RESERVE BANK OF INDIA

# OCCASIONAL PAPERS


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# OCCASIONAL PAPERS

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**Articles**



**Special Notes**



**Book Reviews**

Letter from the Chairman, Editorial Committee

Dear Readers,

In order to bring out the publication in a timely manner, it has been decided to combine the Summer and Monsoon issues of 2003. Owing to unavoidable circumstances the issues for the year 2002 have been omitted. Following this Summer and Monsoon 2003 issue, the Winter 2003 issue of the Journal would be published in the first quarter of 2004.

Yours sincerely,

(Narendra Jadhav)
Chairman, Editorial Committee
Reserve Bank of India Occasional Papers

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*Reserve Bank of India Occasional Papers*
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# *Central Bank Strategies, Credibility and Independence: Global Evolution and the Indian Experience*

**Narendra Jadhav***

The present paper aims at offering a comprehensive perspective on central banking in India. To place the issue in context, it begins by tracing the evolution of central banking, against the backdrop of the debates in the much-contested field of monetary economics. This sets the stage for the genesis, evolution and development of the Reserve Bank of India since Independence in 1947, responding to domestic compulsions on the one hand, and the evolving international best practices, on the other. Against this historical background, the paper turns to three contemporary issues in central banking: formulation and conduct of monetory policy, strengthening financial stability and management of the changes in the payments and settlement system. The emphasis is not only on identifying the contours of the contemporary debates in the international financial community but also on highlighting the challenges and policy dilemmas facing the central bankers in India and abroad today.

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" How puzzling all these changes are !

I m never sure what I'm going to be,

from one minute to another ! " . . .

For, you see, so many out-of-the way things had happened lately,

that Alice had begun to think that very few things

indeed were really impossible!

**Lewis Carroll, in Alice's Adventures in Wonderland**

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## Introduction

Central banks are evolving entities which respond to political and economic forces around them. In that sense, central banks are not 'natural products' but products of history, it has been said.[1]

Today, central banks are perceived as multi-function entities performing a wide range of specialised activities. These generally include conducting banking operations for national governments, supervising and regulating banking institutions, managing the payments and settlement system and formulating monetary policy for the economy. Interestingly, the early central banks founded in Europe - the Swedish Riksbank in 1668 and the Bank of England in 1694 - were not intended to undertake these functions of a modern central bank. Instead, the initial impetus for these 'government - sponsored' banks was much more basic, relating generally to the financial advantages that governments felt they would obtain from the support of such banks. This involved some favoured treatment, often supported by legislation, especially granting monopoly rights over the note issue. In the course of time, the privileged legal position of these banks in note issue and as banker to the government, naturally led to a degree of centralisation of reserves within the banking system in their hands, thus making them bankers' banks. It was the responsibility that this position was found to entail, in the process of historical experience, which led these banks to develop discretionary monetary management, and assume overall support and responsibility for the health of the banking system at large.[2] Early central banks were, thus, characterised by evolutionary development rather than being programmed to undertake from the start what they subsequently did. In other words, central banking functions developed naturally from the context of evolving relationships within the system.

Until 1800, the Riksbank and Bank of England were the only central banks. The total number of central banks worldwide remained in a single digit as late as 1873. Considerable expansion in the number of central banks occurred in the latter part of the 19$^{th}$ century as the concept of central banking crystallised. Several nations that had previously conducted their monetary and financial operations without central banks decided that it was in their best interests to establish

central banks. Subsequently, the expansion of central banks became especially pronounced in the second half of the 20th century with the establishment of central banks by former colonies that achieved independence, finally leading to a situation today wherein nearly every sovereign nation has established its own central bank.

Each central bank has a distinctive historical origin. Illustratively, the Bank of England was established to lend money to the Government whereas, the Federal Reserve Board came into being in 1914 for the provision of a nation-wise payment and depository system. On the other hand, the German central bank was set up in 1875 against the backdrop of the need to restore and maintain a stable currency. These differing historical origins have influenced not only the tasks that these central banks perform today, but also the way in which they operate.

The Reserve Bank of India was set up in 1935. The legislation to set up the Reserve Bank was first introduced in January 1927. It was seven years later, in March 1934, that the relevant enactment was made in the form of the Reserve Bank of India Act, 1934. The Reserve Bank started functioning with effect from April 1, 1935. While there is no specific provision in the Act laying down the objectives, the Preamble to the Act does say that the Bank has been constituted,

> "to regulate the issue of bank notes and keeping of reserve with a view to securing monetary stability in India and generally to operate the currency and credit system of the country to its advantage……."

Set up as a private shareholders' bank, the Reserve Bank was nationalised in 1948. The evolution of the Reserve Bank over the last fifty five years has been influenced by both, the evolution of ideas on central banking practiced elsewhere in the world as also imperatives of the domestic economy.

This paper aims at offering a comprehensive perspective on central banking in India and abroad. Section I traces the genesis and evolution of central banking in the global context in response to the corresponding developments in macroeconomic thinking in general and those relating to monetary policy, in particular. Section II then

recounts the developments of central banking in India and delineates various broad phases of financial sector development. An attempt is made to relate the development of central banking in India with the global thinking on central banking on the one hand, and the domestic macroeconomic compulsions, on the other. Against that historical backdrop, finally, Section III presents a range of contemporary issues in central banking, in the context of three main areas: formulation and conduct of monetary policy, strengthening of financial stability and the management of the payments and settlement system. The accent is especially on issues relating to the central bank strategies, credibility and independence. This discussion aims not only at identifying the main issues being debated by the central banking community, but also at highlighting the challenges and policy dilemmas facing the central bankers in India and abroad today.

## Section I

## Central Banking : Global Evolution

"Monetary policy has relevance…", pointed out Dr. Bimal Jalan, former Governor of the Reserve Bank, recently, "as long as there is money".[3] As a matter of fact, global thinking on monetary policy, and by implication, that on central banking, has evolved over time in accordance with the changing perceptions regarding the role of money in economic activity. Indeed, central banking has come a long way since the publication of Bagehot's "Lombard Street" in 1873.[4]

In the 18th and early 19th centuries, the thinkers who had the most influence on the subsequent development of monetary theory, *i.e.*, David Hume, Adam Smith and David Ricardo, placed emphasis on money as a reflector rather than regulator, of levels of economic activity which in turn, were deemed to be determined by non-monetary factors.

Among the classical economists, Adam Smith emphasised the role of a 'properly regulated' banking system, which in his view would provide the appropriate amount of money endogenously through the expansion and contraction of credit. According to Smith, the introduction of banks and credit money would have a once and for all effect on economic activity by releasing for production, social capital previously tied up in stocks of money commodity. However,

once the banking system was in place and functioning according to rules, the quantity of money, now endogenous to the system, would have no independent effect on the level of economic activity.

Both Smith and Hume argued that the quantity of money does not influence the level of interest rates, which according to them, was determined by the level of profit rates in the economy, and *not* by an abundance of the money commodity. Ricardo believed that the only rational end of economic activity was consumption. Following Say, he argued that every commodity offered for sale represents a demand for some other commodity, and thus, in the aggregate, the value of commodities offered on the market equalled the demand. In other words, money is purely a medium for the exchange of commodities against each other, and thus, has no independent role in determining economic activity: money is a *veil.*

In the early part of the 20th century, Irving Fisher took this line of thinking further. Fisher assumed the existence of a given amount of money, exogenously determined in the economic system. He also assumed that there was a single exogenously determined rate at which the total quantity of money would circulate (*i.e.*, the velocity of money). Accordingly, he argued that the total monetary value of the transactions in an economy is determined independent of the level of economic activity. Fisher believed that the market system would lead to a given level of production of commodities determined by available resources and technological possibilities. As a result, the only variable free to adjust was the level of commodity prices. Thus, while in the short run a change in the quantity of money or velocity might have some impact on the level of economic activity in the society, in the long run the whole adjustment would be made in the prices of commodities. This thinking dominated the focus of central banking for quite some time.

John Maynard Keynes (1936) revolutionalised macroeconomic thinking, *inter alia*, by constructing a monetary theory that conformed to the realities of fully developed financial system with the central bank at its centre. The Keynesian vision of the economic system was not that of a self-regulating entity, but of a complex set of causal linkages that a policy maker seeks to guide.

Keynes emphasised that the liabilities of the central bank may or may not be convertible into a money commodity. Deviating from the classical economists, Keynes thus deemphasised convertibility as a limit on the operations of the central bank. He explicitly introduced bonds and equities as competing monetary assets and argued that the rates of return on bonds and equities must adjust until wealth holders are content to hold them and deposits in the proportions in which they are being supplied to the public. In other words, a change in the reserve creation by the central bank forces a change in the rate of return to bonds and equities, which in turn, alter the incentives for firms to make long term investments, and therefore influence the level of economic activity. Furthermore, Keynes suggested that the relationship between money demand, interest rates and the level of economic activity was volatile, subject to sharp changes depending on the mood of wealth holders and their expectation and fears about the future.

In the first two decades after the Second World War, the Keynesian orthodoxy took the position that 'money does not matter', *i.e.*, spending decisions of consumers and firms move largely independent of asset rates of return and are more responsive to expectational variables. Any attempt to restrict economic activity by limiting the expansion of bank reserves, it was argued, could be circumvented by the substitution of other liabilities. This extreme non-monetary interpretation of Keynes became the conventional wisdom for central bankers.

Not surprisingly, in the first two decades after the Second World War, the fiscal policy came to the centrestage of policy affairs while monetary policy was relegated to the backstage. The ascendancy of fiscal policy during this period was due, in part, to the Depression of 1930s and the process of post-World War II reconstruction besides of course, the acceptance of the Keynesian dictum that fiscal action was necessary to prevent deficiency in the aggregate demand. Keynes dispelled the resolute faith of classical economists in market forces and legitimacy of the *laissez faire*. Neo-Keynesians took the same argument further and proclaimed that government intervention could remedy market failures. Problems associated with deficiency of aggregate demand, it was argued, could be resolved by expansionary

fiscal policies. In the 1960s, neo-Keynesians added the so-called Phillips curve to their kit of analytical tools. The Phillips curve depicted an inverse relationship between inflation and unemployment, *i.e.*, lower unemployment was seen to be consistent with higher inflation - a trade-off. A logical corollary of this relationship was that higher economic growth could be achieved only at the cost of acceleration of inflation.

Policy implications of the Keynesian and neo-Keynesian thinking were clear. Neo-Keynesians regarded the Phillips curve relationship as stable and asserted its usefulness for demand management policies. Fiscal measures were especially deemed to be effective in moving the economy along the Phillips curve - setting it at a preferred combination of inflation and unemployment. These policy prescriptions were widely accepted. Accordingly, by the 1960s, the central banker had come to be regarded as a "*demiurg* able to choose between inflation and unemployment, and to do so almost on a quarter-by-quarter basis".[5] Even the events contrary to this belief did not shake the conviction in the abilities of the central bankers in containing inflationary pressures. For example, in the 1950s and early 1960s, there were brief bouts of inflation in USA that did cause some concern, but only momentarily. The faith in the ability of the system in arresting inflationary tendencies remained firm as was reflected in the low inflation premium then embedded in long-term bonds.[6]

The neo-Keynesian hegemony was called into question by a chain of traumatic events in the early 1970s: breakdown of the fixed exchange rate system, the first OPEC oil shock, and bad harvests combined with the aftermath of the Vietnam War led to acceleration in inflation rates and high unemployment rates in the USA. The economies of several other countries also faltered simultaneously. The phenomenon of 'stagflation' became commonplace. The incidence of a high inflation rate contemporaneous with a high unemployment rate and stagnating (or even faltering) output seemed at odds with the neo-Keynesian Phillips curve. This, more than anything else, challenged the foundations of the earlier confidence in the maintenance of full employment and the existence of an exploitable trade-off between inflation and unemployment that was suggested by the Phillips curve. The typical policy response to the oil shock of

1973-74 comprising expansionary fiscal policies coupled with accommodating monetary policy stance could not generate lasting gains in terms of economic growth. Subsequent analysis showed that the Phillips curve actually provided at best a *temporary* trade-off between inflation and unemployment when the economy was adjusting to shocks to aggregate demand and that too as long as expected inflation was lower than actual inflation. It was recognised that there is essentially no *long-run* trade-off between inflation and unemployment since anticipated inflation adjusts fully to actual inflation, with the long-run Phillips curve becoming almost vertical at the 'natural' rate of unemployment. In any event, recurrence of high inflation and the cumulative worsening of government finances brought into sharp focus both, the limitations of fiscal activism and the heavy costs of monetary instability. These developments paved the way for a more determined fight against inflation.

Professional response to these developments was characterised by a significant polarisation in favour of the so-called monetarism. During the 1950s and 1960s, the influence of monetarism was minimal. Indeed, Milton Friedman, the eloquent champion of monetarism, was deemed to be a heretic then. The events of the early 1970s brought forth monetarism as a paradigm to reckon with.

The debate between monetarists and neo-Keynesians had major implications. Neo-Keynesians, in general, diluted their earlier position that money does not matter at all. Monetarists, on the other hand, went to the extreme of suggesting that "inflation is always and everywhere a monetary phenomenon." While neo-Keynesians conceded the inappropriateness of the position that money does not matter, they did not accept the monetarist view that money is *all* that matters.[7] The neo-Keynesians conceded that money is important but stressed that fiscal policy as well as 'animal spirits' also contribute to fluctuations in aggregate demand.

Monetarists and neo-Keynesians both agreed subsequently that monetary policy actions will have a substantial effect on output and prices. The difference between them concerned *not* whether monetary policy can affect output and prices but regarding how it should be used for economic stabilisation. In the academic literature, this debate is referred to as the controversy involving 'rules *versus*

discretion'.

Monetarists are non-interventionists; they favour a constant money growth rate which they believe would create an environment in which the inherently stable private sector can function effectively. On the other hand, neo-Keynesians are interventionists. They see the need for discretionary monetary and fiscal policies to keep an unstable private economy on track.

According to monetarists, since money is the dominant influence on nominal income and in the short run, on output as well, stabilising the money growth rate will eliminate the major source of instability in income determination. In any case, discretionary policies are beset with several lags, such as the data lag (*i.e.*, the time it takes for policy-makers to obtain data that tell them what is happening in the economy), the recognition lag (*i.e.*, the time it takes for policy-makers to be sure that the data signals impending problems), the *implementation lag,* (*i.e.*, the time it takes for policy makers to change the relevant policy instruments) and the effectiveness lag (*i.e.*, the time it takes for policy actions to actually have an impact on the economy). In view of these lags, according to monetarists, discretionary policies are, at best, useless and at worst, maladjusted and destabilising.

Neo-Keynesians, on the other hand, ridicule the constant money growth rule advocated by monetarists. According to them, policy makers can anticipate shocks and design policies to combat them. No doubt, there will be errors of judgement but, on the whole, such policies will result in a more stable economic performance than would be the case with set policy rules.

These developments profoundly affected the course of monetary policy in the 1970s and the 1980s. The case against policy activism was reinforced by parallel literature, which emphasised the need to ensure policy makers' accountability. Elected regimes, by their very nature, were seen to be largely susceptible to generating political business cycles.[8] As such, the central bank, given its technocratic character, emerged as an ideal mode of ensuring accountability. Central banks, thus, shifted to the very centre of the economic policy

apparatus in most economies. The received wisdom then was to assign the central banks a simple monetary policy rule consistent with price stability and a stated growth objective. To the extent there existed a stable relationship between money, output and prices, monetary management entailed prescription of a simple monetary target consistent with the macroeconomic objectives. Central banks could announce their commitment to a pre-announced monetary target (and by corollary, a certain level of the inflation rate), which could then guide business decisions throughout the economy. A number of central banks including Germany (1975), Japan (1975-94), UK (1976-94) and USA (1975-94) began to set monetary targets with varying degrees of commitment.

Around the late 1970s when the debate between monetarists and neo-Keynesians stalemated, a new paradigm emerged on the macroeconomic landscape - the so-called new classical economics, which has had a pervasive influence on macroeconomic thinking. Leading protagonists of new classical economics included Robert Lucas, Jr., Tom Sargent, Neil Wallace, Bennett McCallum and Robert Barro.

The new classical economics was based on three principal tenets:

- Real economic decisions by economic agents - *i.e.*, those about saving, consumption or investment, are based entirely on real, *not* nominal or monetary factors.
- Economic agents are consistently successful optimisers within the bounds of their information and are, therefore, continuously in equilibrium.
- Economic agents hold rational expectations - *i.e.*, they do not make any *systematic* errors in evaluating the economic environment.

The Rational Expectations Hypothesis (REH) is perhaps the most striking feature of new classical economics, so much so that early new classical economists were also called the 'rational expectationists'. This perception, however, changed in the 1980s with the realisation that the REH is a necessary but *not* a sufficient condition for new classical economics, *i.e.*, every new classical

economist necessarily believes in the REH but *not* every economist using the REH is new classical economist. Several eclectic economists like Fischer, Mishkin and others, sometimes called the non-Classical rational expectationists, accept the rational expectations but do *not* subscribe to other tenets of the new classical thinking.

The REH has had several interpretations. The common sense interpretation of the REH is that economic agents use *all* available information and their knowledge of the way economy works to form their expectations. In the monetarist approach, expectations are formed adaptively, *i.e.*, economic agents adjust their current expectations to correct expectational errors made in previous periods. In this approach, current expectations are determined, *in entirety,* by past observations. Adaptive expectations are *not* rational in the sense that such expectations could be left unaffected by changes in government policies even when economic agents actually know that those changes influence the variable under consideration. The REH, in contrast, argued that economic agents do the best they can with the information that they have. For example, if people have information that money supply will increase and know that this will result in higher prices, then under the REH they will raise their price expectations and alter their behaviour with regard to consumption, savings and investment.

Policy implications of the new classical economics were devastating. Notably, there was some divergence of views within the adherents of the new classical doctrine. Yet, all their models gravitated towards the conclusion that the government should abstain from active demand management policies. This characteristic feature of the new classical school is referred to as the 'policy-ineffectiveness proposition'.

New classical economists contended that monetarists like Friedman are too generous in ascribing power to demand management policies (especially the monetary policy) over output and employment *even* in the short run. Illustratively, in the monetarist framework, an initial price rise in the wake of an expansionary policy is deemed to be temporary by workers and given the adaptive nature of their expectations, it does not get immediately translated into an upward revision of price expectations.

Consequently, output and employment expand until the price expectations catch up with the actual inflation rate, thus making the expansionary policy potent in the short run. New classical economists argued on the other hand, that expansionary policies operate essentially by inducing expectational errors. With adaptive expectations, such errors might persist for some time but with rational expectations they cannot persist beyond an initial surprise. If economic agents have rational expectations, they use their knowledge of the monetary authority's policy rule to form their expectations of prices. As a result, the authorities cannot trick economic agents into incorrectly forecasting prices and since there are no systematic expectational errors, there is no systematic effect on output and employment. The demand management policies are, thus, ineffective.

These recent developments in macroeconomic thinking have had a profound impact on the way most economists now think about the conduct of economic policies including the monetary policy. The rational expectations hypothesis and new classical economics seemed to have cast a shadow of doubt on the efficacy of monetary policy. A relevant question then is whether it has totally debunked the earlier thinking. From the viewpoint of central bankers, an even more pertinent question is whether new classical economics has irreparably discredited the rationale of monetary policy. Has it seriously undermined its efficacy such that there is no scope for any meaningful monetary policy? Contrary to the widespread belief, this does not seem to be the case.

New classical economists are not always anti-policy. A case to the point is Sargent's historical analysis (1982) of the 'ends of four big inflations'. Sargent has documented that these four hyperinflations were halted by (i) the creation of an independent central bank legally committed to resisting government attempts to finance deficits by printing money; and (ii) substantial reduction in the government deficit, by cuts in government spending and increase in taxes. Given the conventional Phillips curve trade-off between inflation and output, this should have meant a formidable loss of output. Yet, the German hyperinflation was stopped in its tracks within two months in late 1923 with a loss of only 10 per cent of GNP. Sargent attributed this achievement to the rational expectations on the part of the public and credibility of the announced policy actions.

The new classical contributions demonstrate that the effect of a particular policy depends critically on the expectations of economic agents about the policy. Policy makers cannot be overly confident about efficacy of policy actions if they are anticipated successfully by economic agents and countervailing measures are possible. The rational expectations revolution has also highlighted the importance of credibility to the success of anti-inflation policies. If an anti-inflation policy is not believed by the public, it may be less effective in reducing the inflation rate when implemented and may also lead to a larger loss of output than would otherwise be the case. Achieving credibility should then be an important goal for policy makers. In order to achieve credibility, policy makers would have to pursue consistency in their policy actions.

The case against the destabilising effects of bad monetary policy is clear by now. The question is, could systematic monetary policy stabilise the economy? The case for non-neutrality of money essentially rests on the degree and length of time during which people suffer from money illusion. The issue began to attract more attention after Paul Volcker's monetary tightening in the early 1980s, which not only cut inflation but also produced a deep recession. The challenge was to show that even rational agents, who would usually not let dollar bills lie on the sidewalk, to use Lucas' felicitous phrase, could still take time to adjust to prices. The New Keynesians,[9] on their part, did recognise the role of rational expectations. In their response to the New Classicals, they explained how the markets could fail to clear even in the presence of rational agents because of inherent rigidities. These rigidities emanated from long-term contracts, imperfect competition, price adjustment (or menu) costs and co-ordination failures. Out of such stickiness of prices arose a micro-theoretic rationale for the real effects of monetary policy.[10]

In the contemporary macroeconomic thinking, there is no clear winner. No doctrine can claim universal dominance once enjoyed by the Classicals, Keynesians or Monetarists by turn. Adherents to monetarism as well as the Keynesian school continue to hold their beliefs though neo-Keynesians are now less sanguine about the policy makers' abilities to fine tune the economy and monetarists are now

somewhat sceptical about the length of the short run. Besides, it appears that the policy-ineffectiveness stance of the new classical economics should not be taken too literally - certainly not without proper understanding and appreciation of the underlying assumptions. Of course, this does not mean that the contributions of new classical economics need to be denigrated. It is just that their conclusions need not be exaggerated out of context. The new classical school demonstrated that 'extreme' conclusions could be derived under a set of 'extreme' assumptions. In that process, they brought out several constraints on the meaningful conduct of monetary policy.

Besides the intellectual flux, the central banking community has had to contend with a radical transformation of the financial environment emanating from the impact of liberalisation and financial innovations. Salient features of this metamorphosis, which matured in the 1990s, included: wide-ranging deregulation, globalisation of finance and acceleration of competitive pressures leading to a mind-boggling variety of financial instruments and a spectacular rise in the volume and value of transactions. This has been accompanied inevitably by substantial financial deepening and widening as well as blurring of distinction between different types of financial institutions.

Financial innovations are, in a sense, a natural corollary of the process of financial liberalisation. These cover essentially three types of developments,[11] all of which enhance economic efficiency but impinge on the traditional monetary policy framework:

- Investment products, of finer risk and tenor, which could be traded directly between the issuer and the saver, thereby sparking off a process of financial disintermediation,
- Futures products, which gave a business shape to the diverse expectations of the agents in the economy, and
- Improvements in transactions, arising out of developments in information technology, with implications for market liquidity.

The first burst of financial innovations, especially during the 1970s and 1980s, concentrated on instruments, such as commercial

paper, which could cater to the requirements of both the issuer and the investor more fully. Their impact on the money targeting framework, then in vogue in many economies, varied depending on the system - bank-based or market-based - and the degree of financial maturity of the economy. In case of market-based economies, such as the USA, the resultant process of financial disintermediation effectively meant that the existing stock of money could support a higher volume of output by churning that many times more.[12] Technically speaking, this implied that the relationship between money, output and prices broke down because the underlying assumption of a stable income velocity no longer held good. It is in this context that a number of central banks had to abandon money targeting. In case of bank-based systems, in continental Europe, innovations were often bank-driven so that the central banks, such as those of France and Germany (and now the European Central Bank), can still persist with a variant of money targeting. In case of developing countries, the relationship is even more complex. The velocity of money typically falls in developing economies in the early stage of development, with the monetisation of the economy and then begins to rise, as financial deepening results in disintermediation. The rapid diffusion of financial innovations in the 1990s implied that financial innovations could arrest the decline in the income velocity.

The implications of the other types of financial innovations for the conduct of monetary policy are very different. In case of derivatives, originally instruments of hedging risks, the challenge of monetary policy arises out of the possibility of speculation by leveraging, *i.e.*, taking on a large notional burden for a nominal payment. The implications of failure, exemplified by the Barings case, requires central banks to put in place various mechanisms of risk management, while also adapting themselves to developments in information technology. While financial innovations are often pioneered by the market in advanced financial systems, they are often introduced by central banks themselves in emerging market economies. From the narrow angle of financial stability, there is often a first mover disadvantage, because the regulatory implications of the new products are not fully understood.

Taken together, these developments have influenced the central banking in industrially advanced economies in more ways than one and profoundly so. First, in view of the consensus that the dominant objective of monetary policy should be price stability, the policy environment is increasingly shifting in favour of endowing central banks with a greater degree of autonomy. Several countries have, in fact, formally adopted inflation targeting, often with price stability as a legislated mandate, as a strategy of monetary policy. Monetary policy has re-affirmed itself as an instrument of economic policy particularly in the fight against inflation. Secondly, issues relating to the conduct of monetary policy have come to the forefront of policy debates. With financial liberalisation and globalisation, the relationship between money, output and prices has turned increasingly unstable and unpredictable. Long and variable lags in monetary policy and uncertain transmission channels have posed a considerable challenge for the conduct of monetary policy. As a result, several central banks have abandoned monetary targeting and experimented with a number of other nominal anchors, such as interest rates and the exchange rate, which could provide a fix on inflation - a sort of monetarism without money. Thirdly, with the growing concern for preventing financial crises, safeguarding the stability of the financial system has gained renewed prominence on the agenda of central bankers. Fourthly, the enormous growth in settlement volumes have highlighted the imperative need to address the liquidity and credit risks that arise in the process of executing transactions. Accordingly, prescription of prudential norms and effectiveness of supervision have emerged as major policy concerns. Fifthly, financial markets have emerged as a powerful force and, potentially a valuable source of discipline on overly ambitious policies. As a corollary, there is a growing recognition that successful pursuit of both monetary and financial stability ought to rely on mechanisms that worked with, rather than against, the spirit of market forces. Finally, with the rising volumes of cross-border transactions and the growing inter-dependence across countries, the need for co-ordination in policy actions has been heightened. Along with the exchange rate regime, the degree of openness has a stronger influence now on the choice of the monetary policy strategy than ever before.

In sum, these broad developments are at work today in the industrially advanced economies in shaping the evolving relationship between central banks, governments and financial markets and as such, have had an inevitable bearing on the evolution of central banking in developing economies like India.

## Section II

## Central Banking in India

The role of the Reserve Bank of India in the process of economic growth and development was recognised at an early stage. In fact, the First Five-Year Plan (1951) stated that:

> "Central banking in a planned economy can hardly be confined to the regulation of overall supply of credit or to a somewhat negative regulation of the flow of bank credit. It would have to take on a direct and active role, firstly in creating or helping to create the machinery needed for financing developmental activities all over the country and secondly, ensuring that the finances available flow in the directions intended."

Following this imperative, the evolution of central bank thinking in India is mirrored in the actual evolution of the Indian financial system. Over the 55 years of central banking, the financial system in India has evolved in four distinct phases:

a) Foundation Phase;

b) Expansionary Phase;

c) Consolidation and Diversification Phase; and

d) Financial Sector Liberalisation Phase.

### A. Foundation Phase

In the early 1950s, development economics was itself at its nascent experimental stage. The Keynesian analysis, as extended by Harrod-Domar models, was the cornerstone of thinking about

economic growth. Underdevelopment was seen as the result of deficiency of capital. Accordingly, with the heavy emphasis on the increase in capital stock as the key determinant of economic growth, it was widely believed that the Government should promote capital formation and allocate it according to priorities. Another strand of professional thinking at that time centred around the so-called "export pessimism", given the inelastic demand for the then exports from developing economies. Under these circumstances, the notions of "Big Push" and "Balanced Growth" held the sway underscoring the need for planning an investment program in a closed economy framework. This was the underlying rationale for the strategy of planned economic growth and development during the 1950s and early 1960s.

During the foundation phase for the Indian financial system, covering the 1950s and much of the 1960s, the accent of the central bank strategy was on development of the necessary legislative framework for facilitating reorganisation and consolidation of the banking system. Importantly, the Banking Regulation Act, 1949 provided powers to the Reserve Bank to issue directions to banking companies generally or to any banking company in particular when it was satisfied that it was in the public interest to do so or in the interest of banking policy or to protect the interests of the depositors or to secure better management of the banking company. During this period, the co-operative credit structure was strengthened and institutional framework for providing long-term finance to agriculture and industry was set up. The Industrial Development Bank of India (IDBI) and the Unit Trust of India (UTI) were established during this period.

The need for co-ordination between monetary and fiscal policy was recognised early on. The late Dr. C.D. Deshmukh, the first Indian Governor of the Reserve Bank, stated that:

> "After all, it is not the theoretical constitution of the Institution that matters, but the spirit in which the partnership between the Ministry of Finance and the Bank is worked. The success of the partnership will, in the ultimate analysis, depend on the manner in which Government desires to be served and provides opportunities accordingly" (March 1948).

The role of banks in the process of economic development was well recognised by the Indian central bankers. For example, Governor H.V.R. Iengar stated:

> "Banks could take a share in the vast enterprise of development to the extent of a modest proportion of these resources, and without any jeopardy to their liquidity position" (August 1959).

More specifically, Governor B. Rama Rau observed :

> "Reserve Bank could not have justified its existence in India, if it confined its activities to the industrial sector and completely ignored the agricultural sector, on the prosperity of which industrial development, to a large extent, depended. No apology is, therefore, needed for the enormous interest which has been taken by the Reserve Bank in rural finance and co-operatives during the last two decades" (April 1960).

Given the reasonable degree of price stability which prevailed in India until the mid-1960s, the central bank thinking during the foundation phase was confined to making broad observations and assessments. Such statements clearly lacked the sharpness, which became discernible only later.

Governor H.V.R. Iengar, for example, observed:

> "A fundamental question in any developing economy is the degree to which stability is maintained during the development process" (August 1959).

In the same spirit, Governor B. Rama Rau pointed out the perils of the fiscal-monetary nexus:

> "There seems to be an impression in certain sections that deficit financing is a pernicious system in all cases and circumstances. It is certainly an unmitigated, though very necessary, evil during war time, when it is utilised for

> financing defence expenditure, which, of course, must necessarily be unproductive. Even in peace time, it should be condemned as a means of raising money for unproductive schemes. It can, however, be justified in the case of schemes which are productive within a short period" (April 1960).

The Indian economy came under strain around mid-1960s. The levelling- off of foreign aid and the increase in defence expenditure in the wake of conflicts with China (1962) and Pakistan (1965) were followed by serious droughts in two consecutive years in 1966 and 1967. The sharp deterioration of the economic situation called for adjustment in macroeconomic policy, which led, *inter alia*, to the devaluation of the Indian rupee in 1966.

With the emergence of persistent double-digit inflation rates in the second half of 1960s, the monetary policy came into a sharp focus. For example, Governor P.C. Bhattacharyya stated:

> "Monetary policy has to be used in such a way that it brings about conditions in which funds required for the growth of the economy are available to the various sectors in the right magnitude and composition and at the right time"(February 1966).

In the context of the devaluation of the rupee, Governor Bhattacharyya observed:

> "The challenge of devaluation, in short, is a challenge to our ability to stand on our feet. The success with which we are able to contain inflation, increase exports and reduce dependence on others for imports will determine how soon we can do so" (August 1966).

The perils of inflation were aptly described by Governor L.K. Jha when he stated:

> "Inflation is not only an inefficient means of financing investment expenditure; it is also inequitious because it imposes a greater burden on the fixed income earner than on the more prosperous section of society" (April 1968).

On the whole, and for most part of the foundation phase, however, price stability was not a major area of concern. This phase was characterised instead mainly by the vision to build for the financial system, the potential for the future. This spirit of the foundation phase was succinctly captured by Governor Jha, when he said:

> "Unlike developed countries, developing countries have to concentrate not only on growth but also on building up the potential for growth" (July 1968).

## B. Expansionary Phase

The economic and political fall out of the 1966 devaluation cast a long shadow on economic policy making in the country. The Five-Yearly Plan exercise was suspended for three years and was supplanted by annual plans, before resuming in 1969. The earlier consensus on the long-term management of the economy broke down under the pressure of heightened political uncertainties following the general elections in 1967 and the split of the ruling party in 1969. These upheavals gave a major turn to the economic policies towards nationalisation.

The year 1969 was a major turning point in the Indian financial system when 14 large commercial banks were nationalised. The main objectives of bank nationalisation were:

(i) Greater mobilisation of savings through bank deposits;

(ii) Widening of branch network of banks, especially in the rural and semi-urban areas; and

(iii) Re-orientation of credit flows so as to benefit the hitherto neglected sectors such as agriculture, small scale industries and small borrowers.

Following bank nationalisation, several important steps were taken including nationalisation of six more banks in 1980. A priority sector target of 33.3 per cent was prescribed for public sector banks in 1974, revised further to 40 per cent in 1980. Special schemes were introduced for the weaker sections, such as the Differential Rate of Interest (DRI) scheme in 1972 and Integrated Rural Development

Programme (IRDP) in 1980. A comprehensive branch licensing policy was announced for 1978-81 and subsequently for 1982-83 to 1984-85. New specialised institutions were created including Regional Rural Banks (RRBs) in 1975, National Bank for Agriculture and Rural Development (NABARD) and Export and Import Bank of India (EXIM Bank) in 1982.

The decade and a half following the bank nationalisation in 1969 was marked by a rapid expansion of the banking system. A distinct transformation of far-reaching significance occurred in the banking system. By and large, the major objectives of bank nationalisation were fulfilled. Banking in India acquired a broad mass base and emerged as an important instrument of socio-economic change.

The central bank thinking during the expansionary phase was well reflected in the statements of the then Governors. For instance, Governor S. Jagannathan observed:

> "Commercial banks should certainly move away from their traditional security orientation in favour of an evolution based on repayment potential and anticipated income but they must also make sure that such income is, in fact, forthcoming" (November 1970).

This was reiterated further by Governor M. Narasimham when he observed:

> "Banking has thus been moving away from a security-oriented approach to a purpose-oriented operation and the question bankers increasingly should be asking themselves is not what they are lending against but what they are lending for" (May 1977).

The rationale for the emergence of the priority sector lending, which emerged during this phase, was illustrated by Governor I.G. Patel when he said:

> "The accent of our policy has to be not only on growth but also on greater equality, on the poorest and the hitherto

> neglected receiving the highest priority, on *Antyodaya*, on Unto the last, if you like" (February 1979).

With the drought of 1972 and the oil price shock in 1973 (and again towards the end of the decade), inflationary pressures in the economy remained acute while the balance of payments situation deteriorated significantly. (Indeed, inflation reached an annual rate of as much as 23 per cent in 1973-74, which was unacceptable.) In this regard, Governor Patel clarified:

> "While it is not true to say that if we take care of our balance of payments we take care of the economy, it is certainly right to assert that if we take care of the economy, the balance of payments will take care of itself" (August 1980).

On the inflation front, given the then debate on whether or not inflation was a monetary phenomenon, Governor Patel came out sharply and stated:

> "I am afraid this country of ours, great and blessed as it is, enjoys no such divine dispensation of immunity from monetary laws - which are after all, only reasonable approximations to the laws of supply and demand which at least business men should not belittle or deride" (February 1979).

This was echoed further by Governor Manmohan Singh when he observed:

> "Economic policies must have a strong systematic bias in favour of minimizing inflationary pressure. By now, there is a convincing amount of evidence that inflation distorts Plan priorities, can play havoc with the balance of payments and brings about highly arbitrary shifts in income distributions leading to disruptive social tensions" (November 1982).

Notwithstanding the notable achievements of the expansionary phase one cannot deny, with the benefit of hindsight, however, that competitive efficiency deteriorated. In the banking sector, with wider

geographical coverage, lines of supervision and control lengthened. Retail lending to more risk-prone areas at concessional interest rates raised costs, affected the quality of assets of banks and strained banks' profitability. In response to these developments, the financial system entered the next phase - the phase of consolidation and diversification, beginning the mid-1980s.

## C. Consolidation and Diversification Phase

A series of policy initiatives were taken in this phase aimed mainly at consolidation and diversification and to an extent, at deregulation.

The consolidation measures included:

(i) a significant slowdown in branch expansion while emphasising coverage of spatial gaps in rural areas,

(ii) comprehensive action plans of individual banks covering organisation and structure, training, house-keeping, customer service, credit management, recovery of dues, staff productivity, profitability and computerisation, and

(iii) introduction of Health Code System for banks in 1985.

Greater flexibility of operations was provided to banks by withdrawing restrictions on transfer of borrowal accounts from one bank to another, by abolishing the requirement of prior authorisation under the Credit Authorisation Scheme (CAS) in 1988, and by allowing banks to enter business of equipment leasing (1984), and mutual funds (1987).

Policy-related constraints on bank profitability were relieved to an extent by phased rationalisation of bank deposit and lending rates, by raising coupon rates on government securities, and by removing the ceiling of 10 per cent of call/notice money fixed by the IBA (in 1989).

Structural constrains were relaxed by pursuing development of the money market - widening its scope, introducing new instruments and strengthening the existing ones. New instruments included 182-day Treasury Bills (1986), inter-bank participation certificates

(IBPCs) (1988) and certificates of deposit (CD) and commercial paper (CP) (both 1989). Additionally, during this phase, new institutions were established, such as the Discount and Finance House of India (DFHI) in 1988 and Small Industries Development Bank of India (SIDBI) in 1990. Moreover, priority-sector lending was made obligatory for foreign banks in India (1989).

The consolidation phase broadly coincided with the tenure of Governor R.N. Malhotra who offered the following assessment:

> "It would thus be clear that banking is no longer confined to the more affluent sections of population. It has acquired a broad base and has also emerged as an agent of development in the rural sector… Having achieved adequate geographical spread, the banking industry has entered a new phase. In this new phase, the key aim would be to consolidate the gain made so far. Consolidation would imply strengthening of banks' structures, training, house keeping, internal procedures and systems, improvement in the quality of loan appraisals and loan asset, and better customer service and profitability… Banks need to make special efforts to improve their profitability. They must enhance cost consciousness at all levels and raise productivity substantially"(May 1986).

Governor Malhotra brought the issue of monetary-fiscal policy co-ordination back on the policy agenda when he stated:

> "Though inflation rates in India have been comparatively moderate, they have caused widespread concern and affected the levels of interest rates and exchange rates. This calls for better coordination between fiscal and monetary policy" (September 1990).

Governor Malhotra also warned that:

> "While pursuing their promotional role, central banks in developing countries cannot ignore their primary function as regulators of the overall volume of money and credit in the economy with a view to ensuring a reasonable degree of price stability" (September 1990).

Although the Reserve Bank attempted to rejuvenate a degree of market-based resource allocation, fiscal dominance continued to constrain the manoeuvrability of monetary policy. High fiscal deficits - at an average of 7.7 per cent of GDP during 1985-90 - began to sear the macroeconomic balance. The current account deficit began to widen reaching an unsustainable 2.3 per cent during the latter half of the 1980s. The sudden hike in the oil import bill after the Gulf war enlarged the current account deficit to 3.2 per cent of GDP in 1990-91. As investor confidence waned, the economy was pushed into an unprecedented balance of payments crisis in 1991. Since the fiscal policy was immobilised by high deficits, the Reserve Bank had to restore macroeconomic stability with measures aimed at demand containment and import compression. The process of structural adjustment was gradually dovetailed into a broader process of economic reforms in order to enhance growth through higher productivity and macroeconomic stability. In this connection, Governor Venkitaramanan pointed out that:

> "Sharp reduction of fiscal deficit, removal of restrictions on industrial investment, trade policy changes, liberalisation of the financial sector and opening of the economy to foreign investment in a manner and at a speed which will not be disruptive are the building blocks of the reform process in India" (September 1992).

The comprehensive package of structural reforms in the wake of the macroeconomic crisis of 1991 paved the way for the current phase of financial sector liberalisation.

## D. Financial Sector Liberalisation Phase

The financial sector reform programme underway since 1992-93 aims at promoting a diversified, efficient and competitive financial sector with the ultimate objective of improving the allocative efficiency of available savings, increasing the return on investments and promoting an accelerated growth of the real sector of the economy.

The reform package has had three broad components:

(a) improvement in the overall monetary policy framework;

(b) strengthening of financial institutions; and

(c) gradual integration of the domestic financial system into the global economy.

More specifically, the on-going financial sector reform programme seeks to achieve the following:

(i) Suitable modifications in the policy framework within which banks operate, such as rationalisation of interest rates, reduction in the levels of resource pre-emptions and re-structuring of directed credit programmes.

(ii) Improvement in the financial health and competitive capabilities of banks by means of prescription of prudential norms, recapitalisation of banks, restructuring of weaker banks, allowing freer entry of new banks and generally improving the incentive system under which banks function.

(iii) Building financial infrastructure relating to supervision, audit technology and legal framework.

(iv) Upgradation of the level of managerial competence and the quality of human resources by reviewing the policies relating to recruitment, training, placement and so on.

In conformity with these objectives, the measures that have been taken under the current phase are highly significant.

At the heart of monetary reforms lay the limiting of the draft of resources by the fisc from the banking system by *fiat*. The system of automatic monetisation of Government deficit has been replaced by a system of Ways and Means advances (WMA). With the Reserve Bank gradually regaining control of its balance sheet, it was possible to drastically reduce reserve requirements and gradually shift to other instruments of monetary control, such as open market operations and changes in the Bank Rate consistent with a market-based process of resource allocation. This also enabled a significant deregulation of interest rates, initially on the lending side and subsequently on the deposit side.

The Reserve Bank, like central banks in most emerging market economies, took major initiatives in terms of market and product development with a view to rejuvenating the process of price discovery. The Government borrowing programme was put through the auction process in 1992. As interest rates on government paper became increasingly market-related, it was possible to cut statutory liquidity requirements (SLR) to the statutory minimum of 25.0 per cent. This was well supported by the development of a gilts market through a number of significant steps: First, the development of new instruments, such as, Treasury Bills of varying tenor, zero coupon bonds, floating rate bonds, partly paid stock and government paper with options. This was meant for reconciling different objectives of managing the maturity profile, for meeting requirements of investor groups (for example, insurance companies with a demand for long-term paper) and for creating liquidity in scrips through reissuance while at the same time avoiding bunching of repayments; secondly, introduction of a primary dealer network to act as market makers; thirdly, institution of a system of Delivery *versus* Payment in which the transfer of securities synchronises with the cash payment reducing settlement risk in securities transactions; and finally, setting up a National Dealing System (NDS), providing on-line dealing and reporting of transactions in money market instruments and government paper as well as the Clearing Corporation of India Limited (CCIL), an industry service organisation for clearing and settlement of trades in foreign exchange, government securities and other debt instruments.

The implications have been many:

- The markets for short-term funds received a boost after restrictions on the cash credit system put the onus of short-term cash management on the borrowers.
- The phasing out of on-tap 4.6 per cent Treasury Bills (April 1997), which could be purchased and later discounted by banks on the basis of their liquidity position, also helped to deepen money markets.
- The withdrawal of CRR stipulations on inter-bank liabilities, because of which the inter-bank market used to almost vanish

on reporting Fridays and distort the pricing of 14-day money, facilitated the emergence of a yield curve.

- The call money market was initially widened by introducing non-bank participants. In tandem with the parallel development of a repo market outside the Reserve Bank, non-banks are being phased out of the call money market, which would now operate as a purely inter-bank market.

On the institutional side, financial sector reforms have attempted to inject competitive pressures in the banking system by allowing new private sector banks and by withdrawing balance sheet restrictions so as to enable banks to optimise their portfolios across credit, foreign exchange, gilts and capital markets. The greater freedom of operation has been accompanied by safeguards to ensure financial stability, essentially under the *aegis* of the Board for Financial Supervision (BFS). In consonance with the need to foster market forces, the strategy of supervision has shifted from micro-regulation to macroeconomic incentive-based management through the prescription of prudential norms relating to income recognition, asset classification and provisioning requirements and capital adequacy. This has been supplemented by the guidelines in respect of asset-liability management and risk management systems.

It is necessary to appreciate that just as the conduct of monetary policy shaped the process of financial sector reforms, financial liberalisation itself posed fresh challenges to the conduct of monetary management. In view of strong capital flows, which followed macroeconomic stabilisation, the Reserve Bank absorbed the surplus in its balance sheet in order to maintain export competitiveness of the economy and at the same time, sterilise the monetary impact to rein in inflation which was spilling into double digits. Although the battle against inflation was won by the latter half of the 1990s, domestic growth decelerated to 5.0 per cent levels during 1996-97 to 2001-02 from 7.0 per cent levels during 1993-94 to 1995-96. This necessitated the institution of an easy liquidity regime to spur investment demand. Contemporaneously, frequent switches in capital flows necessitated swift policy action to maintain monetary stability. Secondly, the operating

procedures of monetary policy had to contend with shifts in monetary transmission channels as a result of financial liberalisation. Finally, the evolution of inter-linked money, Government securities and foreign exchange markets, while necessary for efficiency, posed challenges to monetary management in terms of heightened risks of contagion.

The transition from a planned economy to a market economy in the 1990s, thus, sharpened the Reserve Bank's monetary policy dilemma of providing credit to both the Government and the commercial sector at a reasonable cost, while at the same time containing inflationary pressures. While sudden external shocks required a hardening of monetary conditions in order to ensure orderly conditions in the financial markets, the growth objective presaged a softer interest rate regime. In view of the increasing complexities of monetary management, the Reserve Bank adopted a multiple indicator approach in which a host of macroeconomic variables are monitored for the process of monetary policy formulation. Furthermore, the monetary authority had to simultaneously hone up an array of monetary policy instruments - quantum and rate - in order to harness monetary conditions to the desired macroeconomic objectives in this *milieu* of uncertainties.

The present day challenges to central banking in India and abroad are too complicated to allow a simple summing-up. The unsettled state of the policy debates and the central banks' dilemmas call for a fuller discussion, to which we turn next.

## Section III

## Contemporary Issues in Central Banking

Most central banks today perform functions which go well beyond the core central banking functions. The range of contemporary issues in central banking may be discussed under the following three broad headings:

A. Formulation and Conduct of Monetary Policy,

B. Financial Stability,

C. Payments and Settlement System,

Broader issues relating to central bank strategy, credibility and independence, at this juncture, could be meaningfully analysed in this specific context.

## (A) Formulation and Conduct of Monetary Policy

There is no uniform interpretation of monetary policy strategy in the literature. Monetary policy broadly comprises a clear specification of the monetary policy reaction function and communicating the reaction function and the actual policy decisions to the public.[13] The former component of the strategy includes:

- The objectives of monetary policy;
- the (intermediate) policy target through which the ultimate objectives are obtainedl; and
- the institutional framework of monetary policy decision-making (*i.e.*, the operating procedures of monetary policy).

On the other hand, the latter component of the strategy emphasises communication policy, in respect of the pre-commitment to policy targets, transparency about the decision making process and the signals to condition/anchor public expectations, derived from the degree of central bank autonomy.

### (i) Objectives

The key issue here is whether the attainment of price stability should be the dominant objective of monetary policy. The case of price stability as the prime objective of monetary policy rests on the assumption that volatility in prices creates uncertainty in economic decision making. Rising prices affect savings adversely while they make speculative investments more attractive. The most important contribution of the financial system to an economy is its ability to augment savings and allocate resources more efficiently. A regime of rising prices, thus, clearly vitiates the atmosphere for promotion of savings and allocation of investment. Furthermore, the domestic inflation rate also has a bearing on the exchange rate of the currency. Besides, there is a social dimension, particularly in developing

economies. Indeed, inflation affects adversely the poorer sections of the society who have no hedges against inflation. Thus, a critical question that arises in this context is at what level of inflation the adverse consequences begin to set in.

The empirical evidence on the relationship between inflation and growth in cross-country framework is somewhat inconclusive. In many cases, the sample includes countries with inflation rates as low as only one to two per cent as well as countries with inflation rates going beyond 200 and 300 per cent. It is, however, clear that growth rates tend to fall with high inflation.[14] The appropriate inflation threshold beyond which costs tend to exceed benefits, thus, needs to be estimated for each country separately.[15] Nevertheless, even moderate inflation levels are often perceived to be worrisome by the policy makers because, inflationary pressures, if not held in check, can lead to higher inflation and eventually affect growth.

While there is a growing consensus among the central bankers regarding the virtues of price stability, the case against price stability is not without its protagonists. Notably, Prof. Paul Krugman has recently argued that.

> "……..the belief that absolute price stability is a huge blessing, that it brings large benefits with few if any costs, rests not on evidence but on faith. The evidence actually points the other way: the benefits of price stability are elusive, the costs of getting there are large, and zero inflation may not be a good thing even in the long run."

Prof. Krugman's arguments do not seem relevant for developing economies because his criticism is aimed against those countries which seek 'absolute' price stability and (unlike most developing countries), attempt to bring down inflation rate from about 2 per cent to almost zero. This is evident from what he himself advocates: "….adopt as a long run target fairly low but not zero inflation, say 3-4 per cent. This is high enough to accommodate most of the real wage cuts that markets impose, while the costs of the inflation itself will still be very small."

The anti-inflationary stance of monetary policy during the 1990s was essentially framed against the backdrop of high inflation of the 1960s, fuelled by large-scale monetisation of fiscal deficits. In a sharp contrast, the recent co-existence of low and stable inflation - even deflation - with low growth, has naturally fostered a degree of revisionism. In many cases, financial crises, often sparked off by irregularities in the banking system and "irrational exhuberance" in capital markets, which could not be picked up by inflation indicators, had adverse output effects. This set off a process of deflation, which in turn, fed back into the system by eroding collateral values. Combating the spiral of falling prices and output in a conventional monetary policy framework is especially difficult given the zero bound on nominal interest rates. This has fostered a lively debate between the proponents of the so-called "continuity view", who interpret the present situation as an aberration and those advocating the so-called "new view", who urge a broader degree of central bank activism, especially in response to financial market developments, which have potential output effects.[16] Notwithstanding the extreme theoretical positions, most central banks tend to operate on the golden mean of constrained discretion which takes the pragmatic view that within the mandate of price stability, monetary policy has to stabilise swings in effective demand as well (Bernanke[17], 2003). This is reinforced by the recent report of the IMF's Interdepartmental Task Force on Deflation.[18] The Report suggests that central banks need to pay attention to a wide menu of macroeconomic indictors, including developments in aggregate prices, output gaps and asset, credit and financial markets (which are aggregated to construct an index of deflation vulnerability) so as to ward off the potential deflationary tendencies.

Despite a generalised recognition of price stability as the primary goal of monetary policy, in the face of a benign inflationary environment in the last few years, the objective of output stabilisation has, thus, been prominently pursued by central banks all over the world, both in terms of preventing economic overheating and providing stimulus to faster recovery from recessions. Several developing countries have also used monetary measures to defend the exchange rate. In this context, the debate on "rules *versus* discretion" has engaged the attention of policy makers, and given

the scope for time-inconsistent behaviour and the associated inflation bias of central bankers, there has been a growing emphasis on policy rules, particularly the Taylor-type rules.[19] Constrained discretion seems to be the preferred rule for most central banks today.

A number of central banks, beginning with New Zealand (1989), adopted price stability as the sole goal of monetary policy during the 1990s. Presently, there are 18 inflation targeters.[20] This also implies there are many others, including the US Federal Reserve, no less, outside the fold. Interestingly, a 1999 Bank of England[21] survey of monetary policy frameworks reveals the continuing diversity of central bank objectives. While price stability emerged as the main/ other important policy objective in 50 out of the 77 central banks, as many as 54 central banks reported exchange rate management to be the main/other important policy objective. There is no doubt that inflation targeters have been able to achieve a reasonable degree of price stability. At the same time, there is little evidence to suggest that inflation targeting on average improves performance as measured by the behavior of inflation, output, or interest rates.[22]

In the Indian context, the broad objectives of monetary policy have been:

- to maintain a reasonable degree of price stability; and
- to help accelerate the rate of economic growth.

The emphasis as between the two objectives has changed from year to year depending upon the prevailing conditions.

The crucial question that is being debated in India as elsewhere is whether the pursuit of the objective of price stability by monetary authorities undermines the ability of the economy to attain and sustain high growth. A considerable part of the relevant research effort has been devoted to the trade-off between economic growth and price stability.

In India, the Chakravarty Committee (1985) had presumed precisely the same target of four per cent as "the acceptable rise in

prices' purported to reflect 'changes in relative prices necessary to attract resources to growth sectors". Subsequent research places estimates of threshold inflation in India in the range of 4-7 per cent, depending on the period and methodology.

A macro-econometric model of the Indian economy shows that a 10 per cent sustained hike in real public investment in the non-agriculture sector, financed by primary money leads to an annual inflation rate of about 2.3 per cent and additional GDP growth of one per cent, on an average, during the first two years. In a span of 10 to 15 years, inflation rate rises to about 17 per cent per annum while additional output growth slows down considerably to an average of 2.7 per cent over this period. This implies that in the long run a sustained improvement in growth through monetisation of the fiscal deficit could involve a severe trade-off in terms of inflation as every one per cent additional output growth would entail nearly 6 to 6.5 per cent increase in the inflation rate in the long-run.[23]

It may be noted, however, that there is a need to have an appropriate fix on the acceptable level of the inflation rate in India. In the 1970s, the average annual inflation rate, as measured by the Wholesale Price Index (WPI), was 9 per cent. In the 1980s, it was 8 per cent. However, in the period between 1990 and 1995, the average inflation shot up to around 11.0 per cent before decelerating to about 5.3 per cent during 1995-2002. The objective of the policy has been to keep the inflation rate around 4 to 5 per cent. This itself is much higher than what the industrial countries are aiming at and therefore, does have some implications for the exchange rate of the rupee. Monetary growth can be so moderated that meeting the objective of growth does not push inflation rate beyond this tolerable level on an average.

No one in India is advocating absolute price stability or even the order of price stability that is being sought as an objective in the industrially advanced countries. The Advisory Group on Monetary and Financial Policies (Chairman: Shri M. Narasimham), however, recommended that the Reserve Bank should be mandated a sole price stability objective. There are several operational constraints, as noted

by Governor Jalan in the Monetary and Credit Policy Statement of April 2000:

> "Based on the experience of some industrialised countries, there is a view that, in India also, monetary policy, to be transparent and credible, should have an explicit narrowly defined objective like an inflation mandate or target. While technically this appears to be a sound proposition, there are several constraints in the Indian context in pursuing a single objective. First, there is still fiscal dominance and the debt management function gets inextricably linked with the monetary management function while steering the interest rates…Secondly, in the absence of fully integrated financial markets, which remain still imperfect and segmented, the transmission channel of policy is rather weak and yet to evolve fully. Thirdly, the high frequency data requirements including those on a fully dependable inflation rate for targeting purposes are yet to be met " (December 2000).

A question that is sometimes raised in this context is whether monetary policy by itself could be able to contain inflationary pressures particularly in developing economies like ours. It is true that developing economies like India are subject to greater supply shocks than developed economies. Fluctuations in agricultural output have an important bearing on prices. Nevertheless, a continuous increase in prices, which is what inflation is all about, cannot occur unless it is sustained by a continuing increase in money supply. The control of money supply has thus an important role to play in any scheme aimed at controlling inflation.

The mix of monetary and non-monetary factors behind Indian inflation is reflected in Governor Y. V. Reddy's Mid-Term Review of Monetary and Credit Policy of November 2003:

> "…The probability of emergence of any undue pressure on prices during this year appears to be low on current indications. First, the good monsoon and expected recovery of agricultural production would have a favourable impact

> on prices of agricultural commodities. Second, the comfortable stocks of foodgrains and foreign exchange reserves would facilitate better supply management in the unlikely event of price pressures in agricultural commodities. Third, the prices of 'fuel, power, light and lubricants' so far have remained moderate in the absence of any renewed pressure on international oil prices, particularly in the wake of reduction in geopolitical tensions in the Middle-East. Fourth, both $M_3$ and reserve money growth have remained subdued…".

Besides, the issue of the merit of price stability as a central banking objective, there is also the question of measuring inflation. There are several issues involved here:

- The vast range of the consumption basket often makes it difficult to create a comprehensive price index. The measurement of services inflation, for example, is an important issue in the Indian context, which was recognised by the Working Group on the Index Numbers of Wholesale Price in India (1999).
- There is also the choice between wholesale and consumer prices. The Wholesale Price Index (WPI) and the Consumer Price Index (CPI) occasionally diverge because of the problems of coverage and the weighting of commodities comprising the indices. As pointed out in the Reserve Bank's April 2001 Monetary and Credit Policy Statement, this divergence between retail and consumer prices is a reason why central banks need to monitor several indicators.
- The rapidity of product innovations makes inter-temporal comparisons increasingly difficult. Illustratively, while a base-line personal computer could cost the same in 1997 and 2003, its power could have been upgraded from 266 MHz to 1000 MHz.
- Individual consumption baskets have been rapidly expanding, especially in emerging market economies. Thus, individuals could, *ceteris paribus*, be worse-off because the list of items of consumption they perceive as a 'standard need' has expanded although their prices have not changed.

- Another issue is the integration of asset prices in the standard price indices, which typically comprise commodities.[24] It is not clear, first of all, whether asset price changes should be viewed as a cause or a component of inflation as we understand it today. Besides, the methodology of factoring in asset prices in the standard price indices is still not very firm.

- There is a need to distinguish between the pull- and push- factors behind inflation. The recent literature has attempted to construct measures of "core" inflation, which is the part of inflation that emanates from demand side pressures.[25] There are several methodologies available - the most popular one being to exclude commodities whose prices are subject to supply shocks, such as oil. Since the monetary authority is essentially concerned with the management of demand, several central banks, such as Australia, Canada, New Zealand and the UK monitor some variants of core inflation. In case of emerging market economies such as India, the difficulty is often that a measure of 'core' inflation could lose public credibility since a large part of the inflation is driven by a wide-range of regular supply shocks.

It is important to appreciate that, on balance, the monetary policy decisions of the Reserve Bank, like those of most central banks, are essentially environment- specific. Thus, just as price stability is of prime importance, growth is equally a matter of policy concern. Although the two objectives are mutually reinforcing in the long run, short-run trade-offs are often live and real, especially in case of structurally constrained economies. It is in this context, Governor Jalan has summed up the prevalent thinking:

> "…There is a growing consensus now - in theory as well as in practice - that Central Bank should have instrumental independence, and concentrate on a single target of inflation control with the use of a single instrument. The position, no doubt, is theoretically sound, but as I look at the history of economic thought and changing fashions in economic policy making, I must confess to a sense of discomfort on whether the current dominant view on "one target, one instrument" will survive the test of time…In developing countries this

whole question of trade-off - particularly at the margin - and during periods of external or domestic uncertainties, becomes even more relevant because of a large non-monetised and agricultural economy. It seems to me that a certain amount of target flexibility and balancing of conflicting objectives are unavoidable…" (December 2000).

**(ii) Intermediate Target**

Besides the objectives for monetary policy there are other issues connected with the transmission mechanism of monetary policy actions. Central Banks in the industrialised economies have experimented with various intermediate targets in order to influence the economy in general and prices in particular. In choosing appropriate targets, central banks generally keep three major aspects in view: First, the ability to influence the target variable in a reasonably predictable manner is important. Secondly, the target must exhibit a stable (if not constant) relationship with the end objective of monetary policy. Thirdly, the target must lead to the final objectives, even though feedbacks from developments in the goal variable to the target are also important. In the context of the growing emphasis on monetary policy transparency, the chosen target should also be clearly communicable to the public.

In the choice of the target, there is always a trade-off between 'controllability' of the target and the 'attainment' of the end objectives. The monetary policy mechanism holds the key in determining the target. If variables at the beginning of the transmission process are selected (such as interest rate or base money growth), the target may be become controllable but may not show a strong influence on the goal variable. At the other extreme, the final objectives (such as inflation or nominal income) that lie at the end of the transmission process could also be targeted. In such cases, however, the monetary authority may have little control over the target. The middle option could be to adopt intermediate targets (such as money growth or exchange rate) which could lie somewhere at the middle of the transmission process. The importance assigned to targets *vis-a-vis* objectives in the design of the monetary policy strategy is particularly

critical because a mere achievement of targets while missing the objective could erode the credibility of monetary policy.

The question relating to the choice of appropriate target for conducting monetary policy goes into the basic question of the interrelationship between money, output and prices. With the observed instability of the money demand function, several central banks have been disenchanted with monetary targeting and have accordingly either switched over to a 'menu' or 'check list approach' or given up monetary targeting altogether. Nevertheless, in the 1999 Bank of England survey of monetary frameworks, 43 out of 50 central banks viewed monetary aggregates as relevant intermediate targets while only seven central banks preferred the interest rate as intermediate targets.[26]

In developed economies, an alternative to monetary targeting has been the interest rate. This has been primarily due to the fact that interest rates in those countries play a more important role in equilibrating markets. Various segments of the financial markets are closely integrated with interest rates in the different markets mutually influencing one another. This is hardly the case with most developing countries although such an integration could be seen emerging in several of them.

The effectiveness of central bank policies has to be assessed in the context of the great uncertainties against which the policies are implemented. There are concerns about the ability of a central bank to influence the term structure of interest rates. Inflation expectations are highly volatile; hence it is difficult to know the real rate of interest at any point of time. It is also not easy to assess monetary conditions during normal periods. Inflation calls for tightening and recessions call for easing of monetary policy. During the intermediate conditions, it is difficult to assess what the appropriate stance of monetary policy could be. The ability to fight deflation has long been a major challenge for the modern central banks. The exchange rate regime adopted by a country and financing of the fiscal deficits also have significant implications for the independence over the money supply process. The "impossible trinity", *i.e.*, incompatibility between fixed exchange

rate regime, open capital account and independent monetary policy is well recognised by the central banks all over the world.

The growing complexities of macroeconomic management is now leading a number of central banks to monitor a number of macroeconomic indicators rather than centre monetary policy decisions around nominal anchors such as money, interest rates and the exchange rate. The management information system of a number of central banks, including the European Central Bank, the Bank of Mexico and the South African Reserve Bank, has now been broadened to a large set of macroeconomic variables, often including leading indicators, in response to the growing complexities of monetary management.

The Reserve Bank broadly followed a monetary targeting regime since the later half of the 1980s till 1997-98, based on the recommendations of the Chakravarty Committee. The cornerstone of the monetary strategy was a stable relationship between money, output and prices. The available empirical evidence then had clearly suggested that the demand for real money was a reasonably stable function of a select set of variables. In fact, some of the factors that have contributed to the instability of the demand function for money in the industrial economies such as financial innovations and large movements of funds across the border were yet to have the same impact in India. The Reserve Bank was, thus, able to estimate the appropriate growth in money supply, given the expected increase in real output and the acceptable level of inflation. An increase in money supply was seen not only resulting in an increase in demand but also influencing output through the availability of credit. The concept of monetary targeting that was being used in India was a flexible one which took into account the various feedbacks. In this connection, Governor Rangarajan had remarked that:

> "Our approach to money supply has been eclectic. We have not bound by a fixed rate of growth of money. This is a far cry from "mindless monetarism" of which we are sometimes accused…". (February 1997)

The growing complexities of monetary management during the 1990s increasingly required that the formulation of monetary policy

be based on the information gleaned from a large number of macroeconomic indicators rather than being predicated on a single monetary aggregate. This was reinforced by the monetary experience during 1997 and early 1998 when external shocks - most notably during the East Asian crisis - impacted on Indian financial markets. Besides, there was also the policy concern that while the money demand functions estimated typically with time series data continue to be stable, the deregulation of interest rates during the 1990s could impact on money demand. This ambivalence on the vexed issue of the stability of money demand was clearly articulated by Governor Jalan in the Monetary and Credit Policy Statement of April 1998:

> "Most studies in India have shown that money demand functions have so far been fairly stable. However, the financial innovations that have recently emerged in the economy provide some evidence that the dominant effect on the demand for money in near future need not necessarily be real income, as in the past. Interest rates too seem to exercise some influence on the decisions to hold money".

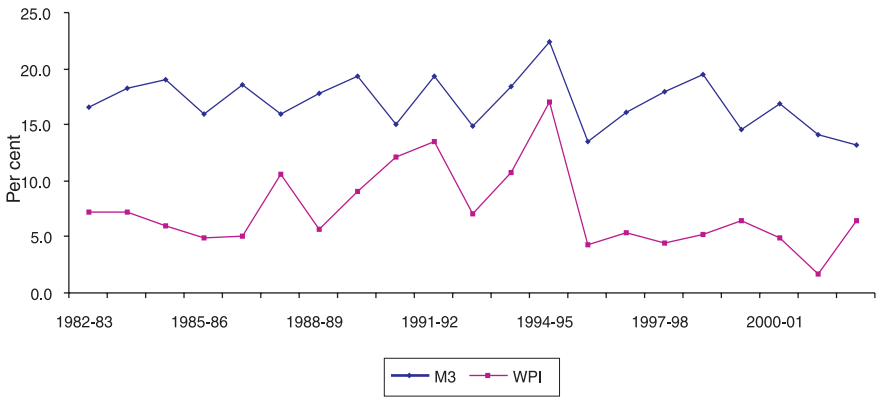
This was echoed in the contemporaneous report of the Working Group on Money Supply: Analytics and Methodology of Compilation (Chairman: Dr. Y.V. Reddy) (1998). The Group reported that while there existed a long-term equilibrium relationship between real money balances and real income, there were short-term deviations from the long-run equilibrium, which could be explained by other relevant variables to ensure predictive accuracy. The Group, thus, concluded that monetary policy exclusively based on the demand function for money could lack precision. In view of the changing monetary dynamics, the Reserve Bank formally switched from monetary targeting and broad-based its list of policy indicators in April 1998. The Monetary and Credit Policy Statement of April 1998 announced that the Reserve Bank would:

> "…adopt a multiple indicator approach wherein interest rates or rates of return in different markets (money, capital and government securities markets) along with such data as on currency, credit extended by banks and financial institutions,

fiscal position, trade, capital flows, inflation rate, exchange rate, refinancing and transactions in foreign exchange available on high frequency basis are juxtaposed with output data for drawing policy perspectives…".

In the new monetary policy framework, although the exclusive use of monetary aggregates has been de-emphasised, it remains an important indicator of the monetary policy stance, with the monetary and credit policy statements announcing monetary projections for the year. Monetary aggregates continue to be relevant for India for two reasons. First, since the money demand function for India has remained reasonably stable, it remains helpful in predicting price movements with reasonable accuracy at least over a period of time, say 3 to 5 years (Chart 1). The Monetary and Credit Policy Statement of April 2001 stressed that while prices could be affected by non-monetary supply side factors in the short run, there is very little disagreement that in the medium to long term, inflation is essentially a monetary phenomenon. This is reinforced by the fact that the income velocity of money - which relates the money stock to nominal income - has remained reasonably stable in sharp contrast to the volatility experienced in economies in which financial innovations have been deep. Secondly, the money stock target is relatively well understood by the public at large. With the money supply target, the stance of monetary policy is unambiguously defined and gives a clear signal

**Chart I : Money and Inflation**



to market participants. This is, of course, not to say that monetary authorities should confine their attention to just one aggregate. In the Indian context, the quantity of money continues to play an important role in determining prices. Under these circumstances, it is better to target money than the interest rate. However, the monetary authority must watch the behaviour of interest rates in various markets and must be willing to intervene and smoothen the volatility. At the same time, it is necessary to decompose the sources of inflation in view of the repeated occurrence of supply-side shocks in the economy since the late 1990s. This is not necessarily inconsistent with an overall monetary target.

A number of central banks, including Australia, Austria, Canada, New Zealand, Norway and Sweden, have experimented, in the mid-1990s, with monetary conditions indices[27](MCI) constructed by a linear combination of domestic interest rates and the exchange rate, weighted by a measure of the degree of openness of the economy. The Monetary and Credit Policy Statement of October 1997 also explored the possibilities of using MCIs as indicators of monetary conditions. Although the Bank of Canada continues to use the MCI as a loose operating target, the cross-country experiences with the MCI have not been very positive, especially as the degree of transmission to the monetary policy objectives of price stability and growth have been often open to doubt.

An important component of the process of monetary policy formulation is to stabilise inflationary expectations. A number of central banks, including the Bank of England, conduct market surveys. Some central banks, such as the European Central Bank (ECB) and the South African Reserve Bank, also monitor yield curves, a locus of the yields of various maturities at a point of time, to gauge market expectations. Simply put, the argument is that if the markets expect higher (lower) demand in the future, the cost of funds would increase (fall) accordingly.[28] In emerging markets, the information content of yield curves is often limited by a number of factors. First, it is not always clear whether shifts in the yields reflect expectations regarding growth or inflation, especially as supply shocks often mean that prices can go up even when the economy is below potential output. Second,

since Government securities markets are not deep enough, players do not necessarily make fine distinctions between tenors available. It is precisely this large set of ifs and buts that render central banking in emerging market economies so much more complex.

### (iii) Operating Procedures of Monetary Policy

The operating procedures of monetary policy have been changing the world over in response to financial liberalisation. The key challenge before the contemporary monetary management is to modulate liquidity conditions in the financial markets consistent not only with the macroeconomic objectives but also with the market outcomes. A number of central banks set formal/informal bands for the overnight interest rate. Such monetary policy impulses travel to real activity if inter-bank markets are deep enough and if the interest rate structure, as a whole, is sufficiently sensitive to movements at the short end.

The strategy of liquidity management followed by a number of central banks now broadly follows a two-step procedure of estimating market liquidity, autonomous of policy action to initiate action in terms of open market operations and interest rate signals to steer monetary conditions.[29] Participants in the Large Value Transfer Systems (LVTS) are provided overdrafts at the ceiling of the interest rate band while post-settlement surplus balances yield interest income at the floor rate of the band. The overnight rate, thus, generally hovers within the band because the participants know that they will at least get the floor rate on their surplus balances and pay the maximum ceiling rate for meeting any shortfall. When the overnight rate goes beyond the ceiling, central banks may inject liquidity through reverse repo operations. Obversely, when the overnight interest rate falls below the ceiling, the central bank may impound liquidity through repo operations. The other advantage of liquidity management is that it accords central banks the flexibility to quickly switch between the quantum and rate of liquidity. In a scenario when transmission channels shift course, this assumes a special significance. The actual framework adopted by a country to manage liquidity, however, may vary in terms of the specific aspects of their operations.

The operating procedures of monetary policy of most central banks are now beginning to converge to variants of three closely-related paradigms:

- A number of central banks, including the US Federal Reserve (since 1992), estimate the demand for bank reserves and then carry out open market operations to target short-term interest rates (the Federal Funds Rate in case of the USA).
- A second set of central banks, including the Bank of Japan (since March 2000), estimate market liquidity and carry out open market operations to target bank reserves, while allowing interest rates to adjust.
- A third and growing number of central banks, including the European Central Bank, modulates monetary conditions in terms of both the quantum and price of liquidity, through a mix of open market operations (OMOs), standing facilities and minimum reserve requirement and changes in the policy rate, but do not announce pre-set money or interest targets.

Central banks in most emerging market economies now follow one of the three leading paradigms. The Bank of Mexico estimates the demand for bank reserves and conducts open market operations to achieve a target level of the banks' settlement balances with itself, allowing interest rates to adjust. The Bank of Korea switched to an interest rate target in 1998, through open market operations conducted on the basis of estimated demand for bank reserves. The Bank of Thailand (BOT) manages market liquidity through daily repurchase market operations, and foreign exchange swaps supplemented by interest rate signals through the fortnightly repurchase rate.

The operating procedure of the conduct of the Reserve Bank's monetary policy have witnessed, in many ways, the most dramatic shifts during the 1990s. The Reserve Bank has gradually shifted from direct to indirect instruments of monetary control in order to align monetary policy to the new market-based environment. The emerging liquidity management framework is broadly in line with cross-country experiences in respect of changes in operating procedures of monetary policy in response to the challenges of financial liberalisation. There

are now an array of monetary policy levers, including open market operations and interest rate signals - which are able to effectively modulate monetary conditions consistent with the process of price discovery. Besides, the shifts in the monetary policy transmission channels as a result of financial liberalisation necessitate policy impulses through both quantum and rate channels. Finally, the experience of sudden switches in capital flows has emphasised the need for swift policy reactions with a view to balancing the domestic and external sources of monetisation to maintain orderly conditions in the financial markets ensure price stability.

The switch to indirect instruments of monetary control began in the early 1990s with the initiation of financial sector reforms. The particular sequencing of the process has been largely influenced by the contemporary monetary developments. The Reserve Bank introduced open market (including repo) operations in 1992-93 to sterilise surplus capital flows which began to pour in with the liberalisation of the capital account. Although the Reserve Bank repeatedly emphasised that it would like to reduce reserve requirements which effectively acted as an indirect tax on the banking system, it nevertheless had to repeatedly raise CRR on more than one occasion in order to contain the monetary (and hence inflationary) impact of capital flows. Once inflation was reined in by the latter half of the 1990s, the Reserve Bank was free to pursue its medium-term goal of cutting reserve requirements to the statutory minimum, especially as the onset of the domestic slowdown simultaneously required easing of monetary conditions. With the gradual liberalisation of interest rates by the mid-1990s, the Reserve Bank was able to reactivate the Bank Rate as a signalling device in 1997-98. The role of the Bank Rate has been changing over the years with the deepening of financial sector reforms. It was initially used as a single lever to change financial prices, with the entire liquidity support from the Reserve Bank, and for a time before full liberalisation, commercial bank deposit rates were linked to it. As the price of the bulk of primary liquidity is now, more or less, market-determined, the Bank Rate now essentially acts as a signal of the Reserve Bank's medium-term monetary policy stance. A number of rates, such as the interest payable on eligible CRR balances, and the interest charged

on Ways And Means Advances to the Government and a portion of export credit refinance, continue to be at the Bank Rate.

The repeated bouts of instability in the financial markets during the second half of the 1990s underscored the need for an effective management of liquidity on a day-to-day basis. The tenor of repo operations, originally introduced to sterilise capital flows in 1992, was gradually reduced from 14 days to daily auctions by 1997-98 to stabilise markets. The Reserve Bank instituted an Interim Liquidity Adjustment Facility, following the recommendations of the Committee on Banking Sector Reforms (Chairman: Shri M. Narasimham), in April 1999, which later evolved into a full-fledged Liquidity Adjustment Facility (LAF) by June 2000. The LAF, which is increasingly emerging as the principal operative instrument of monetary policy, allows the Reserve Bank to manage market liquidity on a daily basis and at the same time, transmit interest rate signals to the market. As the LAF gradually replaces other windows of liquidity support, the Reserve Bank would also be able to phase out sector-specific refinancing facilities which had earlier been a source of market segmentation. At the same time, the Reserve Bank put in place a strategy of temporarily financing the Government deficit through private placements/devolvement in auctions of government securities during times of tight monetary conditions and offloading such paper when liquidity improved to insulate the cost of public debt from temporary vicissitudes of the financial markets.

The Reserve Bank is, thus, now able to manage liquidity through a market oriented mix of open market (including repo) operations reinforced by interest rate signals through changes in the Bank Rate and the repo rates, in addition to the traditional tools of changes in reserve requirements and refinance facilities. While the changes in the Bank Rate signal the medium-term perspective of the central bank, the changes in the LAF rates signal shifts in the day-to-day liquidity management.

The efficacy of the emerging operating procedures of monetary policy remains a matter of debate. There is very little doubt that the

Reserve Bank is now able to set an informal corridor through two-way day-to-day liquidity management. The pass-through to the credit market, however, does not appear very effective because of a variety of factors such as the overhang of high cost deposits, large non-performing assets and high non-operating expenses in the banking system. As a result, real interest rates continue to remain high. This underscores the need to further strengthen structural measures to impart the necessary flexibility to the interest rate structure in the credit markets.

The principal strength of the LAF has been the high degree of flexibility imparted to day-to-day monetary management in terms of both the price and quantum of liquidity. Analytically, it is possible to distinguish partition the LAF experience of market stabilisation into six sets of roles:

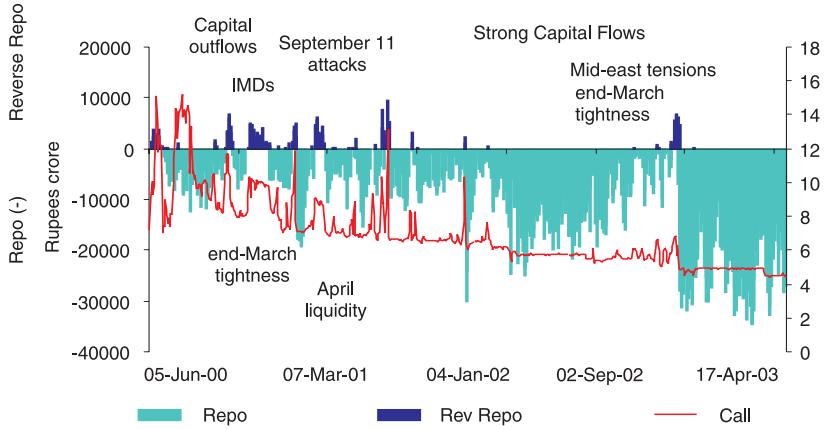
- Stabilising regular liquidity cycles, by allowing banks to tune their liquidity requirements to the averaging requirements over the reporting fortnight and smoothening liquidity positions between beginning-of-the-month drawdown of salary accounts to fund household spending and end-of-the-month post-sales bulge in business current accounts.
- Stabilising seasonal fluctuations, by injecting liquidity during quarterly advance tax outflows or at end-March, when banks avoid lending on call which adds to their CRAR requirements and mopping up liquidity in April to counter the large ways and means advances drawn by the Government prior to the inception of its borrowing programme.
- Stabilising sudden liquidity shocks, by injecting liquidity on account of say, temporary mismatches arising out of timing differences between outflows on account of government auctions and inflows on account of redemptions,
- Stabilising markets in face of sudden capital outflows (as was done during June 2000) by injecting high-cost liquidity, through higher cost reverse repos, to meet the liquidity gap on the one hand and raise domestic interest rates, on the other, to ward off the possibility of speculative attacks on the foreign exchange market.

- Stabilising markets in the face of sudden capital outflows and at the same time neutralising the impact of market volatility on the cost of public debt (as was done during July-August 2000) by funding the Government through private placements and mopping up the liquidity by aggressive repo operations at attractive rates.

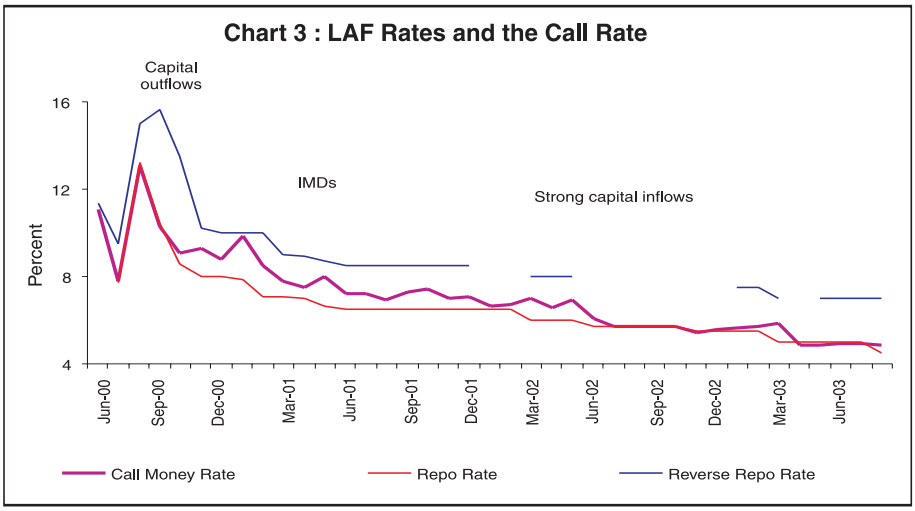
- Stabilising markets in face of sustained capital flows, especially since November 2000, by mopping up bank liquidity through repos and at the same time, gradually reducing repo rates to enable a softening of the interest rate structure.

The Reserve Bank has been able to inject (absorb) liquidity through reverse repos (repos) on almost a day-to-day basis (Chart 2). This has enabled it to encase short-term interest rates (and by extension, gilt prices) within an informal corridor set by the repo and reverse repo rates during the past three years (Chart 3).

**Chart 2 : LAF Repo and Reverse Repo Auctions and the Call Rate**




As the primary instrument of monetary policy, the LAF has to mediate between the several objectives of the Reserve Bank's monetary policy. The quantum of absorption (injection) of liquidity and the price have to be determined bearing in mind not only the day-to-day liquidity position in the financial markets, including the foreign exchange markets but also the medium-term impact on price stability and growth. The multiple objectives pursued by the Reserve Bank along with the changes in the operating environment on




account of technological advances pose a number of challenges:

- Statutory provisions impose limitations on the scale of repo operations (as discussed below in fuller details).
- The Reserve Bank accepts bids in the LAF auctions in accordance with its multiple objectives. This implies that, at times, it is not possible to absorb (inject) the entire surplus (deficit) liquidity. The balance spills into the inter-bank market, especially as the LAF auctions are held early morning, often driving call rates beyond the corridor set by the LAF. Although the LAF is essentially an instrument for fine-tuning liquidity by the central bank, this creates the scope for arbitraging between the LAF and the inter-bank markets by the market players.
- Although LAF rates are supposed to emerge from the market, most players often tend to play safe by bidding at interest rate signals emitted by the Reserve Bank. This effectively implies that the LAF rates function as policy rates set by the central bank, providing the central bank a grip over both the quantum as well as price of liquidity.
- The switchover to real-time gross settlement (RTGS), in which each transaction will have to be settled individually, is likely to create a demand for intra-day liquidity.

An important issue is the ability of the Reserve Bank to manage capital flows. Barring the spurt in remittances in the 1970s, the monetary base has been essentially governed by the monetisation of the fiscal deficit, on the asset side, and the resultant hike in reserve requirements, on the liability side, till the early 1990s. The haemorrhage on account of sustained capital flows, on the one hand and reserve requirements, on the other, has, however, reduced the share of net domestic assets in reserve money to 3 per cent as at end-March 2003 from 91 per cent as at end-March 1991.

The question, then, is to find instruments of sterilisation, especially when central banks do not possess a sufficient stock of domestic assets. In this regard, there are three standard solutions: raising reserve requirements, issuing central bank securities or assuming it is credible enough, conducting uncollateralised repo operations.[30] The choice of instruments is often critical, especially as the degree of market orientation and the associated incidence of the cost on the central bank and the banking system varies a great deal. In case of across-the-board unremunerated reserve requirements, the entire dead weight cost is borne by the market in the form of an indirect tax on the banking system. In case of central bank paper of medium-term maturities, the macro-economic cost is relatively lower since the paper is not only likely to be subscribed by surplus banks but can also be traded, although the payout for the central bank balance sheet could be substantial because the very tradability necessitates market-related pricing. A number of central banks, such as China, Korea, Malaysia and Poland do issue central bank paper although there are often limits in terms of central bank net worth (Malaysia) or money supply (Korea). Faced with strong capital flows, China resorted to raising reserve requirements in September 2003 to buttress the issue of central bank bills. An intermediate solution often is to conduct a continuum of relatively short-term uncollateralised repo operations. In this case, while the central bank has to pay interest rates which are sufficiently high to attract subscribers, the lack of secondary liquidity imposes a cost, although this could be minor if the tenor is sufficiently low.

The challenge of sterilisation, in the Indian case, is not very acute, *per se*, because the large order of fiscal deficit allows the banking system to park the surplus liquidity emanating from capital flows in gilt-edged paper. The problems in this regard are really technical in nature because of the limited degree of manoeuvrability available to the Reserve Bank under the Reserve Bank of India Act, 1934. Under the Act, the Reserve Bank cannot pay interest on government balances or on bank balances, in excess of CRR stipulations, borrow clean beyond the paid-up capital of Rs.5 crore or issue paper in its name. While there is very little doubt that these are sound principles of central banking, they create an artificial central bank demand for domestic assets in the present macro-economic context:

- Since the Government cannot receive interest on surplus balances with the Reserve Bank, it typically 'buys back' Government paper from the central bank for the period of surplus and saves the interest payment. This means if capital flows do not follow the seasonality of the Government expenditure and the Centre runs a surplus, the Reserve Bank needs to have sufficient stock of government paper to transfer to the Government.

- Since the Reserve Bank cannot pay interest on bank balances, over and above CRR stipulations or borrow more than its paid-up capital, repo (reverse repo) operations, which are essentially collateralised borrowing (lending) to absorb (inject) market liquidity have to be camouflaged as two-leg sell-buy (buy-sell) outright transactions in underlying Government securities. There is thus, an asymmetry in the scope of repos (limited to the Reserve Bank's holding of Government securities) and reverse repos (limited, technically, only by the stock of non-monetised public debt).

There is, thus, a need to amend the Reserve Bank Act, 1934 in order to accord it greater flexibility of operations in tune with contemporary developments. While it could be prudent to insist on collateral in reverse repo transactions in which the central bank is lending money, there is certainly a strong case for uncollateralised repos. Besides, although the size of the Reserve Bank's balance sheet has expanded about 2000 times since 1935, the statutory stipulations regarding borrowing

are still defined in terms of the original Rs.5 crore.[31] At the same time, it is necessary to ensure that the fundamental principles of central banking are not compromised - especially as *ad hoc* Treasury Bills began from a similar arrangement of administrative convenience.

The strength of the central bank balance sheet has acquired a new importance in recent years, especially as monetary policy has emerged as the principal tool of macroeconomic stabilisation in most countries.[32] The size and composition of the Reserve Bank balance sheet has changed substantially mirroring the changing imperatives of its monetary policy. The sharp reduction in reserve requirements as a part of the shift to indirect instruments of monetary control has concomitantly shrunk the size of the Reserve Bank balance sheet, as a percentage of GDP. This implies not only that is the monetary impact of every Rupee of primary money is much greater but also that the ability of the Reserve Bank to transfer profits to the fisc is likely to be limited in the future. This, in turn, puts a natural cap to the direct accommodation that the Reserve Bank can provide to the Government. Besides the reduction in the volume of profits, the rate of profits is also likely to be moderated by the decline in the share of net domestic assets because of the scale effect of the cut in reserve requirements and the substitution effect of sterilising sustained capital flows to the extent of the differential between the domestic and foreign rates of interest. Finally, the deregulation of financial prices affects central bank solvency, especially as changes in valuations typically affect the asset side much more than the liability side, which comprises cash and current account balances of various players in the macro-economy. In order to maintain sound health, the Reserve Bank has taken several measures to ensure revaluation of assets, domestic as well as foreign, on a prudential basis and also build up a contingency reserve fund of up to 12 per cent of its asset base by June 2005.

### (iv) Central Bank Autonomy

What transcends these frontline issues in monetary policy formulation is the crucial underlying question of the autonomy of central banks, *i.e.*, the independence that they enjoy in taking monetary policy decisions.

The argument in favour of autonomous central banks rests on the premise that monetary stability can best be achieved only if the task is entrusted to professional central bankers[33] who can take a long-term view of the monetary policy stance. Too much concern with the *short term* can result in 'stop-gap' policies. Implicit in this kind of reasoning is the assumption that political leadership normally tends to take a view guided by *short term* gains without weighing the long-term costs and such an approach is not conducive to ensuring stability. More than any other objective of economic policy, monetary stability requires the pursuit of consistent policy over a long time. It is now increasingly accepted that effectiveness of any policy depends upon how the public perceives policy makers' commitment and behaviour. Based on the premise, it is argued that an autonomous central bank would tend to lend greater credibility to monetary policy and therefore improve its efficacy.

The case in favour of autonomous central banks has not found universal acceptance. Two arguments are advanced in this regard. First, it is argued that all policy decisions in a democratic set up should be subject to scrutiny by the elected legislature and as such, the concept of an autonomous central bank is 'undemocratic'. An expression of this opinion is found in the deliberation on the Balanced Monetary Policy Act of 1982 in the American Senate, wherein, it was stated:

> "It is the time for Congress to wrest control of monetary policy from the hands of a tiny band of monetary ideologues in the White House, the Administration and the Federal Reserve. It is time for basic economic policy once more to be set by elected officials who must bear the final responsibility. It is time to restore common sense, balance and stability to monetary policy."

It may be noted that no central bank is totally autonomous in the sense of not being answerable to any one. Even the most independent central banks have to report, in one form or the other, to the legislature, which in any case has ultimate power to change the law relating to the central bank. All the same, there is a difference between a situation in which policy decisions are under continuous scrutiny, and an arrangement where the central bank periodically reports to the

legislature. At the same time, it needs to be borne in mind that the case of central bank autonomy is really limited to functional rather than goal independence.

Since monetary policy is an integral part of overall economic policy, it is also argued that there can be no meaningful separation between the fiscal policy and monetary policy. If such a separation is forced and if the two policies run at cross purposes, which is deemed to be more than likely with autonomous central banks, one of the two has to give in. This conflict of policies may inflict considerable damage to the economy. An integrated package of policies thus has a better chance of success than a set of conflicting ones.

An interesting question that arises in this context is whether autonomous central banks have a better achievement record in the conduct of monetary policy. Most empirical studies exploring the relationship between independence and performance have judged performance in terms of containment of inflation.[34] Given the considerable differences over the manner of classifying central banks in terms of autonomy, it is not surprising that the empirical evidence is inconclusive. A number of studies have found an inverse link between the two, *i.e.*, that the average rate of inflation is lower in countries which have relatively autonomous central banks. On the other hand, some studies do not establish such an inverse relationship. Even where an inverse relationship is found, it is subject to a number of interpretations.

It has been argued that the success of a central bank in controlling inflation may arise not so much from its independence from the government as from the nature of objectives it is expected to fulfil. If the central bank has multiple objectives, the net result in terms of the achievement of a single objective, such as price stability, may not be that striking. The central bank will also be compelled to think in terms of trade-off between one objective and another. The success of those central banks which have achieved a high degree of price stability may be attributable not so much to their independence as much to the fact, that they have statutory objectives with a narrower focus. Central banks which may not enjoy

independence from government can nevertheless succeed in ensuring price stability if they are asked to pursue that single objective.

The question of autonomy of central banks boils down ultimately to the dynamics of monetary-fiscal policy linkage. In this regard, it may be noted that there is a high degree of consensus emerging among the industrially advanced economies on inappropriateness of the funding of the government by the central bank. This takes either or all of the following three forms: First, segregation of monetary management from debt management, by entrusting the latter to the treasury, or a public debt office or a corporate entity, which is distinct from the central bank, as in the UK. Second, countries have placed legal constraints on central banks' lending to the government. Finally, many countries have enacted legislation which limit fiscal deficits.

There are countries in which central banks are totally prohibited from purchasing government paper from the primary market - the list includes members of the European Union, Japan and the USA. In many other countries, legislative limits have been placed on direct central bank credit to the Government. In several other countries while there are no legal limits, the central banks do not normally provide direct credit to the government. It is recognised that since central banks can acquire government securities as part of their open market operations, there cannot be a ban on central banks acquiring government debt. While statutory limits on credit to Government can be circumvented, direct funding of government, without limits by the central bank, is believed to come in the way of the efficient conduct of monetary policy. The freedom of the central bank to pursue monetary policy according to its judgement requires that direct funding by central bank to the government is restricted and the limits are made explicit.

The Indian experience in respect of central bank autonomy is quite interesting. At the time of the enactment establishing the Reserve Bank, the Indian public opinion was strongly in favour of a central bank that was independent. Interestingly, while introducing the Bill,

the then Finance Minister[35] said:

> ".…….It has generally been agreed in all the constitutional discussions, and the experience of all other countries bears this out, that when the direction of public finance is in the hands of a ministry responsible to a popularly elected Legislature, a ministry which would for that reason be liable to frequent change with the changing political situation. It is desirable that the control of currency and credit in the country should be in the hands of an independent authority which can act with continuity. Further, the experience of all countries is again united in leading to the conclusion that the best and indeed the only practical device for securing this independence and continuity is to set up a Central Bank, independent of political influence."

The subsequent developments, especially after the Independence in 1947, should be seen in terms of the evolution of the borrowing programme of the Government of India through Treasury Bills. The bigger concern was that there emerged a practice of automatically creating *ad hoc* Treasury Bills in favour of the Reserve Bank to the extent of the shortfall in Government balances.[36] In order to *avoid* problems of roll-over, the Reserve Bank began to fund *ad hocs* into marketable securities which could be offloaded to the market in due course by 1959. As the budgetary needs of the Government began to exhaust the ability of the market to absorb government paper, *ad hocs* began to be funded into a unique instrument known as non-transferable special securities without any definite maturity. Until 1955, the total outstanding Treasury Bills had never exceeded Rs. 472 crore. With the sharp deterioration of the fiscal deficit especially during 1980s, the outstanding Treasury Bills rose to Rs. 19, 266 crore by March 1993. Indeed, if allowance is made for the funding of Treasury Bills of Rs. 71,000 crore in aggregate during 1982, 1987, 1988, 1991 and 1992, the actual outstanding Treasury Bills as at end-March 1993 were placed at a formidable level of Rs. 90,266 crore. An overwhelmingly large proportion of these Treasury Bills was held by the Reserve Bank, thereby monetising the budget deficit of the Government. In addition to Treasury Bills, the Reserve Bank has also

held Government dated securities not picked up by the then captive market. As a consequence, the outstanding reserve money (*i.e.*, money created by the Reserve Bank) as on March 1993 for example, amounted to Rs. 1,10,943 crore, of which, the net Reserve Bank credit to the Central Government accounted for as much as Rs. 96, 523 crore or 87 per cent.

This growing fiscal deficit and its monetisation by the Reserve Bank of India raised important issues regarding the relative roles of fiscal policy and monetary policy. Monetary policy particularly in the 1980s had to address itself to the task of neutralising the inflationary impact of growing deficits by continually mopping up the large increases in reserve money. Given the then fully administered interest rate structure, the much needed absorption of excess liquidity in the system was undertaken mainly by increasing the Cash Reserve Ratio (CRR). Furthermore, given the below-market rates on Government securities, the Statutory Liquidity Ratio (SLR) had to be progressively raised so as to meet the large financing requirements of the Government. This process inevitably culminated into the CRR reaching its statutory maximum limit which had to be raised by amending the Act. The SLR reached the phenomenally high level of 38.5 per cent.

The Committee to review the Working of the Monetary System (Chairman : S. Chakravarty, 1985), strongly recommended a fundamental restructuring of the monetary system recognising the dangerous trajectory that the monetary-fiscal policy was on. The Committee argued that price stability should be the dominant objective of monetary policy with inflation control perceived as the joint responsibility of the Government and the Reserve Bank. The Chakravarty Committee strongly advocated a system of monetary targeting which would bind the Government and the Reserve Bank to a mutually agreed level of net RBI credit to Government, consistent with the appropriate level of expansion of money supply.

Besides the inflationary impact of the monetisation of the fiscal deficit, the draft of resources from banks by *fiat* through statutory liquidity requirements also implied that banks could not optimise their portfolios. By the early 1990s, for example, statutory pre-emptions amounted over 63.5 per cent of banks' net demand and time

liabilities. Moreover, the need to contain the interest rate burden of public debt also induced a degree of financial repression. The rate on 91-day Treasury Bills - *ad hoc* as well as tap - was kept fixed at 4.6 per cent since July 1974 even though the average inflation rate ruled well over 8 per cent in the 1970s and 1980s. Put together, this resulted in distorting the process of price discovery and blunting the interest rate channel of monetary policy transmission.

In this connection, Governor Venkitaraman pointed out that:

> "High fiscal deficits, borrowing from the banking system, credit repressions or allocation to the Government at low rates, restricted credit availability to the productive system, high rates of interest - these form parts of a vicious cycle which we have got to break…I realise that the decisions which are needed involve hard choices... if the compulsions of political economy are real, so are the heavy costs of macroeconomic imbalance. The soft political options of today will surely become the hard economic realities of tomorrow" (February 1992).

A similar stance was subsequently reiterated by Governor Rangarajan:

> "…if rates of interest are kept at artificially low levels, it can only result in diverting funds from the organised to the unorganised sectors, losing total control over the end-use of funds. While aggregate savings may not be significantly influenced by changes in interest rate, there is enough evidence, nevertheless to show, even in the Indian context, that savings in the form of financial assets are considerably influenced by interest rate. Therefore, if the financial institutions are to perform effectively their major role of mobilising resources, the rate should be allowed to be determined by the forces of supply and demand…The monetary authority, however, cannot keep interest rates for long at levels that are inconsistent with the basic supply and demand balance" (May 1997).

In the first half of the 1990s, there was a conscious effort to

contain the fiscal deficit and budget deficit. This has facilitated the efforts of the Reserve Bank to moderate the expansion of money supply. However, so long as the practice of issue of *ad hoc* Treasury Bills continued, there was no immediate check on the expansion of the RBI credit to Government. Even when year-end deficits were moderated, deficits during the year were large. It therefore, became necessary to move away from the system of issue of *ad hoc* Treasury Bills and the consequent automatic monetisation of the fiscal deficit so that the Reserve Bank regains control over its balance sheet. This was emphasised by Governor Rangarajan:

> "In the Indian context, perhaps the first step should be to move away from a system in which the deficits that are incurred by the central government automatically get financed by the Reserve Bank...Then the onus of responsibility for the conduct of monetary policy will be squarely on the shoulders of the Reserve Bank, where it should logically rest" (September 1993).

A Supplemental Agreement was signed between the Government of India and the Reserve Bank on September 9, 1994 to phase out the system of *ad hoc* Treasury Bills, over a period of three years. It was agreed that the net issue of *ad hoc* Treasury Bills at the end of the year 1994-95 was not to exceed Rs. 6,000 crore and that, if the net issue of *ad hoc* Treasury Bills exceeded Rs. 9,000 crore for more than ten consecutive working days at any time during the year, the Reserve Bank would automatically reduce the level of *ad hoc* Treasury Bills, by auctioning Treasury Bills or selling fresh Government of India dated securities in the market. Similar ceilings at Rs. 5,000 crore for year end and Rs. 9,000 crore for intra year were stipulated for 1995-96 and 1996-97. The scheme of phasing out *ad hocs* worked reasonably well.

The Government of India and the Reserve Bank of India signed a "historic" agreement on March 26, 1997 to formally put in place the announcement made by the Union Finance Minister in his Budget Speech for 1997-98 as under:

> "The system of *ad hoc* Treasury Bills to finance the budget deficit will be discontinued with effect from April 1, 1997.

> A scheme of ways and means advances (WMA) by the RBI to the Central Government is being introduced to accommodate temporary mismatches in the government's receipts and payments. This will not be a permanent source of financing the government's deficit."

The critical distinction between the present schemes of Ways and Means Advances provided by the Reserve Bank to the Government and the earlier *ad hoc* Treasury Bills is that the former are subject to an absolute mutually agreed limit and therefore, do not take the cumulative character of the latter. If the WMA crosses 75 per cent of the limit, the Reserve Bank could trigger off a fresh floatation of government securities depending on the prevailing monetary conditions. This implies that the Reserve Bank is now able to control the form and timing of its accommodation to the Central Government. The critical question is whether the Reserve Bank is also able to control the size of its credit to the Government.

The share of the net RBI credit to Government in reserve money has fallen very sharply during the latter half of the 1990s. The Government has actually recorded a surplus with the Reserve Bank thrice during 1999-2000, 2001-02 and 2002-03 after the two years of surplus during 1975-76 and 1977-78. At the same time, the share of the Centre's gross fiscal deficit as a proportion of GDP has remained relatively sticky at 5.1 per cent during 1995-2002 as compared with 5.6 per cent during 1990-95. Besides, the share of the incremental net bank credit to the Government in the Centre's gross fiscal deficit actually rose in the latter half of the 1990s as compared with the first half of the 1990s. The decline in the share of the net RBI credit to the Government in reserve money is thus mirrored by an increase in banks' investments in Government securities (with excess SLR securities at 41.6 per cent of NDTL as on October 17, 2003) far above the mandated SLR requirements. This reflects the fact that the Reserve Bank was able to trade the surpluses in the banking system during the last five years or so with the deficits of the Government sector as a result of i) reductions in reserve requirements; ii) strong capital flows on the supply side; and iii) poor credit offtake on the demand side. When liquidity conditions change, such as during bouts of capital outflows, banks often offload government paper back to the

Reserve Bank. If the past is any guide, it would be reasonable to expect that the fiscal gap would re-emerge as a source of monetary pressure once liquidity conditions change in case capital flows dry up or credit demand picks up. It is, in this context, that Governor Jalan warned in the Mid-term Review of the Monetary and Credit Policy for 1999-2000 that:

> "These developments (*i.e.*, fiscal slippage) do not augur well for the future unless determined action is taken to increase revenues, reduce deficits in the public sector, and reduce expenditure through appropriate policy actions. As recently announced by the Government, it is imperative that necessary actions to correct fiscal distortions are taken as early as possible. It may also be mentioned that fiscal slippages are no longer regarded as a matter of domestic concern alone. All over the world, international agencies and investors keep a close watch on emerging trends in Government finances, as they have a bearing on future macro-economic stability."

Returning to the need for fiscal discipline, the April 2000 Monetary and Credit Policy Statement again emphasised:

> "While some comfort can be drawn from the fact that we have been able to manage a large government borrowing programme without undue strain on interest rates or the overall liquidity environment, it is also clear that such high levels of fiscal deficits are not sustainable over the medium term. The continuing large fiscal deficits year after year have already led to sharp increase in repayment obligations on outstanding public debt in the nineties…The large borrowing programmes of Government year after year have also put pressure on the absorptive capacity of the market…If the economy were characterised by excess demand and liquidity pressures, it would have been difficult to meet the large borrowing requirements of government without a sharp increase in interest rates and some crowding out of private investments. It is of utmost importance that such an eventuality is avoided by taking credible fiscal action urgently. A national consensus on an

> effective and time bound programme of fiscal correction is, therefore, essential…"

Fiscal dominance thus continues to be the critical issue in monetary management. There is now a strong view that a separation of monetary and debt management functions which are now simultaneously performed by the Reserve Bank could ease the fiscal constraint. The case for functional autonomy which has been so eloquently urged by successive Reserve Bank Governors now appears within the bird's view of fruition. In this context, the Union Finance Minister noted in his 2000 February Budget Speech:-

> "…In the fast changing world of modern finance it has become necessary to accord greater operational flexibility to the RBI for conduct of monetary policy and regulation of the financial system. Accordingly, I intend to bring to Parliament proposals for amending the relevant legislation..."

The Fiscal Responsibility and Budget Management Act would phase out monetisation of the fiscal deficit through primary subscriptions by 2006. At the same time, it must be appreciated that even if the Reserve Bank does not directly monetise the fiscal deficit, monetary management would still have to contend with the fiscal impact on bank liquidity. It is, thus, necessary to emphasise that monetary management, however deft, and monetary-fiscal co-ordination, however seamless, cannot, in the ultimate sense, be a substitute for fiscal discipline. Governor Jalan himself emphasises that:

> "The most conspicuous failure (of Indian economic policy), in my view, for which there is no *alibi*, and the responsibility for which lies squarely and indisputably at our doors, is the erosion in public savings and the inability of the public sector to generate resources for investment or provision of public services…In the annals of development history, it is hard to find another example of a perfectly sensible idea - the need for higher public investment for greater public good - leading to exactly the opposite result, *i.e*. higher public consumption with diminishing returns for the public!" (January 2001).

## B. Financial Stability

### i) Emerging Issues

Financial stability has always been an integral concern of central banks. Of late, however, issues relating to financial stability have come into a sharper focus with the realisation that financial sector weaknesses lie at the core of economic instability as demonstrated by the recent financial crises in Asia, Russia, Brazil, Turkey and most recently, in Argentina.

The rationale for financial stability and the role of the central bank is increasingly being recognised.[37] Financial crises in the last decade or so generally involved significant loss of output and employment (6 to 10 per cent decline in GDP during the crisis year, and as high as 50 per cent of annual GDP over a period of six years).[38] Widespread financial instability undermines the role of the financial system in performing the primary functions, such as, intermediation between savers and borrowers with an efficient pricing of risks and the smooth operation of the payments system. When financial instability rises to a crisis proportion, it often brings in its wake a macro economic crisis or a currency crisis or both. As recent experiences show, such crises have grave implications for the most vulnerable sections of society who pay for their resolution through increased taxes, reduced public expenditure and unemployment. The costs involved in crisis resolution - particularly in restructuring the weak financial systems in the post crisis period - amounted to 10 to 30 per cent of GDP, which represented essentially additional crisis induced burden for the public sector. Large-scale social dislocations associated with crisis also threatened the governance structures, particularly in the absence of effective social safety nets. This scale of welfare loss to the public justifies the need for public intervention. It follows that the central bank, being placed at the nucleus of the financial system, has a vital role to play in restoring and maintaining financial stability.

The role of the central bank in maintaining financial stability varies cross-sectionally according to the stage of development of the

economy as well as over time, for a given economy. This is because domestic financial system is subject to different kinds of shocks - both home grown and external, depending upon the degree of its integration with the global economy.

During the 1990s, the world economy has changed in a fundamental manner. The most significant among the changes is the liberalisation of capital movements by emerging market economies. On an annual average basis, aggregate net capital flows (official and private) to emerging market economies rose from an annual US $ 47 billion during the 1980s to US $ 155 billion a year in the 1990s. In particular, private capital flows rose sharply during the 1990s, displacing official flows as the major source of external financing by a large margin - private capital flows which averaged under US $ 18 billion a year during the 1980s, shot up to as much as US $ 134 billion per year during the 1990s. While the volume of private capital flows has increased spectacularly, so has the associated volatility. The recent financial crises have unambiguously demonstrated that the international financial markets tend to react exuberantly to successes, hesitantly to early warning signals and overwhelmingly to adversities. In other words, the capital account liberalisation, financial innovations, and technological advances have not only increased the scale of financial transactions significantly, but have also greatly enhanced the inherent risks associated with them, especially by making the transmission of panic easy and fast and often spilling over to other economies.

These developments, coupled with special characteristics of developing countries - such as, the relative thinness and opaqueness of financial markets, weaknesses in the financial sector and often, relative inflexibility of exchange rates, make them inherently more vulnerable to external shocks, especially on capital account, thereby undermining financial stability.

First, the thinness of financial markets relative to the size of global financial flows means that relatively small changes in capital flows, measured by global standards, can cause disproportionately large changes in asset prices. This explains euphoria in good times

as rising asset prices validate initial inflows, and panics in bad times in a symmetrical manner. Secondly, the relative opaqueness of financial markets means that investment flows are often based on inadequate information and, therefore, liable to change suddenly. Asymmetry of information may lead to herd behaviour with less informed investors following the lead of those who are perceived to know better, thus creating familiar boom-bust cycles. The inadequacy of information could also lead to contagion as the investors fail to discriminate between countries.

Thirdly, weaknesses in the financial sector have turned out to be the Achilles' heel for regulators as revealed in the recent spate of financial crises. With a weak financial sector, capital inflows in the boom phase are likely to be intermediated in a manner that creates an excessive build-up of unhedged foreign exchange exposure and accumulation of large short-term foreign debt, often by the banks themselves (for example, Indonesia). For instance, in 1996 - that is, just before the outbreak of the Asian financial crisis - short-term debt as percentage of foreign exchange reserves had shot up to 100 per cent for Thailand, 177 per cent for Indonesia, and as much as 203 per cent for Korea. It is now clear that capital account liberalisation combined with a weak financial sector can push the already weak banks into riskier activities, thus, making them more vulnerable at times of crisis. It is here that the Indian financial system has scored for prudence - keeping short-term debt at 8 per cent of the foreign exchange reserves and 3.9 per cent of total debt - which explains the resilience of the Indian financial system during the recent financial crises.

A typical chain of causation may run on the following lines: with capital account liberalisation, high quality corporate clients shift to lower cost borrowing abroad. Consequently, the asset portfolio of banks deteriorates and bank margins decline, thereby reducing bank profitability. This often induces them to enter into riskier activities. On the liability side, banks may be tempted to borrow short-term abroad, thus increasing their foreign exchange exposure. On the asset side, banks may be tempted to expand into domestic activities, *such as,* real estate and stock market, which are exceedingly risky (being backed by collaterals, which are overpriced on account of asset price

bubbles). Illustratively, in 1996, real estate exposure (as percentage of total lending) of banks reportedly ranged between 30-40 per cent in Thailand and 25-30 per cent in Indonesia, which was perilously high by international standards. In India, this percentage has been negligibly small. Similarly, the exposure of Indian banks to the stock market is limited to 5 per cent of their advances. This prudential regulation has also enabled Indian financial system to withstand the waves of contagion even when stock markets crashed.

It follows that absorption of international capital inflows in excess of the capacity of the financial system to efficiently intermediate them can be a harbinger of trouble. Rapid credit expansion outpacing the absorptive capacity of the real economy, especially with high concentration of credit to property sector and equity markets may be an invitation to a financial disaster. Inadequate or ineffective supervision, poor assessment and management of financial risks, and low capital base tend to make the underlying risks only greater.

Despite the widespread transition towards flexible exchange rates, many developing countries continue to carry the hangover of the earlier fixed exchange rate regime. As a result, exchange rate systems in several developing countries tend to be of the "soft peg" variety. This often creates the appearance of exchange rate stability, which willy nilly encourages borrowers to ignore exchange risk and build up substantial unhedged foreign exchange exposure, thus adding to their vulnerabilities. An appropriately flexible exchange rate regime with a tolerable level of volatility would have induced more explicit recognition of foreign exchange risk. Maturity and currency mismatch and exposure to increased credit risk can eventually lead to a deterioration in banks' balance sheets. When such weaknesses assume systemic proportion, banking crises are inevitable. This banking crisis can, in turn, trigger a currency crisis because it becomes very difficult for the central bank to defend its currency against a speculative attack. Any rise in interest rates to keep the domestic currency from depreciating has the effect of weakening the banking system further. Under the circumstances, when a speculative attack on the currency occurs, if the central bank raises interest rates sufficiently to defend

the currency, the banking system may collapse. Once the investors recognize that a country's weak banking system makes it less likely for the central bank to take steps to successfully defend the domestic currency, they have even greater incentives to attack the currency because expected profits from selling the currency have now risen. Thus, with a weakened banking sector, a successful speculative attack is likely to materialise and can be triggered by any of many factors.[39]

It is clear that challenges facing the central banks in maintaining financial stability are varied and increasingly complex. One can visualize at least four inter-related aspects of the tasks before central banks:

(i) oversight of the financial system;

(ii) crisis prevention;

(iii) crisis management; and,

(iv) crisis resolution.

It is increasingly being recognised that crises could result from both "bad-policies" and "bad-luck", and that strong fundamentals may not insulate a country from "bad-luck". With a view to minimising the frequency and intensity of crises, the end-1990s saw a major restructuring of the domestic and international architectures, with central banks vested with the responsibility of ensuring financial stability.

At the global level, crisis prevention initiatives prominently centres around strengthened IMF surveillance - both under the normal Article-IV discussions and the newly devised Financial Sector Assessment Programme (FSAP)[40], data dissemination and greater transparency, constructive involvement of the private sector, Sovereign Debt Restructuring Mechanism (SDRM), and introduction of new facilities like the Contingent Credit Line (CCL). Development and implementation of standards and codes has been one of the cornerstones of the recent initiatives to strengthen the international financial architecture.[41] The IMF and the World Bank jointly monitor and assess member countries' observance of standards and codes through Reports on the Observance of Standards and Codes (ROSCs).

Besides these formal initiatives, a list of Macro-Prudential Indicators (MPIs)/Financial Soundness Indicators - disaggregated into core and encouraged sets - has also been designed to assist member countries to enhance their ability to early identify the vulnerabilities in the financial systems. Central banks in general had a major role in the evolution of this reformed international architecture, and also had to implement many of those initiatives themselves with a view to contributing to the goal of global monetary and financial stability.

The Reserve Bank has long been conscious of the linkages between macro-economic stability and financial stability. In this context, Governor Jalan remarked in the Mid-term Review of the Monetary and Credit Policy for 1998-99 that:

> "…The financial crisis in South-East Asia and Japan has brought to the fore the problems that weak and fragile domestic financial sector can pose for the real economy. It is now established beyond reasonable doubt that while a persistent and unexpected downturn in the real economy creates difficult problems for the financial sector, a fragile financial sector can deepen the real economy crisis and impose heavy social costs. It is, therefore, of utmost importance to strengthen capital adequacy, income recognition and provisioning norms for banks as well as other financial institutions and to move towards full disclosure and transparency in banking operations in line with international best practices…."

In order to reinforce financial stability, the Reserve Bank has, by and large followed a three-pronged inter-related strategy of:

- maintaining the overall macroeconomic balance, especially through the twin objectives of price stability and growth;
- enhancing the macro-prudential functioning of institutions and markets, as outlined above; and
- strengthening micro-prudential institutional soundness, through regulation and supervision.

This was reinforced by Governor Y. V. Reddy in his November Mid-Term Review of Monetary and Credit Policy for the year 2003-04:

> "The emphasis at this stage is on continuance of measures already taken with an accent on implementation, facilitating ease of transactions by the common person, further of the consultative process and continued emphasis on institutional capacity to support growth consistent with stability in a medium-term perspective".

**(ii) External Sector Management**

It is now recognised that besides domestic disturbances, changes in the external environment also affect the national economic performance with increasing rapidity. In this context, Governor Jalan pointed out in the Monetary and Credit Policy Statement of 2001-02 that:

> "…Monetary management has now become much more complex than was the case even a few years ago. This is because of several factors, such as, the on-going integration of financial markets across the world, the phenomenal increase in financial turnover, liberalisation of the economy, and the rapidity with which unanticipated domestic and international tremors get transmitted to financial markets across the world because of the new technology…The need to quickly change the policy stance in the light of emerging situation has also been the experience of other monetary authorities including the US and European central banks… Keeping these realities in view, it is particularly important for banks and financial institutions to make adequate allowances for unforeseen contingencies in their business plans, and fully take into account the implications of changes in the monetary and external environment on their operations..."

The challenges of the macroeconomic balance have been changing course with the progressive liberalisation of the external sector during the 1990s following the BoP crisis of 1991. The span of reforms in the external sector is indeed expansive:

dismantling of trade restrictions along with greater integration with world markets and in consonance with the World Trade Organisation (WTO) commitments; a transition from a pegged exchange rate regime to a market-determined system - beginning with the Liberalised Exchange Rate Management System of 1993, achieving current account convertibility in August 1994 and progressive liberalisation of capital flows including opening up of foreign direct investment and investment by foreign institutional investors (FIIs). Indeed, while capital account liberalisation is by all means complete for non-resident investors, there is a clear bias against debt flows, particularly short-term borrowings. India has adopted a cautious approach towards free convertibility of domestic assets by residents. The policy stance with respect to capital account convertibility has been recently amply clarified by Governor Jalan:

> "In respect of short-term external commercial borrowings, there is already a strong international consensus that emerging markets should keep such borrowings relatively small in relation to their total external debt or reserves. We would do well to continue with our policy of keeping access to short-term debt limited as a conscious policy at all times - good and bad. ……..So far as the free convertibility of domestic assets by residents is concerned, the issues are somewhat fundamental. Suppose the exchange rate is depreciating unduly sharply (for whatever reasons) and is expected to continue to do for the near future. Now, further suppose that domestic residents, therefore, decide - perfectly rationally and reasonably - that they should convert a part of whole of their stock of domestic assets from domestic currency to foreign currency. Domestic stock of bank deposits in rupees in India is presently closed to US $ 290 billion, nearly three and a half times our total reserves. One can imagine what would have happened to our external situation, if within a very short period, domestic residents decided to rush to their neighbourhood banks and covert a siginificant part of these deposits into sterling, euro or dollar" (August 2003).

It is important to highlight that the liberalisation of the external sector in India was purposefully gradual and judiciously benchmarked by domestic as well as external considerations. The external sector strategy, essentially, hinges on five core elements:

- A sustainable current account balance, of below 2 per cent as suggested by the High Level Committee on the Balance of Payments (Chairman: Dr. C. Rangarajan);
- Sufficiency of reserves;
- Stability of reserves, by encouraging non-debt flows and controlling short-term debt;
- Stability in the foreign exchange market; and
- Prudent external debt management.

This strategy has paid rich dividends in terms of attaining macroeconomic stability, especially demonstrated during the South-East Asian crisis, wherein the Indian economy came out relatively unscathed. There is little doubt that the judicious management of the external sector in India is one of the success stories of the 1990s. The most visible indicator of this success story has been the sharp increase in foreign exchange reserves to US $ 75 billion as at end-March 2003, equivalent to an import cover of 14 months from an import cover of 2 months in 1990-91. The reserves further increased to US $ 93.2 billion by November 7, 2003. The basic thrust of reserve management was laid down by Governor Jalan in his Monetary and Credit Policy Statement of 2001-02:

> "The overall approach to the management of India's foreign exchange reserves in recent years has reflected the changing composition of balance of payments, and has endeavoured to reflect the "liquidity risks" associated with different types of flows and other requirements. The policy for reserve management is thus judiciously built upon a host of identifiable factors and other contingencies. Such factors, *inter alia*, include: the size of the current account deficit; the size of short-term liabilities (including current repayment obligations on long-term loans); the possible variability in portfolio investments and other types of capital flows; the

> unanticipated pressures on the balance of payments arising out of external shocks (such as the impact of the East Asian crisis in 1997-98 or increase in oil prices in 1999-2000); and movements in the repatriable foreign currency deposits of non-resident Indians. Taking these factors into account, India's foreign exchange reserves are at present comfortable. However, there can be no cause for complacency. We must continue to ensure that, leaving aside short-term variations in reserve levels, the quantum of reserves in the long-run is in line with the growth in the economy and the size of risk-adjusted capital flows. This will provide us with greater security against unfavourable or unanticipated developments, which can occur quite suddenly."

The management of the foreign exchange market poses a number of challenges. The relative thinness of the markets imply that they are especially susceptible to "news", so that day-to-day movements, in the short-run, often have little to do with the so-called 'fundamentals'. Adverse expectations, especially fuelled by the uni-directional depreciation of the rupee till recently, often turn out to be generally self-fulfilling because of their adverse effect on "leads and lags" in export/import receipts and payments, remittances and inter-bank positions, reinforced by the herd behavior, often induced by the "Daily Earnings At Risk" (DEAR) strategies of risk management. The task of exchange rate management is often further complicated by the persistent disconnect between economic theory and central bank practice. The rigid assumptions of economic modelling typically throw up intellectual support for corner solutions such as freely floating exchange rates, or a currency board type arrangement of fixed rates. The operational realities of foreign exchange markets have, however, led most countries to adopt intermediate regimes of various types of managed floats, including fixed pegs, crawling pegs, fixed rates within bands, managed floats with no pre-announced path, and independent floats with foreign exchange intervention.

After the liberalisation of the exchange rate regime in the mid-1990s, the Reserve Bank has, therefore, had to chart its own course of exchange rate management, learning from the contemporary experiences. There is now a well-laid out policy response to sudden

changes in capital flows so as to stabilise markets: on demand-side, including monetary tightening and changes in the cost of import finance as well as on supply-side, including the Reserve Bank's operations in the foreign exchange market and changes in the cost of delaying export proceeds. Governor Jalan laid down the basic tenets of exchange rate management in his Monetary and Credit Policy Statement of 2001-02:

> "India's exchange rate policy of focusing on managing volatility with no fixed rate target while allowing the underlying demand and supply conditions to determine the exchange rate movements over a period in an orderly way has stood the test of time."

The Indian exchange rate policy has been appreciated by a recent IMF report, which describes it comparable to the global best practices.[42]

Another area where significant progress has been achieved is external debt consolidation. From being classified as a nearly severe indebted country, India now figures in the less indebted list of developing countries as classified by the World Bank. The external debt to GDP ratio has improved from 38.7 per cent in 1991-92 to 20.0 per cent in 2002-03. The turn around has been possible due to a conscious policy entailing a cautious and prudent approach towards external debt management. The main pillars of external debt management include a preference for a longer maturity profile, tight control and vigil on short-term borrowings, and restricting commercial borrowings within manageable limits with emphasis on cost considerations and end-use restrictions like real estate and the stock market, and de-emphasising guarantees. In recent times, external debt restructuring is being encouraged which include prepayment and refinancing of high-cost debt with low-cost debt. The consolidation of the external debt position has indeed provided the necessary flexibility to the Reserve Bank to further liberalise the external sector.

It is now clear that the pursuit of financial stability requires structural changes in the world economic order, beyond national

central bank policy-making. The Reserve Bank not only contributed to the design of the new international financial architecture by voicing its perspectives in major decisions through the Executive Director of India at the IMF, but also implemented several measures so as to enhance the stability of the domestic financial system in an international context. India was one of the first members to subscribe to the SDDS through which data relevant for assessment of macro-economic stability are being disseminated regularly. India voluntarily agreed for a Financial Sector Assessment Programme (FSAP) and after the completion of the programme in 2001, the appropriateness of India's internal frameworks for assessing financial system stability has been validated. So far external assessment has also been completed in respect of 7 standards and codes through preparation of ROSCs for India.

In December 1999, the Reserve Bank, in consultation with the Government of India, had also appointed a Standing Committee on International Financial Standards and Codes (Chairman: Dr. Y. V. Reddy) to identify and monitor developments in global standards and codes, to consider all aspects of applicability of these standards and codes to Indian financial system, and to periodically review the status. All the non-official Advisory Groups, appointed by the Committee, have already submitted their reports. The work of the Standing Committee and its advisory groups in this important area has been commended internationally.

Besides the set of measures which were introduced in line with the international trend and India's commitment to help preserve global financial stability, keeping in view the specific features of the Indian financial markets and institutions, internally developed frameworks for crisis prevention have also been put in place. To strengthen the effectiveness of the internal stability assessment framework, an inter-departmental group of the Reserve Bank was constituted in accordance with the announcement made in the Mid-term Review of October 2000 to develop a core set of MPIs for India and to prepare a pilot review and subsequent half-yearly modified updates enabling superior internal assessment of financial stability.

The manner in which the Indian rupee withstood the South Asian contagion, and the fact that India has successfully avoided any systemic banking crisis so far suggest that Reserve Bank's performance has been remarkable among the emerging market economies. Its ability to ensure both exchange rate and overall financial stability has significantly enhanced its credibility. Its managed flexible exchange rate regime, cautious approach to liberalisation of the capital account, and foreign exchange reserves policy taken together provide the strongest impetus to the domestic crisis prevention architecture.

**(iii) Banking Supervision**

Central banks in a number of countries perform supervisory functions in relation to the banking system. There are several countries in which the supervisory function is either shared between central bank and other authorities or is totally left outside the ambit of the central bank. Since monetary stability cannot be divorced from financial stability, several studies have argued for the supervisory function to be an integral part of a central bank. However, there are others who perceive a conflict of interest between supervisory and monetary policy concerns. There can be occasions when a tight monetary policy can force difficulties on the banking system, which if the central bank as a supervisor tries to moderate, could lead to a situation involving a conflict of interest. Most of the difficulties associated with financial stability, however, arise out of factors not directly connected with monetary policy, such as poor asset quality, inadequate capital, *etc*. An associated issue is the debate over the relative merits of unified supervision and separate regulators in view of the trend towards the formation of financial conglomerates operating across banking, insurance and securities sectors.[43] The points of debate deepen even further if the central bank is mandated the responsibility of unified supervision, and thus assumes, *de facto* responsibility over all segments of the financial sector.

While some banking supervision is conducted by the Federal Reserve Board, it is largely the responsibility of other institutions such as the office of the Comptroller of the Currency, banking

regulators in each separate state and the Federal Deposit Insurance Corporation. The European Central Bank can take up specific tasks concerning policies relating to the prudential supervision of credit and other financial institutions (except insurance undertakings). Member national central banks continue to be either directly responsible or closely associated with prudential supervision within their national jurisdictions. In Germany, though a government office is responsible for banking supervision, it is the central bank staff who undertake much of the day-to-day work of monitoring individual banks. In France, supervision is the responsibility of the Commission Bancaire, but its Secretariat is effectively part of the Banque de France, and the Governor chairs it. In Japan, the central bank closely monitors the large banks, though the responsibility for supervision formally rests with the Finance Ministry. A few central banks, such as the Monetary Authority of Singapore supervise all the banking, insurance and securities segments. At the other extreme, there are a number of countries, most notably the UK and in the Scandinavian countries, in which super regulators have been created outside the central bank. The Bank of England, however, continues to bear responsibility for systemic regulation.

The challenge of supervising the large banking system in the Indian economy was recognised by Governor Deshmukh,

> "…The difficulty of the task of the Reserve Bank in dealing with the banking system of the country does not lie in the multiplicity of the banking units alone. It is aggravated by its diversity and range…While the bigger Indian banks have always responded readily to advise …some of the newer or smaller ones have pursued policies that did not accord with the best traditions of commercial banking…" (March 1948).

The Reserve Bank has been involved in broad based supervision. As a part of the ongoing financial sector reforms and in line with international best practices, the Indian supervisory framework, which had earlier concentrated on onsite micro-supervision, is now being strengthened with off-site surveillance and risk-based supervision.

In this connection, Governor Jalan has observed that:

> "Regulation is largely perceived to be free or costless and as such, tends to be over-demanded by the public and over-supplied by the regulator. However, regulation involves a range of costs, which are ultimately reflected in the price of financial intermediation. In fact, the focus in the current debate is whether regulation should be imposed externally through prescriptive and detailed rules or alternatively, by the regulator creating incentive compatible contracts that reward appropriate behaviour. The main responsibility for risk management and compliant behaviour has to be placed on the management of financial institutions. In the ultimate reckoning, it is necessary to recognise that there are distinct limits to what regulation and supervision can achieve. In particular, it does not provide a fool-proof of assured contact of safety and does not absolve either management or consumers of their responsibilities" (December 2002).

The Reserve Bank instituted a supervisory strategy comprising on-site inspection, off-site monitoring and control systems internal to the banks. Steps have also been taken to set up a formal off-site monitoring system (OSMOS). The scope of the new prudential supervision reporting system introduced effective the quarter ended September 1995, has been strengthened over the years. In order to exercise integrated supervision over the financial system, the Board for Financial Supervision (BFS) with an Advisory Council was constituted on November 16, 1994 under the Reserve Bank of India (BFS) Regulations, 1994. The BFS has assumed the supervisory responsibility of all India financial institutions effective April 1995 and registered non-banking financial companies (NBFCs) effective July 1995. In view of repeated bankruptcies in the sector, the Reserve Bank was vested with comprehensive legislative powers in respect of NBFCs in January 1997. While the reform process has attempted to achieve regulatory convergence among various intermediaries, co-operative banks continues to pose a supervisory challenge not only because of the large numbers but also because of multiple reporting authorities.

The cornerstone of the strategy of supervision is the institution and progressive strengthening of prudential norms for income recognition, asset classification and provisioning besides adopting the Basle Committee framework for capital adequacy. The capital position of Indian banks has improved significantly - while 75 out of 92 banks had a CRAR of above 8 per cent as on March 31, 1996, 91 out of 93 banks recorded a CRAR satisfied the statutory minimum CRAR of 9 per cent by March 2003. It is, however, important not to lose sight of the fact that Rs.22,516 crore was infused as recapitalisation by the Government in respect of public sector banks between 1992-2003. Furthermore, all financial institutions except IFCI and IIBI, had a CRAR much above the stipulated norm of 9 per cent as at end-March 2003. As at end-March 2002, 620 out of 663 reporting NBFCs had a CRAR of 12 per cent and above. Similarly, there was a significant improvement in asset quality. The share of gross NPAs to gross advances for scheduled commercial banks declined from 15.7 per cent as at end-March 1997 to 8.8 per cent as at end-March 2003. Net NPAs as a proportion of net advances also declined from 10.7 per cent in 1994-95 to 4.4 per cent in 2002-03. What is even more encouraging is that this decline had taken place inspite of domestic slowdown, which typically raises the probability of default by borrowers. In fact, during 2002-03, NPAs, gross and net, witnessed an absolute decline for the first time in six years. It is also important to note that the improvement in bank health has been accompanied by an improvement in bank profitability. Net profits of scheduled commercial banks jumped to 1 per cent of total assets during 2002-03 from 0.16 per cent during 1995-96.

The prudential norms are reinforced by disclosure norms, individually as well as in terms of the group, especially following the recommendations of the Committee on Banking Sector Reforms (Chairman: Shri M. Narasimham) (1998). Additionally, several steps have been taken with a view to improve the statutory audit and inspection systems and strengthening the internal defence within the supervised entities through better internal control. Banks and FIs have already put in place asset-liability management systems, typically supervised by an Asset Liability Management Committee (ALCO). The Reserve Bank has also issued guidelines on risk management

systems in October 1999, supplemented by guidance notes on credit risk and market risk management in October 2002, intended to serve as a benchmark to the banks, which are yet to establish integrated risk management systems. Furthermore, a credit information bureau, Credit Information Bureau (India) Limited (CIBIL), has been set up in August 2001 with a view to improve data dissemination. The Reserve Bank has also repeatedly stressed the need for marking investment to the market in order to capture true current values. Banks were initially required to mark to market 30 per cent of their investment portfolio in 1992-93 and the proportion was gradually raised to 75 per cent in 1999-2000. At present, the investment portfolio is required to be classified into 'held to maturity', 'available for sale' (at least annual revaluation) and 'held for trading' (at least monthly revaluation) in accordance with GAAP practices.

The Reserve Bank has been gradually developing a risk-based supervision methodology in line with international best practices. This will facilitate allocation of supervisory resources by focusing them on relatively vulnerable banks and in areas in which the bank is relatively more vulnerable. Besides, the introduction of consolidated accounting and quantitative techniques for consolidated supervision is also being implemented. Banks have been advised to voluntarily build in risk-weighted components of their subsidiaries into their own balance sheets on a notional basis from year ended March 2001. Besides developing a supervisory rating based on the CAMELS (capital adequacy, asset quality, management, earnings, liquidity and systems and controls) methodology for domestic banks and the CALS (capital adequacy, asset quality, liquidity, compliance and systems) methodology for foreign banks for optimising scarce resources, the Reserve Bank has put in place a framework for prompt corrective action (PCA) based on early warning triggers.

A detailed self-assessment of the Core Principles for Effective Banking Supervision in October 1999 showed that the Indian regulations were in line with international norms. Identified gaps have since been addressed with issuance of detailed guidelines on country risk and consolidated accounting. The Advisory Group on Banking Supervision (Chairman: Shri M.S. Verma) (2000), set up by the

Standing Committee on International Financial Standards and Codes, have indicated that the Indian regulations are more or less in line with international standards. The Reserve Bank has been sharpening risk management practices in line with the recommendations of the New Basel Capital Accord, which essentially refines the concept of credit risk and also emphasises the need to account for a variety of related risks, including market risk. At the same time, the Reserve Bank has emphasised the need to tailor the emerging Basel II risk management framework to the particular macroeconomic circumstances, technical skills and technological feasibilities.

Apart from these issues, a feature unique to the Indian financial system relates to the dominance of Government ownership of most of the commercial banks in India. This introduces another element in the relationship between Government and the Reserve Bank. While at a conceptual level, the problem can be resolved, in practice the issue may not be fully worked out. As the owner of the banks, Government must exercise proprietal control on all matters directly relating to ownership whereas the Reserve Bank, as the supervisory authority should exercise the supervisory function in the same way as it would exercise on any bank, whether owned by the Government or not. Supervisory functions would include the prescription of prudential norms and their effective monitoring. Ownership functions, which are unambiguous, relate to the appointment, term and emoluments of chief executives and the constitution of the board of directors. Government and central bank may confront a conflicting situation only if the Government issues directions which may have the effect of going against the prudential and other guidelines issued by the Reserve Bank of India. Deterioration in the quality of loan assets of the nationalised banks in recent years is partly attributable to the fact that explicit prudential norms relating to income recognition, provisioning or capital adequacy were not in place. In fact a firm set of prudential norms will itself act as restraint on the Government in its direction to the banks. The Government has also to redefine its relationship with banks. While exercising strict control over certain aspects, the nationalised banks must be allowed to enjoy a high degree of operational autonomy. A similar situation exists in countries like Italy and Switzerland where the Government owns a

fairly large number of banks. Since monetary stability and financial stability are all inter-woven with each other there has necessarily to be a continuous dialogue between the Government and the Reserve Bank and appropriate conventions need to be established. In this regard, the possible role of the central bank as the "lender of the last resort" assumes special significance.

The international financial community has come a long way since the days of Bagehot who first established the concept of lender of the last resort (LOLR) way back in 1873. Indeed, in recent years, there is an outpouring of research on the LOLR role of the central bank. The LOLR takes different connotations in different situations but the essence is the degree of discretionary provision of liquidity to a financial institution or the market as a whole that the central bank is willing - and in some cases - mandated to make.[44] The Reserve Bank is not explicitly mandated to perform lender-of-the-last-resort functions in Chapter III (Central Banking Functions) of the Reserve Bank of India Act, 1934. Section 18, however, allows an omnibus power to the Reserve Bank to initiate action - including advancing loans repayable on demand and up to a maximum of 90 days - when "…in the opinion of the Bank a special occasion has arisen…".

In the context of contemporary financial crises, one can identify at least four kinds of situations that may threaten financial stability. These include:

- Bank runs;
- Failure of the inter-bank market;
- Failure of illiquid but solvent bank(s); and,
- Failure of one or more insolvent banks.

**(a) Bank Runs**

In the literature on bank runs, the nature of the deposit contract coupled with the absence of complete information on the assets of the bank(s) are cited as the main reasons for a solvent bank to experience a depositor run. When assets of banks are largely illiquid term loans while their liabilities comprise predominantly unsecured

short term deposits, it makes them susceptible to deposit runs. If such banks' assets are not readily marketable, depositor runs can result in a forced disposal of assets at depressed prices, thus leading an otherwise sound bank to insolvency. Each depositor is aware that if other depositors withdraw early, the bank would have to convert illiquid assets into cash to cover all deposits. Given these "co-ordination problems", any external event which triggers a belief that other depositors will withdraw their deposits results in a run. More recently, the literature has extended the notion of the "co-ordination failure" to cover general creditor-borrower relationship and introduced the concept of incomplete information.[45] It has been argued that depositors are not readily able to observe the financial condition of the bank or its borrowers, since loans are based on private information about its borrowers. Accordingly, any external impulse which raises doubts among depositors whether other depositors will find the bank sound can lead to pre-emptive withdrawals even if they themselves do not share the view about the bank being unsound.

The instances of bank runs in the Indian economy have been rare, especially because the banking industry is dominated by public sector banks and because of wide-spread deposit insurance. The response of the Reserve Bank varies depending on its assessment of the causes of the bank run. When several co-operative banks in Gujarat faced a loss of depositor confidence following the unearthing of irregularities in the securities markets in March 2001, the Reserve Bank took action against several erring banks. On the other hand, when the ICICI Bank faced a temporary cash gap arising out of sudden deposit drawals in Gujarat in April 2003, the Reserve Bank, on request, granted a temporary special liquidity facility of Rs.800 crore based on a favourable assessment. The Reserve Bank also provided lines of credit to the Unit Trust of India in the late 1990s.

**(b) Failure of the Inter-bank Market**

The inter-bank market is also subject to incomplete or asymmetric information. As such, doubts may arise about the solvency of a bank, which is in fact sound. In such cases, even solvent banks may be unable to borrow from the interbank market. In this regard, it

would be desirable for the central bank with up-to-date supervisory information to lend to banks, which the inter-bank market may have wrongly judged insolvent.

Secondly, the inter-bank market may become more cautious in times of crisis. When the liquidity problem is small, a bank with surplus liquidity would be able to lend to all illiquid banks. However, an individual bank's surplus is, typically, insufficient to lend to all illiquid banks.[46] The surplus bank(s) may be unwilling to place their surpluses in the problem bank(s) given the higher perceived probability of loss. Again, in such cases, there is a scope for the central banks to lend to troubled banks.

Thirdly, liquidity may dry up in the interbank market because each bank refuses to lend if it cannot be confident that it will itself be able to borrow in the interbank market in order to address its own possible liquidity shortage.[47] In such cases, the central bank may have to step in either to provide liquidity or reassurance to banks that liquidity will be available in the case of a shortage.

The Reserve Bank has recently taken several steps to strengthen the inter-bank market. The need for limiting large exposures, which are uncollateralised by their very nature, was especially brought home when a co-operative bank, which had been funding unsustainable positions on call, was not able to meet its commitments in the aftermath of the irregularities in the securities market in April 2001. Bank operations in the call money market is now linked to their owned funds (and in case of borrowing, aggregate deposits). These restrictions have also been extended to primary dealers. Non-bank participants, introduced to broad base turnovers in the early 1990s, are now being phased out to limit the call money market to a purely inter-bank market.

### (c) Failure of illiquid but solvent bank(s)

The failure of illiquid but solvent bank(s) is deemed to be the most important rationale for LOLR. A failure of a large bank or a number of smaller banks could result in systemic financial instability. This

possibility arises essentially because of ripple effects given the network of inter-bank exposures of various kinds, the failure of one bank to fulfil its obligations may have an immediate and direct effect on other banks.

There are at least three mechanisms identified in the literature. The first is inter-bank lending which is generally unsecured. Peer monitoring is a potential source of systemic risk *via* inter-bank lending.[48] Secondly, there is the possibility of contagion. The failure of one bank may lead to run on another bank in a domino fashion if depositors perceive similarities between the two - based either on specialisation in type of business or geographic areas. Financial systems with deferred uncollateralised net settlement tend to generate substantial inter-bank exposures whereas RTGS eliminates them. Thirdly, systemic risk may emanate from the operation of settlement and payment arrangements. In this regard the distinction between deferred uncollateralised net settlement and real-time gross settlement (RTGS) becomes important. The issues relating to the payment and settlement system are taken up more fully later.

**(d) Failure of one or more insolvent banks**

Financial instability resulting from a bank failure is usually characterised by panic in which the behavior of depositors becomes unpredictable.[49] When a bank approaches the central bank for liquidity support, the central bank typically does not have time to verify whether or not the bank is solvent. If the central bank provides liquidity support to a bank which later turns out to be insolvent, it will incur a direct financial loss besides suffering from a reputational cost.

In the case of incipient failure of an insolvent bank, the provision of risk capital rather than liquidity support may need to be considered. The central bank need to weigh the probable cost of providing capital to a possibly insolvent bank against the cost of the instability that its failure could possibly generate.[50] A central bank may want to remain a LOLR and *not* become *owner of last resort* ! However, it may be less costly to restructure an insolvent bank than to allow it to fail. "Banks are usually worth more alive than dead" in the sense that the liquidation value of a bank is lower than its market value as a going concern.

By insuring banks against the cost of liquidity or solvency problems, the provision of support may result in banks being less concerned than would be the case otherwise to avoid such problems. In other words, there could be a serious moral hazard problem. In particular, if LOLR is given to individual institutions on too favourable terms, it may cease to be last resort lending altogether and banks may come to rely on it as 'a matter of course'. More importantly, the expectation of bail out in an insolvency situation may result in bank managers and shareholders taking excessive risks and depositors not properly monitoring their banks.

A potential method to reduce, if not eliminate, the moral hazard problem is to impose a high penal rate relative to the pre-crisis period. However, that may

i) aggravate the bank's crisis;

ii) send a signal to the market that precipitates an untimely run; and

iii) give the managers incentives to pursue a higher risk-reward strategy in order to repay the higher rate (the so called gamble for resurrection).

Yet another solution to the moral hazard problem is the notion of "constructive ambiguity". By maintaining a degree of uncertainty about which financial institutions receive support and which will be allowed to fail, coupled with procedures for 'punishing' the managers and shareholders of imprudently managed financial institutions can help limit the moral hazard problem.

Constructive ambiguity, by definition, is difficult to pin down and formalise. Moreover, it places a large degree of discretion in the hands of the authorities, which raises a time-consistency problem: While it is in the interest of the authorities to deny their willingness to provide a safety net, they may later find it optimal to intervene. One way out is to have firm rules for disclosure after the event. This was exemplified by the Bank of England's handling of the small banks crisis in the early 1990s where, at the time, it was not made public that the bank was providing assistance to a small number of small banks. But after

the direct systemic threats were averted, the central bank then disclosed its operations to the public and accounted for its actions.

### (C) Payments and Settlement System

With advances in data processing and telecommunication, issues relating to payments and settlements system are emerging at the centre stage. Until the 1980s, the term 'payments system' was almost completely absent from central bank reports. Today, there are many who argue that monetary policy functions would not have developed in the way they did without the first revaluation in payment technology.[51]

A payment system comprising a set of rules, institutions and technology for transfer of funds from one financial entity to another constitutes the core of a well functioning financial system. A sound and sophisticated payment system is necessary not only for efficient delivery of financial services but by imparting effectiveness to the transmission of policy induced impulses, it also adds to the potency of monetary policy.

With the spectacular growth in volume of financial transactions and globalisation, the central bank involvement in developing appropriate payments and settlements system is on the rise - the anchoring principle being 'timely settlement'. Securing the final settlement of transactions removes an important source of uncertainty in the financial system and can restrict the excessive concentration of exposures on the financial entities providing settlement services. In this process, central banks can contribute in distinguishing temporary liquidity difficulties from underlying solvency problems and thus help containing the spread of financial strains.

Guided by the notion of timely settlement, central banks in advanced industrial economies seem to focus on four inter related areas:

(a) large-value inter-bank funds transfer system (LVTS),

(b) settlement of securities transactions,

(c) settlement of foreign exchange transactions, and

(d) settlement of derivatives transactions.[52]

The LVTS is being strengthened by promoting the introduction of real-time gross settlement (RTGS) and the upgrading of multilateral net settlement systems. In order to improve the safety of securities settlement system, the accent is on shortening the time interval between trading and settlement and on the introduction of delivery versus payment system (D*v*P). In respect of foreign exchange transactions, individual banks are being actively encouraged to manage their settlement exposures more effectively. Of late, central banks have been drawing pointed attention to potential weaknesses in the clearing of derivatives and suggesting ways of eliminating them, *inter alia*, through mechanisms for securing timely intra-day settlement.

In India, we still have miles to go in terms of development of payments and settlements system, but a significant beginning has been made. In the capital market segment, the introduction of scripless trading in the National Stock Exchange (NSE) and on-line trading at the Mumbai, Delhi and other stock exchanges have brought in strong elements of accessibility, efficiency and transparency in operations. These are reinforced by regulatory measures aimed at dematerialisation and even more importantly, introduction of rolling settlement.

The Reserve Bank, like many central banks in emerging market economies, has taken the initiative of payments reforms in both the operational and supervisory capacities, having inherited the functions of the clearing houses set up at the turn of the 20th century, on its foundation. The need for payments reform was, in fact, underscored by the Chakravarty Committee as early as the mid-1980s.

The Mission Statement of the Reserve Bank's Payment Vision statement emphasises the need to establish a modern, robust, efficient, secure, and integrated payment and settlement system for the country. This essentially involves a three-pronged strategy of i) developing an institutional framework to oversee the payments systems, under the aegis of the National Payments Council set up in May 1999, ii) operationalising information

technology applications and iii) instituting satellite-based and terrestrial-based communications infrastructure and providing for adequate bandwidth. Innovations include the introduction of cheque truncation and imaging of cheques to hasten realisation, spread of electronic clearing and funds transfer services (ECS and EFT) to speed up movement of funds, setting up of an automated teller machine (ATM) network to facilitate customer functions. With the INFINET, a wide area based satellite communication and terrestrial lines network using VSAT technology, becoming fully operational and widespread in usage, e-banking encompassing e-payments and Electronic Data Interchange would be easily facilitated. The Reserve Bank is now putting in place a real time gross settlement system (RTGS) in which processing and final settlement of funds transfer instructions take place continuously, reducing *domino* risks of default in place of the present deferred net settlement system.

As the modernisation of the payment and settlement system gathers momentum, there is a need to define the precise role of the Reserve Bank. A question in this regard is whether the persistence of the central bank monopoly over currency and related payment and settlement systems is economically efficient. The case for the central bank is, by and large, justified on the ground that the imperatives of macroeconomic stability in this case are more important than microeconomic efficiency.

Secondly, there is an influential view that combining provision of payment services (apart from settlement of bank funds) and supervision could create moral hazard problems. It is in this context, the Advisory Group on the Payment and Settlement System (Chairman: Shri M.G. Bhide) (2000) recommended that though the RBI should gradually come out of its role as a payment system provider except for settlement of funds after drawing lessons from a cross-country survey on payment system objectives, their management and the relevant legal backing obtained in these countries to draw appropriate lessons from it. A movement towards the segregation of the operation and regulation of payment systems has already been set in motion. The MICR cheque clearing systems

in centres other than the four major metropolitan centres are being entrusted with a suitable commercial bank. Similarly, the newly set-up Clearing Corporation of India would be responsible for the settlement in the securities and foreign exchange markets.

Third, international practices regarding the scope of central bank supervision over the payment system vary. Since the supervisory authority of the Reserve Bank is not grounded in statute, a draft Payment Systems Bill has been prepared, with provisions relating to the four broad areas of payment systems regulation, regulatory powers to the Reserve Bank for regulation of payment systems, provision of legal basis for clearing services and for netting of clearing settlements and powers to frame regulations.

Finally, a related issue is the impact upgradation of payment systems would have on monetary policy. There are two broad views. The first somewhat cataclysmic view is that central bank money could eventually disappear once debit and credit cards substitute cash in transactions demand and settlements take place through private networks which do not need to take recourse to central bank systems.[53] William MacDonough[54] of the Federal Reserve Bank of New York points out that "…A few years ago I might have discounted the potential of these new networks but no longer…". The alternate view is that while the central bank balance sheet would certainly shrink as the demand for cash diminishes, the monetary base would survive if central banks could insist on central bank clearing.[55] This would still allow the central banks to modulate the price and quantum of primary money to harness liquidity conditions in the financial market conditions to the macroeconomic objectives.

In the Indian case, this is still an academic issue especially as e-money transactions essentially take place through the banking channel. It is, in this context, that the recent Working Group on Electronic Money (Chairman: Shri Zahir Cama) (2002) recommended that multi-purpose e-money should be permitted to be issued only against payment of full value of central bank money or against credit only by the banks.

## Section IV

## Concluding Remarks

Central banking is perhaps both an art and science. One needs to judge it in terms of current market practices and existing milieu of the economy under consideration, as well as in terms of analytical foundations. How far the central bankers fulfil the expectations of players in the financial markets/institutions, the academia and the general public? Have they made the 'black box of monetary transmission' more visible? The answers to these questions are not necessarily the same, and it is here that a central banker needs to do some degree of tight rope walking. This concluding section delves into some ongoing challenges for central banks drawing either from the theoretical literature or from the experience of the past, worldwide.

First of all, there is the challenge of financial sector liberalisation. It is now increasingly clear that while competitive financial markets are necessary for efficient allocation of resources, failures in the financial markets carry serious output costs. Besides domestic disturbances, domestic financial markets are increasingly affected by contagion effects of external crises, over which domestic authorities have very little control. This implies that central banks have to intervene to ensure market stability in order to maintain the macroeconomic balance. This, in turn, calls into question, the ruling paradigm of inflation targeting, which, in its strictest form require monetary policy to be set by inflation numbers. While a number of central banks have attempted to address this problem by broadening their management information system, the changing inter-linkages between the macroeconomic indicators often obfuscate the information content. The matters are complicated further in emerging market economies, because of shifts in the channels of policy transmission.

An associated issue is the number of objectives the central bank can effectively pursue and the forms of intervention through which monetary policy can act. While most monetary theories prefer a single target-single instrument rule, it is increasingly clear that central banks must, at any given time, simultaneously pursue three objectives of price stability, growth and financial stability. While there is very little

disagreement that these objectives are mutually reinforcing in the long run, the challenge of contemporary central banking is to manage their short-run conflicts and trade-offs.

Secondly, there is the challenge of ensuring soundness of financial institutions. It is now abundantly clear that the effectiveness of monetary policy action critically hinges on the efficiency of the institutional framework. The supervision of the financial system is getting increasingly complicated with conglomerates - both domestic and foreign, as also by the offshore financial activities operating in multiple segments of the financial markets. Accordingly, the various segments themselves are getting increasingly integrated with each other. Repeated financial crises - and rapid contagion - have increasingly underscored the need for effective supervision. The problem of central banking today is that the jury is still out on the experiments that are taking place: in terms of various forms of supervision - onsite, off-site and risk-based, and the organisation of supervision - unified, lead regulators and single regulators.

Finally, there is the challenge of information technology. There is, first of all, the need to harness financial markets to fully exploit the advances in communications. Beyond the technological upgradation, is also the issue of formulating an appropriate legal framework, in which transactions could take place. At the same time, the operating procedure of monetary policy has to be increasingly tuned to the emerging new forms of e-transactions.

How does the Reserve Bank fare in terms of these challenges? The Reserve Bank has time and again emphasised the need to maintain stability in financial markets, in the context of financial liberalisation, and especially the risks of contagion emerging from the opening up of the economy. The pursuit of financial stability, in the broadest sense of the term, is increasingly emerging as a policy concern, almost at par with the twin objectives of price stability and growth. While there is little doubt that the Reserve Bank's record of financial stability is indeed impressive, the fact remains that like central banks in most emerging market economies, it has so far enjoyed the first-mover advantage in financial innovations, especially as earlier regulations

were often prohibitive in character and markets were not sufficiently developed to initiate sophisticated financial instruments on their own. As markets deepen and instruments - spot and futures develop, the challenges of financial stability are likely to grow sharper requiring further refinements in the speed and effectiveness of the instruments of monetary policy.

The Indian financial system on the whole, is in sound health. The Reserve Bank has been refining its supervisory framework in recent years, buttressing the traditional onsite supervisory practices with off-site supervision and increasingly, risk-based supervision. The process of agglomeration of financial activities has been paralleled by initiatives in consolidated supervision. The Indian supervisory framework is, by and large, comparable to international norms. There is wide-spread agreement that the ten years of prudential norms have been able to clean up bank balance sheets, but it is equally true that structural rigidities in the banking system, such as high levels of non-performing assets continue to constrain the efficacy of monetary policy. The challenges inevitably sharpen as markets grow competitive, the number and size of private players increase and as noted above, instruments of financial transactions grow more complex.

As regards the challenge of technology, the Reserve Bank has once again spearheaded the innovations in payment systems in the 1990s. The gradual upgradation of settlement systems in financial markets has been successful - as the launch of the T+3 (and subsequent, T+2) rolling settlement systems show. While e-money transactions continue to grow rapidly, they do not, as of writing, appear to pose a challenge to the conduct of monetary policy, especially their relative size remains miniscule and transactions take place through the banking channel. The future challenge of payment systems are likely to emanate from three quarters: the upgradation of technology, *per se*; the development of the associated legal framework and finally, the supervision of the clearing houses, which would emerge as payments systems providers, as the Reserve Bank gradually restricts itself to a regulatory role.

A final challenge relatively unique to the Indian economy (and to a large extent, a number of emerging market economies) is the size of the Government's fiscal deficit and the associated constraint it imposes on the conduct of monetary policy. It is a matter of increasing concern that most deficit indicators have now come to follow an U curve during the 1990s - as most of the gains of fiscal consolidation during the earlier half of the 1990s were dissipated in the later half of the 1990s. The impact of the recent high fiscal deficits was, however, muted by the fact that easy liquidity conditions, enabled by strong capital flows and poor credit off-take fostered a demand for government paper. There is every possibility that the fiscal gap would once again pose a constraint to monetary policy should liquidity conditions change.

The performance of the Indian economy during the 1990s demonstrates its inherent resilience. It cannot but be a matter of satisfaction that the post-reform growth rate has actually marginally accelerated to 6.0 per cent during 1993-94 from 5.8 per cent during the 1980s notwithstanding the rash of external shocks, domestic restructuring and occasional political instability. At the same time, there was a distinct deceleration in the inflation rate to 6.1 per cent from 8 per cent over the two periods. Reflective of the growing investor confidence, capital flows have been strong. The very fact that sterilisation has emerged as the principal challenge of contemporary monetary management in an economy which was once perpetually starved of foreign capital reflects the dramatic changes that have taken place in the 1990s.

There is widespread agreement that the record of the Reserve Bank in monetary management has been, on balance, satisfactory, to say the least. It is perhaps appropriate to conclude that the degree of credibility that the Reserve Bank has earned over time, is in itself likely to be an effective instrument of monetary policy in meeting the challenges of the future.

## Notes

1. Rosa Maria Lastra, (1996).

2. Goodhart, Charles (1996).

3. Interview in the Financial Express (August 8, 2003).

4. "Lombard Street" is the *locus classicus* on central banking which coined the expression 'lender of last resort', which came to be regarded later as a *sine qua non* of central banking the world over.

5. Padoa – Schioppa, Dott Tommaso (1997), p.1.

6. Greenspan, Alan (1996).

7. Michael Parkin, an ardent monetarist, recounts that when he gave a lecture entitled "Does Money Matter?", a friend remarked that only an economist could ask such a question!

8. For example, see Alesina (1988).

9. For example, see Clarida *et al* (1999). Leading New Keynesians include George Akerlof, Lawrence Ball, Ben Bernanke, Alan Blinder, Russell Cooper, Andrew John, Gregory Mankiew, Julio Rotemberg, Joseph Stiglitz and Janet Yellen.

10. Besides, the issue of non-neutrality of money, the stickiness of prices brought back the issue of monitoring financial quantities to the centre stage. For example, the focus on credit aggregates returned especially with the realisation that interest rates could be sticky on account of credit rationing.

11. For example, see Solans (2003).

12. See Goldfeld and Sichel (1990) and Ball (2002).

13. For example, see Houben (1999).

14. For example, see Fry, Goodhart and Almeida (1996).

15. For example, see Sarel (1996) and Khan and Senhadji (2001).

16. For example see, Borio *et al* (2003) and BIS Paper No.18 (2003).

17. For example see, Bernanke (2003).

18. See, for example, IMF (2003).

19. The initial literature on policy rules was based on stable relationship between money, income and prices, which allowed central banks to target inflation by fixing a monetary target given a rate of growth through the equation:

$m_t = k_t + p_t + y_t$ , where
m is money growth,
p is the inflation rate,
y the real growth rate and,
k, the rate of change of the inverse of income velocity of money taken to be zero.

As financial innovations allowed larger number of transactions to be serviced by a smaller amount of money (*ie*, k turned non-zero), central banks attempted to retain a fix on the macroeconomy through the price rather than the quantum of money. The most prominent of the interest rate based rules was the Taylor rule, which posited that
$i_t = r_t + \pi_t + \lambda_1(y_t) + \lambda_2(\pi_t - \pi^t_t)$, where
i is the nominal interest rate to be set by the central bank,
$r_t$ the equilibrium interest rate, $\pi$ the actual inflation rate,
$\pi^t$ the targeted inflation rate, and
y the output gap, *ie*, the difference between the actual and potential output, with the weights $\lambda$ measuring the monetary policy reaction to the deviations of the actual output from the potential and actual inflation from the target.

20. For example, see Bernanke and Mishkin (1997) and IMF (2003).

21. For example, see Fry (1999).

22. For example, see Ball and Sheridan (2003).

23. Reserve Bank of India (1996).

24. For example, see Bernanke and Gertler (1999).

25. For example, see Cecchetti (1996).

26. The lack of unanimity is clear in a comparison of the monetary policy operating frameworks of the three leading central banks. The US Federal Reserve sets a inter-bank interest rate target (*viz*., the Federal Funds Rate) and explicitly states that the monetary and credit aggregates do not possess any information content. The European Central Bank monitors monetary aggregates as a reference value as part of its twin pillar policy framework. The Bank of Japan switched from targeting interest rates to bank reserves in March 2001.

27. For example, see Freedman (1994) and Eika, Ericsson and Nymoen (1996). MCIs are essentially a linear weighted combination of nominal or real interest and exchange rate deviations with respect to a base period. In case of relatively short-term interest rates, nominal values suffice as it may be assumed that the inflation rate would not change very drastically in the short run. Thus, normalising and setting baseline value (= $r_t = r_0$ and $e_t = e_0$) at 100,

$$MCI\ (v) = \alpha\ (r_t - r_0) + \beta(e_t - e_0) + 100 \quad (1)$$

where,

$r_t$ and $e_t$ refer to the interest rate and exchange rate in terms of foreign currency, respectively, at time t,
$r_0$ and $e_0$ to the base period interest and exchange rates, and
v to the ultimate target variable, typically output (y) or inflation (p).

The weights reflect the relative influence of the particular variable on the monetary policy target, *viz*., inflation and/or real output growth. Thus,

$$y = -\propto r - \beta e + \text{other variables}$$
$$\text{or, } p = -\propto r - \beta e + \text{other variables}$$
$$\text{and, } dv/dr = \alpha\ ,\ dv/de = \beta \text{ where } v = p,y$$

An increase (decrease) in $r_t$ and/or an appreciation (depreciation) in $e_t$ in (1) increases (decreases) the MCI, signaling tighter (expansionary) monetary conditions.

28. For example, see Shiller (1990).

29. For example, see Borio (1997).

30. A repo is effectively a borrowing by central bank from the financial markets. Conservative accounting norms would suggest that the central bank should, like any other lender, furnish a collateral, say a government security. This also implies that the ability of the central bank to mop up liquidity through repo operations is limited by its stock of government paper. If a central bank is credible enough, it could conduct repo operations without collateral. In that case, a repo would essentially be a promise to pay, akin to an increase in a contingent liability of the central bank. In the context of the Reserve Bank balance sheet, this would effectively mean that the present reduction in the net Reserve

Bank credit to Government would instead be substituted by an increase in the non-monetary liabilities (NNML).

31. The size of the Reserve Bank's balance sheet has enlarged from about 50 times the Reserve Bank's paid-up capital to 1,03,968 times by June 2003.

32. For example, see Stella (2002).

33. For example, see Rogoff (1985).

34. For example, see Alesina and Summers (1993) and Blinder (1998).

35. 'Finance Member' as it was then called.

36. The genesis of the practice of automatic monetisation is also quite revealing. While the Reserve Bank is authorised to grant to the Government advances repayable not later than three months from the date of making the advance, these provisions are enabling and not mandatory. The provisions of the Act do not require the Reserve Bank to finance unlimited deficits of the Government. History reveals that once the Government slipped into deficit during the Second Plan after years of surplus, as a matter of operational convenience, an official of the RBI and an official of the Ministry of Finance agreed in early 1955, that whenever the cash balances of the Government fell below Rs. 50 crore, *ad hoc* Treasury bills would be created to restore the Central Government's cash balances to Rs. 50 crore. The then Finance Minister, Shri T.T. Krishnamachari, did assure the Reserve Bank that it would be the duty of the Finance Ministry to formulate its proposals for borrowing and deficit financing in consultation with the Reserve Bank but as subsequent history shows, a seemingly innocuous operational arrangement opened up the floodgates of automatic creation of *ad hocs* to finance the Government deficit.

37. For example, see Cecchetti and Krause (2001).

38. For example, see Goldstien and Turner (2003) and NBER (2001).

39. For example, see Mishkin (1999).

40. Recognizing the close Nexus between financial sector fragility and macro-economic vulnerability, a joint Fund/bank FSAP was launched in May 1999 as a part of the enhanced surveillance mechanism with the objective of reducing the likelihood and severity of financial sector crises and cross-border contagion through comprehensive assessments of national financial systems. These assessments essentially aim at: (a) identifying strengths, vulnerabilities and risks, (b) ascertaining the financial sector's development and technical assistance needs, (c) evaluating observance and implementation of relevant international standards and codes including an assessment of the ability of this observance in addressing the problems, and (d) helping in the formulation and implementation appropriate policy responses.

41. A set of 12 standards have been developed by different international organisations. These are: (1) monetary and financial policy transparency, (2) fiscal policy transparency, (3) data dissemination, (d) insolvency, (5) corporate governance, (6) accounting, (7) Auditing, (8) payment and settlement, (9) money laundering, (10) banking supervision, (11) securities regulation, and (12) insurance.

42. See IMF (2003b).

43. For example, see Abrams and Taylor (2000).

44. For example, see Freixas, Giannini, Hoggarth and Soussa (1999).

45. For example, see Morris and Shin (1999).

46. For example, see Flannery (1996).

47. For example, see Freixas, Parigi and Rochet (1998).

48. For example, see Rochet and Tirole (1996).

49. For example, see Goodhart and Huang (1999).

50. For example, see Guttentag and Herring (1983).

51. For example, see Davies (1997).

52. Bank for International Settlement (BIS), Annual Report No. 64.

53. For example, see Friedman (1999) and King (1999).

54. For example, see MacDonough (1998).

55. For example, see Goodhart (2000), Freedman (2000) and Woodford (2000, 2001).

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# *Social Sector Expenditure and Attainments: An Analysis of Indian States*

**Balbir Kaur and Sangita Misra***

Recognising the role of human capital formation and the need for social spending, the study, covering a sample of 15 non-special category states, examines the level and effectiveness of social sector expenditure in the field of education and health over the period 1985-86 to 2000-01. Empirical findings establish that public spending on education has been productive, though it has been more at the primary than at the secondary level of education. The relationship is stronger for poorer than non-poorer states. Female education is instrumental in enhancing both primary and secondary enrolments. The relationship between public spending and health outcome turns out to be weaker, though it is indicative more of inadequate than ineffective health expenditure. Infrastructure availability seems to have a significant influence in reducing infant mortality. State spending has played a less important role in case of health than education in narrowing down the gender and rural-urban disparties.

JEL Classification : H72, I20, I10

Key Words : Public spending, Education, Health

## Introduction

'Investing in people' is now well recognised as the prime motive behind various development and poverty alleviation initiatives. At the international level, one sees several initiatives in the 1990s aimed at sustainable economic and social development, which have finally culminated in the shape of the United Nations Millennium Declaration of September 2000, setting out various developmental goals influencing the well-being of people. Education and health sector goals have been recognised as crucial components of the Millennium Development goals. The importance being attached to these two sectors by the

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international community is associated with the changing perceptions about the desirability of human capital formation not only as a means, but also as an end in itself. The World Development Report 2003 also notes that one of the initiatives to promote sustainable development in a dynamic world is to empower underprivileged sections of population by increasing their access to education and health.

In recognition of the fact that economic prosperity, measured in terms of per capita income alone, does not always ensure enrichment in quality of life, the development strategy adopted in the Tenth Plan in India is also built on the need to exploit synergies between economic growth, desirable social attainments and growing opportunities for all. In line with this broad thinking, it is envisaged that the Government's role will clearly have to expand in social sectors.

Against the backdrop of the increasing importance being attached to human development both at national and international levels, an attempt has been made to analyse the present state of social sector development across states and to examine the effectiveness of public spending on social sectors *viz.*, education and health in terms of select human development indicators of various states. As social sector expenditure is supposed to have a bearing on quality of life of beneficiaries, the study is extended to cover some analytical issues in related areas.

With this broad objective, Section I presents a brief account of the need for public provision and subsidisation of education and health services. Section II brings out the comparisons across countries with respect to social expenditure and attainment indicators, in particular education and health. Earlier studies on the subject, both at the national and international level, have been glimpsed upon in Section III. Section IV offers an analysis of the pattern of expenditure on education and health across the Indian states. The subsequent two sections empirically analyse the impact of education and health expenditure on corresponding attainment indicators, both direct impact and the distributional impact, using data for Indian states. Section VII sets out the concluding observations.

## Section I
## Public Provision and Subsidisation of Education and Health Services

Education and health services are the two crucial segments of the social sector that attract significant public expenditure with strong elements of subsidy. The role of public policy is supported on the premise that expansion of health care, education and social security can directly improve the quality of life, increase productivity of workforce, lead to higher growth and reduce poverty (RIS, 2002). In the literature, there is substantial talk of 'growth mediated' success *vis-à-vis* 'support led success' and the latter strategy is found effective and therefore recommended for the achievement of a better quality of life in terms of social indicators in developing countries.

Public provision of social services, particularly education is also considered as an effective instrument to promote equity by way of providing equality of opportunity to the masses. Further, disparities prevailing in education levels and health indicators between rich and poor and between urban and rural populations in several developing countries including India necessitate the need for public sector financing of education and health to take care of such disparities. The paper on Government Subidies in Inida (1997) observed in this context that "social services, even though highly subsidised, may still be out of reach for the poor, because the component of private costs (transportation, books, medicines, etc.) may be prohibitively high". This underlies the basis for a pro-poor bias in public funding of social sector programmes to ensure that the targeted population is covered to the extent possible. As rightly observed by Reddy (2002), "The poor, the vulnerable and the underprivileged will continue to be the responsibility of national governments and hence of public policy." Dreze and Sen (2002) are also of the view that the promotion of education and health sectors should be seen as irreducibly social concerns, even when particular services are effectively provided through private channels.

Apart from the social and welfare concerns, the justification for state action in provision of education and health services is based on

public goods character of these services.[1] Theoretically, both education and health have large externalities leading to differences between social and private returns. It is well established that the dependence on market mechanism may not provide an optimal solution in such situations. Efficiency considerations, therefore, call for public intervention (Musgrave, 1996). Further, there is no guarantee of an equitable provision of these basic services under the market mechanism. The role of public sector in information provision in health sector itself is considered important due to asymmetry of information between users and providers of health services. Another reason put forward to justify public intervention is the principal-agent problem. Further, it is the peculiar nature of insurance markets for health care and the resultant consequences of inefficiency and inequity, which necessitate an increasing role of the government in health care and insurance.

The positive interconnections between health and education are well recognised.[2] Education in general and female education in particular is supposed to have positive effects on child health, schooling and fertility. Agnihotri (2002) points out that there is a threshold effect in the relationship between literacy and child population size. These interconnections between health and education sectors therefore assume importance from the point of view of policy formulation and implementation. Overall, public provision and subsidisation of education and health services to the masses and thus their empowerment is considered critical for human resource development in the overall development strategy of any country.

## Section II
## International Comparisons

Public policy has come to play an important role in education and health sectors the world over. International comparisons reveal that public spending on education and health accounts for a higher percentage of GDP in high income countries. In fact, public sector's role in health is most prominent in developed countries that are generally market-oriented. On the contrary, a smaller percentage of

health care is financed publicly in low income countries. This seems to be in contrast to the theoretical view that the appropriate state role in health sector is expected to be larger when poverty is widespread (Musgrave, 1996).

Interestingly, countries with almost same per capita income levels have also shown marked differences in terms of public policy intervention and achievement in education and health sectors. For example, within sub-Saharan Africa, substantial differences are observed across countries, attributed to factors like the impact of implementation of stabilisation and structural adjustment policies, prevailing macro-economic environment, administrative collapse, war, etc. (Appleton et al, 1996). The role of an active public policy is quite clear in East Asian Countries and also in China where public sector financing helped in laying down the initial endowments before allowing the market forces to play their role in social sectors[3] (Dreze and Sen, 2002).

A comparison of education levels across countries having similar initial positions, in some empirical studies, points out that their performance has varied over time. For example, China and India both faced problems of high levels of illiteracy in early 1950s but China has moved ahead of India in terms of elimination of illiteracy in the younger age groups. Comparing India *vis-à-vis* others with respect to education and health services have generally revealed low levels of public spending and also gaps in infrastructure leading to poor usage of financial support being extended to these sectors.

In India, public spending on education accounted for 4.1 per cent of GDP in 2000. At this level, India remained close to the middle income and many European countries (Table 1). The education sector in India has seen a number of policy initiatives taken by the Central Government in the 1990s although State Governments continue to be major spenders. There is no doubt that there has been an improvement in education performance indicators in general and higher and technical education in particular over the past years. Yet India remains behind other middle income and European countries with regard to educational attainment indicators. Further, India's present position is not considered good enough against the backdrop

**Table 1: International Comparisons-Expenditure on Health & Education and Select Performance Indicators**

| Group of Countries/ Country | Public Expend. on Education[4] (% of GDP) (2000) | Public Expenditure on Health | | | Gross Enrolment Ratio | | | Life expect-ancy at birth (2001) | Infant Mortality rate (2001) |
|---|---|---|---|---|---|---|---|---|---|
| | | Percen-tage of GDP (2000) | Percen-tage of Total (1997-2000) | | Pri-mary (2000) | Secon-dary (2000) | Terti-ary* (2000) | | |
| | | | Public | Private | | | | | |
| Low Income | 2.8 | 1.1 | 27.1 | 72.9 | 95 | 44 | 8 | 59 | 80 |
| Middle Income | 4.5 | 3.0 | 51.8 | 48.2 | 109 | 70 | 17 | 70 | 31 |
| High Income | 5.3 | 6.0 | 62.2 | 37.8 | 102 | 106 | 62 | 78 | 5 |
| East Asia & Pacific | 2.3 | 1.8 | 38.6 | 61.4 | 106 | 61 | 9 | 69 | 34 |
| Europe & Central Asia | 4.4 | 4.0 | 72.4 | 27.6 | 94 | 88 | 44 | 69 | 30 |
| Latin America & Carib. | 4.4 | 3.3 | 47.6 | 52.4 | 130 | 86 | 21 | 71 | 28 |
| Middle East & North Africa | 5.3 | 2.9 | 61.9 | 38.1 | 95 | 76 | 22 | 68 | 44 |
| South Asia | 2.5 | 1.0 | 20.8 | 79.2 | 98 | 48 | 10 | 63 | 71 |
| Of which: | | | | | | | | | |
| India | 4.1 | 0.9 | 17.8 | 82.2 | 102 | 49 | 10 | 63 | 67 |
| Pakistan | 1.8 | 0.9 | 22.9 | 77.1 | 75 | .. | .. | 63 | 84 |
| Bangladesh | 2.5 | 1.4 | 36.4 | 63.6 | 100 | 46 | 7 | 62 | 51 |
| Sri Lanka | 3.1 | 1.8 | 49.0 | 51.0 | 106 | 72 | .. | 73 | 17 |
| China | 2.9 | 5.3 | 36.6 | 63.4 | 106 | 63 | 7 | 70 | 31 |
| Sub-Saharan Africa | 3.4 | 2.5 | 42.4 | 57.6 | 86 | 27 | 4 | 46 | 105 |
| Europe EMU | 4.8 | 6.7 | 73.4 | 26.6 | 104 | 107 | 52 | 78 | 4 |
| US | 4.8 | 5.8 | 44.3 | 55.7 | 101 | 95 | 73 | 78 | 7 |
| UK | 4.5 | 5.9 | 81.0 | 19.0 | 99 | 156** | 60 | 77 | 6 |
| Germany | 4.6 | 10.6 | 75.1 | 24.9 | 104 | 99 | 46 | 78 | 4 |

Source: World Development Indicators, 2003.

* As per UNESCO's definition, tertiary education refers to post-secondary education regardless of whether it leads to an advanced research qualification or not.

** Includes training for the unemployed.

of sharp differences across states and persistence of large female-male and rural-urban disparities. This type of situation is often interpreted as a failure of state initiatives to bring about desired improvements in education performance indicators. It is also held that the strategy adopted for educational expansion has had limited spillover effects.

The share of public expenditure on health in GDP has remained much lower relative to international levels (around 0.9 per cent as compared to 1.1 per cent for low-income and 6.0 per cent for high-

income countries, Table-1). Further, the share of public expenditure to total health expenditure is also one of the lowest for India (around 18 per cent as against 36 per cent for Bangladesh, 36.6 per cent for China, 49 per cent for Sri Lanka, 27 per cent for low income and 62 per cent for high income countries). India's performance in terms of health indicators viz., infant mortality rate and life expectancy is not very impressive. This is attributed, among others, to an expensive hospital based curative strategy adopted for provision of health services in India as against low cost community based strategies preferred in China and Sri Lanka.

## Section III
## Review of Literature

At the cross-country level, the relationship between social sector expenditure and various social sector performance indicators has been analysed in many studies using cross/panel data regression analysis. Although higher public spending on these sectors is expected to show up an improvement in social indicators, this is not empirically established in all studies. The results vary widely and tend to support either growth-led or direct intervention strategies to address the human development issues particularly in the context of developing countries. While in the case of health sector empirical results vary from no relationship (Filmer and Pritchett, 1999) to weak relationship (Verhoven et al, 2002) between health spending and outcome, the education sector results show weak to strong relationship (Verhoven et al, 2002) between education spending and performance indicators. Per capita income remains an important determinant of both health and education attainment indicators (Baldacci et al, 2002). However, the relationship between public spending on health care and the health status of the poor is observed to be stronger in low-income countries than high income countries (Gupta et al, 2001).

The empirical work in India has looked at several aspects of social sector expenditure extending from a simple analysis of trends in expenditure at the Central and State levels to micro level as well as some technical issues. Some studies (Shariff et al, 2002) have included

expenditure on poverty alleviation programmes as an important component of social sector expenditure. The focus of empirical analysis in some cases has been on quality of public education and health services in influencing the utilisation of these services. While the impact of social sector expenditure on human development has generally been recognised, there are only a few studies that have actually examined the issue empirically for India. Prabhu and Chatterjee (1993) viewed social priority and human expenditure ratios as indicators of the government's commitment to the cause of human development. They tried to relate these indicators to the levels of development of physical infrastructure as well as government expenditures during 1983-86 and 1988-91[5] using the principal component analysis method. Infrastructure development was found to have a significant influence on health indicators, while it was not so for educational performance indicators. Recognising the role of human capital accumulation for growth, a study using data for Indian states (1980-97) reveals that human development policy has a significant impact on economic growth (Pradhan and Abraham, 2002).

Empirical studies in the Indian context also reveal inter-state as well as intra-state (across districts) differences and rural-urban and male-female disparities in health and education indicators (Sipahimalini, 2000). It is generally viewed that per capita income is an important determinant of educational achievements but it fails to explain differences in literacy rates across states with comparable levels of income. This is attributed to differences observed among states in public commitment to the provision of educational facilities. The success of Himachal Pradesh and Kerala on the educational front is often highlighted to establish the role of active public policy in these states (Dreze and Saran, 1999).

## Section IV
## Government Expenditure on Education and Health in India

The social sector[6] involves major responsibility in respect of expenditure liability on State Governments although in view of significance and importance attached to this sector, the Central

Government remains involved either directly or indirectly by way of both financial and directional/policy support being extended to State Governments enabling them to extend such services efficiently and effectively to the general public.

A quick look at the social sector plan outlays reveals that education continues to receive priority attention. During the Ninth Plan period, education sector expenditure aggregated to Rs.51,343 crore, accounting for 29.3 per cent of total public sector expenditure on social services. In contrast, the share of plan outlay on 'medical and public health' in total social services expenditure during the Ninth Plan stood at only 9.9 per cent.

In view of the importance of education sector in overall development strategy, an important initiative has been taken at the

**Table 2 : Plan Outlays of Centre, State and Union Territories on Social Sectors**

| Plan | Education | Medical and Public Health | Social Services |
|---|---|---|---|
| First Plan (1951-56) | 149.0 | 65.2 | 472.6 |
| Second Plan (1956-61) | 273.5 | 140.8 | 854.8 |
| Third Plan (1961-66) | 588.7 | 225.9 | 1491.8 |
| Annual Plans (1966-69) | 306.8 | 140.2 | 975.9 |
| Fourth Plan (1969-74) | 774.3 | 335.5 | 2985.2 |
| Fifth Plan (1974-79) | 1710.3 | 760.8 | 6833.9 |
| Annual Plan (1979-80) | 263.0 | 223.1 | 1967.5 |
| Sixth Plan (1980-85) | 2976.6 | 2025.2 | 15916.6 |
| Seventh Plan (1985-90) | 7685.5 | 3688.6 | 34959.7 |
| Annual Plan (1990-91) | 2316.5 | 1040.8 | 9606.6 |
| Annual Plan (1991-92) | 2599.0 | 924.8 | 10298.7 |
| Eighth Plan (1992-97) | 21598.7 | 8137.6 | 88806.6 |
| Ninth Plan (1997-2002)[7] | 51343.2 | 17379.7 | 175214.6 |
| Annual Plan (1997-98) | 7656.6 | 2641.5 | 26867.2 |
| Annual Plan (1998-99) | 9684.1 | 5411.9 | 38735.3 |
| Annual Plan (1999-2000) | 10018.4 | 3568.7 | 37013.9 |
| Annual Plan (2000-01) | 17644.5 | 4346.6 | 45710.8 |
| Annual Plan (2001-02) | 6339.6 | 1411.0 | 26887.4 |

Source: Indian Public Finance Statistics, various issues, Government of India.

Central Government level to supplement funds available for this sector through extra budgetary means by setting up a registered society named 'Bharat Shiksha Kosh'. The objective is to mobilise resources by way of contributions, donations or endowments from individuals, Central and State Governments, Non Resident Indians and People of Indian Origin for various educational purposes.

Notwithstanding the Centre's efforts, it is the State Governments that account for a majority share (of more than 80 per cent) of the social sector spending. Hence, a detailed analysis of trends in state government spending is of significance. For the purpose of analysis, we have considered actual spending of 15 non-special category states from 1985-86 to 2000-01. It is important to note here that our analysis is limited to revenue expenditure only. Though capital expenditure constitutes nearly 17-18 per cent of total expenditure of states, its share in education lies between 0.2 per cent and 1.4 per cent for most states except Goa, for which it is around 3.6 per cent. Capital expenditure accounts for a still smaller proportion in the case of health expenditure.

**Table 3: Trend in Education and Health Expenditure across States**

| State | Growth in GSDP per capita p.a. (1985-86 to 2000-01) | Education expenditure as % of GSDP | | Health expenditure as % of GSDP | | Change in real expenditure per capita p.a. (1985-86 to 2000-01) | |
|---|---|---|---|---|---|---|---|
| | | 1985-86 | 2000-01 | 1985-86 | 2000-01 | Education | Health |
| Andhra Pradesh | 5.9 | 3.5 | 2.7 | 1.2 | 0.7 | 3.1 | 1.2 |
| Bihar | 3.2 | 5.9 | 8.7 | 1.5 | 1.5 | 7.7 | 3.5 |
| Goa | 10.1 | 5.0 | 3.3 | 1.8 * | 1.1 | 4.2 | 3.9 |
| Gujarat | 5.9 | 3.4 | 3.3 | 0.8 | 0.7 | 5.5 | 3.6 |
| Haryana | 3.8 | 2.3 | 2.5 | 0.8 | 0.5 | 4.5 | -0.5 |
| Karnataka | 8.2 | 3.3 | 3.3 | 1.2 | 0.7 | 8.3 | 2.5 |
| Kerala | 5.9 | 5.5 | 3.8 | 1.5 | 0.8 | 2.0 | 0.4 |
| Madhya Pradesh | 5.8 | 2.8 | 3.8 | 1.0 | 1.0 | 10.5 | 5.7 |
| Maharashtra | 6.3 | 2.7 | 3.6 | 1.6 | 0.5 | 11.1 | -2.2 |
| Orissa | 1.4 | 2.9 | 4.8 | 1.1 | 1.0 | 7.1 | 1.0 |
| Punjab | 3.5 | 2.5 | 2.7 | 0.9 | 0.9 | 4.4 | 3.3 |
| Rajasthan | 4.8 | 3.7 | 4.2 | 1.2 | 1.0 | 6.4 | 2.5 |
| Tamil Nadu | 6.8 | 3.6 | 3.2 | 1.7 | 0.7 | 5.4 | -1.0 |
| Uttar Pradesh | 3.0 | 2.8 | 3.4 | 1.0 | 0.6 | 4.9 | -0.7 |
| West Bengal | 5.4 | 2.8 | 3.3 | 1.1 | 0.8 | 7.3 | 3.1 |

Note: For data source see Annexure IV * for 1986-87.

### *(a) Public Education and Health expenditure across states[8]*

State government policy initiatives have given due focus to education as is evident from the fact that in 11 out of 15 states, the rate of growth of real expenditure per capita per annum almost matched or exceeded the rate of growth in GSDP per capita per annum during the period 1985-86 to 2000-01 (Table 3). Resultantly, the ratio of education expenditure to GSDP in these states moved up.[9] The states, which deviated from this pattern, included Andhra Pradesh, Goa, Kerala and Tamil Nadu. Of these, Goa, Tamil Nadu and Kerala could still maintain relatively higher per capita education expenditure due to their relatively higher base level expenditure.

Health has remained a low priority area for most states. Health expenditure as a percentage of GSDP has remained not only low but also declined in 11 out of 15 states. In 2000-01, the ratio remained in the range of 0.5 per cent to 1.5 per cent for the states under review. Further in 4 states, viz., Haryana, Maharashtra, Tamil Nadu and Uttar Pradesh, real expenditure on health per capita per annum exhibited negative growth rates.

### *(b) Ranking of states with regard to per capita expenditure on education and health*

Observed trends (Table 4) reveal the following:

- In the case of both health and education, the last four positions kept shuttling between the states of Bihar, Madhya Pradesh, Uttar Pradesh and Orissa and there was no substantial change in their ranking during this period.
- Kerala and Punjab have remained among top four states in terms of per capita expenditure during this period for both health and education.
- While the ranking of Maharashtra has improved in terms of per capita expenditure on education, the state has seen a substantial fall in its ranking for health expenditure.
- Haryana has seen a deterioration in its ranking for both the sectors.
- There has been a slight improvement in ranking of Rajasthan and Karnataka in the case of education expenditure and of Rajasthan, West Bengal and Andhra Pradesh in the case of health expenditure.

**Table 4: Ranking of states in terms of per capita expenditures on education and health #**

| Ranking of States | Education Expenditure | | Health Expenditure | |
|---|---|---|---|---|
| | 1985-86 | 2000-01 | 1985-86 | 2000-01 |
| **From top** | | | | |
| 1. | Kerala (148.8) | Maharashtra (969.9) | Maharashtra (67.3) | Punjab (247.0) |
| 2. | Gujarat (124.7) | Kerala (818.7) | Tamil N. (49.6) | Kerala (181.8) |
| 3. | Punjab (124.4) | Punjab (774.5) | Punjab (44.1) | Tamil N. (156.7) |
| 4. | Maharashtra (113.0) | Gujarat (720.0) | Kerala (40.1) | Gujarat (149.2) |
| **From bottom** | | | | |
| 1. | U.Pradesh (63.3) | U.Pradesh (368.6) | Bihar (16.8) | U.Pradesh (68.9) |
| 2. | M.Pradesh (66.0) | M.Pradesh (458.3) | U.Pradesh (23.1) | Bihar (86.1) |
| 3. | Bihar (66.8) | Orissa (470.7) | M.Pradesh (21.4) | Orissa (96.5) |
| 4. | Orissa (69.1) | Bihar (482.8) | Orissa (25.5) | M.Pradesh (120.3) |

# Figures in brackets indicate per capita expenditures in Rupees.

**Note:** The state of Goa has been excluded, as comparable data was not available for all the years. For data source see Annexure IV.

- There has been no substantial change in the gap in expenditure on education and health between the highest and lowest spending state. The ratio of highest to lowest spending state remained close to 2 in the case of education while it declined in the case of health from 4.0 in 1985-86 to around 3.6 in 2000-01.

### *(c) Composition of education expenditure*

State-wise details of composition of education expenditure reveal a bias in favour of primary and secondary school spending with the latter turning out to be more important than the former in Goa, Haryana, Punjab and West Bengal (Table 5), which can be explained in terms of higher primary enrolment figures for these states and the need to do more in the area of secondary school education. At the Central Government level, however, primary education expenditure remains the predominant component of total expenditure on education.

### *(d) Recoveries from education and health*

The recoveries from education and health sectors (includes medical and public health) by way of user charges have generally remained low and account for small proportions of corresponding revenue expenditure for most states. The ratio of recoveries to expenditure on revenue account is particularly lower for education

## Table 5 : Sectoral Composition of Expenditure on Education- State-wise details

(in per cent)

| State | 1985-86 | | | 2000-01 | | |
|---|---|---|---|---|---|---|
| | Primary | Secondary | Others* | Primary | Secondary | Others* |
| Andhra Pradesh | 45.88 | 28.57 | 25.54 | 44.28 | 25.47 | 30.25 |
| Bihar | 61.37 | 20.19 | 18.45 | 68.67 | 18.41 | 12.92 |
| Goa | 32.26 | 47.89 | 19.84 | 27.68 | 51.75 | 20.57 |
| Gujarat | 58.45 | 27.48 | 14.06 | 56.96 | 29.90 | 13.14 |
| Haryana | 40.69 | 39.42 | 19.89 | 38.91 | 40.14 | 20.95 |
| Karnataka | 53.00 | 26.93 | 20.07 | 48.36 | 27.84 | 23.80 |
| Kerala | 50.97 | 29.65 | 19.37 | 47.15 | 31.86 | 20.99 |
| Madhya Pradesh | 61.66 | 19.96 | 18.37 | 63.47 | 17.03 | 19.50 |
| Maharashtra | 44.82 | 38.29 | 16.89 | 43.68 | 35.88 | 20.44 |
| Orissa | 51.38 | 26.91 | 21.71 | 60.58 | 21.20 | 18.22 |
| Punjab | 34.33 | 48.38 | 17.28 | 29.34 | 56.76 | 13.90 |
| Rajasthan | 52.14 | 34.31 | 13.54 | 57.66 | 32.45 | 9.89 |
| Tamil Nadu | 51.95 | 26.04 | 22.01 | 43.46 | 36.71 | 19.83 |
| Uttar Pradesh | 49.46 | 34.73 | 15.80 | 56.96 | 31.56 | 11.48 |
| West Bengal | 39.81 | 39.19 | 21.00 | 33.54 | 45.51 | 20.95 |

Source: Budgeted Expenditure on Education,Department of Education, Ministry of Human Resource Development, various issues.

* Includes adult education, technical education, university/higher education and others.

## Table 6: Recoveries from Education and Health Sectors

| **State** | **Education recoveries as % of revenue expenditure on education** | | **Health recoveries as % of revenue expenditure on health** | |
|---|---|---|---|---|
| | **1985-86** | **2000-01** | **1987-88**** | **2000-01** |
| Andhra Pradesh | 2.40 | 3.13 | 3.09 | 2.47 |
| Bihar | 0.74 | 0.47 | 2.95 | 2.24 |
| Goa | 0.38* | 0.69 | 4.22 | 6.04 |
| Gujarat | 1.97 | 1.04 | 8.52 | 6.52 |
| Haryana | 4.30 | 1.64 | 8.21 | 9.17 |
| Karnataka | 2.48 | 1.14 | 1.54 | 3.79 |
| Kerala | 4.14 | 1.72 | 5.95 | 3.56 |
| Madhya Pradesh | 0.76 | 0.48 | 2.39 | 1.33 |
| Maharashtra | 0.83 | 0.34 | 6.36 | 5.52 |
| Orissa | 1.84 | 1.14 | 3.00 | 2.83 |
| Punjab | 1.27 | 0.56 | 5.53 | 5.06 |
| Rajasthan | 0.73 | 0.76 | 3.24 | 2.22 |
| Tamil Nadu | 1.83 | 1.22 | 5.85 | 6.36 |
| Uttar Pradesh | 1.41 | 2.90 | 3.86 | 2.85 |
| West Bengal | 0.57 | 0.39 | 10.03 | 3.87 |

Note: For data source see Annexure IV, * For the year 1987-88, ** Data for 1987-88 has been used as comparable information for all states for the earlier period is not available.

(less than 1 per cent for certain states) as compared to health. Further, for 11 out of 15 states, the ratio has declined for both education and health sectors in 2000-01 as compared to 1985-86.

## Section V
## Link between Social Spending and Attainment- Panel Data Evidence

The empirical analysis is done to examine whether public spending has been productive in the sense that whether increased social outlays have been reflected in improved social indicators. The analysis is done for the 15 non-special category states for which data is available on all the chosen indicators over the period 1985-86 to 2000-01. For the state of Goa, data on health variables are not available. Hence, the health care analysis is restricted to the remaining 14 states.

### *V.1. The Choice of Variables*

A wide range of social indicators is available to gauge the performance of public spending. Also, in addition to the policy variable *viz*. public spending, a number of other variables are known to determine the social outcome such as the economic development of the state, the social infrastructure availability in the state, the socio demographic conditions, the efficiency in resource use, initial levels of social attainment, etc. Annexure I lists out the whole range of variables that have been used in the literature either individually or in combination. The selection of variables in our analysis has been based on two factors: first, variables, which have been most frequently used by other empirical studies for inter-state and inter-country comparisons; secondly, variables for which reasonably upto date time series data are available. Based on the above considerations, listed below are the variables that have been chosen for our analysis:

1. Social Attainment Indicators- Gross Enrolment Ratio (GER *i.e.*, number of students enrolled as a percentage of total number of school age persons). Both Primary (in the age group of 6-13 years) and Secondary (14-18 years) enrolment ratios are used as education attainment indicators. Infant Mortality Rate (IMR) is used as health attainment indicator.

2. Social Spending- Statewise expenditure (revenue account) on education and health as a percentage of GSDP has been taken.

3. A set of control variables that are known to affect the relation between 1 and 2.

   - Extent of economic development of the state- NSDP per capita at constant prices is used as a proxy for this for both education and health.
   - Level of development of physical infrastructure of the state- No. of schools per thousand population and No. of hospitals per 100 square km. are used as infrastructure proxies for education and health regressions, respectively.
   - Socio demographic factors- Total Fertility Rate (TFR) and share of girls in secondary enrolment are used as proxies for health and education analysis, respectively.
   - Other specific indicators- No. of beds per thousand population and Pupil-Teacher ratio (capturing the probable impact of literacy on health) has been used for health regression while only the latter has been used for education.

### *V.2. The model*

The following regression equation is estimated using panel data

$Yit = f (Eit, GSDPit , Xit)$ …… (1)

where Y denotes social indicator

E denotes social sector spending

GSDP is defined in per capita terms

X is the vector of other control variables

i denotes states in the sample

t denotes time period.

Apart from the linear specification, two other specifications have been used to estimate the above relation:

1. Log linear (log-log or double log) specification where all variables are in logarithmic form.

2. Linear log (lin-log specification) where only independent variables are in logs.

Instead of going into the debate as to which functional form to use, we have taken the functional forms used frequently in the literature to examine such relationships, especially at the cross country level. [10,11]

In a heterogenous cross section analysis such as this, heteroscedasticity could be a major problem. To take care of that as can be seen, most variables have been normalised. Further, both dependent and independent variables have been quite frequently transformed into logarithms to scale down the variation. Nevertheless some heteroscedasiticity could still persist in a sample of heterogenous group of states. Greene's procedure provided in LIMDEP econometric software for correcting the OLS covariance matrix is used in the present exercise to correct for any potential heteroscedasticity.

Since the data set pools observations across 15 states and over 16 periods of time, controls for state and time dimensions have been added. With our prime objective being analysing the variations across states, each state is considered as a separate unit and in case of time, a time dummy kind of variable is introduced, which takes only two values, 0 for pre 1991-92 and 1 for post 1991-92 period.

### *V.3. Estimations and Inferences*

### *V.3.1 Education Regression*

Equation (1) is estimated using two measures of education attainment: (a) Gross enrolment ratio in primary and secondary education and (b) Gross enrolment in secondary education. Results are reported in Tables 7 and 8.

#### *V.3.1.1 Primary and Secondary Enrolment*

It is observed that with gross primary and secondary enrolment as the dependent variable, both public spending and per capita income coefficients are found to have signs that are consistent with our expectations. The significance level of per capita income coefficient is,

however, lower. It is also noticed that the role of per capita income relatively increases for secondary education as compared to primary education.

Of the control variables, the share of girls in secondary enrolment turns out to be important in explaining the differences in enrolment rates across states reflecting the important role that female literacy can play in improving the education outcomes. The infrastructure variable, 'Number of Schools for general education' though correctly signed demonstrates low significance levels. However, one may not rule out the importance of informal (out of school) methods of teaching, more prevalent at the primary level, which have not been captured by the schools data. Surprisingly, the pupil-teacher ratio is significant with a positive sign. A possible reason, which is very often cited in Indian case, is that in the post independence era, though the number of educational institutions has increased significantly, the utilisation of these educational facilities has also increased resulting in higher pupil-teacher ratio. Further higher enrolment indicates the pressure on educational institutions. Hence, there is a need for opening more schools for taking care of demand side and improving the quality of education at the same time.

**Table 7 : Gross Primary and Secondary Enrolment - Panel Regression Results**

| | **Linear** | | **Lin-Log** | | **Log-Log** | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (1) | (2) | (1) | (2) |
| Constant | 19.4** | 9.87 | -74.5** | -78.2** | .78*** | .74*** |
| State spending | 2.4*** | 2.98*** | 10.7*** | 11.7*** | .73E-01*** | .77E-01*** |
| NSDP | .33E-02 | .56E-03** | 10.9 | 7.8 | .10** | .83E-01* |
| Schools | .11*** | .67E-01** | 2.14 | .4E-01 | .17E-01 | .13E-02 |
| G-Share | .25E-01 | .41*** | 5.08 | 29.7*** | .38E-01 | .21*** |
| Pupil Teacher ratio | .60*** | .49*** | 50.11** | 38.4**** | .31 | .24*** |
| N | 154 | | 154 | | 154 | |
| F-value | 94.2 | | 86.35 | | 92.94 | |
| p-value | .00 | | .00 | | .00 | |
| Adjusted R square | .92 | | .91 | | .92 | |
| | FE | RE | FE | RE | FE | RE |

***, ** and * indicate significance at 1, 5 and 10 percent; FE: Fixed Effect, RE: Random Effect
Fixed effect allows us to account for the presence of heterogeneity or differences in behaviour across individuals. The fixed effect approach takes $\alpha$ i to be a group specific constant term (and assumed to be correlated with the included variables) in the regression model that embodies all the observable effects for that group. The term fixed implies that it does not change over time. The random effect approach assumes individual heterogeneity to be uncorrelated with the included variables and specifies a group specific random element.

This model is able to explain more than 90 per cent of the variation in primary and secondary enrolment rates in a two-dimensional set up. The F-statistic for all regressions is statistically significant at the 1 per cent level.

### *V.3.1.2 Secondary Enrolment*

Next we take the gross secondary enrolment ratio as the dependent variable with all the independent variables remaining the same so as to enable comparability with earlier analysis.[12] Results are clearer in this case. All variables are found to be correctly signed (even pupil-teacher ratio) though the significance levels of state spending and pupil-teacher ratio remain lower. The infrastructure index improves its significance level relative to the earlier regression though it still continues to remain low, indicating that education is more demand determined. In this context, the quality of services being offered in the existing infrastructure also plays an important role. Considering the case of Kerala, its rank in terms of infrastructure availability is not very high, yet with respect to education outcomes its results have been the best. This finding reinforces the earlier findings that mere setting up of schools is not an end in itself. What is more important is the efficiency/quality of services being rendered in these schools. With limited resources available with the states, it is important that whatever amount is spent on this sector, it should be targeted at the end, not at the means.

In the case of only secondary enrolment regression, the explanatory variables account for more than 80 per cent of cross-state variations in education attainment. The F-statistic for all regressions is statistically significant at the 1 per cent level.

One interesting result that emerges is that while state spending is a very important determinant in the case of primary education, its importance gradually fades out as we move on to secondary education where the per capita income turns out to be a more important determinant of education outcome measured in terms of enrolment ratio. One probable reason could be the fact that the expenditure on education here refers to only public spending ignoring the possible impact of private expenditure, which is more important at the secondary level.

**Table 8: Gross Secondary Enrolment - Panel Regression Results**

| | Linear | | Lin-Log | | Log-Log | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (1) | (2) | (1) | (2) |
| Constant | 5.04 | 1.19 | -73.2** | -51.6* | .98E-01 | .34E-01 |
| State spending | 1.01 | 1.3** | .63 | .37 | .37 | .22 |
| NSDP | .12E-02*** | .12E-02*** | 27.6*** | 17.2*** | .30** | .15 |
| Schools | 60.7** | 32.2* | 5.1 | 5.9* | .98E-01 | .98E-01 |
| G-Share | .23 | .37*** | 14.2 | 29.5*** | .38* | .63*** |
| Pupil Teacher ratio | -.8E-01 | -.8 | -13.3 | -16.0* | -.21 | -.24 |
| N | 154 | | 154 | | 154 | |
| F-value | 53.3 | | 49.71 | | 25.52 | |
| p-value | .00 | | .00 | | .00 | |
| Adjusted R square | .86 | | .85 | | .74 | |
| | FE | RE | FE | RE | FE | RE |

***,** and * indicates significance at 1, 5 and 10 percent FE: Fixed Effect, RE: Random Effect

### *V.3.1.3 Regional and Inter-temporal effects*

Looking at the fixed effect (FE) coefficients, one observes that FE intercept coefficient is markedly significant for nine out of 15 states in the case of first regression with primary and secondary enrolment as the dependent variable indicating the presence of some state specific variables. For the states of Andhra Pradesh, Bihar, Orissa, Rajasthan and U.P, the coefficient is significant with a negative sign indicating that the average enrolment in these states is lower than all states average. For Kerala, Goa, Tamil Nadu and Maharashtra, it is significant with a positive sign indicating that the average enrolment is higher than all states average.

In the case of second regression with only secondary enrolment as the dependent variable, the FE intercept coefficient is significant for only four out of 15 states. For the states of Andhra Pradesh and Orissa, the coefficient is significant with a negative sign indicating that the average enrolment in these states is lower than all states average. For Kerala and Tamil Nadu, it is significant with a positive sign indicating that the average is higher than all states average. The success of these states, especially Kerala is very often associated with an early public commitment to provision of educational

services together with complementarity between state intervention, the market mechanism, and co-operative action.[13]

The time dummies are generally insignificant revealing no pattern in case of both primary and secondary enrolment ratios. The intertemporal effect exhibits significance only for secondary enrolment regression in linear form. The coefficient in this case for pre 1992 is significant with a negative sign and post 1992 is significant with a positive sign indicating that secondary enrolment has picked up across states over the post 1992 period.

### *V.3.1.4 Poor States vs. Non-Poor States*

To examine the impact of spending on low income countries, Gupta, Verhoven and Tiongson (2001) in their study have classified the countries in their sample into two categories based on whether they are eligible for assistance from the World Bank and the IMF under the IDA and PRGF facility or not[14]. We have divided the 15 states into two categories- poor and non-poor - based on whether their per capita NSDP at constant prices for 2000-01 is above/below all-India average and examined the same relationship. This provides an indication of the differences in the effectiveness of public spending for poor *vis-a-vis* non-poor states. Table 9 provides the public spending coefficients separately for poor and non-poor states, as obtained from linear regressions, with all other variables remaining the same.

Two findings are noteworthy. First, in case of enrolment at primary level, the coefficient of public spending is significant for both the categories, with the coefficient being higher for poor states as compared to non-poor. This implies that public spending has a more important role to play in enhancing primary enrolment for poor states as compared to non-poor states. Second, in case of secondary enrolment, results show the absence of a statistically significant association between spending on education and enrolment for the poor states. Public spending coefficient is, however, positive and significant for non-poor states. Even if it is admitted that private spending is relatively more important at

secondary education level, the above result could be attributed to inefficiencies in the provision of services and poor targeting in the poorer states that weaken the impact of pubic spending on education.

**Table 9 : Public Spending and Enrolment- Poor vs Non-Poor States**

| Enrolment | Poor States | Non-Poor States |
|---|---|---|
| **Primary Enrolment** | | |
| Coefficient | 3.0** | 2.46*** |
| Adjusted R square | 0.63 | 0.77 |
| N | 90 | 105 |
| **Secondary Enrolment** | | |
| Coefficient | -0.37 | 1.5** |
| Adjusted R square | 0.63 | 0.84 |
| N | 66 | 81 |

***,** and * indicates significance at 1, 5 and 10 percent

### *V.3.2 Health Regression*

The findings of health regressions are reported in Table 10. Public spending on health care is clearly negatively associated with mortality rate, although not always at statistically significant levels. Per capita income is relatively more important vis-à-vis state spending in influencing health outcome, its coefficient being significant in all regressions. This is in line with the conclusion arrived at by Filmer and Pritchett (1999) for a data set comprising of both developed and developing countries and by Musgrave (1996). Also as expected, TFR moves in the direction of IMR and quite significantly. Of the two infrastructure variables, 'number of hospitals per 100 square km.' turns out to be more significant than 'number of beds per lakh population' of the state. Pupil-teacher ratio does not perform, as one would expect. Most of the time it has a negative sign although it is not significantly different from zero in statistical terms. Baldacci et al (2002) in their study have also observed low significance for pupil-teacher ratio.

**Table 10: Infant Mortality Rate - Panel Regression Results**

| | Log-Log | | Lin-Log | |
|---|---|---|---|---|
| | (1) | (2) | (1) | (2) |
| Constant | 2.8*** | 2.7*** | 184.9*** | 180.4*** |
| Public Expenditure on health | -.47E-01 | -.6E-01* | -11.9 | -15.56* |
| NSDP per capita | -.31*** | -.28*** | -39.66** | -38.56*** |
| TFR | .46*** | .56*** | 82.1*** | 98.1*** |
| Hospitals per 100 sq.km. | -.6E-01** | -.71E-01*** | 2.14 | -1.12* |
| Beds per lakh population | -.38E-01 | -.48E-01 | -3.9 | -6.4 |
| Pupil Teacher Ratio | -.79E-03 | .39E-01 | 3.87 | 0.56 |
| N | 154 | | 154 | |
| F-value | 219.46 | | 114.68 | |
| P-value | .00 | | .00 | |
| Adjusted R square | .96 | | .93 | |
| | FE | RE | FE | RE |

***,** and * indicates significance at 1, 5 and 10 percent FE: Fixed Effect, RE: Random Effect

The income elasticity of infant mortality obtained in log-log regression is comparable with earlier estimates. Studies have shown that this elasticity lies between -0.2 to -0.4 for developing and transition economies.[15] Income elasticity in our sample of states turns out to be around -0.3.

For a cross country analysis, Gupta, Verhoeven and Tiongson (2002) have tried to take into account the decreasing returns to scale in the improvement of health by constructing a separate index.[16] Strictly speaking, this logic does not hold for Indian states, as most of them perhaps have not even reached the critical minimum as far as health attainment is concerned.

At the cross-country level, there are studies, which have pointed out that health care spending has differential impact on health status in low/high income countries (Gupta, Verhoeven and Tiongson, 2001).[17] The same was tried for Indian states based on whether their per capita income for 2000-01 is higher/lower than the all-India average. No such result was observed for states with high per capita income. State spending exhibits low significance for both low and high income states. Interestingly, the role of income substantially rises for the high income states, income elasticity being higher at 0.42.

### *V.3.2.2 Regional and Intertemporal effects*

Looking at the FE coefficients, one observes that it is markedly significant for the states of Bihar, Kerala, Madhya Pradesh and Orissa for all functional forms. This indicates the presence of some state specific variables. For Madhya Pradesh and Orissa, the coefficient is significant with a positive sign indicating that the average mortality rate in these two states is higher than all states average and for Kerala and Bihar, it is significant with a negative sign indicating that their average mortality rates are lower than all states average.

The intertemporal effect has also been quite significant. For both functional forms, the coefficient for pre 1992 is significant with a positive sign and post 1992 is significant with a negative sign indicating that IMR has declined consistently across states over the period under review.

### V.3.3 Rank Correlation Co-efficients

**Table 11 : Rank Correlation between Social Expenditure and Human Development Index**

| Correlation Between | 1991 | 2001 |
|---|---|---|
| HDI and social expenditure | 0.90 | 0.90 |
| HDI and Education Expenditure | 0.93 | 0.84 |
| HDI and Health Expenditure | 0.81 | 0.82 |

Note: Social, education and health expenditure are per capita expenditures in real terms for 1990-91 and 2000-01.

To see how social expenditure affects human development, we have calculated simple rank correlation coefficients between HDI ranking of the state as given by Planning Commission in its National Human Development Report 2001 and the per capita real expenditure of different states on social services. It is observed that the HDI and social expenditure are strongly positively correlated. Further, disaggregated analysis reveals that the rank correlation coefficients

between HDI and two other components of social expenditures, namely, education and health also turn out to be high. Of the two, education expenditure seems to be playing a more important role than health expenditure. The role of education in human development is well recognised and this finding further reinforces earlier findings.

## Section VI
## Distributional Effects of Social Spending

This section makes a preliminary attempt to explore whether increased education spending has had some impact on the inequality levels within the sector.[18] An appropriate way of testing this would be to see the impact of education expenditure on enrolment ratios for different income groups. However, because of non-availability of data on distribution of social indicators by income quintiles, this kind of analysis has not been attempted in the Indian context. At the cross-country level, a few studies (e.g., Bidani and Ravallion, 1997) have attempted to tackle this ecological inference problem by decomposing social indicators income group-wise with a view to analysing its impact on poor vis-à-vis non-poor. These studies reveal that the poor are more strongly affected by public spending on health care in comparison with the non-poor. This is said to be happening logically due to the fact that the better-off have the capacity to provide for and also substitute private for public health spending. This can be an area for future research using the state-wise social outcome data. The present study has looked at the problem from a slightly different angle - "whether social spending has been successful in narrowing down the gaps - gender gap and rural urban gap - which is typical of Indian society, thus, in the process helping the disadvantaged more than the advantaged."

### *VI.1 Education Spending Per Capita and Gender Gap in Primary Enrolment*

By plotting real per capita education expenditure and male-female gap in primary enrolment over the period 1985-86 to 2000-01, one observes that eight out of 15 demonstrate a clear opposite

movement of the two variables (Annexure II). Of these eight states, the male-female gap over the years has come down to below 5 per cent for Maharashtra and has dissappeared for Punjab and Haryana, which is a positive trend. These are also the states with per capita real expenditure on education greater than Rs. 400/-.

For certain other states namely, Bihar, Orissa, U.P. Rajasthan, Gujarat and Goa, no conclusion can be drawn as such. Surprisingly for most of these states, education expenditure and gender gap have shown a co-movement since the mid 1990s, leading to a deterioration in the already existing disparties. Kerala has exhibited a trend of its own. The gender gap has remained at very low levels ever since mid 1980s. It fluctuated within a narrow range of 2-3 per cent from 1985-86 to 1997-98, subsequent to which it declined to around 1 per cent, associated with a jump in per capita real expenditure on education.

### *VI.2 Health Spending Per Capita and Rural-Urban Gap in Infant Mortality Rate*

Plotting the rural-urban gap in IMR against the real per capita health expenditure over the period from 1985-86 to 1998-99 (Annexure III), one observes that unlike in case of education, real per capita health expenditure has not shown any rise for most of the states. In fact it has gone down for a few states e.g. Maharashtra and Uttar Pradesh. Secondly, rural-urban gap in IMR has also followed no consistent trend. For some states such as Haryana, Uttar Pradesh and Tamil Nadu, it has shown considerable decline over the years, while for other states like Andhra Pradesh and Punjab the gap has further widened in 1999 as compared to 1986. For Kerala, which ranks number 1 with respect to health attainment indicators, the per capita real health expenditure has remained more or less stagnant over the period under reference. The rural-urban gap in IMR has fluctuated between 2 and 8 per thousand and has remained more or less constant at 2 per thousand since 1997. Thus, we see that policy variable i.e. state spending seems to play a less important role in the case of health than education in explaining the gaps that prevail.

### *VI.3 Variation around All-India average*

**Table 12 : Co-efficient of variation**

| | Primary Enrolment | Secondary Enrolment | Education expenditure as % of GDP | Health Expenditure as % of GDP | Infant Mortality Rate |
|---|---|---|---|---|---|
| 1985-86 | 18.75 | 8.2 | 1.056 | .368 | 28.2 |
| 2000-01 | 20.98 | 8.6 | .868 | .295 | 21.5 |

A look at the variation of the states around the All-India average between two time periods 1985-86 and 2000-01 reveals that both the expenditure variables (education and health expenditure as a percentage of GSDP) show a fall in inter-state disparities. Inter-state variation around all-India average with respect to IMR has also shown a fall. However, what is of concern in this context is the fact that all education outcome indicators are showing an increase in inter-state variations between 1985-86 and 2000-01 (Table 12).

## Section VII
## Conclusion and Policy Implications

The study presents an up to date analysis of the levels, pattern and effectiveness of public expenditure (state government expenditure) with respect to education and health and hints at certain policy prescriptions, some of which are standard while others are in the nature of providing policy direction and making it more focussed. The study clearly brings out that health status and educational attainment are multi-dimensional concepts whose outcomes are determined by complex interaction among a variety of variables, with the importance of each variable being different for health and education status and also for different stages of education.

Panel data evidence reveals that public spending on primary education has a perceptible impact on enrolment ratios and therefore reinforces the need to protect or even step up public spending. However, the role of public spending decreases at higher stages of

education. It needs mention that female education is instrumental in enhancing both primary and secondary enrolments. Further, the relationship between public spending on education and primary enrolment is stronger for poorer states.

The association between public spending and health outcome turns out to be weaker. Income turns out to be a more significant determinant of health outcome than public spending. Child survival is probably related to other factors such as adequate nutrition and overall living conditions, which are income determined. This result, which has also been the finding of some earlier studies, presents a policy dilemma-whether government should invest in health or not? The section on international comparisons clearly reveals that public expenditure on health accounts for only 18 per cent of total expenditure on health in India, which is quite low as compared to international standards. Even this meagre expenditure is very often not targeted towards primary health care services. Much of this expenditure in India is devoted towards payment of salaries and maintaining the existing facilities. The trend analysis makes it quite clear that the proportion of GSDP being spent on health has not only remained low, but also declined over the last fifteen years. All these taken together could mean that the weak relationship between public spending and health outcomes is probably not an indication of ineffective health expenditure, but of inadequate level of public spending and poor targeting.

The main limitations of this kind of analysis are well documented. Cross state analysis does not allow for direct assessment of the impact of micro determinants of education and health outcomes such as school management indicators, quality of health services being rendered, etc. Some other macro variables such as private sector spending, governance issues (influencing the quality of expenditure) have been excluded from the analysis for lack of data. Notwithstanding the fact that these variables have not been incorporated directly, logical interpretations and fixed effect coefficients do point to the importance of these excluded variables in explaining the differences in performance of various states. From analytical angle, future research in the area can consider exploring the distributional effects of state spending. And from econometric

technique point of view, researchers can explore the relative role of different factors for different states by examining the slope coefficients.

## Notes

1. Control of disease vectors and protection of food and water safety are defined as examples of (nearly) pure public goods in health while public intervention to control communicable diseases provides substantial externalities.

2. A World Bank Study: India, Reducing Poverty, Accelerating Development, Oxford University Press, 2000, pp.21-32.

3. Privatisation of public services in health and education during the reform phase in China has although attracted some criticism.

4. Education spending data refer to public spending-government spending on public education plus subsidies for private education. Many countries supplement public funds for education. Teachers' compensation accounts for two-thirds of education spending.

5. It is emphasised that the efficiency of use of resources as well as the initial levels of attainment and the policies pursued by state governments are also important in determining the social sector attainment levels.

6. Education sector is placed in the concurrent list while health is a state subject.

7. Latest information relating to plan outlays during the Ninth Plan places the actual plan expenditure at Rs. 24, 908.38 crore.

8. For Statewise analysis of health care expenditure, we have taken only the medical and public health expenditure of various states, thereby excluding the family welfare component as most of the expenditure on family welfare is met by central transfers.

9. One limitation of taking education expenditure as a proportion of GSDP is the fact that states with low GSDP such as Orissa and Bihar may show high ratios, though actual expenditure on education sector, both in absolute and per capita terms remains significantly lower.

10. See Bidani and Ravallion (1997) (Linear model), Baldacci, Guin Siu and Mello (2002) (Double log model) & Gupta, Verhoven and Tiongson (2001) (log-log and lin-log model).

11. There is evidence in the literature to support that linear specification is more appropriate for education regression and log-log specification for health regression though there is no unanimous answer in this regard.

12. It is to be noted that number of schools now refers to the number of higher secondary and high/post basic schools per lakh population of the particular state for the concerned year.

13. Co-operative action is described in terms of community participation and monitoring leading to accountability and better performance of educational institutions (Dreze and Sen, 2002). The effectiveness of community participation, however, depends on the extent to which the social structure is egalitarian and therefore works in the interest of the local community at large.

14. The Poverty Reduction and Growth Facility (PRGF) is the IMF's lending facility for low-income countries with an explicit focus on poverty reduction in the context of a growth

oriented strategy. PRGF eligibility is based on a country's per capita income and eligibility for assistance under the International Development Association (IDA).

15. Pritchett L. and Summers L (1993), 'Wealthier is Healthier', World Bank Policy Research Paper, 1150, Washington, D.C. World Bank, also cited in Appleton et al (1996).

16. The index is defined for a given country i as (ln(Max-Min)-ln(MRi-Min))/ln(Max-Min), where Max and Min refer to maximum and minimum of observed mortality rate respectively, MRi is the mortality rate observed in country i. As the mortality rate in country i approaches the minimum of observed mortality rates, the index for country i approaches 1.

17. Also in Wolfe (1986) cited in a World Bank study by Musgrave P. (1996) on ' Public and Private Roles in Health- Theory and Financing Patterns'.

18. Prabhu and Kamdar (2000) have tried to examine just the opposite relation-how income distribution impacts upon social attainment- at the all-India level using time series data over 1970-71 to 1994-95. They have used GINI Index as one of the independent variables and conclude that it is a significant determinant of education attainment, but not of health outcome.

19. The positive effect of per capita public health spending on the life expectancy of the poor is also admitted.

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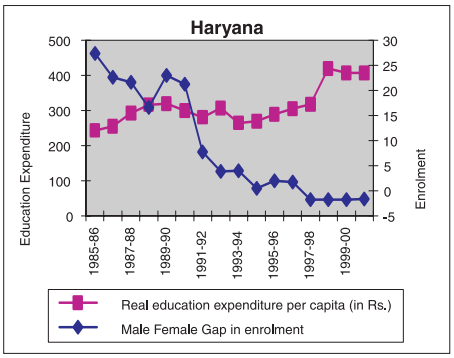
# ANNEXURE I

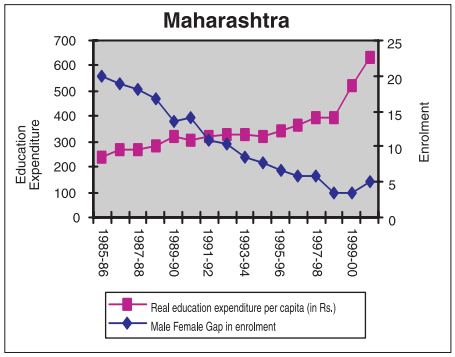
## Education & Health Attainment Indicators and Control Variables used in Empirical Studies

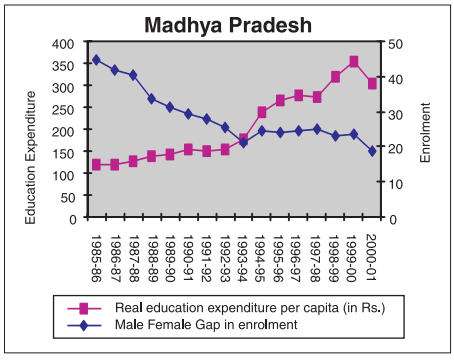
| Attainment Indicators | Control Variables |
|---|---|
| ***Education*** | |
| • Gross enrolment in primary and secondary education<br>• Persistence through Grade 4 (per cent of children reaching that grade)<br>• Primary school drop out rates | • Per capita income<br>• Public spending on education as a percentage of GDP<br>• Public spending on education per student<br>• Composition of public spending i.e., allocation to elementary, secondary and higher education<br>• Parental perception of costs and benefits<br>• Parental education<br>• Urbanisation<br>• Child nutrition<br>• Demand factor being captured by income distribution or Gini coefficient<br>• Teachers' salaries<br>• Pupil-Teacher ratio |
| ***Health*** | |
| • Infant Mortality Rate (0 to 1 year)<br>• Child Mortality Rate (0 to 5 years)<br>• Life expectancy | • Per capita income<br>• Public Health spending as a percentage of GDP<br>• Composition of public health spending (primary, secondary and tertiary)<br>• Poverty<br>• Adult literacy rate<br>• Female literacy rate<br>• Access to sanitation and safe drinking water<br>• Urbanisation<br>• Demand factor being captured by income distribution or Gini Coefficient |

# Annexure II : Relationship between Education Expenditure and Enrolment

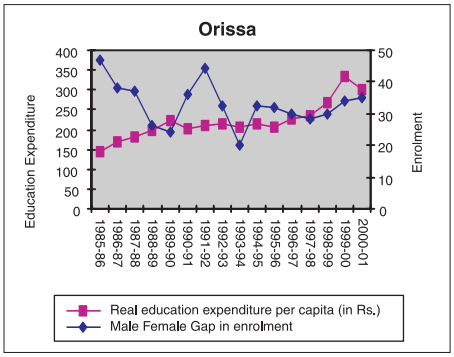
## Select States with opposite movement

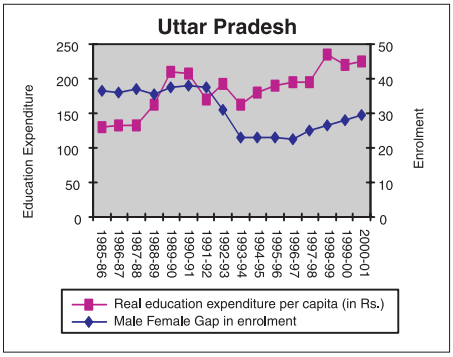


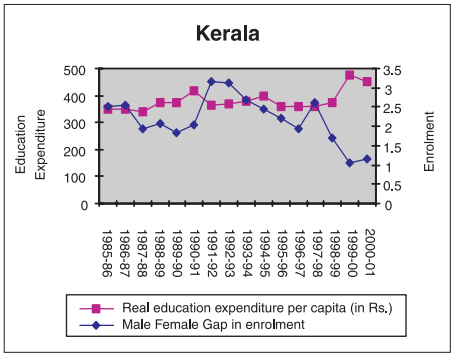



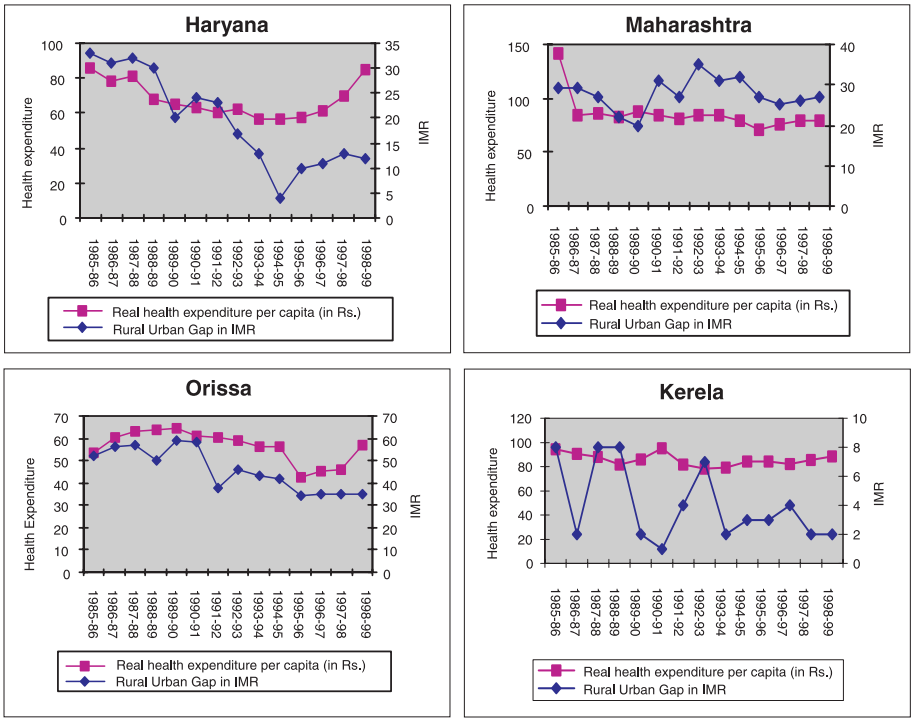

## Select States with no definite movement



# Annexure III : Relationship between Health Expenditure and IMR



## Annexure IV : Data Sources

The data used has been collected from a variety of sources. All data pertaining to state-wise social sector expenditure, education and health in particular have been taken from State Finances- A Study of Budgets and earlier issues of RBI Bulletin. The National Accounts data of Central Statistical Organisation (CSO) has been utilised to calculate education and health expenditures as a percentage of GSDP for all states. Census data (population) has been used to calculate the per capita expenditures for different states. It may be noted here that we have used GSDP at market prices to calculate per capita expenditure. However, in the panel regression we have used, per capita NSDP at constant prices (1993-94 series) as one of the variables. The panel regression utilises various outcome indicators as already mentioned, collected from concerned Ministries. The time series data for Gross Enrolment Ratio (both primary and Secondary), No. of schools for different classes and the pupil-teacher ratio has been collected from Department of Education, Ministry of Human Resource Development (Sources are Education in India and Selected Educational Statistics, various issues). Statewise data on number of hospitals and beds have been collected from Health Ministry. The main source of information for Statewise time series data on Total Fertility rate (TFR) and Infant Mortality Rate (IMR) is the Office of Registrar General, Ministry of Home Affairs.

## Annexure V

## India: Income, Social outcome and Infrastructure Indicators in Selected Years

| State | Indicators | 1985-86 | 1990-91 | 1995-96 | 2000-01 |
|---|---|---|---|---|---|
| All India | Per capita Income ( Rs.) | 6,120.7 | 7,430.3 | 8,625.1 | 10,428.0 |
| | G. En. Ratio -Primary | 95.62 | 100.10 | 88.6 | 95.7 |
| | -Secondary | 24.39 | 19.28 | 30.9 | - |
| | IMR | 97.0 | 80.0 | 74.0 | 66.0 |
| | TFR | 4.3 | 3.8 | 3.5 | 3.2* |
| | No. of Hospitals | 7,474.0 | 11,254.0 | 15,097.0 | 15,501.0 |
| | No. of Beds | 5,35,735.0 | 6,19,433.0 | 6,23,819.0 | 6,81,643.0 |
| | No. of Schools -Primary | 6,63,718.0 | 7,12,391.0 | 7,67,555.0 | 8,45,007.0 |
| | -Secondary | 57,342.0 | 79,796.0 | 99,274.0 | 1,21,416.0 |
| | Pupil-Teacher Ratio | 36.0 | 38.0 | 38.0 | 39.0 |
| Andhra Pradesh | Per capita Income ( Rs.) | 5,248.3 | 6,873.1 | 8,086.0 | 9,982.0 |
| | G. En. Ratio -Primary | 101.1 | 109.0 | 80.1 | 104.1 |
| | -Secondary | 22.3 | 4.1 | 31.0 | - |
| | IMR | 82.0 | 73.0 | 65.0 | 66.0 |
| | TFR | 3.8 | 3.0 | 2.5 | 2.4* |
| | No. of Hospitals | 612.0 | 615.0 | 2,950.0 | 3,133.0 |
| | No. of Beds | 35,911.0 | 36,400.0 | 45,832.0 | 69,778.0 |
| | No. of Schools -Primary | 47,634.0 | 54,849.0 | 56,423.0 | 65,705.0 |
| | -Secondary | 4,724.0 | 5,882.0 | 7,983.0 | 10,359.0 |
| | Pupil-Teacher Ratio | 45.0 | 45.0 | 41.0 | 35.7 |
| Bihar | Per capita Income ( Rs.) | 3,200.9 | 3,567.5 | 2,728.0 | 3,345.0 |
| | G. En. Ratio -Primary | 82.9 | 82.9 | 73.0 | 79.9 |
| | -Secondary | 16.9 | 11.7 | 15.4 | - |
| | IMR | 101.0 | 69.0 | 71.0 | 62.0 |
| | TFR | 5.2 | 4.4 | 4.5 | 4.5 |
| | No. of Hospitals | 226.0 | 298.0 | 328.0 | 328.0 |
| | No. of Beds | 22,574.0 | 28,137.0 | 29,090.0 | 29,090.0 |
| | No. of Schools -Primary | 62,821.0 | 66,116.0 | 66,969.0 | 66,922.0 |
| | -Secondary | 3,684.0 | 4,022.0 | 4,102.0 | 4,461.0 |
| | Pupil-Teacher Ratio | 43.0 | 44.0 | 51.0 | 57.9 |
| Goa | Per capita Income ( Rs.) | 9,310.7 | 14,708.5 | 17,929.0 | 26,106.0 |
| | G. En. Ratio -Primary | 135.6 | 102.9 | 91.2 | 66.2 |
| | -Secondary | 41.4 | 55.0 | 58.1 | - |
| | IMR | - | 20.8 | 24.8 | 19.0 |
| | TFR | - | - | - | - |
| | No. of Hospitals | 95.0 | 108.0 | 114.0 | 118.0 |
| | No. of Beds | 3,004.0 | 3,383.0 | 3,644.0 | 3,953.0 |
| | No. of Schools -Primary | 1,166.0 | 1,125.0 | 1,135.0 | 1,137.0 |
| | -Secondary | 306.0 | 373.0 | 432.0 | 436.0 |
| | Pupil-Teacher Ratio | 29.0 | 25.0 | 24.0 | 22.5 |
| Gujarat | Per capita Income ( Rs.) | 7,273.8 | 8,787.8 | 11,649.0 | 12,975.0 |
| | G. En. Ratio -Primary | 111.1 | 125.6 | 115.4 | 126.2 |
| | -Secondary | 24.7 | 32.1 | 34.8 | - |
| | IMR | 107.0 | 69.0 | 61.0 | 60.0 |
| | TFR | 3.8 | 3.1 | 3.0 | 3.0 |
| | No. of Hospitals | 1,236.0 | 1,563.0 | 2,528.0 | 2,528.0 |
| | No. of Beds | 38,915.0 | 46,374.0 | 63,417.0 | 63,417.0 |

| State | Indicators | 1985-86 | 1990-91 | 1995-96 | 2000-01 |
|---|---|---|---|---|---|
| | No. of Schools -Primary | 27,765.0 | 31,309.0 | 33,119.0 | 36,745.0 |
| | -Secondary | 4,297.0 | 5,122.0 | 5,713.0 | 6,343.0 |
| | Pupil-Teacher Ratio | 37.0 | 38.0 | 39.0 | 43.5 |
| Haryana | Per capita Income ( Rs.) | 9,171.9 | 11,124.9 | 11,570.0 | 14,331.0 |
| | G. En. Ratio -Primary | 86.9 | 86.8 | 77.7 | 78.9 |
| | -Secondary | 19.0 | 29.0 | 26.6 | - |
| | IMR | 85.0 | 68.0 | 68.0 | 65.0 |
| | TFR | 4.4 | 4.0 | 3.5 | 3.2 |
| | No. of Hospitals | 87.0 | 78.0 | 79.0 | 80.0 |
| | No. of Beds | 7,527.0 | 7,003.0 | 7,180.0 | 7,250.0 |
| | No. of Schools -Primary | 6,199.0 | 6,513.0 | 7,000.0 | 12,905.0 |
| | -Secondary | 2,046.0 | 2,356.0 | 3,096.0 | 4,228.0 |
| | Pupil-Teacher Ratio | 36.0 | 37.0 | 36.0 | 32.6 |
| Karnataka | Per capita Income ( Rs.) | 5,344.7 | 6,628.9 | 8,368.0 | 11,910.0 |
| | G. En. Ratio -Primary | 98.9 | 109.0 | 105.9 | 113.6 |
| | -Secondary | 28.3 | 29.8 | 34.3 | - |
| | IMR | 73.0 | 77.0 | 53.0 | 58.0 |
| | TFR | 3.5 | 3.1 | 2.6 | 2.5 |
| | No. of Hospitals | 238.0 | 288.0 | 293.0 | 293.0 |
| | No. of Beds | 31,342.0 | 34,477.0 | 38,449.0 | 38,479.0 |
| | No. of Schools -Primary | 38,855.0 | 40,207.0 | 44,139.0 | 49,848.0 |
| | -Secondary | 4,801.0 | 5,414.0 | 7,772.0 | 9,850.0 |
| | Pupil-Teacher Ratio | 39.0 | 44.0 | 42.0 | 39.4 |
| Kerala | Per capita Income ( Rs.) | 5,688.3 | 6,850.9 | 8,748.0 | 10,627.0 |
| | G. En. Ratio -Primary | 109.7 | 102.8 | 94.0 | 87.1 |
| | -Secondary | 44.1 | 40.14 | 41.9 | - |
| | IMR | 27.0 | 16.0 | 14.0 | 11.0 |
| | TFR | 2.3 | 1.8 | 1.8 | 1.8 |
| | No. of Hospitals | 328.0 | 2,924.0 | 2,040.0 | 2,107.0 |
| | No. of Beds | 43,533.0 | 70,349.0 | 77,199.0 | 97,840.0 |
| | No. of Schools -Primary | 9,714.0 | 9,682.0 | 9,700.0 | 9,731.0 |
| | -Secondary | 2,435.0 | 2,627.0 | 3,196.0 | 4,182.0 |
| | Pupil-Teacher Ratio | 30.0 | 31.0 | 29.0 | 27.7 |
| Madhya Pradesh | Per capita Income ( Rs.) | 5,283.3 | 6,359.5 | 6,778.0 | 7,003.0 |
| | G. En. Ratio -Primary | 97.4 | 106.1 | 95.3 | 111.4 |
| | -Secondary | 15.9 | 21.5 | 33.8 | - |
| | IMR | 118.0 | 117.0 | 97.0 | 86.0 |
| | TFR | 4.9 | 4.6 | 4.1 | 3.9 |
| | No. of Hospitals | 289.0 | 362.0 | 363.0 | 363.0 |
| | No. of Beds | 19,891.0 | 22,103.0 | 18,141.0 | 18,141.0 |
| | No. of Schools -Primary | 75,166.0 | 82,886.0 | 94,073.0 | 1,13,398.0 |
| | -Secondary | - | 4,500.0 | 6,378.0 | 10,199.0 |
| | Pupil-Teacher Ratio | 37.0 | 37.0 | 39.0 | 36.8 |
| Maharashtra | Per capita Income ( Rs.) | 78,89.6 | 10,158.8 | 13,221.0 | 15,172.0 |
| | G. En. Ratio -Primary | 117.5 | 125.5 | 110.3 | 110.4 |
| | -Secondary | 30.8 | 32.8 | 41.0 | - |
| | IMR | 63.0 | 60.0 | 48.0 | 45.0 |

| State | Indicators | 1985-86 | 1990-91 | 1995-96 | 2000-01 |
|---|---|---|---|---|---|
| | TFR | 3.6 | 3.0 | 2.8 | 2.5 |
| | No. of Hospitals | 1,540.0 | 2,104.0 | 3,115.0 | 3,446.0 |
| | No. of Beds | 91,207.0 | 1,11,420.0 | 78,920.0 | 99,062.0 |
| | No. of Schools -Primary | 54,406.0 | 57,740.0 | 62,342.0 | 66,370.0 |
| | -Secondary | 8,177.0 | 9,972.0 | 13,093.0 | 14,767.0 |
| | Pupil-Teacher Ratio | 36.0 | 36.0 | 36.0 | 35.8.0 |
| Orissa | Per capita Income ( Rs.) | 4,483.0 | 4,299.6 | 5,053.0 | 5,187.0 |
| | G. En. Ratio -Primary | 103.3 | 113.9 | 94.8 | 112.6 |
| | -Secondary | 21.7 | 20.2 | 24.4 | - |
| | IMR | 123.0 | 124.0 | 96.0 | 90.0 |
| | TFR | 4.2 | 3.3 | 3.1 | 2.7 |
| | No. of Hospitals | 311.0 | 287.0 | 430.0 | 273.0 |
| | No. of Beds | 12,223.0 | 13,988.0 | 14,884.0 | 11,980.0 |
| | No. of Schools -Primary | 45,429.0 | 49,438.0 | 53,114.0 | 53,614.0 |
| | -Secondary | - | 4,895.0 | 6,022.0 | 6,396.0 |
| | Pupil-Teacher Ratio | 33.0 | 33.0 | 29.0 | 34.7 |
| Punjab | Per capita Income ( Rs.) | 10,257.0 | 11,775.5 | 13,008.0 | 15,390.0 |
| | G. En. Ratio -Primary | 97.9 | 96.4 | 81.5 | 79.1 |
| | -Secondary | 24.1 | 37.4 | 33.8 | - |
| | IMR | 68.0 | 53.0 | 51.0 | 51.0 |
| | TFR | 3.4 | 3.1 | 2.8 | 2.5 |
| | No. of Hospitals | 258.0 | 230.0 | 220.0 | 220.0 |
| | No. of Beds | 14,617.0 | 15,018.0 | 14,821.0 | 14,926.0 |
| | No. of Schools -Primary | 13,767.0 | 13,821.0 | 14,253.0 | 15,610.0 |
| | -Secondary | 2,298.0 | 2,759.0 | 3,142.0 | 3,388.0 |
| | Pupil-Teacher Ratio | 30.0 | 34.0 | 33.0 | 32.0 |
| Rajasthan | Per capita Income ( Rs.) | 4,657.4 | 6,759.8 | 72,16.0 | 7,937.0 |
| | G. En. Ratio -Primary | 79.4 | 79.2 | 84.5 | 112.0 |
| | -Secondary | 16.3 | 23.2 | 36.3 | - |
| | IMR | 107.0 | 79.0 | 85.0 | 79.0 |
| | TFR | 5.0 | 4.6 | 4.2 | 4.2 |
| | No. of Hospitals | 244.0 | 267 | 218.0 | 219.0 |
| | No. of Beds | 19,544.0 | 21,815.0 | 21,187.0 | 21,447.0 |
| | No. of Schools - Primary | 35,581.0 | 39,674.0 | 46,959.0 | 51,284.0 |
| | -Secondary | 2,124.0 | 4,053.0 | 4,902.0 | 6,709.0 |
| | Pupil-Teacher Ratio | 33.0 | 32.0 | 33.0 | 39.7 |
| Tamil Nadu | Per capita Income ( Rs.) | 6,320.6 | 7,863.8 | 10,177.0 | 12,779.0 |
| | G. En. Ratio -Primary | 130.8 | 134.0 | 128.4 | 96.4 |
| | -Secondary | 28.9 | 37.0 | 43.3 | - |
| | IMR | 80.0 | 57.0 | 53.0 | 49.0 |
| | TFR | 2.7 | 2.2 | 2.1 | 2.0 |
| | No. of Hospitals | 402.0 | 408.0 | 408.0 | 408.0 |
| | No. of Beds | 44,263.0 | 48,780.0 | 48,780.0 | 48,780.0 |
| | No. of Schools - Primary | 34,809.0 | 35,603.0 | 36,020.0 | 36,845.0 |
| | -Secondary | 4,123.0 | 5,147.0 | 5,909.0 | 7,939.0 |
| | Pupil-Teacher Ratio | 38.0 | 42.0 | 46.0 | 35.2 |

| State | Indicators | 1985-86 | 1990-91 | 1995-96 | 2000-01 |
|---|---|---|---|---|---|
| Uttar Pradesh | Per capita Income ( Rs.) | 4,270.4 | 5,130.8 | 5,229.0 | 5,770.0 |
| | G. En. Ratio -Primary | 70.0 | 71.1 | 61.2 | 65.7 |
| | -Secondary | 23.0 | 23.8 | 25.5 | - |
| | IMR | 132.0 | 97.0 | 85.0 | 82.0 |
| | TFR | 5.4 | 5.1 | 4.9 | 4.7 |
| | No. of Hospitals | 735.0 | 735.0 | 735.0 | 735.0 |
| | No. of Beds | 47,278.0 | 47,278.0 | 47,278.0 | 47,278.0 |
| | No. of Schools -Primary | 90,483.0 | 95,611.0 | 1,08,333.0 | 1,20,005.0 |
| | -Secondary | 2,361.0 | 6,053.0 | 6,977.0 | 9,915.0 |
| | Pupil-Teacher Ratio | 33.0 | 40.0 | 39.0 | 39.4 |
| West Bengal | Per capita Income ( Rs.) | 5,387.5 | 5,990.7 | 7,492.0 | 9,778.0 |
| | G. En. Ratio -Primary | 111.4 | 113.9 | 100.1 | 107.2 |
| | -Secondary | 27.2 | 27.3 | 25.2 | - |
| | IMR | 71.0 | 71.0 | 55.0 | 51.0 |
| | TFR | 3.6 | 3.2 | 2.6 | 2.4 |
| | No. of Hospitals | 409.0 | 410.0 | 399.0 | 400.0 |
| | No. of Beds | 52,907.0 | 53,977.0 | 55,230.0 | 53,658.0 |
| | No. of Schools -Primary | 53,424.0 | 53,541.0 | 53,825.0 | 54,768.0 |
| | -Secondary | 5,524.0 | 6,491.0 | 7,293.0 | 9,382.0 |
| | Pupil-Teacher Ratio | 36.0 | 44.0 | 46.0 | 48.8 |

Per capita income refers to Per capita Net State domestic product at constant prices (1993-94)
Note: For detailed data source see Annexure IV.

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# *Analytics of Credit - Output Nexus in India*

**Biswa Swarup Misra***

This paper studies the relationship between bank credit and output for 25 states of India for the period 1981 to 2000. Long-term relationship between credit and output was found for 19 out of the 25 states, whose share is around 95 percent both in the combined credit and output for all the states under study. The causality analysis done in the Vector Error Correction framework reveals that it is output which granger causes credit for the majority of the states in India. Further, the elasticity of credit to output turns out to be much higher than that for output to credit. This goes to indicate that credit flow to different states in India is guided by the credit absorptive capacity of the states. The policy implication is that lack of credit off-take should not be seen as a problem in itself but should be seen in conjunction with what is happening on the growth front. The growth fatigue that India is experiencing in the second half of 1990s, therefore, needs to be tackled by addressing the structural issues rather than concerns over lack of credit off-take.

JEL Classification : C320, R110

Key words : State Domestic Product, Bank Credit, Error Correction Model.

## Introduction

Judicious credit allocation to further growth has been a recurring theme of monetary policy in India. Growth is all about putting the economy to a trajectory of higher savings and channeling the savings into productive investment. In this scheme of growth the banking system has a dual role to play. The banking system acts both as a mobiliser of savings as well as an allocator of credit for production and investment. Banking activity in India was greatly State controlled till the onset of financial sector reforms in the early 1990s.[1] The motivation for state control of banking activities can be better appreciated if one traverses the broad agenda of economic policy making since independence.

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Under the broad rubric of growth, balanced regional development has been one of the explicit planks of economic policy in India since the early days of planning. To pave the way for a more balanced pattern of development, it was necessary to ensure that availability of credit does not act, as a constraint on growth. Further there was a need to augment the savings of the economy to attain higher growth rates. This was sought to be achieved through mobilisation of savings by widening the reach of the banking system throughout the country. In this context nationalisation of banks through the Banking Companies (Acquisition and Transfer of Undertakings) Act 1970 in the late 1960s was a major landmark. The objective behind bank nationalisation was broadly two fold. First, it was directed at inculcating banking habits in the people so that deposit mobilisation is smoother, simpler and faster. Secondly, credit needs of the different sectors and states were sought to be adequately and timely addressed for balanced development. Consequent to nationalisation, the number of offices of scheduled commercial banks has increased from 8262 in 1969 to more than 66,000 at present. Also there has been significant improvement in the various indicators of financial development.[2]

While the success of bank nationalisation in mobilising savings is well documented, it has been a gray area as to how far the reach of banks has influenced credit allocation in the spatial and sectoral dimension and its consequent impact on the states' growth. Going by the credit view of growth, monetary policy by affecting the external finance premium[3] in the credit markets, influences real economic activity. The literature refers to two channels *i.e.*, the balance sheet channel and the bank lending channel through which, monetary policy actions impact on the external finance premium (Bernanke and Gertler, 1995). The balance sheet channel of monetary policy arises because changes in monetary policy not only affect the market interest rate but also the financial position of the borrowers. The bank lending channel, on the other hand, comes in force when changes in monetary policy affects the liquidity in the system and thus the availability of the resources with the banking system for lending. The ascendancy of the credit view in India can be traced back to the early 1950s when monetary policy was

supposed to be designed in the context of overall development planning. Fiscal policy being the dominant arm of the then policy, monetary policy was designed to cater to the objectives of the former. Consequently, monetary policy in India evolved with credit rationing as an integral part of it and the credit needs of the different sectors were prioritised. The rationing of credit was schematised with food credit as the top priority, followed by prescribed priority sector lending, sectoral limits for credit deployment and selective credit controls. Sectoral credit targets became the proximate target for monetary policy, which operated through the allocations of non-food commercial bank credit. The underlying idea is that credit does matter in the growth process. The interest rate structure was administered and given importance of second order in the conduct of monetary policy.

While the emphasis on the credit channel for the transmission of monetary policy in India still continues, its focus has undergone a change with the pursuing of economic reforms in the 1990s.The scope of the credit channel has been broadened to consider not only the quantum of credit but more importantly, the cost aspect of it while framing the monetary policy, in the changed scenario. Notwithstanding the change in focus, certain regulatory provisions such as directed lending are still in operation. This goes to indicate that the quantity aspect of credit is still taken with seriousness in policy making in India. This paper makes an attempt to study the impact of bank credit on growth at the regional level. The objective of the present study is two fold: First, to analyse the temporal and spatial pattern of growth and credit allocation over the last two decades, and second, to enquire into the nature of relationship between bank credit and output at the regional level. The rest of the paper is schematised as follows. Section I reviews the literature on the relationship between bank credit and growth. The major changes in the pattern of growth and credit allocation over the last two decades have been dealt in Section II.The data and empirical framework *i.e.*, methodology of the study) have been discussed in Section III. The econometric findings are discussed in Section IV. Finally, Section V presents some concluding observations.

## Section I

## Review of Literature

From the early days of Adam Smith, there has been a continuing and intense debate on the role of financial intermediaries in the development process. Adam Smith in his 'The Wealth of Nations' was skeptical about banks' ability to create capital. Nonetheless Adam Smith perceived banks' role in augmenting the productivity of capital stock in the economy and in the process driving growth. Dunning McLeod writing some 80 years after Smith's ' The Wealth of Nations' had attributed a much more positive role to banks' in promoting growth (Skaggs, 1999). He not only disagrees with Adam Smith's view that banks do not create capital but adds that by lending, banks bring unutilised resources into production; extend the market by providing credit facilities and more importantly promote venture capitalists through their cash credit facilities.

Schumpeter in his 'Theory of Economic Development' argued that financial intermediaries help the growth process in a variety of ways such as mobilising savings, evaluating projects, managing risks, monitoring managers, and facilitating transactions. Further, in his analysis of business cycles, bank credit play a crucial role in accentuating or moderating the phases of business cycles. Over the last fifty years, the literature on finance and development has proliferated both on theoretical as well as empirical plane. Two broad schools of thought, *viz.*, the financial structuralist and financial repressionist have been expounded in the literature that deal with the relationship between financial intermediaries and growth. The financial structuralists put forward a theory of quantity aspects of financial variables such as volume of credit that positively affect growth. The financial repressionists on the other hand contend how financial repression, especially in the form of below-equilibrium real interest rate and domestic currency over-valuation, retard growth.

Patrick (1966) provides a useful reference framework for the study of the causal relationships between bank claims and growth. Patrick makes a distinction between the 'demand-following approach' and the 'supply-leading approach' to financial development. Demand

following is defined as a situation where financial development is an offshoot of the developments in the real sector. Markets expand with growth and require more and efficient financial services to maintain the pace of growth. In the case of supply leading, financial development precedes and stimulates the process of economic growth; the supply of financial services and instruments create the demand for them. Patrick suggested that in the early stages of economic development, a supply-leading relation is more likely since a direct stimulus is needed to collect savings to finance investment for growth while, at a later stage, when the financial sector is more developed, the demand-following relation will be more prevalent. The two alternative hypotheses have been put to empirical testing by several authors. Gupta (1984) found support for the supply-leading hypothesis in a study of 14 developing countries. Both Jung (1986) and St. Hill (1992), using data on 56 countries, of which 37 were LDCs, found a moderate support for this hypothesis in LDCs, while the demand-following hypothesis appeared to fit more closely the situation in developed nations. These results are suggestive of the pattern of financial development envisaged by Patrick (1966).

Although the question of causality remains unresolved until now, the answer to this question has far-reaching policy implications and has, therefore, been a recurring subject of debate in the literature on financial markets and economic development. It is often argued that only in the case of supply leading, there is a need to direct attention to developments in the financial sector leading to adoption of credit focussed financial policy to stimulate growth. In the case of financial development arising spontaneously as the economy grows (demand-following approach), the thrust should be more on developments in the real economy. However such a theoretical dichotomy is difficult to defend in the context of continuous interaction between the real and the financial sectors in practice. Even when the evidence is suggestive of the demand-following approach to hold, the financial policy needs to be fine-tuned to let the demand following scheme run its full course.

Fase (2001) presents an empirical examination of the relationship between financial intermediation and economic growth. Employing data of aggregated balance sheets of financial institutions in the

Netherlands for the period 1900-2000 and conducting estimations and causality tests, Fase shows that financial intermediation encourages economic growth. Employing GMM (Method of Generalised Moments) panel estimators on a panel data set of 74 countries and cross sectional instrumental variable estimator for 71 countries, Levine *et al* (2000) find that the exogenous component of financial intermediary development is positively associated with economic growth.

King and Levine (1993) have studied the empirical link between a range of indicators of financial development and economic growth. They found that indicators of the level of financial development such as the size of the formal financial intermediary sector relative to GDP, the importance of banks relative to the central bank, the percentage of credit allocation to private firms, and the ratio of credit issued to private firms to GDP are strongly and robustly correlated with growth, the rate of physical capital accumulation, and improvements in the efficiency of capital allocation. Besides, the predetermined components of these financial development indicators significantly predict subsequent values of the growth indicators. Gregorio and Guidotti (1995) examined the empirical relationship between long-run growth, financial development (proxied by the ratio between bank credit to the private sector) and GDP for a large cross-country sample (sample of 98 countries for 1960-85). They found a positive effect of financial development on long run growth of real per capita GDP. Goldsmith (1969) used the ratio of assets of the financial intermediary to GNP as a proxy for financial development under the implicit assumption that the size of the financial system is positively correlated with the quality and provision of financial services. Using data on 35 countries from 1860 to 1963, his results indicated a rough 'parallelism' between economic and financial development.

Empirical studies of the credit-output relationship for the Indian Economy are at variance with each other. Industry level studies generally confirm the positive impact of unanticipated changes in credit on the level of output. Employing bivariate vector auto regression model, the Reserve Bank of India's (RBI's) Report on Currency on Finance (2001a) had found two-way Granger causality between GDP growth and real bank claims growth for the Indian economy over the period 1972 through

2000. Further, RBI's Report on Currency and Finance (2002a), using a simultaneous equations framework, shows that demand for non-food credit is predominantly influenced by output represented by index of industrial production (IIP) not only contemporaneously but also by 1 month and 2 month lagged output. Causality analysis in the Indian context (RBI, 2001b) reveals bi-directional causality in the Granger sense between cyclical movements of non-food credit and overall industrial production as well as with latter's components *i.e.*, basic goods, capital goods and consumer goods production. While the relationship between bank credit and growth has been studied at the sectoral level, studies relating financial development to growth at the aggregate level are rather few in the Indian context and particularly at the state level. The present study seeks to fill this gap.

## Section II

## Pattern of Growth and Credit Allocation

*Overall Trends*

A close examination of growth in credit[4] and output[5] over the last two decades (table-1) reveals the following :

**Table 1: Growth of Output and Credit**

**(Figures are in percentages)**

| Variable | 1981-1990 | | 1991-2000 | | 1981-2000 | |
|---|---|---|---|---|---|---|
| | Output | Credit | Output | Credit | Output | Credit |
| NSDP* | 4.9 | 16.6 | 6.6 | 15.7 | 5.6 | 16.2 |
| Agriculture | 2.7 | 16.7 | 3.5 | 10.5 | 3.2 | 12.6 |
| Industry | 6.0 | 16.6 | 7.2 | 15.8 | 6.5 | 16.6 |
| Services | 6.5 | 16.8 | 8.4 | 17.2 | 7.2 | 17.0 |

* Net State Domestic Product
Source: Central Statistical Organisation and Reserve Bank of India.

While output growth has improved in 1990s, credit growth has declined as compared to their growth rates in 1980s for all states taken together. Nevertheless, credit has grown much higher than output in both the decades. Except the services sector, credit growth has decelerated for agriculture and industry in the 1990s as compared to the 1980s. While

credit growth for the agriculture, industry and services was of the same order (around 16.5%) in the 1980s, credit growth for industry (15.8%) was distinctively higher than that for agriculture (10.5%) and credit for services (17.2%) grew at a faster pace than industry in the 1990s.

Now if we look at the share of different sectors in output and credit (table-2), the following pattern emerges:

**Table 2: Share in Output and Credit**

**(Figures are in percentages)**

| Sector | Average Share in the 1980s | | Average Share in the 1990s | |
|---|---|---|---|---|
| | Output | Credit | Output | Credit |
| Agriculture | 39 | 17 | 31.6 | 12 |
| Industry | 24 | 46 | 26 | 48 |
| Services | 37 | 37 | 42.4 | 40 |

Source: Central Statistical Organisation and Reserve Bank of India.

While the respective shares of industry and services sectors in output have improved, that for agriculture has gone down in the 1990s as compared to the 1980s. The same applies to the share of the different sectors in credit over the two decades.

*State wise Trends*

What is happening to the share of different states in output and credit over the two decades can be seen from table-3.

**Table 3: Changing Share of Different States in Output and Credit: 1990s *vis-a-vis* 1980s**

| States with increased share in output and credit | States with increased share in output but reduced share in credit | States with increased share in credit and reduced share in output | States with decline in their share in output and credit |
|---|---|---|---|
| Andhra Pradesh, Arunachal Pradesh, Delhi, Tamil Nadu, Maharastra, | Gujarat, Haryana, Karnataka, Rajasthan, Tripura, Nagaland | Andaman & Nicobar Islands, Manipur, Meghalaya, Madhya Pradesh | Assam, Bihar, Himachal Pradesh, Jammu & Kashmir, Kerala, Pondicherry, Punjab, Orissa, Uttar Pradesh, West Bengal |

Source: Central Statistical Organisation and Reserve Bank of India.

While on the output front, 14 states have suffered a decline in their share (in the aggregate output for 25 states) in the 1990s as compared to the 1980s, 16 states underwent a deterionation in their share in aggregate credit in the 1990s. However, in terms of per-capita NSDP (PNSDP), 16 states have witnessed a rise in the compound growth rate of PNSDP in the 1990s over the 1980s and these 16 states have a share of more than 70 per-cent in the combined output of all the 25 states under consideration.

*Changing Share of Different States in Output and Credit Across Sectors*

Scanning through the data (Table-4,overleaf) for the share of different sectors in output and credit across states in the 1990s as compared to the 1980s reveals the following :

1. While the decline in the share of agriculture in output is universally applicable for all states, such decline in the share of credit is also observed for all states except for Andaman & Nicobar Islands, Arunachal Pradesh and Nagaland.

2. Of the 25 states, only five have suffered a decline in the share of industry in their output. The prominent among them are Maharastra, Tamil Nadu and West Bengal. However in terms of industry's share in total credit, as many as 14 have experienced a dip. The decline is noticeable in states such as Arunachal Pradesh, Assam, Bihar, Kerala, Tamil Nadu, Uttar Pradesh and West Bengal.

3. Except for Andaman & Nicobar Islands, Nagaland and Punjab, all other states witnessed an improvement in their share of the services sector in output. Similarly, share of services sector in credit improved for all states except for Delhi, Maharashtra, Manipur and Nagaland.

## Table 4: Share in Output and Credit: States-wise and Sector-wise

**(Figures are in percentages)**

| | AGRICULTURE | | | | INDUSTRY | | | | SERVICES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Share in NSDP | | Share in Total Credit for the State | | Share in NSDP | | Share in Total Credit for the State | | Share in NSDP | | Share in Total Credit for the State | |
| | 1980s | 1990s | 1980s | 1990s | 1980s | 1990s | 1980s | 1990s | 1980s | 1990s | 1980s | 1990s |
| Andaman & Nicobar Islands | 44 | 41 | 17 | 20 | 15 | 20 | 32 | 21 | 40 | 38 | 51 | 68 |
| Andhra Pradesh | 46 | 33 | 31 | 21 | 17 | 22 | 38 | 39 | 39 | 45 | 32 | 39 |
| Arunachal Pradesh | 53 | 44 | 10 | 14 | 20 | 23 | 59 | 47 | 28 | 34 | 31 | 39 |
| Assam | 47 | 42 | 18 | 14 | 22 | 20 | 45 | 40 | 34 | 39 | 38 | 46 |
| Bihar | 51 | 40 | 26 | 23 | 21 | 23 | 39 | 32 | 30 | 37 | 35 | 45 |
| Delhi | 8 | 3 | 3 | 2 | 24 | 23 | 42 | 56 | 70 | 74 | 54 | 42 |
| Gujarat | 38 | 25 | 15 | 12 | 29 | 35 | 61 | 60 | 35 | 40 | 24 | 28 |
| Haryana | 46 | 40 | 31 | 22 | 24 | 26 | 45 | 51 | 29 | 34 | 25 | 27 |
| Himachal Pradesh | 42 | 32 | 20 | 13 | 21 | 29 | 36 | 35 | 36 | 39 | 44 | 52 |
| Jammu & Kashmir | 45 | 38 | 12 | 7 | 16 | 16 | 34 | 25 | 40 | 46 | 54 | 60 |
| Karnataka | 43 | 34 | 23 | 19 | 24 | 26 | 43 | 42 | 34 | 41 | 34 | 39 |
| Kerala | 36 | 31 | 18 | 15 | 19 | 20 | 36 | 31 | 45 | 48 | 46 | 54 |
| Madhya Pradesh | 43 | 37 | 25 | 21 | 23 | 26 | 39 | 40 | 33 | 37 | 36 | 39 |
| Maharastra | 25 | 19 | 7 | 5 | 34 | 33 | 51 | 54 | 41 | 48 | 42 | 41 |
| Manipur | 45 | 35 | 17 | 13 | 19 | 20 | 23 | 35 | 40 | 45 | 60 | 52 |
| Meghalaya | 42 | 29 | 27 | 21 | 13 | 16 | 20 | 23 | 48 | 55 | 53 | 56 |
| Nagaland | 32 | 26 | 18 | 20 | 7 | 14 | 37 | 36 | 78 | 60 | 45 | 44 |
| Orissa | 57 | 42 | 28 | 20 | 18 | 21 | 34 | 32 | 28 | 37 | 39 | 48 |
| Pondicherry | 22 | 15 | 25 | 14 | 38 | 39 | 46 | 47 | 34 | 44 | 29 | 38 |
| Punjab | 50 | 46 | 33 | 21 | 16 | 20 | 34 | 41 | 35 | 33 | 33 | 38 |
| Rajasthan | 43 | 37 | 29 | 23 | 22 | 25 | 36 | 38 | 34 | 38 | 35 | 38 |
| Tamil Nadu | 27 | 23 | 17 | 13 | 35 | 33 | 50 | 48 | 39 | 44 | 33 | 39 |
| Tripura | 52 | 36 | 27 | 22 | 10 | 11 | 19 | 20 | 40 | 53 | 54 | 58 |
| Uttar Pradesh | 47 | 40 | 23 | 21 | 18 | 22 | 41 | 39 | 34 | 38 | 36 | 40 |
| West Bengal | 34 | 33 | 9 | 6 | 24 | 23 | 62 | 59 | 41 | 44 | 30 | 36 |

Source: Central Statistical Organisation and Reserve Bank of India.

## Section III

## Data Source and Methodology

In this study we analyse the relationship between finance proxied by scheduled commercial banks' credit and output at the state level. Income originating from the states rather than income accruing to state concept has been used to measure output. The State Domestic Product (SDP) data - overall and sector wise - with 1993-94 as the base year has been taken from the information supplied by the various states to the Central Statistical Organisation. The data on credit used in the study refers to the outstanding credit to different sectors from all scheduled commercial banks in a state. The data for credit have been taken from the 'Basic Statistical Returns' published by the Reserve Bank of India. The study examines the credit - growth relationship for 25 states over the period 1980 to 2000.

The output variable is represented by log of per capita net State Domestic Product (LPNSDP) and the credit variable by the log of per capita credit for the state (LPTCAS). The choice of the states and the time period has been completely motivated by the availability and consistency of the data series. Certain new states have been carved out from the existing ones in 2000, thus extending the period of analysis beyond year 2000 might introduce serious comparability problems. The period of study, thus, is confined up to the year 2000. However, with inclusion of states having share of less than 1 percent and as well having more than 10 percent in the combined NSDP for all the 25 states, heterogeneity that prevails across states in India has been captured considerably.

What we try to explore here are the causal relationships between credit and output. The widely accepted nomenclature for causality in econometrics is Granger Causality. According to Granger (1969), Y is said to Granger-cause X if and only if X is better predicted by using the past values of Y than by not doing so with the past values of X being used in either case. If Y causes X and X does not cause Y, it is said that unidirectional causality exists from Y to X. If Y does not cause X and X does not cause Y, then X and Y are statistically

independent. If Y causes X and X causes Y, it is said that feedback exists between X and Y. Essentially, Granger's definition of causality is framed in terms of predictability.

To implement the Granger test, a particular autoregressive lag length k (or p) is assumed and Equation (1) and (2) is estimated by OLS:

$$X_t = \lambda_1 + \sum_{i=1}^{k} a_{1i} X_{t-i} + \sum_{j=1}^{k} b_{1j} Y_{t-j} + \mu_{1t} \qquad (1)$$

$$Y_t = \lambda_2 + \sum_{i=1}^{p} a_{2i} X_{t-i} + \sum_{j=1}^{p} b_{2j} Y_{t-j} + \mu_{2t} \qquad (2)$$

In the above system of equations, F- test is carried out for the null hypothesis of no Granger causality *i.e.*, if the F statistic is greater than a certain critical value for an F distribution, then we reject the null hypothesis that Y does not Granger-cause X (equation (1)), which means Y Granger-causes X. The definition of the Granger causality, however, is based on the hypothesis that X and Y are stationary or I(0) time series. And a stationary series is one, which has both a stable mean and standard deviation. If d differences have to be made to produce a stationary process, then it can be defined as integrated of orderd.

If several variables are all I (d) series, their linear combination may be cointegrated, that is, their linear combination may be stationary. Although the variables may drift away from equilibrium for a while, economic forces may be expected to act so as to restore equilibrium, thus, they tend to move together in the long run irrespective of short run dynamics. If the series at hand appear to contain a (or at least a) unit root in their autoregressive representations, it may not be proper to apply the fundamental Granger method for variables of I(1).The classical approach to deal with integrated variables is to difference them to make them stationary. In the absence of cointegration, the direction of causality can be decided upon *via* standard F-tests in the first differenced Vector Auto Regression(VAR).

The VAR in the first difference can be expressed as:

$$\Delta X_t = \lambda_1 + \sum_{i=1}^{k} a_{1i}\Delta X_{t-i} + \sum_{j=1}^{k} b_{1j}\Delta Y_{t-j} + \mu_{1t} \qquad (3)$$

$$\Delta Y_t = \lambda_2 + \sum_{i=1}^{p} a_{2i}\Delta X_{t-i} + \sum_{j=1}^{p} b_{2j}\Delta Y_{t-j} + \mu_{2t} \qquad (4)$$

However when both Yt and Xt are truly I(1) and cointegrated, the bivariate dynamic relation between Y and X will be misspecified if one works with the differences of Y and X. According to Engle and Granger (1987), the test needs to be carried out with error-correction models (ECM). They proved that any cointegrated series must have an error correction representation, and the converse also holds.

An ECM representation is essentially a restricted VAR with co-integration specification. So it is designed for the non-stationary series, which are found to be to be co-integrated.

$$\Delta X_t = \lambda_1 + \sum_{i=1}^{k} \alpha_{1i}\Delta X_{t-i} + \sum_{j=1}^{k} \beta_{1j}\Delta Y_{t-j} + \phi_1 ecm_{1t-1} + \mu_{1t} \quad ecm_{1t-1} = (X - \gamma Y)_{t-1} \qquad (5)$$

$$\Delta Y_t = \lambda_2 + \sum_{i=1}^{k} \alpha_{2i}\Delta X_{t-i} + \sum_{j=1}^{k} \beta_{2j}\Delta Y_{t-j} + \phi_2 ecm_{2t-1} + \mu_{2t} \quad ecm_{2t-1} = (Y - \delta X)_{t-1} \qquad (6)$$

Where (i=1, 2) is error-correction (EC) term(s) and are called coefficients of adjustment and one of them must not be equal to zero according to Engle and Granger (1987). In Equation (5) and (6), all series are I(0) processes. The parameters in the ECM have the following interpretations. In Equation (5), the coefficient of Y in the EC term ($ecm_{1t-1}$) is the long-run elasticity of X with respect to Y. Conversely, in Equation (6), the coefficient of X in the EC term ($ecm_{2t-1}$) is the long-run elasticity of Y with respect to X and clearly reflect the immediate response of X to changes in Y and the immediate response of Y to changes in X respectively. They are therefore the short-run elasticities. In Equation (5), the larger the parameter $\phi_1$, the faster adjustment of X to the previous period's deviation from long-run equilibrium. At the opposite extreme, very small values of $\phi_1$ imply that X is unresponsive to the last period's equilibrium error. The same condition exists in equation (6). Since the ECM terms $\phi_1$ and $\phi_2$ cannot at the same time be equal to zero in the

presence of the cointegrating relationship, there must exist one direction of long-term causality between Y and X.

An advantage of the cointegration analysis with respect to the conventional test is that if the two variables are cointegrated then there must exist Granger-causality at least in one direction. If the coefficient of the error correction term is significant, a causality relationship will exist between the two variables. Standard t test are used to test the significance of $\phi_1$ and $\phi_2$. Engle and Granger (1987) and Johansen (1988) present alternative methods for testing cointegration and the estimation of cointegrating vectors. However, the Johansen technique, which is based on the full system, multi-equation estimation has significant power advantage over the single-equation Engle-Granger method. Further, it avoids the simultaneous equation bias and estimator inefficiency problems inherent in single-equation methods by the full-system specification. This study uses augmented Dickey-Fuller (ADF) method to test the order of the series, and Johansen's method to test for cointegrating relationship. The credit-output relationship has been studied for each state under study to find whether any meaningful relationship exists between the two entities and if yes, the sensitivity parameter.

## Section IV

## Empirical Results

Using the Dickey-Fuller (Augmented) test for the appropriate lag length, it is found that both the variables for each state contain a unit root (Appendix-1). However both the variables are found to be stationary in their first difference *i.e.* they are I (1). As standard OLS would give spurious regressions if the variables under consideration were non-stationary, the next step was to test for co-integration between the two variables. Applying Johansen's co-integration tests for the appropriate lag length, it was found that for 19 out of the 25 states, the two variables were co-integrated (Appendix-2). This indicates that that there exists a long-term equilibrium relationship between credit and growth for the majority of the States.

Further, the six states where no co integrating relationship was found between the two variables, Granger causality was carried out on the first differences of the two variables. No evidence of causality, except for Meghalaya,[6] was found for five out of the six states. States such as Bihar, Jammu & Kashmir and Nagaland where no cointegatring relationship was found may be because growth in these states is adversely affected by factors beyond the purview of economic policy. Moreover, these states because of their past record of non performing assets and troubled character, lack the confidence of the banks when it comes to funding projects in these states. Frequent ethnic clashes and political instability in Nagaland perhaps act as a strong deterrent for the commercial banks to deploy their funds, thus absence of any co-integrating relationship between credit and output for these states. Absence of cointegrating relation for Haryana is a bit perplexing and needs further investigation, which is beyond the scope of the present study. For the states where cointegrating relationship was found to be valid, an error correction representation following the Johansen framework was worked out to infer about the nature of causality between the two variables (Appendix-3). The causality results are given in table-5.

**Table 5: Causality Results based on ECM**

| **Nature of causality** | **Direction of causality** | **Long-run** | **Short-run** |
|---|---|---|---|
| Uni-Directional | Credit - Output | Karnataka, Orissa, Punjab, West Bengal | Delhi, Maharastra, Rajasthan, Tamil Nadu |
| Uni-Directional | Output-Credit | Andaman & Nicobar Island, Andhra Pradesh, Delhi, Gujarat, Himachal Pradesh, Kerala, Madhya Pradesh, Maharastra, Nagaland, Rajasthan, Tripura, Uttar Pradesh | Himachal Pradesh, Maharastra, Rajasthan |
| Bi-directional | Output - credit | Arunachal Pradesh, Assam, Tamil Nadu | |

It is evident from the error correction framework that causality is predominant in the long run than in the short run. Further causality holds from credit to output only for Orissa, Punjab, Karnataka and West Bengal. But for the majority of the sates causality runs from output to credit. Further, the evidence of bi-directional causality is

restricted to only 3 states. As far as elasticities are concerned, elasticity of credit to output turned out to be much higher than elasticity of output to credit (table-6).

**Table 6: Short-Run and Long Run Elasticities**

| STATE | Elasticity of Output to Credit | | Elasticity of Credit to Output | |
|---|---|---|---|---|
| | Short run | Long run | Short run | Long run |
| Andaman & Nicobar Islands | na | na | na | 2.68 |
| Andhra Pradesh | na | na | na | 2.29 |
| Arunachal Pradesh | na | 0.15 | na | 6.39 |
| Assam | na | -0.03 | na | 26.84 |
| Delhi | 0.16 | na | na | 3.77 |
| Gujarat | na | na | na | 3.00 |
| Himachal Pradesh | na | na | -1.17 | 3.14 |
| Karnataka | na | 0.13 | na | na |
| Kerala | na | na | na | 6.48 |
| Madhya Pradesh | na | na | na | 3.83 |
| Maharastra | 0.21 | na | -1.04 | 2.91 |
| Nagaland | na | na | na | -1.34 |
| Orissa | na | 0.13 | na | na |
| Punjab | na | 0.18 | na | na |
| Rajasthan | 0.86 | na | -0.62 | 2.96 |
| Tamil Nadu | -0.32 | 0.33 | na | 3.02 |
| Tripura | na | na | na | -6.74 |
| Uttar Pradesh | na | na | na | 4.85 |
| West Bengal | na | 0.104 | na | na |

na-Not Applicable.

For the majority of the states, long run elasticities of both credit to output and output to credit are positive and the long run elasticities were significantly higher than short-run elasticities. The long-run elasticity of credit to output turned to be negative only for Nagaland and Tripura. This may be because these states account for a miniscule proportion both in the combined credit and output for all states. Further, growth in these states is being financed by loans and grants from the center than by credit from the commercial banks. In fact these states have suffered a decline in their share of credit for all states over the period under study. While states like Karnataka, Kerala, Punjab and Orissa displayed very high elasticity

of credit to output, the elasticity of output to credit was relatively higher for Andhra Pradesh, Madhya Pradesh, Gujarat, Rajasthan, Maharastra and Tamil Nadu.

## Section V

## Conclusion

The idea behind a vast network of commercial bank branches cutting across the length and breadth of the country is that dispersion of credit for production activities is on a balanced footing. Though financial reforms are in vogue for over a decade in India, certain regulatory provisions such as directed lending is still in operation. The primary motive for such provisions is that no sector or state should compromise on development owing to lack of credit. The underlying hypothesis is that credit is an important input for production and possibly it is credit which Granger causes output. However the empirical exercise undertaken in the study reveals that for the majority of the states it is output which Granger causes credit. Thus a key feature on the dynamics of credit flow that emerges from this study is that credit flow to different states depends more on the credit absorptive capacity of the states notwithstanding regulatory provision on directed lending. This goes to support that demand-following approach predominates over the supply-leading hypothesis.

The other finding that long run elasticities are far greater than short run elasticites is along the expected lines. The nexus between credit and output is essentially a medium to long-term phenomenon. Further the present focus on growth supportive policy is well justified in light of the empirical finding that output Granger causes credit. Lack of credit off take should not be seen as a problem in itself but should be seen in conjunction with what is happening on the output front. The growth fatigue that India is experiencing in the second half of 1990s needs to be tackled by addressing the structural issues rather than concerns over lack of credit off-take and measure to improve the same. Credit, no doubt, plays an important role in the growth process but the dice seems to be loaded in favour of promoting growth so as to ensure a more balanced and growth-sustaining credit flow.

## Appendix-1
## Unit Root Tests Based on DF / ADF-Statistics

| STATE | VARIABLE | TEST FOR UNIT ROOTS IN LEVEL (APPROPRITAE LAG) | TEST FOR UNIT ROOTS IN FIRST DIFFERENCE (APPROPRITAE LAG) |
|---|---|---|---|
| Andaman & Nicobar Islands | LPNSDP | -1.894 | -4.438 *$ |
| | LPTCAS | -.7874 | -4.96 ** |
| Andhra Pradesh | LPNSDP | -3.710(3) | -4.061 * |
| | LPTCAS | -2.545(2) | -3.348(2) *** |
| Arunachal Pradesh | LPNSDP | -1.791 | -5.818 ** |
| | LPTCAS | -1.751 | -4.501 * |
| Assam | LPNSDP | -2.674 (2) | -4.723 * |
| | LPTCAS | -1.749(3) | -3.804 * |
| Bihar | LPNSDP | -2.72 | -5.806 * |
| | LPTCAS | -1.1101 | -4.341 * |
| Delhi | LPNSDP | -3.253(2) | -6.127 ** |
| | LPTCAS | -2.621 | -4.354 * |
| Gujarat | LPNSDP | -3.088 | -6.104 * |
| | LPTCAS | -2.082 | -4.583 * |
| Haryana | LPNSDP | -3.388 | -4.799(1) * |
| | LPTCAS | -2.226(2) | -4.722 * |
| Himachal Pradesh | LPNSDP | -2.810 | -5.184 ** |
| | LPTCAS | -4.355(2) | -3.3976 * |
| Jammu &Kashmir | LPNSDP | -2.162 | -5.952 ** |
| | LPTCAS | -4.11(3) | -3.384 *** |
| Karnataka | LPNSDP | -2.266 | -6.244 * |
| | LPTCAS | -2.542(1) | -3.122 * |
| Kerala | LPNSDP | -3.320 | -3.839 * |
| | LPTCAS | -2.864 | -5.126 * |
| Madhya Pradesh | LPNSDP | -3.562 | -7.742 ** |
| | LPTCAS | -1.998 | -4.012 * |
| Maharashtra | LPNSDP | -2.850 | -3.913(1) * |
| | LPTCAS | -2.387 | -3.896 * |
| Manipur | LPNSDP | -2.889 (4) | -3.768(1) *** |
| | LPTCAS | -1.450 | -3.436(3) *** |
| Meghalaya | LPNSDP | -2.258 | -3.692 * |
| | LPTCAS | -1.913 | -4.242 * |
| Nagaland | LPNSDP | -2.611 | -4.057(3) * |
| | LPTCAS | -0.882(3) | -4.541(2) * |

| STATE | VARIABLE | TEST FOR UNIT ROOTS IN LEVEL (APPROPRITAE LAG) | TEST FOR UNIT ROOTS IN FIRST DIFFERENCE (APPROPRITAE LAG) |
|---|---|---|---|
| Orissa | LPNSDP | -1.266(2) | -5.791(1) ** |
| | LPTCAS | -1.846 | -3.453 *** |
| Pondicherry | LPNSDP | -2.979(3) | -2.742 *** |
| | LPTCAS | -2.504(1) | -3.517 *** |
| Punjab | LPNSDP | -2.122 | -6.193 (1) * |
| | LPTCAS | -3.632 | -5.754(2) ** |
| Rajasthan | LPNSDP | -4.398 | -7.910 ** |
| | LPTCAS | -3.757 | -4.738 ** |
| Tamil Nadu | LPNSDP | -1.290(2) | -7.387(1) ** |
| | LPTCAS | -3.021(2) | -4.845 * |
| Tripura | LPNSDP | -2.474 | -4.17 * |
| | LPTCAS | -1.497 | 4.49(1) * |
| Uttar Pradesh | LPNSDP | -2.026 | -4.189 * |
| | LPTCAS | -1.851 | -4.251 * |
| West Bengal | LPNSDP | -.1586 | 44.420 * |
| | LPTCAS | -1.783 | -5.244 * |

Note: Where lags are not mentioned (in brackets) it means 0 lag is the optimal lag and the results refer to the DF test. The optimal lag length is determined on the basis of Akike and SBC criteria. For non-zero optimal lag, the results are on the basis of Augmented DF test.

* Refers to significance at 95% level, ** Refers to significance at 99% level and*** Refers to significance at 90% level.

## Appendix-2
## Results of Co-integration Test

| Region | Likelihood Ratio | Presence of Cointegration |
|---|---|---|
| Andaman & Nicobar Islands | 18.592* | |
| | 4.965 | Yes |
| Andhra Pradesh | 25.049* | |
| | 6.953 | Yes |
| Arunachal Pradesh | 23.025* | |
| | 6.248 | Yes |
| Assam | 22.021* | |
| | 5.332 | Yes |
| Bihar | 15.944 | |
| | 4.098 | No |
| Delhi | 18.335* | |
| | 5.650 | Yes |
| Gujarat | 18.586* | |
| | 4.878 | Yes |
| Haryana | 16.980 | |
| | 6.598 | No |
| Himachal Pradesh | 29.049* | |
| | 12.102 | Yes |
| Jammu & Kashmir | 9.639 | |
| | 1.779 | No |
| Karnataka | 18.526* | |
| | 7.283 | Yes |
| Kerala | 25.049* | |
| | 6.953 | Yes |
| Madhya Pradesh | 19.988* | |
| | 6.679 | Yes |
| Maharastra | 31.240* | |
| | 5.027 | Yes |
| Manipur | 17.605 | |
| | 4.451 | No |
| Meghalaya | 13.863 | |
| | 5.949 | No |
| Nagaland | 19.635* | |
| | 5.322 | Yes |
| Orisa | 24.999* | |
| | 6.473 | Yes |

| | | |
|---|---|---|
| Pondicherry | 13.444<br>3.220 | No |
| Punjab | 24.142*<br>6.433 | Yes |
| Rajasthan | 27.411*<br>4.059 | Yes |
| Tamil Nadu | 29.052*<br>8.371 | Yes |
| Tripura | 18.772*<br>6.404 | Yes |
| Uttar Pradesh | 21.986*<br>4.270 | Yes |
| West Bengal | 27.426*<br>1.600 | Yes |

Note: The 1%, 5% and 10% critical values for the LR statistics are 24.67,19.96 and 17.85 respectively.
* Denotes rejection of the null hypothesis that there is no co-integration.

## APPENDIX-3
## Error Correction Mechanism

| STATE | DEPENDENT VARIABLE | F-Statistics | INDEPENDENT VARIABLE | | |
|---|---|---|---|---|---|
| | | | $(DLPNSDP)_{t-1}$ | $(DLPTCAS)_{t-1}$ | $(ECM)_{t-1}$ |
| Andaman & Nicobar Island | DLPNSDP | 0.651 | -0.349 (-1.116) | -0.106 (0.087) | 0.044 (1.087) |
| | DLPTCAS | 1.517 | -0.238 (-0.278) | -0.257 (-1.072) | -0.095 (-2.303) |
| Andhra Pradesh | DLPNSDP | -.117 | -0.158 (-0.643) | -.0.2370. (-.749) | 072 (1.389) |
| | DLPTCAS | 3.336 | (0.126) 0.023 | -0.188 (-0.804) | -0.077 (-4.593) |
| Arunachal Pradesh | DLPNSDP | 3.691 | 0.363 (-1.667) | -0.032 (-0.536) | -0.218 (-3.745) |
| | DLPTCAS | 2.835 | -1.265 (-1.334) | -0.116 (-0.445) | 0.129 (3.251) |
| Assam | DLPNSDP | 2.087 | -0.380 (-1.858) | .001 (0.035) | -0.118 (-1.956) |
| | DLPTCAS | 2.531 | -0.494 (-0.371) | -0.415 (-1.868) | -0.048 (3.327) |
| Delhi | DLPNSDP | -0.382 | -0.138 (-0.402) | 0.165 (2.426) | 0.177 (0.791) |
| | DLPTCAS | 8.018 | -0.392 (-0.513) | -0.028 (-0.189) | 0.491 (-3.712) |
| Gujarat | DLPNSDP | 2.216 | -0.456 (-1.840) | -0.203 (-0.395) | 0.044 (1.127) |
| | DLPTCAS | 1.111 | -0.210 (-1.741) | 0.035 (0.142) | -0.026 (-4.077) |
| Himachal Pradesh | DLPNSDP | -1.433 | -0.047 (-0.166) | 0.33 (0.325) | 0.014 (0.091) |
| | DLPTCAS | 4.042 | -1.170 (-2.195) | 0.107 (0.568) | -0.380 (-4.128) |
| Kerala | DLPNSDP | 0.638 | 0.301 (1.071) | 0.101 (0.529) | 0.006 (0.395) |
| | DLPTCAS | 1.177 | -0.234 (-0.579) | -0.359 (-1.303) | -0.015 (-4.088) |

| STATE | DEPENDENT VARIABLE | F-Statistics | INDEPENDENT VARIABLE | | |
|---|---|---|---|---|---|
| | | | $(DLPNSDP)_{t-1}$ | $(DLPTCAS)_{t-1}$ | $(ECM)_{t-1}$ |
| Madhya Pradesh | DLPNSDP | 2.622 | -0.523 | 0.107 | 0.008 |
| | | | (-2.384) | (0.609) | (0.494) |
| | DLPTCAS | 1.510 | -0.065 | -0.113 | -0.056 |
| | | | (-0.212) | (-0.462) | (-4.046) |
| Maharastra | DLPNSDP | 0.852 | 0.003 | 0.217 | 0.040 |
| | | | (0.010) | (2.220) | (0.195) |
| | DLPTCAS | 8.560 | -1.040 | 0.293 | -0.599 |
| | | | (-2.460) | (2.156) | (-6.244) |
| Nagaland | DLPNSDP | 1.746 | -0.133 | 0.140 | 0.003 |
| | | | (-0.509) | (1.700) | (0.127) |
| | DLPTCAS | 8.920 | -0.945 | -0.209 | -0.216 |
| | | | (-1.466) | (-1.023) | (-4.255) |
| Orissa | DLPNSDP | 21.22 | 0.333 | 0.100 | -2.023 |
| | | | (1.421) | (1.168) | (-5.144) |
| | DLPTCAS | 2.750 | -0.278 | 0.857 | 0.139 |
| | | | (-0.694) | (0.147) | (1.539) |
| Rajasthan | DLPNSDP | 6.097 | -0.781 | 0.866 | -0.355 |
| | | | (-3.391) | (2.214) | (-1.073) |
| | DLPTCAS | 0.074 | -0.624 | 0.261 | -0.245 |
| | | | (-3.415) | (0.839) | (-2.759) |
| Tamil Nadu | DLPNSDP | 5.874 | 0.110 | -0.329 | -0.443 |
| | | | (0.530) | (-2.149) | (-4.447) |
| | DLPTCAS | 0.781 | 0.307 | -0.198 | 0.255 |
| | | | (0.760) | (-0.665) | (3.984) |
| Tripura | DLPNSDP | -1.118 | 0.252 | -0.003 | -0.042 |
| | | | (1.081) | (0.048) | (-1.218) |
| | DLPTCAS | 4.612 | -0.474 | -0.305 | -0.070 |
| | | | (-0.571) | (-1.333) | (-3.842) |
| Uttar Pradesh | DLPNSDP | -0.710 | -0.315 | 0.058 | 0.244 |
| | | | (-1.014) | (0.379) | (0.973) |
| | DLPTCAS | 1.296 | -0.414 | -0.190 | -0.376 |
| | | | (-0.743) | (-0.692) | (-4.063) |
| West Bengal | DLPNSDP | 1.488 | -0.184 | -0.038 | 0.072 |
| | | | (-0.571) | (-0.449) | (2.471) |
| | DLPTCAS | 0.094 | -0.357 | -0.103 | -0.019 |
| | | | (-0.286) | (-0.310) | (-1.680) |

(Figures in parentheses indicate the t-values)

| STATE | DEPENDENT VARIABLE | F Statistics | | INDEPENDENT VARIABLE | | | |
|---|---|---|---|---|---|---|---|
| | | | $(DLPNSDP)_{t-1}$ | $(DLPNSDP)_{t-1}$ | $(DLPTCAS)_{t-1}$ | $(DLPTCAS)_{t-1}$ | $(ECM)_{t-}$ |
| Karnataka | DLPNSDP | 1.573 | -0.897 | -0.566 | -0.183 | 0.112 | 0.162 |
| | | | (-2.306) | (-1.351) | (-0.904) | (0.721) | (2.304) |
| | DLPTCAS | 1.083 | -0.390 | 0.544 | 0.488 | -0.114 | -0.015 |
| | | | (-0.627) | (0.811) | (1.504) | (-0.458) | (-1.048) |
| Punjab | DLPNSDP | 4.083 | -0.211 | -0.580 | -0.009 | -0.029 | -0.155 |
| | | | (0.896) | (-3.022) | (-0.238) | (-0.879) | (-4.180) |
| | DLPTCAS | 1.321 | 0.133 | 2.778 | 0.547 | -0.252 | 0.015 |
| | | | (0.066) | (1.699) | (1.595) | (-0.893) | (0.048) |
| West Bengal | DLPNSDP | 2.980 | -0.659 | -0.722 | -0.057 | -0.084 | 0.199 |
| | | | -1.980 | -2.476 | -0.813 | -1.162 | 3.719 |
| | DLPTCAS | 0.164 | 0.547 | 0.245 | -0.050 | -0.031 | 0.147 |
| | | 0.330 | 0.169 | -0.143 | 0.088 | 0.551 | |

(Figures in parentheses indicate the t-values)

## Notes:

1. Committee on Financial Sector Reforms (Chairman: Shri M.Narasimham) gave the blue print of financial sector reforms in India in 1992.
2. For a discussion of various financial development ratios like financial interrelations ratios see Rangarajan (1997).
3. External Finance Premium is the difference in cost between funds raised externally (by issuing debt, say) and funds generated internally by retained earnings.
4. The classification of sectoral allocation of credit is as per RBI's Basic Statistical Reeturns-1 and 2. For instance, credit to agriculture includes both direct and indirect finance, credit to industry includes mining and quarrying, food manufacturing and processing, beverages and tobacco, textiles, paper, paper products and printing, leather and leather products, rubber and rubber products, chemical and chemical products etc. Services sector credit is inclusive of credit to transport operators, professional and other services, personal loans, trade, and finance.
5. Agriculture includes agriculture, forestry and fishing and logging. Industry includes mining and quarrying, manufacturing (registered and non-registered) and services include electricity gas and water supply, transport, storage and communication, trade hotels and restaurants, banking and insurance, real estate, ownership of dwellings and business services, public administration and other services.
6. Causality runs from output to credit for Meghalaya.

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# *Special Notes*

# *Reserve Bank's Clean Note Policy: An Overview*

**R. K. Jain***

Reserve Bank is charged with the responsibility of providing adequate supply of currency for facilitating transactions of the Government, banks and the public. Over the years, with the expansion of the economic activities and growth, the volume of currency in circulation has multiplied by many times. Of late, it was observed that many of the notes in circulation were soiled and mutilated and these were no longer considered as a decent medium of exchange. Such notes were also not found conducive for introducing new technology such as dispensing machines, counting machines, automatic teller machines (ATM), *etc.* to improve customer service. To overcome this problem, the Reserve Bank took a number of initiatives to increase the supply of clean notes on the one hand and suck out the soiled and mutilated notes from the circulation on the other, known as 'Clean Note Policy'. This note attempts to analyse how far these measures have been effective in improving the then prevailing situation and providing a new direction to the currency management.

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## Introduction

The Reserve Bank of India is the sole authority for the issue of currency in India. Although one-rupee notes/coins and subsidiary coins, the magnitude of which is relatively small, are issued by the Government of India, these are put into circulation only through the Reserve Bank. This authority is given to the Reserve Bank because it is charged with the responsibility of providing adequate supply of currency for facilitating transactions of the Government and the exchange and remittance requirements of banks and the public. With the expansion of the economic activities and growth, the volume of currency in circulation has multiplied by more than 200 times during last 50 years. Of late, it was observed that many of the notes in circulation were soiled and mutilated and these were no more

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considered as a decent medium of exchange. No body wanted to accept these notes, however, if somebody acquired these notes while transacting, they wanted to get rid of them at the first available opportunity. With the result, these soiled and mutilated notes were effectively driving out the good notes out of circulation, as if the Gresham's Law was in operation. These were also not at all conducive for use of new technology such as dispensing machines, counting machines, automatic teller machines (ATM), *etc*. for improving banks' efficiency and customer service. To overcome this problem, the Reserve Bank of India took a number of initiatives to increase the supply of clean notes on the one hand and suck out the soiled and mutilated notes from the circulation on the other, known as 'Clean Note Policy'. This note attempts to analyse how far these measures have been effective in improving the then prevailing situation and providing a new direction to the currency management.

The note has been organised into three sections. Section I explains the main features of currency management in India in a historical perspective, while Section II focuses on various measures taken under 'Clean Note Policy' and their impact on currency management. Section III contains the concluding observations.

## Section I

## Currency Management in India

Up to March 31, 1935, the regulation of currency was carried out by the Central Government departmentally through the Controller of Currency under the Paper Currency Act (XIX of 1861). On its establishment, the Reserve Bank took over the management of currency in India under Section 3 of the Reserve Bank of India Act, 1934 (RBI, 1970). Accordingly, the liability of the Government of India notes in circulation on that date and assets equal to that amount of liability were transferred to the Issue Department of the Bank. Under Section 22 of the Act, the Bank has the sole right to issue currency notes (referred to as 'bank notes' in the Act in order to distinguish them from the notes issued by the Government) in India. Currency notes are legal tender at any place in India in payment or on account, without limit (RBI, 1983).

In India, currency forms a significant part of the money supply, even though its importance has been declining over the years due to the increasing monetisation of the economy and the spread of banking facilities. Currency is an important economic indicator of economic activity, especially in rural India and its behavioural pattern throws up many interesting insights. Cash demand tends to increase in the beginning of the month when salaries are spent and tapers off at the end of the month when consumers spending returns to business accounts. Similarly, currency seasonality, by and large, mirrors the seasonality in economic activity. The variance of the ratio of currency to gross domestic product (GDP) at current market prices, an indicator of the role of currency in economic activity, has stabilised since the mid-eighties (RBI, 2001). Since currency constitutes the base for the expansion of money supply, regulation of currency is also an important element of monetary control.

The RBI Act permits the issue of notes in the denominations of rupees two, five, ten, twenty, fifty, one hundred, five hundred, one thousand, five thousand and ten thousand or such other denominations not exceeding rupees ten thousand as the Central Government may specify, on the recommendation of the Central Board of the Bank. At present, all denominations except rupees two, five thousand and ten thousand are being issued. Of the various denominations, one hundred rupee notes account for nearly 41 per cent of the total value of currency issued, followed by five hundred rupee notes (about 28 per cent) and fifty rupee notes (about 15 per cent). The value of lower denominations is too little though their volume is enormous. Rupees one, two and five notes account for just one per cent of the total value of currency issued, while they account for about 15 per cent of the total volume. Similarly, rupees ten notes account for only 3 per cent of the total value, while their share in total volume is 25 per cent (Kamesam, 2003). The design, form and material of the notes have to be approved by the Central Government, after consideration of the recommendations made by the Central Board of the Bank. The Bank takes special care in the choice of the size, colour and design of the notes to enable the public to distinguish the different denominations easily.

The Central Government may deprive currency notes of any denomination of their legal tender character or direct the non-issue of any denomination, on recommendation of the Central Board of the Bank. In this connection, special mention may be made of demonetisation of high denomination notes by the Government of India on two occasions. On January 12, 1946, with the object of checking unaccounted money and tax evasion, Government demonetised notes of rupees five hundred, one thousand and ten thousand. The Bank reintroduced from April 1, 1954, notes of rupees one thousand and ten thousand. Five thousand rupee notes were also introduced from that date. It was again after a lapse of more than 30 years that high denomination notes (rupees one thousand, five thousand and ten thousand) were demonetised on January 16, 1978, on the ground that the availability of these notes facilitated the illicit transfer of money for financing transactions, which were harmful to the national economy or for illegal purposes (RBI, 1983). However, the notes of rupees five hundred and rupees one thousand have since been reintroduced.

The volume of note issue (excluding one rupee coin) grew from Rs. 186 crore in 1938 to Rs. 1,114 crore in 1952 and further to Rs. 2,75,096 crore at end-March 2003 (RBI, 1970, 1983 and 2003). Thus, the volume of note issue multiplied by over 200 times during the last 50 years. While various reasons could be attributed to explain the phenomenal growth in note issue, certain factors stand out, namely, large expansion of the economy requiring greater use of cash, continuing public preference for currency notes as a medium of exchange and growth of population. All transactions relating to issue of currency notes are separated, for accounting purposes, in the Issue Department of the Bank. The Issue Department is liable for the aggregate value of the currency notes of the Government of India and currency notes of the Reserve Bank in circulation from time to time and it maintains eligible assets for equivalent value. The assets, which form the backing for the note issue, are kept wholly distinct from those of the Banking Department. The Issue Department will issue currency notes only in exchange for currency notes of other denominations or against such assets, which are statutorily acceptable

for being held as part of the reserve.

In practice, the distinction between the Issue Department and the Banking Department has little economic significance since there are frequent shifts between the assets of the two departments. However, not all the assets of the Banking Department are eligible for being held in the Issue Department (*e.g.*, State Government securities, small coins), an arrangement designed to provide some check on the issue of currency. The Issue Department is also responsible for getting its periodical requirements of notes printed from the currency printing presses of the Government of India, distribution of currency among the public and withdrawal of unserviceable notes and coins from circulation.

The mechanism of putting currency into circulation and its withdrawal from circulation (*i.e.*, expansion and contraction of currency, respectively) is effected through the Banking Department. Thus, if a scheduled bank wants to withdraw Rs. one crore from its deposits with the Reserve Bank, the transaction is handled by the Banking Department, which gives currency in the denominations required by the bank, debiting the bank account. For this purpose, the Banking Department holds stock of currency, which it replenishes as and when necessary from the Issue Department against transfer of eligible assets. Likewise, if a bank tenders cash to the Reserve Bank for its account, the cash is received by the Banking Department. If the holding currency in the Banking Department becomes surplus to the normal requirements of the Department, the surplus is returned to the Issue Department in exchange for equivalent assets. In respect of the exchange of currency notes for rupee coins and rupee coins for notes and exchange of notes of one denomination for another, the Issue Department deals directly with the public and not through the Banking Department.

Reserve Bank notes have a cent per cent cover in approved assets. There is no ceiling on the amount of notes that can be issued by the Bank at any time. According to Section 33 of the RBI Act, the assets of the Issue Department against which currency notes are issued have to consist of gold coin and bullion, foreign securities, rupee coin,

Government of India rupee securities of any maturity and bills of exchange and promissory notes payable in India which are eligible for purchase by the Bank. In practice, such bills and promissory notes have not figured as assets so far due to the lack of proper bill market.

The original RBI Act prescribed a proportional reserve system. Under this system, the Bank was required to keep 40 per cent of assets in the form of gold coin, gold bullion and foreign securities, subject to the condition that the value of gold (coin and bullion) should not be less than Rs. 40 crore in value. This system was a relic of the old international gold exchange standard and it placed rigid limitations on the central bank. In India, the rapid growth in economic activity under the impetus of the development plans and the expansion in the monetised sector of the economy called for a large expansion of currency. The financing of the plans also necessitated heavy drafts on the foreign reserves held by the Bank. The Reserve Bank of India (Amendment) Act, 1956, sought to provide for the needed flexibility in note issue, while maintaining a specified quantity of reserves in gold and foreign securities. Under the new system, known as minimum reserve system, the Reserve Bank is required to ensure that in the different items of assets kept as backing, the value of gold coin and bullion should not be less than the value of Rs. 115 crore. The other minimum condition, which can be dispensed with during unforeseen contingencies, is that there should be foreign securities of the minimum value of Rs. 85 crore, so that together with gold (coin and bullion) the minimum value of these assets is Rs. 200 crore (RBI, 1983). The new system seems to provide for gold of a higher value, but this did not imply need for additional gold. It is because the value of the existing gold was revised upward in accordance with the new higher price.

The Bank has made elaborate arrangements for the discharge of its currency functions. It has set up a full-fledged 'Department of Currency Management' to streamline various functions related to currency management. The Department addresses policy and operational issues relating to designing of banknotes, forecasting demand for notes and coins, ensuring smooth distribution of banknotes and coins throughout the country and retrieval of unfit notes and uncurrent coins from circulation, ensuring the integrity of banknotes, administering the RBI

(Note Refund) Rules, reviewing/ rationalising the work systems/ procedures at the Issue Offices on an ongoing basis and dissemination of information on currency related matters to the general public. The Department makes estimates of currency for incremental needs, replacement needs and reserve needs through statistical analysis and long-term forecasts and accordingly allocates printing/ minting of currency notes/ coins among various Presses/ Mints. Delivery schedules of currency notes/ coins to various Issue Offices of the Bank are also decided in advance. The distribution of currency to the Government, banks and the public is undertaken through offices of the Issue Department. At present, the Bank maintains 19 offices of the Issue Department at Ahmedabad, Bangalore, Belapur, Bhopal, Bhubaneshwar, Chandigarh, Chennai, Guwahati, Hyderabad, Jaipur, Jammu, Kanpur, Kolkata, Lucknow, Mumbai, Nagpur, New Delhi, Patna and Thiruvananthapuram. The currency requirements at other centers are met through 4,422 currency chests maintained by the Bank with (i) its agencies, namely the branches of the State Bank of India, its associates and nationalised banks, and (ii) Government treasuries and sub-treasuries. Currency chests are receptacles in which stocks of new and reissuable notes are stored along with rupee coins. The balances in the chests are the property of the Reserve Bank. Besides, 3,784 bank branches spread throughout the country have also been authorised to establish small coin depots to stock small coins and distribute them into other bank branches in the area of their operations (Kamesam, 2003).

The Reserve Bank's responsibility is not only to put currency into, or withdraw it from circulation, but also to exchange notes and coins into such other denominations of notes and/or coins as may be required by the public. Section 27 of the RBI Act imposes an obligation on the Bank to maintain the quality of note issue by stipulating that the Bank shall not reissue currency notes, which are torn, defaced or excessively spoiled. Besides the Reserve Bank, public sector banks accept soiled notes and slightly mutilated notes in payment of dues and afford free facilities to their customers and other persons for exchanging such notes. The value of any lost, stolen, imperfect or mutilated note of the Government of India or the Reserve Bank cannot be claimed by any person as of right. However, with a view to mitigating the hardship to the public in genuine cases, the

Bank, as a matter of grace, arranges to make refund of the value of such notes in accordance with the rules called the Reserve Bank of India (Note Refund) Rules, which have been framed for this purpose in terms of the proviso to Section 28 of the RBI Act.

The Bank, for the first time, issued the RBI (Note Refund) Rules in 1935 based on the rules of the Paper Currency Department as they then stood. In 1975, the Bank issued a new set of rules known as RBI (Note Refund) Rules, 1975 in order to provide powers to examine and dispose of the claims to be delegated to a number of officers at various levels. The element of discretion, which was previously vested in the currency officers, as prescribed officers entitled to adjudicate claims in respect of notes which were not exchangeable over the counters, were abolished and replaced by precisely formulated rules intended to test and establish the genuineness of the notes and the claims in relation thereto. The defective and mutilated notes tendered for adjudication were classified with reference to the degree of mutilation and the difficulties likely to be experienced in the examination and disposal of the claims. The mission behind the initiatives was to facilitate the expeditious settlement of all genuine claims (RBI, 1975).

Notes and coins returned from circulation are deposited at the issue offices of the Reserve Bank. The Bank then separates the notes that are fit for reissue and those which are not fit for reissue. The notes which are fit for reissue, are sent back into the circulation and which are not fit for reissue are, after processing, shredded. The coins withdrawn are sent for melting. The replacement of notes returning from circulation is a continuous process and is carried out to keep the notes in circulation in as clean a condition as possible. The pursuit of this on-going process can aptly be described as the Bank's Clean Note Policy.

## Section II

## The Bank's Clean Note Policy

With a view to facilitating the management and servicing of a very large and growing volume of currency notes, the Reserve Bank took a number of steps since 1975. A new metallic rupee was issued

on 1st April 1975 to supplement the availability and stocks of one-rupee notes. Subsequently, rupees two and five notes were also coinised. The installed capacity for printing of fresh notes and the production of bank note paper was substantially increased. The existing currency note printing presses at Nasik and Dewas and the mints owned by the Government of India at Hyderabad, Kolkata, Mumbai and Noida are being modernised. Two new printing presses with the state-of-art technology have been set up at Mysore and Salboni under the aegis of the Bharatiya Reserve Bank Note Mudran Ltd., a wholly owned subsidiary of the Reserve Bank. To bridge the demand-supply gap, the Government, as a one-time measure even allowed the import of 3.6 billion pieces of notes in 1997-98. The production capacity of the four Government Mints is being augmented. The Government of India has also been importing rupee coins to supplement the quantity of coins supplied by the four mints. So far, more than two billion rupee coins have been imported. Thus, by 1999, enough printing capacity was installed to take care of the current and foreseeable future requirements.

Simultaneously, the number of note examination sections and staff employed for the examination of soiled and mutilated notes were increased with a view to enabling the Bank to retire and replace excessively soiled, defective and mutilated notes as expeditiously as possible. In spite of these efforts, the claims in respect of soiled and mutilated notes were rising by leaps and bounds and the quality of notes in circulation was fast deteriorating. It was no more possible to handle these claims manually and maintain the quality of notes in circulation at the desired level by using the prevailing methods and techniques of currency management. Hence it was no more a choice, but an imperative to bring the methods and techniques of currency management in consonance with new technology and international best practices.

Accordingly, Dr. Bimal Jalan, the then Governor, Reserve Bank of India announced the Bank's 'Clean Note Policy' in January 1999. For effective execution of 'Clean Note Policy', withdrawing soiled and mutilated notes from circulation is as important as pumping fresh notes into circulation. For the achievement of the twin-goals, the Reserve Bank has, over the past four years, introduced various changes

in the systems and procedures related to currency management. The steps include: mechanisation of the currency verification and processing as also shredding and briquetting for destruction of soiled and mutilated notes. The Bank has installed a number of Currency Verification and Processing System (CVPS) at its various Issue Offices to supplement the manual processing of notes.

The CVPS is an electronic-mechanical device designed for examination, authentication, counting, sorting and on-line destruction of the notes, which are unfit for further circulation. The system is capable of sorting the notes on the basis of denomination, design and level of soilage. Generally, the system sorts the notes into fit, unfit, reject and suspect categories. The unfit notes are shredded online. The fit notes are retrieved from the system in packets of 100 pieces. These packets are banded by the system and information such as denomination, date of processing, name of office and operator code is printed on the label to facilitate easy identification. The notes in the reject and suspect categories are received in different stackers since these have to be inspected manually for the presence of counterfeit or different denomination notes. The CVPS ensures uniformity and consistency in the examination of notes on the basis of soilage levels and other parameters and classification thereof into re-issuable and non-issuable. The element of subjectivity, which characterises manual examination of notes, is thus eliminated through CVPS (RBI, 2002).

Each CVPS is capable of processing 50,000 – 60,000 notes per hour. It counts, examines the genuineness of notes, sorts notes into fit and unfit and shreds the unfit notes on-line. The shreds are on-line transported to a separate Shredding and Briquetting Systems (SBS) where they are compressed into briquettes of small size. The system is environment-friendly, as it does not create pollution that was created by burning of notes in the past. The briquettes can be used as residual fuel in industrial furnaces. They can even be used for land fillings or for making items for use at office and home and paperboard. The SBS are capable of destroying notes off-line and briquette the shreds on a stand-alone basis. They can also make

briquettes online out of shreds generated in the CVPS units. So far, 48 CVPS and 27 SBS at all the Issue Offices have been installed (Kamesam, 2003).

Apart from weeding out soiled and mutilated notes from circulation, the Reserve Bank has also taken measures to supply adequate quantities of fresh notes and to prevent excessive soilage of the existing currency notes. As on April 1, 2003, the total annual capacity of printing presses is 18 billion pieces as against the current requirement of about 12 billion pieces. This capacity can be raised up to 28 billion pieces with two shifts. Similarly, the total annual minting capacity is 4,700 million pieces as against the current requirement of about 4,000 million pieces. Thus, the installed capacity of the presses and mints is adequate to take care of not only current requirements, but also of foreseeable future requirements. Further to ensure supply of clean notes and coins among the public, mobile vans are periodically sent at city centers and in various parts of towns. Distribution of clean notes and coins has also been arranged through milk co-operatives in the State of Gujarat and through Post Offices in rural areas in the State of Maharashtra. Coin dispensing machines have been installed at public places and bank branches. Issue of notes of lower denominations to bulk users by the Bank is compulsorily accompanied by issue of some part in small coins.

The number of counterfeit notes detected at the Reserve Bank's regional offices and branches of commercial banks has been on the rise in recent years. However, the value of forged notes detected, as a proportion to the total value of notes in circulation has remained miniscule. In order to mitigate the difficulties faced by the public on account of counterfeit notes, the Bank has undertaken several measures to enhance public awareness. A film on security features of Rs.100 and Rs.500 denomination notes was telecast on Doordarshan and other TV channels. Banks were advised to establish 'Forged Note Vigilance Cells' at their Head Offices for dissemination, monitoring and implementation of the Reserve Bank's instructions on forged notes. The Bank has also initiated a number of steps to track forgery on the one hand and improve the quality of notes on the other. The substance of bank note paper has

been increased and a melamine resin has been incorporated in the paper to increase its wet strength. The new Mahatma Gandhi series of notes with special security measures have been introduced since 1996. Although the predominant reason for new security features is to make counterfeiting difficult, they also assume importance in the context of the mechanised cash processing activities by high-speed CVPS. The success of these systems in achieving the authenticity and rated capacity depends greatly on the notes having machine-readable security features. The notes in the Ashoka Pillar Series, *i.e.*, Ashoka Pillar in watermark window, are being phased out from circulation, as they do not contain adequate anti-counterfeit security features as compared with the Mahatma Gandhi series notes. These features are windowed security thread, latent denominational image, micro printing, registration mark and raised identification mark for identification of a denomination by the visually impaired, among others. Moreover, portraits of human beings have been recognised as a strong security feature on bank notes all over the world. The watermark with a human face is a unique and an inimitable feature which provides the desired light and shade effects. In particular, a human face brings into focus the shine/ glean in the eyes. The portraits involve deep engravings with very minute details and are difficult to counterfeit. The choice of the personality from the security point of view should be such that the face should be expressive and should have lots of lines and folds so that there is an ample scope of engravings of different depths, which would be difficult for counterfeits. The Government and the Reserve Bank, therefore, introduced a portrait of Mahatma Gandhi on banknotes as well as in the watermark window (RBI, 2003). The notes on which the above features are not available can be suspected as forged notes and detected on examination. Thus, these features are very helpful in detecting the forged notes.

A major factor for soilage and mutilation of notes was stapling and multi stapling of notes/ note packets. The Reserve Bank and the Government of Inida were receiving a large number of complaints against stapling of notes. A study conducted by the Reserve Bank indicated that no other country followed the practice of stapling note packets. The Government of India and the Reserve Bank, therefore,

decided to do away with the practice of stapling of note. The practice of non-stapling of fresh notes was initiated in 1996 and now the fresh notes supplied by the note printing presses are totally in unstapled condition. Moreover, non-stapling of notes facilitates proper sorting of notes at bank branches by using table-top sorting machines, as also, mechanised processing at the CVPS. The note packets are now secured by paper/ polythene bands and both banks and public need to accept the change to paper/ polythene bands and move away from staple pins. Hence, towards implementation of 'Clean Note Policy', the Reserve Bank has taken into confidence the banks, the trade and the public at large. It has made mandatory on the banks to discontinue the practice of stapling the currency note packets. It has issued a public interest directive to all banks under Section 35A of the Banking Regulation Act, 1949 in November 2002 instructing them:

(i) Not to staple bank notes,

(ii) To tender soiled notes to the Reserve Bank in unstapled condition,

(iii) To use bands instead of staple pins,

(iv) To issue only clean notes to members of public,

(v) To open select currency chest branches on Sundays to provide exchange facility to members of public all over the country, and

(vi) To provide unrestricted facility for exchange of soiled and mutilated notes to members of public.

The Reserve Bank has also urged members of the public not to write on the currency notes and deface them. Interestingly, the Bank occasionally also arranges to collect soiled and mutilated notes from the public by going to market places. As a result, the number of public complaints in respect of soiled notes in circulation has considerably declined and availability of fresh notes has significantly improved.

Some complaints of restrictive practices were also being received according to which some currency chest branches in the rural and semi-urban areas do not accept lower denomination notes. To mitigate the position, the Reserve Bank has given specific

monthly targets for distribution of coins to these currency chests. The Bank monitors these targets from the feedback reports. Further on experimental basis, the Reserve Bank had requested banks between September and November 2002 to open one currency chest branch on one Sunday in a month at selected centers to exclusively provide currency exchange and distribution of small coins and suck out the soiled and mutilated notes. The reports received from the banks show that this experiment has received tremendous response from the public. It has, therefore, been decided that banks should run this scheme on a permanent basis with wholehearted participation. The choice of the center and the Sunday in the month has been left to the individual bank to decide.

Efforts are underway to design, develop and implement an 'Integrated Computerised Currency Operations and Management System'in the Reserve Bank. Computerisation will cover issue accounting, resource planning and distribution of currency, cash department operations, note exchange counters in Issue Department, claims section, currency chest reporting and management information systems in the Regional and Central Offices. The development of the application software is being outsourced. Furthermore, the Reserve Bank has envisaged the establishment of a Monetary Museum in Mumbai with display and archival facilities, which would house contemporary and ancient monetary artifacts and coins capturing the history of currency in India. The website for the proposed Monetary Museum has now been made a part of the Reserve Bank website (RBI, 2003).

For the success of the 'Clean Note Policy', high degree of coordination is necessary between chest branches and non-chest branches and the currency chest branches should mechanise their operations by installing smaller desk top versions in addition to banding machines so that members of public receive good staple free notes and the Reserve Bank receives staple free soiled notes ready for processing and destruction. The Regional Directors of the Reserve Bank could also be contacted for proper coordination of remittances of notes and coins. It is hoped that banks will extend

full co-operation to the Reserve Bank in delivery of its Clean Note Policy and it may not have to think of any regulatory intervention for this purpose.

## Section III

## Conclusion

As mentioned earlier, Section 27 of the RBI Act, 1934 imposes an obligation on the Bank to maintain the quality of note issue. Accordingly, the Bank framed and issued rules called the 'RBI (Note Refund) Rules' in 1935 for the first time. In 1975, a new set of rules known as the 'RBI (Note Refund) Rules, 1975 was issued in order to abolish the element of discretion, which was previously vested in the currency officers and replace the same with precisely formulated rules intended to test and establish the genuineness of the notes. Over the years with large and growing volume of currency, the number of note examination sections and staff employed therein were increased substantially with a view to enable the Bank to replace soiled and mutilated notes as expeditiously as possible. Despite these efforts, the number of claims against soiled and mutilated notes went on increasing and the quality of notes in circulation was fast deteriorating. It was no longer possible to maintain the quality of notes in circulation by the prevailing methods and techniques of currency management. Hence to tackle this problem on an urgent basis, the Bank came out with the 'Clean Note Policy' in January 1999.

As a follow up of the 'Clean Note Policy' of the Bank, the supply of fresh notes and coins has increased adequately with the setting up of new printing presses and modernisation of the existing printing presses and mints. Periodically resorting to import of notes and coins and temporary printing of rupees 5 notes has improved the supply position further. The quality of notes has also improved considerably due to improved quality of printing paper and addition of other distinctive features in the new series. The notes are now less susceptible to forgery. Simultaneously, currency verification and processing systems have stabilised in operation taking care of processing and briquetting of soiled and mutilated notes. Most of the soiled and mutilated notes, which were

in circulation earlier, have now been withdrawn. Bank's instructions against stapling of notes and writing thereon also had the desired impact. Thus the Bank's 'Clean Note Policy' is showing good results and being implemented successfully.

Nonetheless, there is no place for complacency. There are challenges of adjusting the volume of various denominations of currency notes and coins in accordance with the changing requirements of the growing economy, their distribution across various states and regions throughout the country amidst increasing security considerations, safeguarding the currency notes, particularly high denomination notes from concerted onslaught of forgery and continuously weeding out the soiled and mutilated notes from circulation. To meet these challenges effectively, first of all the volume of currency notes needs to be contained within sustainable levels. This can be achieved by shift in preference from lower denomination notes to higher denomination notes, expanding banking facilities throughout the country, particularly in rural areas and inculcating banking habits among the masses. Coinising rupees ten notes could also be useful in containing the volume of currency notes. At present, rupees ten notes constitute about 25 per cent of the total volume, while they account for just 3 per cent of the total value of currency notes issued. Secondly, there is need for continuing the process of upgradation of systems, procedures, methods and techniques of currency management in line with the best international practices so that clean notes on an ongoing basis could replace the soiled and mutilated notes. In this regard, early implementation of 'Integrated Computerised Currency Operations and Management System' has become imperative. Thirdly, there is a need to educate the public against stapling, multi-stapling and any type of writing on notes through mass media, awareness campaigns and legally prohibiting these practices. Finally, there is a need for adding distinctive features such as new design, form, security thread, identification mark, printing image, special ink, *etc.* in currency notes in order to distinguish them from forged notes. These distinctive features should be innovated through ongoing research and development efforts. Simultaneously, there

is a need for enhancing public awareness about these distinctive security features in order to make it easier for the public to identify counterfeit notes. In effect, there is a need for all concerned to make concerted efforts to make the 'Bank's Clean Note Policy' a success.

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# *Financial Infrastructure and Economic Development: Theory, Evidence and Experience*

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Last three decades have witnessed economists' growing interest in exploring for a possible link between financial structure and economic activities. In more recent years, the horizon of economists' inquiry has expanded to include the interrelationship between financial infrastructure and economic development. Financial infrastructure of an economy is defined in this paper to include financial system, legal system, accounting standards, and payment and settlement system. The financial system consists of financial institutions, markets and instruments. An attempt has been made in this paper to address some of the theoretical issues and discuss evidence thereon in relation to the following proposition: there is a direct and symbiotic relationship between sound and efficient financial infrastructure and financial stability and economic development.

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## Introduction

Undoubtedly, the canvas of the above proposition is not only very vast but also highly complex. For, the proposition engenders a number of complicated questions such as: does efficient financial intermediation lead to an increase in saving rate and enhancement in efficiency of investment? Is "supply-leading role" as against "demand- following role" or active versus passive role of the institutions like banks significant for development? Is financial infrastructure merely the catalytic agent or one of the endogenous factors affecting the growth? Are microeconomic dimensions of financial intermediation such as transaction costs, scale and scope economies, information asymmetry, innovations/inventions, monitoring, risk and uncertainty management, and so on, important factors affecting growth and development? Does institution matter? Are institution perspective and market perspective in the matter of

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financial intermediation mutually exclusive in the context of increasing technological advancement? Is efficient financial system alone or the entire financial infrastructure sufficient for contributing to the financial stability and sustained economic growth? Do the available theoretical literature and evidence provide satisfactory answers to these questions? By discussing briefly experience and evidence relating to such inquiries with special reference to India, this paper purports to offer broad answers at least to some of the questions.

An evaluation of contributions in theoretical literature and empirical studies provides a rich insight essential for understanding and appreciating the interaction between financial infrastructure and economic aggregates. Accordingly, section I of the paper focuses on select theories/models on the interrelationship between financial system and economic development both at macro and micro levels. An analysis of macroeconomics as also microeconomics of financial intermediation is presented in this part. Incidentally, an evaluation of studies based on the institution perspective and market perspective is found to be supportive of the eclectic theoretical approach. The integrated approach to study the financial intermediation is essential to gain a complete understanding of the interrelationship between financial infrastructure and economic development. The experience of financial sector reform and financial policies is examined in section II. Here it is highlighted how the efficient financial system alone is not adequate enough to ensure financial stability and growth. For, weaknesses in legal system, accounting standards and payment system might pose serious threats to financial stability. Hence the financial stability necessitates the overall efficiency of the financial infrastructure. In the light of discussion in the preceding two sections, development experience of financial infrastructure in India has been traced in section III. An analysis of the policy environment and package of policy measures including those concerned with the financial sector reform is also presented in this part. Broad evidence in regard to link between financial infrastructure and economic growth and development with special reference to India is presented in section IV.

## Section I

## Financial Infrastructure and Development: A Macro Perspective

The strong and positive correlation between the level of financial infrastructure and economic growth has been widely recognized in the pioneering works of Gurley and Shaw, Schumpeter, Goldsmith, Patrick, Greenwood and Javanovic, Bencivenge and Smith, Diamond and Dybvig, Prescott and Boyd, and Sussman and Zeira. The salient feature of the theoretical literature is, as Mark Gertler (1988) aptly observes, that 'the theoretical models developed thus far are highly stylized and capable of generating only qualitative prediction'.

Financial institutions as intermediaries between lenders and borrowers mobilize savings and ensure their efficient allocation among the competing economic activities. Such efficient intermediation has positive impact on growth and development. The resultant higher level of growth, in turn, necessitates establishment of sound and sophisticated institutions with horizontal or vertical integration, instruments and markets. Furthermore, smooth integration and development of the financial infrastructure requires an efficient legal, accounting, and payment and settlement system. Clearly the subject of interrelation between financial infrastructure and economic development represents a vast canvas.

*Financial Institutions in General Equilibrium –Development Theory*

The traditional theory of financial intermediation is based on the classical notion of perfect market *a la* Adam Smith, Walras and Marshall. The concept has attained its formal status in the resource allocation model developed by Arrow and Debreau. In competitive equilibrium, under the assumption of complete market, banks and other financial institutions play only a passive role. In keeping with, the majority of the first generation development economists were greatly influenced by the spirit implicit in Joan Robinson's observation that 'where the enterprise leads the finance follows'. The second generation development economists of 1970s became more concerned with the role of financial system in carrying out its allocation and

intermediation between savers and investors. The development economists began to recognize the significance of "supply-leading" role of the financial institutions (Patrick, 1966). Following the experience of adverse selection, moral hazard, information asymmetries and transaction costs, weaknesses in the legal and accounting systems as well as their adverse impact on the growth and development, the economists have begun to attach considerable weight to the role of efficient financial system. Thus, the emphasis has been shifted from demand following to supply-leading role of financial institutions, and thereby from the passive role to the active and dynamic role of the financial intermediaries.

*Market Failure – Link between Financial Structure and Economic Development*

In the aftermath of the Great Depression of 1929, there has been a flurry of studies on financial markets and their interface with real economic activities. While one set of such studies was mainly concerned with devising an alternative paradigm to the market system, the other set focused on exploring the linkage between performance of the financial markets/ banks/aggregate money supply and output. For instance, Fisher (1933) looked into debt deflation and its impact on down turn in the trade cycle. The borrowing class with high leverage position in the wake of prosperity prior to 1929 was prone to suffer from high risks associated with a sharp decline in net worth, fall in current expenditure and future commitments as a result of price deflation. As drop in prices, output and income was accelerated, debt liabilities far exceeded total assets. In sequel, number of bankruptcies rose significantly. The business down-turn was intensified by the poor performance of financial markets. Fisher's idea of the link between the financial structure and aggregate economic activity is reflected in a number of subsequent works. For instance, Gurley–Shaw (1955) maintained that financial intermediaries play a critical role in facilitating the circulation of loadable funds between savers and investors. Similarly, Goldsmith (1969) argued that a positive correlation exists between economic development and sophistication of the financial structure. The Keynesian economists, by and large, have not explicitly recognized the critical role of financial

intermediaries in economic development, albeit the financial system implicitly formed an integral part of the Keynesian macroeconomics.

*Emergence of Money View*

The General Theory of Keynes has engendered highly influential literature focusing on the indirect link between financial markets and real economic activities via liquidity preference. Implicit in this approach is the "money view"— the medium of exchange role of money. The 'money view' considers the aggregate money supply as the most relevant concept representing the aggregate economic behavior. The money view insists that bank liabilities (money) alone matter. In the process, it broadly ignores the impact of bank loans on real economic activity.

The issues relating to the linkage between money supply, output and prices as well as the empirical mechanism have been debated since long. Among the notable ones, Modigliani-Miller (1958) argued that real economic decisions are independent of financial structure and that investment decisions are independent of credit. According to this theorem, finance is a veil. The monetary policy in such situation can have only transitory impact on real variables through unanticipated changes in money supply. Similarly, the famous work 'A Monetary History of the United States' by Friedman–Schwartz (1963) laid a strong foundation of monetarism. The main finding of this study is that the aggregate money supply declined sharply along with output from the start of down-turn in 1929 through 1933. Thus, the role of money supply in causing the Great Depression has been highlighted. Furthermore, this study has given birth to the new era in which money occupies the central place in the macro-economic activity instead of the financial system.

*Resurgence of Credit View*

Mishkin (1978) and Bernanke (1983) have explored the relative significance of money stock as against financial forces (represented by break-down in banking), in explaining the depth of the depression. In particular, Bernanke has shown that the monetary forces (shown up in the aggregate money supply) alone are quantitatively insufficient

to explain the severity in the down-turn in the business cycle. The collapse of the banking system is relatively important. Thus, the credit view as reflected in Gurley-Shaw model has revived with emphasis on bank loans in stimulating the aggregate economic activities.

*Emergence of New Paradigm*

The distressing experience of the Great Depression created wide spread mistrust in the efficacy of markets. The subsequent policy making during 1960s and early 1970s has, therefore, attached a significant weight to measures like directed investment, directed lending and regulated interest rates structure. Furthermore, these restrictive policies have been justified on the ground that financial institutions in developing countries are unable to facilitate risky investment as well as risk-sharing of new investments. Besides, the oligopolistic financial institutions are found to be abusing the environment of unregulated interest rates by charging usurious interest rates on the borrowers. In the process, the critical issues of financial intermediation such as operational efficiency, allocation efficiency, financial viability of the institutions, governance, developing instruments, markets and other segments of financial infrastructure needed for the sustained growth of the financial system and economic growth have not received much attention, particularly in the developing countries.

*Financial Repression and Efficiency of Financial Intermediation*

Several studies including the pioneering one by McKinnon-Shaw (1973) have examined the repercussions of a regulated regime on macroeconomic aggregates. The major finding of such studies is that the interest rate structure regulations, directed lending and investments have distorted the financial markets. The distortions, in turn, affect adversely the saving and investment decisions. The regulated and/or subsidized interest rates structure depresses savings and promotes inefficient investments. This phenomenon has come to be known as financial repression. In the light of such analysis, a strong case for liberalization of the repressed credit markets has been made. In the context of paucity of savings and relatively large demand for investible resources, deregulation of interest rates on borrowing and lending

would lead not only to higher savings but also to more efficient use of funds. On the other hand, development of the financial sector *per se* entails two pronged macroeconomic effects: enhancing efficiency of investment and augmenting savings mobilization and hence scale of investments (Gold Smith, 1969 and McKinnon-Shaw, 1973). Partly under this theoretical influence, there has been a strong move towards liberalization and financial sector reform since the early 1970s in both developed and developing countries. Incidentally, the reform experience has been mixed in different countries depending on the prevalent conditions. The detailed discussion of this issue is presented in Section II.

The endogenous growth literature as contributed by Romer (1986), Prescott and Boyd (1987), Rebelo (1987) and Lucas (1988) provides an insight into savings behavior that enhances and maximizes the growth potential of the economy. The financial intermediaries, by effecting transformation of savings into capital, tend to promote capital investments and also raise rates of growth. As early as 1960s, economists like Schumpeter, Gold Smith, and Patrick underlined the critical contribution of financial intermediaries in stimulating economic growth. However, accent of the recent endogenous growth models (e.g., Greenwood and Jovanovich, 1990) has been on efficiency of financial intermediaries and two way causal relationship between financial development and economic growth. The growth process in the economy brings about a chain effect: fostering participation in financial markets; deepening as well as widening of financial markets; emergence of sophisticated financial structure; selection of efficient investment projects; and finally improvement in allocative efficiency of financial institutions. The resultant financial infrastructure in turn stimulates economic growth and development.

Bencivenge and Smith (1993) have introduced an endogenous growth model with multiple assets. The model considers the effects of introducing financial intermediation in an environment in which agents accumulate capital in liquid but unproductive assets taking into account the future uncertainty. The introduction of financial intermediaries brings about shift in the composition of savings towards capital in less liquid but productive assets, which promote growth.

Furthermore, the presence of financial intermediation reduces the socially unproductive liquidation. The financial intermediaries stimulate economic growth in two ways: (1) by channelling savings of individuals into productive areas of development and (2) by allowing individuals to reduce their risk associated with their liquidity needs. This is possible for financial intermediaries because they enjoy the advantages out of the laws of large numbers and coalition of investors, which enable the financial intermediaries to invest in illiquid but more profitable securities while preserving enough liquidity to satisfy needs of individuals investors (Diamond and Dbvig (1983).

In this connection it is appropriate to refer to a banking model developed by Bernanke and Gertler (1987). The model highlights the role of banks in facilitating the flow of credit in the economy. Interestingly the model demonstrates how the financial health of the banking institution plays significant role in expanding the base of the loanable funds and loan portfolio of the bank. The healthy bank with high net worth (capital and reserves) is able to attract larger volume of deposits. With large deposits base/resource base the bank is in a position to allocate larger fraction of its portfolio to risky loans. The model also reveals how the monetary policy can matter to real economic activity by influencing the flow of bank credit.

***Micro-Economic Perspective – Financial Intermediation***

As the motives behind saving and investment are very different, it is very unlikely to have any semblance of equality between the two and more so in the absence of financial intermediation. If there is a complete market of Arrow-Debreau type, there exists a complete set of contingent claims. Consequently, the degree of uncertainty is almost absent or very much minimum. However, in a real world situation, the degree of uncertainty from the point of view of individual saver or investor is certainly high since the preference pattern undergoes change depending on the time horizon. It is, particularly, true from a long run perspective for market equilibrium between demand for and supply of savings. Another factor that contributes to uncertainty and risk is the extent of imperfection in financial markets. Notwithstanding

the market imperfection, financial markets are important since they provide signals to the agents to assess the risks arising from fluctuations in the market.

The characters of individuals and critical aspects of the individual financial institutions in the process of financial intermediation such as liquidity preference, safeguard against risk associated with liquidity needs, transaction costs, choice and monitoring of the projects, governance, regulation/supervision, information asymmetries and incentives, adverse selections, moral hazards and asset/liability-risk related aspects, legal and enforcement systems, accounting standards etc. are also essential elements in explaining the behaviors of savers and investors as well as coordination between saving and investment in the economy. In short, a reference to microeconomics of financial institutions, instruments, markets, and other segments of the financial infrastructure is equally important and instructive in understanding and appreciating the linkage between financial infrastructure and economic development.

Gurley-Shaw (1960), Benston-Smith (1976), and Fama (1980) argue that financial intermediaries like banks, insurance companies, and mutual funds are there to transform financial contracts and securities. For, conditions like indivisibility and non-convexities in transaction technology necessitate the service of intermediaries to undertake the transformation. For instance, banks transform such as demand deposits (divisible in amount, in maturity and with low risk) into non-marketed loans (large in amount with indivisibility, longer maturity, high risks). Thus banks are specialized in providing financial services of divisibility, term and risks transformation. One might argue that individuals with adequate knowledge of markets might also undertake the type of asset transformation, which banks are supposed to perform. But the missing point in this argument is the importance of scale and scope economies involved in transfer technology. Thus, Benston and Smith (1976) observe that the raison d'etre for financial intermediaries is the existence of economies of transaction costs. If they perform supply-leading role, they go beyond these economic demands. Developments in the transfer technology, telecommunication, computer, and also innovations in financial

services and instruments would bring about radical changes in the extant transaction costs.

*Miscellaneous Micro Factors*

Other areas of operations where financial institutions enjoy distinct economic advantages include systematic screening of projects, efficiency and effectiveness in monitoring project finance, ensuring end use of credit and recovery of loans and so on. As seen in the preceding paragraph, they enjoy substantial costs advantages on account of the operation of the scale and scope economies. Furthermore, they are endowed with the comparative advantages of having reliable and credible information on the nature and quality of the projects, its execution, cash flows, credit worthiness of individual borrowers and its future prospects. With these distinctive advantages, financial institutions are arguably in a position to prevent adverse selection of projects, moral hazard, and opportunistic behavior of borrowers during realization of projects. In this connection it is plausible to argue that individual investors and rating agencies can also undertake the screening and monitoring activities. However, in such cases, individual investors will have to incur exorbitant costs to undertake such activities. Indeed, the models developed by Helloing (1991), Broacher (1990), Holmstrom and Tirole (1993), Diamond (1984) emphasise the important role of the financial institutions in screening and monitoring the project finance. They also stress that the effectiveness and efficiency of the financial institutions in these areas of operations are the significant contributory factors for economic growth and development.

***Theory of Firm Approach***

Busman and Zebra (1995) have extended the monitoring model of Diamond (1984) by including transportation costs. As a matter of fact, the transportation costs represent an element of horizontal differentiation. The model demonstrates that the horizontal differentiation could be an important source of feed-back effect between economic development and financial development. This model belongs to the theoretical approach known as industrial organization approach to financial intermediation. Such models

provide useful insight into issues pertaining to cost effectiveness, innovations, risk management, market failures and effectiveness of monetary policy. The focus of these models is on the responses of the financial institutions as independent entities to different kinds of environment. Broadly in these models the banking sector is not treated as a passive player as is done in the standard approach to the monetary policy. As a matter of fact the banking sector is viewed as the active and independent entity reacting optimally to the changing environment in the economy. For instance, the industrial organization approach to modeling the financial institutions like banks considers the banks as firms specialized in generating spectrum of financial products and services to their customers' changing and growing preferences. By using the inputs (men and materials) the banking firms produce output in the form of portfolio of assets and liabilities as well as diversification by transforming shorter position in liability portfolio into long-term position in the loan/ asset portfolio. From the perspective of balance sheets of financial institutions, financial transactions are only the visible counterpart to the financial services provided by the banking firms. The cost of providing these services in relation to their earnings involves a number of economic functions such as exploiting scale and scope economies, asset/liability risk-return management, product differentiation, innovations/inventions, selling costs management, corporate governance and so on. These and other related aspects need to be considered alongside assets-liability structure and balance sheet size in order to assess the operational and allocative efficiency of the financial intermediaries.

*Integrated Approach*

An integrated approach encompassing macro considerations, micro aspects of financial institutions including scale and scope economies and asset/liability risk management, etc or industrial organization approach and balance sheet approach would be essential to comprehend the inter-relation between economics of growth and financial infrastructure. The above discussion of select theoretical models reveals clearly that micro and macro aspects of financial intermediation are not mutually exclusive. The efficient financial performance as measured in terms of cost effectiveness, productivity,

profitability, sustainability and so on hinges on both micro and macro factors. From a macro perspective, efficient operations of financial intermediaries in a given environment, contribute to efficient life cycle allocation of household consumption and efficient physical capital to its most productive use (Merton-1993).

***Eclectic-Theoretic Approach***

The theoretical models briefly discussed above, can broadly be classified into two categories: (1) those dealing with institutional perspectives – organizational matters, functional matters, at both macro and micro levels etc., and (2) those dealing with market perspectives - issues relating to marketing of financial products and forms of markets, full equilibrium and partial equilibrium conditions, perfect/imperfect markets and so on. There is a vast body of literature dealing distinctly with each group. But in the present context of increasing use of advanced technology, rapidly growing financial innovations, rising trend in portfolio diversification and asset/ liabilities/risk management, it is very difficult to maintain a separate identity of different bodies of literature. The theoretical literature concerned with financial intermediation is likely to become inseparable in the dynamic conditions. Thus, the eclectic or integrated theoretic approach seems to be appropriate in understanding and assessing the role of financial infrastructure in growth and development. Metron (1995) in his model on dynamics of financial evolution has viewed the financial institutions as financial intermediaries performing important latent economic functions. Their economic functions are concerned with creating and testing new products before they are seasoned enough to be traded in a market. The resultant interactions between financial institutions and financial markets reinforce and improve the efficiency of their functions. Ultimately this process pushes the financial system – consisting of institutions, markets and instruments — towards an idealized goal of full efficiency.

Lihui-Lin *et al* (2001) argue that financial intermediaries should be viewed against the backdrop of a financial system. Financial institutions produce " matching" between markets and participants. The traditional financial intermediaries act like manufacturers and/

or wholesalers while the financial markets act like retailers. Even this distinction becomes absurd in the case of electronic banking and use of Internet device in financial transactions. The financial intermediation based on highly advanced technology encompasses both production process and marketing of financial products and services. Such financial intermediation representing integration of institution perspective and market prospective can only be studied by employing an integrated approach. Incidentally, a major part of the traditional theory of intermediation by treating market mechanism as exogenous, has not recognized fully the value addition generated by the process of marketing.

Clearly, there exists a two-way causal relationship between development of the financial system and development of the economy. It is possible to explain the sub-optimal level and rate of growth of savings, and investment as also financial weaknesses and low efficiency of the institutions in the developing countries. It is observed that financial repression is one of the important factors responsible for the sub-optimal performance of the financial system in these countries. In view of this, financial sector reforms in many developing countries are designed to eliminate ill effects of "financial repression."

## Section II

## Experience with Structural Reform Policies

As stated earlier, the McKinnon-Shaw hypothesis has had a far-reaching influence on the financial policy making in a number of developing economies, *inter alia,* in terms of easing of the regulated interest rates structure, directed lending and investment, and imparting a diversified ownership pattern of financial institutions. However, experience with the structural reform policies especially in the developing countries has been mixed with notable failures in Latin American countries. Following financial reforms in 1980s and 1990s in Mexico and other southern cone countries, their banking sector experienced chaotic situation and even collapse. Fry (1995) has analysed the international experience in financial sector reforms over the past two decades and identified five important pre-requisites for

success of financial reforms: (1) adequate prudential supervision and regulation of commercial banks, efficient legal and accounting systems and also other financial infrastructure facilities, (2) reasonable degree of price stability, (3) fiscal discipline, (4) profit maximizing competitive behavior of the commercial banks, and (5) taxation system that does not impose discriminating (explicit or implicit) taxes on financial intermediaries. The liberalization and structural reform not based on the conscious and critical assessment of the situation could not yield expected results Gibson and Tsakalotos (1994).

Williamson and Maher (1998) have reviewed the experience of financial sector reforms in 34 countries and found that the benefits of financial liberalization are greater the higher are the financial depth and efficiency in allocation of investments. The financial sector reforms do not, however, support decisively improvement in savings as predicted by McKinnon–Shaw. Dobson-Jacquet (1998) has also observed that the effect of financial liberalization on rate and level of savings is less robust in reality. Therefore, contribution of financial liberalization to growth and development lies more in quality of resource allocation than in quantity of resources potentially available. As per Pagano (1993), there are three important channels through which the efficient financial sector can influence the long-term growth, viz: (1) increase in the proportion of savings transferred to investment spending; (2) improvement in social marginal productivity of investment; and (3) augmenting the private saving rates. The survey results of King and Levine (1993) also reveal that the benefits of the financial sector reforms accrue to the economy as a whole in the form of faster economic growth. According to Levine (1996), efficiency in financial intermediation affects favorably net return to savings and gross return on investment.

*Financial Infrastructure and Economic Development*

The overall efficiency of the financial system is closely linked with the efficiency of the legal system, accounting standards, and payment and settlement system. Weaknesses in enforcement mechanism for financial contracts, lack of standardized accounting system or transparency deficiencies in payment and settlement system hinder the growth of financial sector and hence economic

development. Similarly, there has been evidence of early recovery from the financial crisis with efficient and sound financial infrastructure. Besides, success or failure of financial reforms in a given country depends to a large extent on the efficiency of financial infrastructure. Indeed, prior to the introduction of financial sector reform, there is an imperative need for refinement in the legal system, particularly in the areas of bankruptcy laws, secured transactions, enforceable contracts, banking Act for prudential supervision and regulation. Financial infrastructure also plays a vital role in not only stimulating but also sustaining the economic growth (John L. Walker, 2001). For instance, a legal system based on common law being more flexible and dynamic is found to be more effective in contributing to the overall efficiency of the financial infrastructure as compared with the system based on civil law. Such a system provides for more diversified ownership structures and development of capital market. Alongside the sound legal system, transparency and credible accounting standards are emphasized. The recent episodes of accounting irregularities in the US corporate sector highlight the imperative need for evolving a system of credible accounting standards and extensive transparency to improve the efficiency of the financial infrastructure. The payment and settlement system constitutes one of the most significant segments of the financial infrastructure facilitating smooth transactions with minimum risks for the economy. Besides, an efficient payment and settlement system has a decisive bearing on efficacy of the monetary and credit policy.

*Financial Infrastructure, Financial Stability and Economic Growth*

Confidence of the participants in various segments of the financial infrastructure forms the essential pillar for financial stability in a country. The extent of confidence and trust of the participants is, thus, dependant, among other things, on the presence of sound and strong financial institutions, efficient financial markets, and financial infrastructure. Financial stability also requires establishing links between financial markets and the macro economy; and within the financial markets among different participants. Finally, credible crisis management system is essential for ensuring financial stability. Effective execution of the task necessitates exchange of information,

proactive remedial measures, and coordination among the financial policy-making bodies, namely, central bank, government and supervisory authorities (if they are separate entities).

In an interesting review of empirical literature, Simson Johnson (2002) focused on the relationship between economic prosperity and quality of institutions in an individual country. In particular, the issue is whether an effective legal system, regulatory/supervisory system enforcing laws, prudential norms relating to protection to depositors /investors rights, transparency, stability and viability of the financial institutions contribute to economic growth and development. It is demonstrated beyond doubt that institutions do matter and countries with strong institutional set-up experience relatively high long-term growth. Johnson also highlighted contribution of efficient institutions to the success of financial sector reforms in Poland as against Czech Republic. While designing reform packages and policies thereof, Poland took care of protecting the investors' rights by introducing certain effective regulatory measures. In contrast, Czech Republic established far fewer institutional protections to the investors' rights, relying more on market forces. Outcome of these two models of financial sector reform is quite revealing. Czech Republic model was not only less successful but also suffered series of financial crisis. On the other hand, Poland's financial sector reform turned out to be quite successful. Johnson's study of the East-Asian financial crisis also reveals that countries with strong institutional set-up have handled the crisis much better than those with weak institutional set-up.

## Section III

## Indian Experience with Financial Infrastructure and Economic Development

Last five decades have witnessed concerted efforts of the Government of India and the Reserve Bank of India to develop and promote the financial infrastructure in the country. The driving force underlying the persistent endeavor in respect of the financial infrastructure seems to be the planners and policy makers' belief in the concept of 'supply-leading' role as against the 'demand following' role of the financial intermediaries. The policy thrust since 1969 and

till the mid-1980s had been relatively on achieving equity in regional distribution of banking facilities in general and institutional credit in particular as compared to the sustained growth and stability of the financial infrastructure such as viability and soundness of the institutions. With the financial sector reform introduced since the early 1990s, there has been a paradigm shift in the financial sector and the necessity of reform measures in the legal, accounting and payment systems alongside the financial system has come to the fore. At present what is required is to identify gaps in the segments of financial infrastructure and devise appropriate policy measures as well as the strategy for effective implementation. It is towards such an end, the following discussion starts with agricultural finance.

*Agricultural Finance–Institutional Development*

Owing to the then predominantly agricultural basis of the Indian economy, there has been the imperative need to expand and coordinate the credit facilities available to agricultural sector. Recognizing this distinctive feature of the Indian economy, the Reserve Bank of India Act 1935, has itself laid down in section 54 that the Bank should set up a special Agricultural Credit Department (ACD).

Accordingly, the ACD was set up with the establishment of the Reserve Bank of India in 1934. The major findings of the preliminary reports prepared by the Department were: (i) money lenders were by and large the sole financiers of agriculture with negligible finance by institutional agencies like cooperatives; (ii) legislation needed to be framed for regulating the money lenders; (iii) credit extended by money lenders was subject to high interest rates and other usurious practices; and (iv) land mortgage corporations might be set up for meeting the long term credit needs of the farmers.

Several other expert committees subsequently addressed the issues pertaining to augmenting the agricultural credit and strengthening the multi-agency set-up for agricultural finance. For example, the Committee of Direction of the All-India Rural Credit Survey (1951-52) suggested for supplementing cooperative credit by commercial banks. However, a majority of the expert committees on agricultural credit held the view at least till the early 1980s that the

major responsibility of providing credit to agriculture should be that of co-operatives.

Since inception of the Five Year Plans, a number of steps have been taken by the Bank/Government of India to augment the institutional credit flow, *inter alia*, through provision of national agricultural credit (long term operations) funds, national agricultural credit (stabilization) fund, geographical expansion of commercial banking facilities to rural areas and directed lending at concessional rates.

The major institutional arrangements for agricultural credit, which have been created over a period of time consist of establishment of new institutions and supportive policy measures: gigantic cooperative credit structure, Agricultural Refinance and Development Corporation, rural branch network of State Bank of India and 14 leading commercial banks following their nationalization in 1955 and 1969 respectively, Regional Rural Banks (RRBs) to focus upon the targeted rural groups, National Bank for Agriculture and Rural Development (NABARD) by merging the erstwhile Agricultural Refinance and Development Corporation and ACD of the Reserve Bank, comprehensive branch licensing policy and branch expansion programme, and service area approach. In the co-operative sector, at the apex level, there are state cooperative banks and their branches. The district or central cooperative banks and their branches form the middle layer of the structure. A sizeable number of primary agricultural societies at the village level are at the bottom level of the cooperative of credit structure in the country. The cooperative institutions account for 30 per cent of rural deposits, and 44 per cent of outstanding loans and advances of the banking system. About 55 per cent of the short-term production loans for the agriculture sector have come from the cooperative credit institutions. A number of other initiatives have been taken in recent years to improve the flow of the institutional credit in the rural areas: launching of new tranches of Rural Infrastructure Development Fund (RIDF), enhancement of the reach of schemes relating to Kissan Credit Card (KCCS), Self- help and Micro-Credit. Thus, a vast network of rural branches of commercial banks, RRBs, cooperative banks/credit societies and other

financial institutions like chit funds money-lenders and indigenous bankers are engaged in financing rural economic activities. During 1990s, a comprehensive framework of prudential regulation and supervision of urban cooperative banks as well as other cooperative institutions has been put in place to strengthen their financial viability.

*Commercial Banking Sector*

The accelerated progress in spread of banking has taken place from 1969 when 14 major commercial banks were nationalized. The number of bank offices has since risen from a little more than 8000 in 1969 to 68000 in 2000. The population per bank office has declined substantially from as high as 64000 to as low as 15000 during the period. There has been a spectacular growth in rural branches from 1833 in 1969 to 32654 in 2001. In sequel, deposits of the scheduled commercial banks as per cent of national income (at current prices) recorded a significant increase to 55.7 per cent in 2001 from 15.5 per cent in 1969. The per capita deposits have gone up from Rs.88 to Rs.9770. Similarly, the per capita credit has increased from Rs. 68 to Rs. 5228 during the period under consideration. The flow of credit to the hitherto neglected sector, i.e., priority sectors expanded sizably from 14 per cent of total bank credit to 35.4 per cent during the period under review. As the commercial banks' credit, under policy intervention, has begun to flow to agriculture and other priority sectors, the credit flow to medium and large-scale industries has shown a sizeable decline since the late 1960s. This trend could also be attributed to the introduction of credit discipline in the field of industrial credit since the mid-1960s.

*Industry and Commercial Sector Financing: Institutional Development*

In order to provide long and medium term industrial finance, particularly in the absence of a vibrant capital market, a vast financial structure consisting of development financial institutions, investment institutions, insurance companies, mutual funds, other non-banking financial institutions and credit guarantee institutions in addition to the commercial banking network has come up both at State and all-India levels mainly under the initiatives of the Government of India and the Reserve Bank.

There has been a general aversion on the part of the commercial banks to extend medium and long-term finance to the industrial sector due to the strong influence of the British banking practices and the lessons from banking failures. Way back in 1931, the Central Banking Enquiry Committee recommended for formation of provincial industrial credit corporations given the prevailing constitutional position. The Committee also did not rule out the desirability of formation of all-India industrial finance corporations. Further, the Committee suggested that sound and conservative banks such as the Imperial Bank should adopt the German System of mixed banking (i.e., universal banking). The Committee also recommended for investment by banks in debt instruments and equities. However, the material progress in industrial financial infrastructure has taken place only after independence. Following the Act passed by the Constituent Assembly, IFCI was established in 1948. Subsequently, similar institutions came up in provinces under the State Financial Corporations Act, 1952 with a focus on small-scale industries.

Today, the industrial financial set-up includes a wide spectrum of institutions such as Industrial Finance Corporation of India, 18 State Financial Corporations, Industrial Credit and Investment Corporation of India (now ICICI Bank), Industrial Development Bank of India, Industrial Investment Bank of India, Power Finance Corporation, several industry specific or trade–specific companies/ corporations, Small Industries Development Bank of India, Export-Import Bank, Unit Trust of India, other private mutual funds organizations, Life Insurance Corporation of India, General Insurance Corporation, private insurance companies, several State Industrial Development Corporations, Deposit Insurance and Credit Guarantee Corporation, Export Credit Guarantee Corporation, non-bank finance companies including companies for housing finance, investment finance, loan, lease and hire-purchase, mutual benefit companies, infrastructure finance companies, Discount and Finance House of India, Securities Trading Corporation of India, Primary Dealers, Bombay Stock Exchange, National Stock Exchange and regional stock exchanges.

*Financial Instruments*

The majority of savers in India have low income and hence their saving potential is limited. Such small savings need to be pooled for financing indivisible (large) capital investment. Herein, the basic need is to engineer a variety of saving instruments to suit preferences of different individuals and institutions. Faced with this challenge, the banking industry in India has introduced various types of deposit schemes in course of time, *inter alia:* cash certificates, annuity or retirement schemes, farmers' deposits scheme, insurance linked deposits, housing deposits scheme, automatic extension deposit scheme, and suvidha deposit scheme. Alongside, banks have come out with different instruments to finance the economic activities. Similarly, a host of other instruments have come in vogue such as debentures, equities, bonds, treasure bills, government dated securities, stock investment, zero coupon bonds, tap stocks, term money, repos, intercorporate deposits, commercial papers, certificates of deposits, mutual fund schemes, insurance schemes, swaps, futures, options and so on.

*Strategy for Developing Diversified Financial Markets System – Promoting Integration*

The basic theoretic approach underscores the need for a diversified system of financial markets coupled with an institutional infrastructure of banks and non-bank financial institutions. The network of diversified markets enhances efficiency in resources pooling, resource allocation, and thereby maximize return and minimize risk besides providing risk sharing opportunities for investors and borrowers. According to Mr. Greenspan, Chairman of the US Federal Reserve System, coexistence of domestic bond market and banking system helps each to act as a backstop for the other. In short, it lays foundation for effecting an appropriate integration of the markets.

Over the years, the Reserve Bank and the Government of India as policy-makers and regulators have been making concerted efforts towards establishing sound practices and procedures in different segments of the financial markets, *inter alia:* inter-bank call market,

commercial paper market, certificate of deposits market, Government securities market, private corporate debt market, equity market, foreign exchange market, and derivatives market. Particularly, the decade of 1990s have witnessed both quantitative and qualitative changes in the financial markets; quite a few new markets have been added and the financial markets in general have been widened and deepened significantly. The market specific developments are discussed in the following paragraphs.

*Equity Market Development*

The equity market in India has a long history. However, in the 1990s and beyond it has witnessed far-reaching changes. The National Stock Exchange has been set up in 1992 The Bombay Stock Exchange (BSE), which is the oldest stock exchange in Asia, has been thoroughly modernized. The number of regional stock exchanges has gone up from nine at the beginning of 1980s to 24 in 2000. The number of listed companies has recorded a substantial rise from 2,265 in 1980 to 7,500 in 2000. Besides, there is the OTC exchange of India.

In recognition of the imperative need for a strong and powerful watchdog for securities industry, Securities and Exchange Board of India (SEBI) was set-up in 1988. The SEBI Act, 1992 encompasses the entire gamut of securities industry covering, inter alia, the activities of stock brokers, sub-brokers, merchant bankers, underwriters, registrars to issue and transfer agents, insider trading, mutual fund, debenture trustee, disclosure norms, credit rating.

Several steps were undertaken to ensure a vibrant capital market with healthy market practices. The statute was amended in July 1987 permitting corporate membership of stock exchanges. The restrictions on rights and bonus issues were withdrawn. New or established companies are now able to price their issues according to their assessment of market conditions. All the listed companies are required to publish quarterly financial accounts. For ensuring greater transparency, negotiated and cross deals are not allowed presently. Besides, screen-based trading, uniform and rolling settlement cycles in all exchanges, and banning of deferred products in cash segment have been introduced.

*Debt Market*

A well-functioning debt market acts as a mechanism of monetary policy transmission and provides access to funds at competitive rates. There are mainly three segments of debt market, viz., government securities market, public sector unit (PSU) bonds market, and private corporate sector bonds market. The aggregate outstanding debt amounted to Rs.8,50,000 crore and formed 37 percent of GDP in 2001. Government securities market constitutes the major segment of debt market while private corporate bonds/debenture market accounts for a small proportion. In the recent period, around 90 per cent of corporate debt instruments have been privately placed. Both government and corporate debt instruments are being traded in the stock exchanges.

Over the years, the Reserve Bank has introduced numerous measures to enhance efficiency and impart stability of the market, e.g., exposure and valuation norms, and asset-liability management guidelines. Besides, there has been a phased deregulation of bank's investment limit in non-government debt instruments. In addition to risk weights for interest rate risks, investment fluctuation reserves have been mandated. Legal changes have also been announced in the budget for 2002-2003 to create conducive atmosphere for securitization of assets.

It is encouraging to note that the Fixed Income Money Market and Derivatives Association of India (FIMMDA) and Primary Dealers Association of India (PDAI) are working broadly as self-regulatory organizations (SROs) for the development of bond and money markets in India. These bodies are involved in evolving standard practices and code of conduct for market players.

*Government Securities Market*

Government securities accounted for 75 percent of the total outstanding debt stock and nearly 95 per cent of the volume traded in the secondary market. Currently, government securities are being traded on the stock exchanges as also through negotiated dealing system involving members of stock exchanges. Two depositories, *viz.*,

National Securities Depository Limited and Central Securities Depository Limited maintain records of securities holding in dematerialized form.

While the Reserve Bank regulates the issue of government securities, corporate debt securities fall within the purview of SEBI. The development of government securities market has been one of the primary concerns of the Reserve Bank for a variety of reasons, inter alia: (i) A deep and liquid government securities market facilitates public borrowing and avoidance of automatic monetisation; (ii) It provides the backbone of most fixed income markets across the world; (iii) It enables use of indirect instruments of monetary policy; and (iv) It makes available instruments with zero credit risk to institutions and high net worth individuals for parking their surplus funds. With a view to catering to the different investor preferences for government securities, the Reserve Bank has experimented with various types of instruments such as fixed coupon bonds, zero coupon bonds, floating rate bonds, bonds with put and call options, etc. Most of the bonds are of the fixed coupon variety though recently floating rate bonds have also been issued.

The institution of Primary Dealers (PDs) has been adopted in India in 1996 for developing both primary and secondary markets in government securities. PDs obligations include giving annual bidding commitment, underwriting the primary issuance, and offering two-way quotes. In return, the PDs are extended liquidity support by the Reserve Bank and access to call money market as borrowers and lenders. Gilt Mutual Funds dedicated almost exclusively to investment in government securities were also established in 1996.

*Money Market Development*

One of the prerequisites for developing a vibrant market for bond/ dated government securities is the existence of an active money market since the latter supports the former through availability of liquidity. The money market in India has its both formal and informal segments. The Reserve Bank of India, commercial banks, cooperative banks, insurance companies, mutual funds, term lending institutions are the main participants in the formal market. A host of non-banking

companies like loan companies, chit funds, nidhis, indigenous bankers, and moneylenders constitute the informal market.

During the last two decades, a number of measures have been taken to widen and deepen the market, particularly in line with the Committee to Review the Working of Monetary System (Chakravarty Committee, 1985) and Working Group on the Money Market (Vaghul Committee, 1987). Rationalisation of term structure of interest rates, progressive deregulation of interest rates, introduction of several financial instruments, establishment of Discount Finance House of India, Securities Trading Corporation of India and Primary Dealers, etc are some of the important measures adopted during the 1980s to improve the functioning and efficiency of the money market. Recently a number of steps have been taken to develop a short-term Rupee yield curve. The call money market is being developed as a pure inter-bank market with a phased withdrawal of non-bank market participants. For improving the system of clearing and settlement, a Clearing Corporation of India Ltd (CCIL) has been established.

*Credit Rating and other Confidence Enhancing Legal Measures*

Credit rating is one of the important tools to instill confidence among investors in financial markets. SEBI is the regulator of credit rating agencies. Credit rating of all public issues including debentures with maturity exceeding 18 months has been made compulsory. Amendment to the Indian Stamp Duty Act, 1899 has exempted dematerialized debt instruments from stamp duty. The recent amendments to section 47 of IT Act facilitating securities lending and borrowing operations will ensure safe and smooth settlement through the Clearing Corporation of India Ltd. The most remarkable legislative measure in the recent times has been 'The Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest, 2002', strengthening creditors' right to foreclosure and enforcement of securities by banking and financial institutions. The other noteworthy legal and institutional steps were the Government Securities Act, replacing the Public Debt Act and facilitating wider participation in government securities market, and the Fiscal Responsibility Bill, introducing STRIPS, Negotiated Dealing System

(NDS) and Real Time Gross Settlement System (RTGS), among others.

Historically, a number of committees and commissions with their foresights and insight contributed to the legal framework of the Indian financial system: The Indian Central Banking Enquiry Committee (1931) for a comprehensive banking legislation covering organization, management, audit, and liquidation of banks, Banking Commission (1972) for suggesting suitable changes in banking legislation, and Committee on Banking Law (P.V. Rajmannar Committee) for its report on Negotiable Instrument Act, Real Property Security Law, Personal Property Security Law, Documents of Title to Goods, and Narasimham Committee on the financial system for identifying various gray areas in financial laws and regulations.

*Accounting Standards*

A sound accounting system is essential to ensure reliability of information for customers, regulators, shareholders, planners and policy makers while evaluating strength and weaknesses of financial players and institutions. In this regard, the recent initiative of the Reserve Bank has been setting up of the Standing Committee on International Financial Standards and Codes. The standing committee, in turn, constituted 10 advisory groups in the areas of banking supervision, bankruptcy law, corporate governance, data dissemination, fiscal transparency, payment and settlement system, and securities market regulation. The recommendations of the standing committee are in various stages of implementation.

*Prudential Supervision/Regulation*

While evolving a credible accounting and auditing standards in line with the best international practices is important, equally important is their compliance on an on-going basis. This necessitates presence of a sound and efficient regulatory and supervisory system. In regard to the supervision of banking and non-banking financial institutions, a system of on-site and off-site supervision has been put in place. Micro-prudential norms for monitoring institution-specific idiosyncratic risks and macro-norms for identifying and containing systemic risks have

been adopted. The micro-prudential framework uses a set of indicators enabling: 1) peer group analysis based on critical financial ratios and (2) development of bank-rating systems. Such monitoring approach employs CAMELS model based on capital, assets, management, earning, liquidity, and systems. In addition, Prompt Corrective Action Framework based on micro-prudential indicators such as capital to risk-assets weighted ratio, net non performing assets and return on assets has also been operationalised. This system is meant to trigger corrective action at the earliest possible sign of weaknesses and prevent deterioration in financial viability and growth.

The refined risk-based supervisory /regulatory approach on the lines of the second Basle risk supervisory norms is being developed and is likely to be put in place shortly. Furthermore, a comprehensive management system and credit information system are being developed. The present genre of risk based supervision-prudential regulation is essentially a macro-level supervision. The Securities Exchange Board of India (SEBI), Insurance Regulatory and Development Authority, and Department of Company Affairs (Ministry of Finance & Company Affairs) are also engaged in evolving regulatory mechanism to monitor operations of capital market, insurance sector, and other non-banking non-financial companies respectively. Alongside the regulatory/ supervisory role, the regulatory authorities in India also shoulder the responsibility of discharging promotional and developmental role with a view to ensuring stable environment for sustained growth of financial institutions.

*Payment and Settlement System*

The payment and settlement system forms one of the basic segments of the financial infrastructure. The Reserve Bank has taken a number of initiatives to improve the efficiency of payment and settlement systems broadly in line with the core principles enunciated by the Group Ten Report (BIS). According to the Report, the safety and efficiency of the payment systems is governed by 10 core principles including well founded legal basis, clear rules and procedures, clearly defined risk management systems and procedures, prompt settlement during the day, timely completion of daily

settlements under multilateral netting system, using claims on central bank as assets for settlement, high degree of security, operational reliability and efficient contingency arrangements, practical means of payments, publicized criteria and open access, and effective, accountable and transparent governance.

## Section IV

## Indicators of Financial Development

As observed in the preceding paragraphs, influence of financial infrastructure is reflected in the behaviour of macro-economic aggregates like savings and investment as well as their composition. In particular, the increasing trend in saving and investment could, *inter alia*, be attributed to the development in the financial infrastructure over a period of time. The gross domestic saving (GDS) as a percent of GDP registered a consistent improvement from 9.9 percent in the 1950s to 12.7 percent in 1960s, 17.5 in 1970s, and further to 19.4 per cent in 1980s before attaining the peak of 23.0 percent in the 1990s. At present, the GDS/GDP ratio is hovering around 22.0 percent to 23.0 percent. In tandem with the GDS rate, the gross domestic capital formation (GDCF) as a percent of GDP moved up from 11.3 percent in the 1950s to 17.6 percent in the 1970s, 21.2 percent in the 1980s and further to 24.4 percent in the 1990s.

The significance of the financial infrastructure, in general, and the role of financial intermediation, in particular, can be better appreciated by observing the shift in the composition of GDS. The share of household financial saving in total saving increased from 51.6 per cent in early 1970s to 66.7 percent in the late 1990s. Correspondingly, there had been a downward shift in the share of physical saving from 48.4 percent to 33.3 percent. Bank deposits constituted the major proportion of total financial saving. This period also witnessed a significant rise in contractual savings, e.g., in the form of fixed deposits, company deposits, provident funds and insurance funds. The growing financial saving could be attributed, *inter alia*, to financial diversification, geographical spread of banking, accessible financial assets with a spectrum of yields in terms of risks,

returns and maturities. The growing scale of operations of the financial intermediaries has facilitated pooling of independent risks.

The movements in finance ratio (FR), defined as a ratio of financial issues to national income, reflect, among others, developments in the financial system in relation to the real sector. A high FR indicates greater widening and deepening of the financial system. The FR, which was as small as 0.01 in the 1950s grew to as high as 0.37 in the 1980s and further to 0.46 in the 1990s. The closely related ratio to the FR is the financial interrelation ratio (FIR). This represents the total volume of financial assets in the economy in relation to stock of physical assets. The FIR has gone up significantly over the years from 0.11 in the 1950s to 2.41 in the 1980s and further to 2.39 in the 1990s. The two ratios – FR and FIR – taken together reflect substantial geographical spread, functional specialization and diversification of the financial sector. Yet another indicator of financial development is the ratio of new issues, which indicates the amount of primary issues in relation to capital formation and thereby tracks the extent of financial needs of the non-financial sector met up by the financial sector. The ratio has increased from 0.18 in 1951-52 to 1.42 in the 1980s and further to 1.32 in the 1990s. Similarly the intermediation ratio, which represents the extent of institutionalization of financing, shows the importance of financial institutions relative to non-financial institutions in raising resources to finance investment. The ratio stood at a negative of 0.39 in 1950-51. Thereafter, it went up to 0.71 in the 1970s and further to 0.82 in the 1990s. The financial assets of scheduled commercial banks as percentage of GDP went up substantially from 31 percent in 1980 to 43.5 percent in 2000. The financial assets of financial institutions like IDBI, ICICI, EXIM Bank, IFCI, SIDBI, registered a sharp increase from 11.6 percent of GDP in 1980 to 25.6 percent in 2000. The market capitalization in 1981 accounted for merely 3.8 per cent as against 47 per cent in 2000.The market capitalization as percentage of scheduled commercial banks' financial assets rose from 12.2 per cent in 1981 to 107 percent in 2000. The real GDP growth in India recorded a progressive increase from a low of 2.9 per cent in the 1970s to 5.8 per cent in the 1980s and further to 6.4 per cent in the 1990s (excluding 1990-91 and 1991-92). Similarly, the rate of growth of net fixed capital formation has

risen from 3.6 percent in the 1970s to 4.2 per cent in the 1980s and further to 5.3 in the 1990s. The contribution of productivity to growth has been about 4 per cent, fluctuating significantly from negative contribution in the 1980s to positive contribution in the 1990s.

## Section IV

## Concluding Observations

Faster expansion of financial structure in relation to GDP growth is found to facilitate the growth process at least in the early phase of economic development. This is corroborated in the case of India, wherein financial institutions have played a 'supply-leading role' until recently. In particular, the Indian banking industry has witnessed remarkable geographical spread and functional diversification mainly due to policy intervention. The progressive institutionalization of savings, shift in its composition as also in investment pattern are attributable, *inter alia*, to the development of financial infrastructure over the last five decades. The evidence and experience also corroborate the following oft-quoted hypotheses. The efficient financial system can influence the long term growth through three important channels, namely, 1) increase in the proportion of saving transferred to investment spending, 2) augmenting private saving rate and 3) improvement in the social marginal productivity. The financial intermediaries stimulate economic growth in two ways: (1) by channeling the individual saving into productive areas of development and (2) by allowing the individuals to reduce risk associated with their liquidity needs. In the Indian case, the trend in three major financial indicators, viz., gross domestic saving as percentage of GDP (about 23 per cent), share of household saving in total saving (around 86 per cent) and proportion of financial saving to aggregate saving (about 50 per cent) could partly be explained in terms of vast network of financial infrastructure developed over a period of time. The concerted efforts directed towards expanding institutional set-up, developing spectrum of saving instruments, and diversified markets, reducing risk perception and uncertainty, ensuring liquidity and safety to the savers/investors and so on, have definitely contributed to the growth of household saving. The relatively low saving of both private corporate and public sectors has been contributed, among others, by low investment efficiency. The

gaps and gray areas in the segments of financial infrastructure reflecting its operational inefficiency, might have also adversely affected the investment efficiency. Contribution of the financial liberalisation to economic growth and development has been more by way of enhancement in the quality of resource allocation rather than through augmentation of quantity of resources potentially available in the economy.

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# *Fiscal Expansion: Keynesian Recent Econometric Evidence from India*

**Tapas Kumar Chakrabarty***

Feeling or sense of 'adjustment fatigue' becomes costlier. The present study tries to get some preliminary econometric evidence of fiscal impact on growth during 1990-91 to 2000-01, using data (relative fiscal variables as well as growth variable) relating to the Indian Economy. The study indicates that fiscal policy was marginally effective to influence the growth of the Indian Economy contemporaneously (Keynesian) during the reform period from 1990-91 to 2000-01.

JEL classification : H620

Key words: Keynesian multiplier, Relative fiscal variables, Lagged effect, Quality deficit

## Introduction

How effective is fiscal policy at stimulating economic activity? Is Keynesian multiplier effect in evidence? The issue continues to be focus of economic research in general and for developing countries in particular, even at present. Recent studies on market economies in recession, conclude that fiscal expansions are more effective when (a) there is excess capacity in the economy in the year before a recession and (b) the economy is open and has fixed exchange rate. Fiscal multipliers are larger for expenditure increases than for the tax cuts.

In this context, the present study tries to get some preliminary econometric evidence of fiscal impact on growth during 1990-91 to 2000-01, using data (relative fiscal variables and growth variable) relating to the Indian economy.

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## Section I

### Review of Some latest Evidence on Developed as well as Emerging Market Economies - Fiscal Experience

Hemming and others examine the evidence that despite Keynesian orthodoxy, fiscal policy is only marginally effective in countering economic downturns. Uncertainty about the impact of fiscal policy on growth is reflected in debates about its role during the Asian crisis, in attempts to turn around the stagnant Japanese economy, and in questions about the best response to the recent slow down in the United States, as well as in the concurrent weakening in the euro area.

With an average length of slightly less than one and a half years, the typical recession is quite short - most last year, while only a few longer than two years, Japanese experience is historically unique.

Fiscal response to a recession is on average towards a larger deficit, with the fiscal balance deteriorating by slightly less than 2 percent of GDP. Of the 61 recession episodes, fiscal policy was expansionary in this sense in 49 (or 80 percent) of the cases, with the fiscal balance deteriorating by 2.5 percent of GDP on average. For the 12 recession episodes in which policy makers responded with fiscal contraction, the fiscal balance improved by about 0.75 to 1 percent of GDP on average. Fiscal deficits are the norms before, during, and after recession episodes.

The initial fiscal position could clearly be important, and, on average, fiscal deficits and debt are indeed much lower before fiscal expansions. This provides more room for fiscal policy manoeuvre. Inflation was higher and fiscal policy was looser in many advanced economies during the year 1970s and 1980s.

The study concludes that fiscal expansions are more effective when

(a) there is excess capacity in the economy in the year before a recession; and

(b) the economy is open and has a fixed exchange rate.

Monetary policy is directed toward preserving the fixed exchange rate and fiscal policy is therefore not significantly crowded out by interest rates or the exchange rate. Fiscal expansions are also more effective in closed economies than in open economies with a flexible exchange rate.

Fiscal expansions are generally more effective when government is big because larger automatic stabilizers provide more timely and effective response to recessions. Fiscal multipliers are larger for expenditure increases than for tax cuts.

Authors find that in a closed economy the marginal effect of fiscal policy is Keynesian. A fiscal expansion equivalent to 1 percentage point of GDP increases growth during a recession by 0.7 percentage point. However, the result is different in open economies, which see an overall reduction in growth by 0.8 percentage point when the exchange rate is flexible and by 0.4 percentage point when it is fixed - in other words, in an open economy, fiscal policy becomes non-Keynesian.

Masson and others discuss the experience with budgetary convergence in the West African Economic and Monetary Union (WAEMU: Benin, Burkina, Faso, Cote d'Ivore, Guinea - Bissau, Mali, Niger, Senogal, and Togo). WAEMU's budgetary convergence criteria specify a budget deficit (fiscal revenue minus expenditures and excluding both grants and - foreign - financed investment) of no more than 3 percent of GDP.

A ceiling on the overall ratio of public debt to GDP is set at 70 per cent as a norm (Central Government finances) in the WAEMU, whereas the EU has a 60 per cent target (Central Government). Authors feel that cyclical conditions are very important factors in a country's ability to meet convergence criteria. Some of the Europe's current difficulties are due to relatively unfavourable cyclical conditions over the past few years. The strength of automatic stabilizers supports progressive taxes and welfare payments that kick in when workers lose their jobs.

In looking at the effect of the cycle on the budget deficit, authors found that, indeed, the fiscal stance is highly sensitive. They estimated that a 1 percentage point shortfall of output from potential worsens the fiscal balance by 0.3 percentage point of GDP on average in the WAEMU, compared with the euro-zone average of 0.5 percentage point. Although smaller in WAEMU, these effects are still significant. For the terms of trade, the effect would be on the order of 0.08 percentage point, which given the large movements in that variable, is associated with a substantial impact on deficit. So they argue that both the growth performance and the terms of trade need to be taken into account to some extent in assessing countries' progress towards fiscal adjustment. Electoral cycle resists governments for fiscal adjustments. However, fiscal adjustment might look at the composition of government spending.

## Section II

## Recent Empirical Evidence Relating to the Indian Economy

With a view to drawing policy lessons for India, Khatri and Kochhar examined fiscal adjustments pursued by four East Asian countries - Korea, Indonesia, Malaysia and Thailand in the 1950s in the context of their contributions to growth, and increases in savings and investment in these countries. In the 1970s and 1980s, these countries pursued, to varying degrees, a developing strategy relying on protection and heavy government intervention to "pick winners" and influence the direction on industrialisation. It was initially relatively successful. However, these policies proved not to be sustainable and resulted in large domestic and external imbalances - a large public sector, a widening external current account deficits, rising external debt and structural problems.

Fiscal consolidation was at the heart of the adjustment strategy in all cases. After the initial sharp reduction in fiscal deficits, the fiscal consolidation effort was sustained and strengthened with all four countries running fiscal surpluses for a number of years (prior to the Asian crisis). The strengthening of the fiscal consolidation came primarily on the back of strong GDP growth, but also a

continuation of vigilant expenditure policies and further structural reforms.

The outcome of fiscal adjustment (improved tax administration and rational expenditure management) and structural policies in terms of key activity variables - growth, saving and investment were spectacular. Per capita growth rates strongly export led, in excess of 6 per cent per annum was maintained. A sharp increase in domestic investment, led by private investment occurred. However, public saving increased national saving. Any offsetting reduction in private sector savings was felt to only be partial. Fiscal adjustment strongly influenced investors' confidence and led to the surge in capital inflows.

According to authors, in many ways, the initial macroeconomic conditions facing India in 1990-91 were very similar to the ones faced by the four East Asian countries more than a decade earlier. The adverse external shocks of early 1990s precipapitated a crisis, which brought India to the brink of default in 1991. In response, a strong stabilisation and adjustment package was put in place, focused on fiscal consolidation, and major structural reforms- including industrial deregulation and trade liberalisation. The India economy's response to the adjustment efforts undertaken since 1991 surpassed even the most optimistic projections. However, India did not succeed in initiating a strong virtuous circle of growth, saving and investment. More progress was needed in reducing fiscal current spending and reorienting its composition.

Salgodo highlighted that following the policies implemented in response to the 1991 balance of payments crisis, economic growth in India accelerated in the mid-1990s. Annual GDP growth ( at factor cost) in five years to 1996-97 was 6.75 percent, the highest five-year average ( based on a moving average) recorded in India since 1950-51. The benefits of reforms were most evident in private fixed investment growth, which surged to an average of 15.25 per cent in the period.

In the late-1990s, however, economic activity weakened substantially. Growth in 2000-01 was only 4 per cent and in the five years to 20012-02 averaged 5.25 per cent.

Following a secular rise starting in the early 1950s, the domestic investment rate of India stagnated in the 1990s. The investment rate peaked in 1995-96 at 27 per cent of GDP and subsequently fell to 24 per cent of GDP in 2000-01. In particular, the private fixed investment rate (in real terms) fell to under 18.5 per cent of GDP in the late-1990s, and the private corporate fixed investment rate fell to 6.75 per cent of GDP.

A model of private investment growth in India was estimated starting with a broad set of potential variables. The regressions were estimated based on annual data from 1970-71 to 1999-2000 and using ordinary least squares with white heteroskedasticity-consistent standard errors. A number of the variables-including lagged output growth, lagged investment growth, inflation, real interest rates, real credit growth were found to be insignificant. The final estimation result was:

IP=0.07-0.92 IG+4.56 WGDP+0.93 IG infra (-1)
(0.07) (-3.05) (1.81) (3.41)
-0.70 EXG(-1) -0.07 VINFL
(-1-173) (-2.03)
R-Square=0.46
Adjusted R-square =0.35; DW statistic=2.30

Where IP was private investment growth (in log), IG was public sector investment growth (in log), WGDP was world output growth (in log), IG infra was public sector infrastructure investment growth (in log), EXG was public expenditure growth excluding infrastructure investment (in log), and VINFL was the monthly variance of WPI omissions; government investment included inventories; and infrastructure investment was investment in agriculture, electricity, gas and water, and transportation, storage and communication.

Almost 70 per cent of the slow down in private investment in the late 1990s was attributed to a deterioration in the composition of public expenditures, which shifted toward public consumption and non-infrastructure investments after 1995-96 compared to the earlier part of the decade.

## Section III

## Empirical Results in Present Exercises

In the late 1990s, a series of very insightful works on public finance policy issues for India was published. The insights and analysis presented were found useful in designing the next phase of fiscal reforms in India. Public finance experts have devoted most of their attention to taxation and the revenue side of the budget. However, efficacy of public expenditure in order to stimulate growth potential needs to be analytically assessed in order to provide some input towards the sustainability and efficiency of fiscal reforms. Feeling a sense of 'adjustment fatigue' becomes costlier.

The present exercise attempts to stress some econometric evidence out of recent period data indicating fiscal led growth. A full-fledged analysis of the determinants of growth during the current reforms period is not attempted. The note tries to observe any growth dimension of fiscal response during the period from 1991-92 to 2001-02. Empirical debate on various definitions of fiscal deficits is avoided for sake of easy availability of data on fiscal deficits.

**Table 1 : Relative Fiscal Variables (% of GDP)**

| Year | C.F.D. | G.F.D. | C.T.E. | C.D.E. | C.S.S. | RGDP (Growth Rate ) |
|---|---|---|---|---|---|---|
| 1990-91 | 9.4 | 7.85 | - | - | - | 5.4 |
| 1991-92 | 7.0 | 5.56 | 17.05 | 9.08 | 1.04 | 0.8 |
| 1992-93 | 7.0 | 5.37 | 16.38 | 8.75 | 0.97 | 5.3 |
| 1993-94 | 8.3 | 7.01 | 16.51 | 8.43 | 1.40 | 6.2 |
| 1994-95 | 7.1 | 5.70 | 15.87 | 8.18 | 1.50 | 7.8 |
| 1995-96 | 6.5 | 5.07 | 15.01 | 7.11 | 1.57 | 7.2 |
| 1996-97 | 6.4 | 4.88 | 14.69 | 6.88 | 1.48 | 7.5 |
| 1997-98 | 7.3 | 5.84 | 15.24 | 7.29 | 1.63 | 5.0 |
| 1998-99 | 8.9 | 6.45 | 15.89 | 7.81 | 1.65 | 6.5 |
| 1999-2000 | 9.4 | 5.35 | 15.23 | 6.60 | 1.63 | 6.1 |
| 2000-01 | 9.1 | 5.13 | 15.36 | 6.44 | 1.58 | 4.0 |
| 2001-02 | 8.1 | 4.70 | 15.16 | 6.36 | 1.56 | 5.4 |
| Period Average | 7.80 | 5.70 | 15.60 | 7.40 | 1.40 | 5.6 |

Source: RBI Reports

**Notations:**

CFD = Combined Fiscal Deficit (Gross) State and Central
GFD = Central Gross Fiscal Deficit
RGDP = Real GDP Growth
CTE = Central Total Expenditure
CDE = Central Development Expenditure
CSS = Central Social Sector

Simple econometric exercise was carried during the same period using all variables of Table 1 in order to have some preliminary idea about correlations among different fiscal variables and real GDP. It might be focused that the association between real GDP. and other fiscal variables did not show any significant contemporaneous relation. Central social expenditure showed some contemporaneous association. However, association was in the lagged nature among variables during the reform period. Table 2 below presents pearson correlation.

**Pearson Correlation Matrix : 1990-91 to 2001-02**

| | RGDP |
|---|---|
| GFD | .041 |
| GFD-1 | .494 |
| GDF-2 | -.014 |
| CFD | -,092 |
| CFD-1 | -.340 |
| CFD-2 | -.400 |
| CTE | -.557 |
| CTE-1 | .215 |
| CTE-2 | .342 |
| CDE | -.309 |
| CDE-1 | .377 |
| CDE-2 | .484 |
| CSS | .514 |
| CSS-1 | -.005 |
| CSS-2 | -.591 |

Taking a cue form the correlation matrix, the various ordinary regression models were attempted during 1990-91 to 2001-02. The following estimated models are reasonably accepted.

(1) RGDP= 4.970 + 0.041 GFD
(t value ) (0.932) (0.122)
Adjusted R Square = 0.109
D-W Statistic : 1.034

(2) RGDP = 3.733 + 0.708 GFD-1 -0.594 CFD-1
(t value) (1,290) (2.610) (2.192)
Adjusted R Square = 0.424
D-W Statistic: 1.806

The preliminary empirical exercises thus suggest that fiscal response during the current fiscal reform initiatives had some evidence of Keynesian orthodoxy. However, fiscal policy was marginally effective to influence the growth of the Indian economy contemporaneously during the reform period. Lagged effect of fiscal deficits on growth signalled more towards some policy input for fiscal reforms. Using partial coefficients, it might be crudely implicated that a reduction of 1 percentage point in the combined fiscal deficit ratio might increase the real growth of the economy by around 0.6 percentage point within a span of two years (non Keynesian). However, a reduction of 1 percentage point in Central gross fiscal deficit ratio might reduce the real growth by around 0.7 percentage point within a span of two years (Keynesian). The quality of fiscal deficit matters. Vigilant expenditure policy is deeply warranted.

## Section IV

## Concluding Remarks

Sound performance of public institutions ( less direct roles in productive economic activity) is increasingly felt to be at the heart of the sustainable economic development. Proper resource allocation for targeted interventions established the private-public economic linkages. Decisive government action through long-term goal might emphasize protecting increasing budget allocation in critical areas. The authorities might thus achieve a break through in community

participation and civil society involvement in basic social services, especially for the poor.

The social protection in Keynesian perception through temporary employment, job-skills training and assistance for job search or self-employment might need special attention as indispensable to enhancing development effectiveness. However, further efforts are needed on public expenditure issues-including improving the quality and efficiency of public expenditure, and strengthening government spending management system.

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# *Short-term Forecast of Corporate Investment since 1970's - Three Decades in Retrospect*

**R. Satyanarayana and S.V.Savalkar***

The short-term forecasting of corporate investment based on time phasing of corporate projects assisted by financial institutions was pioneered by Dr. C. Rangarajan in 1970 and annual studies on 'one-year ahead' forecast of corporate investment following his methodology have since appeared regularly in the past three decades. This paper attempts to present a retrospective view of, how these short-term forecasts of corporate investment have performed and also to what extent the objectives of the forecasting exercise have been fulfilled.

JEL Classification : G390

Key words : Assisted Corporate Projects, Envisaged Fixed Capital Expenditure

## Introduction

It is indeed well known that the short-term forecasting of corporate investment was pioneered by Dr. C. Rangarajan over three decades ago in 1970 when for the first time, an elegant yet an operationally simple model based on time-phasing of corporate projects assisted by financial institutions was introduced in the seminal article 'Forecasting Capital Expenditure in Corporate Sector' published in the December 19, 1970 issue of the Economic and Political Weekly. We know of no other such exercise of short-term investment forecasting, taken up annually since 1970s, save for a very few years.

In his classic book titled 'Short-term Investment Forecasting - An exploratory Study' (co-author, Dr. Samuel Paul: 1974), the

* Shri R. Satyanarayana is Adviser and Shri S.V.Savalkar was Research Officer in the Department of Statistical Analysis and Computer Services (Shri Savalkar has since left the organisation). The authors wish to express their sincere gratitude to Dr. C. Rangarajan, Chairman, 12th Finance Commission for his magnanimous guidance on critical issues relating to the forecast of corporate investment, which has enlightened us with rare insights and of immeasurable value in the preparation of this paper. We are thankful to Dr. R.B.Barman, Executive Director for his constant encouragement and to the former Principal Adviser, Shri V.S.Santhanam for his keen interaction in this endeavour. We wish to acknowledge the valuable assistance of Smt. U.R.Kelkar, Statistical Assistant. We also wish to thank two anonymous referees for their comments. The views expressed in this paper are those of the authors and not of the institution to which they belong. They alone are responsible for errors, if any.

quintessence of the role of short-term forecasting of corporate investment was elaborated in the following words:

"… Investment results in the creation of new productive capacity, which can augment the supply of goods and services in future periods. It is this ability of investment to add to the stock of capital and thereby help to raise the standard of living that has given it a pivotal role in national economic planning. Since investment today can increase the potential capacity of the economy to raise the level of output in subsequent periods, forecasters study and watch investment trends carefully. The critical role of investment in developing countries where productive capacity is often a major constraint on growth cannot be overemphasised. …

… There are two reasons why the forecasting of industrial investment must be accorded high priority. In the first place, investment is the most unstable among the national income components. Investment is more subject to larger relative variations from one period to the next than consumption because of the postponability of capital expenditures, the volatility of factors affecting profit expectations, and the role of external financing. Since variations in investment can affect the levels of economic activity significantly, any fresh clues on the likely movement of this variable will be of considerable value to the forecaster. Secondly, we know precious little about non-governmental investment in the industrial sector in India. …"

In countries like Australia, Japan, the UK and the USA, forecasts of corporate investment intentions are based on well-organised surveys of investment intentions of companies and the likely investment is predicted on the basis of these intentions. Such surveys were attempted in India in the late 1980s and also the late 1990s but the response from companies as also the quality of data did not turn out to be adequate for attempting short-term forecast of corporate investment. As already mentioned, annual articles based on Dr. C Rangarajan's model have appeared in the 1970s and the late 1980s mostly in the issues of Economic and Political Weekly and since 1989, the studies were published by the Reserve Bank of India (RBI) in the

monthly issues of the RBI Bulletin. We now have a valuable annual time series on corporate investment forecasted following the above methodology covering almost the 30-year period, similar to the time series data on gross fixed capital formation of the private corporate sector available from the National Account Statistics. This paper undertakes a retrospective view of the short-term forecast of corporate investment over the last three decades with the twin objectives of examining, (i) as to how these short-term forecasts of corporate investment have performed over the period and (ii) to what extent the objectives of the forecasting exercise have been fulfilled. The paper is divided into five sections: Section I deals with the evolution of the methodology for forecasting corporate investment – its adequacies and inadequacies. Growth trends as emerging from the forecasted corporate investment were compared with similar trends obtained from other independent data sources and limitations inherent in such comparison are examined in Section II. In Section III, an attempt is made to gauge the extent to which corporates adhere to time-phasing of the projects assisted by the institutions at the time of sanction, by suitably juxtaposing these data with the data on expenditure on fixed capital *(ex-post)* as obtained from the annual accounts of these companies. Apart from the time-phasing of capital expenditure, annual studies on corporate investment have provided data on industry-wise, state-wise and purpose-wise flows of fixed capital investment and the salient features as depicted by these data are presented in brief in Section IV. A summary of observations is given in Section V.

## Section I
## Methodological Issues

In countries like the US, a standard approach for short-term forecasting of fixed capital investment has been to survey the investment intentions of companies and to predict the likely investment on the basis of these intentions. As already mentioned, such surveys were also attempted in India but did not yield good results. In the book titled "Short-Term Investment Forecasting – An Exploratory Study" (referred to earlier) Dr. C. Rangarajan dealt with various issues connected with the short-term forecasting of corporate

investment extensively, both the theoretical as well as practical aspects, from different angles. Attempts to forecast plant and equipment expenditure, construction expenditure, and experiments with financial data as predictive tools for forecasting private corporate investment as well as their outcome were lucidly explained. Approaches to forecasting based on data on sources of funds for corporate investment as also forecasting corporate investment with data of term-lending institutions were systematically explored. Utility of behavioural and non-behavioural forecasting schemes have been examined. Finally, what emerged was that data on investment intentions were found to be more useful in making short-term forecast of corporate investment. In regard to the efficacy of data relating to investment intentions in making short term forecasts, Arthur Okun *inter alia* observed that "… I know of no naive model and no causal explanation resting on predetermined causal variables which rivals the anticipations data in accuracy". In the context of predictive ability of non-behavioural investment functions, D.W. Jorgenson, J. Hunter and M. I. Nadiri have stated "… Not unexpectedly, the anticipatory data provide an explanation of actual investment expenditures that is superior to that provided by econometric models for all but a very few of the fifteen industries *(studied by them)*. The performance of these data provides a clear indication of the value of the anticipation surveys. No econometric model currently available can compete with the anticipated investment data in explanatory power". After all forecasting is inseparable part of human intellectual activity, be it based on intuition or logic. For serious forecasters, forecasting is a perennial evolving process and the forecasts generated by this process, over the time, provide feedback to it.

By way of recapitulation, we give here a brief description of Dr. C. Rangarajan's model as outlined in the 1970 article. The rationale for an alternative approach based on the time phasing of the assisted corporate projects stemmed from the nature of the financing of the projects in India. Almost all major projects in the corporate sector approach the term-lending institutions such as the Industrial Credit and Investment Corporation of India (ICICI), the Industrial Development Bank of India (IDBI), the Industrial Finance Corporation of India (IFCI) etc., for obtaining finance. The term

lending institutions, thus have with them the most complete data on the projects for which they have been approached for loans or for underwriting. These data include the total value of the projects and the capital expenditure to be incurred in the various years on the projects. From the point of view of forecasting investment in the corporate sector, the data relevant are those relating to the time phasing of capital expenditure on the projects. By aggregating this information, one should at the beginning of any year be able to indicate the investment that is likely to be made in the course of the year on all projects for which assistance has been provided by the term-lending institutions. This will include expenditures on projects sanctioned not only in the immediate past year but also those sanctioned in all the previous years and on which expenditures are to be incurred during the year.

However, in using this approach for forecasting investment, there are difficulties, some of which are procedural and some more fundamental. At the time of granting of the loans, project proposals are very carefully examined by the term-lending institutions. The cash flow statements and the phasing of capital expenditures are given special attention to. But once the loans are granted, the same care is not exercised in revising the total value of the projects or the phasing of the capital expenditures. While some efforts are made in this direction as part of the follow-up procedure, the revisions undertaken are not thorough. One cannot, therefore, place as much confidence on the capital expenditures to be incurred during a given year on a project for which the loan had been sanctioned some years ago as the one for which sanction had been given only in the previous year. Most big projects approach more than one term-lending institutions to obtain assistance. Therefore, to avoid double counting the projects which receive assistance from more than one institution should be included only once.

From the point of view of forecasting, there are two fundamental difficulties. For the year for which forecast is made one can by collecting the information available with the various long-term institutions indicate expenditures likely to be incurred on projects for which loans or other assistance had been sanctioned in that and in the previous years. But the capital expenditures to be incurred in

the forecast year will also include projects for which assistance might be provided in that year itself. To some extent this can be anticipated by looking at the pending applications as at the beginning of the year. Thus in forecasting investments in the corporate sector for any year, there is a segment that is to be guessed and for which internal data available with the long-term institutions will not be of help. It is this segment, which depends upon the investment "climate" prevalent in that year and which in turn becomes difficult to forecast.

The second difficulty encountered is to relate the changes in capital expenditures on project, which go through the long-term institutions with the changes in total investments made by the corporate sector. Since these institutions are making an effort to expand their activities an increase in capital expenditures on projects sanctioned by them may reflect more their enlarged activities than a real rise in investment in the corporate sector. Since the capabilities of the institutions to provide finance may not change considerably from year to year, a rise or fall in the value of the projects going through these institutions may still provide an index of the change in investment in the corporate sector taken as a whole.

In the absence of any general formula by which one can modify the original phasing of capital expenditures, one has to be content with incorporating changes in the original phasing of capital expenditures as and when new information is made available to the financial institutions and using judgement so as to take into account the existence of major operating factors such as availability of necessary inputs, the performance of the infrastructure sector.

A question that often crops up is about the representative character of the short-term forecast of corporate investment following the above model. It may be mentioned that, in the studies for the last two years, attempts have been made to cover the projects directly financed by the major public sector banks. Though banks have been participating in consortium finance with financial institutions in funding corporate projects, direct project lending is a recent development, and on a limited scale. With the coverage of projects financed by the major public sector banks, one can say that the

representative character of the studies will be better. Essentially phased capital expenditure represents the ex-ante corporate investment and the success of the forecasts depends to the large extent on the adherence by corporates to the time-phasing of investment as envisaged by them at the time of seeking the financial assistance. In broader terms the main objective of the short-term forecast of corporate investment is not so much to estimate the quantum of corporate investment for corporate sector as a whole, but the endeavour is directed more towards obtaining an idea about the dimension and direction of growth of corporate investment a year ahead. To what extent this objective has been achieved is examined in the following section.

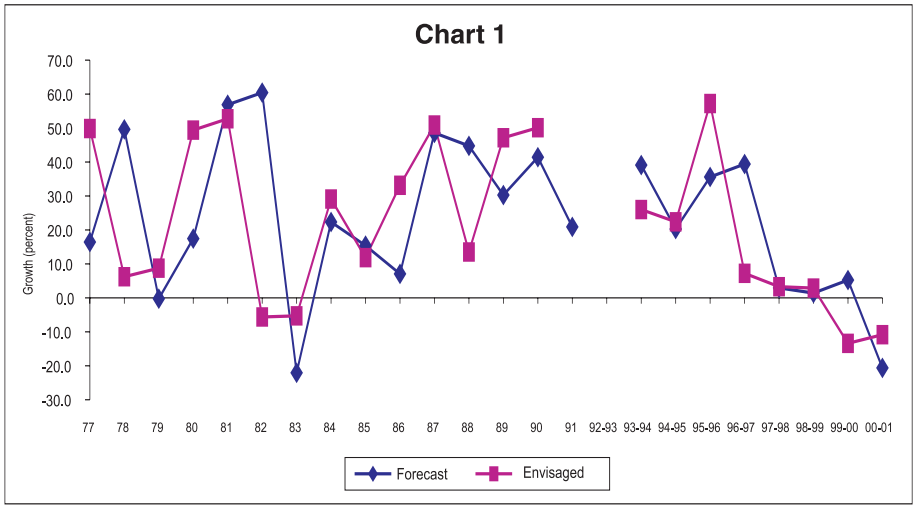
## Section II
## Trends in the Growth of Corporate Investment

A question which often lurks in the minds of the observers of the trends in the fixed capital investment of the corporate sector, is: How well the growth trends based on the envisaged fixed capital expenditure of the assisted corporate projects, serve as a proxy to investment trends of the overall private corporate sector? In search of an answer to this question, we make here an attempt to compare the growth trends based on series of capital expenditure of assisted corporate projects with the similar trends available from other independent data series viz., Gross Fixed Capital Formation (GFCF) of the private corporate sector of the National Accounts Statistics (NAS), Annual Survey of Industries (ASI) and the Annual company finance studies of the RBI, and explore if this approach would provide some useful insight on this aspect.

In the annual studies on the 'One year ahead' forecast of corporate investment of the private corporate sector, the growth in capital expenditure in the year of forecast is worked out as percentage change of the forecasted capital expenditure in the year of forecast over the envisaged fixed capital expenditure of assisted projects in the preceding year. Envisaged fixed capital expenditure on any project in a given year, for this paper is taken to be same as the annual fixed

capital expenditure planned to be incurred over time span of implementation of the project, as spelt out at the time of seeking assistance from the financial institutions.

In order to obtain an idea about the performance of forecast series, over the years the growth rates of the forecast of fixed capital expenditure (Col. 3, Table 1) of the assisted projects and that of the envisaged capital expenditure (Col. 5) were compared. From the growth trends of these two series depicted in Chart 1, it is clearly discernible that the forecast series captured the direction of growth of envisaged capital expenditure, well in the last three decades.




The annual studies of short term forecast of investment generated data on the envisaged fixed capital expenditure of assisted projects and an insight into these data, sheds some light on the fixed capital investment facet of the private corporate sector.

During the collection of data on the time phasing of investment of assisted projects for the annual studies, we do come across, occasionally, some companies reporting changes in the phasing of the projects assisted in the previous years. In such cases, the database is suitably modified, and the data on the phasing of investment gets updated over the years. In other words, investment figures of assisted projects get firmed up based on such information over the years. The

**Table 1: Growth Trends in Forecast and Envisaged Fixed Capital Expenditure of the assisted corporate projects**

| Year of Forecast | Forecast | | Envisaged @ | |
|---|---|---|---|---|
| | Amount (Rs crore) | Growth (Per cent) | Amount (Rs crore) | Growth (Per cent) |
| (1) | (2) | (3) | (4) | (5) |
| 1977 | 680 | 16.4 | 955 | 49.9 |
| 1978 | 1,018 * | 49.6 | 1,015 | 6.2 |
| 1979 | 1,015 | -0.2 | 1,104 | 8.7 |
| 1980 | 1,192 | 17.4 | 1,649 | 49.4 |
| 1981 | 1,870 | 56.9 | 2,519 | 52.8 |
| 1982 | 3,000 | 60.4 | 2,377 | -5.6 |
| 1983 | 2,338 * | -22.1 | 2,251 | -5.3 |
| 1984 | 2,860 * | 22.3 | 2,906 | 29.1 |
| 1985 | 3,300 | 15.4 | 3,250 | 11.8 |
| 1986 | 3,533 | 7.1 | 4,328 | 33.2 |
| 1987 | 5,250 * | 48.6 | 6,531 | 50.9 |
| 1988 | 7,600 * | 44.8 | 7,413 | 13.5 |
| 1989 | 9,900 | 30.3 | 10,907 | 47.1 |
| 1990 | 14,000 | 41.4 | 16,372 | 50.1 |
| 1991 | 16,927 | 20.9 | — | # |
| 1992-93 | 22,443 | # | 25,794 | # |
| 1993-94 | 31,220 | 39.1 | 32,500 | 26.0 |
| 1994-95 | 37,551 | 20.3 | 39,778 | 22.4 |
| 1995-96 | 50,923 | 35.6 | 62,543 | 57.2 |
| 1996-97 | 70,993 | 39.4 | 67,067 | 7.2 |
| 1997-98 | 73,075 | 2.9 | 69,277 | 3.3 |
| 1998-99 | 74,105 | 1.4 | 71,270 | 2.9 |
| 1999-00 | 77,990 * | 5.2 | 61,728 | -13.4 |
| 2000-01 | 61,901 | -20.6 | 55,032 | -10.8 |

**Note:** @ Envisaged fixed capital expenditure in the year preceding the year of forecast.
* The mid-value of the range.
\# Growth rates are not worked out due to the change in the reference period from calendar year to financial year.

series so revised (herein after referred to as 'Revised Series) is presented in col. 2 of Table 2 and the growth rates worked out using this series are presented in col. 3.

With a view to obtaining an idea of the relationship, if any, between series of envisaged fixed capital expenditure and the series of Gross Fixed Capital Formation (GFCF) from National Accounts Statistics (NAS), an attempt is made to trace the movement of these series, over the last three decades. It can be seen that both the series (Chart - 2) moved together showing a rising trend over the period.

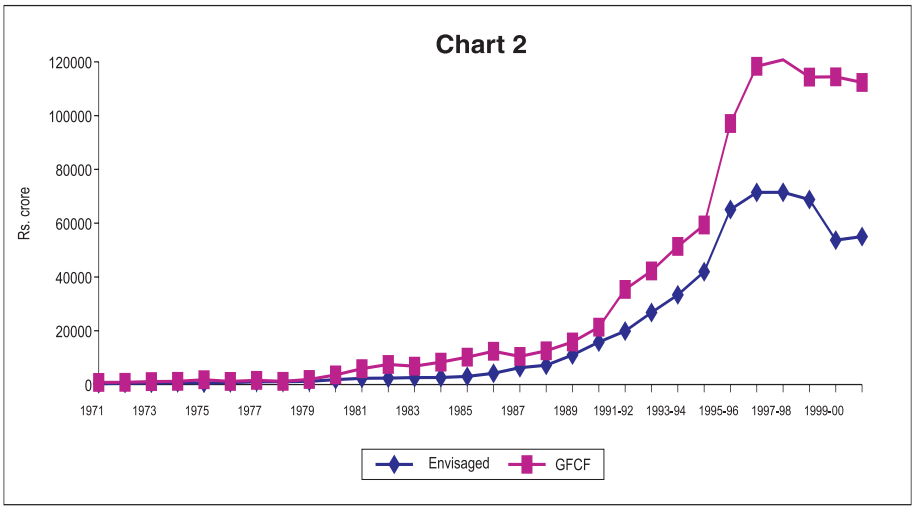
## Table 2: Envisaged Fixed Capital Expenditure (Revised) of assisted corporate projects and Gross Fixed Capital Formation of the Private Corporate Sector

| Fore-cast Year | Envisaged Fixed Capital expenditure-Revised@ | | GFCF of the Private Corporate Sector (at current prices)# | | Ratio of envisaged fixed capital expenditure to GFCF (Per cent) |
|---|---|---|---|---|---|
| | Amount (Rs crore) | Growth rate (per cent) | Amount (Rs crore) | Growth rate (per cent) | |
| (1) | (2) | (3) | (4) | (5) | (6) |
| 1971 | 319 | -6.2 | 799 | 25.8 | 39.9 |
| 1972 | 463 | 45.1 | 843 | 5.5 | 54.9 |
| 1973 | 531 | 14.7 | 1,084 | 28.6 | 49.0 |
| 1974 | 681 | 28.2 | 1,185 | 9.3 | 57.5 |
| 1975 | 530 | -22.2 | 1,793 | 51.3 | 29.6 |
| 1976 | 706 | 33.2 | 1,148 | -36.0 | 61.5 |
| 1977 | 1,025 | 45.2 | 1,569 | 36.7 | 65.3 |
| 1978 | 1,068 | 4.2 | 1,182 | -24.7 | 90.4 |
| 1979 | 1,207 | 13 | 1,904 | 61.1 | 63.4 |
| 1980 | 1,830 | 51.6 | 3,598 | 89.0 | 50.9 |
| 1981 | 2,337 | 27.7 | 5,896 | 63.9 | 39.6 |
| 1982 | 2,393 | 2.4 | 7,479 | 26.8 | 32.0 |
| 1983 | 2,572 | 7.5 | 6,836 | -8.6 | 37.6 |
| 1984 | 2,637 | 2.5 | 8,318 | 21.7 | 31.7 |
| 1985 | 3,015 | 14.3 | 10,194 | 22.6 | 29.6 |
| 1986 | 4,176 | 38.5 | 12,383 | 21.5 | 33.7 |
| 1987 | 6,272 | 50.2 | 10,461 | -15.5 | 60.0 |
| 1988 | 7,174 | 14.4 | 12,534 | 19.8 | 57.2 |
| 1989 | 10,981 | 53.1 | 15,834 | 26.3 | 69.4 |
| 1990 | 15,813 | 44.0 | 21,322 | 34.7 | 74.2 |
| 1991-92 | 19,884 | * | 35,391 | 66.0 | 56.2 |
| 1992-93 | 26,777 | 34.7 | 42,251 | 19.4 | 63.4 |
| 1993-94 | 33,362 | 24.6 | 51,388 | 21.6 | 64.9 |
| 1994-95 | 41,948 | 25.7 | 59,332 | 15.5 | 70.7 |
| 1995-96 | 65,074 | 55.1 | 97,062 | 63.6 | 67.0 |
| 1996-97 | 71,446 | 9.8 | 118,330 | 21.9 | 60.4 |
| 1997-98 | 71,479 | 0.0 | 120,752 | 2.0 | 59.2 |
| 1998-99 | 68,780 | -3.8 | 114,336 | -5.3 | 60.2 |
| 1999-00 | 53,709 | -21.9 | 114,437 | 0.1 | 46.9 |
| 2000-01 | 55,032 | 2.5 | 112,326 | -1.8 | 49.0 |

**Note:** # Source: National Account Statistics,CSO

* Growth rate is not worked out due to the change in reference year from calendar year to financial year

@ Envisaged fixed capital expenditure for years 1970 to 1990 was on the calender year basis.

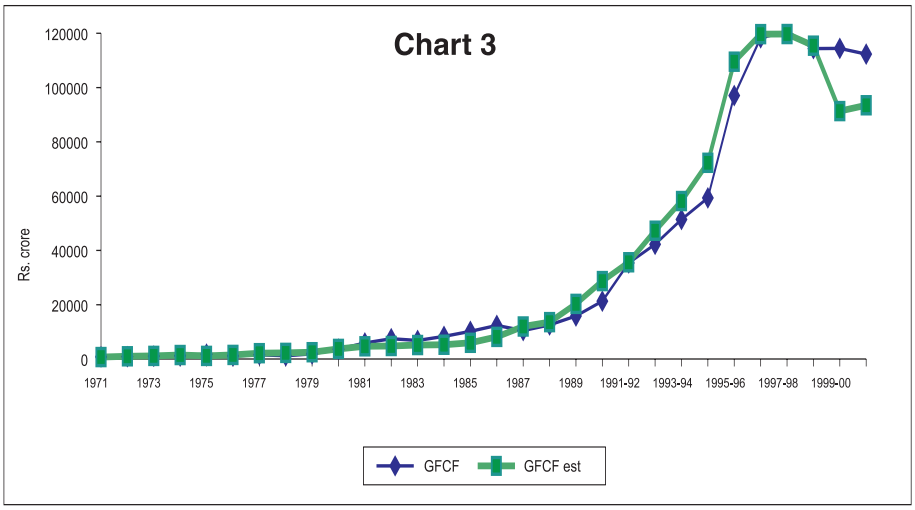



*Prima facie*, these two series are closely related. To test the relationship between these two series, GFCF of the private corporate sector is postulated to depend on the envisaged fixed capital expenditure of the assisted projects (ENVCAP) and adopting the regression approach, the following log-linear relationship is estimated.

ln GFCF = 1.1106 + 0.9468 ln ENVCAP

t- Statistic 4.3128 32.2655

Adj $R^2$ 0.9729 F = 1041.06 DW= 0.9057



The regression coefficient of log ENVCAP estimated at 0.9468 is found to be statistically significant at 5 per cent level of significance. The plot of observed and estimated values of GFCF from this equation (Chart - 3) showed a close relationship between the two series.

The Durbin-Watson (DW) value of this regression worked out to 0.9057. However, the Co-integrated Regression Durbin-Watson (CRDW) test showed it was significantly different from zero confirming that there is a long-run relationship between these two variables. The elasticity of the GFCF with respect to envisaged fixed capital expenditure worked out to 0.9468 implying that a change of, say, 10 per cent in envisaged fixed capital expenditure would result in the corresponding change of 9.5 per cent in the GFCF of the private corporate sector. The above relationship should not, however, be interpreted as the rationale for method of forecasting of corporate investment based on the ex-ante corporate investment of assisted corporate projects; the argument, in fact, confirms the existence of long-run relationship.

Further, an attempt is made to compare the rate of growth of Envisaged fixed capital expenditure (Revised Series) with that of Gross Fixed Capital Formation (GFCF) of the private corporate sector (col. 4), from the National Accounts Statistics (NAS), to examine whether the growth trends based on the envisaged fixed capital expenditure of the assisted corporate projects would serve as a proxy to investment trends of the overall private corporate sector.

Growth trends of corporate investment, based on (i) Revised series and (ii) GFCF of the NAS when juxtaposed (Chart 4), indicate that growth trends based on the revised series could capture the direction of growth rates fairly well, more so in the 1980s and 1990s, however, for a few years (1983, 1987, 1999-2000 and 2000-01) these two series moved in opposite direction[ψ].

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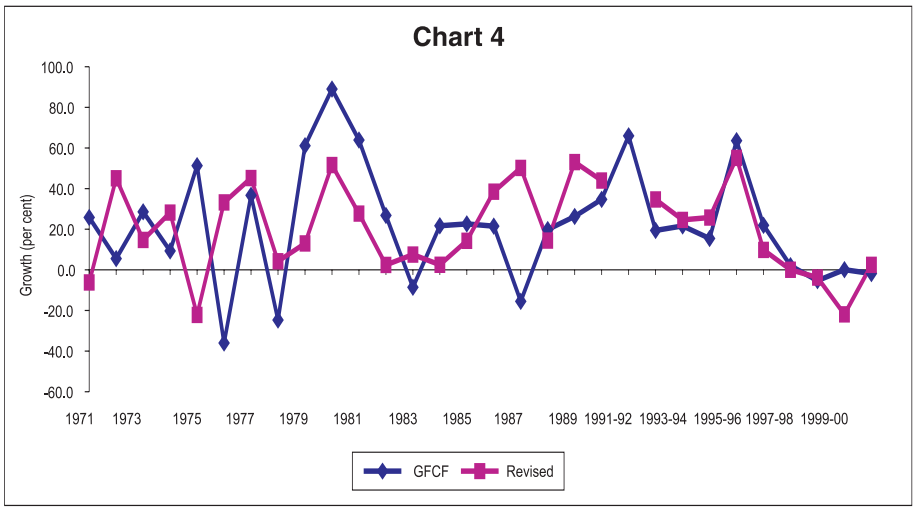
ψ While the causal economic factors for the observed counter movements in rates of growth of envisaged fixed capital expenditure and that of GFCF, in the years 1983 and 1987 are not easily identifiable, the substantial fall in the envisaged capital expenditure observed in 1999-2000 is mostly attributable to the cancellation of assistance to some major power projects by the financial institutions in 2000-01, resulting in the downward revision of envisaged capital expenditure in the previous years. In fact, companies implementing such projects, which are not operational, are not included in the regular RBI studies on the finances of companies.




The differentials in the growth rates between the Envisaged fixed capital expenditure series (Revised series) and the series of GFCF of the private corporate sector would need to be viewed with some circumspection keeping in view the differences in the coverage, method of estimation, etc of these two data series. Some of the important limitations are:

(I) It may be mentioned that the data on corporate investment available from other sources also have their own merits and limitations. The estimation of gross fixed capital formation of private corporate sector (NAS) has the two basic steps: (1) the gross fixed assets formation of selected companies, after adjusting for revaluation, is worked out separately for non-Government non-financial, (i) public and (ii) private limited companies and (iii) non-Government financial companies; and (2) The GFCF of all the non-Government companies is obtained using blow-up factor (which is the reciprocal of the coverage of selected companies in terms of population paid-up capital) for public and private limited companies and financial companies separately. Implicit in this method is the assumption that the relationship between individual items of a company's balance sheet and the paid-up capital is linear. To this estimate, the GFCF of co-operative enterprises is added by the Central Statistical Organisation to arrive at the gross fixed capital formation of the private corporate sector. The estimate of GFCF of private corporate sector is accordingly dependent on the twin components (i) the

capital formation of the selected companies, and (ii) the blow-up factor which in turn depends on the growth of population paid-up capital relative to the growth of paid-up capital of selected companies. From the coverage of companies selected in the published studies, it is observed that the growth of population paid-up capital considerably exceeded that of the selected companies which implies a rising trend in the blow-up factors. A broad dimensional comparison of the rates of growth of the GFCF (NAS) with that of the selected companies covered in the regular studies, indicated that the growth of the GFCF showed a tendency to over-state the growth and under-state the decline for the private corporate sector. Therefore, when we scrutinize the differentials in the rates of growth of these two series, it is necessary to keep in the background all these factors, particularly the role of blow-up factor in the estimation of GFCF.

It is also observed that the ratio of envisaged capital expenditure to the GFCF (Col. 5) over the 30-year period was fairly high for most of the years. The ratio averaged to 56.2 per cent in 1970s and 46.5 per cent in 1980s. However, during the 1990s the ratio had a relatively higher mean of 59.8 per cent.

(II) Another point to be noted is that in the 70s and the 80s, month of closure of annual accounts of companies was spread over the year and the companies with month of closure of account other than March and December were quite substantial in number. According to provisions of the Income Tax Act introduced by the Direct Tax Laws Amendments Act, 1987, a uniform accounting year has been introduced for all tax payers with effect from the financial year ended March 31, 1989* . Since the early 90s, many companies adopted the accounting year coinciding with the financial year (March as closing month), followed by the companies with the accounting year same as the calendar year (i.e. December closing). The point we wish to make here is that the GFCF for any year, say, prior to 1991-92, may not necessary imply that fixed capital expenditure was incurred in the period from April to March of that year.

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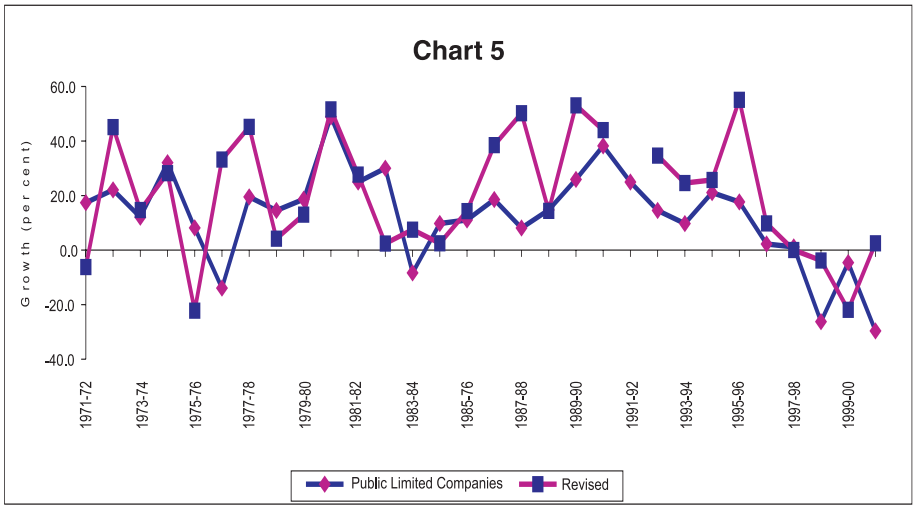
* 'Finances of Large Public Limited Companies, 1991-92' published in September 1994 issue of the RBI Bulletin

(III) Another important point to be kept in view is that the forecasts represent the ex-ante investment, while the NAS data essentially represent the ex-post investment. To the extent the realisation falls short of intentions, the forecasted series may slightly overstate the corporate investment.

Notwithstanding the limitations above, an overall co-movement of the growth trends between series of the envisaged fixed capital expenditure and the GFCF of the private corporate sector is visible over the last three decades.

The limitations of the methods of estimating GFCF for the private corporate sector (NAS), as also comments thereon are too well known to warrant recapitulation here. Keeping such limitations of the above data series in view, we have also made an attempt to build a data series on the growth trends of gross fixed capital (assets) formation of non-government, non-financial public limited companies (RBI annual studies on the finances of public limited companies) which claim a lion's share in the GFCF of the private corporate sector. The choice of this series is somewhat deliberate, as it obviates the use of paid-up capital linked blow-up factor. The growth trend based on the fixed capital investment of public limited companies *vis-à-vis* that of revised series of assisted corporate projects may be seen in Chart 5.



The growth trends of revised series of assisted projects are also found to be well aligned with those of the investment series of non-financial non-Government public limited companies. In regard to the data series of the growth of gross fixed capital formation of the public limited companies, it would be appropriate here to mention a few limitations. It may be noted that in respect of the data for the decade of the 70s, the first half related to 1,650 public limited companies and for later half to 1,720 public limited companies. However, in the 80's and the 90's the number of companies and the percentage of total paid-up capital covered in the annual studies on finances of public limited companies varied from study year to study year. As such, the growth trends of fixed capital investment are based on varying size of sample of selected companies. Gross fixed capital investment of public limited companies is derived as a difference between the stocks of gross fixed assets at the close of the accounting year adjusted for revaluation and the stock of gross fixed assets at beginning of the accounting year. It may also be mentioned that gross fixed assets formation of public limited companies presented in the Table 3 for the previous year (col. 3) and current year (col. 4) relate to same set of companies (col. 2).

The co-movement observed in the growth rates of fixed capital expenditure viz. (i) GFCF (ii) Revised envisaged fixed capital expenditure and (iii) Gross fixed assets formation of public limited companies is validated through a statistical test procedure based on the binomial distribution. It is observed that the growth rates of envisaged fixed capital expenditure are closer to that of public limited companies covered in the RBI studies as indicated by lower mean absolute differential of growth rates (mean of 16.7 percentage points and standard deviation of 13.3 percentage points) as compared with growth differentials between envisaged fixed capital expenditure and GFCF (mean 23.4 percentage points and standard deviation of 20.0 percentage points).

Some attempts are also made to compare the forecasted capital expenditure with similar estimates available from the Annual Survey of Industries, with a view to obtaining an idea of the share of gross fixed capital formation of the companies covered in the RBI studies

## Table 3: Gross Fixed Capital Formation - Public Limited Companies and Assisted Corporate Projects

| Year | Public limited companies | | | | Growth of envisaged fixed capital investment (Revised) (per cent) |
|---|---|---|---|---|---|
| | No. of companies | Gross Fixed Assets Formation (Rs Crore) | | | |
| | | Previous year | Current year | Per cent growth [col(4) over col(3)] | |
| (1) | (2) | (3) | (4) | (5) | (6) |
| 1971-72 | 1650 | 325 $ | 381 | 17.4 | -6.2 |
| 1972-73 | 1650 | 378 | 461 | 22.1 | 45.1 |
| 1973-74 | 1650 | 470 | 526 | 12.1 | 14.7 |
| 1974-75 | 1650 | 525 | 694 | 32.0 | 28.2 |
| 1975-76 | 1650 | 691 | 747 | 8.1 | -22.2 |
| 1976-77 | 1720 | 732 $ | 630 | -13.9 | 33.2 |
| 1977-78 | 1720 | 630 | 753 | 19.5 | 45.2 |
| 1978-79 | 1720 | 753 | 863 | 14.5 | 4.2 |
| 1979-80 | 1720 | 856 | 1016 | 18.7 | 13.0 |
| 1980-81 | 1720 | 1016 | 1512 | 48.9 | 51.6 |
| 1981-82 | 1651 | 1635 $ | 2043 | 25.0 | 27.7 |
| 1982-83 | 1651 | 2043 | 2657 | 30.0 | 2.4 |
| 1983-84 | 1838 | 2818 $ | 2583 | -8.4 | 7.5 |
| 1984-85 | 1838 | 2583 | 2835 | 9.8 | 2.5 |
| 1985-86 | 1867 | 2947 | 3272 | 11.1 | 14.3 |
| 1986-87 | 1942 | 3278 | 3885 | 18.5 | 38.5 |
| 1987-88 | 1953 | 3916 | 4234 | 8.1 | 50.2 |
| 1988-89 | 1885 | 4297 | 4930 | 14.7 | 14.4 |
| 1989-90 | 1908 | 5140 | 6474 | 25.9 | 53.1 |
| 1990-91 | 2131 | 6465 | 8935 | 38.2 | 44.0 |
| 1991-92 | 1836 | 8690 | 10859 | 25.0 | * |
| 1992-93 | 1802 | 12362 | 14159 | 14.5 | 34.7 |
| 1993-94 | 1700 | 13923 | 15276 | 9.7 | 24.6 |
| 1994-95 | 1720 | 16327 | 19769 | 21.1 | 25.7 |
| 1995-96 | 1730 | 20389 | 23992 | 17.7 | 55.1 |
| 1996-97 | 1930 | 30666 | 31351 | 2.2 | 9.8 |
| 1997-98 | 1948 | 32427 | 32804 | 1.2 | 0.0 |
| 1998-99 | 1848 | 34906 | 25744 | -26.2 | -3.8 |
| 1999-00 | 1914 | 24455 | 23328 | -4.6 | -21.9 |
| 2000-01 | 1927 | 21190 | 14912 | -29.6 | 2.5 |

$ Estimated due to break in the data series

Source: Annual Studies on Finances of Medium and Large Public and Public Limited Companies

* Growth rate is not worked out due to the change in reference year from calendar year to financial year

in that of the factory sector*. The 'Summary Results' of the ASI for the factory sector present data on some selected characteristics such as fixed assets, depreciation, etc., by type of ownership. The GFCF of the private corporate sector for the years 1991-92 to 1997-98 is derived based on the data relating to the public and private limited companies for the respective years. When compared with the estimates of GFCF of the private corporate sector (NAS), the estimates of the ASI are much lower in magnitude and the rates of growth showed considerable divergence. Population estimates of Gross Fixed Capital Formation (GFCF) based on ASI data and the aggregate corporate investment data from the studies based on the phasing details of corporate projects showed considerable divergence, even after accounting for the differences in coverage, concepts of these databases.

Firstly, GFCF for the entire factory sector in 1997–98 (as estimated from the ASI) amounted to only Rs.71,772 crore, which was of the same order as that of the RBI's investment estimates for private corporate sector during the same year at Rs.71,479 crore (Table 4). The earlier years also show similar high coverage, with the RBI estimate in 1993–94 being well above the GFCF estimate for the factory sector in the same year (122.6 per cent).

The differences in comparisons become even more glaring when the GFCF estimates for the private corporate sector are considered. In particular, RBI's investment estimates for private corporate sector at Rs.71,479 crore in 1997–98 was about twice (186.2 per cent) of ASI's corresponding figures for the private corporate sector derived at Rs.38,385 crore, which is, *prima facie*, not possible. Similar undercoverage of the ASI is also apparent in data for earlier years.

It is also true that one factor contributing to the divergence in estimates could be that the fixed capital expenditure made by companies, apart from that in the operating factories, *i.e.*, in factories

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* "Data Base on Gross Fixed Capital Formation of the Indian Private Corporate Sector - Some Issues": R. Satyanarayana and Arnab Bhattacharjee, paper presented at the Biennial Conference of the Indian Association for Research in National Income and Wealth, at Pondicherry, in Sept. 2000.

**Table 4: Estimates of Capital Formation - ASI and RBI Corporate Investment Data**

(Rs. Crore)

| | 1990-91 | 1991-92 | 1992-93 | 1993-94 | 1994-95 | 1995-96 | 1996-97 | 1997-98 |
|---|---|---|---|---|---|---|---|---|
| **ASI estimates** | | | | | | | | |
| 1. Gross Fixed Capital Formation (All factories) | 24293 | 30610 (26.0) | 36041 (17.7) | 27223 (-24.5) | 59522 (118.6) | 69120 (16.1) | 79937 (15.6) | 71772 (-10.2) |
| 2. Gross Fixed Capital Formation (Private Corporate Sector) | —- | 21179 | 30203 (42.6) | 16961 (-43.8) | 49334 (190.9) | 65426 (32.6) | 64413 (-1.5) | 38385 (-40.4) |
| **CSO Estimate** | | | | | | | | |
| 3. Gross Fixed Capital Formation of the Private corporate sector (NAS,CSO) | 21322 | 35391 (66.0) | 42251 (19.4) | 51388 (21.6) | 59332 (15.5) | 97062 (63.6) | 118149 (21.7) | 122705 (3.9) |
| **RBI studies on Corporate Investment Forecast** | | | | | | | | |
| 4. Investment (Private Corporate Sector) | 19079 | 19884 (4.2) | 26777 (34.7) | 33362 (24.6) | 41948 (25.7) | 65074 (55.1) | 71446 (9.8) | 71479 (0.0) |
| 5. Share of RBI estimates | | | | | | | | |
| a) 4 as % of 1 | 78.5 | 65.0 | 74.3 | 122.6 | 70.5 | 94.1 | 89.4 | 99.6 |
| b) 4 as % of 2 | —- | 93.9 | 88.7 | 196.7 | 85.0 | 99.5 | 110.9 | 186.2 |

Figures in brackets indicate growth rates

under construction, does not get reflected in the ASI data. In particular, capital expenditure incurred by existing companies in new factories is not covered in the ASI, as also a portion of fixed investment in land and buildings, administrative premises, staff quarters, townships etc. It may also be noted that while for the ASI an operating factory is the primary unit for selection, for the RBI studies on short-term corporate investment forecast the assisted project is the basic unit. Other factors, which may also have to be considered in this respect are, differential treatment for revaluation of fixed assets, and capital work–in-progress.

Further, the RBI data on company finances may perhaps be considered a more reliable indicator among the two, being, as it were, based on audited (and, by implication more reliable) annual accounts, as compared to the data collected in the ASI at the factory level. However, as already mentioned, the selection of companies for RBI studies on company finances is, to some extent, purposive, and aimed at covering a larger segment of corporate operations. Perforce, the global estimates of GFCF in the private corporate sector are worked out using blow-up factors based on the data on paid-up capital of companies in the DCA list. But, foremost of all reasons for the high

level of incompatibility between estimates from these two sources could be the more fundamental differences between the population frame of companies and factories. When we view the corporate investment as emerging from the RBI studies based on time-phasing of corporate projects assisted by the institutional agencies and those available from the regular company finances studies of RBI with similar estimates of ASI, the ASI estimates turned out to be lower consistently during the years 1990-91 to 1997-98 and more importantly growth trends as emerging from the two data series were out of alignment.

As mentioned in the preceding discussion, the divergence observed among the different series on growth trends of corporate investment are, *inter-alia,* attributable to the definitional, conceptual and coverage factors. In the strict sense, we do not have independent data series of growth trends of corporate sector, which can be compared with the investment forecast series of assisted corporate projects. A point which needs to be highlighted here is that the chief merit of corporate investment forecast series of assisted projects, is that this series covers the investment of under-construction projects better than the series of the NAS or RBI's studies on the finances of public and private limited companies. On the balance, the growth trends emerging from the data series on investment of assisted projects indicate the direction of corporate investment, a year ahead - a lead indicator - fairly well and more importantly these data are available with the minimal timelag.

In this context, it is necessary to recall the important recommendations made by the National Statistical Commission (NSC) in regard to the data of the corporate sector. The NSC observed that the RBI studies on Company Finances are based on the annual reports and balance sheets of certain sample companies. In the absence of a reliable population frame, the RBI is not in a position to apply suitable sampling techniques. Further, the RBI is also constrained by the poor response from companies and non-receipt of annual reports directly from the ROCs. The RBI's findings are, thus, based mainly on the data of responding companies and the Fact Sheets prepared by the DCA. The reliability of the estimates of savings and investment

in the private corporate sector arrived at by blowing up the sample results available from the RBI's studies in proportion of the coverage of the paid-up capital (PUC) of the sample companies to the PUC to all companies has been questioned time and again. Major recommendations that need to be mentioned in this context are:

- A one-time census of all registered companies to create a frame by eliminating closed down and defunct companies should be conducted. This will also facilitate the estimation of population parameters.
- The Registrars of Companies (ROCs), vested with the responsibility of allotting the Corporate Index Number (CIN), should monitor the submission of Annual Reports rigorously for a proper implementation of the Act and for purposes of annual updation of the frame as well as improvement of the database.
- In the long run, this process of assigning CINs along with updation in respect of closed down and defunct companies would result in a complete frame. It should be made compulsory through the provisions of the Companies Act to mention the unique code (CIN) in all returns submitted by the companies.
- Since some attributes, like listing status, ownership, industrial activity and State of registration are likely to change over a period of time, the CIN should take into account the likely changes in these attributes with the passage of time, to maintain the continuity in information at the individual company level.
- At present, the DCA or ROCs are not processing the information contained in the Annual Reports and Balance Sheets. They should be entrusted with the responsibility of processing and dissemination of information in respect of a set of variables for monitoring and policy formulation. To accomplish these tasks, suitable strengthening of the statistical personnel should be provided.
- The DCA should also ensure that annual reports of companies required by RBI whether listed, deemed or private limited are available to RBI so that further detailed analysis can be conducted. A mechanism for smooth supply of annual reports of

all companies, both public limited and private limited, and both listed and non-listed, should be mutually agreed upon by the DCA and RBI.

In regard to the Annual Survey of Industries, the Commission had observed that a large number of units, which are qualified for inclusion in the Chief Inspector of Factories (CIF) list, have not been included and at the same time many defunct units have not been removed. The data generated by the ASI system based upon this deficient ASI frame do not, therefore, depict the true situation of organised industrial sector. Urgent steps should be taken for making the ASI frame more comprehensive by including in it all units that are eligible for registration with the CIF, followed by an appropriate updating mechanism. With the objective of generating reliable benchmark estimates at the disaggregated level, of providing an efficient weighting diagram for revision of the base year of Index of Industrial Production and also of updating the ASI frame, the commission has recommended a one-time census of units eligible for registration. The estimates of different variables of industrial statistics derived by the ASI are often associated with large sampling and non-sampling errors. To enhance the credibility and utility of these estimates, sampling errors need to be published along with the estimates of important survey characteristics. Further, a periodic review of the sampling design and of the sample size in the ASI must be undertaken with the objective to improve the precision of the estimates at the industry-group levels.

It is, therefore, necessary that the above far-reaching recommendations of the NSC are implemented with all earnestness. With the changes becoming reality the methods of short-term forecasting of corporate investment can further be refined with a view to improving their reliability further.

We would, however, like to stress that the reference to the limitations of independent data series of the NAS, ASI on the fixed capital investment of the private corporate sector, is incidental to the comparison of growth rates of corporate investment derived from these data series, attempted in this paper and does not intend to be

critique on their relative merits/demerits. These independent data series indeed shed valuable light on the several facets of the corporate activities over the years.

## Section III

## Corporate Investment - Intentions versus Actual

The projections made on the basis of time phasing of corporate investment will be reliable to the extent corporates adhere to investment plan envisaged at the time of sanction of projects by the institutional agencies. The relevant question, which often crops up in this context is, to what extent corporates realise their investment intentions. In search of an answer to the question, we have made an attempt to juxtapose the data of the phasing of capital expenditure of assisted projects of companies with the data on gross fixed capital formation as derived from their annual accounts, with a view to arrive at some measure of realisation of the intention of fixed capital investment. In this exploratory but indicative exercise, the focus was on corporates, which had undertaken projects each with an aggregate cost of Rs. 25 crores and above in years upto 1998-99. For the year 1998-99, 70 such companies planned to invest about Rs.24,600 crore and annual accounts of these companies showed the gross fixed assets formation (change in the gross fixed assets during 1998-99) was of the order Rs.18,800 crore and the realisation ratio (ratio of gross fixed capital formation to planned investment) worked out to 76.3 per cent. In the preceding year, 1997-98, 68 companies planned to invest about Rs. 26,700 crore and annual accounts of these companies showed the gross fixed capital formation of about Rs. 24,300 crore with the realisation ratio working out to 91.1 per cent. A limitation to be noted is that the gross fixed capital formation of the companies as derived from the annual accounts of companies may include capital expenditure other than that envisaged for the assisted projects and to that extent realisation ratio may have some upward bias. These data indicated that at the aggregate level, the planned fixed capital investment is fairly in alignment with the actual investment. At least it would indicate that realisation may not be very low, as one might fear. It may, however, be stressed that further detailed work needs to be taken up in this area, before we arrive at a more definite conclusion.

## Section IV
## Flow of Corporate Investment

The annual studies on short-term forecast of corporate investments also provide valuable information on fixed capital investment according to industry, state and purpose of projects. Cost of assisted corporate projects, in the year of sanction, is classified according to these characteristics and a snapshot view of major features emerging through these data is presented here.

Over quinquennial intervals from 1975 to 1999-2000, industry groups, which occupied top slot, claiming the largest share in the total cost of projects, were automobiles and cycles in 1975 (18.6 per cent), metals and metal products in 1980 (24.8 per cent), pesticides and fertilizers in 1985 (19.1 per cent), metals and metal products in 1990 (26.2 per cent), chemical and petrochemicals in 1994-95 (27.0 per cent) and power (electricity, gas and steam) in 1999-2000 (19.9 per cent) (Table 5).

**Table 5: Pattern of Corporate Investment according to Major Industries**

*Continued*

| Year | Industry | % share | Industry | % share | Industry | % share |
|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1975 | Automobiles and Cycles | 18.6 | Metals & Metal Products | 16.7 | Cement | 12.1 |
| 1980 | Metals & Metal Products | 24.8 | Textiles (other than Jute) | 17.5 | Cement | 15.2 |
| 1985 | Pesticides & Fertilisers | 19.1 | Cement | 15.7 | Chemicals & Petrochemicals | 14.9 |
| 1990 | Metals & Metal Products | 26.2 | Chemicals & Petrochemicals | 22.1 | Textiles ( other than Jute) | 8.0 |
| 1994-95 | Chemicals & Petrochemicals | 27.0 | Electricity Gas & Steam | 17.7 | Textiles ( other than Jute) | 14.1 |
| 1995-96 | Chemicals & Petrochemicals | 28.2 | Metals & Metal Products | 19.1 | Electricity Gas & Steam | 7.8 |
| 1996-97 | Metals & Metal Products | 17.2 | Automobiles and Cycles | 16.4 | Chemicals & Petrochemicals | 13.5 |
| 1997-98 | Electricity Gas & Steam | 21.8 | Metals & Metal Products | 11.6 | Chemicals & Petrochemicals | 11.1 |
| 1998-99 | Electricity Gas & Steam | 30.5 | Metals & Metal Products | 12.8 | Chemicals & Petrochemicals | 10.8 |
| 1999-00 | Electricity Gas & Steam | 19.9 | Storage, Roads and Ports | 15.8 | Metals & Metal Products | 14.7 |
| 2000-01 | Electricity Gas & Steam | 30.6 | Storage, Roads and Ports | 22.1 | Metals & Metal Products | 10.3 |

***Note: For details Statement 1 may be referred .***

**Table 5: Pattern of Corporate Investment according to Major Industries**

*Concluded*

| Year | Industry | % share | Industry | % share | Combined share of top five industries | Total cost of projects (Rs. Crore) |
|---|---|---|---|---|---|---|
| (1) | (8) | (9) | (10) | (11) | (12) | (13) |
| 1975 | Chemicals & Petrochemicals | 11.9 | Rubber Products | 11.8 | 71.1 | 784 |
| 1980 | Chemicals & Petrochemicals | 10.3 | Pulp, Paper & Paper Products | 5.3 | 73.1 | 1,669 |
| 1985 | Textiles (other than Jute) | 13.1 | Metals & Metal Products | 11.4 | 74.2 | 4,070 |
| 1990 | Automobiles and Cycles | 7.2 | Cement | 4.3 | 67.8 | 17,040 |
| 1994-95 | Metals & Metal Products | 13.1 | Food Products | 2.8 | 74.7 | 60,582 |
| 1995-96 | Textiles (other than Jute) | 7.5 | Cement | 6.8 | 69.4 | 69,009 |
| 1996-97 | Textiles (other than Jute) | 7.9 | Electricity Gas & Steam | 7.0 | 62.0 | 56,669 |
| 1997-98 | Telecom | 8.5 | Textiles (other than Jute) | 6.2 | 59.2 | 61,950 |
| 1998-99 | Telecom | 8.6 | Automobiles and Cycles | 6.3 | 69.0 | 65,932 |
| 1999-00 | Chemicals & Petrochemicals | 10.3 | Telecom | 7.3 | 68.0 | 47,009 |
| 2000-01 | Telecom | 9.8 | Chemicals & Petrochemicals | 7.5 | 80.3 | 69,400 |

**Note:** For details Statement 1 may be referred .

In fact, in the last four years from 1997-98 to 2000-01, power sector was at the top, with the share varying from 19.9 per cent to 30.6 per cent. Old economy industries like engineering (metals and metal products), chemicals & petrochemicals and infrastructure projects by and large occupied the second and third positions in these years. The top five industry groups together claimed a lion's share (bulk pertaining to engineering, chemical and infrastructure industries) of the total cost of projects and it was generally in the range of 68.0 - 75.0 per cent (lowest at 59.2 per cent in 1997-98 and highest at 80.3 per cent in 2000-01).

Bulk of the corporate investment seemed to flow to five major states, accounting for about three-fourths of the cost of corporate projects (Table 6). While Uttar Pradesh occupied the top position in

## Table 6: Pattern of Corporate Investment according to Major States

*Continued*

| Year | State | % share | State | % share | State | % share |
|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| 1985 | Uttar Pradesh | 25.2 | Maharashtra | 16.2 | Tamil Nadu | 8.8 |
| 1990 | Maharashtra | 26.6 | Gujarat | 18.6 | Bihar | 12.4 |
| 1994-95 | Gujarat | 24.8 | Maharashtra | 17.3 | Tamil Nadu | 12.4 |
| 1995-96 | Gujarat | 30.0 | Maharashtra | 15.0 | Karnataka | 11.4 |
| 1996-97 | Gujarat | 24.0 | Maharashtra | 14.2 | Uttar Pradesh | 12.0 |
| 1997-98 | Tamil Nadu | 21.1 | Gujarat | 19.5 | Maharashtra | 13.4 |
| 1998-99 | Maharashtra | 29.2 | Gujarat | 18.5 | Tamil Nadu | 13.6 |
| 1999-00 | Maharashtra | 23.4 | Tamil Nadu | 16.1 | Gujarat | 14.3 |
| 2000-01 | Gujarat | 20.2 | Maharashtra | 17.4 | Tamil Nadu | 16.5 |

| Year | State | % share | State | % share | Combined share of top five States | Total cost of projects (Rs. Crore) |
|---|---|---|---|---|---|---|
| (1) | (8) | (9) | (10) | (11) | (12) | (13) |
| 1985 | Rajasthan | 8.4 | Madhya Pradesh | 7.2 | 65.8 | 4,070 |
| 1990 | Madhya Pradesh | 8.4 | Andhra Pradesh | 7.5 | 73.5 | 17,040 |
| 1994-95 | West Bengal | 11.7 | Karnataka | 6.5 | 72.7 | 60,582 |
| 1995-96 | Tamil Nadu | 7.7 | Madhya Pradesh | 6.7 | 70.8 | 69,009 |
| 1996-97 | Tamil Nadu | 9.3 | Andhra Pradesh | 8.2 | 67.7 | 56,669 |
| 1997-98 | Andhra Pradesh | 11.8 | Madhya Pradesh | 7.5 | 73.3 | 61,950 |
| 1998-99 | Karnataka | 6.1 | West Bengal | 6.0 | 73.4 | 65,932 |
| 1999-00 | Andhra Pradesh | 10.9 | Orissa | 8.4 | 73.1 | 47,009 |
| 2000-01 | Andhra Pradesh | 13.1 | Uttar Pradesh | 7.8 | 75.0 | 69,400 |

**Note:** For details Statement 2 may be referred .

1985 (share of 25.2 per cent), Maharashtra (26.6 per cent), Gujarat (24.8 per cent) were in the top slot in 1990 and in 1994-95 respectively. During the period 1995-96 to 2000-01, Gujarat occupied the top position (in 1995-96, 1996-97 and 2000-01) and Maharashtra was top in 1998-99 and 1999-2000. Over the last fifteen years, the top two positions were usually claimed either by Gujarat or Maharashtra. The share of the top five states, over this period moved usually in a narrow band of 72.0 per cent to 75.0 per cent. These data clearly indicate that the corporate investment is taking place mostly in the western and southern regions of the country.

In 1990, projects for expansion (25.2 per cent), modernisation (24.9 per cent) and new projects (18.7 per cent) together accounted for 68.8 per cent of the total cost of projects (Table 7).

In 1994-95, new projects (60.9 per cent) predominated the scene and in the later years, the share varied between 43.0 per cent (1995-96) and 77.1 per cent (2000-01). In the second half of 1990s, the combined share of new projects and projects for expansion was in the range of 77.8 per cent to 88.1 per cent.

**Table 7: Pattern of Corporate Investment according to Major Purposes**

| Year | Top three purposes | | | | | | | Total cost of projects (Rs. Crore) |
|---|---|---|---|---|---|---|---|---|
| | Purpose | % share | Purpose | % share | Purpose | % share | Combined share of top three purposes | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 1990 | Expansion | 25.2 | Modernisation | 24.9 | New projects | 18.7 | 68.8 | 17,040 |
| 1994-95 | New projects | 60.9 | Expansion | 22.3 | Diversification | 9.9 | 93.1 | 60,582 |
| 1995-96 | New projects | 43.0 | Expansion | 34.8 | Diversification | 11.3 | 89.1 | 69,009 |
| 1996-97 | Expansion | 53.0 | New projects | 30.2 | Overrun | 7.3 | 90.5 | 56,669 |
| 1997-98 | New projects | 68.7 | Expansion | 15.3 | Overrun | 6.8 | 90.8 | 61,950 |
| 1998-99 | New projects | 49.0 | Expansion | 31.4 | Overrun | 16.3 | 96.7 | 65,932 |
| 1999-00 | New projects | 52.6 | Expansion | 26.5 | Overrun | 13.3 | 92.4 | 47,009 |
| 2000-01 | New projects | 77.1 | Expansion | 11.0 | Overrun | 9.8 | 97.9 | 69,400 |

**Note:** For details Statement 3 may be referred .

## Section V
## Summary of Observations

Investment is more subject to relatively larger variations from one period to the next than consumption because of the postponability of capital expenditures, the volatility of factors affecting profit expectations, and the role of external financing. Since variations in investment can affect the levels of economic activity significantly, any fresh clues on the likely movement of this variable will be of considerable value to the forecaster. In countries like Australia, Japan, the UK and the USA, forecasts of corporate investment intentions are based on well-organised surveys of investment intentions of companies and the likely investment is predicted on the basis of these intentions. Such surveys were attempted in India in the late 1980s and also the late 1990s but the response from the companies as also the quality of data did not turn out to be adequate for attempting short-term forecast of corporate investment. Over three decades ago, Dr. C. Rangarajan developed an elegant yet an operationally simple model of short-term forecasting of corporate investment in 1970 based on time-phasing of capital expenditure of corporate projects financed by the leading term-lending institutions. This paper presents a retrospective view of the short-term forecasts of corporate investment over the last three decades with the twin objectives of examining, (i) as to how these short-term forecasts of corporate investment have performed over the last three decades and (ii) to what extent the objectives of the forecasting exercise have been fulfilled. Dr. C. Rangarajan extensively dealt with various issues connected with the short term forecasting of corporate investment, both theoretical as well as practical aspects, from different angles. Various approaches to forecasting, inter alia, based on data on sources of funds for corporate investment as also forecasting corporate investment with data of term-lending institutions, were systematically explored. Utility of behavioural and non-behavioural forecasting schemes were examined. Finally, what emerged was that data on investment intentions were found to be more useful in making short-term forecast of corporate investment. An alternative approach based on the same idea then stemmed from the nature of the financing of the projects in India. Interestingly, this approach is equally valid even after the lapse of three decades. There is a perception that the corporate

investment estimated on the basis of the corporate projects financed by the financial institutions may not represent well, the trends of the corporate sector. With a view to examining the validity of this proposition, we explored relationship between the envisaged corporate investment and the Gross Fixed Capital Formation (GFCF) of the private corporate sector, as available from the National Accounts Statistics (NAS).

Firstly, the series of *ex-post* gross fixed capital formation (GFCF) of the private corporate sector and the series of *ex-ante* envisaged fixed capital expenditure of assisted corporate projects are co-integrated. Secondly, growth trends of corporate investment, based on (i) revised series and (ii) GFCF of the NAS when juxtaposed (Chart 2), indicate that growth trends based on the revised series could capture the direction of growth rates fairly well. It needs to be, however, stressed that other databases like the NAS have also their own limitations, and cannot be taken to be providing exhaustive and superior estimates. It would, therefore, be reasonable to conclude that the corporate investment forecasted following Dr. C. Rangarajan's model was fairly in alignment with the trends depicted by the other independent source say, National Accounts Statistics and would serve as lead indicator of growth of corporate investment. Some attempts were made to compare the forecasted capital expenditure with the estimates available from the Annual Survey of Industries, with a view to obtaining an idea of the share of gross fixed capital formation of the companies covered in the RBI studies in that of the factory sector. It is observed that the ASI estimates in general were of much lower order during the years 1990-91 to 1997-98 and more importantly growth trends as emerging from the two data series were out of alignment. The National Statistical Commission made far-reaching recommendations relating to database of corporate sector. With the changes consequent upon the implementation of the recommendations becoming a reality, the methods of short-term forecasting of corporate investment can further be refined with a view to enhancing their predictive power.

Another relevant question, which often crops up is to what extent corporates realise their investment intentions. An exploratory but indicative exercise was attempted by comparing the time-phasing of projects of some companies assisted by financial institutions with

the actual investment measured from annual accounts of those companies, as the change in the gross fixed assets during the accounting year, for the years 1997-98 and 1998-99. These data indicated that at the aggregate level, the envisaged gross fixed capital expenditure of these companies at the time of seeking assistance was fairly in alignment with the actual investment. It may, however, be stressed that further detailed work needs to be taken up in this area, before we arrive at a more definite conclusion.

The annual studies on short-term forecast of corporate investment also provide some interesting data on fixed capital flows according to industry, location and purpose of projects. The top five industry groups claimed a lion's share (bulk pertaining to engineering, chemical and infrastructure industries) of the total cost of projects and it was usually in the range of 68.0 - 75.0 per cent over the years 1975 to 2000-01. Like-wise these data also clearly indicated that the corporate investment was taking place in five or six large states, and mostly confined to the western and the southern regions of the country.

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**Statement 1 : Industry-wise Distribution of Total Cost of Projects (continued)**

(Per cent share)

| Indusry | 1975 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|---|---|---|
| Metals and Metal Products | 16.7 | 12.8 | 22.0 | 11.9 | 24.8 | 10.6 | 14.8 | 11.9 |
| Automobiles and Cycles | 18.6 | 4.3 | 1.1 | 4.6 | 3.2 | 7.6 | 3.9 | 9.9 |
| Electrical Equipment | 2.7 | 1.7 | 2.3 | 3.2 | 4.5 | 2.8 | 2.2 | 4.4 |
| Electronics | – | – | – | – | – | – | 1.4 | 1.5 |
| Non-Electrical Machinery | 5.5 | 2.9 | 2.2 | 4.0 | 5.0 | 2.4 | 2.8 | 3.0 |
| Chemicals & Petrochemicals | 11.9 | 2.8 | 6.4 | 12.5 | 10.3 | 2.6 | 12.2 | 14.8 |
| Pharmaceuticals & Drugs | – | – | – | – | – | – | 0.5 | 0.5 |
| Pesticides & Fertilisers | 2.0 | 24.2 | 1.6 | 22.6 | 3.7 | 3.4 | 3.7 | 0.9 |
| Cement | 12.1 | 6.5 | 8.0 | 11.2 | 15.2 | 8.9 | 17.6 | 27.6 |
| Electricity Gas & Steam | 3.8 | 5.0 | 27.6 | 2.9 | – | 7.9 | 6.5 | 1.6 |
| Construction | – | – | – | – | – | – | – | – |
| Textiles (other than Jute) | 3.0 | 13.4 | 18.8 | 16.1 | 17.5 | 31.9 | 16.7 | 9.8 |
| Sugar | 1.1 | 3.6 | 2.3 | 0.7 | 1.4 | 1.0 | – | 0.8 |
| Food Products | 0.2 | 0.6 | 0.3 | 0.6 | 0.3 | – | 1.3 | 1.9 |
| Rubber Products | 11.8 | 1.4 | 1.2 | – | 2.5 | 1.6 | 3.0 | 4.5 |
| Pulp, Paper & Paper products | 4.1 | 15.5 | 2.9 | 5.1 | 5.3 | 4.4 | 2.0 | 2.2 |
| Printing & Publishing | – | – | 0.2 | – | – | 2.3 | 2.1 | 0.5 |
| Glass & Pottery | 2.6 | – | 2.3 | 2.1 | 0.5 | 1.1 | 0.4 | 1.6 |
| Transport | – | – | – | – | – | – | – | – |
| Hotels | – | – | – | – | – | – | – | – |
| Storage,Roads and Ports | – | – | – | – | – | – | – | – |
| Telecom | – | – | – | – | – | – | – | – |
| Others | 4.0 | 5.3 | – | 2.2 | 5.8 | 11.4 | 8.8 | 2.5 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| **(Total cost of projects in Rs crore)** | **(784)** | **(1129)** | **(1101)** | **(1182)** | **(1669)** | **(2641)** | **(1560)** | **(2280)** |

| Indusry | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|
| Metals and Messtal Products | 9.9 | 11.4 | 13.4 | 14.1 | 9.3 | 26.9 | 26.2 |
| Automobiles and Cycles | 8.2 | 3.2 | 10.5 | 4.9 | 2.6 | 1.2 | 7.2 |
| Electrical Equipment | 1.8 | 2.8 | 4.7 | 6.5 | 3.8 | 2.1 | 2.0 |
| Electronics | 1.0 | 0.4 | 3.9 | 2.4 | 1.1 | 4.1 | 4.1 |
| Non-Electrical Machinery | 2.8 | 2.9 | 3.8 | 2.4 | 4.2 | 3.9 | 3.3 |
| Chemicals & Petrochemicals | 9.3 | 14.9 | 14.0 | 13.3 | 27.2 | 18.7 | 22.1 |
| Pharmaceuticals & Drugs | 0.5 | 0.4 | 0.2 | 0.3 | — | 2.2 | 0.6 |
| Pesticides & Fertilisers | 4.6 | 19.0 | 8.9 | 12.3 | 16.1 | 0.4 | 1.0 |
| Cement | 12.0 | 15.7 | 14.3 | 11.7 | 8.4 | 4.4 | 4.3 |
| Electricity Gas & Steam | 12.8 | 6.2 | 4.7 | — | — | — | — |
| Construction | — | — | — | — | — | — | — |
| Textiles (other than Jute) | 18.7 | 13.1 | 8.9 | 17.3 | 4.1 | 15.0 | 8.0 |
| Sugar | 0.4 | — | 0.5 | — | 1.5 | 0.8 | 1.7 |
| Food Products | 1.2 | 1.0 | 2.2 | 2.4 | 2.4 | 1.8 | 0.9 |
| Rubber Products | 1.9 | 0.6 | 0.6 | 0.8 | — | 0.9 | 1.2 |
| Pulp, Paper & Paper products | 3.1 | 1.1 | 1.8 | 2.4 | 0.8 | 1.2 | 2.3 |
| Printing & Publishing | 1.8 | 0.5 | 0.2 | 0.2 | — | — | — |
| Glass & Pottery | 0.9 | 2.4 | 4.3 | 2.2 | 1.1 | 4.8 | 1.6 |
| Transport | — | — | — | — | — | — | — |
| Hotels | — | — | 0.7 | 2.2 | 2.8 | 2.2 | 0.9 |
| Storage,Roads and Ports | — | — | — | — | — | — | — |
| Telecom | — | — | — | — | — | — | — |
| Others | 9.2 | 4.2 | 2.4 | 4.3 | 14.5 | 9.5 | 12.6 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| **(Total cost of projects in Rs crore)** | **(3243)** | **(4070)** | **(4122)** | **(6080)** | **(10426)** | **(12050)** | **(17040)** |

## Statement 1: Industry-wise Distribution of Total Cost of Projects (concluded)

(Per cent share)

| Indusry | 1991-92 | 1992-93 | 1993-94 | 1994-95 | 1995-96 | 1996-97 | 1997-98 | 1998-99 | 1999-2000 | 2000-01 |
|---|---|---|---|---|---|---|---|---|---|---|
| Metals and Metal Products | 39.0 | 16.1 | 18.4 | 13.5 | 19.1 | 17.2 | 14.0 | 15.3 | 14.7 | 10.3 |
| Automobiles and Cycles | 1.3 | 2.1 | 2.3 | 2.3 | 1.8 | 16.4 | 2.2 | 7.5 | 1.2 | 0.4 |
| Electrical Equipment | 1.3 | 2.0 | 1.5 | 1.2 | 1.5 | 4.8 | 1.3 | 0.4 | 0.8 | 0.2 |
| Electronics | 2.9 | 2.2 | 1.6 | 1.6 | 2.2 | 1.5 | 1.2 | 1.2 | 1.0 | 1.9 |
| Non-Electrical Machinery | 1.1 | 1.6 | 0.9 | 0.7 | 1.1 | 1.8 | 0.5 | 0.7 | 1.4 | — |
| Chemicals & Petrochemicals | 10.0 | 27.8 | 32.7 | 27.9 | 28.2 | 13.5 | 13.3 | 13.0 | 10.3 | 7.5 |
| Pharmaceuticals & Drugs | 0.9 | 1.0 | 2.2 | 1.4 | 1.9 | 2.1 | 1.6 | 0.3 | 0.2 | 0.6 |
| Pesticides & Fertilisers | 2.2 | 5.1 | 0.6 | 0.2 | 1.8 | 3.2 | 0.3 | 2.7 | — | 1.6 |
| Cement | 6.0 | 4.5 | 6.6 | 2.8 | 6.8 | 3.9 | 2.4 | 1.8 | 3.5 | 2.7 |
| Electricity Gas & Steam | — | — | — | 17.7 | 7.8 | 7.0 | 21.8 | 30.5 | 19.9 | 30.6 |
| Construction | — | — | — | — | — | — | — | — | 3.1 | 1.0 |
| Textiles (other than Jute) | 9.6 | 16.6 | 9.5 | 14.6 | 7.5 | 7.9 | 7.5 | 3.5 | 7.1 | 3.2 |
| Sugar | 1.7 | 1.2 | 1.7 | 1.2 | 1.8 | 1.4 | 2.4 | 1.5 | 2.1 | 0.5 |
| Food Products | 1.9 | 2.8 | 2.4 | 2.9 | 1.8 | 1.6 | 1.9 | 0.7 | — | — |
| Rubber Products | 0.2 | 0.5 | 0.4 | 0.8 | — | 0.9 | 6.9 | 0.5 | — | — |
| Pulp, Paper & Paper products | 3.2 | 2.5 | 2.4 | 2.4 | 4.8 | 3.0 | 1.2 | 1.2 | 1.0 | 0.9 |
| Printing & Publishing | — | — | — | — | — | — | — | — | — | — |
| Glass & Pottery | 1.9 | 2.8 | 2.7 | 0.2 | — | 0.7 | — | — | — | — |
| Transport | — | — | — | 1.3 | — | 4.1 | 0.6 | 0.8 | 1.4 | — |
| Hotels | 0.7 | 0.5 | 0.7 | 0.9 | — | 1.8 | 3.4 | 1.5 | 3.4 | 2.3 |
| Storage,Roads and Ports | — | — | — | — | — | — | 3.9 | 2.9 | 15.8 | 22.1 |
| Telecom | — | — | — | — | 3.5 | 3.2 | 10.3 | 10.4 | 7.3 | 9.8 |
| Others | 16.3 | 10.7 | 13.5 | 6.3 | 8.5 | 3.9 | 3.3 | 3.7 | 5.8 | 4.2 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| **(Total cost of projects in Rs crore)** | **(24000)** | **(25829)** | **(35653)** | **(60582)** | **(69009)** | **(56669)** | **(61950)** | **(65932)** | **(47009)** | **(69400)** |

***Note: — Nil / negligible***

## Statement 2: State-wise Distribution of Total cost of Projects (continued)

(Per cent share)

| State/ Union territories | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|
| Andhra Pradesh | 7.0 | 5.9 | 20.0 | 7.1 | 8.3 | 7.5 |
| Bihar | 2.0 | 0.8 | 1.9 | 1.7 | 0.9 | 12.4 |
| Delhi | 0.7 | — | 1.4 | 1.7 | 1.1 | 0.5 |
| Gujarat | 6.9 | 28.1 | 13.5 | 21.8 | 27.3 | 18.6 |
| Haryana | 1.6 | 2.2 | 3.6 | 1.4 | 3.1 | 1.2 |
| Himachal Pradesh | 0.5 | 0.4 | 0.3 | 0.5 | 0.6 | 1.6 |
| Karnataka | 3.2 | 3.2 | 6.5 | 3.9 | 3.2 | 3.5 |
| Kerala | 0.5 | 1.8 | 0.6 | 0.5 | 0.4 | 0.5 |
| Madhya Pradesh | 7.2 | 7.4 | 3.8 | 5.8 | 4.5 | 8.4 |
| Maharashtra | 16.2 | 16.4 | 15.4 | 13.3 | 24.2 | 26.6 |
| Orissa | 0.8 | 1.6 | 1.8 | 3.8 | 2.4 | 1.1 |
| Punjab | 2.7 | 3.7 | 3.4 | 3.8 | 1.0 | 2.1 |
| Rajasthan | 8.4 | 4.2 | 8.0 | 9.9 | 2.2 | 2.0 |
| Tamil Nadu | 8.8 | 7.2 | 7.1 | 7.7 | 6.3 | 5.3 |
| Uttar Pradesh | 25.2 | 13.7 | 9.0 | 12.9 | 6.9 | 5.5 |
| West Bengal | 6.0 | 0.8 | 2.2 | 2.5 | 4.0 | 1.5 |
| Others | 2.2 | 2.5 | 1.4 | 1.8 | 3.6 | 1.6 |
| **Total** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** | **100.0** |
| **Total cost of Projects (Rs. Crore)** | **4070** | **4122** | **6080** | **10426** | **12050** | **17040** |

***Note: — Nil / negligible***

## Statement 2: State-wise Distribution of Total cost of Projects (concluded)

(Per cent share)

| State/ Union territories | 1991-92 | 1992-93 | 1993-94 | 1994-95 | 1995-96 | 1996-97 | 1997-98 | 1998-99 | 1999-00 | 2000-01 |
|---|---|---|---|---|---|---|---|---|---|---|
| Andhra Pradesh | 4.7 | 8.0 | 9.0 | 5.8 | 6.7 | 8.2 | 11.8 | 4.3 | 10.9 | 13.1 |
| Bihar | 14.5 | 2.0 | 0.3 | 0.1 | 1.4 | 1.9 | 0.2 | 4.0 | — | — |
| Delhi | 0.3 | 0.8 | 1.0 | 1.3 | 0.8 | 0.9 | — | — | 2.1 | 2.0 |
| Gujarat | 19.5 | 14.4 | 30.2 | 24.8 | 30.0 | 24.0 | 19.5 | 18.5 | 14.3 | 20.2 |
| Haryana | 1.6 | 2.4 | 1.8 | 1.1 | 2.8 | 3.1 | 1.2 | 2.7 | 1.0 | 1.3 |
| Himachal Pradesh | 3.1 | 0.7 | 0.3 | 3.0 | 0.6 | 0.6 | — | — | — | — |
| Karnataka | 2.0 | 10.5 | 1.7 | 6.5 | 11.4 | 3.7 | 5.5 | 6.1 | 4.3 | 3.8 |
| Kerala | 0.6 | 0.7 | 0.3 | 0.6 | 0.9 | 0.5 | 0.4 | 1.4 | 1.2 | 0.3 |
| Madhya Pradesh | 5.7 | 8.9 | 8.1 | 2.2 | 6.7 | 3.6 | 7.5 | 1.8 | 2.7 | 1.4 |
| Maharashtra | 15.2 | 24.2 | 17.7 | 17.3 | 15.0 | 14.2 | 13.4 | 29.2 | 23.4 | 17.4 |
| Orissa | 1.0 | 1.4 | 1.4 | 0.2 | 1.7 | 7.5 | 1.5 | 2.9 | 8.4 | 5.2 |
| Punjab | 1.8 | 4.5 | 2.5 | 2.0 | 1.5 | 1.8 | 2.3 | 0.5 | 4.5 | 5.7 |
| Rajasthan | 3.9 | 4.7 | 4.1 | 3.7 | 3.1 | 4.4 | 1.1 | 0.5 | — | — |
| Tamil Nadu | 6.9 | 5.2 | 5.9 | 12.4 | 7.7 | 9.3 | 21.1 | 13.6 | 16.1 | 16.5 |
| Uttar Pradesh | 7.3 | 8.8 | 11.7 | 3.8 | 6.1 | 12.0 | 5.2 | 5.0 | 4.1 | 7.8 |
| West Bengal | 10.4 | 1.7 | 1.7 | 11.7 | 1.3 | 2.7 | 5.9 | 6.0 | 4.6 | 0.9 |
| Others | 1.8 | 1.2 | 2.3 | 3.3 | 2.3 | 1.5 | 3.5 | 3.5 | 2.4 | 4.5 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** |
| **Total cost of Projects (Rs. Crore)** | **24000** | **25829** | **35653** | **60582** | **69009** | **56669** | **61950** | **65932** | **47009** | **69400** |

***Note: — Nil / negligible***

## Statement 3: Purpose-wise Distribution of Total cost of Projects

(Per cent share)

| Purpose | 1988 | 1989 | 1990 | 1991-92 | 1992-93 | 1993-94 | 1994-95 | 1995-96 | 1996-97 | 1997-98 | 1998-99 | 1999-00 | 2000-01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New projects | 46.0 | 33.4 | 18.7 | 12.4 | 29.1 | 56.6 | 60.9 | 43.0 | 30.2 | 68.7 | 49.0 | 52.6 | 77.1 |
| Modernisation | 15.0 | 12.9 | 24.9 | 23.9 | 8.7 | 4.4 | 3.0 | 2.6 | 3.6 | 2.5 | 2.3 | 2.7 | 1.6 |
| Diversification | 8.5 | 30.4 | 12.1 | 3.1 | 9.9 | 11.6 | 9.9 | 11.3 | 3.9 | 5.8 | 0.7 | 4.5 | 0.2 |
| Overrun | 7.3 | 4.2 | 3.7 | 6.3 | 14.2 | 4.2 | 1.4 | 4.3 | 7.3 | s6.8 | 16.3 | 13.3 | 9.8 |
| Expansion | 19.3 | 14.3 | 25.2 | 44.4 | 21.2 | 20.3 | 22.3 | 34.8 | 53.0 | 15.3 | 31.4 | 26.5 | 11.0 |
| Eqipment Finance | 2.6 | 2.4 | 1.9 | 1.6 | 1.2 | 1.8 | 0.8 | 1.3 | 1.9 | — | — | — | — |
| Rehabilitation | 0.8 | 0.7 | 1.6 | 1.0 | 1.0 | — | 0.2 | — | 0.1 | — | — | — | — |
| Others | 0.5 | 1.6 | 12.0 | 7.3 | 14.6 | 1.1 | 1.6 | 2.7 | — | 1.0 | 0.2 | 0.4 | 0.3 |
| ***Total*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** | ***100.0*** |
| **Total cost of projects (Rs. Crore)** | **10,426** | **12,050** | **17,040** | **24,000** | **25,829** | **35,653** | **60,582** | **69,009** | **56,669** | **61,950** | **65,932** | **47,009** | **69,400** |

***Note: — Nil / negligible***

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# *Book Reviews*

## The Subsidy Syndrome in Indian Agriculture by Ashok Gulati and Sudha Narayanan, Oxford University Press, New Delhi, 2003, pages 297, Price Rs.695

The Uruguay round of Agricultural Agreements (URAA) has brought subsidies in to sharp focus as it seeks to bring the world of trade under some discipline; its objective is to reduce trade-distorting subsidies. This has compelled countries to reappraise their policies on subsidies *vis-à-vis* the URAA/World Trade Organisation (WTO) negotiations. A common methodological framework has been devised to evaluate the Aggregate Measure of Support (AMS) (comprising Product Specific Support and Non Product specific Support) extended to Agriculture. These measures are treated as trade distorting if they are above a *de minimus* level. In developed countries, support is extended to agriculture through high output prices. In India input prices are subsidised and output prices controlled. The authors' major thesis is that this has a negative impact on Agriculture. As output prices are not in congruent with export/import parity prices, implicitly agriculture is taxed.

The book is organised in to six chapters. The key issues addressed by the authors' in the first three chapters are definitional. Chapter one sets out the scope of the study and discusses the composition of subsidies to agriculture. Chapter two considers India in a Global setting and appraises the position of India *vis-à-vis* major countries in terms of support to agriculture. It also delineates the steps being taken by developed countries to reduce support to agriculture and the pace of reform. The authors have evaluated the magnitude of product and non-product specific support to agriculture in India. Chapters 3, 4 and 5 discuss the three major input subsidies *viz.*, Fertilisers, Power and Irrigation, which constitute the bulk of agricultural subsidies. In the last Chapter, the authors present a synoptic overview of input subsidies in Indian Agriculture, pricing policy framework and the

overall implications for policy. The three basic questions the book raises are:

1. Whether subsidies are financially sustainable?
2. Do they promote efficiency in resource use while sub-serving equity and welfare considerations?
3. Who benefits?

The analysis is in line with the general perception that the pricing of critical inputs to Indian agriculture is highly subsidised and distorted and does not sub-serve equity or efficiency considerations.

Chapter 3 contains a detailed analytical study of Fertiliser subsidy and its existing pricing policy framework. It discusses the distortions created by fertiliser subsidy, and fertiliser pricing. The authors discuss how Nitrogenous ,Phosphatic and Potassic (NPK) components are being utilised in proportions deviant from prescribed norms leading to environmental degradation. In 1999-2000 the NPK use ratio is estimated to be 6:9:27:1 as against 8.5:3:1:1 in 1998-99 whereas the desirable ratio is 4:2:1 Corrections in fertiliser pricing would lead to a more balanced application of fertilisers. The authors have also discussed the findings of 'The High Power Fertiliser Pricing Policy Review Committee set up under C.H. Hanumantha Rao in January 1997 and the Report of the Expenditure Reforms Commission. The authors conclude that, the fertiliser subsidy benefits the fertiliser industry more than the farmers it is meant. Although farmers receive lower fertiliser prices, the gains of input subsidisation are offset by controls on the output prices of wheat and rice, which are the major consumers of fertilisers, and hence there is an implicit tax on farmers. The options available for fertilisers policy reforms have been detailed. The Big Bang approach as an option entails the abolition of Retention Pricing Scheme (RPS), decentralisation of urea imports, raising farmers' prices by 10 to 14 per cent and giving a flat rate subsidy of Rs.1,500 on imported urea and Rs.2,000 on domestically produced urea. Besides the above, dealing with the more vexed questions of power subsidies in agriculture, power pricing policy framework for agriculture and the performance of State Electricity Boards (SEBs) are vital areas fro reform. The authors conclusively establish

that the inefficiency of SEBs has contributed significantly to the deterioration of the fiscal position of the States. The huge losses of SEBs are attributed to the growing cost of power supply in combination with the SEBs pricing policy towards agriculture. The increasing cost of power supply has been the result of: (a) low levels of operational efficiency; (b) high rates of transmission and distribution losses on the one hand; and (c) high cost of expanding rural electrification. The authors have also stated that the fixing of power tariff has been at the discretion of State Governments rather than SEBs. They have estimated the degree and trends of power subsidies to agriculture and analysed the share of States by region; Northern Region cornered the bulk of power subsidy with 46 per cent share, followed by Western Region and Southern Regions with 26 per cent and 21 per cent respectively. The authors conclude that the existing method of fixing agricultural tariff encourages inefficient practices by providing perverse incentives to the farmer**.** An important conclusion is that 'the rapidly increasing subsidies in power appear to deter public sector investments in agriculture that may slow down the growth process in agriculture particularly when private sector investment fails to fill up the growing vacuum of public sector investment. The authors analyse irrigation subsidy and approaches to quantifying irrigation subsidy in Chapter 5. They present policy framework and water usage at length and brings out clearly the physical constraints, the wastage and inefficiencies in water use and inequity caused by under-pricing of surface water which leads to intensive watering of fields by farmers at the head, leaving tail enders literally high and dry and also lowering productivity per unit of water used. This chapter also briefly touches on the major recommendations of the Vaidyanathan Committee (1992) on pricing of irrigation water and stresses the need for institutional reform and discusses the role of Water User Associations (WUA). The major recommendation of the Vaidyanathan Committee on the institutional front was that user groups should be involved in the management of their irrigation systems and their role should be gradually increased from 'management distributaries to main canal systems'. The success of the Baldev medium irrigation project, Pigut medium irrigation project where the WUAs are in charge of water management fixation of rates and their collection are discussed. There is also a reference to the Mohini Pilot Project in Gujarat where water is sold wholesale on volumetric basis to the Association by

the irrigation agency with the Association being responsible for the collection of water usage charges from its members. An interesting conclusion of this analysis is that there should be a statewide policy where institutions are designed to suit the physical, technical, legal and socio political framework of the States. To sustain these institutions farmers should be made co-owners of the systems through equity shares in a way that would allow them to participate in the management, design and constitution of irrigation projects.

In the concluding Chapter, the authors opine that viewing India in a Global frame it is time to review the current pricing Policy framework for inputs and reform it to ensure that it promotes growth, efficiency, equity as also financial and environmental sustainability.

Arguing for the conversion of subsidies into investments, the authors have stressed that while input subsidies are covered under the Amber Box in the Global Agreement on agricultural trade and thus have to be pruned, investments are permissible under the Green Box without any compulsion for reduction. They have concluded that increasing subsidies at the expense of investment in agriculture only serves to jeopardise growth in the agriculture sector. The policy of input subsidisation has failed to achieve its objective of ensuring equity and on the contrary it has created problems with regard to efficiency in input use coupled with financial sustainability concerns. Focusing on India's primary economic sector, this lucid and incisive study tackles a large number of issues of crucial importance, which are pertinent to the future growth and productivity of Indian Agriculture. The book is a useful piece of academic work. The regression exercises; charts, diagrams and tables containing valuable data will be of use to agrarian economists as also policy makers.

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**Free Trade Zones (FTZs) to Special Economic Zones (SEZs):- The Great Indian Dream by Thothathri Raman and Prof. Parag Diwan, Pentagon Press, New Delhi, 2002, pages 306, Price Rs 495.**

The Book "Free Trade Zones (FTZs) to Special Economic Zones (SEZs):- The Great Indian Dream" has dealt extensively with Special Economic Zones (SEZs) of China and Export Processing Zones (EPZs) of India, including a small topic on similar zones in other countries. The book, besides other factors look into the reasons for the failure of Indian EPZs. The book is divided into two sections. The first section comprehensively deals with the developments that resulted in the setting up of SEZs in India. This section gives an insight to the similar zones in other countries with special reference to the Chinese SEZs. The second section deals with the administrative procedures, notifications and documents with regards to setting up of these zones.

India is all set to open a number of SEZs all over the country to further increase country's exports and attract foreign investment. The controversies regarding SEZs such as, widening of regional inequality, labour exploitation increases the importance of any study on preferential zones. In one view, the attractiveness of special preferences in Special Economic Zones may fade away once the WTO policies are fully implemented, because as per the WTO rules, a country as whole may be considered as a preferential zone. However in a huge country like India setting up of SEZs may help to solve infrastructural problems in a relatively short period because of the focused approach on development of a specific area by pooling resources and expertise. In this context it may be indicated that, the medium term export strategy 2002-2007 points out that, a pragmatic solution to attract foreign investment in India and increase exports is to identify and prioritise specific infrastructure projects within SEZs.

According to the book under review, the Indian SEZs cannot be compared with Chinese SEZs, in respect of their size, the type of industries or even the economy of the country. The authors indicate

that merely demarcating a piece of acreage and calling it a SEZ is not going to solve the problem. What would spur investment in these zones is action matching the words and infrastructure matching expectations of the investors. It means declaration of setting up of EPZs/SEZs alone is not enough. Concrete measures has to be taken to put the policies into practice. A similar study by Ashok Kundra (2000), "The performance of India's Export Zones A comparison with the Chinese Approach" , points out that, India should learn from its own earlier EPZ experience which has been characterized by poor infrastructure, lack of objective clarity, centralized management structure and absence of linkages with the domestic economy.

China established its first special economic zone in Shenzen in the beginning of 1980's, as a virtual laboratory for experimentation with a free market economy. The abundance of cheap labor and customs free industrial environment has helped Shenzen. Some of the secrets of its success are the investments from Hong-Kong and Taiwan, fiscal incentives, delegation of powers (local governments were given powers to negotiate concessions with firms interested in investing in the SEZs ) and relaxed Labour laws. Shenzen was the first Chinese city to be given legislative authority which gave the city a control over local policy. Trade unions were ineffective in the SEZs. Contractual labour is permitted and hence, the costs of doing business are far lower. Authors mention that, the SEZ fitted very well with the psyche of the Chinese people as historically Chinese firms were encouraged to specialise in their core areas of competence.

A major drawback of the preferential trade region policy, is that although the southern coastal provinces have grown rapidly, the hinterland of China has been left behind. The book has not given adequate attention to problems faced by SEZs like, the bottlenecks in power, housing, diversion of agricultural land and widespread smuggling in the coastal provinces especially in some of the Chinese SEZs like Shenzen. The problem of migration to SEZs and resultant inflation in prices of even food articles is also a cause for concern. The spatial structure of the SEZs is generally unbalanced, since most of the shops are selling luxury consumer articles, while everyday goods are sometimes difficult to buy.

China's market economy is further developing and with more areas opening to the outside world, the rest of the country is gradually catching up. Many of the favorable policies, which once applied only to the SEZs, are now enjoyed by other regions. Although SEZs continued to be an entry point for new ideas to be introduced nationwide, SEZs may not be a suitable model for the western regions in China partly due to geographical differences. The proximity of such zones to near by trading groups /countries is important for the take off of these zones. It may be indicated that, Indian EPZs, unlike Chinese SEZs, are not having this geographical advantage. For example most of the Chinese SEZs are neighboring East Asian countries. As authors note, "Without the strong connection from Hong-Kong, Guangdong's SEZs may not have accelerated China's export". In this context it may be noted if the proposed free trade arrangements in South Asia develops, it may relatively help some of the zones in India like Positra SEZ (Gujarat), Mumbai (SEEPZ) and Cochin SEZ.

In the Chinese case, it may not be correct to presume that units set up in EPZs or SEZs are meant only for exports. That may be true for smaller countries such as UAE, South Korea or Taiwan, which have limited domestic market. But not for India or China which have large expanding markets. If foreign investors are to be lured to set up export-oriented units in SEZs, they need to be given incentives for domestic market access as well. Chinese SEZs have been exchanging 'market' for "technology"; for example in case of Shenzen SEZ, the Shenzen Provisional Technology Regulations had helped much in technology transfer to China. According to this regulation, the supplier is responsible for training the Chinese party and must ensure that the recipient masters the entire technology. India need to learn from the Chinese experience for evolving a win-win situation for all.

Regarding labour laws, the study points out that Chinese labour laws are loose and the foreign investors negotiate wages each time they receive a new export order. Foreign investors are free to hire or fire in the zone. There is, virtually, no uniform law for the SEZs. Each has introduced its own legislation to govern investment and approval procedures relating to FDI. Before the national policy on foreign

investment is passed, an SEZ promulgates its own legislation to test its effectiveness. SEZs in China are like a city rather than an industrial park. It may have a number of sub-zones, which would include an export processing zone, tourism zone etc. The book gives a detailed discussion on management of labour in the SEZs. India has merely stated the SEZs as public utilities under the Industrial Disputes Act. This will not serve much purpose as is borne out by the EPZ experience. Authors reproduces an article by a national trade union pertaining to the FTZs in the country about the unfriendly labour atmosphere in the zones. The instances like workers do not getting paid leaves and maternity leaves, instances of child labour etc are cited. It further says that zone authorities usually support the owners and neglect health and safety of the workers. The book under review does not make any specific comments on any of these allegations. The study should have made some comments on this and recommended some policy measures for Indian zones to avoid the labour disputes / problems to the maximum**.** It would have been very useful for grasping a comparative picture if the study has covered labour conditions in SEZs of China as well.

India was the first country in the Asia-Pacific region, to establish an FTZ at Kandla, Gujarat. Government of India has now permitted the development of EPZs in the private, state or joint sector. The cumulative exports from all the EPZs reached US $ 1117.5 millions in 1998-99 and they accounted for a share of only 3.9 per cent of Indian exports, against a desirable share of 5 per cent. According to the study, in India, FTZs operate in more or less the same manner as in almost all the other countries, and offer lucrative packages to entice the investors. India established its first SEZ in Positra, Gujarat. The tax incentive in this zone is for 15 years instead of 10 years in the existing FTZs.

The book also presents a brief discussion on Nanguneri zone. Nanguneri SEZ has been promoted by TIDCO, Tamil Nadu Industrial Development Corporation, which has since transferred its rights to ATMAC of the US and retained merely one per cent control over the project. Here author gives excessive focus on the geographical features of different regions, which may not be very relevant. Authors points out that land acquisition is the trickiest of the problems in setting up an SEZ. SEZs may do well to develop a network of partnerships and

stimulate the networks using the talents of the local population. It also gives a list of companies involved in building of the Indian SEZs like Jurong Town Corporation of Singapore, Sumitomo Corporation of Japan etc. The book presents a brief list of guidelines for setting up of a unit in SEZ, which will be informative to the corporate sector. The authors gives information on rules and regulations in India to set up liaison offices, project offices etc. Authors mentions that the Free Trade Area of the Americas (FTAA) would eventually replace the North Atlantic Free Trade Association (NAFTA). Most of the countries in the Americas belong to one of the five major regional economic organizations. Some of those organisations are NAFTA, CACM, the Andean Pact, CARICOM etc. with each claiming to a free trade area. These organizations are of particular importance now that the move is toward a hemispheric free trade by the year 2005.

The book strongly supports the view that greater delegation of power to local authorities is necessary for the success of SEZs. In China the local authorities of SEZs have power to grant approval for foreign investment upto US $ 30 million. There is very little intervention from state government and central government. This is in stark comparison to the operation of SEZs in India, where the local authorities do not have such legislative freedom. If appropriate support and powers are given to local authorities and state government by the central government the SEZs in India may be successful. Availability of skilled labour and English speaking population is an asset in India. Greater interaction between authorities in charge of Indian SEZs and other SEZs worldwide will be a helping factor. It is interesting to know from this study that the incentive package in India may even be a shade better than that of Chinese SEZs. But in relation to the labour laws and decentralisation of powers, it falls short of expectations. In this context it may be indicated that the draft cabinet note on the proposed SEZ act, had recommended vesting all power relating to the regulation of SEZs to the development commissioners (DCs), which may give the necessary legislative freedom to local bodies in India to promote SEZs in an effective manner.

In the epilogue author indicates that SEZs can survive only based on their uniqueness and attractiveness. The SEZ managements should

keep a track of the progress of the working of the SEZ units independent of the official agencies involved. Periodic statistics should be collected about the various aspects of units working in the zone. Frequent interaction between the units and management and a common media and communication strategy is a must. A common platform for marketing may be developed, quality of life of people should be ensured. The list of frequently asked questions on SEZs presented in the book is useful for readers of the subject. Section II of the book gives a detailed presentation of the procedures, notifications and documents relating to the setting up of SEZs.

Even though the book under review gives a detailed information on the preferential zones, the issues like the role of Chinese and Indian diaspora in the development of SEZs could have been addressed adequately. Chinese expatriates have played a major role in investment in Chinese SEZs. On these lines, the resources from NRIs may be utilised to develop emerging Indian SEZs. Linkage of industries in domestic tariff area and industries in SEZs is another area which the book has not explored much; for example policies regarding DTA sales by the SEZ units, collaboration between DTA firm and firm in SEZ, subcontracting etc. The earlier Indian EPZs linkage with the hinterland was checkmated by restrictive procedures for sub-contracting etc. Here it will be worth to point out the linkage strategy adopted by the Chinese SEZs; for example in China, inland enterprises had made use of the advanced techno-managerial skills etc from SEZs by establishing representative offices in SEZs, through training their personnel in zones etc. It is important to note here that Shenzen SEZ have invested heavily in inland provinces to build over 500 co-operatives projects. In retrospect we can say that the book is very timely and informative on the topic.

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