE DECADAL	TNDV /TE PRE-REFORMS
1970-71 to 1979-80	33.91	35.72	49.86	48.29
1980-81 to 1989-90	37.53		46.71	
	TDEV /TE DECADAL	**TDEV /TE POST-REFORMS**	**TNDV /TE DECADAL**	**TNDV /TE POST-REFORMS**
1990-91 to 1999-00	31.04	19.27	59.86	62.25
2000-01 to 2007-08	36.52		65.24	

Source: APPENDIX TABLE AI.1 & AI.2

N.B. *Total expenditure, apart from Development and Non-Development components, contains the item loans & advances (not separately shown here). For this reason, Development plus Non-development will not add up to the Total expenditure amount,*

TE: TOTAL EXPENDITURE (DEVELOPMENTAL, NON-DEVELOPMENTAL *plus* LOANS & ADVANCES)

TDEV: DEVELOPMENTAL EXPENDITURE

TNDV: NON-DEVELOPMENTAL EXPENDITURE

We now examine the revenue account expenditure more closely, and study the patterns in its constituent items to better understand the pattern of its growth. This brings us to the individual functional item-wise break-up.

Of the sub-categories already presented in tables above, revenue non-developmental expenditure has been showing the most dramatic growth and claiming the lion's share of expenditure categories. In the subsequent discussion, therefore, it is the revenue non-developmental category which we have discussed in most detail.

Table 5.5 presents the respective pre-Reforms and Post-Reforms scenario so far as the major expenditure components belonging to revenue account are concerned, as well as decadal weightages. In the pre-reform decades (among revenue non-development expenditure items), interest payments are clearly seen as having claimed the largest share.

The accompanying charts representing the compositions of both revenue developmental as well as non-developmental components for the pre-Reforms vs. the post-Reforms periods, as also for individual decades, clearly bring out the compositional shifts that have continually taken place over the entire period of our study.

As indicated by the accompanying charts, the respective weightages of major items/ item-groups over the entire period of study (1970-71 to 2007-08) along with the respective pre-Reforms and post-Reforms scenario, have been undergoing considerable change. Thus, considering revenue non-developmental items, where the major items can be identified as subsidies, interest payments, defence, followed by grants and others, have all undergone significant evolution and changes in their respective share as the accompanying pie-charts and bar diagrams bring out. The

diagrammatic overviews have been provided for the Pre- as well as Post-Reforms periods, and for the last 8-year period of our study, viz., 2000-01to 2007-08, to get the latest glimpse into the changing composition.

Growth-wise, by far the fastest growing item among the functional categories have been subsidies. This is followed by the rapid growth in “Economic Services”, although, as we presently see, the weightage of this latter item in expenditure has not been substantial. However, if we look at the SHARES, on the other hand, of the constituent items interest payments have been claiming the lion’s share in revenue expenditure, posting as high as 35.0% of the total revenue expenditure, and a staggering 53.02%, that is, claiming more than half of, the revenue non-development expenditure component in the post-reforms period.

In the following we discuss the individual major components in greater detail and bring out their salient features over the period of our study with frequent reference to the accompanying charts.

Interest Payments and Their Significance

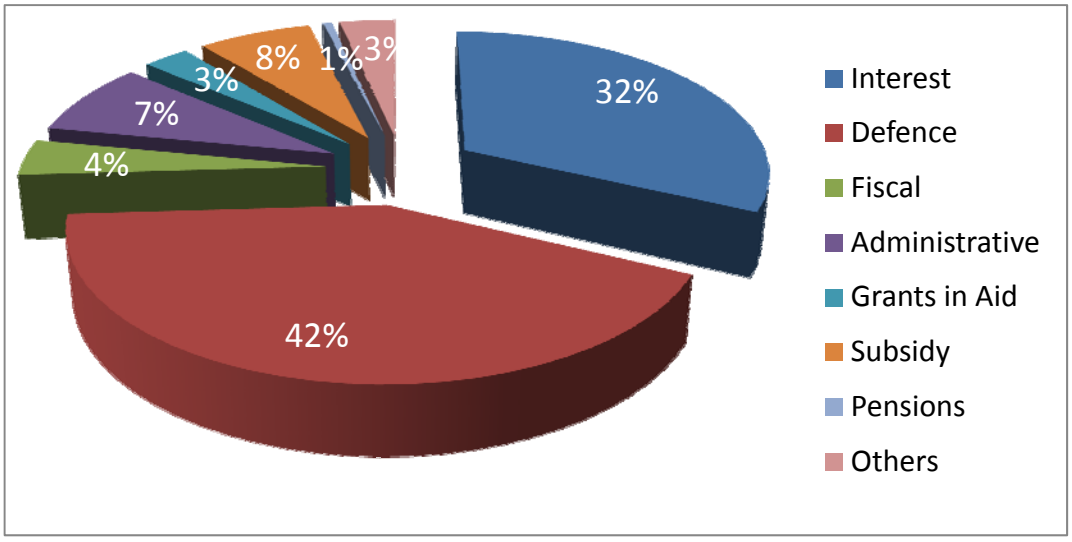
The most remarkable aspect in the changing composition of revenue expenditure is that of interest payments, which has grown from a Pre-Reforms average weightage of nearly 21% to 35% in the Post-Reforms period. If we look at the details for the individual decadal weightages, the respective weightages of interest payments were, respectively, around 18.5% over 1971-1980, followed by 23.45% in the 1980s. it reached a peak weightage of 35.75% in the 1990s, from which the weightage has marginally climbed down to 34% in the eight year period of 2001 to 2008.

TABLE 5.5: REVENUE ACCOUNT EXPENDITURE

Period	Year	Interest/ Revenue Exp		Interest/ Rev Non-Dev		Pension/Rev Non-Dev		Subsidy/ Rev. Exp		Subsidy/Rev Non-Dev		Grant/ Rev Exp		Grant/ Rev Non-Dev		Defence/ RNDV	
Pre-Reform	1971 to 1980	18.49	20.97	26.55	31.77	0.63	0.81	5.04	7.02	7.42	10.81	12.55	12.80	18.05	19.27	45.16	41.66
	1981 to 1990	23.45		36.99		1.00		8.99		14.20		13.06		20.50		38.16	
Post-Reform	1991 to 1999	35.75	35.00	53.51	53.02	3.67	4.01	5.46	6.09	8.75	9.43	13.18	14.41	9.80	9.18	21.38	20.02
	2000 to 2008	34.05		52.42		4.44		6.88		10.28		15.95		8.41		18.33	

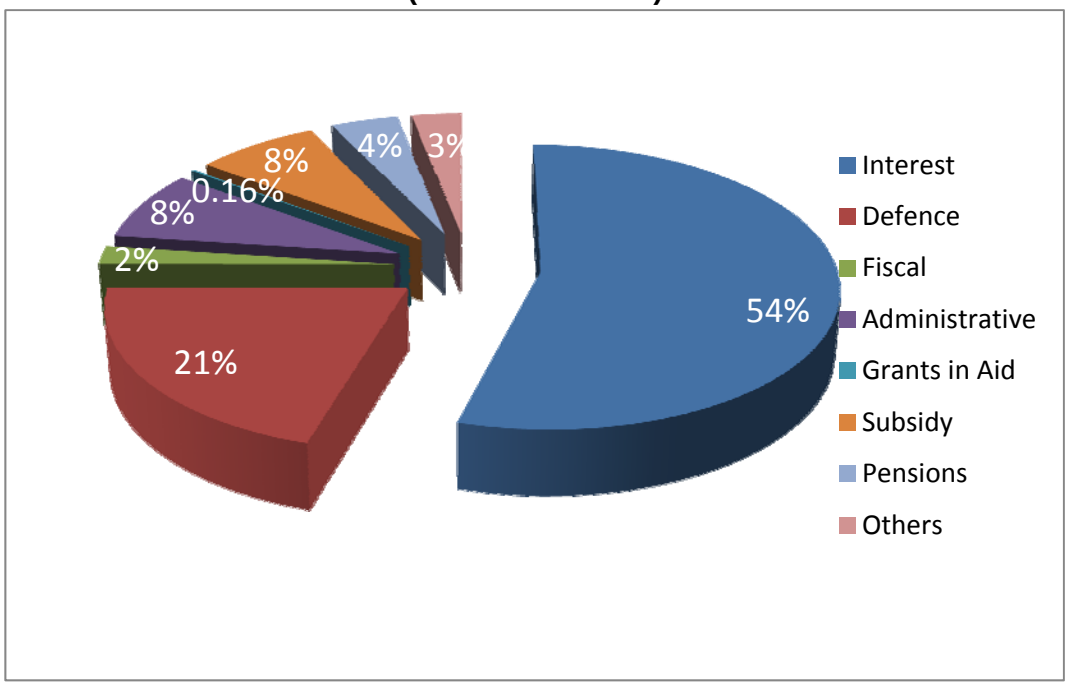
Source: Based on APPENDIX TABLES AI.1 & AI.4

Fig. 5.3 REVENUE NON-DEVELOPMENT ITEMS 1970-71 TO 1989-90 (PRE-REFORMS)



Source: Based on APPENDIX TABLE AI.4

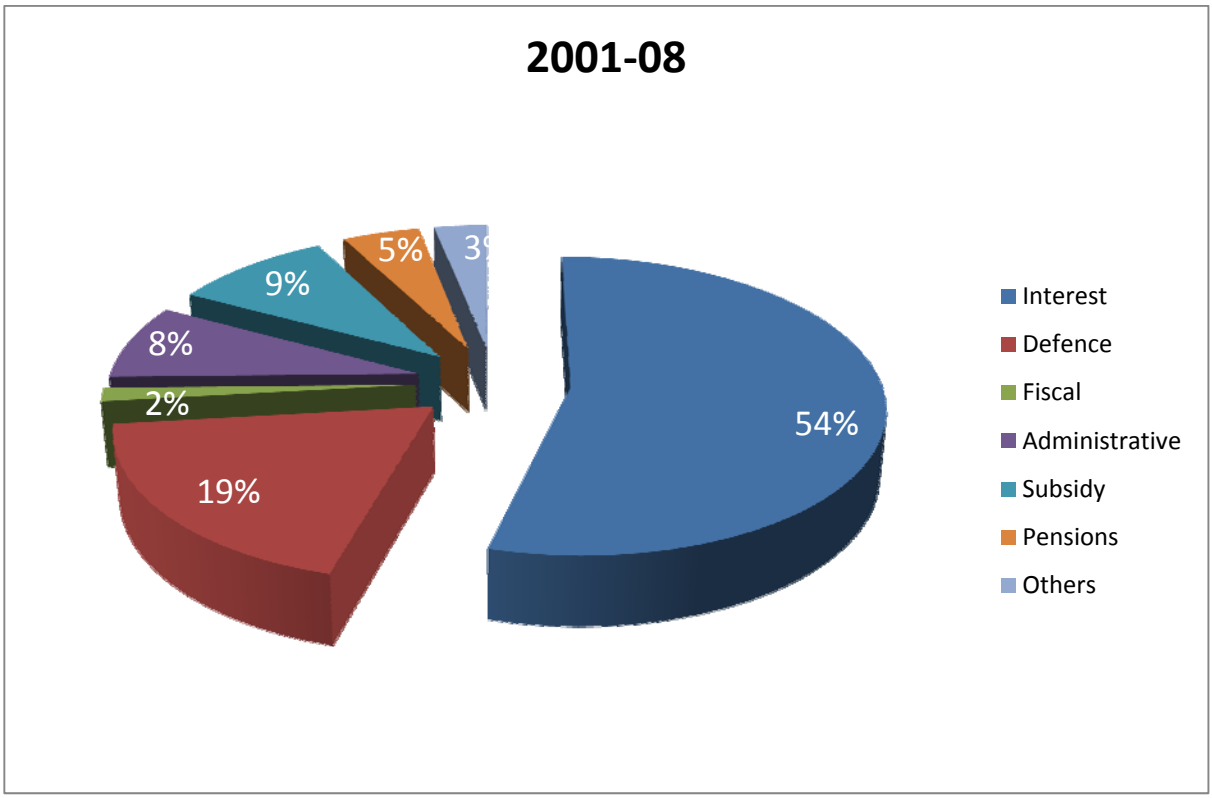
Fig. 5.4 REVENUE NON-DEVELOPMENT ITEMS 1990-91 TO 2007-08 (POST-REFORMS)



Source: As Above

Fig. 5.5 REVENUE NON-DEVELOPMENT ITEMS

2000-01 TO 2007-08



Source: APPENDIX TABLE AI.4

Now, interest payments are in the main the result of obligations incurred by governments in the previous periods, and they represent the enormous liabilities which no government can afford to default from or evade. They represent the claim of households and the rest of the private sector on the government sector, and are thus representing that part of the expenditure which is obligatory and committed. That is, the component of interest payments represents an inescapable burden on the government from "the sin of its predecessors in office" (*Economic Survey 2007-08*), and one which allows little or no room for manoeuvring any escape in the form of expenditure reduction.

The above discussion relates to the weightage of interest payments in entire revenue expenditure. Considering the revenue non-development expenditure category alone,

the percentage share of interest payments in this category has been naturally even higher, for instance, at 54% of revenue-non-developmental expenditure, in the time segment 2001-08.

Subsidies

Subsidies represent another highly sensitive area of expenditure management where much has been debated about the pervasive influence of subsidies and the various suggestions as to the containment of this component (Rao and Srivastava 2003, Srivastava and Sen 2007). Subsidies are politically and socially an extremely sensitive area, so that room for management here too, is extremely limited, in spite of the well-documented and researched unsatisfactory targeting and the urgent need to control the sheer volume of the subsidies. It must be noted, in addition, that much of the subsidies offered by government are not in fact reflected in the budget, so that the actual subsidy bill is much higher than what is reflected in the above table on budgetary expenditure (NIPFP).

As the above tables and charts show, the share of subsidies in revenue expenditure has climbed, although much less dramatically, from around 7% in the pre-Reforms period to nearly 9.5% in the Post-Reforms period. Decade-wise, this weightage has steadily grown from around 5% in the 1970s to above 10% in the eight-year period 2001 to 2008.

Rationale of Subsidies

Subsidies provided by the government are typically argued to have the basic purposes of intervening in the price system when there is a huge differential between private cost/ benefit and the social cost/ benefit of certain consumables and/ or production items.

Left on its own, the market pricing by itself would lead to unaffordable costs to either consumers (end-users), or make production or supply of certain desirable goods and services too costly for the private producer. In India, subsidies has typically been sought to be targeted to the poorer sections to enable consumption of certain necessities by the masses, and to encourage production/ supply of items by the private producer. A distinction is made between “Merit” and “Non-merit” subsidies (NIPFP 1997, Ministry of Finance (in collaboration with NIPFP) 2004). Over time, however, as the subsidy regime in India has become much too complex and overburdened, and poor targeting has often led to corruptions and bypassing of the genuine targeted beneficiaries, strong case has been made for overhauling the system and particularly withdrawal of Non-merit subsidies altogether.

Providing a fully consistent and comparable time-series database on the numerous subsidies provided at different periods, with sufficient details at the same time, is a very difficult task to accomplish over our study period spanning close to four decades (1970-71 to 2007-08). This is because not only of the innumerable number of heads under which subsidies have been initiated and often discontinued later, but also because of repeated reclassifications, and the extremely scattered nature of the database under question. However, in order to indicate the general trends, we have used the Indian Public Finance Statistics Database (relevant years), various Budget Documents and the database provided by expert commentators, to provide as far as possible an overview of Central Government Subsidies covering our study period 1970-71 to 2007-08 (please refer to the APPENDIX TABLE **AI**.**9** for a complete and comprehensive detailed look at the respective major subsidies).

Execution of Subsidy Programmes: A Note on Petroleum Products

Of the subsidies administered by the Central Government, many of which used to be "Off-Budget," an important example of the above until 2002 pertained to the petroleum sector that was subsequently brought on the budget. Prior to 1st April 2002, the pricing in the petroleum sector used to follow administered pricing mechanism (APM), whereby the main items that were cross-subsidised were PDS kerosene, domestic LPG and certain freight subsidies, through an "Oil Pool Account" mechanism. With dismantling of the APM by the Government with effect from 1st April 2002, it was decided that the aforesaid subsidies/under recoveries to the oil companies should henceforth be met from the Government budget. Accordingly, a number of schemes were notified with a view to put in place a mechanism to provide the post APM subsidy to the oil companies from the Government budget.

While Public Sector Oil Marketing Companies (OMCs) were allowed to adjust the retail selling prices (RSP) of their products in line with international prices, the pricing of PDS Kerosene and domestic LPG however continued to be subsidized honouring Government directives, the subsidies slated to be phased out in 3-5 years through consultations between the Ministry of Petroleum and Natural Gas and the Ministry of Finance. Accordingly, till the very recent decision of partial withdrawal of subsidies in the case of LPG that generated considerable controversy, oil PSUs continued to share the burden of subsidizing domestic LPG and PDS kerosene in addition to the Government subsidy.

In their exhaustive criticism and commentary on the various aspects of the subsidy regime in India, Srivastava et al (NIPFP 2003) commented on subsidies as often promoting inefficiencies. Fertiliser subsidies were cited as inefficiency-generating as

well as poorly targeted so that it was deemed better to discourage administering subsidies through inputs. A case could be at best made for subsidising small and marginal farmers, and that too, to a limited extent (Srivastava et al 2003).

The basic ceiling selling price of domestic kerosene being about 30 percent of its international price, as well as being substantially lower than production or supply cost, the inefficient targeting of this huge subsidy has resulted in substantial leakage to "unintended beneficiaries/ uses" (Srivastava et al. 2003).

Various notable commentators have voiced the concern that the principle of cross-subsidization at the base of the designed subsidy system would become a budgetary liability even if the subsidy might be "off-budget" for the time being. The overall logic of cross-subsidisation was ostensibly to subsidise products meant for the vulnerable sections of society… However.. "To the extent that the increased cost of products like petrol and ATF feeds back into government expenditures, the cross-subsidisation simply replaces oil pool deficit by conventional budgetary deficit" (Srivastava et al. 2003).

The authors also warned that artificially maintaining a large differential over a long period between international prices or domestic costs on one hand, and the prices that consumers pay, would eventually impair the economy's capacity to respond properly to the market signals. As they bluntly put…"These adjustments cannot be postponed indefinitely, and when such adjustments are eventually made, the element of shock to the economy is much larger" (Srivastava et al 2003).

The major items of subsidy are Food, followed by Fertilizer, Exports, and from 2001-02 onwards, petroleum subsidy. As table above already shows, subsidies as a whole grew at a compound rate of over 17% in real terms over the pre-reforms era (1970-71 to 1989-90), with a subsequent reduction in the real rate of growth to 7.14% in the post-

reforms decades (1990-91 to 2007-08). On further decomposition decade-wise, the pre-reform decade of 1970-71 to 1979-80 showed subsidies growing by as much as 31.46%, while the in immediate post-reforms decade (1990-91 to 1999-2000) subsidy growth slowed down to a mere 3.14% in real terms, followed by a moderate 7.14% in real terms in the period 2000-01 to 2007-08

Pensions

The issue of pensions presents the unique case where the government's social and welfare obligations to its people present an unavoidable conflict with the issues of efficiency and sustainability. Much has been discussed over the dilemmas of a government facing the double-edged sword of pension obligations on one hand and the problem of fiscal sustainability over an intergenerational horizon (Asher 2006, for example). In the present context, considering revenue non-development expenditure, the respective weightage of pensions have been from less than 1% pre-Reforms to 4% in the Post-reforms era, and 4.4% in the last phase of our study, viz., 2000-01 to 2007-08. However, even though its weightage has till now not been unmanageable, as compared to other more alarming items, it must be urgently kept in mind that with an increasingly aging population with growing longevity, as more and more of the population continue to retire, this will only add to future pension bill obligations on the government. Hence this is a policy impact area needing urgent and thoughtful remedial steps.

Defence

Discussing on Defence expenditure in this context, we have to remember that a sizeable part of Defence falls under capital head too, so that a full treatment of this item

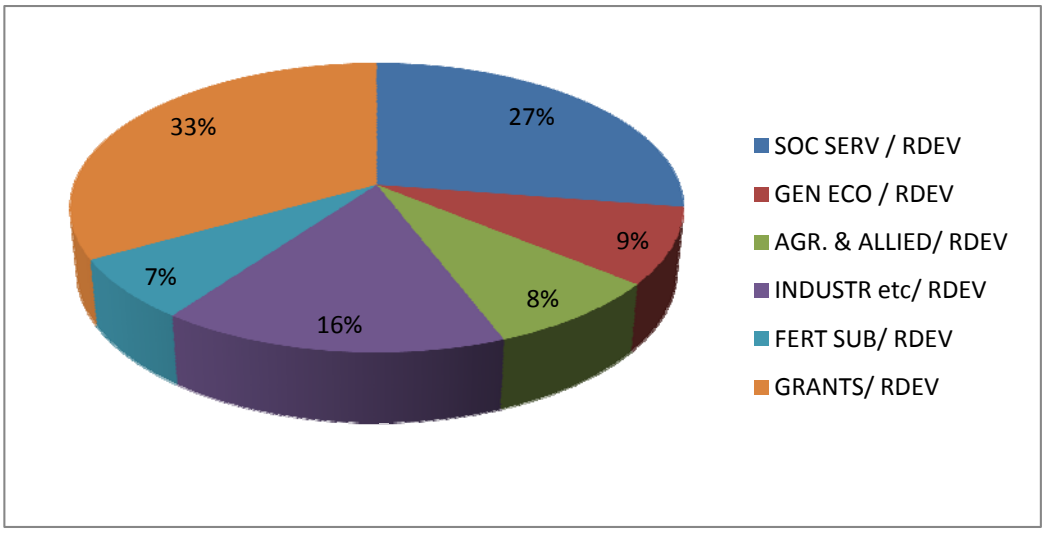
needs to be in terms of revenue and capital heads taken together. Anyhow, so far as the weightage in revenue non-developmental expenditure is concerned, we can infer that post-reforms, the weightage of defence *in this component*, has declined, on an average. During the decade of 1970-71 to 1979-80, Its weightage in revenue non-developmental expenditure had been as high as 45.16%, with an overall pre-Reforms average weightage of approximately 42%. Post-Reforms, its weightage in revenue non-developmental expenditure has come down to the neighbourhood of a much more modest 21%. One should be reminded here, of course, the fact that to understand the full extent of Defence expenditure the capital account also must be taken into account.

Grants

The element of grants has actually fallen as a share of both revenue and revenue non-development expenditure, from around pre-Reforms 3% to close to 0.15% post-Reforms.

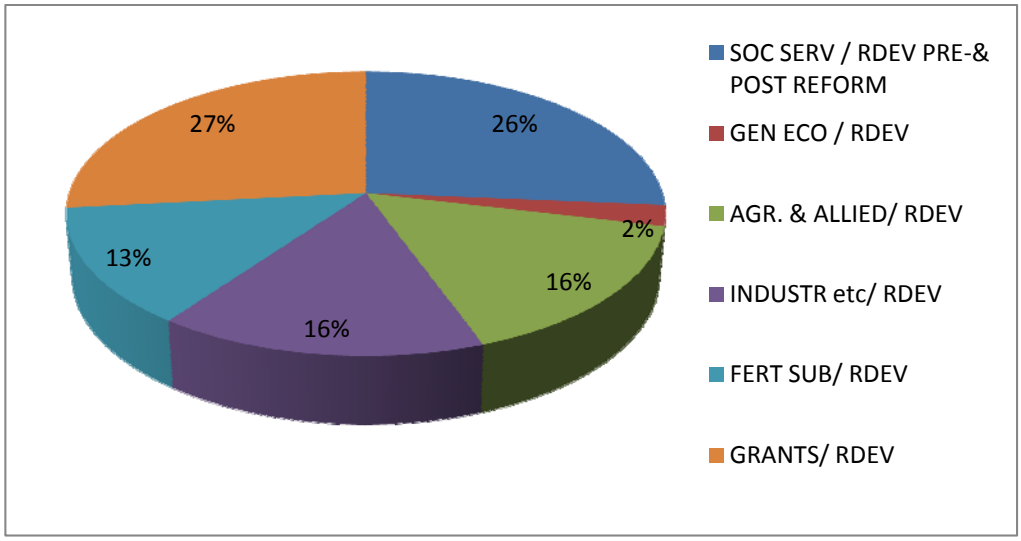
Having so far discussed the evolving composition of *revenue non-development expenditure* in detail, we now turn to the constituent items of *revenue developmental expenditure,* which, as the data shows, have undergone similar compositional shifts. These are being briefly discussed next, using the following pie-charts to facilitate a convenient overview of the relative composition of items under this head.

Fig 5.6 ITEMS IN REVENUE DEVELOPMENT 1970-71—1989-90 (PRE-REFORMS)



Source: Based on APPENDIX TABLEA I.5.

Fig 5.6 ITEMS IN REVENUE DEVELOPMENT 1990-91—2007-08 (POST-REFORMS)



Source: Based on APPENDIX TABLE AI.5

To discuss the trends observed in the above charts in brief, we take up some of the major items under the head revenue developmental expenditure.

Social and Economic Services

For Social services, the compound growth rate for the overall period 1970-71 to 2007-08 was 13.99% in nominal terms and 7.75% in real terms. Further break-up into pre- and post-reform years shows that the growth was 15.76% (nominal) and 7.81% (real) between 1970-71 and 1989-90, while post-reforms there was a marginal fall in the growth to 13.26% (nominal) and 7.53% (real terms), respectively. The weightage of social services has tended to remain stable overall, from 8.47% and 8.38% respectively in the pre-reforms decades (1970-71 to 1989-90) to 8.19% in 1991-2000 and picking up to above 9% over 2000-2008.

As noted earlier, the component "Economic Services", although having very small weightage has shown remarkably rapid growth, second only to that of interest payments. In terms of weightage in revenue expenditure however, the true impact of economic services has steadily gone down from 2.59% over 1970-1979 to a meagre 0.38% of total revenue expenditure in the period 2000-2008.

TABLE 5.6 DEVELOPMENTAL ITEMS: DECADAL WEIGHTS IN REVENUE EXPENDITURE (%)

Period	Social & Community Services	General Economic Services	Industry & Allied
1970-1979	8.47	2.59	4.40
1980-1989	8.38	2.79	5.58
1990-1999	8.19	1.14	3.65
2000-2008	9.14	0.38	6.90

Source: APPENDIX TABLE AI.5

Coming next to the scenario for capital expenditure, tables 5.7 and 5.8 below show the details of capital development (pre- & post-reforms) and non-developmental expenditure.

TABLE 5.7: COMPOSITION OF CAPITAL DEVELOPMENT EXPENDITURE

Period	Year	RLWY/ CDEV DECADAL	RLWY/ CDEV	TRNS, COMM. INDSTR/ CDEV DECADAL	TRNS, COMM. INDSTR/ CDEV	POWER & WATER/ CDEV DECADE	POWER & WATER/ CDEV	SOC & COMM/ CDEV DECADE	SOC & COMM/ CDEV	GEN ECO SERV /CDEV DECADE	GEN ECO SERV /CDEV
Pre-Reform	**1970-71 to 1979-80**	19.12	18.20	59.76	53.73	8.19	13.65	10.36	10.50	2.41	3.82
	1980-81 to 1989-90	17.29		47.70		19.12		10.65		5.23	
Post-Reform	**1990-91 to 1999-00**	24.02	29.76	32.18	31.67	28.28	22.62	15.33	11.48	0.18	4.47
	2000-01 to 2007-08	36.94		31.02		15.53		6.67		9.84	

Source: APPENDIX TABLE AI.7

Where:
CDEV: Capital Development Expenditure RLWY: Railways
TRNS, COMM, INDSTR: Transport, Communications & Industry
SOC. & COMM: Social and Community Services
GEN ECO. SERV: General Economic Services

As a perusal of table 5.7 above shows, the major item in capital developmental expenditure has been the combined item of transport, communications and industry taken together, although railways were the single major-most item. Together, the component transport, communications and industry accounted for nearly 60% (59.76%) during 1970s, and after a relatively slower growth their combined weightage over the pre-reform period (1970-71 to 1989-90) stood at 53.73%. The post-reforms period, however, saw a relative slow-down in the rate of growth of this component, which stood at 31.67%, marginally higher than the weightage of the second and single largest

component viz. railways which commanded 29.76%. During 2001-2008, in fact, railways commanded the highest share of capital developmental expenditure at 36.94%. These items are respectively followed by Power and Water (13.65% pre-reforms and 22.62% post-reforms), Social and Community services (10.50% and 11.48% respectively for the pre- and post-reforms periods), and General Economic Services (3.82% and 4.47% respectively over the pre-reforms and post-reforms period). Notably, the item Social and Community services, which had a share of 15.33% during the decade 1991-2000, came down to mere 6.67% of capital developmental expenditure during 2001-2008. On the other hand, “General Economic Services”, which commanded a mere 0.18% over 1991-2000 grew in share to 9.84% during 2001-2008.

TABLE 5.8: COMPOSITION OF CAPITAL NON-DEVELOPMENT EXPENDITURE (1971-2008)

Period	Year	DFNC/ CNDV DECADAL	DFNC/ CNDV	FISCAL / CNDV DECADAL	FISCAL / CNDV	OTHERS/ CNDV DECADAL	OTHERS/ CNDV
Pre-Reform	1970-71 to 1979-80	85.35	76.98	20.24	25.91	-5.59	-2.89
	1980-81 to 1989-90	68.61		31.59		-0.19	
Post-Reform	1990-91 to 1999-00	75.55	82.30	23.45	14.95	1.00	2.75
	2000-01 to 2007-08	90.74		4.32		4.93	

Source: APPENDIX TABLE AI.8

Of Capital non-development expenditure, as table 5.8 indicates, the major, indeed lion's share, has typically been commanded by defence. After a high of 85.35% during 1970-71 to 1979-80, comprising the well-known years of Bangladesh Liberation War (1971-

73), the percentage share of defence declined to a level of 68.61% during 1980s, followed by a relatively larger share of 75.55% during 1990-91 to 1999-2000. The span of 2000-01 to 2007-08 shows an apparently extremely high share of 90.74%. At the same time, the relatively slower growth in the other item, namely, “Fiscal Services”, (from 23.45% of capital non-development expenditure during 1991-2000, to a mere 4.32% during 2001-2008), also needs to be noticed here, as it is this extreme decline that has also contributed to the apparently dramatic increase in the weightage of defence in capital non-development expenditure over this period.

In terms of actual magnitudes, as a reference to APPENDIX TABLE AI.**8** reveals, the component of Fiscal Services has shown extremely wide fluctuations all through our study period. From values of Rs. 168.86 crores in 1970-71 followed by Rs.3.11 crores in 1977-78, Fiscal Services registered respectively Rs 573.21 crores and Rs. -17.01 crores in the consecutive years 1980-81 and 1981-82. Similarly, from a value of Rs. 1976.87 crores during 1999-2000 it subsequently declined to Rs. 610.55 crores during 2000-01, climbing up to Rs. 1576.58 crores in 2003-04 and again reverting to the low figure of Rs. 404.40 crores in 2006-07. The major explanation for such extreme fluctuations lies mainly in the component “Subscription to IMF” which has been occurring in the capital expenditure accounts since 1975, and has been registering highly fluctuating amounts throughout the study period. During the period 2001-2008, thus, “Subscription to IMF” registered Rs. 1011.45 crores, Rs. 414.87 crores, and as low as Rs. 39.57 crores in the years 2002-03, 2004-05 and 2006-07, respectively. The figures for 2007-08 (Actuals) were Rs. 649.30 crores for Fiscal Services, and 0.00 for Subscription to IMF, respectively, thus accounting for the seemingly excessive weightage of Defence over 2001-2008.

5.2 ELASTICITY AND BUOYANCY OF CENTRAL GOVERNMENT EXPENDITURE: A BRIEF DISCUSSION

The concepts of elasticity and buoyancy are among the other major characteristics that are used in describing the observed behaviour of government revenue/ expenditure, and to predict the potential changes therein, in response to change in economic variables, principally, income.

In case of government *revenues*, high revenue productivity is considered one criterion of a good tax system. Buoyancy and elasticity are two measures of such productivity. Tax revenues may change because of a variety of factors, e.g., discretionary changes in the tax rates, the efficiency of tax administration and income. In order to estimate income elasticity, historical tax series must be adjusted to eliminate the effects on tax revenues of all factors other than income. Thus income elasticity may be defined as the ratio of the percentage change in adjusted tax revenues to the percentage change in income. Buoyancy on the other hand refers to changes in tax revenues that are due not only to changes in income but also to discretionary changes.

For government expenditure, on the other hand, Asher (1989) recommended it usual as to regard buoyancy and elasticity as identical, since unlike taxes, few expenditure items vary automatically with income, a possible exception being transfers to individuals.

However, in the present analysis we have retained the practice of separately estimating the elasticities and the buoyancies of expenditure and their components.

An elasticity value exceeding unity w.r.t. GDP implies that for every one per cent change in GDP, the revenue (or, as in the present case, expenditure) changes by more

than one per cent. On the other hand, buoyancy estimates in excess of unity imply a greater than proportionate response to the respective total category under concern. Typically, higher buoyancy values for revenue expenditure have been customarily observed even in times of severe restrains placed in the 1980s on government expenditure, particularly development expenditure (Asher 1989).

Low buoyancy values for government revenues, on the other hand, indicate major implications for the sustainability of the fiscal system. Low revenue buoyancy has necessitated severe restrain on government expenditure, particularly development expenditure. These restraints, if allowed to continue much longer, could constraint future economic growth.

In this section of the analysis, we undertake the following:

- ***Elasticity estimates*** of significant expenditure items have been derived, with respect to GDP factor cost, at both current and constant (2004-05 prices), both for the whole study period, decade-wise and for the Pre- and Post-Reforms periods.
- The ***buoyancy*** of significant expenditure items (that is, by how much individual expenditure items are responding to a change in the relevant expenditure category), have been derived at *constant (2004-05) prices,* again both for the entire study period, the individual decade-wise as well as for the Pre- and Post-reforms periods.
- The implications of the above findings and results are discussed in detail.

The following section presents in detail both elasticity of various expenditure components with respect to GDP, and their respective buoyancies relative to the

relevant total categories of expenditure. That is, elasticity estimates of various expenditure categories with respect to GDP are presented, while buoyancy estimates for various components of government expenditure are presented with respect to the relevant overall expenditure category.

Elasticity estimates have been presented at both current and constant prices. Elasticities for revenue expenditure are greater than unity, both for overall 1971-2008 as well as for both pre-reforms. (1971-1990) and post-reforms (1991-2008).

TABLE 5.9
Elasticity w.r.t GDP_{fc} Central Government Expenditure
1970-71 to 2007-08

	At Current Price			At Constant 2004-05 Price		
	1970-71 to 2007-08	1970-71 to 1989-90	1990-91 to 2007-08	1970-71 to 2007-08	1970-71 to 1989-90	1990-91 to 2007-08
1	2	3	4	5	6	7
Revenue Exp.	1.12	1.26	1.00	1.34	1.85	1.01
Capital Exp.	0.73	1.21	0.34	0.34	1.64	-0.24
Total Exp.	1.03	1.25	1.03	1.13	1.79	0.79
Revenue Development	1.15	1.44	1.02	1.43	2.34	1.08
Revenue Non-Development	1.10	1.20	0.98	1.31	1.65	0.96
Capital Development	0.67	1.11	0.79	0.24	1.33	0.72
Capital Non-Development	1.22	1.43	0.85	1.59	2.40	0.74
Total Development	1.03	1.32	0.99	1.13	1.99	1.03
Total Non-Development	1.11	1.22	0.96	1.33	1.71	0.93

*Source: APPENDIX TABLES **AII.1 to AII.9** and **AII.36 to AII.45***

Interestingly, Elasticities at constant prices (2004-05 base) are higher than estimates at current prices. On the other hand, capital expenditure yields overall elasticity estimates (1970-71 to 2007-08) at 0.73 (current prices) and a much lower 0.34 at constant prices.

Notably, both sets (i.e. current prices as well as constant prices) show an elasticity exceeding unity (1.21 and 1.64, respectively) for the period pre-reforms (1970-71 to 1989-90). Finally, for the post-reforms period (1991-2008), capital expenditure shows an elasticity of 0.34 and -0.24, respectively, at current and constant prices. Overall, the weightage of revenue expenditure in the total having far outweighed capital expenditure, total expenditure shows overall Elasticities of 1.03 (current prices) and 1.13 (constant prices) over the entire study period (1970-71 to 2007-08).

Among the further divisions into development and non-development, capital non-developmental showed the highest elasticity, 2.40 (*constant prices*) over the pre-reform period 1970-71 to 1989-90, that was followed by an elasticity of 0.74 post-reforms (1991-2008). Revenue developmental expenditure apparently showed the second largest elasticity at *constant prices,* viz. 2.34, again over the pre-reform period.

TABLE 5.10

Elasticity w.r.t GDP_{fc} Central Government Expenditure 1970-71 to 2007-08 (Function-wise*).*

	At Current Price			At Constant 2004-05 Price		
	1970-71 to 2007-08	1970-71 to 1989-90	1990-91 to 2007-08	1970-71 to 2007-08	1970-71 to 1989-90	1990-91 to 2007-08
1	2	3	4	5	6	7
Interest	1.30	1.47	0.97	1.78	2.46	0.92
Defence	0.93	1.08	0.91	0.88	1.30	0.83
Social Services	1.09	1.27	1.11	1.28	1.82	1.25
Economic Services	0.68	1.58	0.45	0.27	2.74	0.24
Subsidies	1.38	2.01	1.07	1.93	3.89	1.17
Pension	1.81	1.72	1.23	3.05	3.19	1.44
Grants	1.01	1.23	0.86	1.06	1.74	0.76
Loan	0.46	1.24	-1.06	-0.48	1.72	-3.25

Source: Computed on the Basis of APPENDIX TABLE II.10 to AII.17, & AII.46 to AII.53

Functional category-wise, both in terms of current and constant prices for the overall study period of 1971-2008, while interest payments, subsidies, social services,

pensions and grants all show Elasticities in excess of unity, it is the item of pensions that seems to be the most elastic component among those presented, with estimates of 1.81 at current price and as high as 3.19 at constant prices. The fact needs, of course, to be taken into account that pensions still command a relatively low share.

TABLE 5.11
Decade-wise Elasticity w.r.t GDP factor cost

	At Current Price				At Constant 2004 price			
	1970-71 to 1979-80	1980-81 to 1989-90	1990-91 to 1999-00	2000-01 to 2007-08	1970-71 to 1979-80	1980-81 to 1989-90	1990-91 to 1999-00	2000-01 to 2007-08
1	2	3	4	5	6	7	8	9
Revenue Exp.	1.28	1.37	0.95	0.87	1.75	2.24	1.03	0.75
Capital Exp.	1.40	1.03	0.23	1.09	2.07	1.37	-0.68	1.14
Total Exp.	1.31	1.26	0.83	0.91	1.82	1.95	0.74	0.80
Revenue Development	1.61	1.46	0.78	1.27	2.91	2.47	0.63	1.39
Revenue Non-Development	1.11	1.32	1.08	0.62	1.16	2.10	1.32	0.34
Capital Development	1.35	0.75	0.12	1.73	1.91	0.64	-0.87	2.15
Capital Non-Development	0.38	1.98	0.56	1.35	-0.42	3.81	0.06	1.52
Total Development	1.51	1.23	0.68	1.34	2.51	1.87	0.40	1.52
Total Non-Development	1.05	1.38	1.02	0.69	1.03	2.25	1.18	0.45
Interest	1.27	1.64	1.00	0.57	1.68	2.93	1.36	0.25
Defence	0.92	1.27	0.88	0.78	0.53	1.99	0.88	0.60
Social Services	1.66	1.29	1.07	1.44	2.62	2.02	1.32	1.67
Economic Services	2.61	1.24	-1.63	4.34	6.11	1.97	-4.95	6.43
Subsidies	3.61	1.79	0.75	1.05	7.99	3.32	0.54	1.04
Pension	1.38	1.68	1.38	0.89	2.08	3.02	2.10	0.78
Grants	0.99	1.06	0.61	1.31	1.24	1.41	0.19	1.45
Loan	1.72	0.98	0.03	-3.22	2.89	1.25	-1.17	-5.96

Source: Please Refer to NOTE in APPENDIX II

Considering the pre-reform period, subsidies appear to be the most elastic with values of 2.01 (current prices) and as high as 3.89 (*constant prices*) respectively. Somewhat contrary to common perception / expectation, defence appears to have a less than unitary elasticity overall (1971-2008) although elasticity estimates for the pre-reform period exceeded unity at both current price (1.08) and constant prices (1.30).

From the following section onwards, the buoyancies of different categories of expenditure are presented, with respect to their relevant total categories, estimated at *constant prices* (*Base 2004-05*). Details of the estimate results are followed by a subsequent comprehensive discussion regarding the observations and inferences that can be drawn on the basis of the estimates presented.

DISCUSSION ON BUOYANCY ESTIMATES OF EXPENDITURE CATEGORIES

A brief overview follows of the results and implications of the various buoyancy estimates of different categories of expenditure. The results are presented for the relevant categories in equation form. Most of the results are presented for the overall study period, viz., 1970-71 to 2007-08, with sub-periods taken into account where deemed necessary only for a selected group of items. Comprehensive discussion follows regarding the observations and inferences that can be drawn on the basis of the estimates. All the estimate results in detail have been attached in the APPENDIX section for the interested reader. *Unless otherwise mentioned, all estimates are at constant 2004-05 prices.*

The respective estimates for the major two expenditure categories, viz., revenue and capital expenditure are presented first. Results for revenue expenditure and its development as well as non-developmental components are presented, w.r.t. the total expenditure and its developmental and non-developmental categories.

Similar presentation of capital expenditure with its respective components then follows with discussion.

Finally, estimates are briefly presented for the various functional components.

At this point, we also need to bear in mind that the above statistical estimates of buoyancy coefficients must be scrutinized and interpreted in the context of the respective importance (weightage) of the concerned components with respect to the relevant total category.

RELATING BUOYANCY OF EXPENDITURE TO THEIR RESPECTIVE RATIOS

The weightages of various expenditure components have already been discussed in the preceding sections, with the respective buoyancies being reported here. Now, we simultaneously address the implications of these two sets of results in connection to each other. Given the ratio of a specific item in the respective total, & their buoyancies with respect to the same, we must also pay attention to the "story" the results are telling us, and how observed trends can be expected to behave in the near future, *in the absence of major upheavals, Policy or otherwise*? Are ratio & buoyancy results accordance with our common-sense expectations?

To briefly recapitulate, we begin by reproducing the respective weightages of expenditure items, and then combining these with the buoyancy estimates as obtained, in order to get the full implications of our results.

TABLE 5.14
RESPECTIVE WEIGHTAGES OF COMPONENTS
CENTRAL GOVERNMENT EXPENDITURE 1970-71 TO 2007-08

PRE-REFORMS (1971--1990)

Year	Rev. Exp/Total Exp.	Rev.Dev/ Rev. Exp	Rev. non Dev./ Rev. EXp.
	RE/TE	RDEV/RE	RNDV/RE
1970-71	65.57	27.20	72.80
1971-72	70.72	25.48	74.52
1972-73	67.27	28.88	71.12
1973-74	69.30	26.81	73.19
1974-75	63.23	25.41	74.59
1975-76	62.67	28.72	71.28
1976-77	65.46	30.15	69.85
1977-78	67.36	34.79	65.21
1978-79	64.40	37.21	62.79
1979-80	66.79	36.37	63.63
1980-81	61.44	34.81	65.19
1981-82	64.29	34.69	65.31
1982-83	65.82	35.76	64.24
1983-84	66.04	35.82	64.18
1984-85	64.97	37.08	62.92
1985-86	65.93	36.06	63.94
1986-87	66.87	35.39	64.61
1987-88	70.10	37.45	62.55
1988-89	71.05	37.87	62.13
1989-90	71.15	39.51	60.49

POST-REFORMS (1991--2008)

Year	Rev. Exp/Total Exp.	Rev.Dev/ Rev. Exp	Rev. non Dev./ Rev. EXp.
	RE/TE	RDEV/RE	RNDV/RE
1991-92	75.48	36.90	63.10
1992-93	74.87	36.01	63.99
1993-94	75.89	33.79	66.21
1994-95	78.88	33.74	66.26
1995-96	79.58	31.55	68.45
1996-97	81.63	31.25	68.75
1997-98	86.47	31.01	68.99
1998-99	86.09	30.13	69.87
1999-00	85.81	29.94	70.06
2000-01	88.38	30.30	69.70
2001-02	86.57	30.88	69.12
2002-03	92.39	31.99	68.01
2003-04	97.02	33.91	66.09
2004-05	95.00	33.70	66.30
2005-06	88.06	37.36	62.64
2006-07	90.56	40.44	59.56
2007-08	83.97	42.16	57.84

Source: Computed on the Basis of APPENDIX TABLE AI.1.

As already observed, Central Government revenue account expenditure has been the leading-most component of total expenditure over our study period, and hence we begin the discussion with this item and its sub-categories, of which, revenue non-developmental expenditure, again, has been showing the most dramatic growth and claiming the lion's share of expenditure categories.

With these characteristics in mind, we begin our discussion of the buoyancy results where the most significant category has been discussed in greater detail, with relatively less stress accorded to other comparatively less significant items.

Buoyancy of Selected Expenditure Items

As already stated, all buoyancy computations have been carried out with *2004-05* as the *base-year* unless reported otherwise. .

The buoyancy of Revenue expenditure (RE) with respect to Total Expenditure (TE) has been estimated in the following equations:

The equation estimated for the overall period 1970-71 to 2007-08 was:

Log(RE)=-1.514 + 1.66 log(TE) …… 1a)

(R2 = 0.989, t-value 59.002 significant at 1% level)

For the Pre-reforms period (1971-1990), the equation was:

Log(RE)=- -0-493 + 1.018 log(TE) …….. 1b)

(R2 = 0-992, t-value 50.764 significant at 1% level)

While Post-Reforms, that is, from 1991-2008, the equation estimated is:

Log(RE)=- -2.171+ 1.251 log(TE) …… 1c)

(R2 = 0.969 , t-value 22.701 significant at 1% level)

On decade-wise analysis, the buoyancy estimates are as follows:

For 1970-71 to 1979-80:

Log(RE)= -0.133+ 0.966 log(TE) …… 1d)

(R2 = 0.985, t-value= 23.000 significant at 1% level).

Between 1980-81 and 1989-90, the immediate Pre-Reforms decade, buoyancy estimates are,

Log(RE)=-1.393 + 1.136 log(TE) …….. 1e)

(R2 = 0.995, t-value 44.076 significant at 1% level).

Similarly, over the immediate post-Reforms decade 1990-91 to 1999-00, buoyancy estimates are:

Log(RE)=-2.663 + 1.311 log(TE) …… 1f)

(R2 = 0.974, t-value 17.464 significant at 1% level)

Finally, over the last eight-year period of our study, 2000-01 to 2007-08, the buoyancy estimates are

Log(RE)=1.365 +0.829 log(TE) …… 1g) *

(R2 =0.898, t-value 7.284 significant at 1% level)

For detailed statistics for equations 1a) to 1g) please refer to APPENDIX TABLE **AIII.1*

From the above, with respect to Total Expenditure, Revenue Expenditure showed an overall buoyancy of 1.66 (significant with a high R^2 of 0.989) throughout the entire period 1971-2008. On decomposing the time-period, buoyancy estimates exceeded unity both prior to and in the post-Reforms periods..

Overall, too, on a decadal level, buoyancy of revenue expenditure with respect to total expenditure has typically exceeded 1, except for the starting decade of 1970s, when it was 0.966, and the last eight-year segment of our study, that is 2001-2008 (buoyancy 0.829). Buoyancy was highest during the immediate post-reforms decade 1991-2000 at 1.311 (R^2 0.974), while it was lowest (0.829), for the period 2000-2008. Typically, therefore, revenue expenditure has always shown a buoyancy of greater than unity w.r.t. total expenditure excepting the decade of 1970sm presumably given its overriding principle of relative fiscal conservatism (Chelliah 1973, Planning Commission 1980), and the last period (2001-2008) marking the era when Fiscal Consolidation again began

to be the hallmark of fiscal stance (even though consolidation efforts were soon to be overtaken by the exigencies of the Global Financial Crisis).

This is a result that is expected and intuitively clear from the variously observed trends and patterns in Revenue Expenditure over our study period.

Considering the weightage of Revenue Expenditure in Total, the tables presented earlier above clearly bring out the respective year-wise ratios of revenue in total expenditure over the entire study period. This weightage has grown phenomenally, from around 65% in 1970-71, to as high as exceeding 92% in 2003, after which the weightage expectedly started to grow more slowly as a result of conscious expenditure reigning in via the FRBMA (2003, enacted in 2005 at the Central level), until fiscal consolidation effects again began to be sabotaged by the dire necessities of stimulus and revival in the wake of the Global Financial Crisis.

Hence, combining the trend indicated by buoyancies, and the weightages computed as earlier, the following conclusions are permissible:

1. Revenue expenditure has been extremely buoyant, all over our study period, but its trend had been started to be moderated around 2008.
2. The buoyancy results indicate the expected trends as revealed from the weightages on year-by-year basis of revenue expenditure in total and are fully in accordance with the actual weightages.
3. Going by the trend in buoyancy estimates, we would have expected revenue expenditure growth with respect to total expenditure to become somewhat moderated by the end of 2008 onwrads. As real and actual events showed, however, that was not to be, as 2008 onwards was the period when the Global

Financial Crisis struck its peak and huge fiscal stimuli packages had to be initiated by governments all the world over.

4. As this part of the post-2008 period takes us beyond the chosen study period, we are not elaborating the consequences in detail, but only must note here our foremost stated pre-condition, that the above discussed buoyancy and trend estimates would only have been true, *had there been no external/ policy "Shocks",* conditions that were soon to be belied by the events during and subsequent to, 2008.

We next turn to the results for Development and Non-Development categories of Expenditure since within this again, the behaviour of revenue developmental and revenue non-developmental expenditure are of particular interest to us.

Buoyancy of Development expenditure(TD) with respect to Total Expenditure(TE):

Log(TD) =--1.124 +1.007 log(TE) (1970-71 to 2007-08)

(R^2=0.971, t= (35.071)***, F= 1230.02) ... ... **2a)**,

that is, buoyancy for the overall period is significant and exceeds unity with robust statistical parameter values. R^2 value is even higher (0.984) in the pre-Reforms period (1970-71 –1989-90). with a significant and higher than unity buoyancy value (1.103), and in the subsequent period buoyancy continues to exceed unity (1.301) though R^2 is now lower (0.914).(*please refer to APPENDIX TABLE for the detailed estimates*).

Buoyancy of Non-Development expenditure(TND) with respect to Total Expenditure(TE):

Log(TND) = --1.762+ 1.152 b log(TE) (1970-71 to 2007-08)... **2b)**

(R^2 =0.979, t= 38.979***, F= 1519.40)

That is, buoyancy for the overall period significantly exceeds unity. It will be apparent, from the equation that the individual buoyancy values for both pre- and post-Reforms periods are lower, with a lower R^2 than the overall, although results continue to be significant.

Coming to the buoyancy of Revenue Development expenditure (RD), with respect to Total Expenditure (TE) as well as Revenue Expenditure, we have the following results:

Log(RD) = --3.404 + 1.266 log(TE) (1970-71—2007-08)

(R^2 =0.991, t= 64.524***, F= 4263.41) ... ...**2c)**

That is, revenue developmental expenditure has had a significantly higher than unity buoyancy estimate with respect to Total Expenditure overall, with a high R^2. This buoyancy has been high for both the pre- as well as post-Reforms periods, though R^2 has been marginally less, in both cases. The immediate post-Reforms period (1990-91—1999-2000), however, needs to be separately mentioned, where we have:

Log(RD) = --0.423 + 0.884 log(TE) (1990-91—2007-08)

(R^2 =0.951, t= 12.482***, F= 155.82) ... . **2d)**

Clearly, buoyancy for the immediate post-Reforms period, so far as revenue development expenditure is concerned, went lower than unity, though it bounced back above unity in the next period (2000-01 to 2007-08).

Similar results are obtained for. Revenue development w.r.t. Revenue Expenditure.

We now come to the case of Revenue Non-Development Expenditure, which, recalling the trend observed in Fig. 4.5 (Chapter 4), and also earlier in this chapter, has in fact

been the dominant component of revenue expenditure. For the overall period 1970-71 to 2007-08, we have:

Buoyancy of Revenue Non Development expenditure(RNDV) with respect to Total expenditure (TE):

Log(RNDV)= -1.894 + 1.131 log(TE) ... ...**2e)**

(R^2 =0.975, t= 37.536***, F= 1408.95),

that is, buoyancy significantly exceeding unity for the overall study period.

Two significant departures from this observed characteristic should be mentioned here separately. First, the first decade of our study period, viz., 1970-71—1979-80, where we have:

Log(RNDV)= 1.324 + 0.684 log(TE) ... . **.2f)**

(R^2 =0.920, t= 9.651***, F= 93.14)

and the pattern over the last sub-period of our study, viz. 2001-2008:

Log (RNDV)= 4.624 + 0.382 log(TE) .. .. **.2g)**

(R^2 =0.769, t= 4.475***, F= 20.02)

That is, in both these sub-periods, we have had a quite low buoyancy of revenue non-development expenditure w.r.t. total expenditure. The explanation is not hard to seek. In the first case, that is the decade of 1970s, the fiscal conservatism exhibited stringently over the 1960s was yet to be relaxed, although a gradual mounting of the revenue expenditure over and above revenue receipts was slowly begun to be felt. The second instance, viz. the span of 2000-01 to 2007-08 conceivably shows the effects of renewed fiscal consolidation efforts to some extent.

Results are rather more mixed regarding the buoyancy of Revenue Non Development expenditure (RNDV) with respect to Non-Development expenditure (TND): where we report the overall result for the entire study period (1970-71 to 2007-08)

Log(RNDV)= 0.035 + 0.981 log(TND) ... ... **2h)**

(R^2 =0.998, t= 135.751***, F= 18428.59)

That is, an overall buoyancy of less than unity, with highly significant parameter values. We may mention that of the two sub-periods, in this case, the buoyancy in the pre-Reforms period was less that unity while it exceeded unity in the post-Reforms period.

Buoyancy of Revenue Non Development expenditure (RNDV) with respect to Revenue expenditure (RE) gives the overall equation:

Log (RNDV)=--0.259 + 0.974 log(RE) (1970-71 to 2007-08) ... ... **.2i)**

(R^2 =0.994, t= 77.940***, F= 6074.75),

again an overall buoyancy estimate below unity with significantly high parameters. Interestingly, in this case, (that is, revenue non-development w.r.t. revenue expenditure), buoyancy estimate exceeded unity only during the single sub-period 1990-91 to 1999-00, that is, the immediate post-Reforms decade.

Log (RNDV) =--2.379 + 1.252 log(RE) (1990-91 to 1999-00)... ...**2j)****

(R^2 =0.988, t= 22.113***, F= 790.38)

For detailed statistics for equations 2a) to 2j) please refer to APPENDIX TABLES **AIII.2 to AIII.9

Our next point of discussion is Capital expenditure. The extreme fluctuations shown by the component of capital expenditure have been repeatedly reiterated, and here we present a few selected sample results:

Buoyancy of Capital expenditure(CE) with respect to Total Expenditure(TE): *(all results at constant 2004-05 prices)*

Log(CE) =3.801 +0.395 log(TE) (1970-71 to 2007-08) ... **3a)**

(R^2 = 0.401, t= 4.849***, F= 23.52).

Thus, both the buoyancy estimate and the R^2 value, are significantly lower. Examining further the pre-reforms and post-reforms period, we observe the following:

Log(CE) =--0.504 +0.914 log(TE) Pre-Reforms (1970-71 to 1990-91) ... **3b)**

(R^2 = 0.966, t= (23.568)***, F= 555.23).

whereas, Post-Reforms, we have

Log(CE) =7.411 --0.149 log(TE) (for 1990-91 to 2007-08) ... ... **3c)**

(R^2 = 0.014, t= (--0.471) Not Significant, F= 0.222)

Thus, in marked contrast between the pre-Reforms and the Post-Reforms periods, the buoyancy value which was significantly positive and quite close to unity pre-Reforms with high R^2, has climbed down to *negative* in the post-Reforms period, with very low R^2 and insignificant parameter values. The *individual decade-wise* specific characteristics can be further deduced from the *APPENDIX TABLES.*

Coming next to buoyancy of Capital Non Development expenditure (CNDV) with respect to Total expenditure (TE):

Log(CNDV) = --6.159 + 1.410 log(TE) (1970-71 to 2007-08)..... **3d)**

(R^2 = 0.873, t= (15.795)***, F= 249.48.

Thus, for the overall study period, buoyancy of capital non-development w.r.t. total expenditure is found to be significant and exceeding unity, although R^2 value is lower than that in case of revenue expenditure.

For the pre-Reforms period, we have:

Log(CNDV) = --5.574 + 1.321 log(TE) (1970-71 to 1989-90)... ... **3e)**

(R^2 = 0.716, t=(6.927)***, F= 47.98).

While post-Reforms,

Log(CNDV) = --2.131—0.176 log(TE) (1990-91 to 2007-08) ... **3f)**

(R^2 = 0.489, t= (3.920)***, F= 15.36).

Thus, as before, between the pre- and post-Reforms periods, buoyancy estimates have turned from 1.321 (exceeding unity) to negative, this time both with significant t-values. The R^2 however, is quite low for both the periods.

Thus, when it comes to the buoyancy of capital non-development expenditure w.r.t. Total Expenditure, the observed pattern begins to change. The R^2 values are now much lower than before. Although the buoyancy for the overall study period continues to be significant, this is no longer the case when we come to the decade of 1970-71 to 1979-80. The buoyancy estimate is insignificant (with both low t-value and F-value), and the same follows for the immediate post-Reforms decade 1990-91 to 1999-2000.

However, considering the buoyancy of capital non-development expenditure *within* the *sub-category of non-development expenditure,* we get a different scenario.

Buoyancy of Capital Non Development expenditure(CNDV) with respect to Total Non-Development Expenditure (TND):

Log(CNDV) =-4.009 + 1.224 log(TND) (1970-71 to 2007-08)... .... **3g)**

(R^2=0.895, t=(17.605)***, F= 309.94),

a significantly higher than unity buoyancy estimate, where, as the detailed equation evidence, buoyancy values for the sub-periods 1980-81 to 1989-90 and 2000-01 to 2008-08 are, respectively, 1.713, and as high as **3.080,** both with significant parameter values.

Finally, the buoyancy of Capital Non Development expenditure (CNDV) with respect to Capital expenditure (TND):

Log(CNDV) = --3.952 + 1.387 log(CE) (1970-71 to 2007-08) ... **3h)**

(R^2= 0.326, t= (4.117)***, F= 16.95

Here, once more, the R^2 values are uniformly low. Results are non-significant for the post-Reforms period 1990-91 to 2007-08, as well as the three sub-periods 1970-71—1979-80, 1990-91 to 1999-00 and 2000-01 to 2007-08. Interestingly, the period 1980-81 to 1989-90 yields a significant buoyancy estimate of 2.447, the period when all components of central government expenditure had been experiencing rapid expansion.

For detailed statistics for equations 3a) to 3h) please refer to APPENDIX TABLES **AIII.10** to **AIII.13

At this point, summing up the above result summaries, we can infer the following:

i) The above results are respectively for Total, and its major categories, viz. Revenue and Capital Expenditure on one hand, and Developmental vs. Non-Developmental on the other.

ii) Details for Revenue Development and Non-Development expenditure have been presented.

iii) In particular, the highly fluctuating component of Capital Non-Development expenditure, has also been presented in detail.

iv) In case of most of the revenue expenditure items, buoyancy results have uniformly high R^2 values, and are significant (as shown by the high t-values).

v) The F-statistic, too, is uniformly significant, implying that the estimates are robust.

vi) The above conclusions are with a handful of exceptions, valid for each decadal period, for the pre-reforms (1970-71 to 1989-90) period as well as the post-reforms (1990-91 to 2007-08) period.

vii) Thus far, we have been focussing on the revenue and developmental vs. non-developmental components. As soon as we come to capital expenditure and its sub-categories, however, the scenario is changing altogether.

viii) With very few exceptions, R^2 values are now almost uniformly much lower.

ix) Buoyancy estimates are now much more frequently lower than unity.

x) To interpret these results, a high buoyancy value implies that any expenditure increase leads to a more than proportionate increase in the concerned component. At the same time, the same high buoyancy also implies room for greater compression of the respective components when a program of expenditure containment is being undertaken.

xi) Conversely, just as a low buoyancy figure means less than proportionate increase in times of fiscal expansion or, even, mismanagement, it at the same time implies that there is little room for manoeuvre left when seeking to target reduction in specific expenditure components through containing the respective total expenditure.

We next follow up the discussion with the buoyancy estimates of selected functional categories, where some illustrative results have been showcased as before.

For capital expenditure, we have earlier noted the overall quite low buoyancy with respect to Total Expenditure (0.395 overall with a very low R^2 of 0.401) throughout the entire period 1971-2008. Buoyancy in the pre-reforms period (1971-1990) was much greater at nearly unity (0.914) with a significant R^2 of 0.966. Post- reforms, that is, over 1991-2008, the buoyancy was in fact negative, -0.149 With a very low R^2 . On a decadal level, while buoyancy was lowest (-0.606, with an extremely low R^2 of 0.298) for the period immediate post-reforms period (1991-2000), this was interestingly followed by the highest decadal value of 2.092 over 2000-2008, although R^2 continued to remain low at 0.486.

Finally, the individual buoyancy estimates for the functional items interest payments (INT), Defence (DEF), pensions (PEN), subsidies (SUB) and others have been presented in *APPENDIX TABLES AIII.14 to AIIII. 24*

Ultimately, what buoyancy figures tell us is the responsiveness of various expenditure categories to the overall changes in major macro-aggregates. However, more often than not, these are highly influenced by political considerations, rather than strictly economic rationale/ objectives. As a result, the government priority also gets moulded accordingly, where, as we find in our analysis above, there is an apparently obvious preference on the part of the government towards *revenue expenditure* in order to meet its political expediencies or compulsions, that has at times come at the cost of capital expenditure.

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6

Analysis of Central Government Expenditure 1970-71 — 2007-08

Phase III

"Public economics is a case in point how empirical testing is held hostage to data availability and its accuracy. Findings are shaped as much by underlying theory and assumptions as by the techniques employed to test the theory"

--Ott and Cebula (2006).

CHAPTER 6

Analysis of Central Government Expenditure: 1970-71 — 2007-08

Phase III: Analyzing the Central Government Expenditure Process

The present chapter, the last among the three chapters comprising the Analysis Section of this Thesis, consists of the following major sections.

6.1 Introducing the Government Expenditure Mechanism

So far in the present study we have confined ourselves to the inspection of various components, and the detailed composition, of various expenditure categories, including their respective growth rates, period-wise shares in respective total categories and vis-à-vis each other, and their elasticity and buoyancy properties. The major trends prior to the 1991 economic reforms, as well as in the subsequent period, have been studied at length.

Having analyzed in detail what might be termed the "Arithmetic" of the central government expenditure over our study period 1971-2008, it is now time to turn our attention to the "Economics" of the government expenditure process, in particular in India over our chosen period of study. We now come to the part of our analysis where we attempt to explicitly formalize the government expenditure mechanism in terms of economic/ structural variables as well as political/ institutional factors operating in the economy and, quite plausibly, impacting various aspects of government expenditure.

This part of the analysis, therefore, focuses on *how*, *and to what extent*, the process and patterns of government expenditure observed in actual practice are shaped by the various factors working in the economy, some of them observable or quantifiable in economic terms and some of them political or institutional. It would perhaps be pointing out the obvious to state that in spite of the best attempts at formalization, there will always remain at least some observed characteristics that one would be unable to capture fully in terms of economic analysis, a limitation that we fully acknowledge at the outset. Nevertheless, the necessities and justifications of undertaking such attempt at formalization and understanding can never be underestimated.

Now, thus far in our analysis, we have refrained from explicitly addressing the time dimension involved in our series under consideration, an issue that we must now tackle explicitly. Time-series data on Government expenditure, like almost all other macro-economic variables, involve characteristics that demand explicit time-series considerations for a valid and complete analysis. These aspects would now require us to devote some attention to the problems involved in Time-Series Econometrics, specifically, the problems of Non-stationarity and "Spurious Regression", and analytical concepts such as Unit Roots and Cointegration techniques. The relevant conceptual and methodological issues have already been discussed at length in the Methodology chapter. Here, we follow up on that discussion by explicit incorporation of the above issues in the analysis where they apply.

The intuitive definitions of the concept of (Non)-Stationarity have already been developed in the Methodology Chapter (Chapter 3). This is a conceptual issue of crucial significance in the subsequent phase of our analysis, where we are interested in capturing, and to a plausible extent, formalize, the observed behaviour of government expenditure over time. That is, we are now in a position to appreciate how the methodological issues discussed at length in chapter 3 become relevant when we are actually endeavouring towards a plausible formalization of the government expenditure mechanism, and its growth over time.

6.2 Analyzing Government Growth: Brief Overview of the Empirical Literature

The growth of government expenditure has long been typically sought to be explained by a few uni-causal explanatory models, among them the well-known Wagner hypothesis, or the Peacock-Wiseman displacement hypothesis etc. However, while these were sought to be complemented by more comprehensive formulations or

explanations for government growth that look beyond a single explanatory mechanism, there was a growing awareness of the perceived inadequacies of unicausal premises (for instance, as Gemmell et al (1999) point out, “With the increasing availability of time-series data and modern time-series techniques, evidence in the last decade has strongly undermined what previous empirical support there was, both for Wagner’s Law and the Peacock–Wiseman hypothesis, certainly in the case of the UK”, (Gemmell et al 1999).

Solomon fabricant’s 1954 study is among the pioneering efforts at depicting government expenditure in terms of a multitude of explanatory factors. Although subject to some methodological weaknesses, principally the inevitable problem of multicollinearity among the explanatory factors that the author himself recognized, this study led the way to a tradition of continued attempts to incorporate a body of relevant explanatory factors into public expenditure analysis. Attempts to integrate the political or institutional side of the economy with the purely economic factors resulted in proposing more and more comprehensive characterization of the public expenditure process.

Authoritative works in the contemporary public expenditure growth literature that have aimed at more comprehensive explanations for government growth include Borcherding (1985, 2001), Henrekson (1992), among others. Factors have been characterized as “demand-side” vis-a-vis “supply-side” factors (Buchanan 1975, Borcherding 1985 and 2001, Henrekson 1992, 1993, Lane and Ersson 2002). In other words, such a characterisation recognizes factors that affect the demand for government services posed by citizen-voters, and those affecting the supply-side of government expenditure. Foremost among the demand-side factors are premises like Wagner’s Law, postulating an increase in the demand for government provision of certain goods and services as

per capita income rises in course of economic development. Among supply-side factors, on the other hand, are a host of proposed explanations, including “Baumol’s Cost Disease” that sees the increased government expenditure as a fall-out of rising price of public goods relative to private goods due to lagging productivity in the public sector and the simultaneous compulsion to pay wages in line with that in the private sector (Baumol 1975).

Henrekson (1992) commented that it was not inevitable that demand and supply side factors should balance out each other in equilibrium. In fact, Henrekson explicitly characterizes the government expenditure mechanism in the more plausible terms of a disequilibrium process.

Empirical works have also modeled Government growth in terms of economic and demographic factors, and in some cases dealing explicitly with political forces or institutional factors (see Daniel Tarschys (1975), Johan A. Lybeck, (1988) for extensive discussions on the proposed explanatory factors).Gemmell et al (1999) for instance, explicitly recognize the variety of factors determining public expenditure, although their 1999 study is primarily centered around a model of expenditure growth in terms of “fiscal illusion associated with taxation” (Gemmell et al 1999).

In other alternative proposed characterizations, clear distinction is made explicitly between variables that represent economic (structural) factors vis-à-vis political (institutional) elements (Lybeck 1988), where these are explicitly recognized and sought to be integrated in a comprehensive analytical framework (Hackl et al 1993, Doessel et al 2003, Dash et al 2012). In the context of characterizing government expenditure (the size or the growth thereof), in terms of structural/ economic vs. political/ institutional

factors that shape it, we encounter a number of related and hypotheses that are, in most cases, complementary, rather than competing, with each other.

An integration of the whole body of factors is unanimously agreed to be hard to come by, given the consensus on the lack of a theoretically satisfactory or comprehensive enough framework for analyzing government growth as various authors have commented.

With the exception of Dash (2012) for India, Doessel and Valadkhani (2003) for the transition economy of Iran, and a handful of studies principally in the African context, however, analyses of public expenditure in such holistic terms in a developing country context are still somewhat scarce in the public finance literature. Hence, this part of our study is an attempt at partially contributing to, and filling in the gap in, the literature specifically in the Indian context. The approach follows that of Hackl et al (1993) in the Australian context, Henrekson (1992) for the Swedish economy, Gemmell (1999), Doessel et al (Iran, 2003), and Dash et al (2012) in the Indian context.

The present analysis thus tentatively explores in the Indian context a holistic integrated approach to the public expenditure process, where factors like fiscal illusion, political determinants, and other economic / structural and political-institutional factors are explicitly taken into account. In such a characterization, variables representing economic (structural) factors vis-à-vis political (institutional) elements are explicitly recognized and are sought to be integrated.

In our model, disequilibrium considerations enter the formulation via the adjustment lags that we have introduced in the government expenditure mechanism (Hackl et al 1993 for illustrative discussion on this aspect).

6.3 Factors in Government Growth: Variables and their Explanation

In course of characterizing government expenditure (the size or the growth thereof), in terms of structural/ economic vs. political/ institutional factors that shape it, we encounter a number of related hypotheses that are, in most cases complementary to each other rather than rivals. A brief overview is presented in the following (Hackl et al 1993, Doessel and Valadkhani 2003, Shelton 2007, Dash 2012, among others).

Economic/ Structural factors:

The "Income Effect": Wagner's Law

The most familiar among the structural-economic factors and one that is foremost among the demand-side factors in government sector growth, is the well-known Wagner's "law of increasing state activity", which seeks to locate observed government growth in terms of the historical stage of development of the economy. Although initially coined in rather imprecise terms (Musgrave 1958, Goffman 1973), and therefore subjected to a number of various interpretations and formulations in numerous empirical studies, the premise, as it is generally understood, proposes a positive dependence of government share on per capita income, or as in certain alternative formulations, national income of an economy. This suggests real GDP and per capita income as the first variables in the structural/ economic body of explanations. The obvious high correlation among these two variables, however, suggests that at least one of them would be redundant, and hence, in our formulation, the first variable is real per capita income (RPCY), expressed in log terms.

Structure of the Economy

A closely related corollary of the income effect above is the structural change undergone by the economy in course of development. As the typical fallout of development, a shrinking share of the primary sector and expansion of the secondary and tertiary sector is expected to affect the size of government positively. The share of the service sector in the national economy (SERV) is therefore taken as representing another contributory factor.

Urbanization

Increased demand for government services also stems from growing demands by the citizen-voters as economies become increasingly urbanized, and the urbanization process pulls up the demand for government provision of law and order, civic amenities and other public provisions. The proportion of urban in total population (URBAN) has been incorporated as a third explanatory variable in the structural/economic explanatory framework.

Relative Prices (Baumol's Cost Disease)

Baumol (1975) posited a tendency of the relative price of goods and services in the public sector to rise vis-à-vis the private sector, as productivity in the public sector tends to lag behind that in the private sector and yet the compulsions remain to pay wages and salaries in line with those in private sector. The result is an increase in the relative price of public goods vis-à-vis private goods, as measured by the ratio between the respective deflators for the two sectors, and a concomitant increase in government

expenditure. In our analysis, too, we have used the relative price of public vs. private goods measured as the ratio of the respective deflators applicable to public and private goods. This has been included in the framework as relative prices (of public vs. private goods), or RP.

Economic Shocks/ Break in Economic Policy Regime

Hackl et al (1993) have used a couple of dummy variables belonging to the class of structural-economic variables to denote significant breaks in economic policy regime. In our study of the Indian context, the year 1991 represents a sea-change in the economic policy climate, including fiscal policy, that followed upon the precarious macroeconomic imbalances faced by India around 1989-90. In the present analysis, we have considered it appropriate to include a dummy variable representing the economic shock and paradigm change in policy environment since 1991, marking a break-point in the entire study period of 1970-71 to 2007-08.

Political / Institutional Factors

Foremost among institutional factors is the presence of interest groups and bureaucracy in inflating government spending in favour of specific lobbies (Hackl et al 1993, Gemmell 1993, Doessel and Valadkhani 2003). In India, the significant study by Rao et al (1995) explicitly mentioned the critical role of interest groups in shaping growth of government expenditure. Hackl et al (1993) used a host of factors including the proportion of organized industrial employment on one hand, and public sector employment on the other, to capture this aspect. Share of agricultural employment has also been taken as an important indicator of the influence of the farm lobby.

So far as the Indian economy is concerned, the vastness of the informal or unorganized sector vis-à-vis the meagre organized employment (94% as against 6% at the turn of 2010 as per recent NCEUS data) is a well-known fact of life. In our study, we have attempted to employ the share public sector employment (PUBEMP) to represent the influence of interest groups. As for share of agricultural employment to represent the influence of the farm lobby, we decided to postpone its inclusion for the time being and reserve this aspect for a later, fuller analysis

Fiscal Illusion

Among the foremost principal aspects of the political/ institutional explanatory factors, the crucial dimension of "fiscal illusion" and its implications for observed government size and growth has been well-documented by Buchanan and Wagner (1975). The literature on fiscal illusion is relatively scarce in India. Internationally, illuminating discussions by Gemmell (1999) extensively deals with it. Hackl et al (1993) have used the Herfindahl[i] index as a measure of tax complexity and for denoting fiscal illusion.

Fiscal illusion is the phenomenon where the tax-payers are not aware of the precise extent of resources being transferred to government. This may be the result of a number or combination of factors, relevant being the method of financing the budget deficit, the complexity of the tax system, and similar factors. Indeed, the proposition of citizen-voters suffering from "fiscal illusion" is in direct contradiction with the "Ricardian Equivalence" premise long accepted in the literature.

Gemmell (1998), Gemmell et al. (1999) indicate four clearly enumerated sources of fiscal illusion, including tax complexity, and what is termed as "Deficit Illusion". The characteristics of the tax system associated with Fiscal illusion are proposed to be measured by the Herfindahl index in the literature, a composite index denoting the

complexity of tax system. In an alternative and simpler approach, this is also measured by the proportion of direct or alternatively indirect taxes in the total taxes collected by the government. Concerning the use of the Herfindahl index by Hackl et al (1993), however, two analytical issues are relevant when we conceive of the analysis in an Indian scenario. The first is the absence of a suitably defined Herfindahl index for India. The second relates to the conceptual problem involved in the index itself (Gemmell 1999). Accordingly, we have used the "relatively straightforward" measure of the ratio of direct taxes (DT) following standard empirical literature.

A second related aspect in fiscal illusion is deficit financing. The Buchanan-Wagner hypothesis says that the bigger the deficit the more is the government spending (Buchanan and Wagner 1975, Musgrave 1976). We have adopted the measure of central government deficits in the fiscal illusion parameter.

Dealing with political determinants, Dash et al (2011) have dealt with states. Expenditure allocation has been treated as to whether states had a coalition government, whether elections are imminent and a host of relevant political or institutional factors. The same principle can however be extended logically to the Centre so far as government expenditure is concerned where the relevant issues are such as election timings, lobbies, etc involved. Accordingly, we have followed Dash (2012), Hackl (1993) et al in using a body of political-institutional determinants. Table 1 below summarizes a brief account of the causative forces at work as variously hypothesized in the literature.

Political Regime Change/ Change in Ideology: In particular, the observation that there is a sudden spike or spurt in the trend in government expenditure in the years when elections are imminent, has been captured by an "Election-Year Dummy" (EY1).

Centralization: Brennan-Buchanan: The degree of centralization (/decentralization0, in a federal set-up has been found to affect the level and extent of government spending at the centre. The problem is in devising the precise measure of centralization to apply as suited to the specific purpose at hand. Dziobek et al (IMF, 2011) refer to the "challenge in measuring decentralization and the need for several indicators to address it". The problem here is that at least four measures of (de-)centralization have been suggested in the literature, not all of them inevitably leading to the same conclusions (Dziobek et al, 2011).

In the present context, we have used the measure of centralization as given by the proportion of Central Expenditure in the total expenditure of Centre + States, an index that is termed CENTR.

"Fiscal Drag" (CPI): The effect of inflation on government budgetary magnitudes has been discussed at length in the literature, the general finding being that inflation pushes up taxes as there is a "bracket creep" in the tax system. Additionally, however, it has been also argued that inflation pushes up government expenditures by more than it does revenues, resulting in a widening of the deficit. In the political-institutional framework proposed in the present literature, the effect of inflation, termed "fiscal drag", is posited as influencing government spending upwards, to capture which we have used the Consumer Price Index (CPI, as also used by Hackl et al 1993).

Lagged Adjustment Factor G_{t-1}: There is, finally, the well-known fact that past or lagged expenditure of previous period(s) influences expenditure in the current period. In fact, government expenditure has been frequently modelled as an Autoregressive Distributed Lags (ARDL) process where the influence of lags from quite a number of previous periods has been incorporated. In our simplified version, we incorporate the 1-

period lagged expenditure element through G_{t-1}, the previous period's expenditure level as influencing the current level positively.

The model that is suggested by our detailed survey of the literature sees government expenditure as associated with a body of economic (/structural) and political (/institutional) factors as represented in the analytical schema below.

ANALYSIS TABLE DETAILING VARIABLES/ HYPOTHESIS/ DIRECTION OF RELATIONSHIP

TABLE 6.1 FACTORS IN GOVERNMENT GROWTH

Economic / Structural Factors

VARIABLE	STANDS FOR	MEASURED BY	HYPOTHESIS / /PREMISE	DIRECTION
RPCY	Real per capita Income	NNP per capita Constant price	The Wagner Premise—Growth in Income raises Government Expenditure	(+)
SERV	Structural Change: Weightage of Service Sector in N.Y.	Share of Service Sector in GDP	Corollary of Wagner's Law:	(+)
URBAN	Degree of urbanization	Share of Urban Population in Total Population	Variant of Wagner's Law: Greater urbanization pulls up demand for provision of urban infrastructure, law and order etc. services	(+)
RP	Relative price of public goods w.r.t private goods	Ratio of Deflators applicable to public sector to that for private sector	Baumol: Lagging productivity in the Public Sector and the compulsion to pay wages in line with the private sector raises the cost of provision of public goods	(+)
TRADE	Openness/ Share of Trade in the National Economy	Total (Exports + Imports) as % of GDP	Trade / Openness leads to change in government spending i) Hackl et al (1993) ii) Rodrik 1998 in Shelton (2007) pp 3-4, iii) Dreher et al.	**?**
CENTR	Centralization	Central Govt. Expenditure as ratio of Expenditure of (Centre+ States)	The Brennan-Buchanan Hypothesis	(+)
D1	Significant Economic Shock / Policy Regime Change 1990-91	Dummy Variable	Shocks / Crisis pushes up Government Expenditure	(+)

Contd.

TABLE 6.1 FACTORS IN GOVERNMENT GROWTH *Contd.*

Political / Institutional Factors

VARIABLE	STANDS FOR	MEASURED BY	HYPOTHESIS / PREMISE	DIRECTION
E(Y1)	Election Year Dummy	Dummy Variable	Imminent Elections push up Govt. Expenditure	(+)
DT	Tax complexity (/alternatively, "visibility")	Share of Direct Taxes (Total Tax Revenue in GDP or Total Revenue)	i) Revenue constraint ii) Fiscal Illusion	(+)
DEF	The "Deficit Illusion" dimension	Government's Fiscal Deficit as a ratio of its Expenditure	The "Deficit Illusion" aspect of fiscal illusion	(+)
CPI	Inflation rate	Consumer Price Index	"Fiscal Drag"	(+)
G_{t-1}	The built-in lag in the government expenditure process	Level of Government Expenditure in previous period	Residual Effect of Previous Period's Expenditure impacts that in current period	(+)

Source: Adapted from Hackl et al. (1993), Doessel and Valadkhani (2003), Gemmell (1998)

The crucial fact that needs to be remembered at this point is that although we have enumerated and defined the chosen measures of the required variables involved in our envisaged analysis, the critical issue of appropriately transforming all of them for actual estimation purposes still remains to be tackled. This is a task that is taken up in the subsequent Section 6.7.

6.4 Measure of Government Expenditure and Explanatory Variables

When attempting to study the impact of various economic/ institutional factors on the trend and structure of Government Expenditure, we need to identify the specific categories of Expenditure under consideration.

In this particular context, since we are specifically relating government expenditure to the economic and institutional structure, our choice of the expenditure measure should

be such that has meaningful economic interpretation. This is most appropriately represented by the economic classification of Government Expenditure.

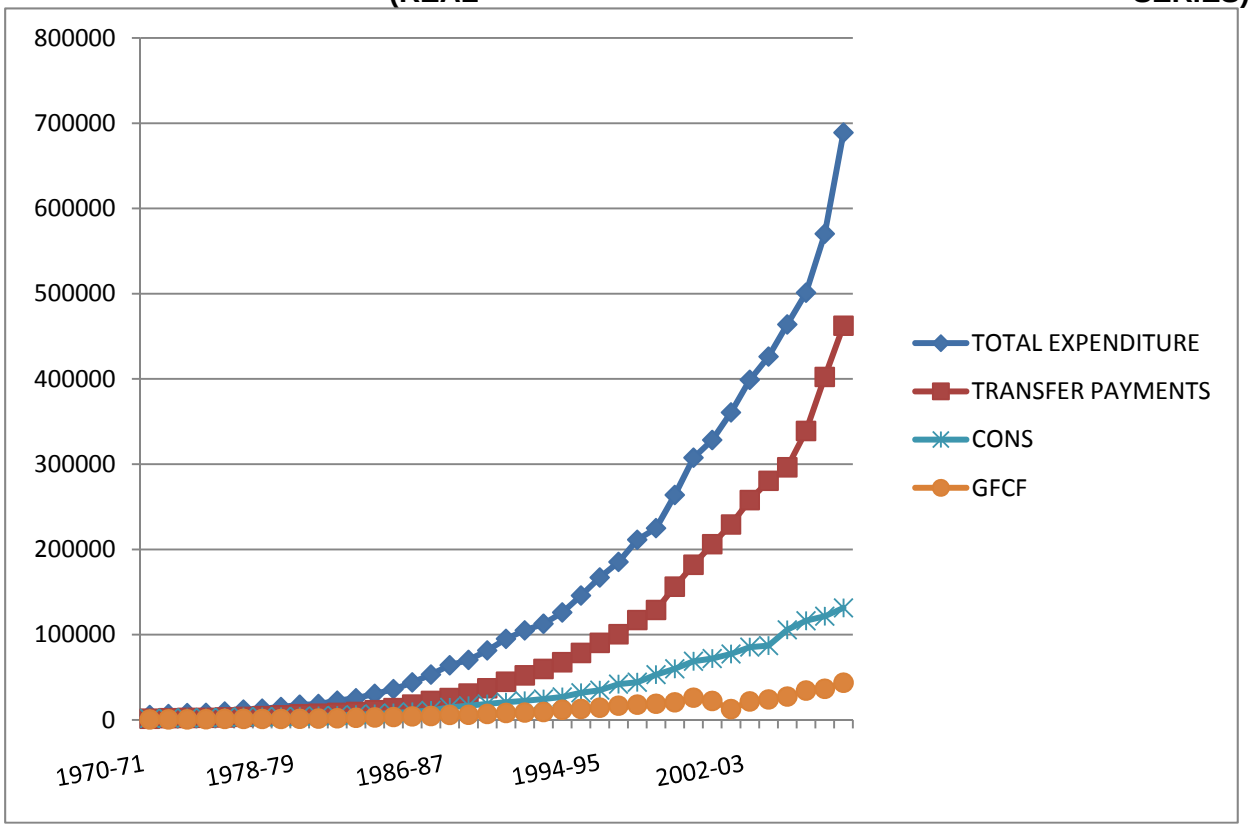
Our decision, in this part of the study, is therefore to take the economic categories of expenditure, viz.

- Central Government Final Expenditure on goods and services,
  - Government Final Consumption
  - Government Gross Capital Formation.
- Central Government Transfer Payments, and
- Loans and Financial Investments to the States and UTs

which constitute the broad categories under which economic components are provided.

In figure 6.1 below, we have plotted the real values of central government economic categories of expenditure (selected series) for an idea and an overview of our series of interest.

Fig 6.1 CENTRAL GOVERNMENT ECONOMIC CATEGORIES 1970-71 – 2007-08 (REAL SERIES)



Source: Based on APPENDIX TABLE AIV.1

One immediate characteristic that is observable here is the extremely wide fluctuations in the gross capital formation component, and the generally very low level at which it has remained nearly all throughout our study period (1970-71 to 2007-08). On careful consideration, we opt for omitting the component of capital formation from our analysis detailed above in terms of the forces related to structural-institutional factors.

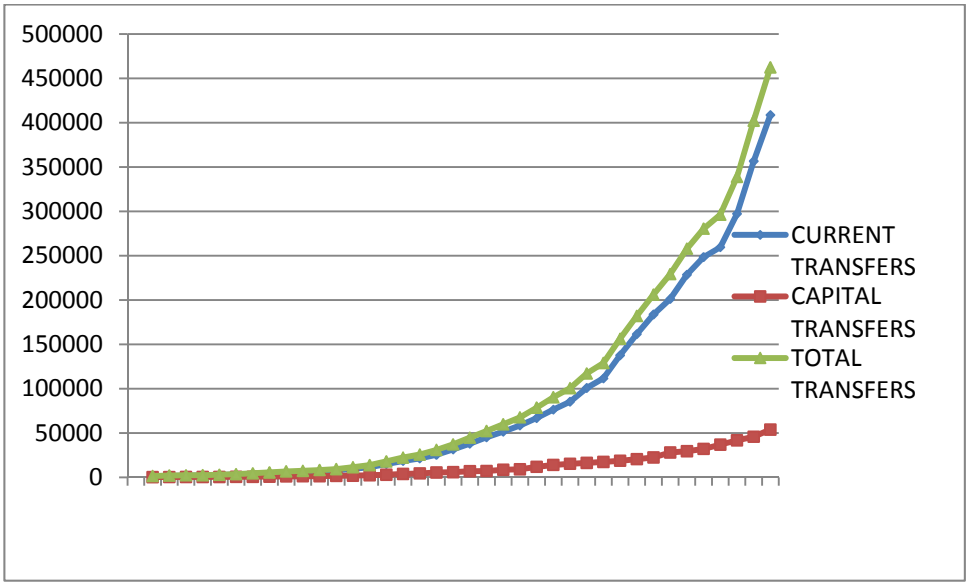
Indeed, our decision is supported by the explicitly stated point by Rajaraman et al. (2001) ... "There is prior evidence that capital expenditure is an accommodative component that is compressed at times of fiscal stress" (Rajaraman et al. (2000) cited in Rajaraman, Mukhopadhyay and Rao 2001 p3). Our decision, therefore, so far as the growth in Central Government economic categories are concerned, is to focus on Total, Transfers and Final Expenditure--- and within the latter, government final consumption

expenditure. Accordingly, we analyze the final consumption component along with total final expenditure of the central government.

A similar consideration also applies to the component “capital transfers”.

Fig 6.2 CURRENT & CAPITAL COMPONENTS OF CENTRAL TRANSFERS

1970-71 – 2007-08



Source: Based on APPENDIX TABLE AIV.1

Fig. 6.2 above presents the respective current and capital transfer components of total central government transfer payments over our study period. Central government transfer payments, comprising of both current and capital transfers components, have been completely dominated by current transfers. as FIG **6.2** above shows. The average weightage of capital transfers vis-à-vis the current component in the total has never amounted to appreciable levels, suggesting to us that rather than treating the very small item of capital transfers separately, we can club together transfers as a whole and analyse this component.

Finally, the element of financial investments and loans has shown wide fluctuations and has generally remained at a very low level.

In our final analysis scheme, then, the components of government expenditure that are ultimately taken up for analysis consist of Central Government Expenditure (Total and Final Expenditure), Central Government Final Consumption Expenditure, and Transfer Payments consisting of current and capital transfers.

6.4.1 Data and Data Sources:

As per the requirements of the analysis at hand, we need data on two sets of variables. The first among these, viz. the *variables that are to be explained* are the government expenditure data belonging to various economic categories, which have been already elaborated at length in the above. The next section (**6.2**) presents data on the respective real magnitudes of the government expenditure components under study. The relevant government expenditure data have been sourced from the Economic Survey, Ministry of Finance (various years), NAS published by the CSO (various years), and the Reserve Bank Handbook of Statistics on the Indian Economy, 2012.

The second set of variables, viz., the *explanatory* group, encompasses a host of variables that mainly belong to categories: i) The so-termed "structural-economic" variables, and ii) the "Political-Institutional" variables. We briefly indicate the source and the measures employed for each of these.

For purposes of statistical estimation, frequently the standard measure/ definition of specific variables have had to be adapted so as to permit use in the analysis. Apart from indicating the original variables, we have also indicated in Section **6.7** below the relevant variable transformations that were deemed necessary

VARIABLE NAME	MEASURE /DEFINITION	SOURCE /AVAILABILITY
RPCY	Real PCY	*RBI Handbook of Statistics on Indian Economy (2012)*
SERV	Service Sector Value normalized by GDP Deflator	
URBAN	Proportion of Urban in Total Population	*Interpolated from decadal data Census (2011)*
RP	Relative price of public vis-à-vis private goods	*RBI (2012) and NAS various years*
TRADE	Total Volume of trade normalized by GDP Deflator	*RBI (2012)*
D1	Dummy variable representing the pre-and post- Economic Reforms Periods (before and after 1991)	
E(Y1)	"Election-year Dummy"	
CENTR	Degree of Centralization: Central Expenditure in Total Centre + States	*RBI (2012)*
DT	Central Direct Taxes in Centre + States	*-As above-*
DEF	Central Government Deficit in total Expenditure	*-As above-*
CPI	Consumer Price Index representing "fiscal drag" due to inflation	*-As above- Converted to Base 2004-05 by author*
G_{t-1}	Government Expenditure Series lagged by 1-period	*Economic Survey (various)*

Variable values have been provided in *Appendix Table* ***AIV.7*** & **AIV.8**

6.4.2 Deriving Real Magnitudes

The government expenditure series presented above clearly include the effects due to inflation, which needs to be removed from the data. This calls for deflation of each series using suitable deflators, a procedure that has already been indicated in the earlier chapters.

The deflation procedure adopted in this part of the analysis is as follows:

Central Government Total Expenditure	Wholesale Price Index (Base 2004-05)
Central Government Final Expenditure On Goods and Services	Wholesale Price Index as above
Government Final Consumption	Deflator applicable to Government Consumption Expenditure (derived using NAS data)
Transfer Payments incl. Current and Capital Transfers	Deflated using the CPI (vide Gemmell et al.1999)

[*We might also note here that the omitted, or alternatively, subsumed components, had they been of appreciable magnitude, would have been treated as follows:*

Gross Capital Formation	*Deflator applicable to public sector capital formation (Derived from current and constant price series, RBI)*
Capital Transfers	*Deflator applicable to public sector capital formation (Derived from current and constant price series, RBI)*
Loans and Financial assistance to of the Economy	*Deflator used for public sector capital the rest formation, since loans are mostly given for the purpose of capital formation].*

Accordingly, in our final analysis scheme the following components of government expenditure are taken up for analysis.

CENTRAL GOVERNMENT TOTAL REAL EXPENDITURE ("**TOTAL**")

CENTRAL GOVERNMENT REAL FINAL EXPENDITURE ("**FINAL**")

CENTRAL GOVERNMENT REAL FINAL CONSUMPTION EXPENDITURE ("**CONS**")

TRANSFER PAYMENTS IN REAL TERMS BY CENTRAL GOVERNMENT TO THE REST OF THE ECONOMY ("**TRANS"**)

The resulting dataset for our final analysis is reproduced in TABLE 6.2 below**.**

TABLE 6.2 CENTRAL GOVERNMENT REAL EXPENDITURE (SELECTED ECONOMIC CATEGORIES) *(Base Year 2004-05, Money Values Rs. Cr)*

YEAR	TOTAL	TRANS	FINAL	CONS
1970-71	73381.58	20311.53	28802.63	18729.70
1971-72	82839.51	27032.02	32740.74	22057.40
1972-73	88191.01	27926.43	33022.47	21657.23
1973-74	75990.65	23227.48	28925.23	20449.66
1974-75	73022.39	22367.87	30552.24	20534.95
1975-76	90503.76	31890.5	34992.48	22629.18
1976-77	97407.41	37429.42	34948.15	23113.45
1977-78	105535.2	43017.58	33697.18	23685.92
1978-79	124767.6	50687.19	37161.97	24538.35
1979-80	110802.4	51782.07	36107.78	25810.99
1980-81	114187.8	52511.41	35949.24	25378.32
1981-82	118144.2	52537.78	40223.26	26950.72
1982-83	134929.2	60017.03	43986.73	29326.69
1983-84	148098.8	64493.78	47267.49	31188.41
1984-85	169417	78739.36	52324.32	34035.87
1985-86	196711.1	91594.79	58400	40620.59
1986-87	223856.6	97490.89	71923.08	48723.25
1987-88	227524.3	107372.4	72854.37	53285.42
1988-89	245186.7	118573.1	77771.08	55183.82
1989-90	266243.7	133951.7	81008.4	55822.68
1990-91	266428.9	140752.4	78581.22	54795.44
1991-92	251631.7	142029.8	75279.02	53176.53
1992-93	255430	146100.7	78578.09	54182.09
1993-94	273011.2	158213.8	83483.15	58973.52
1994-95	277866.9	165000.5	81873.54	58157.89
1995-96	285412.9	167032.9	90240.37	63911.97
1996-97	311134	177735.7	91581.74	67285.40
1997-98	317159.4	183162.5	101616.4	77465.27
1998-99	351205.1	196263.3	107279.6	88738.90
1999-00	396274.5	221005.2	122301.5	102565.50
2000-01	395024.1	241045.8	113399.5	98616.83
2001-02	418833.9	256969.2	104480.8	101631.82
2002-03	447675.6	278097.5	120186.3	101948.65
2003-04	453814.7	291181.3	118388.7	96223.36
2004-05	463831	296351	133088	99859.84
2005-06	479505.3	324625.5	144263.2	105258.33
2006-07	511835.7	361106.7	141916.5	106052.81
2007-08	590831	390833.1	150126.9	118042.99
2008-09	686679.9	452866.4	179355.8	140294.03

Source: APPENDIX TABLE AIV.2.

Note: *Owing to deflation of Nominal Values by separate deflators applicable to each Series, values may not add up to the respective total Categories.*

6.5 Stationarity Considerations and Unit Roots

Having derived the analytical magnitudes in real terms, our next consideration is the fact that the data under analysis are all time-series macro-economic variables. It is by now well-known that Time-series macro data generally exhibit pronounced non-stationarity properties (discussed at length in the Methodology chapter). Non-stationarity implies that the assumptions implicit in the Classical Linear Regression Model (CLRM) techniques no longer hold, and thus checking for Stationarity (/ absence of same) becomes a mandatory requirement before attempting to investigate plausible relationships between our variables concerned. In formal terminology, we first need to check for the absence or presence of "Unit Roots" in all the series under consideration. Despite their well-documented limitations (Maddala and Kim, 1998 among others), Unit Root tests, and among them the Dickey-Fuller (DF) and Augmented Dickey-Fuller (ADF) tests remain the most frequently employed diagnostic check for (Non)-stationarity[ii].

The detailed results of the Unit Root tests have been provided in Appendix **IV**. As the tests show, there is significant non-Stationarity in the variables, implying that we need to suitably transform our data in order to permit Regression. In the present case, the majority of our variables permit logarithmic transformation suggesting the convenient double-logarithmic (DL) specification. In order to determine the most suitable data transformation so as to satisfy normality conditions, we used the Ladder Transformation facility offered by STATA. The resulting suggested transformations for individual variables, and our ultimate decision in this respect have been discussed in section 6.7 below.

6.6 Cointegration: A Brief Digression

A valid question at this point may be raised as to why we are not going in for cointegration analysis, which would have been intuitively the most obvious approach since the data under consideration is time-series in nature. Indeed, use of the cointegration approach has become almost mandatory in empirical work including the field of public expenditure research.

However, given the rather low frequency (annual observations) of the data and the limited number of observations (we have 38 annual observations, that is, rather low frequency data of sample size less than 40), cointegration is not a mandatory requirement here. Our decision to refrain from going in for Cointegration can be better appreciated with reference to the scepticism Pandit (2002) expressed regarding the appropriateness of cointegration methods in the Indian context (Pandit 2002 p12).

Generally, the Double-log (DL) form is a smoothing practice whereby fluctuation in the series can be moderated, without changing the relative position of the observations (as the transformation is monotonic in nature). In addition, it provides elasticity interpretation to the parameters which makes the procedure very popular.

A related question arising almost immediately is that of the time element in the present case being stochastic rather than deterministic. With this aspect in mind, we have checked the stationarity properties of our time-dependent variables (as referred to in above and in Appendix **IV**). Even though the problem of stochastic trends remains in the levels of the variables, the log series are relatively free from this problem as here the fluctuation is depressed.

6.7 Variable Transformation

Using the Ladder Transformation facility in STATA 11.0 to determine the most suitable data transformation so as to satisfy normality conditions, we obtained the following suggested transformations for individual variables:

G, RPCY, TRADE, DT, CPI, G_{t-1}:	Logarithmic Transformation
RP, URBAN, CENTR, DEF:	"Identity" (At Levels)
PUBEMP:	Square
SERV:	Inverse

Where "G" stands for each of the relevant measures of government expenditure components of our concern.

Of the logarithmic transformations suggested, the variables TRADE and DT are in ratio form, indicating that they need suitable transforming into magnitudes that permit the log form. In the new definition/ measurement, we define TRADE as the real value of the total volume of trade (Value of Exports plus Imports deflated by the GDP Deflator). On the other hand, DT, initially taken as the share of Direct Taxes in total Taxes, is now being measured by the level of Direct Taxes, deflated by the WPI deflator to approximate the real value.

The logarithmic transformation, where possible to apply, has the well-known econometric property that where non-Stationarity, that is, pronounced time trend is present, taking log transformations helps to some extent in dampening the effect of time. This is particularly useful where we would prefer not to enter into cointegration and allied technicalities.

The second property, more relevant from the economic interpretation aspect is that the co-efficient estimates obtained from log transformation lend themselves to elasticity interpretations.

6.8 The Proposed Model

The various empirical works & theory discussed suggest a comprehensive model for estimation. The general form of our relationship to estimate is as follows:

$G_t = G\ (RGDP_t, SERV_t , URBAN_t , RP_t , TRADE_t , D1, E1, PUBEMP_t, CENTR_t , DT_t , DEF_t , CPI_t, G_{t-1})$ … … … … … 1)

Where

i) Variables are in their respective appropriately transformed form
ii) G is the appropriate measure of real government expenditure, and
iii) G_{t-1}, the last term denotes the residual effect of previous period's expenditure on current expenditure level.

Applying the respective transformations, we have the following specific form:

$$LnGt = \alpha + \beta_1 LnRPCYt + \beta_2(1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta 4Dt + \beta_5 LnTRADEt$$

STRUCTURAL-ECONOMIC FACTORS

$$+\beta_6 E_1 + \beta_7 CENTRt + \beta_8(PUBEMP)^2t + \beta_9 DEFt + \beta_{11} LnDTt + \beta_{12} LnCPIt + \beta_{13} LnGt_{-1} + \varepsilon_t \quad \ldots 2)$$

POLITICAL-INSTITUTIONAL FACTORS

Where, G_t stands, in turn, for Central Government Total Expenditure, Central Government Final Expenditure on Goods and Services, Government Consumption Expenditure, and Transfer Payments, respectively (Hackl et al (1993), Gemmell et al (1999)).

As explained already, equation 2) above is to be estimated separately for each individual economic category of Government Expenditure. As an illustration, therefore,

using Government Final Consumption Expenditure (**CONS**), we have the following equation to estimate:

$$Ln(CONS)t = \alpha + \beta_1 LnRPCYt + \beta_2(1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta 4Dt + \beta_5 LnTRADEt$$

$$+\beta_6 E_1 + \beta_7 CENTRt + \beta_8(PUBEMP)^2 t + \beta_9 DEFt + \beta_{11} LnDTt + \beta_{12} LnCPIt + \beta_{13} Ln(CONS)t_{-1} + \varepsilon_t \quad \ldots 3)$$

Similar equations, for each of the components of government expenditure indicated above, are to be separately estimated.

6.9 Estimation

The first aspect that strikes one about the combined model proposed in equations 1) to 3) above is the rather large number of variables, and the resulting, almost inevitable problem of multicollinearity. As a partial solution to this problem, we have chosen to estimate the model in the following stages.

1. In the first stage, we consider the explanatory factors on the structural-economic side. That is, we work with the following sub-equation

$$LnGt = \alpha + \beta_1 LnRPCYt + \beta_2 (1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta_4 Dt + \beta_5 LnTRADEt + \varepsilon_t$$

STRUCTURAL/ECONOMIC FACTORS … … … 4a)

2. The above estimation would therefore yield the appropriateness, and explanatory power, of the structural-economic explanations for government expenditure growth.
3. In the next stage, we then estimate the political-institutional model separately:

$$LnGt = \delta + \beta_6 E_1 + \beta_7 CENTRt + \beta_8 (PUBEMP)^2 t + \beta_9 DEFt + \beta_{11} LnDTt + \beta_{12} LnCPIt + \beta_{13} LnGt_{-1} + u_t \quad \ldots 4b)$$

POLITICAL/ INSTITUTIONAL FACTORS

4. This step-wise estimation allows us to estimate the structural-economic model and the political-institutional models side-by-side, and allows a comparative analysis of the robustness of each class of explanations.
5. Finally, we also test the encompassing model, combining both classes of explanatory factors and analyze the results.

Accordingly, we have the following four (4) sets of regression equations (5 to 16) to estimate for the respective components of Government Expenditure:

$$Ln(CONS)t = \alpha_1 + \beta_1 LnRPCYt + \beta_2 (1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta 4Dt + \beta_5 LnTRADEt + \beta_6 E_1 + \beta_7 CENTRt + \beta_8 (PUBEMP)^2 t + \beta_9 DEFt + \beta_{11} LnDTt + \beta_{12} LnCPIt + \beta_{13} Ln(CONS)t_{-1} + \varepsilon_{1t} \quad \ldots 5)$$

THE "COMPREHENSIVE" MODEL COMPRISING STRUCTURAL AND POLITICAL EXPLANATORY FACTORS

$$Ln(CONS)t = \alpha_2 + \beta_1 LnRPCYt + \beta_2 (1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta_4 Dt + \beta_5 LnTRADEt + \beta_6 Ln(CONS)_{t-1} + \varepsilon_{2t} \quad \ldots 6)$$

STRUCTURAL-ECONOMIC FACTORS INCLUDING LAGGED ADJUSTMENT

$$Ln(CONS)t = \alpha_3 + \beta_7 E_1 + \beta_8 LnCENTRt + \beta_9 LnDEFt + \beta_{10} LnDTt + \beta_{11} LnCPIt + \beta_{12} Ln(CONS)t_{-1} + \varepsilon_{3t} \quad \ldots 7)$$

POLITICAL-INSTITUTIONAL FACTORS

$$Ln(CONS)t = \alpha_4 + \beta_1 LnRPCYt + \beta_2 (1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta_4 Dt + \beta_5 LnTRADEt + \varepsilon_{4t} \quad .8)$$

STRUCTURAL-ECONOMIC FACTORS WITHOUT LAGGED ADJUSTMENT

And in similar fashion, we have the rest of the sets of equations, four (4) each for each of the expenditure components.

$$Ln(FINAL)t = \alpha_1 + \beta_1 LnRPCYt + \beta_2 (1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta 4Dt + \beta_5 LnTRADEt + \beta_6 E_1 + \beta_7 CENTRt + \beta_8 (PUBEMP)^2 t + \beta_9 DEFt + \beta_{11} LnDTt + \beta_{12} LnCPIt + \beta_{13} Ln(FIINAL)t_{-1} + \varepsilon_{1t} \quad \ldots 9)$$

$$Ln(FINAL)t = \alpha_2 + \beta_1 LnRPCYt + \beta_2 (1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta_4 Dt + \beta_5 LnTRADEt + \beta_6 Ln(FINAL)_{t-1} + \varepsilon_{2t} \quad \ldots 10)$$

$$Ln(FINAL)t = \alpha_3 + \beta_7 E_1 + \beta_8 LnCENTRt + \beta_9 LnDEFt + \beta_{10} LnDTt + \beta_{11} LnCPIt + \beta_{12} Ln(FINAL)t_{-1} + \varepsilon_{3t} \quad \ldots \quad \ldots \quad 11)$$

$$Ln(FINAL)t = \alpha_4 + \beta_1 LnRPCYt + \beta_2(1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta_4 Dt + \beta_5 LnTRADEt + \varepsilon_{4t} \ldots 12)$$

$$Ln(TOTAL)t = \alpha_1 + \beta_1 LnRPCYt + \beta_2(1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta 4Dt + \beta_5 LnTRADEt + \beta_6 E_1 + \beta_7 CENTRt + \beta_8 (PUBEMP)^2 t + \beta_9 DEFt + \beta_{11} LnDTt + \beta_{12} LnCPIt + \beta_{13} Ln(TOTAL)t_{-1} + \varepsilon_{1t} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad 13)$$

$$Ln(TOTAL)t = \alpha_2 + \beta_1 LnRPCYt + \beta_2(1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta_4 Dt + \beta_5 LnTRADEt + \beta_6 Ln(TOTAL)_{t-1} + \varepsilon_{2t} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad 14)$$

$$Ln(TOTAL)t = \alpha_3 + \beta_7 E_1 + \beta_8 LnCENTRt + \beta_9 LnDEFt + \beta_{10} LnDTt + \beta_{11} LnCPIt + \beta_{12} Ln(TOTAL)t_{-1} + \varepsilon_{3t} \quad \ldots \quad \ldots \quad 15)$$

$$Ln(TOTAL)t = \alpha_4 + \beta_1 LnRPCYt + \beta_2(1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta_4 Dt + \beta_5 LnTRADEt + \varepsilon_{4t} \ldots$$
$$\ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad 16)$$

$$Ln(TRANS)t = \alpha_1 + \beta_1 LnRPCYt + \beta_2(1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta 4Dt + \beta_5 LnTRADEt + \beta_6 E_1 + \beta_7 CENTRt + \beta_8 (PUBEMP)^2 t + \beta_9 DEFt + \beta_{11} LnDTt + \beta_{12} LnCPIt + \beta_{13} Ln(TRANS)t_{-1} + \varepsilon_{1t} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad 17)$$

$$Ln(TRANS)t = \alpha_2 + \beta_1 LnRPCYt + \beta_2(1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta_4 Dt + \beta_5 LnTRADEt + \beta_6 Ln(CONS)_{t-1} + \varepsilon_{2t} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad 18)$$

$$Ln(TRANS)t = \alpha_3 + \beta_7 E_1 + \beta_8 LnCENTRt + \beta_9 LnDEFt + \beta_{10} LnDTt + \beta_{11} LnCPIt + \beta_{12} Ln(TRANS)t_{-1} + \varepsilon_{3t} \quad \ldots \quad \ldots \quad 19)$$

$$Ln(TRANS)t = \alpha_4 + \beta_1 LnRPCYt + \beta_2(1/SERVt) + \beta_3 URBANt + \beta_4 RPt + \beta_4 Dt + \beta_5 LnTRADEt + \varepsilon_{4t} \ldots 20)$$

Where, we have the following components of government expenditure as the dependent variable in turn:

CONS = Central Government Final Consumption Expenditure

FINAL = Central Government Final Expenditure on Goods and Services

TOTAL = Central Government Total Expenditure

TRANS = Central Government Transfer Payments, all in ***real terms***, that is, deflated by the respective suitable deflators, and all the explanatory variables (regressors) are as per elaborated in detail in section 6.8 above.

6.10 Results and Discussion

The summary regression output is provided below. Results for four sets of regression exercises have been provided, for each of our dependent variables, viz., **CONS, TRANS, FINAL** and **TOT**. The four regressions, in turn, are represented as follows:

R_1: The "Comprehensive" Model encompassing all explanatory variables

R_2: The "Structural/ Economic" Model with an additional lagged adjustment factor

R_3: The "Political/ Institutional" Model involving the subset "political" regressors

R_4: The "Structural/ Economic" Model involving the subset "economic/ structural" regressors.

We now present the estimation results as obtained above for the four sets of regressions run on each of our selected categories of central government economic expenditure, and discuss the implications of each, starting with results for government final consumption expenditure, as under.

Table 6.3 Regression Results: DEPENDENT VARIABLE: "LNCONS"
SAMPLE PERIOD 1970-71 – 2007-08

Independent Variables & Diagnostic Values	**R_1** FULL MODEL	**R_2** STRUCT, G_{t-1}	**R_3** POL/ INSTTNL	**R_4** STRUCT
Constant	**3.278 (1947.356)*** **	**3.276 (1460.164)*** **	**3.282 (4228.882)*** **	**3.277 (1333.717)*** **
LnRPCY	**.107 (2.323)** **	**.053**		**.135 (3.599)*** **
SERV*inv*	**--.070 (-2.269)** **	**-.069 (-1.983)** **		**-.062**
LnTRADE	**.000**	**.073**		**-.023**
RP	**.006**	**-.031 (-2.207)*** **		**--.053 (--4.338)*** **
D1	**.015**	**.052 (4.790)*** **		**.050 (4.221)*** **
URBAN	**.451 (7.108)*** **	**.625 (10.572)*** **		**.745 (17.796)*** **
*sq*PUBEMP	**-.012**		**-.062 (-5.013)*** **	
E(Y1)	**-.003**		**-.004**	
DEF	**-.022 (-4.083)*** **		**-.024 (-4.243)*** **	
CENTR	**.004**		**.014 (2.343)** **	
LnDT	**.039**		**.091 (3.402)*** **	
LnCPI	**.300 (6.125)*** **		**.330 (12.299)*** **	
LnG_{t-1}	**.033**	**.118 (2.677)** **	**.034**	
No. of observations	**38**	**38**	**38**	**38**
$\overline{R}^2$	**0.998**	**0.999**	**.999**	**0.999**
F	**12152.971*** **	**6310.841*** **	**14103.314*** **	**6140.360*** **
DW	**1.780**	**.891**	**1.480**	**1.046**

(t-values in brackets) ***significant at less than 1% level; **
significant at less than 5% level; *significant at less than 10% level;

For "**CONS**", viz. CENTRAL GOVERNMENT REAL FINAL CONSUMPTION EXPENDITURE, the estimated regression for the "comprehensive" equation encompassing both structural-economic and political-institutional classes of explanatory factors shows a high adjusted R^2 of 0.998. However, although estimates for the coefficients of LnRPCY, $SERV_{inv}$, URBAN, DEF and LnCPI are significant, the rest including the lagged adjustment factor G_{t-1} have small "t" values. Note that the majority of significant estimates are significant at 1%, while a handful are significant at 5% $SERV_{inv}$, has a negative coefficient (-.070) that is rather small. A rather surprising result is the insignificance of D1 (the policy regime change dummy), The coefficient sign is significant but counter to expectation for "DEF" ("Deficit Illusion")-- negative as against the expected positive sign, with a "t"-value of -4.083.. Other coefficient estimates yielding counter-intuitive signs are, however, statistically not significant. The value of the *DW*-statistic (1.780) indicates that the presence of some positive serial auto correlation cannot be ruled out.

One explanation for the counter-intuitive results may be i) the rather large number of regressors present in the "comprehensive" equation, and the associated possibility of multicollinearity that might well have crept in. Secondly, simultaneity bias, resulting from reverse causation or feedback effect from Government Expenditure to the regressor in question (DEF in this context) could be a second important factor behind counter-intuitive or insignificant results. In this case, just as DEF is posited to have influence on government expenditure, the latter in turn has a well-known strong reverse causality effect on DEF, as increase in government expenditures relative to revenues leads to an automatic increase in deficits..

Separate estimates for the structural-economic vis-à-vis the political institutional explanations as in the next regressions allow us to evaluate the relative strengths of

each of the explanatory frameworks, also reducing the number of regressors and thus the problem of multicollinearity.

For the "structural-economic" explanatory framework estimated (**R_2**), inclusion of the additional regressor LnG_{t-1} (the lagged adjustment factor) with structural factors improves the adjusted R^2 from .998 to .999, but reduces the F-statistic. Interestingly, LnRPCY is no longer significant, and of the regression estimates that are now significant RP has a counter-to-expectations negative coefficient of -.031. D1 (the policy change dummy), URBAN and $LnGt_{-1}$, the lagged adjustment factor have expected positive signs. Here, too, most of the significant estimates are significant at 1%, while a handful are significant at 5% The DW-statistic is however, much lower now.(.891) suggesting uncomfortably high possibility of positive serial correlation.

The negative sign of the coefficient for RP (relative price of public vs. private goods) is contrary to expectations.

In case of the political-institutional equation estimated separately, R^2 continues to be high at 0.999, and a much larger F-statistic of 14103.314 that is significant at less than 1%. Estimates are now significant for all the coefficient estimates except E(Y1)—surprisingly, the "election dummy", and LnG_{t-1}, the lagged adjustment factor. Of those that are significant, $_{sq}$PUBEMP and DEF have counter-intuitive signs (negative). Coefficients are, as expected, positive for CENTR, LnDT ("tax visibility") and LnCPI (fiscal drag due to inflation).

Finally, considering the structural-economic model excluding the lagged adjustment factor, adjusted R^2 still remains high at 0.999, but with a lower F-value. LnRPCY, RP, D1 and URBAN are all found significant at 1%, with however RP showing a negative sign that is counter-intuitive, which may, again, stem from the simultaneity bias referred to above. The coefficient of URBAN in fact is rather high at .745. The DW-statistic

values of 1.480 and 1.046 respectively indicate serial autocorrelation cannot be ruled out. Overall, for Government Consumption, R^2 is found highest when structural-economic and political-institutional groups of explanatory factors are taken separately.

Table 6.4 Regression Results: DEPENDENT VARIABLE: "LNFINAL"
SAMPLE PERIOD 1970-71 – 2007-08

Independent Variables & Diagnostic Values	**R_1** FULL MODEL	**R_2** STRUCT, G_{t-1}	**R_3** POL/ INSTTNL	**R_4** STRUCT
Constant	**.049**	**1.737 (1.825)***	**.846**	**1.439**
LnRPCY	**.962 (3.715)*****	**.266**		**.754 (4.313)*****
SERV*inv*	**--.919 (--4.942)*****	**--.314 (--2.025)****		**-.204**
LnTRADE	**-.254**	**--.598 (--1.943)***		**--1.303 (-4.925)*****
RP	**.155 (2.826)*****	**.027**		**--.006**
D1	**-.065**	**.069**		**.079**
URBAN	**-1.184 (---2.677)****	**0.395**		**1.259 (6.466)*****
*sq*PUBEMP	**.396 (3.099)*****		**-.007**	
E(Y1)	**.004**		**-.015**	
DEF	**-.039**		**--.066 (--1.671)***	
CENTR	**.057**		**.098 (2.254)****	
LnDT	**--.062**		**.321**	
LnCPI	**.791 (2.912)*****		**.220**	
LnG_{t-1}	**.399 (2.211)****	**.579 (3.413)*****	**.627 (4.317)*****	
No. of observations	**38**	**38**	**38**	**38**
$\overline{R}^2$	**0.991**	**0.984**	**0.983**	**0.978**
F	**322.476*****	**323.226*****	**263.517*****	**279.220*****
DW	**2.374**	**1.831**	**1.880**	**1.279**

(t-values in brackets)
***significant at less than 1% level;
**significant at less than 5% level;
*significant at less than 10% level;

"FINAL": CENTRAL GOVERNMENT FINAL EXPENDITURE ON GOODS & SERVICES (REAL)

The results estimated above show that now, though typically continuing to be high, R^2 values are now uniformly lower than in the case for "**CONS**". With the "**comprehensive"** model (**R_1**), .we now have an adjusted R^2 of 0.991, with a much lower though significant, F-value (322.476) than earlier. Parameter estimates are significant for LnRPCY, $SERV_{inv}$,RP, URBAN, sqPUBEMP, LnCPI and LnG_{t-1}. In fact, LnRPCY now has a noticeably high coefficient of .962, and $SERV_{inv}$ has a high negative coefficient of --.919. Coefficient signs are also according to expectations for all the other significant estimates. Again, for the first time here, we are getting a DW-statistic in excess of 2 (2.374) reassuring us of a healthy absence of serial autocorrelation.

When we come to the structural-economic model inclusive of the lagged adjustment factor (G_{t-1}), $\overline{R}^2$ falls to .984. LnRPCY is no longer significant, and results are now significant for $SERV_{inv}$, LnTRADE, and LnG_{t-1} only, with negative signs for the first two. We had noted earlier that the sign of (log)TRADE (direction of causality) could at best be described as ambiguous given the apparently conflicting directions suggested by the few premises in this regard (TABLE **6.1** in Section **6.3** above). The DW-statistic is now 1.831, that is, not high enough to rule out serial correlation.

For the political (/institutional) model, $\overline{R}^2$ is further reduced to 0.983 (although, by usual standards it is still quite high). Estimates are significant for DEF, CENTR and the lagged adjustment factor, of which DEF again has the counter-intuitive negative sign suggesting feedback effects. DW is now 1.880, that is, high but not enough to rule out serial correlation. Finally, for the structural/ economic framework *excluding* lagged adjustment, we have significant estimates for LnRPCY, LnTRADE, URBAN, with all expected signs.

Table 6.5 Regression Results: DEPENDENT VARIABLE: "LNTOT"
SAMPLE PERIOD 1970-71 – 2007-08

Independent Variables & Diagnostic Values	**R_1** FULL MODEL	**R_2** STRUCT, G_{t-1}	**R_3** POL/ INSTTNL	**R_4** STRUCT
Constant	**-.337**	**.910**	**.762 (2.159)****	**.942**
LnRPCY	**.716 (4.235)*****	**.440 (3.273)*****		**.655 (5.658)*****
SERV*inv*	**-.363 (--2.966)*****	**--.096**		**--.042**
LnTRADE	**--.508 (-2.595)***	**--.889 (---4.359)*****		**--1.218 (-6.946)*****
RP	**.024**	**.009**		**--.008**
D1	**--.005**	**.057 (1.705)***		**.045**
URBAN	**.236**	**.943 (4.057)*****		**1.465 (11.359)*****
*sq*PUBEMP	**.236 (2.965)*****		**.030**	
E(Y1)	**-.007**		**--.022**	
DEF	**--.086 (--3.908)*****		**--.125 (-4.710)*****	
CENTR	**.069 (2.874)*****		**.098 (3.517)*****	
LnDT	**.216 (1.758)***		**.463 (4.100)*****	
LnCPI	**.100**		**.095**	
LnG_{t-1}	**.172**	**.363 (2.614)****	**.568 (5.929)*****	
No. of observations	**38**	**38**	**38**	**38**
$\overline{R}^2$	**0.996**	**.992**	**.992**	**.990**
F	**722.788*****	**655.251*****	**684.158*****	**642.406*****
DW	**1.445**	**1.587**	**1.462**	**1.223**

(t-values in brackets) ***significant at less than 1% level;
**significant at less than 5% level; *significant at less than 10% level;

The third set of our regressions, viz., the dependent variable Government **Total** Expenditure (that is, Final ***plus*** Transfers, in real terms). shows the first regression, that is the "comprehensive" model yielding an $\overline{R}^2$ of 0.996, with significant coefficients for

LnRPCY, $SERV_{inv}$, LnTRADE, sqPUBEMP, DEF, CENTR and LnDT. Of these, DEF again has the "wrong" sign (negative), while all the other estimates have signs as expected. For the structural-economic model with a lagged adjustment, $\overline{R}^2$ is 0.992, with significant estimates for LnRPCY, LnTRADE, D1, URBAN and the lagged factor LnG_{t-1} itself. The coefficient of LnRPCY is now lower (.440), and that for D1, though significant and positive, rather small (0.057). The political-institutional model, in turn, has the same $\overline{R}^2$ 0.992, with significant coefficient estimates for DEF (--.125), CENTR (.098), LnDT (.463) and LnG_{t-1} (.568). the implications of the negative parameter estimate for DEF has been already discussed. The final regression in this set, viz. The structural-economic model *without* lagged adjustment, yields an $\overline{R}^2$ of .990, with significant estimates for LnRPCY (.655), LnTRADE (--1.218, a quite high negative coefficient), URBAN (1.465, again, a rather high value, with the "correct" sign).

All the regressions in this set have DW ranging from 1.223 (lowest) to 1.587 (highest), suggesting the strongly probable presence of serial autocorrelation.

Our final results in this part of the analysis concerns that for Government Transfer Payments (real), where we have the following results (table **6.6** below) As before, we start with the comprehensive model, where both structural and political-institutional variables are involved as explanatory variables. The $\overline{R}^2$ is .996, with the coefficients having mixed significance levels at 1% and 5%, and in some cases, even at 10%, respectively.

Table 6.6 Regression Results: DEPENDENT VARIABLE: "LNTRANS"
SAMPLE PERIOD 1970-71 – 2007-08

Independent Variables & Diagnostic Values	R_1	R_2	R_3	R_4
	FULL MODEL	STRUCT, G_{t-1}	POL/INSTTNL	STRUCT
Constant	**.381**	**1.778***	**-.151**	**1.720**
LnRPCY	**.122**	**.070**		**.197**
SERV*inv*	**-.220 (--1.802)***	**--0.136**		**--.051**
LnTRADE	**--.056**	**--.437****		**--.732*****
RP	**--.026**	**.023**		**.017**
D1	**.069 (2.232)****	**.064*****		**.078****
URBAN	**.525 (1.994)***	**.667*****		**1.419*****
*sq*PUBEMP	**.141 (1.746)***		**.077**	
E(Y1)	**--.012**		**--.020**	
DEF	**--.081 (---3.629)*****		**--.106 (--4.100)*****	
CENTR	**.056 (2.444)****		**.068 (2.739)****	
LnDT	**.239 (1.967)8**		**.425 (3.704)*****	
LnCPI	**--.318 (--2.091)****		**-.088**	
LnG_{t-1}	**.363 (3.187)*****	**.520*****	**.629 (6.121)*****	
No. of observations	**38**	**38**	**38**	**38**
$\overline{R}^2$	**.996**	**.993**	**.993**	
F	**737.564*****	**725.538*****	**767.426*****	**582.440*****
DW	**1.767**	**1.586**	**1.415**	**1.119**

(t-values in brackets)
***significant at less than 1% level;
**significant at less than 5% level;
*significant at less than 10% level;

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GENERAL RESULTS & SOME OVERALL OBSERVATIONS

1. Overall, in the above part of our analysis, we have attempted to explain and develop a basic analytical framework involving the various components of government expenditure and specific groups of explanatory factors. We have also justified at length our focus on selected economic categories of (real) government expenditure.
2. As we find in the above, total central government expenditure, as well its major economic categories (viz., total final expenditure on goods and services, final consumption expenditure of the government, as well as government transfer payments to the rest of the economy), all bear considerable relationships to a host of structural-economic as well as political-institutional factors operating in the macro-economy.
3. The first observation that we need to make regarding the results obtained in this analysis is the inevitable problem of multicollinearity that must have invariably crept in in the analytical framework since it involved rather a large number of explanatory variables. As explained in the introductory remarks in the estimation part, we have attempted to tackle the problem by not only presenting the "comprehensive" formulation, but attempting to separately estimate the two sets of explanatory factors, viz., the "structural-economic" factors (with and WITHOUT the presence of the lagged adjustment factor), vis-à-vis the "political-institutional" explanatory group.
4. Among the explanatory factors considered, on the "structural-economic" side, real per capita income, the relative prices of public goods with respect to private goods, the share of services in the economy, and the degree of urbanization, all

seem to play significant roles in the total government expenditure as well as its economic components. A rather surprising finding is the frequently insignificant role played by the policy regime change dummy (D1), the principal reason behind which seems to be that any policy announcement changes take some time to actually get reflected in the corresponding government expenditure magnitudes.

5. Among the above factors, the direction of causation in case of per capita income is sometimes contrary to expectations, a result that is only to be expected for reasons that are explained in point 6 immediately below.
6. Some of the results obtained in this analysis that were found to run counter to the typically expected directions, can be explained by the leading cause of there being simultaneity, or feedback effects, running both ways between the explanatory as well as the dependent variables under concern. To take a specific case in point, the counter-to-expectations sign of the “Deficit” measure in some regression results is better explained if we consider the fact that not only does the “deficit illusion” posited in this analysis influence the demand, and thereby the level of, government spending—but that the latter, in turn, impacts the deficit measure. The presence of this simultaneity bias is a major reason behind some of the significant regression results coming out as contradictory to that posited in the specific premise or hypothesis.
7. The results, where they are found to be counter-intuitive, may usually be explained by i) the rather large number of regressors present in the regression to estimate and the inevitable problem of multicollinearity this might give rise to, and also ii) by the very real possibility of a reverse causation or feedback effect

from Government Expenditure to the regressor in question, so that some simultaneity bias is certain to creep in.

8. What this means is that the above-mentioned simultaneity bias and the related problems will continue to remain so long as we confine our analysis to single-equation estimations, instead of a complete system of simultaneous equations framework, which could be taken to indicate a weakness of the present analysis. However, developing and estimating a complete system of equations, in the present instance, would have become too much complex and taken us rather far beyond the purview of our envisaged scope of our Thesis. A more extended analytical set-up taking into account these considerations is among the foremost concerns in our further research efforts.
9. Among “political-institutional’ class of variables, fiscal illusion seems to play a significant role in impacting government expenditure, although, as explained earlier on, we have been constrained to adopt rather simplistic measures for this crucial and yet, still now relatively under-researched aspect so far as the empirical literature on Indian public finance goes.
10. The issue of fiscal illusion is extremely significant from the policy implications aspect—as the perception on the tax-payers’/ citizen-voters’ part about the actual resources being commandeered by the government has significant bearing on taxation policies adopted, as also the methods of financing expenditure adopted by the fiscal authority.
11. Hence, the fiscal illusion aspect is one area where we need more detailed and careful empirical analysis to infer meaningful policy implications.

12. Among the “deficit illusion” measure, we have already mentioned above the frequently encountered counter-intuitive sign of the deficit factor, and the most plausible reasons behind such a finding.
13. “Fiscal drag”, viz. the creeping up of the tax brackets due to inflation, represented here by the Consumer Price index, is found to play appreciable role.
14. Findings regarding the role of interest groups in shaping government expenditure, attempted to be represented by (suitably transformed) “PUBEMP” variable, is rather disappointing. It seems highly probable that there is a need to involve more fuller measures to capture the influence of the “interest-groups”.
15. To the above purpose, inclusion of the powerful farm lobby could yield more significant results.
16. The equally disappointing results regarding the “Election-Year” effect on spending (frequently insignificant, and often carrying the wrong sing), can be conceivably remedied by using more carefully constructed Election-year Dummies. Hackl et al (1993), for instance, use both “Pre-Elections” as well as a “Post-Elections” dummy (“E(Y1)” and “E(Y2)”) to capture this aspect more fully. We also, therefore, need to pay greater attention to constructing the election-year effects for analytical purposes.
17. Finally, the role of the “lagged adjustment factor”, G_{t-1} representing the residual impact of previous period’s expenditure levels on current spending, is found to be highly significant in the majority of cases.
18. What the above indicates is the strong lag effect built into the government expenditure process, whereby previous decisions play a considerably significant role in shaping current period’s spending. This is a highly significant factor so far as any attempts at policy change attempts on the expenditure side is concerned,

since the presence of this dominant lag means any envisaged policy changes could take quite considerable time before appreciable effects could be observed in practice.

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PART III

SUMMING UP AND EPILOGUE

7

Concluding Remarks and Further Research

"…So, is Holcombe (2005) correct in his pessimistic and cynical conclusion that citizens are manipulated by politicians and government bureaucrats who would like to increase their power over our incomes and garner resources for themselves? The answer is no. It is clear that demand plays a significant role, but so does the agendas of politicians and bureaucrats. (…) the opportunity to tax is restrained by the negative incentive effects that set in, particularly at high levels of government spending. Moreover, politicians are forced to consider what the electorate wants… Thus, there are no simple explanations for the long-run evolution of relative government spending (…). Rather, the evolution is governed by a complex interplay between supply and demand factors, and deep-seated changes in underlying structural conditions over time"

--Durevall and Henrekson (2011)

CHAPTER 7

CONCLUSIONS AND FURTHER RESEARCH

The chapter is organized into the following major sections.

7.1 Conclusions of the Study

We are now in a position to conclude the present study and set out its main findings. Also, any study of this sort must per force be subject to some limitations, the present one being no exception, and in the course of this chapter we will be noting some of the limitations that must have remained despite our best efforts, not the least because of the somewhat restrained scope of analysis with which we started, and which has been amply made clear in the preceding chapters.

This study set out to analyse in detail the pattern and trends in the expenditure of the Central Government in India spanning a period of close to four decades. The time period, staring form 1970-71 and reaching up to the year 2007-08, was chosen not without reason. On one hand, the decade of the 1970s marks the beginning of an almost imperceptible, but unmistakable, gradual relaxation of the fiscally strict conservative stance on the part of the authorities that had informed earlier budgets. The end point of our study period viz. 2007-08, on the other hand, is marked by the imminent Global Financial Crisis that was to unfold almost immediately afterwards, shaking up the world economy and what is even more important, necessitate a total reversal of fiscal consolidation efforts that was being attempted since some time. Hence, our study provides a useful backdrop against which the subsequent events can be highlighted and the post-Crisis period conveniently analysed.

The second noteworthy aspect that we feel lends sufficient significance to our study is that it has aimed at the significant endeavour of providing the basic analytical framework for an analysis of the government expenditure process in a developing economy.

Having presented a conscientious and, as thorough as possible, overview of the pertinent literature on government expenditure analysis in Chapter 2, we then proceeded to discuss in detail the various methodological issues associated with our envisaged analysis. Next came the main analytical body, the "core" of the Thesis as one might put it, which has been carried out in a number of sequential parts.

The first phase consisted of inspection of the individual components and their respective growths. The detailed composition of various expenditure categories, including their respective elasticity and buoyancy properties was studied next. Analysis was done for the broad as well as disaggregated functional categories, for the overall study period and also separately for the Pre-reforms as well as the Post-Reforms years. Sub-periods of individual decades were also studied in detail.

Having analyzed in detail what might be termed the "Arithmetic" of the central government expenditure over our study period 1971-2008, we next turned our attention to the "Economics" of the government expenditure process, in particular in India over our chosen period of study. We attempted to explicitly formalize the government expenditure mechanism in terms of economic/ structural variables as well as political/ institutional ones, that is, focusing on *how*, *and to what extent*, the process of government expenditure observed in actual practice are shaped by the various factors working in the economy, some of them observable or quantifiable in economic terms and some of them political or institutional. This phase of the study exclusively concerned itself with government expenditure classified along *economic* categories, which in turn exhibited significant revelations. Economic and political factors were found to have significant relationships with the government expenditure process.

Clearly, in spite of the best attempts at formalization there will always remain at least some observed characteristics that one would be unable to capture fully in terms of economic analysis, a limitation that we fully acknowledge at the outset. The justification, nevertheless, of undertaking such attempt at formalization and understanding, is in no way trivial.

The third phase of our analysis also explicitly addresses the time dimension involved in our series under discussion, as Time-series data on Government expenditure, like almost all other macro-economic variables, involve characteristics that demand explicit time-series considerations for a valid and complete analysis. These considerations required us to devote some attention to the problems involved in Time-Series Econometrics, the problems of Non-stationarity and "Spurious Regression", and Unit Root Tests.

With the above brief overview in place, we can now present the main findings of the present study. To sum up, the broad conclusions can be enumerated as below:

1. The pattern and trend of central government expenditure over the period 1970-71 to 2007-08 has been varied and uneven. Despite fluctuations in rates of growth however, total central government expenditure over the entire period has grown from Rs.4564.52 Crores in 1970-71 to Rs.675620.8 Crores in 2007-08 (Actuals), an average annual compound rate of increase of 13.24% in nominal terms.
2. Over the same period, expenditure in real terms has grown from Rs. 60059.0 Crores (at constant 2004-05 prices) in 1970-71 to Rs. 579435.0 Crores (at constant 2004-05 prices) in 2007-08, an annual compound average rate of increase of 5.91% in real terms (base 2004-05).

3. For the pre-reform period, viz. 1970-71 to 1989-90, overall central expenditure growth has been much faster with an annual average growth rate of 15.52% (nominal terms), and real rate of growth (annual average compound) of 7.57% at constant prices (base 2004-05).
4. For the post-reform period, viz. 1990-91 to 2007-08, overall central expenditure has grown at a relatively slower rate, with an annual compound growth rate of 10.52% (nominal terms), and real rate of growth of 4.78% at constant prices (base 2004-05).
5. The major component in the total central expenditure has been revenue expenditure which has completely dominated the trend in total expenditure. Revenue expenditure of the central government in nominal terms has grown from Rs. 2992.86 crores at 1970-71 to Rs. 567294.11 crores in 2007-08, at an annual rate of increase of 14.34% at current prices between 1970-71 to 2007-08.
6. Capital expenditure, on the other hand, has been remarkably erratic, fluctuating continually and registering in nominal terms a growth from Rs. 1571.66 crores in 1970-71 to Rs. 108326.69 crores in 2007-08 at an annual compound rate of 9.40% overall (current prices).
7. The respective real rates of growth in the two categories between 1970-71 and 2007-08 have been 6.95% (annual average compound rate) for revenue expenditure, and 1.98% for capital expenditure.
8. Looking at the pre-Reforms vis-à-vis post-Reforms growth, the respective growth rates in revenue expenditure, in real terms, were a pre-Reforms 7.83% vs. for 6.13% post –Reforms, while that of capital (development plus non-development) expenditure were rather fluctuating and uncertain. From

7.02% pre-Reforms at real rate, there has been a distinct deceleration in the growth of capital expenditure post-Reforms which in fact went down to a *negative* --1.62% in real terms, subsequently picking up slightly in the period 2000-01 to 2007-08 to 7.35% (*constant prices)*.

9. Such growth pattern in the respective components has important implications for the macro-economy. This is because revenue expenditure creates no permanent assets or yield future returns, while the capital component is analogous to investment with returns in the future. Hence growth of revenue expenditure at the expense of capital expenditure has led to a sluggish rate of public sector investment.
10. Among Revenue expenditure, growth in non-development expenditure has outstripped development expenditure. Breaking down into functional categories shows that weightage-wise, the lion's share has been consistently claimed by interest payments, followed by defence, and subsidies
11. As far as rate of growth is concerned, the fastest growing item in revenue expenditure has been subsidies.
12. Of capital expenditure, development vs. non-development expenditure growth shows a relative faster growth.
13. Elasticity and buoyancy estimates of the detailed expenditure components reveals that of total and revenue (developmental and non-developmental) expenditure, revenue expenditure has been most buoyant, whereas capital expenditure lacks the similar buoyancy.
14. Coming to the time-series properties of Government Expenditure, in particular its economic components, Unit Root Tests for Stationarity check were duly

carried out. Government expenditure series were found to be generally non-stationary, that is, possessing Unit Roots, with most of them I(1) processes (that is, “Integrated” series of order 1) becoming stationary after first differencing.

15. Although the R^2 found in our analysis has been uniformly high all throughout, the value of the DW-statistic has been found to suggest strong probability of serial autocorrelation, suggesting that the time-series properties of our variables should have been taken more adequately into account.
16. Among the explanatory variables, Unit Root Tests also showed most of the relevant series to be I(1), with a few being I(2).
17. Indeed, this non-uniformity in the orders of Integration is also another major reason why we refrained from straightaway delving into cointegration analysis as that would have demanded more complicated technical sophistication (Bhaskara Rao 1994, Maddala and Kim 1998).
18. Relating the government expenditure process to the structural-economic and political-institutional factors in the economy that interact with and affect the government expenditure mechanism, Central Government Expenditure (Total and Final Expenditure), Central Government Final Consumption Expenditure, and Transfer Payments consisting of current and capital transfers, were found to have significant relationships with most explanatory factors.
19. Of the above mentioned categories, explanatory power was found to be most prominent in case of Final Consumption and Transfer Payments.
20. Explanatory variables on the structural/ economic side that were generally found to be significant and as per expectation include per capita income, urbanization, structural/ economic policy regime change and trade share.

21. The role of relative prices (RP) or “Baumol’s Cost Disease” was significant in some but not all cases.
22. Among political/ institutional factors, fiscal Illusion proved to be significant, although not always having high coefficient.
23. Significant political events like General Elections were found to have appreciable influence on all aspects of government expenditure.
24. Although the break-away point of the 1991 was duly recognized, any possible structural break in the series would be highly plausible. However, we refrained from explicit considerations of the same for the time being.
25. In our study, use of the lagged adjustment factor in Government Expenditure process, whose influence was indeed found to be significant in most cases, provides a possible route to introduce disequilibrium considerations. Arguments could of course be made for more plausible representations of the disequilibrium aspect.

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7.2 Some Significant Contributions of the Study

1. Explicit attempt at capturing the government expenditure mechanism in economic and institutional terms
2. Attempt at synthesizing the diverse in case of a developing economy
3. Explicitly dealing with aspects like fiscal illusion: we feel an important aspect has been incorporated in Indian Public Expenditure Analysis as the literature is still rather scarce in India.
4. Attempting a comprehensive canvas against which central government expenditure in post-Reforms and pre-Global Financial Crisis could be understood.

7.3 Limitations of the Study and Direction of Further Research

Although we have taken every pain and effort to come up with as extensive an analysis as possible within the scope of a Thesis, we are only too aware of some limitations or difficulties that have inevitably crept up in the work. Some of these are in the nature of limitations. However, there are other aspects that have made us keener and more deeply involved in our research, having served the crucial purpose of making us aware of the areas that merit further and more comprehensive research. We enumerate both these aspects in the following:

Data Limitations: Some Observations

1. For a long time, researchers in the area of Indian Public Finance had been facing difficulties in access to suitably detailed, classified, continuous and comparable data over long periods of time. Although, as of now, decided improvements have been made, even then, access to publicly available long time-series on a comparable basis covering all aspects of government expenditure remains somewhat of a problem.
2. Availability of continuous constant price data continues to be a major problem, as opposed to the case of Australia, for example, where the government provides continuous data on constant price basis. In India, although constant price series on government expenditure is available to some extent, the availability is non-uniform and scattered across different sources. The NAS has been carrying out the commendable task of providing constant price series so far as final consumption expenditure, and its further

components, for the central government administration are concerned. However, similar constant price series on the other economic categories including government capital formation is hard to come by. This is an area which needs urgent attention of the Statistical and Data Collection Organizations.

3. The same difficulty of access to suitable constant price figures has also been faced in case of functional categories of expenditure. While the NIPFP has been providing valuable long span of time-series data on functional components of central government expenditure, similar data on constant price basis is still unavailable. The result is that the researcher has to come up with individual decisions regarding suitable deflation procedures and the appropriate, as well as available, deflators to apply. These are among some of the data limitations that this researcher felt need to be shared.

Scope and Limitations of Study including Suggestions towards Further Research

1. The present study has rigorously examined the expenditure trends/ patterns in sufficient detail over our study period 1970-71 to 2007-08. However, formal rigorous analysis of the implications of such observed changes for the macro-economy merits further research—which we intend to take up in our next and continuing research efforts.
2. Adequate analysis separately of the pattern of government investment pre- and post-Reforms seems necessary, given the extremely wide fluctuations in the gross capital formation component of government expenditure, and the generally very low level at which it has remained nearly all throughout our study period (1970-71to 2007-08). If indeed, as Rajaraman et al (2001) put it

bluntly, there exists “prior evidence that capital expenditure is an accommodative component that is compressed at times of fiscal stress” (Rajaraman et al (2000) cited in Rajaraman, Mukhopadhyay and Rao 2001 pp 3), then of course, formal analysis of this aspect becomes fraught with difficulties.

3. In the present study, thus, we deemed it more logical to focus on government final consumption so far as the growth in Final Expenditure is concerned. Further Research on this point is therefore indicated.
4. Although the patterns in Central Government Expenditure have been studied in depth in the present work, we have not explicitly considered HOW government expenditure has been financed, and its future trends. Yet this is an aspect that has crucial implications for the economy, and hence, the aspect of financing is reserved for further research in the area.
5. Similarly, this study can be further enriched by an explicit incorporation of the Public debt aspect and the requisite fuller analysis. Further Research along these lines is eagerly anticipated.
6. In the present study, cointegration considerations have been eschewed, with the rationale behind our decision fully explained and justified. However, we fully intend to extend the data set to include the omitted period of time and employ the nuances of Cointegration Analysis in the course of our future research.
7. In spite of providing a significant route through which the disequilibrium aspect can enter the analysis via the lagged adjustment factor, in our model however, we have not attempted at explicitly introducing disequilibrium considerations. This is because doing so would have taken us beyond the

purview of the present thesis. Such an analysis is reserved for future research explorations to be taken up in subsequent more advanced treatments.

8. The break-away point of 1991 in the economic policy climate has been duly recognized and incorporated via Dummy variable. However, we refrained from explicitly investigating the highly possible existence of structural breaks in the various series involved. Since the existence of structural breaks is a "fact of life" so far as long time series macro-data are concerned, this is an issue that merits explicit consideration and integration into the analysis, thereby enhancing the robustness of results obtained.
9. The aspect of Fiscal illusion needs to be developed more fully in the Indian context, contrasting it with the significant studies on Ricardian Equivalence. We are actively anticipating working further on this still relatively under-represented but extremely promising research area.
10. To capture the full extent of the influence of the interest group factor in shaping government expenditure, the influence of the farm lobby (represented, for instance, by share of agricultural employment) needs to be included. In our analysis we decided to postpone its inclusion for the time being. Hence this aspect deserves future, fuller analysis
11. Consequent upon the successive Finance Commission awards and the conscious policy efforts towards fiscal decentralization in the Federal Finances of India, finances at the State and local government level are becoming more and more important—indicating the need for further research incorporating the latter.

12. The analysis we have carried out should yield extremely promising results should we employ Panel of similarly placed countries over the same time period. Further Research in this direction is being actively contemplated by this researcher.
13. Finally, “a lot of water has flown through the Ganges, the Thames and the Volga” since this study was initiated. The situation post-Global Financial Crisis and in particular, in the context of the Euro-zone Crisis merits further research so far as the problems and prospects facing government revenue-expenditure operations are concerned.

With these observations, we conclude our present study on the Indian Central Government Expenditure over the four-decade long span of 1970-71 to 2007-08.

[i] For a detailed definition, derivation and measurement issues of the Herfindahl index see Gemmell (1999), Hackl et al (1993)

[ii] For an extensive discussion on the various checks for Stationarity, Unit Root tests and their limitations, as well as the alternative proposed tests, see Maddala and Kim (1998).

Epilogue

The story of India's development journey is *seldom* told completely.

As we stand at the autumn of 2013, and events continue to unfold well beyond the period in time originally envisaged in this dissertation, it *would be useful* to look around and to follow the saga unfolding all around us in the complex politico-economic scenario that indeed is the Indian economy.

We had opened this study by embarking upon the dramatic changes with regard to government presence in the national economies the world over, and also the way events have almost turned a full-circle in the purview of the government's desired extent of presence in the global economy. The watershed years of 1990-91 in India's economic fate brought forth subsequent events with their wide-ranging policy implications and the ensuing Reforms era, and when the Global Financial Crisis reached its climax in 2008, threatening to shake the very foundations of the

increasingly interconnected Global Economic Structure, India's ability and resilience to the threats posed were (and are still being) vigorously debated.

The year 2007-08, then, just under the shadow of the crisis, seemed a natural and logical cut-off point for the scope of our ***present*** analysis that sought to concern itself essentially with India's Pre- ***vis-a-vis*** Post- Reforms era experience with its government finances. Since then, as the crises in the global economic scenario and in the Euro-zone seem well on way towards at least partial recovery, the challenges India has been facing seem increasingly to lie internally, in the dramatic developments unfolding within the country's own economy and polity, with Governance and the reputation for a Corruption-free Public Sphere seemingly at stake.

While these are essentially political concerns taking one way beyond the purview of pure economic analysis[i], a few points are in order here. For one, so far as our concern is with the public finances of the economy, as in the present dissertation, the problems of appropriate pricing of public assets can never be turned away from, and it is precisely the one crucial aspect that has been creating furore and unease all around in recent times.

Admittedly, the *present dissertation* as we pointed out at the very outset, has consciously steered clear of value judgments of any sort, or issues like efficiency/ economic transparency in public sphere. This fact might be held as a point of criticism against the present study. However, even as our avowedly *pure* objective analytical endeavour over the envisaged time period has been concluded, we felt it necessary to look back from the vantage point of today in 2013 towards events that have potential crucial implications for the public finances and indeed, the entire economic fate of the country.

It is this concern that has prompted putting down these concluding remarks. The issues of governance, and efficiency, and honesty, in administering the crucial responsibility of political mandate[ii], are aspects that no serious research endeavour can completely abstract itself from. Hence, it is our modest aim to offer the present dissertation as a preliminary contribution, and a building block towards developing a full-fledged analytical future framework with all the necessary tools of analysis in place for a hopefully holistic approach towards the complex arena of Indian public finance.

ENDNOTES

[i] *<u>See</u> <u>eg</u> <u>the</u> insightfully incisive article by Professor C.V. Devan Nair, MOTHER INDIA , Golden Jubilee Special Issue February- March 1999, p.322*

[ii] ."....it is questions, not of taxation, but of the proper.organisation and administration of the economic life of the society which are preparing the revolutions of the future." The words quoted above are those of the seer-poet Sri Aurobindo that appeared first in the book-form in the year 1919. (The name of the book : 'The ***Ideal of human Unity')***

APPENDIX

APPENDIX I

BASIC DATA, GROWTH AND COMPOSITION OF VARIOUS COMPONENTS OF CENTRAL GOVERNMENT EXPENDITURE 1970-71 TO 2007-08

TABLE AI.1: CENTRAL GOVERNMENT EXPENDITURE AND MAJOR MACRO-VARIABLES

(Money value Rs. Crores)

Year	TOTAL	REV	CAP	GDP factor cost		WPI
				CURRENT PR.	CONSTANT PRICE (2004-05 PR.)	BASE YEAR (2004-05)
1970-71	4564.52	2992.86	1571.66	44382.00	589787.00	7.6
1971-72	5555.78	3929.14	1626.64	47221.00	595741.00	8.1
1972-73	6484.54	4362.37	2122.17	51943.00	593843.00	8.9
1973-74	6701.07	4643.71	2057.36	63658.00	620872.00	10.7
1974-75	8343.70	5275.85	3067.85	74930.00	628079.00	13.4
1975-76	10491.36	6575.08	3916.28	79582.00	684634.00	13.3
1976-77	11813.85	7733.53	4080.32	85545.00	693191.00	13.5
1977-78	12589.50	8480.12	4109.38	97633.00	744972.00	14.2
1978-79	15549.97	10013.74	5536.23	104930.00	785965.00	14.2
1979-80	17160.91	11462.60	5698.31	114500.00	745083.00	16.7
1980-81	21032.95	12922.94	8110.01	136838.00	798506.00	19.7
1981-82	23450.67	15076.78	8373.89	160213.00	843426.00	21.5
1982-83	27826.95	18315.26	9511.69	178985.00	868092.00	22.6
1983-84	32787.18	21651.65	11135.53	209356.00	936270.00	24.3
1984-85	40792.34	26503.71	14288.63	235113.00	973357.00	25.9
1985-86	49345.23	32533.76	16811.47	262717.00	1013866.00	27.0
1986-87	59453.49	39753.87	19699.62	292924.00	1057612.00	28.6
1987-88	64008.33	44872.14	19136.19	332068.00	1094993.00	30.9
1988-89	74234.27	52741.59	21492.68	396295.00	1206243.00	33.2
1989-90	87721.79	62412.08	25309.71	456540.00	1280228.00	35.7
1990-91	97484.50	70157.38	27327.12	531813.00	1347889.00	39.4
1991-92	104456.50	78844.34	25612.16	613528.00	1367171.00	44.8
1992-93	118662.43	88836.86	29825.57	703723.00	1440504.00	49.3
1993-94	137655.66	104465.59	33190.07	817961.00	1522344.00	53.4
1994-95	152938.93	120644.47	32294.46	955385.00	1619694.00	60.1
1995-96	168932.70	134428.24	34504.46	1118586.00	1737741.00	64.9
1996-97	188007.46	153473.69	34533.77	1301788.00	1876319.00	67.9
1997-98	204567.68	176899.76	27667.92	1447613.00	1957032.00	70.9
1998-99	247444.79	213028.98	34415.81	1668739.00	2087828.00	75.1
1999-00	285612.91	245081.98	40530.93	1847273.00	2246276.00	77.6
2000-01	301432.36	266396.64	35035.72	1991982.00	2342774.00	83.1
2001-02	333752.16	288913.88	44838.28	2167745.00	2472052.00	86.1
2002-03	356480.84	329346.60	27134.24	2338200.00	2570690.00	89.1
2003-04	348835.98	352042.26	-3206.28	2622216.00	2777813.00	93.9
2004-05	390433.41	370913.80	19519.61	2971464.00	2971464.00	100.0
2005-06	471465.96	415155.21	56310.75	3390503.00	3253073.00	104.5
2006-07	536480.13	485859.17	50620.96	3953276.00	3564364.00	111.4
2007-08	675620.80	567294.11	108326.69	4582086.00	3896636.00	116.6

Source: Economic Survey, Ministry of Finance, GOI, various years

Reserve Bank of India, Handbook of Statistics on Indian Economy, (2012)

Where

TOTAL	Total Central Govt Expenditure	REV	Revenue Expenditure
CAP	Capital Expenditure	WPI	Wholesale Price Index

TABLE AI.2: CENTRAL GOVERNMENT EXPENDITURE: MAJOR SUB-HEADS

(Money value Rs. Crores)

Year	RDEV	RNDV	CAPDEV	CNDV	DEV	NON-DEV	GRANTS	LOANS & ADV.
1970-71	814.03	2178.83	592.04	349.54	1406.07	2528.37	158.08	630.08
1971-72	1001.31	2927.83	847.15	269.50	1848.46	3197.33	160.56	509.99
1972-73	1260.00	3102.37	771.35	161.78	2031.35	3264.15	161.94	1189.04
1973-74	1245.00	3398.71	773.99	234.87	2018.99	3633.58	147.63	1048.50
1974-75	1340.85	3935.00	1411.18	218.92	2752.03	4153.92	497.92	1437.75
1975-76	1888.10	4686.98	1785.48	464.95	3673.58	5151.93	519.37	1665.85
1976-77	2331.38	5402.15	1546.89	303.23	3878.27	5705.38	516.69	2230.20
1977-78	2949.99	5530.13	1980.79	261.85	4930.78	5791.98	599.26	1866.74
1978-79	3726.43	6287.31	1992.55	515.07	5718.98	6802.38	685.31	3028.61
1979-80	4168.96	7293.64	2149.83	289.59	6318.79	7583.23	274.16	3258.89
1980-81	4499.00	8423.94	3059.78	922.93	7558.78	9346.87	335.21	4127.30
1981-82	5229.54	9847.24	3806.01	492.80	9035.55	10340.04	353.68	4075.08
1982-83	6548.72	11766.54	4133.5	724.97	10682.22	12491.51	443.36	4653.22
1983-84	7756.70	13894.95	4904.84	1371.20	12661.54	15266.15	461.14	4859.49
1984-85	9828.47	16675.24	6619.31	1225.43	16447.78	17900.67	540.51	6443.89
1985-86	11731.31	20802.45	6876.22	1621.25	18607.53	22423.70	1070.18	8314.00
1986-87	14067.46	25686.41	7819.78	2574.42	21887.24	28260.83	963.95	9305.42
1987-88	16803.99	28068.15	6149.81	4373.23	22953.80	32441.38	1290.08	8613.15
1988-89	19970.82	32770.77	6547.63	4792.44	26518.45	37563.21	1355.24	10152.61
1989-90	24660.24	37751.84	8158.41	5241.38	32818.65	42993.22	1593.60	11909.92
1990-91	26542.55	43614.83	8023.24	5364.08	34565.79	48978.91	3393.95	13939.80
1991-92	29089.94	49754.40	6958.08	6952.52	36048.02	56706.92	3446.46	11701.56
1992-93	31994.24	56842.62	7177.19	12707.88	39171.43	69550.50	3853.34	9940.50
1993-94	35294.30	69171.29	6020.15	12907.15	41314.45	82078.44	4033.89	14262.77
1994-95	40710.36	79934.11	7841.56	7062.20	48551.92	86996.31	1701.27	17390.70
1995-96	42410.70	92017.54	5350.38	11343.80	47761.08	103361.34	5286.67	17810.28
1996-97	47958.31	105515.38	4966.71	9228.23	52925.02	114743.61	5337.01	20338.83
1997-98	54849.96	122049.80	7559.96	9965.40	62409.92	132015.20	3096.77	10142.56
1998-99	64178.61	148850.37	7963.15	16836.54	72141.76	165686.91	3388.43	9616.12
1999-00	73372.02	171709.96	11171.83	14551.34	84543.85	186261.30	3787.36	14807.76
2000-01	80729.27	185667.37	11154.83	14218.80	91884.10	199886.17	11578.85	9662.09
2001-02	89214.79	199699.09	12316.28	17854.91	101531.07	217554.00	12890.88	14667.09
2002-03	105372.66	223973.94	12598.85	17514.08	117971.51	241488.02	10746.06	-2978.69
2003-04	119363.30	232678.96	15120.46	20170.27	134483.76	252849.23	11002.56	-38497.01
2004-05	124996.11	245917.69	18013.97	34999.72	143010.08	280917.41	12116.86	-33494.08
2005-06	155103.65	260051.56	19848.24	35771.11	174951.89	295822.67	25147.66	691.40
2006-07	196484.02	289375.15	22602.49	36690.69	219086.51	326065.84	28454.17	-8672.22
2007-08	239171.23	328122.88	65122.14	41819.00	304293.37	369941.88	26364.56	1385.55

Source: Economic Survey, Ministry of Finance, various years

Where:

RDEV	Revenue Development Expenditure	RNDV	Revenue Non-Development
CAPDEV	Capital Development Expenditure	CNDV	Capital Non-Development
DEV	Developmental Expenditure	NON-DEV	Non-Developmental Expenditure

TABLE AI.3: REVENUE EXPENDITURE OF THE CENTRAL GOVERNMENT

(Rs. Crore)

Year	Non-Developmental (A)	Developmental (B)	Self-balancing Items & Other Adj (C)	Statutory Grants to States (D)	Total Expenditure (A+B+C+D)
1970-71	**2178.83**	**814.03**	2.26	158.08	**3153.20**
1971-72	**2927.83**	**1001.31**	6.66	160.56	**4096.36**
1972-73	**3102.37**	**1260.00**	3.35	161.94	**4527.66**
1973-74	**3398.71**	**1245.00**	4.16	147.63	**4795.50**
1974-75	**3935.00**	**1340.85**	-60.01	497.92	**5713.76**
1975-76	**4686.98**	**1888.10**	-23.31	519.37	**7071.14**
1976-77	**5402.15**	**2331.38**	69.76	516.69	**8319.98**
1977-78	**5530.13**	**2949.99**	82.41	599.26	**9161.79**
1978-79	**6287.31**	**3726.43**	12.02	685.31	**10711.07**
1979-80	**7293.64**	**4168.96**	18.64	274.16	**11755.40**
1980-81	**8423.94**	**4499.00**	2.60	335.21	**13260.75**
1981-82	**9847.24**	**5229.54**	2.66	353.68	**15433.12**
1982-83	**11766.54**	**6548.72**	2.50	443.36	**18761.12**
1983-84	**13894.95**	**7756.70**	2.00	461.14	**22114.69**
1984-85	**16675.24**	**9828.47**	2.76	540.51	**27046.98**
1985-86	**20802.45**	**11731.31**	4.45	1070.18	**33608.39**
1986-87	**25686.41**	**14067.46**	8.03	963.95	**40725.85**
1987-88	**28068.15**	**16803.99**	4.80	1290.08	**46167.02**
1988-89	**32770.77**	**19970.82**	9.70	1355.24	**54106.53**
1989-90	**37751.84**	**24660.24**	5.10	1593.60	**64010.78**
1990-91	**43614.83**	**26542.55**	5.45	3393.95	**73556.78**
1991-92	**49754.40**	**29089.94**	0.00	3446.46	**82290.80**
1992-93	**56842.62**	**31994.24**	1.65	3853.34	**92691.85**
1993-94	**69171.29**	**35294.30**	0.35	4033.89	**108499.83**
1994-95	**79934.11**	**40710.36**	0.96	1701.27	**122346.70**
1995-96	**92017.54**	**42410.70**	0.04	5286.67	**139714.95**
1996-97	**105515.38**	**47958.31**	0.04	5337.01	**158810.74**
1997-98	**122049.80**	**54849.96**	0.00	3096.77	**179996.53**
1998-99	**148850.37**	**64178.61**	0.00	3388.43	**216417.41**
1999-00	**171709.96**	**73372.02**	0.00	3787.36	**248869.34**
2000-01	**185667.37**	**80729.27**	0.00	11578.85	**277975.49**
2001-02	**199699.09**	**89214.79**	0.00	12890.88	**301774.76**
2002-03	**223973.94**	**105372.66**	0.00	10746.06	**340092.66**
2003-04	**232678.96**	**119363.30**	0.00	11002.56	**363044.82**
2004-05	**245917.69**	**124996.11**	0.00	12116.86	**383030.66**
2005-06	**260051.56**	**155103.65**	0.00	25147.66	**440302.87**
2006-07	**289375.15**	**196484.02**	0.00	28454.17	**514313.34**
2007-08	**328122.88**	**239171.23**	0.00	26364.56	**593658.67**

Source: Indian Public Finance Statistics, Ministry of Finance, various years

TABLE AI.4: REVENUE EXPENDITURE OF THE CENTRE:NON-DEVELOPMENTAL

(Rs. Crore)

Year	Non-Develop-mental	Of which								
		Interest	Defence	Fiscal Services	Administrative incl. Organs of State	Grants incl. Aid	Subsidy	Pensions	Social Security & Welfare	Others
1970-71	**2178.83**	605.54	1051.46	67.83	208.30	95.52	17.98	14.36	n.a.	117.84
1971-72	**2927.83**	670.11	1346.83	70.76	262.95	411.68	49.62	14.59	n.a.	101.29
1972-73	**3102.37**	772.44	1439.36	77.70	279.17	233.67	117.00	13.52	n.a.	169.51
1973-74	**3398.71**	881.64	1480.97	83.85	289.55	218.47	251.00	30.47	n.a.	162.76
1974-75	**3935.00**	1000.76	1920.21	122.61	386.17	22.07	295.00	19.53	41.33	127.32
1975-76	**4686.98**	1228.16	2251.14	183.55	464.02	40.42	250.00	26.88	45.00	197.81
1976-77	**5402.15**	1374.44	2347.20	316.36	480.27	40.06	506.04	31.96	41.09	264.73
1977-78	**5530.13**	1521.35	2385.94	305.97	489.73	50.83	518.70	35.65	39.72	182.24
1978-79	**6287.31**	1828.97	2613.90	331.73	527.70	75.55	608.07	46.31	42.06	213.02
1979-80	**7293.64**	2209.86	3093.61	262.48	590.18	162.67	661.63	54.89	49.85	208.47
1980-81	**8423.94**	2604.30	3540.38	309.83	675.34	200.33	728.44	74.45	54.44	236.43
1981-82	**9847.24**	3194.68	4167.23	332.89	776.15	157.90	825.00	85.38	61.63	246.38
1982-83	**11766.54**	3937.61	4881.73	505.09	880.71	292.69	765.79	97.22	88.14	317.56
1983-84	**13894.95**	4795.46	5666.70	683.29	952.52	315.09	887.74	119.24	77.96	396.95
1984-85	**16675.24**	5974.50	6399.25	895.17	1197.92	332.13	1152.94	153.11	73.38	496.84
1985-86	**20802.45**	7503.46	7552.01	996.38	1372.13	546.80	1700.51	195.60	220.80	714.76
1986-87	**25686.41**	9245.94	9868.00	1231.41	1719.43	449.97	2036.00	230.60	237.81	667.25
1987-88	**28068.15**	11251.36	10074.66	1152.24	1985.91	176.95	2024.00	371.46	138.35	893.22
1988-89	**32770.77**	14278.46	11156.71	1155.55	2291.30	325.38	2486.00	415.84	128.21	533.32
1989-90	**37751.84**	17756.94	12073.00	1120.63	2817.26	58.84	2460.00	448.02	182.78	834.37
1990-91	**43614.83**	21498.25	10874.12	1161.41	3244.29	76.57	2460.00	2138.23	187.38	1974.58
1991-92	**49754.40**	26595.63	11441.62	1517.68	3696.31	86.37	2865.00	2416.08	214.89	920.82
1992-93	**56842.62**	31075.47	12108.49	1861.03	4897.67	51.50	2815.00	3004.82	232.35	796.29
1993-94	**69171.29**	36740.55	14977.33	2118.82	4884.86	61.65	5553.00	3338.41	231.12	1265.55
1994-95	**79934.11**	44060.01	16426.01	2041.99	6101.20	105.88	5110.00	3653.74	254.47	2180.81
1995-96	**92017.54**	50045.03	18841.17	2290.33	6894.36	93.28	5378.00	4287.95	514.95	3672.47
1996-97	**105515.38**	59478.41	20996.70	2293.32	7974.02	187.53	6066.00	5094.20	468.94	2956.26
1997-98	**122049.80**	65637.27	26174.57	2633.12	9752.95	174.70	7500.00	6881.20	338.23	2957.76
1998-99	**148850.37**	77882.38	29861.64	2862.92	11327.55	234.75	8700.00	10056.78	343.91	7580.44
1999-00	**171709.96**	90249.32	35215.94	2979.77	13064.33	265.86	9435.00	14285.92	1575.72	4638.10
2000-01	**185667.37**	99314.21	37237.99	3029.84	15004.50	274.93	12060.00	14219.88	398.52	4127.50
2001-02	**199699.09**	107460.24	38058.83	3046.34	15494.47	362.25	17499.00	11555.08	367.74	5855.14
2002-03	**223973.94**	117803.67	40708.98	3217.00	16608.32	347.85	24176.00	12196.10	356.97	8559.05
2003-04	**232678.96**	124087.82	43203.19	3454.30	17910.55	438.26	25160.00	13605.22	669.02	4150.60
2004-05	**245917.69**	126933.67	43862.11	3682.35	20020.10	504.41	23280.00	18300.14	822.41	8512.50
2005-06	**260051.56**	132630.50	48211.11	3733.13	21761.82	468.10	23077.00	20255.45	2496.58	7417.87
2006-07	**289375.15**	150271.62	51681.36	3273.74	23619.54	509.60	24014.00	22103.75	1378.66	12522.88
2007-08	**328122.88**	169179.24	54219.32	3827.46	24351.32	611.42	31327.86	24261.00	11010.72	9334.54

Source: Indian Public Finance Statistics, Ministry of Finance, various years

TABLE AI.5: REVENUE EXPENDITURE OF THE CENTRE: DEVELOPMENTAL

(Rs. Crore)

Year	Develop-mental	Of which					
		Social & Community Services	General Economic Services	Agriculture & Allied*	Industry, Transport, Power , Civil & Public Works	Fertilizer Subsidy	Grants Incl. States & UTs
1970-71	**814.03**	283.60	50.31	54.98	99.13	n.a.	252.33
1971-72	**1001.31**	339.11	63.86	73.32	109.72	n.a.	334.51
1972-73	**1260.00**	404.58	77.97	99.24	126.18	n.a.	476.08
1973-74	**1245.00**	365.28	77.55	95.20	144.67	n.a.	437.00
1974-75	**1340.85**	461.70	96.80	128.52	270.13	n.a.	383.70
1975-76	**1888.10**	658.83	169.88	160.52	413.40	n.a.	495.47
1976-77	**2331.38**	757.03	307.32	171.31	424.02	59.79	611.91
1977-78	**2949.99**	775.17	369.30	255.42	543.75	107.33	899.02
1978-79	**3726.43**	878.91	445.99	347.71	522.99	173.17	1357.66
1979-80	**4168.96**	912.06	404.81	322.44	688.39	320.78	1520.48
1980-81	**4499.00**	1001.40	455.74	326.62	751.23	170.00	1794.01
1981-82	**5229.54**	1254.04	536.96	409.83	961.85	275.00	1791.86
1982-83	6548.72	1585.58	547.40	522.76	1153.84	550.00	2189.14
1983-84	**7756.70**	1835.16	593.31	614.91	1170.48	900.00	2542.84
1984-85	**9828.47**	2262.06	627.98	749.01	1798.34	1200.00	3191.08
1985-86	**11731.31**	2728.05	689.64	767.00	1678.65	1600.00	4267.97
1986-87	**14067.46**	3270.02	912.65	1049.95	1943.22	1897.12	4994.50
1987-88	**16803.99**	4221.01	1063.40	1049.47	2331.65	2163.85	5974.51
1988-89	**19970.82**	4995.99	1539.43	1512.41	2568.67	3200.70	6153.62
1989-90	**24660.24**	5417.41	2311.93	3674.87	3968.86	4542.10	4745.07
1990-91	**26542.55**	5941.09	2977.51	3172.83	2951.08	4400.00	7100.04
1991-92	**29089.94**	6474.27	1993.36	3712.36	3031.18	4800.00	9079.37
1992-93	**31994.24**	7199.21	1076.86	4123.43	3465.94	5796.00	10332.80
1993-94	**35294.30**	8411.88	912.18	4927.55	4233.29	4562.00	12247.40
1994-95	**40710.36**	9216.41	932.49	7336.70	3906.46	5241.00	14077.30
1995-96	**42410.70**	10966.70	591.57	8669.63	4409.85	6235.00	11537.25
1996-97	**47958.31**	13275.13	744.15	8940.58	6019.47	5906.00	13072.98
1997-98	**54849.96**	16106.02	806.32	10245.99	5963.83	7322.00	14405.80
1998-99	**64178.61**	19829.10	1037.88	11942.49	7259.87	7806.00	16303.27
1999-00	**73372.02**	21289.36	789.99	13130.30	10833.83	8963.00	18365.54
2000-01	**80729.27**	23800.71	1095.98	8447.77	16007.52	9492.00	17569.29
2001-02	**89214.79**	25195.90	240.17	15015.36	19445.78	12595.00	21226.58
2002-03	**105372.66**	26180.91	1014.44	16217.61	26413.41	11015.00	24531.29
2003-04	**119363.30**	28634.53	1480.68	17391.81	31166.91	11847.00	28842.37
2004-05	**124996.11**	35892.51	1490.86	16253.84	22844.60	16127.00	32387.30
2005-06	**155103.65**	44759.44	1906.88	23882.49	29344.39	19671	35539.45
2006-07	**196484.02**	52578.29	2511.7	30498.44	39262.18	26222	45411.41
2007-08	**239171.23**	64404.68	3321.56	43733.59	37694.38	32490.00	57527.02

Source: Indian Public Finance Statistics, Ministry of Finance, various years

TABLE A I.6: CAPITAL EXPENDITURE OF THE CENTRAL GOVERNMENT

(Rs. Crores)

Year	Non-Development (A)	Developmental (B)	Loans and Advances (Net) (C)	Total Expenditure (A+B+C)
1970-71	**349.54**	**592.04**	630.08	**1571.66**
1971-72	**269.50**	**847.15**	509.99	**1626.64**
1972-73	**161.78**	**771.35**	1189.04	**2122.17**
1973-74	**234.87**	**773.99**	1048.50	**2057.36**
1974-75	**218.92**	**1411.18**	1437.75	**3067.85**
1975-76	**464.95**	**1785.48**	1665.85	**3916.28**
1976-77	**303.23**	**1546.89**	2230.20	**4080.32**
1977-78	**261.85**	**1980.79**	1866.74	**4109.38**
1978-79	**515.07**	**1992.55**	3028.61	**5536.23**
1979-80	**289.59**	**2149.83**	3258.89	**5698.31**
1980-81	**922.93**	**3059.78**	4127.30	**8110.01**
1981-82	**492.80**	**3806.01**	4075.08	**8373.89**
1982-83	**724.97**	**4133.50**	4653.22	**9511.69**
1983-84	**1371.20**	**4904.84**	4859.49	**11135.53**
1984-85	**1225.43**	**6619.31**	6443.89	**14288.63**
1985-86	**1621.25**	**6876.22**	8314.00	**16811.47**
1986-87	**2574.42**	**7819.78**	9305.42	**19699.62**
1987-88	**4373.23**	**6149.81**	8613.15	**19136.19**
1988-89	**4792.44**	**6547.63**	10152.61	**21492.68**
1989-90	**5241.38**	**8158.41**	11909.92	**25309.71**
1990-91	**5364.08**	**8023.24**	13939.80	**27327.12**
1991-92	**6952.52**	**6958.08**	11701.56	**25612.16**
1992-93	**12707.88**	**7177.19**	9940.50	**29825.57**
1993-94	**12907.15**	**6020.15**	14262.77	**33190.07**
1994-95	**7062.20**	**7841.56**	17390.70	**32294.46**
1995-96	**11343.80**	**5350.38**	17810.28	**34504.46**
1996-97	**9228.23**	**4966.71**	20338.83	**34533.77**
1997-98	**9965.40**	**7559.96**	10142.56	**27667.92**
1998-99	**16836.54**	**7963.15**	9616.12	**34415.81**
1999-00	**14551.34**	**11171.83**	14807.76	**40530.93**
2000-01	**14218.80**	**11154.83**	9662.09	**35035.72**
2001-02	**17854.91**	**12316.28**	14667.09	**44838.28**
2002-03	**17514.08**	**12598.85**	-2978.69	**27134.24**
2003-04	**20170.27**	**15120.46**	-38497.01	**-3206.28**
2004-05	**34999.72**	**18013.97**	-33494.08	**19519.61**
2005-06	**35771.11**	**19848.24**	691.40	**56310.75**
2006-07	**36690.69**	**22602.49**	-8672.22	**50620.96**
2007-08	**41819.00**	**65122.14**	1385.55	**108326.69**

Source: Indian Public Finance Statistics, Ministry of Finance, various years

TABLE AI.7: CAPITAL EXPENDITURE OF THE CENTRE: DEVELOPMENTAL

(Rs. Crores)

Year	Development	Of which				
		Railways	Transport, Comm., Industry &c	Power & Water	Social & Community incl. Agriculture	General Economic Services
1970-71	**592.04**	135.89	396.22	47.81	2.23	25.22
1971-72	**847.15**	190.84	555.48	56.80	1.56	-20.26
1972-73	**771.35**	209.32	542.72	67.73	1.03	-25.43
1973-74	**773.99**	171.63	510.28	53.93	1.35	62.95
1974-75	**1411.18**	219.23	646.63	109.22	417.95	18.55
1975-76	**1785.48**	250.87	912.57	104.68	443.40	93.96
1976-77	**1546.89**	190.02	1026.66	115.71	181.87	32.63
1977-78	**1980.79**	274.20	1452.64	121.57	91.31	40.98
1978-79	**1992.55**	361.41	1011.67	192.29	252.00	85.18
1979-80	**2149.83**	484.08	890.90	310.83	413.80	50.22
1980-81	**3059.78**	644.77	1451.40	379.82	494.88	88.91
1981-82	**3806.01**	657.17	2070.83	496.70	305.64	275.67
1982-83	**4133.50**	602.74	2314.97	631.64	331.73	252.42
1983-84	**4904.84**	572.30	2995.02	712.58	422.36	202.59
1984-85	**6619.31**	794.15	3680.78	850.70	1134.73	158.95
1985-86	**6876.22**	877.49	3910.74	1139.53	774.11	174.35
1986-87	**7819.78**	1379.40	4255.60	1081.29	797.12	306.77
1987-88	**6149.81**	1349.02	1970.86	1871.87	645.61	312.45
1988-89	**6547.63**	1458.51	2138.61	1947.22	620.53	382.76
1989-90	**8158.41**	1773.36	2161.60	2654.78	576.61	992.06
1990-91	**8023.24**	1631.86	2031.52	2747.71	545.13	1067.02
1991-92	**6958.08**	1756.16	1661.33	1947.61	535.00	1057.98
1992-93	**7177.19**	2589.11	2027.05	1662.35	617.77	280.91
1993-94	**6020.15**	974.47	2300.14	1805.39	663.91	276.24
1994-95	**7841.56**	1144.78	2199.49	2315.31	1332.55	849.33
1995-96	**5350.38**	1140.55	1723.98	2110.94	1240.53	-865.62
1996-97	**4966.71**	1464.82	1904.58	1166.79	1296.42	-865.90
1997-98	**7559.96**	1991.83	2627.29	1985.60	1199.02	-243.78
1998-99	**7963.15**	2185.10	2644.61	2278.15	1646.95	-791.66
1999-00	**11171.83**	2588.40	4425.31	2246.40	1830.20	81.52
2000-01	**11154.83**	3268.79	4257.45	2142.06	1399.87	86.66
2001-02	**12316.28**	5376.89	5456.43	3597.48	-2656.03	546.51
2002-03	**12598.85**	5613.74	4039.57	2853.27	1561.71	-1469.44
2003-04	**15120.46**	6914.91	4098.73	3227.51	1922.36	-1043.05
2004-05	**18013.97**	8468.00	4367.08	2772.65	1912.21	494.03
2005-06	**19848.24**	7811.46	7165.98	1573.15	2011.47	1286.18
2006-07	**22602.49**	7554.21	7359.35	1630.36	2424.13	3634.44
2007-08	**65122.14**	8134.56	8873.45	861.67	3776.26	43476.20

Source: Indian Public Finance Statistics, Ministry of Finance, various years

Where:

Transport, Comm. & Industry includes: Transport & Communication, Posts, Industry, & Public Works

TABLE AI.8: CAPITAL EXPENDITURE OF THE CENTRE: NON-DEVELOPMENTAL

(Rs. crore)

Year	Non-Development	Of which		
		Defence inc. Border	Fiscal Services	Others
1970-71	**349.54**	186.28	168.86	-5.60
1971-72	**269.50**	213.37	5.24	50.89
1972-73	**161.78**	241.15	12.98	-92.35
1973-74	**234.87**	233.62	22.92	-21.67
1974-75	**218.92**	210.43	11.49	-3.00
1975-76	**464.95**	235.58	233.41	-4.04
1976-77	**303.23**	232.24	74.42	-3.43
1977-78	**261.85**	261.84	3.11	-3.10
1978-79	**515.07**	268.14	250.73	-3.80
1979-80	**289.59**	281.01	13.14	-4.56
1980-81	**922.93**	353.15	573.21	-3.43
1981-82	**492.80**	517.19	-17.01	-7.38
1982-83	**724.97**	557.40	171.11	-3.54
1983-84	**1371.20**	702.75	670.61	-2.16
1984-85	**1225.43**	790.38	436.88	-1.83
1985-86	**1621.25**	1008.09	612.09	1.07
1986-87	**2574.42**	1354.12	1219.31	0.99
1987-88	**4373.23**	3199.85	1157.18	16.20
1988-89	**4792.44**	3859.46	925.96	7.02
1989-90	**5241.38**	4284.48	950.71	6.19
1990-91	**5364.08**	4617.42	725.10	21.56
1991-92	**6952.52**	5009.24	1935.90	7.38
1992-93	**12707.88**	5552.37	7180.03	-24.52
1993-94	**12907.15**	6961.95	5885.71	59.49
1994-95	**7062.20**	6904.49	175.10	-17.39
1995-96	**11343.80**	8123.23	3275.71	-55.14
1996-97	**9228.23**	8627.14	622.22	-21.13
1997-98	**9965.40**	9288.23	261.56	415.61
1998-99	**16836.54**	10207.94	6179.68	448.92
1999-00	**14551.34**	12084.27	1976.87	490.20
2000-01	**14218.80**	12598.33	1116.53	503.94
2001-02	**17854.91**	16579.09	610.55	665.27
2002-03	**17514.08**	15344.90	1310.00	859.18
2003-04	**20170.27**	17298.99	1576.58	1294.70
2004-05	**34999.72**	32788.72	870.23	1340.77
2005-06	**35771.11**	32794.24	1031.62	1945.25
2006-07	**36690.69**	34503.57	404.40	1782.72
2007-08	**41819.00**	38348.99	649.30	2820.71

Source: Indian Public Finance Statistics, Minstry of Finance, GOI, various years

Table AI.9: Explicit Subsidies in Central Budget (Major Heads) *(Rs. crore)*

Years	Food	Fertilizer	Petroleum Subsidy	Grants to NAFED for MIS/PPS	Export	Subsidy on Railways	Interest* Subsidy	Debt Relief to Farmers	Assistance to Fertilizer Promotion	Others #	Total	Total as % GDP
1971-72	47				54		5			34	140	0.286
1977-73	117				62		12			14	205	0.380
1973-74	251				66		20			24	361	0.550
1974-75	295				80		30			14	419	0.541
1975-76	250				149		47			24	470	0.564
1976-77	506	60			241		66			74	947	1.055
1977-78	480	266			324		88			129	1287	1.267
1978-79	570	342			375		59			129	1475	1.339
1979-80	600	603			361	56	92			109	1821	1.507
1980-81	650	505			399	69	253			152	2028	1.411
1981-82	700	381			477	78	102			203	1941	1.151
1982-83	711	603			477	97	217			157	2262	1.202
1983-84	835	1042			463	93	118			198	2749	1.252
1984-85	1101	1928			518	100	135			256	4038	1.645
1985-86	1650	1924			603	128	271			220	4796	1.725
1986-87	2000	1898			785	144	229			395	5451	1.752
1987-88	2000	2164			962	174	393			287	5980	1.688
1988-89	2200	3201			1386	207	406			332	7732	1.834
1989-90	2476	4542			2014	233	881			328	10474	2.154
1990-91	2450	4389			2742	283	379			1915	12158	2.138
1991-92	2850	5185			1758	312	316	1425		407	12253	1.876
1992-93	2800	5796					113	1500	340	275	10824	1.446
1993-94	5537	4562					113	500	517	376	11605	1.351
1994-95	5100	5769					76	341		568	11854	1.170
1995-96	5377	6735			100		34			420	12666	1.066
1996-97	6066	7578					1222			633	15499	1.133
1997-98	7900	9918			20		78			624	18540	1.218
1998-99	9100	11596			105		1434			1358	23593	1.355
1999-00	9434	13244			50		1371			388	24487	1.264
2000-01	12060	13800			40		111			827	26838	1.275

Contd.

Table AI.9: Explicit Subsidies in Central Budget (Major Heads) *(Rs. Crores)*

Years	Food	Fertilizer $	Petroleum Subsidy	Grants to NAFED for MIS/PPS	Export	Subsidy on Railways	Interest* Subsidy	Rural Electri-fication	Others @ #	Total	Total as % GDP	
2001-02	17494	8092	4504	345	616	616	896		30		33559	1.48
2002-03	24176	7790	3224	260	628	628	1046		22		44100	1.79
2003-04	25181	11847	3326	6292	764		1328		170		47737	1.68
2004-05	25798	15879	5142	2956	120	741	954		564	200	49397	1.52
2005-06	23077	18460	6596	2683	260	887	986		2177	1100	51618	1.40
2006-07	24014	26222	10298	2699	560	1224	1517		2809	2800	63684	1.48
2007-08	31328	32490	12934	2880	860	1939	2105		2311	3893	81014	1.62

Sources: Up to 2000-01, 1. *Srivastava et al (2003)*

2. *Budget Documents, Expenditure Budget,* (*various issues*).

From 2001-02 to 2007-08,

1. *Indian Public Finance Statistics, Ministry of Finance, various Issues*

Notes: 1. **From 2001-02 onwards the budget presents subsidy magnitudes with a modified classification**.

* Does not include subsidy to Shipping Development Fund Committee which was treated as grant in the economic classification in the absence of the details available then (upto 1977-78) and states and Union Territories for Janata Cloth in the handloom sector which is treated as grant to states in the economic classification.

Includes from 1990-91 Subsidies to DRDA for development of rural children and women

@ Includes for 2002-03 subsidy of Rs. 5225 crores to Jute Corporation of India

$ From 2003-04 onwards, the total for Fertilizer Subsidy has been reported including the sum for Assistance to Fertilizer Promotion.

APPENDIX II

RESULTS PERTAINING TO ELASTICITY ESTIMATES OF VARIOUS COMPONENTS OF CENTRAL GOVERNMENT EXPENDITURE: 1970-71 – 2007-08

In the following, some representative results for the elasticity estimates of various components of central government expenditure have been presented. These include

1. Elasticity estimates at GDP *current prices* for the overall study-period (1970-71 to 2007-08)
2. Elasticity estimates of major sub-heads for the overall period
3. Elasticity estimates at GDP *constant prices (base 2004-05)* for the overall study-period (1970-71 to 2007-08)
4. The above estimates for major sub-heads for the overall period
5. Elasticity estimates period-wise i.e., pre-reforms (1970-71 to 1989-90) and post-reforms (1990-91 to 2007-08).

Note:

In addition, considering the volume of material and the space constraint, the individual regression results for *decade-wise* elasticity estimates (current price as well as constant prices) for all categories have not been included in the appendix, but are readily available from the author upon request.

ELASTICITIES WITH RESPECT TO GDP CURRENT PRICE

1970-71 to 2007-2008

Table AII.1

Dependent Variable: LOG(RE)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.678278	0.173145	-21.24393	0.0000
LOG(GDPCU)	1.116873	0.013255	84.26290	0.0000

R-squared	0.994955	Mean dependent var	10.82604
Adjusted R-squared	0.994815	S.D. dependent var	1.601164
S.E. of regression	0.115293	Akaike info criterion	-1.431488
Sum squared resid	0.478527	Schwarz criterion	-1.345299
Log likelihood	29.19828	Hannan-Quinn criter.	-1.400823
F-statistic	7100.237	Durbin-Watson stat	0.330929
Prob(F-statistic)	0.000000		

Table AII.2

Dependent Variable: LOG(CE)
Method: Least Squares
Sample: 1970 2002 2004 2007
Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.120466	0.609357	0.197695	0.8444
LOG(GDPCU)	0.730574	0.046825	15.60215	0.0000

R-squared	0.874294	Mean dependent var	9.572686
Adjusted R-squared	0.870702	S.D. dependent var	1.107719
S.E. of regression	0.398314	Akaike info criterion	1.049384
Sum squared resid	5.552878	Schwarz criterion	1.136460
Log likelihood	-17.41360	Hannan-Quinn criter.	1.080082
F-statistic	243.4271	Durbin-Watson stat	0.433598
Prob(F-statistic)	0.000000		

Table AII.3

Dependent Variable: LOG(TE)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.333083	0.236821	-9.851666	0.0000
LOG(GDPCU)	1.033162	0.018129	56.98884	0.0000

R-squared	0.989037	Mean dependent var	11.08411
Adjusted R-squared	0.988732	S.D. dependent var	1.485579
S.E. of regression	0.157693	Akaike info criterion	-0.805135
Sum squared resid	0.895217	Schwarz criterion	-0.718946
Log likelihood	17.29756	Hannan-Quinn criter.	-0.774470
F-statistic	3247.728	Durbin-Watson stat	0.216651
Prob(F-statistic)	0.000000		

Table AII.4

Dependent Variable: LOG(RD)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.284318	0.313849	-16.83712	0.0000
LOG(GDPCU)	1.153137	0.024026	47.99564	0.0000

R-squared	0.984613	Mean dependent var	9.690938
Adjusted R-squared	0.984185	S.D. dependent var	1.661811
S.E. of regression	0.208984	Akaike info criterion	-0.241920
Sum squared resid	1.572279	Schwarz criterion	-0.155731
Log likelihood	6.596480	Hannan-Quinn criter.	-0.211255
F-statistic	2303.582	Durbin-Watson stat	0.221816
Prob(F-statistic)	0.000000		

Table AII.5

Dependent Variable: LOG(RNDV)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.965025	0.164340	-24.12689	0.0000
LOG(GDPCU)	1.104302	0.012581	87.77791	0.0000

R-squared	0.995349	Mean dependent var	10.37603
Adjusted R-squared	0.995220	S.D. dependent var	1.582828
S.E. of regression	0.109430	Akaike info criterion	-1.535864
Sum squared resid	0.431099	Schwarz criterion	-1.449676
Log likelihood	31.18142	Hannan-Quinn criter.	-1.505199
F-statistic	7704.962	Durbin-Watson stat	0.413143
Prob(F-statistic)	0.000000		

Table AII.6

Dependent Variable: LOG(CD)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.134195	0.614416	-0.218410	0.8283
LOG(GDPCU)	0.668719	0.047035	14.21751	0.0000

R-squared	0.848827	Mean dependent var	8.550153
Adjusted R-squared	0.844628	S.D. dependent var	1.037929
S.E. of regression	0.409124	Akaike info criterion	1.101598
Sum squared resid	6.025762	Schwarz criterion	1.187787
Log likelihood	-18.93036	Hannan-Quinn criter.	1.132263
F-statistic	202.1376	Durbin-Watson stat	0.385787
Prob(F-statistic)	0.000000		

Table AII.7

Dependent Variable: LOG(CNDV)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.828540	0.598289	-13.08489	0.0000
LOG(GDPCU)	1.220212	0.045800	26.64198	0.0000

R-squared	0.951729	Mean dependent var	8.017790
Adjusted R-squared	0.950389	S.D. dependent var	1.788596
S.E. of regression	0.398385	Akaike info criterion	1.048402
Sum squared resid	5.713590	Schwarz criterion	1.134590
Log likelihood	-17.91963	Hannan-Quinn criter.	1.079067
F-statistic	709.7950	Durbin-Watson stat	1.044297
Prob(F-statistic)	0.000000		

Table AII.8

Dependent Variable: LOG(TD)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.380034	0.326281	-10.35928	0.0000
LOG(GDPCU)	1.031694	0.024978	41.30488	0.0000

R-squared	0.979335	Mean dependent var	10.01810
Adjusted R-squared	0.978761	S.D. dependent var	1.490798
S.E. of regression	0.217262	Akaike info criterion	-0.164228
Sum squared resid	1.699302	Schwarz criterion	-0.078040
Log likelihood	5.120341	Hannan-Quinn criter.	-0.133563
F-statistic	1706.093	Durbin-Watson stat	0.202517
Prob(F-statistic)	0.000000		

Table AII.9

Dependent Variable: LOG(TND)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.983759	0.176653	-22.55138	0.0000
LOG(GDPCU)	1.113185	0.013523	82.31698	0.0000

R-squared	0.994715	Mean dependent var	10.47266
Adjusted R-squared	0.994568	S.D. dependent var	1.596068
S.E. of regression	0.117628	Akaike info criterion	-1.391376
Sum squared resid	0.498112	Schwarz criterion	-1.305187
Log likelihood	28.43614	Hannan-Quinn criter.	-1.360711
F-statistic	6776.085	Durbin-Watson stat	0.373790
Prob(F-statistic)	0.000000		

ESTIMATES FOR FUNCTIONAL COMPOSITION

Table AII.10

Dependent Variable: LOG(INT)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.460547	0.290724	-25.66198	0.0000
LOG(GDPCU)	1.303060	0.022256	58.54987	0.0000

R-squared	0.989608	Mean dependent var	9.461690
Adjusted R-squared	0.989319	S.D. dependent var	1.873124
S.E. of regression	0.193586	Akaike info criterion	-0.394999
Sum squared resid	1.349113	Schwarz criterion	-0.308810
Log likelihood	9.504974	Hannan-Quinn criter.	-0.364333
F-statistic	3428.087	Durbin-Watson stat	0.116413
Prob(F-statistic)	0.000000		

Table AII.11

Dependent Variable: LOG(DEF)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.674004	0.187417	-14.26769	0.0000
LOG(GDPCU)	0.930048	0.014347	64.82449	0.0000

R-squared	0.991506	Mean dependent var	9.404105
Adjusted R-squared	0.991270	S.D. dependent var	1.335646
S.E. of regression	0.124796	Akaike info criterion	-1.273076
Sum squared resid	0.560666	Schwarz criterion	-1.186887
Log likelihood	26.18844	Hannan-Quinn criter.	-1.242410
F-statistic	4202.214	Durbin-Watson stat	0.430575
Prob(F-statistic)	0.000000		

Table AII.12

Dependent Variable: LOG(SS)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.623098	0.290841	-19.33394	0.0000
LOG(GDPCU)	1.090417	0.022265	48.97556	0.0000

R-squared	0.985213	Mean dependent var	8.537646
Adjusted R-squared	0.984802	S.D. dependent var	1.570946
S.E. of regression	0.193663	Akaike info criterion	-0.394193
Sum squared resid	1.350200	Schwarz criterion	-0.308005
Log likelihood	9.489676	Hannan-Quinn criter.	-0.363528
F-statistic	2398.605	Durbin-Watson stat	0.803029
Prob(F-statistic)	0.000000		

Table AII.13

Dependent Variable: LOG(ES)
Method: Least Squares
Sample: 1970 1994 1997 2001 2003 2007
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.157867	1.533544	-1.407111	0.1687
LOG(GDPCU)	0.684464	0.118345	5.783652	0.0000

R-squared	0.503391	Mean dependent var	6.658356
Adjusted R-squared	0.488342	S.D. dependent var	1.387884
S.E. of regression	0.992758	Akaike info criterion	2.878785
Sum squared resid	32.52373	Schwarz criterion	2.967662
Log likelihood	-48.37873	Hannan-Quinn criter.	2.909465
F-statistic	33.45063	Durbin-Watson stat	0.399473
Prob(F-statistic)	0.000002		

Table AII.14

Dependent Variable: LOG(SUB)
Method: Least Squares
Sample: 1970 1994 1997 2001 2003 2007
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.775402	0.874210	-11.18198	0.0000
LOG(GDPCU)	1.383261	0.067463	20.50388	0.0000

R-squared	0.927218	Mean dependent var	8.041658
Adjusted R-squared	0.925013	S.D. dependent var	2.066657
S.E. of regression	0.565930	Akaike info criterion	1.754753
Sum squared resid	10.56913	Schwarz criterion	1.843630
Log likelihood	-28.70817	Hannan-Quinn criter.	1.785433
F-statistic	420.4091	Durbin-Watson stat	0.262173
Prob(F-statistic)	0.000000		

Table AII.15

Dependent Variable: LOG(PEN)
Method: Least Squares
Sample: 1970 1994 1997 2001 2003 2007
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-17.02044	0.572179	-29.74672	0.0000
LOG(GDPCU)	1.809621	0.044155	40.98300	0.0000

R-squared	0.980731	Mean dependent var	6.288349
Adjusted R-squared	0.980147	S.D. dependent var	2.628863
S.E. of regression	0.370407	Akaike info criterion	0.907014
Sum squared resid	4.527634	Schwarz criterion	0.995891
Log likelihood	-13.87275	Hannan-Quinn criter.	0.937695
F-statistic	1679.606	Durbin-Watson stat	0.725095
Prob(F-statistic)	0.000000		

Table AII.16

Dependent Variable: LOG(GRA)
Method: Least Squares
Sample: 1970 1994 1997 2001 2003 2007
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.567244	0.450775	-10.13198	0.0000
LOG(GDPCU)	1.011233	0.034787	29.06959	0.0000

R-squared	0.962416	Mean dependent var	8.457918
Adjusted R-squared	0.961277	S.D. dependent var	1.482945
S.E. of regression	0.291815	Akaike info criterion	0.430049
Sum squared resid	2.810140	Schwarz criterion	0.518926
Log likelihood	-5.525857	Hannan-Quinn criter.	0.460729
F-statistic	845.0409	Durbin-Watson stat	0.632295
Prob(F-statistic)	0.000000		

Table AII.17

Dependent Variable: LOG(LON)
Method: Least Squares
Sample: 1970 2001 2005 2005 2007 2007
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.557208	1.502222	1.702283	0.0984
LOG(GDPCU)	0.464748	0.117073	3.969723	0.0004

R-squared	0.329965	Mean dependent var	8.488893
Adjusted R-squared	0.309026	S.D. dependent var	1.085465
S.E. of regression	0.902291	Akaike info criterion	2.689263
Sum squared resid	26.05212	Schwarz criterion	2.779049
Log likelihood	-43.71746	Hannan-Quinn criter.	2.719882
F-statistic	15.75870	Durbin-Watson stat	0.106731
Prob(F-statistic)	0.000381		

PERIOD-WISE: PRE-REFORMS & POST-REFORMS

PRE-REFORMS: 1970-71 to 1990-91

Table AII.18

Dependent Variable: LOG(RE)
Method: Least Squares
Sample: 1970 1990
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.395059	0.263132	-20.50325	0.0000
LOG(GDPCU)	1.263253	0.022116	57.11884	0.0000

R-squared	0.994210	Mean dependent var	9.604977
Adjusted R-squared	0.993905	S.D. dependent var	0.971340
S.E. of regression	0.075831	Akaike info criterion	-2.230230
Sum squared resid	0.109256	Schwarz criterion	-2.130751
Log likelihood	25.41741	Hannan-Quinn criter.	-2.208640
F-statistic	3262.562	Durbin-Watson stat	1.302448
Prob(F-statistic)	0.000000		

Table AII.19

Dependent Variable: LOG(CE)
Method: Least Squares
Sample: 1970 1990
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.475807	0.447531	-12.23558	0.0000
LOG(GDPCU)	1.207610	0.037615	32.10448	0.0000

R-squared	0.981900	Mean dependent var	8.863514
Adjusted R-squared	0.980947	S.D. dependent var	0.934358
S.E. of regression	0.128972	Akaike info criterion	-1.168047
Sum squared resid	0.316043	Schwarz criterion	-1.068569
Log likelihood	14.26449	Hannan-Quinn criter.	-1.146457
F-statistic	1030.697	Durbin-Watson stat	1.137265
Prob(F-statistic)	0.000000		

Table AII.20

Dependent Variable: LOG(TE)
Method: Least Squares
Sample: 1970 1990
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.925991	0.269761	-18.26056	0.0000
LOG(GDPCU)	1.254444	0.022673	55.32660	0.0000

R-squared	0.993831	Mean dependent var	9.969441
Adjusted R-squared	0.993507	S.D. dependent var	0.964750
S.E. of regression	0.077741	Akaike info criterion	-2.180465
Sum squared resid	0.114831	Schwarz criterion	-2.080987
Log likelihood	24.89488	Hannan-Quinn criter.	-2.158876
F-statistic	3061.032	Durbin-Watson stat	1.351296
Prob(F-statistic)	0.000000		

Table AII.21

Dependent Variable: LOG(RD)
Method: Least Squares
Sample: 1970 1990
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.596987	0.435503	-19.74037	0.0000
LOG(GDPCU)	1.436587	0.036604	39.24674	0.0000

R-squared	0.987815	Mean dependent var	8.461246
Adjusted R-squared	0.987174	S.D. dependent var	1.108190
S.E. of regression	0.125506	Akaike info criterion	-1.222538
Sum squared resid	0.299282	Schwarz criterion	-1.123059
Log likelihood	14.83664	Hannan-Quinn criter.	-1.200948
F-statistic	1540.307	Durbin-Watson stat	1.056004
Prob(F-statistic)	0.000000		

Table AII.22

Dependent Variable: LOG(RNDV)
Method: Least Squares
Sample: 1970 1990
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.096399	0.270552	-18.83702	0.0000
LOG(GDPCU)	1.200182	0.022740	52.77868	0.0000

R-squared	0.993225	Mean dependent var	9.154730
Adjusted R-squared	0.992869	S.D. dependent var	0.923302
S.E. of regression	0.077969	Akaike info criterion	-2.174609
Sum squared resid	0.115505	Schwarz criterion	-2.075131
Log likelihood	24.83340	Hannan-Quinn criter.	-2.153020
F-statistic	2785.589	Durbin-Watson stat	1.275288
Prob(F-statistic)	0.000000		

Table AII.23

Dependent Variable: LOG(CD)
Method: Least Squares
Sample: 1970 1990
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.190719	0.751866	-6.903786	0.0000
LOG(GDPCU)	1.105150	0.063194	17.48813	0.0000

R-squared	0.941509	Mean dependent var	7.931979
Adjusted R-squared	0.938430	S.D. dependent var	0.873231
S.E. of regression	0.216677	Akaike info criterion	-0.130425
Sum squared resid	0.892030	Schwarz criterion	-0.030946
Log likelihood	3.369460	Hannan-Quinn criter.	-0.108835
F-statistic	305.8347	Durbin-Watson stat	0.793519
Prob(F-statistic)	0.000000		

Table AII.24

Dependent Variable: LOG(CNDV)
Method: Least Squares
Sample: 1970 1990
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.27266	1.432104	-7.173126	0.0000
LOG(GDPCU)	1.426280	0.120368	11.84929	0.0000

R-squared	0.880807	Mean dependent var	6.663172
Adjusted R-squared	0.874534	S.D. dependent var	1.165157
S.E. of regression	0.412712	Akaike info criterion	1.158260
Sum squared resid	3.236296	Schwarz criterion	1.257739
Log likelihood	-10.16173	Hannan-Quinn criter.	1.179850
F-statistic	140.4058	Durbin-Watson stat	1.375273
Prob(F-statistic)	0.000000		

Table AII.25

Dependent Variable: LOG(TD)
Method: Least Squares
Sample: 1970 1990
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.761894	0.399265	-16.93585	0.0000
LOG(GDPCU)	1.322068	0.033558	39.39625	0.0000

R-squared	0.987906	Mean dependent var	8.936519
Adjusted R-squared	0.987270	S.D. dependent var	1.019802
S.E. of regression	0.115063	Akaike info criterion	-1.396289
Sum squared resid	0.251548	Schwarz criterion	-1.296811
Log likelihood	16.66103	Hannan-Quinn criter.	-1.374700
F-statistic	1552.065	Durbin-Watson stat	0.948631
Prob(F-statistic)	0.000000		

Table AII.26

Dependent Variable: LOG(TND)
Method: Least Squares
Sample: 1970 1990
Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.224256	0.305596	-17.09531	0.0000
LOG(GDPCU)	1.218158	0.025685	47.42620	0.0000

R-squared	0.991623	Mean dependent var	9.240313
Adjusted R-squared	0.991183	S.D. dependent var	0.937886
S.E. of regression	0.088068	Akaike info criterion	-1.931012
Sum squared resid	0.147365	Schwarz criterion	-1.831534
Log likelihood	22.27563	Hannan-Quinn criter.	-1.909423
F-statistic	2249.245	Durbin-Watson stat	0.979742
Prob(F-statistic)	0.000000		

POST-REFORMS: 1990-91 to 2007-09

Table AII.27

Dependent Variable: LOG(RE)
Method: Least Squares
Sample: 1990 2007
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.064635	0.253821	-8.134226	0.0000
LOG(GDPCU)	1.002870	0.017738	56.53686	0.0000

R-squared	0.995019	Mean dependent var	12.27171
Adjusted R-squared	0.994708	S.D. dependent var	0.650861
S.E. of regression	0.047348	Akaike info criterion	-3.158166
Sum squared resid	0.035869	Schwarz criterion	-3.059236
Log likelihood	30.42349	Hannan-Quinn criter.	-3.144525
F-statistic	3196.417	Durbin-Watson stat	0.506902
Prob(F-statistic)	0.000000		

Table AII.28

Dependent Variable: LOG(CE)
Method: Least Squares
Sample: 1990 2002 2004 2007
Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.638572	1.763936	3.196585	0.0060
LOG(GDPCU)	0.339807	0.123516	2.751112	0.0149

R-squared	0.335360	Mean dependent var	10.48654
Adjusted R-squared	0.291051	S.D. dependent var	0.384680
S.E. of regression	0.323897	Akaike info criterion	0.693348
Sum squared resid	1.573639	Schwarz criterion	0.791374
Log likelihood	-3.893462	Hannan-Quinn criter.	0.703092
F-statistic	7.568617	Durbin-Watson stat	1.393272
Prob(F-statistic)	0.014853		

Table AII.29

Dependent Variable: LOG(TE)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.333083	0.236821	-9.851666	0.0000
LOG(GDPCU)	1.033162	0.018129	56.98884	0.0000

R-squared	0.989037	Mean dependent var	11.08411
Adjusted R-squared	0.988732	S.D. dependent var	1.485579
S.E. of regression	0.157693	Akaike info criterion	-0.805135
Sum squared resid	0.895217	Schwarz criterion	-0.718946
Log likelihood	17.29756	Hannan-Quinn criter.	-0.774470
F-statistic	3247.728	Durbin-Watson stat	0.216651
Prob(F-statistic)	0.000000		

Table AII.30

Dependent Variable: LOG(RD)
Method: Least Squares
Sample: 1990 2007
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.461235	0.567503	-6.099056	0.0000
LOG(GDPCU)	1.022317	0.039660	25.77693	0.0000

R-squared	0.976486	Mean dependent var	11.15311
Adjusted R-squared	0.975017	S.D. dependent var	0.669749
S.E. of regression	0.105862	Akaike info criterion	-1.548929
Sum squared resid	0.179307	Schwarz criterion	-1.449999
Log likelihood	15.94036	Hannan-Quinn criter.	-1.535288
F-statistic	664.4500	Durbin-Watson stat	0.310644
Prob(F-statistic)	0.000000		

Table AII.31

Dependent Variable: LOG(RNDV)
Method: Least Squares
Sample: 1990 2007
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.235195	0.443357	-5.041526	0.0001
LOG(GDPCU)	0.983060	0.030984	31.72783	0.0000

R-squared	0.984354	Mean dependent var	11.81795
Adjusted R-squared	0.983377	S.D. dependent var	0.641451
S.E. of regression	0.082703	Akaike info criterion	-2.042672
Sum squared resid	0.109438	Schwarz criterion	-1.943742
Log likelihood	20.38405	Hannan-Quinn criter.	-2.029031
F-statistic	1006.655	Durbin-Watson stat	0.269400
Prob(F-statistic)	0.000000		

Table AII.32

Dependent Variable: LOG(CD)
Method: Least Squares
Sample: 1990 2007
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.107409	2.004373	-1.051406	0.3087
LOG(GDPCU)	0.797688	0.140076	5.694669	0.0000

R-squared	0.669621	Mean dependent var	9.295797
Adjusted R-squared	0.648973	S.D. dependent var	0.631071
S.E. of regression	0.373894	Akaike info criterion	0.974751
Sum squared resid	2.236749	Schwarz criterion	1.073681
Log likelihood	-6.772760	Hannan-Quinn criter.	0.988392
F-statistic	32.42926	Durbin-Watson stat	0.698691
Prob(F-statistic)	0.000033		

Table AII.33

Dependent Variable: LOG(CNDV)
Method: Least Squares
Sample: 1990 2007
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.500417	1.404146	-1.780739	0.0939
LOG(GDPCU)	0.848547	0.098129	8.647241	0.0000

R-squared	0.823740	Mean dependent var	9.629827
Adjusted R-squared	0.812723	S.D. dependent var	0.605258
S.E. of regression	0.261928	Akaike info criterion	0.262946
Sum squared resid	1.097702	Schwarz criterion	0.361876
Log likelihood	-0.366516	Hannan-Quinn criter.	0.276587
F-statistic	74.77477	Durbin-Watson stat	1.377050
Prob(F-statistic)	0.000000		

Table AII.34

Dependent Variable: LOG(TD)
Method: Least Squares
Sample: 1990 2007
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.826247	0.768937	-3.675523	0.0020
LOG(GDPCU)	0.988451	0.053737	18.39408	0.0000

R-squared	0.954846	Mean dependent var	11.30397
Adjusted R-squared	0.952024	S.D. dependent var	0.654859
S.E. of regression	0.143437	Akaike info criterion	-0.941403
Sum squared resid	0.329187	Schwarz criterion	-0.842473
Log likelihood	10.47263	Hannan-Quinn criter.	-0.927762
F-statistic	338.3421	Durbin-Watson stat	0.348265
Prob(F-statistic)	0.000000		

Table AII.35

Dependent Variable: LOG(TND)
Method: Least Squares
Sample: 1990 2007
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.879379	0.372513	-5.045135	0.0001
LOG(GDPCU)	0.965905	0.026033	37.10281	0.0000

R-squared	0.988511	Mean dependent var	11.92854
Adjusted R-squared	0.987793	S.D. dependent var	0.628931
S.E. of regression	0.069488	Akaike info criterion	-2.390878
Sum squared resid	0.077258	Schwarz criterion	-2.291948
Log likelihood	23.51791	Hannan-Quinn criter.	-2.377237
F-statistic	1376.618	Durbin-Watson stat	0.519020
Prob(F-statistic)	0.000000		

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1970-71 to 2007-08

Table AII.36

Dependent Variable: LOG(RE/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.59251	0.564997	-20.51782	0.0000
LOG(GDP2004P)	1.341038	0.040116	33.42926	0.0000

R-squared	0.968791	Mean dependent var	7.279807
Adjusted R-squared	0.967924	S.D. dependent var	0.778056
S.E. of regression	0.139348	Akaike info criterion	-1.052492
Sum squared resid	0.699041	Schwarz criterion	-0.966303
Log likelihood	21.99735	Hannan-Quinn criter.	-1.021827
F-statistic	1117.516	Durbin-Watson stat	0.291881
Prob(F-statistic)	0.000000		

Table AII.37

Dependent Variable: LOG(CE/WPI2004)
Method: Least Squares
Sample: 1970 2002 2004 2007
Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.204903	1.534503	0.785207	0.4376
LOG(GDP2004P)	0.345031	0.109114	3.162111	0.0032

R-squared	0.222204	Mean dependent var	6.053368
Adjusted R-squared	0.199981	S.D. dependent var	0.413089
S.E. of regression	0.369482	Akaike info criterion	0.899110
Sum squared resid	4.778098	Schwarz criterion	0.986186
Log likelihood	-14.63353	Hannan-Quinn criter.	0.929808
F-statistic	9.998946	Durbin-Watson stat	0.520901
Prob(F-statistic)	0.003229		

Table AII.38

Dependent Variable: LOG(TE/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.312068	0.669797	-12.40983	0.0000
LOG(GDP2004P)	1.126273	0.047557	23.68276	0.0000

R-squared	0.939686	Mean dependent var	7.537875
Adjusted R-squared	0.938010	S.D. dependent var	0.663494
S.E. of regression	0.165195	Akaike info criterion	-0.712184
Sum squared resid	0.982419	Schwarz criterion	-0.625995
Log likelihood	15.53149	Hannan-Quinn criter.	-0.681518
F-statistic	560.8730	Durbin-Watson stat	0.228250
Prob(F-statistic)	0.000000		

Table AII.39

Dependent Variable: LOG(RD/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.95281	0.895515	-15.58076	0.0000
LOG(GDP2004P)	1.428099	0.063583	22.46038	0.0000

R-squared	0.933391	Mean dependent var	6.144702
Adjusted R-squared	0.931541	S.D. dependent var	0.844134
S.E. of regression	0.220865	Akaike info criterion	-0.131335
Sum squared resid	1.756128	Schwarz criterion	-0.045146
Log likelihood	4.495358	Hannan-Quinn criter.	-0.100669
F-statistic	504.4686	Durbin-Watson stat	0.229872
Prob(F-statistic)	0.000000		

Table AII.40

Dependent Variable: LOG(RNDV/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.57856	0.572828	-20.21297	0.0000
LOG(GDP2004P)	1.308070	0.040672	32.16166	0.0000

R-squared	0.966367	Mean dependent var	6.829798
Adjusted R-squared	0.965433	S.D. dependent var	0.759880
S.E. of regression	0.141279	Akaike info criterion	-1.024962
Sum squared resid	0.718553	Schwarz criterion	-0.938773
Log likelihood	21.47427	Hannan-Quinn criter.	-0.994296
F-statistic	1034.372	Durbin-Watson stat	0.321499
Prob(F-statistic)	0.000000		

Table AII.42

Dependent Variable: LOG(CD/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.649527	1.599393	1.031345	0.3093
LOG(GDP2004P)	0.238358	0.113559	2.098969	0.0429

R-squared	0.109036	Mean dependent var	5.003916
Adjusted R-squared	0.084287	S.D. dependent var	0.412220
S.E. of regression	0.394466	Akaike info criterion	1.028626
Sum squared resid	5.601709	Schwarz criterion	1.114815
Log likelihood	-17.54389	Hannan-Quinn criter.	1.059291
F-statistic	4.405672	Durbin-Watson stat	0.411865
Prob(F-statistic)	0.042896		

Table AII.43

Dependent Variable: LOG(CNDV/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-17.95435	1.713609	-10.47751	0.0000
LOG(GDP2004P)	1.593551	0.121669	13.09743	0.0000

R-squared	0.826542	Mean dependent var	4.471553
Adjusted R-squared	0.821723	S.D. dependent var	1.000963
S.E. of regression	0.422635	Akaike info criterion	1.166580
Sum squared resid	6.430329	Schwarz criterion	1.252768
Log likelihood	-20.16502	Hannan-Quinn criter.	1.197245
F-statistic	171.5427	Durbin-Watson stat	0.896554
Prob(F-statistic)	0.000000		

Table AII.44

Dependent Variable: LOG(TD/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.449084	0.849858	-11.11843	0.0000
LOG(GDP2004P)	1.131318	0.060341	18.74867	0.0000

R-squared	0.907100	Mean dependent var	6.471862
Adjusted R-squared	0.904519	S.D. dependent var	0.678332
S.E. of regression	0.209604	Akaike info criterion	-0.235996
Sum squared resid	1.581621	Schwarz criterion	-0.149807
Log likelihood	6.483919	Hannan-Quinn criter.	-0.205330
F-statistic	351.5127	Durbin-Watson stat	0.214641
Prob(F-statistic)	0.000000		

Table AII.45

Dependent Variable: LOG(TND/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.78604	0.612211	-19.25159	0.0000
LOG(GDP2004P)	1.329680	0.043468	30.58986	0.0000

R-squared	0.962953	Mean dependent var	6.926423
Adjusted R-squared	0.961924	S.D. dependent var	0.773801
S.E. of regression	0.150992	Akaike info criterion	-0.891978
Sum squared resid	0.820754	Schwarz criterion	-0.805790
Log likelihood	18.94759	Hannan-Quinn criter.	-0.861313
F-statistic	935.7394	Durbin-Watson stat	0.278121
Prob(F-statistic)	0.000000		

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Table AII.46

Dependent Variable: LOG(INT/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.20513	1.034259	-18.56897	0.0000
LOG(GDP2004P)	1.785030	0.073434	24.30795	0.0000

R-squared	0.942572	Mean dependent var	5.915454
Adjusted R-squared	0.940977	S.D. dependent var	1.049961
S.E. of regression	0.255084	Akaike info criterion	0.156747
Sum squared resid	2.342440	Schwarz criterion	0.242936
Log likelihood	-0.978196	Hannan-Quinn criter.	0.187412
F-statistic	590.8763	Durbin-Watson stat	0.101926
Prob(F-statistic)	0.000000		

Table AII.47

Dependent Variable: LOG(DEF/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.544919	0.532523	-12.29041	0.0000
LOG(GDP2004P)	0.881323	0.037810	23.30930	0.0000

R-squared	0.937859	Mean dependent var	5.857868
Adjusted R-squared	0.936132	S.D. dependent var	0.519698
S.E. of regression	0.131338	Akaike info criterion	-1.170883
Sum squared resid	0.620992	Schwarz criterion	-1.084694
Log likelihood	24.24678	Hannan-Quinn criter.	-1.140218
F-statistic	543.3233	Durbin-Watson stat	0.432187
Prob(F-statistic)	0.000000		

Table AII.48

Dependent Variable: LOG(SS/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.02166	0.748580	-17.39514	0.0000
LOG(GDP2004P)	1.279981	0.053150	24.08226	0.0000

R-squared	0.941554	Mean dependent var	4.991410
Adjusted R-squared	0.939931	S.D. dependent var	0.753296
S.E. of regression	0.184626	Akaike info criterion	-0.489777
Sum squared resid	1.227119	Schwarz criterion	-0.403588
Log likelihood	11.30576	Hannan-Quinn criter.	-0.459112
F-statistic	579.9552	Durbin-Watson stat	0.829387
Prob(F-statistic)	0.000000		

Table AII.49

Dependent Variable: LOG(ES/WPI2004)
Method: Least Squares
Sample: 1970 1994 1997 2001 2003 2007
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.589029	4.075007	-0.144547	0.8859
LOG(GDP2004P)	0.268287	0.290124	0.924733	0.3618

R-squared	0.025259	Mean dependent var	3.176175
Adjusted R-squared	-0.004279	S.D. dependent var	0.973906
S.E. of regression	0.975988	Akaike info criterion	2.844712
Sum squared resid	31.43421	Schwarz criterion	2.933589
Log likelihood	-47.78245	Hannan-Quinn criter.	2.875392
F-statistic	0.855131	Durbin-Watson stat	0.424699
Prob(F-statistic)	0.361818		

Table AII.50

Dependent Variable: LOG(SUB/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-22.63864	2.316054	-9.774657	0.0000
LOG(GDP2004P)	1.937630	0.164444	11.78295	0.0000

R-squared	0.794095	Mean dependent var	4.629468
Adjusted R-squared	0.788375	S.D. dependent var	1.241708
S.E. of regression	0.571219	Akaike info criterion	1.769107
Sum squared resid	11.74647	Schwarz criterion	1.855296
Log likelihood	-31.61303	Hannan-Quinn criter.	1.799772
F-statistic	138.8379	Durbin-Watson stat	0.253466
Prob(F-statistic)	0.000000		

Table AII.51

Dependent Variable: LOG(PEN/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-40.00213	1.820824	-21.96925	0.0000
LOG(GDP2004P)	3.051260	0.129281	23.60169	0.0000

R-squared	0.939296	Mean dependent var	2.937987
Adjusted R-squared	0.937610	S.D. dependent var	1.797888
S.E. of regression	0.449078	Akaike info criterion	1.287955
Sum squared resid	7.260153	Schwarz criterion	1.374144
Log likelihood	-22.47114	Hannan-Quinn criter.	1.318620
F-statistic	557.0400	Durbin-Watson stat	0.460126
Prob(F-statistic)	0.000000		

Table AII.52

Dependent Variable: LOG(GRA/WPI2004)
Method: Least Squares
Sample: 1970 2007
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.877657	1.171897	-8.428778	0.0000
LOG(GDP2004P)	1.057644	0.083207	12.71106	0.0000

R-squared	0.817787	Mean dependent var	5.006470
Adjusted R-squared	0.812726	S.D. dependent var	0.667889
S.E. of regression	0.289030	Akaike info criterion	0.406624
Sum squared resid	3.007382	Schwarz criterion	0.492813
Log likelihood	-5.725856	Hannan-Quinn criter.	0.437289
F-statistic	161.5712	Durbin-Watson stat	0.646341
Prob(F-statistic)	0.000000		

Table AII.53

Dependent Variable: LOG(LON/WPI2004)
Method: Least Squares
Sample: 1970 2001 2005 2005 2007 2007
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.72849	3.858392	3.039735	0.0047
LOG(GDP2004P)	-0.476770	0.275887	-1.728135	0.0936

R-squared	0.085360	Mean dependent var	5.065167
Adjusted R-squared	0.056778	S.D. dependent var	0.850877
S.E. of regression	0.826368	Akaike info criterion	2.513470
Sum squared resid	21.85231	Schwarz criterion	2.603256
Log likelihood	-40.72899	Hannan-Quinn criter.	2.544090
F-statistic	2.986450	Durbin-Watson stat	0.132588
Prob(F-statistic)	0.093604		

APPENDIX III

RESULTS PERTAINING TO BUOYANCY ESTIMATES FOR VARIOUS COMPONENTS OF GOVERNMENT EXPENDITURE

Table : AIII.1: Buoyancy of Revenue expenditure(RE) with respect to Total Expenditure(TE) :

Log(RE)=a + b log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	-1.514	1.66 (59.002)***	0.989	3481.32
1970-71 to 1990-91	-0-493	1.018 (50.764)***	0-992	2577.61
1990-91 to 2007-08	-2.171	1.251 (22.701)***	0.969	515.31
1970-71 to 1979-80	-0-133	0.966 (23.000)***	0.985	529.01
1980-81 to 1989-90	-1.393	1.136 (44.076)***	0.995	1942.69
1990-91 to 1999-00	-2.663	1.311 (17.464)***	0.974	305.02
2000-01 to 2007-07	1.365	0.829 (7.284)***	0-898	53.063

Note: *** t value significant at 1% level; ** t value significant at 5% level ; * t value significant at 10% level and NS indicate t value is not significant

Table: AIII.2: Buoyancy of Development expenditure(TD) with respect to Total Expenditure(TE):

Log(TD)=a + b log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	-1.124	1.007 (35.071)***	0.971	1230.02
1970-71 to 1990-91	-1.761	1.103 (35.154)***	0.984	1235.86
1990-91 to 2007-08	-3.550	1.301 (13.119)***	0.914	173.06
1970-71 to 1979-80	-3.205	1.318 (15.033)***	0.965	226.01
1980-81 to 1989-90	-0.648	0.955 (22.580)***	0.984	509.85
1990-91 to 1999-00	1.386	0.676 (4.155)***	0.687	17.603
2000-01 to 2007-07	-6.820	1.695 (7.905)***	0.912	62.49

Table: AIII.3: Buoyancy of Non-Development expenditure(TND) with respect to Total Expenditure(TE):

Log(TND)=a + b log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	-1.762	1.152 (38.979)***	0.979	1519.40
1970-71 to 1990-91	-0.371	0.949 (26.102)***	0.972	681.36
1990-91 to 2007-08	-1.566	1.134 (13.397)***	0.918	179.49
1970-71 t0 1979-80	1.847	0.617 (8.301)***	0.895	68.92
1980-81 to 1989-90	-1.834	1.144 (30.288)***	0.991	917.36
1990-91 to 1999-00	-4.253	1.472 (10.918)***	0.937	119.21
2000-01 to 2007-07	3.934	0.477 (4.77)***	0.787	22.20

Table: AIII.4: Buoyancy of Revenue Development expenditure(RD) with respect to Total Expenditure(TE):

Log(RD)=a + b log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	-3.404	1.266 (64.524)***	0.991	4163.41
1970-71 to 1990-91	-3.624	1.299 (39.484)***	0.987	1559.03
1990-91 to 2007-08	-4.062	1.346 (17.654)***	0.951	311.67
1970-71 to 1979-80	-5.572	1.593 (14.545)***	0.963	211.58
1980-81 to 1989-90	-3.184	1.239 (26.165)***	0.988	18.21
1990-91 to 1999-00	-0.423	0.884 (12.482)***	0.951	155.82
2000-01 to 2007-07	-5.376	1.506 (6.501)***	0.875	42.27

Table AIII.5: Buoyancy of Revenue Development expenditure(RD) with respect to Development Expenditure (TD): Log(RD)=a + b log(TD) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TD)	R2	F value
1970-71 to 2007-08	-1.847	1.234 (48.429)***	0.984	2345.45
1970-71 to 1990-91	-1.481	1.166 (34.333)***	0.984	1178.82
1990-91 to 2007-08	-0.190	1.005 (30.233)***	0.982	914.04
1970-71 to 1979-80	-1.490	1.171 (10.885)***	0.936	118.48
1980-81 to 1989-90	-2.228	1.279 (18.259)***	0.976	333.40
1990-91 to 1999-00	-0.303	1.021 (6.556)***	0.843	42.98
2000-01 to 2007-07	0.599	0.899 (19.394)***	0.984	376.16

Table AIII.6: Buoyancy of Revenue Development expenditure(RD) with respect to Revenue Expenditure (RE): Log(RD)=a + b log(RE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(RE)	R2	F value
1970-71 to 2007-08	-1.675	1.074 (42.52)***	0.980	1808.03
1970-71 to 1990-91	-2.935	1.267 (31.709)***	0.981	1005.46
1990-91 to 2007-08	-1.522	1.051 (15.148)***	0.934	229.48
1970-71 to 1979-80	-5.301	1.641 (15.624)***	0.968	244.11
1980-81 to 1989-90	-1.678	1.091 (42.989)***	0.995	1848.13
1990-91 to 1999-00	1.533	0.653 (9.399)***	0.916	88.35
2000-01 to 2007-07	-8.011	1.833 (34.111)***	0.994	1163.59

Table AIII.7. Buoyancy of Revenue Non Development expenditure(RNDV) with respect to Total Expenditure (TE): Log(RNDV)=a + b log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	-1.894	1.131 (37.536)***	0.975	1408.95
1970-71 to 1990-91	-0.230	0.917 (32.068)***	0.981	29.88
1990-91 to 2007-08	-1.945	1.167 (11.841)***	0.897	141.21
1970-71 to 1979-80	1.329	0.684 (9.651)***	0.920	93.14
1980-81 to 1989-90	-1.386	1.071 (46.038)***	0.996	2119.55
1990-91 to 1999-00	-5.570	1.623 (11.560)***	0.943	133.64
2000-01 to 2007-07	4.624	0.382 (4.475)***	0.769	20.02

Table AIII.8: Buoyancy of Revenue Non Development expenditure(RNDV) with respect to Non-Development Expenditure (TND): Log(RNDV)=a + b log(TND) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TND)	R2	F value
1970-71 to 2007-08	0.035	0.981 (135.751)***	0.998	18428.59
1970-71 to 1990-91	0.169	0.959 (67.54)***	0.995	4562.26
1990-91 to 2007-08	-0.383	1.035 (39.807)***	0.990	1584.61
1970-71 to 1979-80	-0.491	1.070 (13.526)***	0.958	183.24
1980-81 to 1989-90	0.360	0.931 (41.682)***	0.995	1737.45
1990-91 to 1999-00	-0.758	1.086 (18,532)***	0.977	343.44
2000-01 to 2007-07	1.599	0.785 (9.577)***	0.938	91.73

Table AIII.9: Buoyancy of Revenue Non Development expenditure(RNDV) with respect to Revenue Expenditure (RE): Log(RNDV)=a + b log(RE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(RE)	R2	F value
1970-71 to 2007-08	-0.259	0.974 (77.940)***	0.994	6074.75
1970-71 to 1990-91	0.201	0.903 (53.493)***	0.993	2861.51
1990-91 to 2007-08	-0.065	0.951 (20.134)***	0.962	405.40
1970-71 to 1979-80	1.371	0.716 (13.379)***	0.957	179.01
1980-81 to 1989-90	-0.067	0.941 (68.503)***	0.998	4692.72
1990-91 to 1999-00	-2.379	1.252 (28.113)***	0.988	790.38
2000-01 to 2007-07	3.882	0.474 (7.684)***	0.907	59.05

Table: AIII.10: Buoyancy of Capital expenditure(CE) with respect to Total Expenditure(TE): Log(CE)=a + b log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	3.081	0.395 (4.849)***	0.401	23.52
1970-71 to 1990-91	-0.504	0.914 (23.568)***	0.966	555.23
1990-91 to 2007-08	7.411	-0.149 (-0.471)	0.014	0.222
1970-71 to 1979-80	-1.572	1.072 (8.634)***	0.903	74.55
1980-81 to 1989-90	0.889	0.730 (13.573)***	0.958	184.24
1990-91 to 1999-00	11.087	-0.606 (-1.828)**	0.298	3.34
2000-01 to 2007-07	-11.438	2.092 (2.174)**	0.486	4.72

Table AIII.11: Buoyancy of Capital Non Development expenditure(CNDV) with respect to Total Expenditure (TE): Log(CNDV)=a + b log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	-6.159	1.410 (15.795)***	0.873	249.48
1970-71 to 1990-91	-5.574	1.321 (6.927)***	0.716	47.98
1990-91 to 2007-08	-2.131	0.920 (3.920)***	0.489	15.36
1970-71 to 1979-80	4.388	-0.176 (-0.288)Ns	0.010	0.08
1980-81 to 1989-90	-9.985	1.915 (6.006)***	0.818	36.06
1990-91 to 1999-00	2.801	0.296 (0.452)Ns	0.024	0.20
2000-01 to 2007-07	-6.201	1.408 (2.604)*	0.531	6.78

Table AIII.12: Buoyancy of Capital Non Development expenditure(CNDV) with respect to Total Non-Development Expenditure (TND): Log(CNDV)=a + b log(TND) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TND)	R2	F value
1970-71 to 2007-08	-4.009	1.224 (17.605)***	0.895	309.94
1970-71 to 1990-91	-5.506	1.462 (9.093)***	0.813	82.70
1990-91 to 2007-08	-0.335	0.742 (3.594)**	0.412	12.92
1970-71 to 1979-80	1.924	0.216 (0.230)Ns	0.006	0.05
1980-81 to 1989-90	-7.183	1.713 (7.191)***	0.866	51.71
1990-91 to 1999-00	2.873	0.306 (0.726)Ns	0.061	0.52
2000-01 to 2007-07	-18.836	3.080 (4.071)***	0.734	16.57

Table AIII.13: Buoyancy of Capital Non Development expenditure(CNDV) with respect to Capital Expenditure (TND): Log(CNDV)=a + b log(CE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(CE)	R2	F value
1970-71 to 2007-08	-3.952	1.387 (4.117)***	0.326	16.95
1970-71 to 1990-91	-4.242	1.342 (5.821)***	0.640	33.89
1990-91 to 2007-08	5.922	-0.096 (-0.349)Ns	0.008	0.12
1970-71 to 1979-80	3.724	-0.091 (-0.168)Ns	0.003	0.03
1980-81 to 1989-90	-11.211	2.447 (4.811)***	0.743	23.15
1990-91 to 1999-00	3.431	0.272 (0.465)Ns	0.026	0.216
2000-01 to 2007-07	4.963	0.103 (0.353)Ns	0.024	0.124

Table AIII.14: Buoyancy of Interest (INT) with respect to Revenue Expenditure (RE) : Log(INT) = a + log(RE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(RE)	R2	F value
1970-71 to 2007-08	-3.832	1.339 (47.899)***	0.984	2294.35
1970-71 to 1990-91	-3.763	1.323 (37.180)***	0.986	1382.38
1990-91 to 2007-08	-0.431	0.917 (15.351)***	0.936	235.05
1970-71 to 1979-80	-1.292	0.928 (10.416)***	0.931	108.50
1980-81 to 1989-90	-3.501	1.288 (31.697)***	0.992	1004.75
1990-91 to 1999-00	-2.992	1.250 (11.937)***	0.946	142.49
2000-01 to 2007-07	4.083	0.372 (4.754)***	0.790	22.60

Table AIII.15: Buoyancy of Interest (INT) with respect to Total Expenditure (TE) :

Log(INT) = a + log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	-5.852	1.561 (36.259)***	0.973	1314.77
1970-71 to 1990-91	-4.414	1.347 (29.586)***	0.978	875.35
1990-91 to 2007-08	-2.185	1.118 (10.012)***	0.862	100.25
1970-71 to 1979-80	-1.513	0.911 (12.042)***	0.941	145.03
1980-81 to 1989-90	-5.254	1.458 (20.079)***	0.980	403.19
1990-91 to 1999-00	-5.968	1.595 (7.412)***	0.872	54.95
2000-01 to 2007-07	4.672	0.299 (3.461)**	0.666	11.98

Table AIII.16: Buoyancy of Defense (DEF) with respect to Total Expenditure (TE) :

Log(DEF) = a + log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	0.055	0.769 (31.923)***	0.965	1019.12
1970-71 to 1990-91	0.343	0.729 (16.407)***	0.934	269.19
1990-91 to 2007-08	-1.972	1.018 (14.802)***	0.931	219.10
1970-71 to 1979-80	2.725	0.372 (4.667)***	0.731	21.78
1980-81 to 1989-90	-1.678	1.003 (15.065)***	0.965	14.81
1990-91 to 1999-00	-3.208	1.173 (14.419)***	0.962	207.91
2000-01 to 2007-07	1.803	0.568 (2.975)**	0.596	8.85

Table AIII.17: Buoyancy of Pensions (PEN) with respect to Revenue Non Development (RNDV) :

Log(PEN) = a + log(RNDV) [at constant 2004-05 price]

Period	Constant	Coeff. Log(RNDV)	R2	F value
1970-71 to 2007-08	-12.895	2.318 (29.417)***	0.960	865.36
1970-71 to 1990-91	-10.181	1.866 (11.145)***	0.867	124.21
1990-91 to 2007-08	-6.567	1.498 (15.274)***	0.935	233.32
1970-71 to 1979-80	-7.026	1.328 (2.661)**	0.469	7.08
1980-81 to 1989-90	-7.322	1.412 (11.851)***	0.946	140.44
1990-91 to 1999-00	-7.641	1.647 (10.088)***	0.927	101.77
2000-01 to 2007-07	-5.278	1.331 (1.518)Ns	0.277	2.30

Table AIII.18: Buoyancy of Pensions (PEN) with respect to Revenue Expenditure (RE) :

Log(PEN) = a + log(RE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(RE)	R2	F value
1970-71 to 2007-08	-13.433	2.248 (25.405)***	0.947	645.45
1970-71 to 1990-91	-9.828	1.687 (11.034)***	0.865	121.75
1990-91 to 2007-08	-6.761	1.437 (13.170)***	0.915	173.47
1970-71 to 1979-80	-5.535	1.005 (2.831)**	0.500	8.12
1980-81 to 1989-90	-7.465	1.336 12.945)***	0.954	167.58
1990-91 to 1999-00	-11.951	2.113 (2.412)**	0.963	210.41
2000-01 to 2007-07	-2.193	0.882	0.492	5.81

Table AIII.19: Buoyancy of Subsidies (SUB) with respect to Revenue Non Development (RNDV) :

Log(SUB) = a + log(RNDV) [at constant 2004-05 price]

Period	Constant	Coeff. Log(RNDV)	R2	F value
1970-71 to 2007-08	-5.534	1.488 (13.225)***	0.829	174.91
1970-71 to 1990-91	-9.983	2.214 (7.386)***	0.742	54.55
1990-91 to 2007-08	-2.872	1.122 (8.872)***	0.831	78.71
1970-71 to 1979-80	-25.708	4.879 (2.942)**	0.519	8.65
1980-81 to 1989-90	-5.643	1.562 (27.969)***	0.989	782.28
1990-91 to 1999-00	2.052	0.438 (6.026)***	0.819	36.31
2000-01 to 2007-07	-17.111	2.952 8.858)***	0.928	78.47

Table AIII.20: Buoyancy of Subsidies (SUB) with respect to Revenue Expenditure (RE) :

Log(SUB) = a + log(RE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(RE)	R2	F value
1970-71 to 2007-08	-6.141	1.479 (14.839)***	0.859	220.20
1970-71 to 1990-91	-9.911	2.054 (8.170)***	0.778	66.74
1990-91 to 2007-08	-3.598	1.149 (14.237)***	0.926	202.69
1970-71 to 1979-80	-20.771	3.774 (3.222)**	0.579	11.03
1980-81 to 1989-90	-5.763	1.472 (29.877)***	0.991	892.66
1990-91 to 1999-00	0.882	0.565 (7.037)***	0.861	49.52
2000-01 to 2007-07	-5.671	1.403 (5.760)***	0.846	33.17

Table AIII.21: Buoyancy of Grants (GRA) with respect to Revenue Expenditure (RE) :

Log(GRA) = a + log(RE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(RE)	R2	F value
1970-71 to 2007-08	-0.857	0.805 (16.279)***	0.880	265.03
1970-71 to 1990-91	-2.052	0.987 (7.977)***	0.770	63.64
1990-91 to 2007-08	-0.214	0.721 (6.640)***	0.734	44.17
1970-71 to 1979-80	-3.670	1.237 (2.226)**	0.382	4.95
1980-81 to 1989-90	0.031	0.699 (4.348)***	0.702	18.91
1990-91 to 1999-00	3.704	0.212 (1.234)Ns	0.159	1.52
2000-01 to 2007-07	-9.879	1.886 (11.899)***	0.959	141.58

Table AIII.22: Buoyancy of Grants (GRA) with respect to Total Expenditure (TE) :

Log(GRA) = a + log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	-2.185	0.954 (17.831)***	0.898	317.94
1970-71 to 1990-91	-2.602	1.014 (8.158)***	0.777	66.56
1990-91 to 2007-08	-2.114	0.125 (7.502)***	0.778	56.28
1970-71 to 1979-80	-3.205	1.101 (1.938)*	0.319	3.76
1980-81 to 1989-90	-1.027	0.806 (4.533)***	0.719	20.55
1990-91 to 1999-00	2.893	0.309 (1.380)Ns	0.192	1.90
2000-01 to 2007-07	-6.856	1.512 (4.961)***	0.804	24.61

Table AIII.23: Buoyancy of Loans & Advances (LON) with respect to Capital Expenditure (CE) :

Log(LON) = a + log(CE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(CE)	R2	F value
1970-71 to 2007-08	2.801	0.372 (1.015)Ns	0.031	1.03
1970-71 to 1990-91	-1.106	1.060 (15.96)***	0.931	254.86
1990-91 to 2007-08	15.032	-1.606 (-1.020)Ns	0.080	1.04
1970-71 to 1979-80	-3.130	1.427 (6.125)***	0.824	37.52
1980-81 to 1989-90	-0.381	0.941 (13.349)***	0.957	178.20
1990-91 to 1999-00	-4.106	1.518 (3.091)**	0.544	9.55
2000-01 to 2007-07	21.101	-2.759 (-0.989)Ns	0.328	0.97

Table AIII.24: Buoyancy of Loans & Advances (LON) with respect to Total Expenditure (TE) :

Log(LON) = a + log(TE) [at constant 2004-05 price]

Period	Constant	Coeff. Log(TE)	R2	F value
1970-71 to 2007-08	6.171	-0.148 (-0.636)Ns	0.012	0.41
1970-71 to 1990-91	-1.551	0.957 (11.602)***	0.876	134.62
1990-91 to 2007-08	34.921	-3.730 (-5.339)***	0.703	28.50
1970-71 to 1979-80	-5.284	1.517 (4.666)***	0.731	21.78
1980-81 to 1989-90	0.527	0.677 (8.121)***	0.891	65.96
1990-91 to 1999-00	16.645	-1.416 (-2.211)*	0.379	4.89
2000-01 to 2007-07	53.441	-5.948 (-1.667)NS	0.581	2.78

APPENDIX IV

DATA BASE FOR PHASE III OF ANALYSIS ALONG WITH RESULTS OF STATIONARITY TESTS FOR SELECTED VARIABLES

TABLE A IV. 1: CENTRAL GOVERNMENT EXPENDITURE: ECONOMIC CATEGORIES

(Rs. Crores)

Year	Final Outlays			Transfer Payments to the rest of the Economy			Financial Investments and Loans to the rest of the Economy (gross)	Total Expenditure (4+7+8)
	Government Consumption Expenditure	Gross Capital Formation	Total	Current	Capital	Total		
1	2	3	4	5	6	7	8	9
1970-71	1669	519	2189	1239	193	1432	1956	5577
1971-72	2055	597	2652	1723	284	2007	2051	6710
1972-73	2262	677	2939	1852	429	2280	2630	7849
1973-74	2313	782	3095	2060	356	2416	2620	8131
1974-75	2867	1227	4094	2450	375	2825	2866	9785
1975-76	3449	1204	4654	3018	536	3553	3830	12037
1976-77	3606	1112	4718	3945	502	4447	3986	13150
1977-78	3678	1107	4785	4678	755	5433	4768	14986
1978-79	3975	1301	5277	5683	1063	6745	5696	17717
1979-80	4502	1528	6030	6064	1220	7283	5191	18504
1980-81	5174	1908	7082	6912	1302	8214	7200	22495
1981-82	6096	2552	8648	7728	1525	9253	7500	25401
1982-83	7057	2884	9941	9590	1788	11378	9175	30494
1983-84	8130	3356	11486	11436	2337	13773	10729	35988
1984-85	9428	4123	13552	14938	2958	17896	12432	43879
1985-86	11210	4558	15768	18347	3825	22173	15172	53112
1986-87	14665	5905	20570	21243	4408	25651	17803	64023
1987-88	16551	5961	22512	25380	5474	30854	16938	70305
1988-89	18764	7056	25820	31399	5750	37148	18434	81402
1989-90	20784	8137	28920	37877	6835	44712	21417	95049
1990-91	22359	8602	30961	45134	7117	52251	21760	104973
1991-92	24466	9259	33725	51378	8449	59827	19179	112731
1992-93	26865	11875	38739	58518	9092	67610	19578	125927
1993-94	31815	12765	44580	66750	11811	78560	22648	145788
1994-95	34878	14328	49206	76368	13974	90342	27450	166998
1995-96	41881	16685	58566	85304	15263	100566	26101	185233
1996-97	44238	17946	62184	100807	16294	117101	31975	211260
1997-98	53090	18955	72046	111577	17360	128937	23884	224866
1998-99	59920	20647	80567	137611	18671	156282	26907	263755
1999-00	68831	26075	94906	161549	20482	182031	30572	307509
2000-01	71977	22258	94235	183696	22404	206100	27929	328265
2001-02	77324	12634	89958	201188	28009	229197	41462	360616
2002-03	85389	21697	107086	228501	29406	257907	33886	398879
2003-04	87170	23997	111167	248436	32038	280474	34491	426132
2004-05	105692	27396	133088	259529	36822	296351	34393	463831
2005-06	116305	34450	150755	297267	41681	338948	11380	501083
2006-07	121609	36487	158095	356560	45758	402318	9771	570185
2007-08	131396	43652	175048	408676	53758	462434	51427	688909

Source : Ministry of Finance, Economic & Functional Classification of the Central Government Budget-various issues.

TABLE A IV.2: CENTRAL GOVERNMENT EXPENDITURE ECONOMIC (REAL)

(Rs. Crores)

YEAR	TOTAL	TRANS	FINAL	CONS
1970-71	73381.6	20311.5	28802.6	18729.7
1971-72	82839.5	27032.0	32740.7	22057.4
1972-73	88191.0	27926.4	33022.5	21657.2
1973-74	75990.7	23227.5	28925.2	20449.7
1974-75	73022.4	22367.9	30552.2	20535.0
1975-76	90503.8	31890.5	34992.5	22629.2
1976-77	97407.4	37429.4	34948.2	23113.5
1977-78	105535.2	43017.6	33697.2	23685.9
1978-79	124767.6	50687.2	37162.0	24538.4
1979-80	110802.4	51782.1	36107.8	25811.0
1980-81	114187.8	52511.4	35949.2	25378.3
1981-82	118144.2	52537.8	40223.3	26950.7
1982-83	134929.2	60017.0	43986.7	29326.7
1983-84	148098.8	64493.8	47267.5	31188.4
1984-85	169417.0	78739.4	52324.3	34035.9
1985-86	196711.1	91594.8	58400.0	40620.6
1986-87	223856.6	97490.9	71923.1	48723.3
1987-88	227524.3	107372.4	72854.4	53285.4
1988-89	245186.7	118573.1	77771.1	55183.8
1989-90	266243.7	133951.7	81008.4	55822.7
1990-91	266428.9	140752.4	78581.2	54795.4
1991-92	251631.7	142029.8	75279.0	53176.5
1992-93	255430.0	146100.7	78578.1	54182.1
1993-94	273011.2	158213.8	83483.2	58973.5
1994-95	277866.9	165000.5	81873.5	58157.9
1995-96	285412.9	167032.9	90240.4	63912.0
1996-97	311134.0	177735.7	91581.7	67285.4
1997-98	317159.4	183162.5	101616.4	77465.3
1998-99	351205.1	196263.3	107279.6	88738.9
1999-00	396274.5	221005.2	122301.5	102565.5
2000-01	395024.1	241045.8	113399.5	98616.8
2001-02	418833.9	256969.2	104480.8	101631.8
2002-03	447675.6	278097.5	120186.3	101948.7
2003-04	453814.7	291181.3	118388.7	96223.4
2004-05	463831.0	296351.0	133088.0	99859.8
2005-06	479505.3	324625.5	144263.2	105258.3
2006-07	511835.7	361106.7	141916.5	106052.8
2007-08	590831.0	390833.1	150126.9	118043.0

Source: *Computed on the Basis of Economic Classification of Central ,* Government Expenditure, Ministry of Finance, *Various Issues*
CSO, NAS Data on Constant Price
Reserve Bank of India

TABLE A IV.3: Augmented Dickey-Fuller (ADF) Unit Root Test on VARIABLE "TOTAL"

Null Hypothesis: TOTAL has a unit root
Exogenous: Constand and linear Trend
Lag Length: 0 (Automatic Based on AIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.023235	0.995103
Test critical values:	1% level	-4.226754	
	5% level	-3.536574	
	10% level	-3.200311	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TOTAL)
Method: Least Squares
Date: 29-06-2012 Time: 23:56:22
Included observations: 37 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob
TOTAL (-1)	0.002193	0.094383	0.023235	0.981599
C	-26.979025	5372.002887	-0.005022	0.996022
@trend	709.644784	1179.550115	0.601623	0.551416

R-squared	0.212005	Mean dependent var	13985.119459
Adjusted R-squared	-0.313325	S.D. dependent var	17313.772971
S.E. of regression	15814.857978	Akaike info criterion	22.252892
Sum squared resid	8503730917.646010	Schwarz criterion	22.383507
Log likelihood	-408.678505	F-statistic	4.573735
Durbin-Watson stat	1.440254	Prob(F-statistic)	0.017414

Source: Database in TABLE 1 above

TABLE A IV.4: Augmented Dickey-Fuller (ADF) Unit Root Test on VARIABLE "CONS"

Null Hypothesis: CONS has a unit root
Exogenous: Constand and linear Trend
Lag Length: 10 (Automatic Based on AIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.235510	0.988523
Test critical values:	1% level	-4.339222	
	5% level	-3.587535	
	10% level	-3.229213	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CONS)
Method: Least Squares
Date: 30-06-2012 Time: 00:00:10
Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob
CONS(-1)	-0.053047	0.225244	-0.235510	0.817223
D(CONS(-1))	-0.038470	0.275177	-0.139802	0.890808
D(CONS(-2))	-0.244334	0.275091	-0.888194	0.389441
D(CONS(-3))	-0.337995	0.266336	-1.269056	0.225114
D(CONS(-4))	-0.354738	0.228619	-1.551658	0.143051
D(CONS(-5))	-0.854095	0.277192	-3.081238	0.008130
D(CONS(-6))	0.183258	0.285758	0.641305	0.531684
D(CONS(-7))	-0.823532	0.289772	-2.841996	0.013054
D(CONS(-8))	-0.782481	0.365862	-2.138732	0.050566
D(CONS(-9))	0.343336	0.498574	0.688636	0.502305
D(CONS(-10))	-0.913094	0.447655	-2.039728	0.060713
C	5931.070333	3593.405516	1.650543	0.121078
@trend	828.680958	685.765655	1.208403	0.246908

R-squared	0.740755	Mean dependent var	3432.024815
Adjusted R-squared	0.501452	S.D. dependent var	4700.757933
S.E. of regression	3261.713788	Akaike info criterion	19.324077
Sum squared resid	148942875.690190	Schwarz criterion	19.947998
Log likelihood	-247.875034	F-statistic	3.333579
Durbin-Watson stat	1.783158	Prob(F-statistic)	0.017469

Source: Database in TABLE 1 above

TABLE A IV.5: Augmented Dickey-Fuller (ADF) Unit Root Test on VARIABLE "FINAL"

Null Hypothesis: FINAL has a unit root
Exogenous: Constand and linear Trend
Lag Length: 0 (Automatic Based on AIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.289872	0.428747
Test critical values:	1% level	-4.226754	
	5% level	-3.536574	
	10% level	-3.200311	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FINAL)
Method: Least Squares
Date: 29-06-2012 Time: 23:58:56
Included observations: 37 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob
FINAL (-1)	-0.263604	0.115117	-2.289872	0.028358
C	3857.017779	2305.362199	1.673064	0.103493
@trend	981.699032	381.606625	2.572542	0.014634

R-squared	0.181366	Mean dependent var	3279.034324
Adjusted R-squared	-0.364390	S.D. dependent var	6015.736358
S.E. of regression	5600.741339	Akaike info criterion	20.176790
Sum squared resid	1066522320.520370	Schwarz criterion	20.307405
Log likelihood	-370.270621	F-statistic	3.766297
Durbin-Watson stat	2.099531	Prob(F-statistic)	0.033306

Source: Database in TABLE 1 above

TABLE A IV.6: Augmented Dickey-Fuller (ADF) Unit Root Test on VARIABLE "TRANS"

Null Hypothesis: TRANS has a unit root
Exogenous: Constand and linear Trend
Lag Length: 2 (Automatic Based on AIC, MAXLAG=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		1.350458	0.999948
Test critical values:	1% level	-4.243570	
	5% level	-3.544252	
	10% level	-3.204687	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TRANS)
Method: Least Squares
Date: 29-06-2012 Time: 23:57:44
Included observations: 35 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob
TRANS (-1)	0.070372	0.052110	1.350458	0.186969
D(TRANS (-1))	0.401198	0.181541	2.209960	0.034880
D(TRANS (-2))	-0.436690	0.195486	-2.233872	0.033096
C	1227.807141	2396.805137	0.512268	0.612214
@trend	-40.456699	435.101978	-0.092982	0.926536

R-squared	0.631629	Mean dependent var	10368.762000
Adjusted R-squared	0.336932	S.D. dependent var	9258.155297
S.E. of regression	5981.995542	Akaike info criterion	20.362460
Sum squared resid	1073528119.913600	Schwarz criterion	20.584652
Log likelihood	-351.343044	F-statistic	12.859902
Durbin-Watson stat	1.941828	Prob(F-statistic)	0.000003

Source: Database in TABLE 1 above

TABLE A IV. 7: DATABASE FOR EXPLANATORY VARIABLES-I
STRUCTURAL-ECONOMIC VARIABLES

(Money values Rs. Crores)

Year	RPCY	SERV	TRADE	RP	URBAN	D1
1971	10016.00	40.905	42873.15	1.18	19.9	0
1972	9855.00	41.741	44085.89	1.17	20.24	0
1973	9571.00	43.060	44481.36	1.19	20.58	0
1974	9792.00	41.798	53876.57	1.10	20.92	0
1975	9658.00	42.517	66145.74	1.17	21.26	0
1976	10326.00	42.064	79711.07	1.31	21.6	0
1977	10192.00	43.827	82614.20	1.26	21.94	0
1978	10748.00	43.160	87480.22	1.18	22.28	0
1979	11111.00	42.983	93662.37	1.21	22.62	0
1980	10201.00	45.771	100457.06	1.13	22.96	0
1981	10712.00	45.256	111503.60	1.19	23.3	0
1982	11091.00	45.091	111860.31	1.19	23.54	0
1983	11089.00	45.890	111613.30	1.17	23.78	0
1984	11742.00	44.961	113976.36	1.17	24.02	0
1985	11889.00	45.717	119120.73	1.15	24.26	0
1986	12095.00	47.128	117569.96	1.06	24.5	0
1987	12328.00	48.271	117285.98	1.09	24.74	0
1988	12417.00	49.546	124977.35	1.02	24.98	0
1989	13418.00	48.106	147597.39	1.04	25.22	0
1990	13947.00	49.236	176892.18	1.05	25.46	0
1991	14330.00	49.607	192230.08	1.04	25.7	1
1992	14157.00	51.018	205001.74	1.03	25.91	1
1993	14643.00	51.029	239667.06	1.02	26.12	1
1994	15181.00	51.398	266213.61	1.01	26.33	1
1995	15835.00	51.101	292538.32	1.02	26.54	1
1996	16675.00	52.191	355834.21	1.02	26.75	1
1997	17714.00	51.637	372235.50	0.95	26.96	1
1998	18103.00	54.019	385593.69	0.93	27.17	1
1999	18934.00	54.707	399454.13	0.85	27.38	1
2000	19993.00	56.370	457529.38	0.82	27.59	1
2001	20362.00	56.999	511640.97	0.86	27.8	1
2002	21065.00	57.553	518423.99	0.87	28.14	1
2003	21575.00	59.283	607857.70	0.92	28.48	1
2004	23005.00	59.561	691181.53	0.96	28.82	1
2005	24143.00	60.748	876404.00	1.00	29.16	1
2006	26015.00	61.674	1071430.95	1.06	29.5	1
2007	28067.00	61.968	1273113.49	1.03	29.84	1
2008	30332.00	62.543	1421936.31	0.95	30.18	1

Source: Computed on the Basis of:
Reserve Bank of India Handbook of Statistics on Indian Economy, 2012
Economic Survey, Ministry of Finace, GOI, various years
Census of India, 2011, Ministry of Home Affairs, GOI

TABLE A IV.8: DATABASE FOR EXPLANATORY VARIABLES-II
POLITICAL-INSTITUTIONAL VARIABLES

(Money values Rs. Crores)

Year	PUBEMP	E(Y1)	DEF	CENTR	DT	CPI	Gt-1
1971	5.35	1	58.55	55.62	6723.68	7.05	22057.40
1972	5.46	0	56.12	56.76	7234.57	7.42	21657.23
1973	5.62	0	57.57	57.68	8449.44	8.16	20449.66
1974	5.60	0	61.01	54.69	7925.23	10.40	20534.95
1975	5.61	0	64.83	53.18	8522.39	12.63	22629.18
1976	5.66	0	63.53	55.41	11127.82	11.14	23113.45
1977	5.73	1	62.74	55.74	12488.89	11.88	23685.92
1978	5.79	0	61.51	54.44	12267.61	12.63	24538.35
1979	5.97	0	58.48	56.65	12971.83	13.31	25810.99
1980	5.65	1	58.59	55.15	11676.65	14.06	25378.32
1981	5.64	0	54.34	55.53	9609.14	15.64	26950.72
1982	5.79	0	59.47	52.72	11711.63	17.61	29326.69
1983	5.82	0	56.62	53.45	12048.67	18.96	31188.41
1984	5.84	0	55.47	54.66	12884.77	21.36	34035.87
1985	5.83	1	53.78	56.93	13030.89	22.73	40620.59
1986	5.73	0	53.23	62.76	13696.30	24.21	48723.25
1987	5.79	0	52.58	59.18	14066.43	26.31	53285.42
1988	5.69	0	54.26	58.05	13268.61	28.74	55183.82
1989	5.63	1	55.10	58.69	18135.54	31.33	55822.68
1990	5.68	0	56.29	60.44	16885.15	33.38	54795.44
1991	5.63	1	52.19	59.62	17520.30	37.12	53176.53
1992	5.54	0	59.27	56.19	22551.34	42.12	54182.09
1993	5.44	0	60.45	58.44	24492.90	46.28	58973.52
1994	5.35	0	53.19	59.17	23449.44	49.65	58157.89
1995	5.25	0	56.67	56.05	30630.62	54.75	63911.97
1996	5.13	1	61.78	55.65	34340.52	60.21	67285.40
1997	5.06	0	62.82	54.73	37369.66	65.88	77465.27
1998	4.94	1	57.70	53.09	38324.40	70.39	88738.90
1999	4.84	1	53.51	53.33	42769.64	79.63	102565.50
2000	4.72	0	60.89	52.85	53396.91	82.37	98616.83
2001	4.55	0	59.16	50.61	59748.50	85.50	101631.82
2002	4.34	0	55.56	51.11	55404.18	89.19	101948.65
2003	4.19	0	55.86	50.57	69149.27	92.74	96223.36
2004	3.99	1	55.99	43.80	81565.50	96.32	99859.84
2005	3.85	0	61.41	44.89	95944.00	100.00	105258.33
2006	3.88	0	68.63	49.12	115494.74	104.41	106052.81
2007	3.83	0	74.46	48.37	152368.04	111.41	118042.99
2008	3.75	1	76.03	51.33	198549.74	118.32	140294.03

Source: Computed on the Basis of:
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