

**Innovation and Growth:  
Role of the Financial Sector**

**by**

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**for the  
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## **Innovation and Growth: Role of the Financial Sector**

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*'Accelerating productivity growth entails a matching acceleration in the potential output of goods and services and a corresponding rise in the real incomes available to purchase the new output. The problem is that the pickup in productivity tends to create even greater increases in aggregate demand than potential aggregate supply'—Alan Greenspan*

*'Whatever the supply side may have in store, delivering low and stable inflation—and being expected to do so—is how monetary policy can give sustainable growth its best chance'—John Vickers*

I am deeply honoured to be invited to deliver the Bharti Annual Lecture at the Entrepreneurship Development Institute of India. I thought that since I am speaking at this cradle of entrepreneurship it would be most appropriate for me to speak on "Innovation and Growth". Being in the central bank of the country, however, I should perhaps also focus on the role of the financial sector in fostering such innovation and growth. But you may still ask, what can a central banker say about innovation and entrepreneurship, since we are, by profession, supposed to be staid, boring and non-adventurous: among our key tasks is to provide financial stability.

As it happens, the subject of innovation and growth is very central to the concern of central banks. A key concern, in fact, the primary objective, of monetary authorities is to achieve low and stable inflation. A necessary ingredient for achievement of low inflation is the acceleration of productivity growth in an environment of high economic growth. When growth in productivity is high, a sustained increase in income, leading to sustained growth in demand can be managed with low inflation. So the quest for increasing productivity is of great interest to central bankers, and it is entrepreneurship and innovation that leads to productivity growth.

If I may add a personal note, I have had a long standing academic interest in the promotion of research and development, and hence of productivity. In fact, my first academic papers were on the measurement of productivity of research and extension in agriculture. Somewhat more recently, I also worked on European industrial and technology policy at the United Nations Institute for New Technologies in Maastricht in the mid 1990s. So I am very pleased to get this opportunity today to speak on innovation and growth in India.

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In view of the sharp acceleration in India's economic growth and the keen interest in its potential growth, in my talk today, I will, first, provide a brief overview of India's long-term growth performance. I will then attempt to set out the conditions for successful innovations. To assess the role of innovations in the Indian economy, I will document the estimated contributions of productivity gains to real GDP growth. I then focus on the role of financial sector reforms in contributing to innovation and growth. Finally, I will conclude by outlining the role of monetary policy in sustaining growth and innovations by ensuring price and financial stability.

### India's Growth Experience: An Overview

We are now passing through a period of remarkable change and very interesting times. For half a century before independence in 1947, there was hardly any discernible economic growth in the whole Indian sub-continent. We have come a long way from the growth of 3-3.5 per cent growth in 1950s, to around 5.5 per cent in 1980s, 5.8 per cent in 1990s, and most recently to a sustainable growth path of around 8.5 per cent plus (Table 1). But, what is even more striking is the fact that if we take into account the decline in the rate of population growth from 2.2 per cent for 40 years during 1960-90 to 1.8 per cent in the 1990s and further down to 1.6 per cent currently, the growth in per capita GDP has seen a tremendous push from around 1.6 per cent a year in the 1950s to around 7 per cent per year now.

<b>Table 1: Growth and Inflation in India - A Historical Record</b>			
(Per cent)			
<b>Period (Averages)</b>	<b>GDP Growth Rate</b>	<b>WPI Inflation Rate</b>	<b>GDP Growth Per Capita</b>
<b>1</b>	<b>2</b>	<b>3</b>	
1951-52 to 1959-60	3.6	1.2	1.6
1960-61 to 1969-70	4.0	6.4	1.7
1970-71 to 1979-80	2.9	9.0	0.6
1980-81 to 1990-91	5.6	8.2	3.3
1992-93 to 1999-00	6.3	7.2	4.2
2000-01 to 2006-07	6.9	5.1	5.3
2003-04 to 2006-07	8.6	4.9	7.1

**Source:** Reddy (2007).

With such a high rate of economic growth that we have now experienced in recent years, progress in the country is now very palpable. The growth is manifesting itself in many ways all across the country: innovation and entrepreneurship are in the air. Exciting changes are taking place in all spheres. Even in agriculture, which otherwise has exhibited low growth over the past decade, a great deal of innovation is taking place. You only need to look at the documentation done by the National Innovation Foundation, anchored at your neighbouring institution the Indian Institute of Management in Ahmedabad. Changes in public policy over the past couple of decades have indeed freed the entrepreneurial spirit of India. Our job as macroeconomic managers is to provide the overall environment for such entrepreneurship, innovation and growth to flourish.

What constitutes such an environment? Low and stable inflation is essential: high and uneven inflation enhances risk and is hence inimical to innovation and risk taking. Investment cannot take place without the availability of risk capital, buttressed by the availability of an adequate flow of credit to nurture the investment climate. Furthermore, the cost of money available must reflect appropriately the risk and opportunity cost of lending. Underpricing of risk can lead to excessive risk taking, and overpricing would lead to the converse. For people to take risk, to innovate and grow, to have confidence in the future, the environment of low and stable inflation has to be supported by the maintenance of overall financial stability. Finally, it is the existence of sound financial institutions that is necessary for the appropriate supply of financial resources to take place. It is the job of the central bank and other regulatory institutions to ensure the existence of such an overall financial environment.

The whole process of economic reforms, capital market forms, financial market reforms, banking reforms, and monetary policy reforms have all combined to provide such an environment. We need to ensure that this kind of growth environment – low and stable inflation and financial stability – is indeed maintained and sustained in the medium to long-term, so that in India entrepreneurship can flower and flourish further.

### **Conditions for Innovation and Growth**

The foremost economic thinker who talked about innovation was Joseph Schumpeter. He defined it to encompass any of a number of different features. The introduction of a new method of production would naturally embody some innovation. Indian industry has clearly embraced a host of new methods of production in recent years. Second, the opening of new markets also needs innovation in marketing approaches and techniques. The data collected in the Market Information Surveys of Households (MISH) by the National Council of Applied Economic Research (NCAER) amply demonstrate how new markets have been developed in the country, right since late 1980s. Third, the use of new sources of supply of raw materials also involves innovation. With trade liberalization, industry now has access to all raw materials and goods available in the world, so a great deal of innovation has been taking place in their procurement and use. A fourth possibility is innovation in new forms of industrial organization. With overall change taking place in the economic environment, we are also witnessing new forms of industrial organization on a regular basis. Thus, from all these four points of view, the pace of innovation has been very healthy in India since the early 1990s.

The National Knowledge Commission (2007) in its recent report titled "Innovation in India" has defined innovation in a similar fashion:

"as a process by which varying degrees of measurable value enhancement is planned and achieved, in any commercial activity. This process may be breakthrough or incremental, and it may occur systematically in a company or sporadically; it may be achieved by:

- introducing *new or improved goods or services* and/or
  - implementing *new or improved operational processes* and/or
  - implementing *new or improved organizational/ managerial processes*
- in order to improve market share, competitiveness and quality, while reducing costs."

Besides Schumpeter, there are others who have talked about different types of innovation such as business model innovation, marketing innovation, improvement in product design and in product pricing. Here again, we can observe a bucket-full of innovation in the country. In terms of organizational innovation, Indian business organizations have ventured into all kinds of new kinds of business models -- be it the introduction of flat organizations, lean organizations, or pyramidal organizations -- and things keep on changing according to the changing business environment. New business practices are also being introduced: for example, the practice of 360 degree evaluation within companies is a new concept and perhaps alien to a hierarchical society. Another type of innovation is process innovation. The Indian pharmaceutical industry is known for its great degree of process innovation in drugs. Yet another area is product and service innovation in terms of new goods and services for which Indian examples can be many. As regards supply chain innovation, the best example comes from the rural sector particularly the agriculture sector, but which is still in its infancy in India.

All these innovations take place when there is some need. The old saying that "necessity is the mother of all invention" is clearly true. What has spurred the acceleration of invention in India is the overall economic reform process. For example, delicensing of industry in 1991 ushered in a new era of competition; which was then reinforced by continuing trade liberalization and tariff reform throughout the decade. Furthermore the freeing of foreign direct investment (FDI) not only provided new competition, but also brought new techniques and technology into the country. Thus, Indian industry was forced to innovate in all the different ways mentioned to cope with the new competition.

All the innovations in the real sector needed corresponding innovations in the financial sector as well. Innovations in products and services in the real sector therefore, move ideally in parallel with innovations in the financial sector. Furthermore, strong public policies and good governance structures nurture these two developments and direct them in a non-disruptive and constructive manner so that the positive growth process can be sustained. Financial innovation involves development of new financial services and products. And these new products and services need to be more easily accessible. So, financial firms have to innovate to broaden access to their services. Greater financial inclusion is a must. The spread of micro finance is one method by which financial inclusion is being sought to be achieved.

Innovation involves risk. If risk is to be financed effectively, it is essential for financial institutions to improve their risk management systems in their entirety. First is the need to develop appropriate risk assessment systems. Here the proposed introduction of credit information bureaus should help greatly in the future. Second is the development of risk mitigation systems. Third, appropriate risk allocation mechanisms have to be developed, so that risk is adequately distributed from the point of view of the financial institutions. As financial systems become more market oriented and as price discovery of interest rates becomes more efficient, financial institutions find better and better ways of managing and allocating risk. Effective development of financial systems to finance innovation takes a good deal of time.

Innovations can either be supply induced or demand led. Supply led innovations arise from new research and development activities that give rise to new technologies, new products, and new processes. Demand led innovation essentially arises from the pressures of new competition. And, of course, R & D itself can be demand induced.

For innovation to take place on a continuous and efficient basis in response to the pressures felt there is a need for an effective national innovation system. Apart from the structuring of in house mechanisms within firms, there is need for the existence of mutually supporting networks of organizations that nurture the culture of research development and innovation. R & D institutions have to be supported by standard setting organizations, technical consultancies and the like so that firms have adequate technical support systems. Clusters and incubators are also needed for creating such supportive environments for small and medium firms.

But innovation also comes embedded in both labour and capital. As investment picks up, new machines are installed that have newer technology embedded in them. For the same price the new machine does much more than the old one. The revolution in machine tools with embedded new information technology over the last 20 years is a case in point. Another example could be what is happening to cell phone technology with multi-tasks, at lower prices. A great deal of work can now be accomplished on the cell phone even when people are travelling. Thus, a great deal of innovation gets embedded in new capital, and all these changes enhance efficiency and productivity. Similarly, on the human capital side, newly trained manpower comes with newer skills. They do the same jobs much faster than the less trained older labour force. As organisations renew their labour force or impart training to their existing workers they are likely to increase their pace of innovation and productivity growth.

All such developments that promote innovation and productivity growth are of the utmost interest to central banks.

While it is interesting to note that productivity appears to have picked up worldwide over the last decade or so and new investments could have been the source of its acceleration, the implications of such positive shocks for sustained growth need to be understood. The rapid replacement of new technology means that the technological progress gets embedded in the accumulation of fresh capital stock at a faster rate than would otherwise be the case. Second, recent research shows that new technology is quite sensitive to movements in the cost of capital. A combination of high price elasticity and the declining price of high-tech equipment also contributes to an investment boom. Third, these investments have considerable externalities or spill over effects. The application of new technology has helped to reduce operating expenses and as a result of higher productivity there has been considerable stability in labour costs. Globalisation in terms of outsourcing combined with the availability of new skilled labour in China and India has also contributed to low inflation worldwide. Combined with the impact of competition in exercising pricing leverage, these developments have helped significantly in containing inflationary pressures during the expansion phase of global GDP over the past decade.

In this process, the law of supply creating its own demand also operates. First, productivity increases result in a higher potential for growth and this in turn generates further demand for goods and services. The real rate of return on new investments increases and capital spending accelerates to take advantage of the profit opportunities. Employment and income generated help to augment consumer demand as well. The spurt in capital market valuations could be a reflection of such higher profitability. The wealth effect of such a capital market spurt could further accelerate both consumer and investment demand.

Higher the growth in productivity, higher is the overall growth at given levels of investment and that also means that much higher growth can be sustained by higher investments without arousing inflationary pressures. The best thing thus one can do is to encourage innovation, productivity and growth which can then bring about better control over inflation. This is exactly what has happened in the world in the last 10 years. Central banks around the world congratulate themselves for having been very successful especially in the last 10 to 15 years for having tamed inflation internationally. But, what lies behind that achievement through monetary policy is also the gains that have come through increases in productivity. The productivity boom in the US has contributed immensely to non-inflationary growth in the US and also globally in the last decade. What is important from the central bankers' point of view is that this inflation moderation has taken place in the presence of considerable monetary accommodation over the same period. In the US, most of the 1995-2000 productivity growth acceleration can be attributed to investments in technology and management know-how needed to exploit it (Oliner, Sichel and Stiroh).

Thus, encouraging innovative activity through investments in R & D activity is something that is central to the concern of central banks. Innovation and productivity growth contribute to the attainment of low and stable inflation, and low and stable inflation, in turn, provides an appropriate environment for innovation.

Whereas innovation is characteristically done within firms or in R&D organisation, for such activity to flourish, it is essential that there is both macroeconomic and financial stability.

In sum, we need a conducive macroeconomic environment for innovation and growth, a supportive financial system and an innovation nurturing environment through national innovation systems.

There are now some signs that inflation could be again increasing worldwide. Commodity prices, particularly of food and oil, have been increasing in particular. Similarly there are indications that global growth could be slowing down at the same time, particularly in the United States. Is this happening because innovation and productivity growth is slowing down in the US? Similar tendencies are evident in the UK. So, the outlook for productivity growth is crucial in the global context and of great concern to central bankers.

## India's Growth Experience: Trends in Innovation and Productivity

I have earlier sketched India's broad growth path since independence. When growth was low in the 1950s, 1960s, and particularly in the 1970s, there was little innovation. Now that the growth is much higher there is also the appearance of much more innovation all round. What is the evidence that this is actually happening? Unlike the upsurge in growth in the mid 1990s, the growth this time around has been much more broad-based, driven by robust contributions from both manufacturing and services. And, most importantly, unlike in the past an important ingredient of this growth momentum has been improvements in factor productivity.

Whereas it is difficult to obtain a comprehensive picture of the spread of innovation in the country, occasional surveys provide good evidence on the increasing importance that is being placed by firms on innovation. There are also some macro estimates available on the extent of productivity growth and efficiency in capital use in the Indian economy. I present these in turn.

The National Knowledge Commission carried out a survey of a wide variety of firms to understand the nature of innovations, the differences between firms across sectors, and the role played by innovations in driving growth in India. The survey covered a total of 137 firms – 58 large firms and 79 small and medium enterprises (SMEs). The survey results suggest that innovation is clearly in the air in the Indian business environment.

The survey found that innovation gained in importance in the decision making processes of firms – both large and small. Firms find that an increasing proportion of their growth in revenue, profitability, reduction in costs and increase in market share can be attributed to innovations. Thus investing in innovation is being seen as a necessity for business success. Most innovation is incremental, though breakthrough innovations can bring a more dramatic jump in sales, profitability and the like. As might be expected, it is large firms that can hope to do breakthrough innovations, while small firms typically do incremental innovations.

Consistent with our earlier classification of what constitutes innovation, the survey finds that innovations are well spread across new products, new methods of production, marketing, innovative use of raw materials, and the like. Interestingly, although the intensity of innovation is found to be higher in manufacturing firms, the pace of growth in innovation intensity is higher in service sector firms. Service firms are, furthermore, more likely to be "highly innovative".



As regards the process of innovation, firms that consciously invest in R&D, have better contacts and collaboration with R&D institutions, universities and government laboratories have a better chance of making innovation. Thus, there is great potential synergy between public investment in knowledge generating institutions and private entrepreneurship. In fact, some of the key barriers to innovation are the shortage of skills, dull educational curricula and inadequate interaction with public agencies. Correspondingly, within firms, the attention of top management to the importance of innovation is essential.

These survey results confirm the a priori view of rising innovation activity and awareness in India and their growing importance in driving competitiveness and productivity gains in an increasingly competitive economic environment. At the same time, as the results indicate, there is a need to improve the skills of the workforce. The quality of education imparted in several colleges and universities in the country remains less than adequate to meet the emerging demands for skilled professionals. Substantial expansion and reforms in the education sector would be needed on an urgent basis. Education facilities would need to be extended at all levels, viz., primary, secondary and at a tertiary level.

### **Macro Evidence**

The survey-based evidence of growing recognition of innovation as well as its importance in production, presented above, is also supported by macro evidence in terms of economy-wide growth decomposition exercises. There is evidence that the step-up in Indian growth in the post-1993 period has been led by improvements in factor productivity. Bosworth and Collins (2008) who study the period 1978-2004 find a pick-up in productivity growth in the latter part of their sample (Table 2). Annual real GDP growth rose by 2 percentage points between the period 1978-1993 and the period 1993-2004; according to estimates by Bosworth and Collins (op cit), this pick-up was almost evenly divided between higher capital deepening and productivity growth. The sample period covered by Bosworth and Collins (op cit) ends in the year 2003-04, whereas the acceleration in real GDP growth has occurred in the subsequent years. The same period has also exhibited a surge in domestic savings and investment. With the step up in growth since 2003-04, it will be interesting to study the growth accounting analysis for the period since 2003-04 onwards to find out the comparative contributions of capital deepening and productivity to the acceleration in real GDP growth: but for this we will now have to wait for a few years.

Period	Country /Region	<u>Growth (per cent per annum)</u>			<u>Contribution to growth (percentage points)</u>		
		Output	Employment	Output/worker	Physical capital	Education	Factor productivity
1	2	3	4	5	6	7	8
1978-2004	China	9.3	2.0	7.3	3.2	0.2	3.8
	India	5.4	2.0	3.3	1.3	0.4	1.6
1978-1993	China	8.9	2.5	6.4	2.5	0.2	3.6
	India	4.5	2.1	2.4	1.0	0.3	1.1
1993-2004	China	9.7	1.2	8.5	4.2	0.2	4.0
	India	6.5	1.9	4.6	1.8	0.4	2.3
1960-1980	East	7.0	3.0	4.0	2.2	0.5	1.2
1980-2003	Asia	6.1	2.4	3.7	2.2	0.5	0.9
1980-1993	(excl.	7.3	2.7	4.6	2.6	0.6	1.4
1993-2003	China)	4.5	2.0	2.5	1.8	0.5	0.3

**Source: Bosworth and Collins (2008).**

There has been a good deal of academic discussion on the nature of growth in East and South East Asia, particularly in the aftermath of the financial crisis of 1997. One view to emerge was that the high growth experienced by this region in the 1970s and 1980s was based on extensive capital investment, and that there was little innovation and productivity growth in these countries during that period. This is somewhat different from the more recent growth experiences of China and India. Growth in both China and India has been accompanied by significant productivity growth (Table 2). What is notable is that the growth in capital investment has been very high in China, in contrast to that in India, while employment growth has been comparable. We can also observe that the pace of productivity growth picked up significantly in India in the 1990s, after the advent of economic reforms. India has indeed been very economical in use of capital and therefore the growth in productivity has been relatively high in India since the mid-1990s. The record of the rest of Asia has not been as good with regard to productivity growth.

It is important to speculate on the reasons for such differences in performance. Definitive answers are difficult to find and need much more careful research. However, it is probably correct to say that the Indian financial sector has been less distorted than China and some of the other Asian countries after the financial sector reforms of the early and mid 1990s. The cost of capital became market related after the mid 1990s. Indian industry appears to have responded well to these emerging market signals. Debt equity ratios came down after the late 1990s when real and nominal interest rates rose. And productivity appears to have risen. Capital seems to be used with much more care. So, financial sector reforms could have played an important role in the increase in innovation and productivity in Indian industry in recent years. Indian industry has clearly been working hard over the last decade, which is also now evident in the attainment of very high profit growth over the last 5 years or so.

Despite the favourable features which have helped Indian industry to achieve a consistently high growth in the recent years, the uncertainties about productivity trends pose a major challenge in India. Latecomers to industrialisation can achieve considerable local innovation and growth in productivity by adopting already available technology. As the level of technology improves, greater R & D investment has to be made, both to adapt available technology and to develop the new technology needed for innovation. Once the potential for low hanging technology fruit is exhausted new investment has to be made or greater effort to pluck the higher hanging fruit. Indian industry therefore has to become more conscious of the need for continuing the rate of innovation achieved. It will need greater attention to enhancing the level of human capital through training and higher education, higher rates of capital investment, along with more research and development activities.

Turning to sectoral analysis of productivity growth for the Indian economy, estimates suggest that productivity gains were recorded in both industry and in the services sectors in the post-reform period (Table 3). The gains were relatively modest in industry vis-a-vis the services sector, which recorded a significant pick-up in productivity growth, which is consistent with the sketchy micro evidence available. According to estimates by Bosworth and Collins (op cit), productivity gains accounted for almost 70 per cent of the growth in output per worker of the services sector during the period 1993-2004; over the same period, productivity gains accounted for only a third of the growth in output per worker of the industrial sector. The relatively lower order of contribution of productivity in the industrial sector could perhaps be reflective of the slowdown in the sector over the latter part of the sample period.

Period	Sector	Growth (per cent per annum)			Contribution to growth (percentage points)		
		Output	Employment	Output/worker	Physical capital	Education	Factor productivity
1	2	3	4	5	6	7	8
1978-2004	<b>Overall</b>	<b>5.4</b>	<b>2.0</b>	<b>3.3</b>	<b>1.3</b>	<b>0.4</b>	<b>1.6</b>
	Agriculture	2.5	1.1	1.4	0.4	0.3	0.8
	Industry	5.9	3.4	2.5	1.5	0.3	0.6
	Services	7.2	3.8	3.5	0.6	0.4	2.4
1978-1993	<b>Overall</b>	<b>4.5</b>	<b>2.1</b>	<b>2.4</b>	<b>1.0</b>	<b>0.3</b>	<b>1.1</b>
	Agriculture	2.7	1.4	1.3	0.2	0.2	1.0
	Industry	5.4	3.3	2.1	1.4	0.4	0.3
	Services	5.9	3.8	2.1	0.3	0.4	1.4
1993-2004	<b>Overall</b>	<b>6.5</b>	<b>1.9</b>	<b>4.6</b>	<b>1.8</b>	<b>0.4</b>	<b>2.3</b>
	Agriculture	2.2	0.7	1.5	0.7	0.3	0.5
	Industry	6.7	3.6	3.1	1.7	0.3	1.1
	Services	9.1	3.7	5.4	1.1	0.4	3.9

**Source: Bosworth and Collins (2008).**

The significantly higher order of productivity growth in the services sector could be attributed to the fact that the delivery of services has changed tremendously. The introduction of information technology has changed the face of service delivery. Financial services are the most obvious illustration of this revolution. In fact, it is difficult to imagine the delivery of financial services without the use of information technology. Trading in capital markets is now totally electronic, which has also helped greatly in expanding the access to capital markets across the country. Now access to the capital market is, in principle, equalized regardless of the person's physical location. The introduction of mobile banking has just begun: now that there almost 300 million cell phones in the country we can expect a huge transformation in the delivery of banking services as this technology takes root. Travel services are another area where the use of information technology has changed the form of service delivery. Air, train, bus and hotel bookings can be made from the comfort of the home without the use of intermediaries. This has also resulted in great cost savings, hence an increase in productivity. The delivery of government services is also beginning to take advantage of information technology in a myriad of ways, from land titling to bill payments, information dissemination and the like. Thus innovation is pervasive in our daily lives.

The efficiency in the use of resources in India, in a cross-country context, is also evident from the movements in incremental capital output ratios of the overall economy. Analysis clearly indicates that not only has there been a consistent upward trend in India's investment rate since the 1950s, there is also evidence that capital has been employed productively. Barring the decade of the 1970s, the incremental capital output ratio (ICOR) has hovered around 4. There are some signs of improvement in domestic productivity in the post-reforms period, consistent with the earlier evidence. Cross-country comparison indicates that ICOR has been amongst the lowest in India. This is especially true of the period since the 1980s onwards (Table 4). Various reform measures aimed at increasing the competitiveness appear to be having the desired impact on the productivity of the Indian economy.

<b>Table 4: Growth, Investment and ICOR - Select Countries</b>					
<b>Country</b>	<b>1960s</b>	<b>1970s</b>	<b>1980s</b>	<b>1990s</b>	<b>2000-2006</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Real GDP Growth (Per cent)</b>					
Brazil	5.9	8.5	3.0	1.7	3.1
China	3.0	7.4	9.8	10.0	9.5
India	4.0	2.9	5.6	5.7	7.0
Indonesia	3.7	7.8	6.4	4.8	4.9
Korea	8.3	8.3	7.7	6.3	5.2
Mexico	6.8	6.4	2.3	3.4	2.9
Philippines	5.1	5.8	2.0	2.8	4.8
South Africa	6.1	3.3	2.2	1.4	4.1
Thailand	7.8	7.5	7.3	5.3	5.0
<b>Real Investment Rate (Per cent of GDP)</b>					
Brazil	15.3	18.1	16.4	16.9	15.8
China	23.7	35.9	37.4	40.1	41.4
India	16.9	19.4	20.2	23.3	28.1
Indonesia	8.9	17.9	29.6	33.1	22.7
Korea	12.8	21.0	27.4	35.6	29.4
Mexico	25.9	26.2	20.1	20.4	22.1
Philippines	19.9	23.3	21.6	22.9	20.7
South Africa	16.0	20.0	17.8	14.9	17.2
Thailand	26.8	31.5	30.2	36.4	22.6
<b>ICOR</b>					
Brazil	2.6	2.1	5.5	9.9	5.1
China	7.9	4.8	3.8	4.0	4.3
India	4.3	6.6	3.6	4.1	4.0
Indonesia	2.4	2.3	4.6	6.9	4.7
Korea	1.5	2.5	3.6	5.7	5.7
Mexico	3.8	4.1	8.8	6.0	7.6
Philippines	3.9	4.0	10.7	8.2	4.3
South Africa	2.6	6.2	8.0	10.7	4.2
Thailand	3.4	4.2	4.1	6.9	4.5

**Source: World Development Indicators, World Bank.**

The evidence thus clearly demonstrates that India has achieved its growth in recent years with judicious use of capital accumulation while innovating to achieve significant productivity growth. A conducive macroeconomic policy framework, accompanied by greater efficiency in financial intermediation, which transmits appropriate signals with regard to the cost of capital, has contributed to this pattern of growth. Policy changes have also contributed to the rapid growth in trade and capital flows, which have enabled the diffusion of newer technologies and management systems necessary for continuing innovation and productivity growth. This provides comfort that the improvements in productivity, can be sustained in the medium term.

### **Role of Financial Sector Reforms in Promoting Innovation and Growth**

The key issue for innovation and growth in financial sector development is how well the financial system is able to finance new ideas, new products and new entrepreneurs. In a repressed financial system, sans adequate risk management systems and limited depth of financial markets, banks are typically happy to fund incumbents, and exhibit little interest in funding new businesses and new ideas. As financial systems develop, larger corporates can go to the market directly and disintermediation takes place. So, banks have fewer incumbents to finance and so it can be expected that they would be pushed increasingly into financing more and more new projects, new entrepreneurs and new ideas.

Has this happened in India? Financial sector reforms have covered almost all aspects of banking and the capital market. The decontrol and expansion of capital markets should have made the access to market intermediated financial resources easier for well established, credit rated large incumbents. Reforms in the banking system have been aimed to bring in greater efficiency by introducing new competition through the new private sector banks and increased operational autonomy to public sector banks. In the government securities market, the reform measures have been aimed at better price discovery of interest rates by auctioning government securities, and developing the infrastructure for efficient trading. In the forex market likewise, there has been a gradual movement towards a market-based exchange rate regime coupled with the introduction of newer products and players. Side-by side, conscious steps have been undertaken towards building up of the institutional architecture in terms of markets, technological and legal infrastructure.

Consequent upon the wide array of such measures, the cost of funds for the corporate sector has become market-related. Coupled with greater access to foreign investment alongside improvements through trade liberalization, there is a significant growth in manufacturing exports as also the import intensity of exports. The corporate sector has thus become increasingly exposed to international product and factor prices. Such market-driven pricing of products and factors combined with gradual reduction in rates of interest in an overall benign interest rate environment and moderate debt equity ratios have resulted in lower interest outgo. This, in turn, has promoted better resource allocation and efficient use of new technology, which has become reflected in their profit and efficiency parameters.

What has been the result in terms of corporate performance? All the important parameters: sales, gross profit, profit after tax, all have recorded robust growth rates since 2002-03, implying that economic activity in the corporate sector has improved tremendously over this period (Table 5). The dependence on banks for financing has indeed gone down. There has been a very significant reduction of interest expenses in total expenditure. To that extent, the corporate sector could have become more insensitive to small movements in interest rates.

<b>Table 5: Corporate Financial Performance</b>						
Item	1990/91	1991/92 to 1996/97	1997/98 to 2002/03	2003/04 to 2006/07	2006-07 (Apr-Sept)	2007-08 (AprSept)
1	2	3	4	5	6	7
<b>Growth Rates (per cent)</b>						
Sales	15.8	16.9	7.0	20.7	27.4	17.4
Expenditure	15.1	16.6	7.4	19.7	25.6	16.9
Depreciation provision	10.1	16.6	12.9	10.2	16.1	15.1
Gross profits	27.8	18.2	3.6	30.9	39.8	28.1
Interest Payments	16.2	18.7	3.8	-0.6	20.8	10.1
Profits after tax (PAT)	53.3	21.1	7.8	47.3	41.6	31.1
<b>Select Ratios (per cent)</b>						
Gross Profits to Sales	11.2	12.4	10.6	12.7	15.6	16.9
PAT to Sales	4.0	5.5	3.6	8.0	10.6	11.7
Interest Coverage Ratio (Times)	1.9	2.1	1.8	5.2	7.1	8.4
Interest to Sales	5.8	6.0	6.0	2.6	2.2	2.0
Interest to Gross Profits	51.6	48.5	56.6	21.0	14.1	11.9
Interest to Total Expenditure	5.8	6.0	6.0	2.8	2.5	2.3
Debt to Equity	99.0	75.1	67.0	51.4	NA	NA
Internal Sources of Funds to Total Sources of Funds	35.8	30.6	50.4	50.9	NA	NA
Bank Borrowings to Total Borrowings	35.6	31.6	35.5	52.6	NA	NA
<b>Note:</b>						
1. Data up to 2005-06 are based on audited balance sheet, while those for 2006-07 and 2007-08 are based on abridged financial results of the select non-Government non-financial public limited companies.						
2. Growth rates are per cent changes in the level for the period under reference over the corresponding period of the previous year for common set of companies.						
<b>Sources:</b> RBI Studies on Company Finances and Performance of Private Corporate Business Sector during First Half of 2007-08 (RBI Bulletin, January 2008).						

The high growth in profits of the corporate sector suggests that competition is inadequate and that entry of new firms or even the threat of entry of new firms is low. Growth in output is being driven more by expansion of existing firms rather than through the creation of new firms. This pattern would suggest that new firms are not finding it easy to access funds from the banking system at reasonable risk adjusted rates. It is essential that banks should be careful in their risk assessment, and that the interest rates charged and volumes of funds lent should reflect the risk assessed. In the presence of the kind of high growth rates being observed in the economy, are banks being adequately supportive? What is the evidence?

First, the pattern of funding from banks is predominantly to the urban and metropolitan sectors which account for the overwhelming share of credit. The share of metropolitan areas, in fact, has risen further in the current decade, with that of rural and urban areas declining (Table 6).

<b>Table 6: Population group-wise outstanding credit of commercial banks</b>				
(Per cent to total)				
<b>Population Group</b>	<b>March 2001</b>	<b>March 2005</b>	<b>March 2006</b>	<b>March 2007</b>
Rural	10.1	9.2	8.4	7.9
Semi urban	11.5	11.3	10.0	9.7
Urban	16.8	16.4	16.4	16.2
Metropolitan	61.6	63.1	65.3	66.1
Memo: Amount (Rupees billion)				
All India	5564	11578	15175	19496
<b>Source: Reserve Bank of India</b>				

Second, the pattern of funding by the banks remains skewed towards larger firms. The problem for the banks, however, is that profit growth in the corporate sector has been so high in recent years, that they do not need much bank borrowing, and the share of debt service in corporate balance sheets has been getting lower and lower. In fact, in view of the reduced need of large firms for bank funding there is great competition among banks to fund the incumbents, to fund the larger firms, leading to lending rates levied on them becoming much lower than the declared benchmark prime lending rates (BPLR). This is in some sense an encouraging sign, so that if the banks do not have enough income generation from the larger firms, they may be willing to lend more to the newer entrepreneurs. The existing preference for lending to larger firms is presumably due to the old banking habit of greater comfort with incumbents to whom it is safer and easier to lend. Finding new entrepreneurs, new ideas, new products, and new services to finance need greater effort and more sophisticated risk management systems. Indian banks have also been handicapped by the absence of credit information bureaus and any availability of centralized credit records of small and medium entrepreneurs. This problem should now get rectified since the Credit Information Companies Act has been passed by parliament. Guidelines for these companies have also been issued by the Reserve Bank, so we can expect such new companies to get established in the near future.

There is some corroborating evidence suggesting the difficulty of entry for new business entrepreneurs. When we look at the World Bank surveys on doing business across countries, India typically ranks quite low in the range of 120-130. At the same time, we find that both the level of profits of the corporate sector in India and growth of profits is among the highest in the world. How can both be true: that doing business in India is more difficult than in other countries, while at the same time the Indian corporate sector has exhibited higher profit growth than probably any other country in the world over the past 4-5 years? A possible explanation for this apparent contradiction seems to be the high entry costs: once you get in, it is easy to grow, but getting in, in the first place, is difficult. This suggests that the Indian financial system is, perhaps, still not adequately geared to finance new ideas and new firms.



Further, one of the distinguishing features of the high credit growth in recent years has been the continuing low share of credit going to small and medium enterprises (SMEs), although there has been some change in the trend this past year. Again, it is puzzling how the credit growth to SMEs among all the segments has actually been the lowest. What has really happened is that banks have essentially moved from lending to the corporate sector to individuals and retail, still leaving out the middle, namely SMEs. And again, banks appear to have moved to individuals and retail because of the high quality of collateral available for such loans. For the financial system to nurture innovation and growth, its risk assessment practices need to improve while transaction costs are reduced. Greater availability of credit histories and credit information should help in this regard. All these will lead to better capacity in the financial system to take informed credit decisions. As we go ahead with further development of the financial system, it should enable slicing of risk in such a way that investors with different risk appetites from higher to lower, are able to find appropriate vehicles for investment. The issue is basically one of informed risk management in terms of segregating more risky from less risky credits and finding appropriate ways of financing them. As we go along with reforms, we need to work harder to develop such institutions and systems. Venture capital has also a role to play.

Strengthening of the domestic financial system is a prerequisite for external sector opening up particularly in the capital account. Periodic assessment of financial sector gains importance in this respect. Such assessment includes appraisals of the relative importance of the various financial institutions in the system; the sensitivity of the system to shocks under alternative scenarios and financial soundness indicators. They also encompass assessments of liquidity developments and policies, the crisis-management framework, the regulation and supervisory practices. Secondly, assessments of the extent to which financial sector standards and codes are observed make it possible to identify gaps in regulation and transparency, evaluate the overall stability of the financial system, and measure a country's practices against international benchmarks. India undertook a comprehensive self-assessment of financial standards and codes some five years ago and this is being reviewed on an ongoing basis. India was one of the earliest to participate in the financial sector assessment by the IMF and World Bank and recently a Committee has been constituted by Government of India in consultation with the Reserve Bank to take up a comprehensive self assessment of financial sector.

### **The Role of Monetary Policy**

Coming to the role of monetary policy: what we have achieved over the last decade? And how is it relevant for fostering innovation, entrepreneurship and growth? A great deal of market development has taken place in the financial sector. We now have market related flexible interest rates, more open forex markets, and flexible market related exchange rates, although the Reserve Bank continues to intervene in the forex market. We also have an active capital market for equities, though the corporate bond market has some way to go. We also have more competition in banking. So there has been pro-active monetary and financial sector policy during last decade or so, which has promoted economic growth, maintained low inflation along with financial stability.

In India, monetary policy has the twin objectives of price stability and growth. While the Reserve Bank does not target an explicit inflation rate as some countries do, the objective currently is to contain the inflation rate within an upper bound of 5 percent and attempt to reduce it further in the medium term. The relative emphasis of monetary policy stance varies with the prevailing macroeconomic and monetary conditions: for example, inflation was an issue during much of 2007, and continues to be of concern now. The upshot of these concerns has been reflected in a gradual tightening of policy rates and additional measures such as increase in cash reserve ratio since the latter part of 2004.

The best contribution that monetary policy can make for fostering innovation and growth is to provide an environment of low inflation, low inflation expectations, along with confidence in the maintenance of financial stability. Entrepreneurs take considerable risk as it is: on top of that if we add macro-economic risks in terms of higher inflation, high inflation volatility and higher interest rates, then the risk perception can be such that entrepreneurship, innovation and investment gets effectively constrained. That will inevitably result in lower investment rates and hence lower economic growth. Therefore, to keep the momentum of high growth, it is extremely important to recognise that the best contribution that monetary policy can make is indeed to ensure that inflation and inflation expectations are well anchored.

There is evidence that pro-cyclical behaviour of financial markets and pro-cyclical macroeconomic policies have not encouraged growth; they have in fact increased growth and consumption volatility in developing countries that have integrated to a larger extent in international financial markets. The menu of macroeconomic policies for financial and real economic stability has thus expanded in recent years to multiple objectives and significant trade-offs. Preventive or prudential macroeconomic and financial policies, which aim to avoid the excess accumulation of public and private sector debts during periods of upward cycle, have become a part of the standard policy prescription.

Policy choices presently involve a mix of counter-cyclical fiscal and monetary policies, which also include the practice of an appropriate exchange-rate regime, buttressed by active capital account management that reduces the risks that can arise from turbulence in international financial markets. Such measures would also include adequate prudential regulation of the financial sector, and particularly of the banking system. Thus, for instance, the increase in risk weights on lending to certain sectors such as real estate has been aimed at curbing excessive credit growth to sectors that seem in danger of over-extension.

We need to pursue somewhat counter cyclical monetary and fiscal policies with appropriate external sector management, ensuring overall financial stability – price stability, low inflation, low inflation expectations and low inflation volatility. It is only under these conditions, that investment, innovation and growth can be maintained in a sustainable fashion. We must continue to ensure that the growth momentum is sustained with price stability.

While India has been maintaining one of the highest growth rates among countries for quite some time now, the growth dynamics has dramatically shifted in the last three to four years and the economy is poised to break from an intermediate growth rate of around 6 percent to a high growth rate regime of well above 8 percent. Despite high levels of internal resource generation and access to external borrowings, credit demand across sectors also had picked up quite substantially pushing the rate of investment to new heights. The increasing consumer and business confidence have been attracting foreign investment flows resulting in easy liquidity conditions in the financial system. The central bank had to address these complex set of pressures of increased liquidity, substantial expansion in credit particularly to certain sensitive sectors such as real estate and retail and the growing capital inflows and consequent need for sterilization.

A cross-country comparison of major EMEs that have adopted inflation targeting (IT) indicates that growth in India has been amongst the highest while inflation remains relatively low (Mohan, 2007). Thus, the recent record of macroeconomic management in India is exemplary, even amongst the EMEs that target inflation. The challenge for monetary policy now is to reduce inflation further in the medium term towards international levels, while maintaining the momentum of high growth and preserving financial stability.

Real GDP growth has averaged 8.7 per cent per annum during the 5-year period ending 2007-08. The present domestic investment rate of around 36-37 per cent is expected to help sustain the current growth momentum. In Indian economic history, there has never been this order of growth for five consecutive years; this has been achieved while keeping inflation low and stable and anchoring inflationary expectations. Apart from increase in productivity, benefits through trade liberalization, fiscal consolidation and more effective monetary policy have also helped in sustaining relatively a low inflation rate since the mid-1990s. Spikes and seasonal falls in headline inflation rates will continue to occur due to relative price adjustments and supply shocks emanating from agricultural and other commodity prices. Such shocks have evidently amplified over the past 2-3 years on account of large increases in a range of global commodity prices such as oil, food and metals. In view of the success in reducing inflation from the long-run average of 7-8 per cent to 4-5 per cent now, the society's tolerance rate of inflation has also come down. In this crucial stage of transition, it is important to recognize that price and financial stability are very crucial to sustain the growth at current levels without any disruptive forces coming into play.

Let me conclude.

The relevance of monetary policy for inducing innovation and growth is then obvious. Entrepreneurs, investors and innovators take a great deal of risk while putting their money behind their ideas. Such entrepreneurial and innovative behaviour flourishes when other risks are reduced: when inflation is low and stable, and hence inflation expectations are anchored; when interest rates are low and stable; when the exchange rate is not volatile; and when credit flow is available in adequate quantity. This is what Indian monetary policy has aimed to achieve. And the outcomes in terms of growth, investment, entrepreneurial activity and innovation in this decade would suggest that we have indeed achieved some success in attaining the objectives of monetary policy as transparently expressed.

## References

- Bosworth, Barry and Susan M. Collins (2008), "Accounting for Growth: Comparing China and India", *Journal of Economic Perspectives*, Volume 22, Number 1(Winter),pp.45-66.
- Campo, J.S. (2005)" "A broad view of macroeconomic stability", DESA Working Paper No. 1, ST/ESA/2005/DWP/1, United Nations.
- Ferguson, Jr. Roger W (2000): "Technology, Macroeconomics and Monetary Policy', Federal Reserve Board.
- Greenspan, Alan (2001): "Monetary Policy in the face of Uncertainty", *Cato Journal*, Vol. 21 No.2 (Fall)
- Levine.R. "Finance and Growth: Theory and Evidence". *NBER Working Paper No. 10766*, 2004.
- Mohan, Rakesh (2006), "Financial Sector Reforms and Monetary Policy", RBI Bulletin.
- (2007), "India's Financial Sector Reforms: Fostering Growth While Containing Risk", RBI Bulletin, November.
- (2008), "The Growth Record of the Indian Economy, 1950-2008: A Story of Sustained Savings and Investment", RBI Bulletin, March.
- National Knowledge Commission (2007), *Innovation in India*, National Knowledge Commission, Government of India, June.
- Rajan. R, and L.Zingales (2003), "*Saving Capitalism from the Capitalists: Unleashing the Power of Financial Markets to Create Wealth and Spread Opportunity*". Crown Business, New York.
- Vickers, John (2000). 'Monetary Policy and the Supply Side', Bank of England Bulletin.