

III The Real Economy (Part 2 of 2)

3.76 Achievement of higher growth in agricultural production will require much faster crop diversification. The changes in consumption pattern also make crop diversification imperative. There is a growing preference by consumers towards processed foods such as flour, packaged milk, instant foods, meat, poultry, fish, fruits and vegetables. With the share of unprocessed foods falling in the consumption, the future growth in agriculture lies in these value added products and areas like horticulture and floriculture, which also have higher export potential. In such emerging areas of agriculture, the heterogeneity of products is much greater. There is a multiplicity of varieties that can be produced. However, so far production is often regionally concentrated and the production and marketing conditions differ significantly as also the input requirements. Furthermore, the lack of adequate storage facilities act as a major bottleneck in the development of food processing industry. Another matter of concern regarding processed foods in India is the lack of standardisation of product quality, which is important for meeting the international norms like the Codex Standards.

3.77 Policies and programmes that need to be designed to support higher productivity and production in these areas should be regionally disaggregated and knowledge intensive. The promotion of diversified agriculture will also need a greater concentration of resources in research and extension in the new areas. Further, a greater thrust needs to be provided to the development of rural infrastructure, *viz.*, rural roads, cold storage, transport facilities with greater private sector participation. This would require a decentralised private sector framework with appropriate policies and supportive financing facilities. Furthermore, in view of the relatively high level of food security that has been now achieved, there is a need to focus on the distributional aspects of foodgrains rather than encouraging unsustainable levels of cereal production through the Minimum Support Prices. There is a need to develop markets by way of removing movement restrictions so as to enable markets to take care of the distributional aspects. Next, demand driven agricultural production requires introduction of futures trading so as to enable price discovery. International competitiveness requires more rational usage of inputs, particularly pesticides, so that Indian products can meet the Codex Norms. In this regard, rationalisation of input prices, particularly of fertilisers, electricity and irrigation is required to attain a sustainable agricultural growth. Agricultural marketing needs to be developed, with emphasis on brand building and standardisation of product quality to increase the export competitiveness of Indian processed foods on one hand and to help more effective utilisation of the vast production potential of fruits and vegetables in the country.

III. INDUSTRY

3.78 The adverse impact of the crisis of 1991 was perhaps most pronounced in case of the industrial sector in India, which experienced a negative growth of 0.6 per cent in 1991-92. Following the reform measures, there was an initial turn-around in the industrial growth profile. However, it was short-lived, and deceleration has set in the industrial sector since 1996-97.

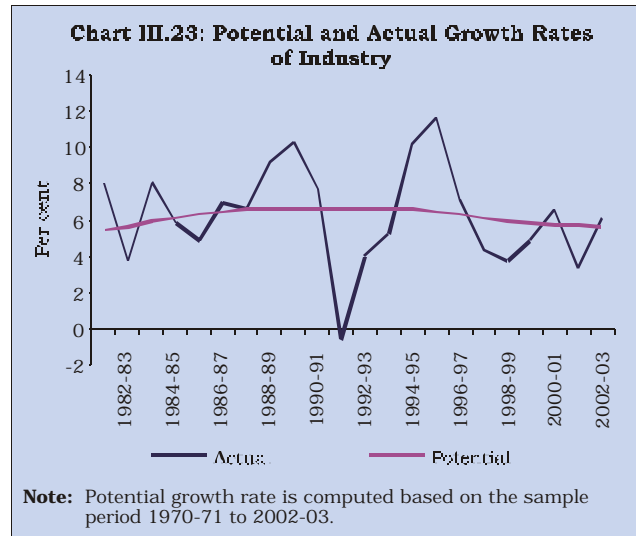
3.79 Structural factors inhibited productivity and cost efficiency and hence, the overall growth of the industrial sector until the 1980s. These included myriads of controls and regulations, lack of technological development and restricted access to foreign technology. This resulted in a situation where the impetus to technological upgradation emanated primarily from the public

sector. The controls on industry through licensing, MRTP, thus, inhibited competition. Further, institutional rigidities prevented restructuring in the manufacturing sector. It is against this background that a set of policy measures having a bearing on the industrial sector was introduced. Elements of the new industrial policy sought to increase competition by abolishing restrictions on MRTP companies, terminating the phased manufacturing programmes, freeing foreign direct investment and import of foreign technology and dereservation of sectors hitherto reserved for public sector. The thrust of these measures was to create a competitive environment as a means to improve productivity and efficiency. These measures created a favourable environment for the industry to upgrade its technology and build-up its capacity through imports in order to cater to growing domestic and external demand. The industrial sector responded favourably to the initial phase of structural reforms, but later industrial deceleration set in. The manufacturing sector, which accounts for more than half of the overall industry, was affected the most with its growth decelerating not only to lower than the first phase of reforms but lower than the 1980s as well. Given the contribution of manufacturing to GDP growth and its sectoral linkages, the persisting slowdown has raised several concerns. The poor performance of the manufacturing sector, apart from being influenced by business cycles, is strongly affected by supply side bottlenecks, which are emerging as major constraints to productivity growth and competitiveness of the industrial sector. Such constraints are operating primarily through infrastructure - both in terms of unstable supply as well as higher unit cost, financing constraints, and lack of adequate institutional and structural reforms to facilitate the required degree of industrial re-structuring.

3.80 Against this backdrop, the growth performance of industry, with particular reference to the manufacturing sector, and its changing production structure is analysed in the present Section. The manufacturing slowdown has been examined both in terms of cyclical factors operating through aggregate demand as well as structural factors, reflecting the supply constraints, with a view to ascertaining their relative roles. In view of the growing importance of structural factors in posing a binding constraint on manufacturing, the provision of infrastructure and finance as also the issue of manufacturing productivity have been examined.

Profile of Industrial Growth

3.81 The actual industrial growth during the latter phase of the reform period fell below the potential growth, indicating a decline in the capacity utilisation over the medium-term.¹² Besides, there have been distinct signs of the potential growth itself slowing down compared with the first phase of the reform period and the latter half of the preceding decade (Chart III.23). This can be attributed to a deceleration in growth across all sub-sectors, *i.e.*, registered manufacturing, mining and quarrying as well as electricity, gas and water supply. An analysis of industrial slowdown as per the use-based classification reveals that while the consumer goods industries sustained growth momentum to some extent during the latter part of the reform period, substantial decline in growth was witnessed in basic and intermediate goods segments. The demand for these goods in the face of sustained consumption demand in the latter period of the reforms implies that industry may be undertaking inventory adjustment created by the initial phase of capacity creation and overproduction. Although production of capital goods witnessed an improved average growth during the latter phase of the reform period, a rapid decline was observed from 2000-01 onwards, indicating the impact of weakening investment demand in the economy.



3.82 The 1990s witnessed a shift in the production structure in favour of the registered manufacturing as against the unregistered one. While the share of registered manufacturing in industrial GDP increased from 38.6 per cent in 1990-91 to 41.5 per cent in 2001-02, the share of unregistered manufacturing declined from 22.5 per cent to 21.6 per cent during the same period. Even within registered manufacturing, traditional industries such as textile, jute and other vegetable fibre textiles witnessed a decline in their respective shares in the reform period while the modern segments like metal products and electrical machinery forged ahead. The relatively low growth in productivity, lack of technological improvements and reduced access to credit have, *inter alia*, possibly acted as a more binding constraint in respect of the traditional segment *vis-à-vis* the modern one.

3.83 During the 1980s, although the average growth in value added in the manufacturing sector was relatively high at 7.3 per cent, it was not reflected in the commensurate growth in employment mainly on account of reduction in employment in cotton textiles and jute textiles, which were high employment generating industries. The employment growth in the organised manufacturing sector rose to 2.3 per cent in the first half of the 1990s from 0.8 per cent in the 1980s. This may be attributed to increased employment in small and medium size factories as a result of liberalisation of industrial and trade policies (Goldar, 2000). The deceleration in the manufacturing growth rate in the latter half of the 1990s had, however, adverse implications on employment growth. This was visible in employment growth turning negative (-2.1 per cent) in the latter half of the 1990s.

3.84 While the emerging production structure of industry bodes well for the economy, the stagnant share of manufacturing at around 17 per cent of GDP during the 1990s is a matter of concern. Other emerging market economies have exhibited a rising share of manufacturing and industry at similar levels of developments, with these sectors being the lead growth centres. The contribution of industry to GDP in such developing countries is placed in the range of 28 per cent to 51 per cent in 2000, much higher than 25 per cent in India. As a matter of fact, the fast growing East Asian countries witnessed a rise in the share of industry in GDP between 1990 and 2000 (Table 3.15). The differences in the nature of industrial policy and their implementation are found to be critical to the industrial success of such countries. Important elements of industrial

policy in these countries included flexibility of labour use, build up of large and efficient social infrastructure, favourable attitude towards international technology transfer, substantial investment in public technology institutions and competitive pressures resulting from exports (Box III.3). Given the stagnating share of industry in GDP in India, the issues of manufacturing slowdown, productivity and competitiveness need further examination, which is attempted next.

Table 3.15: Share of Industry in GDP: Cross-Country Comparison

Country	(Per cent)	
	1990	2000
	1	2
India	24	25
China	42	51
Indonesia	38	47
Korea, Rep.	43	43
Malaysia	42	45
Thailand	37	40
Brazil	39	29
Argentina	36	28
Mexico	28	28

Source : World Development Indicators 2002, World Bank.

The Manufacturing Slowdown

3.85 The loss of momentum in manufacturing growth, which occurred in the latter part of 1996, has since continued during the second phase of the reform period. At the disaggregated two-digit level, the manufacturing sector witnessed substantial deceleration in 11 industry groups with a combined weight of 64 per cent in the manufacturing production (Table 3.16). Six industry groups with a combined weight of 36 per cent withstood the slowdown and posted an accelerated growth during 1996-2002. However, in view of their relatively low weight, the manufacturing sector, as a whole, registered a slowdown.

Table 3.16 : Growth of IIP-Manufacturing at Two-Digit Level

Industry Group	Weight	(Per cent)	
		1992-93 to 95-96	1996-97 to 01-02
	1	2	3
1. Food products	9.08	4.5	2.7
2. Beverages, tobacco and related products	2.38	10.9	11.6
3. Cotton textiles	5.52	6.1	2.4
4. Wool, silk and man-made fibre textiles	2.26	14.6	9.0
5. Jute and other vegetable fibre textiles (except cotton)	0.59	4.3	-0.2

6. Textile products (including wearing apparel)	2.54	2.3	3.8
7. Wood and wood products, furniture & fixtures	2.70	7.7	-4.3
8. Paper and paper products and printing, publishing and allied industries	2.65	8.7	5.4
9. Leather and leather & fur products	1.14	3.2	8.3
10. Basic chemicals and chemical products (except products of petroleum & coal)	14.00	7.5	8.0
11. Rubber, plastic, petroleum and coal products	5.73	4.5	6.7
12. Non-metallic mineral products	4.40	9.6	9.0
13. Basic metal and alloy industries	7.45	15.6	3.1
14. Metal products and parts (except machinery and equipment)	2.81	-1.0	6.4
15. Machinery and equipment other than transport equipment	9.57	9.4	6.4
16. Transport equipment and parts	3.98	10.1	7.6
17. Other manufacturing industries	2.56	8.4	4.8
Overall Manufacturing	79.36	11.6	5.6

Note : The category of wool, silk and man-made fibre is available since 1993-94 onwards.

Source : Central Statistical Organisation

Box III.3 Industrial Policy in East Asian Countries

There has been considerable focus on the selective intervention of industrial policies in accelerating economic growth in the East Asian countries. The role of industrial policy in the growth process of these economies was particularly recognised in the 1970s and the 1980s. A number of questions have been raised in the backdrop of the role of industrial policy in the East Asian economies. Whether the selective intervention policies pursued were an important part of their economic success? Whether the changes in international economic environment inhibit developing countries to implement similar industrial policies? The East Asian experience of industrial growth has been, thus, debated for choosing alternative policy options for attaining rapid industrial growth, higher employment and exports as witnessed by these economies (Table 3.17).

Table 3.17: Contribution of Industry to GDP and Exports in Japan and Korea

Item	Japan		Korea	
	1990	2000	1990	2000
	1	2	3	4
Share of Manufacturing in GDP (%)	27	22	29	31
Share of Industry in GDP (%)	39	32	43	43
Share of Manufacturing Exports in Merchandise Exports (%)	96	94	94	91

Source: World Development Indicators 2002, World Bank.

Japan implemented sectoral industrial policy in the post-1950 period through direct subsidies; tax policy and off-budget finance through Fiscal Investment and Loan Programme; subsidised credit, including the channelling of capital to specified sectors; and controls on international trade, investment and technology imports. The focus of these efforts was aimed at rebuilding heavy industries such as steel and transportation equipment. The trade protection provided to Japanese industry, as measured by effective rate of protection, is argued to be associated with lower than the expected performance of exports, contradicting the notion that infant industries were promoted (Noland, 1997). The research and development (R&D) financed by the Government, however, had favourable impact on trade competitiveness during the 1970s and 1980s. The role of direct subsidies in fostering changes in Japan's industrial composition was minimal. Indirect subsidies such as low interest loans were, however, found to be associated with expansion of output and improved trade performance. Industrial policies were effective in the sense that market interventions appeared to have impacted on resource flows and composition of output.

The orientation of industrial policy in Korea had changed drastically in the mid-1960s with an emphasis on exports. There was a drive towards heavy and chemical industry in order to alter the composition of industrial output with more technology and engineering intensive products. It also aimed at upgrading export profile and reducing reliance on imports. The policies for channelling capital through interest subsidy were augmented by extensive tax incentives for priority industries. However, the era of protection to industries came to an end in 1979 when the Government announced a comprehensive stabilisation plan. Policies undertaken during this period are, however, found to be unsuccessful on the ground of creation of excess capacity in favoured sectors while starving non-favoured sectors of resources. It is also observed that during the heavy and chemical industry drive, the establishment of oligopolistic positions by the *Chaebol* retarded technological change. Further, Lee (1996) finds that trade protections were negatively associated with the growth rate of labour and total factor productivity, while tax incentives and subsidised credit were uncorrelated with sectoral productivity growth. The labour productivity growth is found to be slower in protected sectors. Nevertheless, inter-industry externalities of industrial policies emanating from domestic production of intermediate goods, movements of workers from protected sectors to other sectors and direct interaction on equipment design between producers and local buyers would have potentially increased total factor productivity (TFP) growth in other sectors (Pack, 2000).

A critical component of Taiwan's success was that its industrial policies helped to establish new and successful manufacturing sector. The industrial growth was facilitated by low level of trade protection, availability of inputs at international prices, conservative macroeconomic policy, and competitive factor markets. The basic fiscal incentive programme for industry from 1961 to 1990 provided for participating firms to choose tax exemptions or accelerated depreciation on capital equipment. Such fiscal incentives targeted specific industries, though the focus shifted over time from labour intensive exports in the 1960s to capital-intensive sectors in the 1970s to technology intensive sectors in the 1980s. In the 1990s, the Government discontinued such fiscal concessions and replaced them with the system where firms were eligible for tax relief based on expenditure on activities such as R&D expenditure or pollution control. A second industrial policy tool was subsidised credit for export financing and import of raw materials. The third major tool of industrial policy was trade controls. However, since 1989 the Government undertook far reaching trade liberalisation that brought the level of trade protection down to developed country levels, at least in the manufacturing. Besides these standard tools of selective intervention, there was also another set of policy conducive to the development of manufacturing sector *viz.*, establishment of a large number of institutions that were designed to identify, transfer, defuse and efficiently absorb foreign industrial technologies and then to undertake innovation. These latter policies were largely introduced in the late 1970s and 1980s. These efforts reflected the fact that Taiwan's policies were more neutral than those of Korea and Japan with respect to firm size. Much of its industrial development was in firms with fewer than 100 employees. Pack and Lin (2001) find that industrial policy could have added 1 percentage point to TFP growth in manufacturing.

Much of the early growth in Japan, Korea and Taiwan consisted of simple, labour intensive products such as clothing, toys, sporting goods and simple electronics. Perhaps, the main miracle in these countries was maintenance of a high rate of investment and relatively efficient absorption. After the oil price shocks in the 1970s, Japan, Korea and Taiwan were able to pursue a policy of reducing domestic absorption and altering the real exchange rate between tradables and non-tradables for exports to respond to the new price structure. De Mello (1985), using the standard input-output based demand decomposition, found that rapid expansion of exports than of other components of final demand accounted for about three-quarters of the rise in growth of manufacturing sector. The phenomenal

expansion of exports generated rapid employment growth in these sectors.

Despite ambiguity on the role of industrial policy in causing TFP growth, favourable impact of industrial policy was that investment ratio and TFP growth did not fall in the face of phenomenal rates of capital accumulation (Noland and Pack, 2003). An important factor that contributed to the high marginal product of capital especially in Korea and Taiwan was the considerable flexibility of labour and the efforts of firms to improve their productivity. Workers moved without impediment to expanding areas rather than sticking to the sectors under increasing competitive pressure. Measures at enhancing industrial growth in the East Asian countries also focused on building large and efficient social infrastructure, favourable attitude towards international technology transfer and substantial investment in public technology institutions. The difference in performance of these countries is also attributed to more competitive pressure that resulted from reliance on exports as a measure of performance. In addition, a critical difference was the relative openness of these countries to disembodied technology imports obtained through technology licenses where as Latin American countries and India were restrictive.

In the above backdrop, the relevant lesson for contemporary developing countries is that the differences in the nature of policy and its implementation are critical for robust industrial growth. Japan, Korea and Taiwan undertook continuous monitoring of progress of firms where the protection was provided. Subsidised credit and protection in the domestic market in Korea were contingent on export performance of firms. Firms were, thus, forced to improve productivity which led to intensive efforts to import and assimilate foreign technology. Consequently, Korea and Taiwan experienced high TFP growth rate compared with other developing countries, although much of this might have accrued without selective intervention.

Factors Causing the Industrial Slowdown: Some Hypotheses

3.86 A number of hypotheses in terms of cyclical and structural factors have been put forward to explain the slowdown in the manufacturing activity during the latter phase of the reform period. The explanations provided, however, fall short of giving a satisfactory answer to what has led to the manufacturing slowdown and its persistence. The onset of slowdown is often attributed to the satiation of the pent-up domestic demand of 'once-for-all' nature for a host of import-intensive goods, which could be domestically assembled or produced following trade liberalisation (Chandrasekhar and Ghosh, 2002). The short-run increase in domestic demand was seemingly facilitated by easy access to credit, including consumer credit in the wake of financial liberalisation. Once that pent-up demand of transitory nature was satisfied, industry entered the phase of slowdown in the absence of demand support - domestic or exports. However, the huge capacity-build up noticed in the first phase of the reform period runs counter to the momentary surge in demand that was not likely to be sustained in the long run.

3.87 Another hypothesis on the onset of slowdown relates to the 'credit crunch' which, it is argued, triggered off the manufacturing slowdown (Sen *et al*, 1997 and Desai, 2001). The unexpected and temporary tightening of liquidity in money markets during 1995-96, resulting from large dollar sales by the Reserve Bank to contain volatility in the forex market, was mistaken to be an expression of deflationary credit policy (Acharya, 2002).

3.88 Yet another factor was the role of the corporate sector. The proportion of corporate funds locked up in inventories and receivables went up steadily, leading to a scarcity of working capital (Sen *et al*, 1997). Further, the proportion of funds invested in financial instruments, which had hovered around 5 per cent during 1985-1993, crossed the level of 10 per cent subsequently. The depressed stock market conditions in 1995-96 inhibited the redemption of financial instruments. The rising interest rates may also have been prohibitive for new projects and investment, particularly, in the informal sector which has limited access to funds (Shetty, 1997a and 2001b).

Reinforced by the increased borrowings by the Government, the weighted average lending rate of scheduled commercial banks rose to 17.1 per cent in 1995-96 from 16.1 per cent in 1994-95. In real terms, the rate shot up to 8.5 per cent in 1995-96 from an all-time low (for the 1990s) of 3.9 per cent in the preceding year.

3.89 What follows below is an account of these cyclical and structural factors which have impacted upon industrial growth in recent years.

Cyclical Factors in Industrial Slowdown

3.90 Cyclical factors have generally been recognised as an important source of industrial slowdown. In this context, the significant fall in Government capital investment especially since 1995, has been recognised as the key contributor to the slowdown (Nayyar, 1996). It is, however, important to underscore that while the contraction in Government expenditure does have adverse implications for the manufacturing growth, it declined even during the manufacturing boom (1992-93 to 1995-96). Thus, decline in Government expenditure *per se* does not provide a satisfactory explanation of the slowdown.

3.91 The manufacturing slowdown can also be seen in terms of decline in fixed investment in industry in the context of over-expansion of capacities during the manufacturing boom, slump in the capital market for new issues and rise in real interest rates in 1995-96 (Acharya, 2002). The increase in real fixed investment in manufacturing from 6.8 per cent of GDP in 1990-91 to 13.0 per cent in 1995-96 and the subsequent decline to 7.9 per cent by 2000-01 seems to have mirrored the pattern of manufacturing growth.

3.92 Among the other cyclical sources of demand, the lagged effect of the negative agricultural growth in 1995-96 seems to have worked towards slowing down the growth of rural demand for consumer durables and non-durables subsequently (Government of India, 2000). As the demand for industrial products, particularly the consumer durables, is significantly influenced by the rural demand, fluctuations in the agricultural production seem to have adversely impacted the industrial growth.

3.93 The cyclical downswing was not confined to the domestic sources of demand but was also clearly visible in manufacturing exports. In anticipation of high potential demand in the wake of reforms, the manufacturing sector built up huge capacity through imports of capital goods during 1994-97 (Table 3.18). Such capacity build-up was not sustainable on the basis of normal growth in domestic demand, and the only feasible outlet was the exports market. However, signs of exports slowdown were visible in 1995-96 when manufacturing exports decelerated. Subsequently, with slowdown in the world trade, sluggishness in the global manufacturing prices and variations in the cross-currency exchange rates, manufacturing exports growth declined to a meagre 3.6 per cent by 1996-97. The real appreciation of Rupee between 1993 and 1995 and the Asia-wide slowdown in exports following the loss of market share to China also contributed to the slowdown in exports [See Chapter VII for a discussion].

Table 3.18 : Production and Imports of Capital Goods and IIP Growth

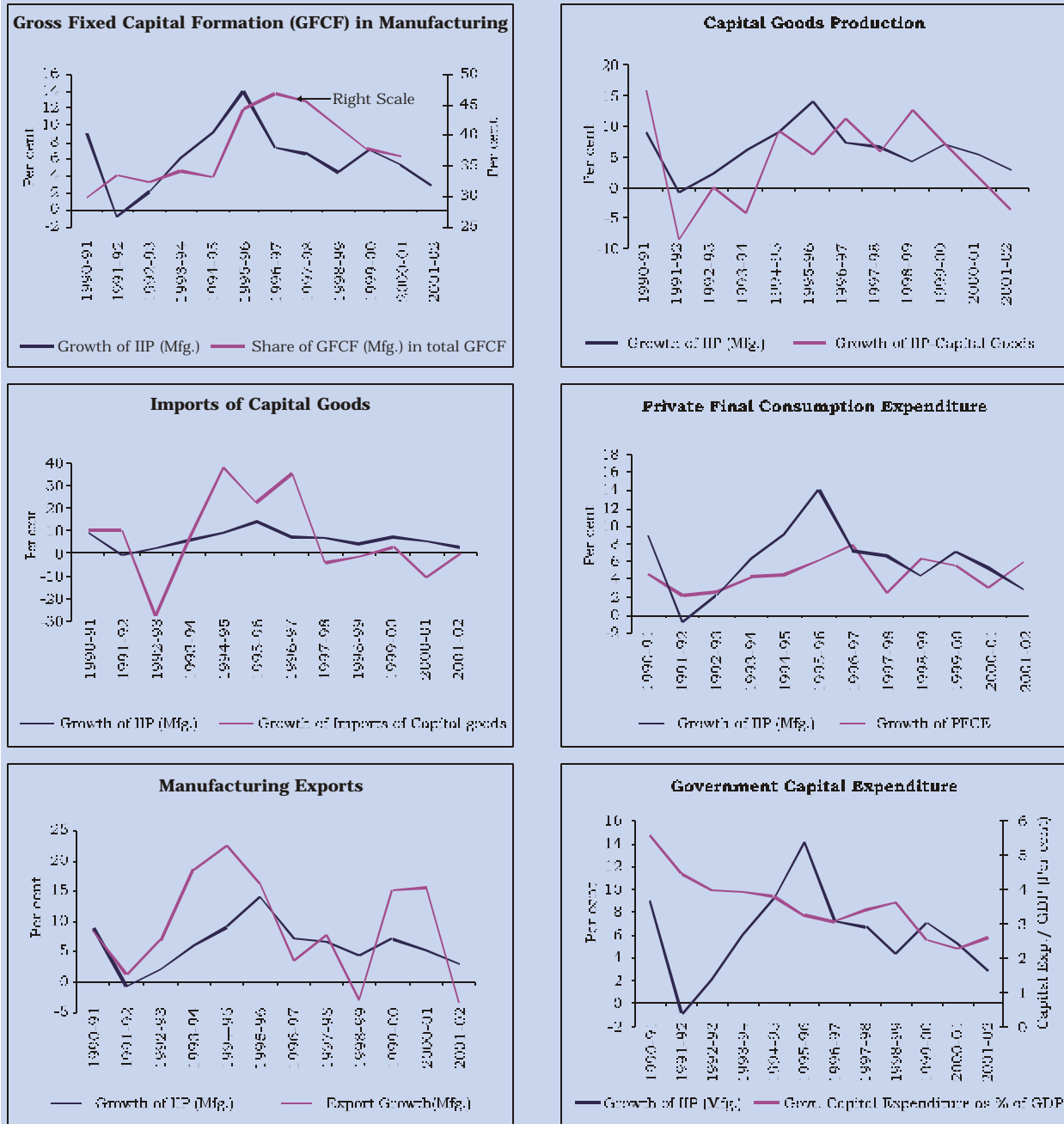
Year	IIP	Capital Goods	(Per cent)
			Capital Goods

	(Manufacturing)	Production	Imports
	1	2	3
1990-91	9.0	16	10.1
1991-92	-0.8	-8.5	10.4
1992-93	2.2	-0.1	-27.5
1993-94	6.1	-4.1	7.1
1994-95	9.1	9.2	37.8
1995-96	14.1	5.4	22.4
1996-97	7.3	11.4	35.2
1997-98	6.7	5.8	-4.0
1998-99	4.4	12.6	-1.3
1999-00	7.1	6.9	2.7
2000-01	5.3	1.8	-10.9
2001-02	2.9	-3.4	-0.3

Sources : 1. Central Statistical Organisation.
2. Directorate General of Commercial Intelligence and Statistics

3.94 As is evident from the foregoing analysis, the growth momentum in manufacturing slackened towards the end of 1996, largely under the influence of factors outside the realm of public policy in the short-run. The movement in major indicators of aggregate demand, *viz.*, domestic capital formation, Government capital expenditure, capital goods production, import of capital goods, manufacturing exports and private final consumption expenditure, all witnessed deceleration during the latter phase of the reforms (Chart III.24). Some empirical evidence of the determinants of industrial demand is set out in Box III.4.

Chart III.24: Indicators of Manufacturing Activity



Source: Based on the data from the Central Statistical Organisation, DGCI & S and Union Budget, Government of India.

**Box III.4
Determinants of Demand for Manufacturing and Overall Industry**

The influence of demand factors on manufacturing is corroborated by the empirical estimates of a manufacturing demand function. The estimated demand function for manufacturing (mfgcy) indicates that agriculture (Lagr) has a dominant positive impact on manufacturing with an elasticity of 0.21. The export elasticity (Lex) of manufacturing demand is positive but relatively low at 0.08. The manufacturing demand is found to be sensitive to manufacturing inflation (Lpm) with elasticity of (-) 0.19. There has been a significant adjustment to the desired level of demand as indicated by the lagged dependent variable. The demand function for the industrial sector (indcy) as a whole also

reveals that the maximum positive demand impact emanates from agriculture (elasticity = 0.18), closely followed by exports (elasticity = 0.11). The industrial demand also turns out to be sensitive to industrial inflation with elasticity of (-) 0.21.

Demand Function for the Manufacturing Sector

(Sample: 1970-71 to 2001-02)

$$\text{mfgcy} = -2.490 + 0.211 \text{Lagr} + 0.077 \text{Lex} - 0.189 \text{Lpm} - 0.047 \text{Dum1}$$

(2.103) (2.234) (-3.025) (-2.533)

$$+ 0.292 \text{mfgcy}(-1)$$

(2.07)

$$R^2 = 0.61, \text{ Durbin's } h = 0.50, F = 7.37$$

Demand Function for the Overall Industry

$$\text{indcy} = -2.311 + 0.179 \text{Lagr} + 0.111 \text{Lex} - 0.212 \text{Lp} - 0.038 \text{Dum2}$$

(2.540) (3.023) (-3.874) (-2.887)

$$R^2 = 0.67, \text{ DW} = 1.91, F = 9.83$$

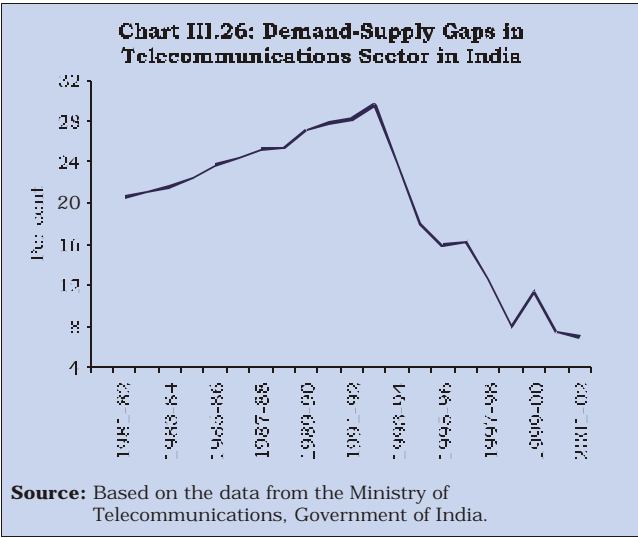
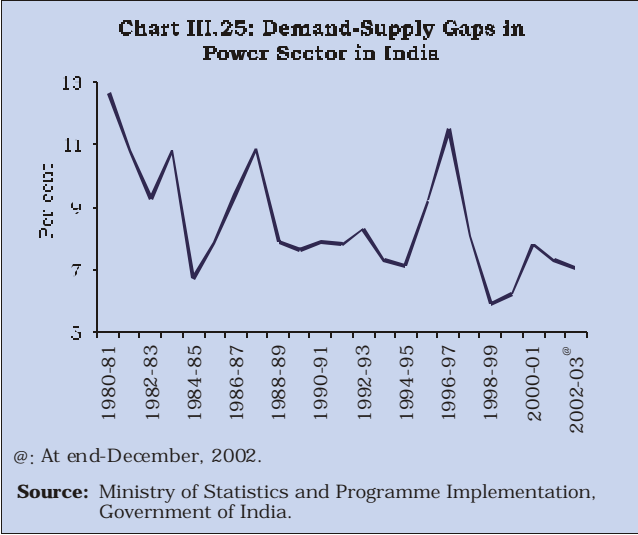
Where, mfgcy = cyclical demand component of manufacturing sector, indcy = cyclical demand component of overall industry, Lagr = log of agriculture output, Lex = log of exports of manufacturing items, Lpm = log of prices of manufacturing products, Lp = Log of WPI, Dum1 and Dum2 represent the impact of irregular shocks.

Structural Factors

3.95 To the extent the slowdown is prolonged and protracted, it seems to have its origin in structural factors, including, inadequate industrial restructuring undertaken in the face of growing openness of the economy and the associated external competitive pressure. The inadequacy of institutional and structural reforms, which held back the industrial restructuring, has, thus, emerged as a binding constraint on manufacturing growth in the liberalised trade regime.

Infrastructure Constraints in the Industrial Sector

3.96 The industrial performance continues to be hampered by physical infrastructure bottlenecks with the demand-supply imbalances persisting and growing during the reform period. A worrisome feature of infrastructure development has been the declining trend in potential output of a number of basic activities such as steel, coal, cargo handling and freight loading. There are, however, signs of improvement for a few sectors, like power and communication. With the initiation of power sector reforms, the demand-supply gap for power has witnessed a decline to 7.9 per cent during the reform period from 8.9 per cent during the pre-reform period. Notably, the power deficit remained high at around 9 per cent during the mid-1990s when the industrial sector was growing at a faster rate (Chart III.25). The downtrend in demand-supply gap for telecommunications accompanied by a decline in unit cost reflects the regulatory reforms and increased competition arising from private sector participation (Chart III.26).



3.97 The deteriorating infrastructure services represent a direct fall out of shrinkage in infrastructure investment in the context of grossly inadequate internal resources of public infrastructure entities and dwindling Plan outlay for infrastructure. The real capital formation in electricity, gas and water supply declined to 2.6 per cent of GDP during the 1990s from 2.9 per cent during the preceding decade (Table 3.19). A similar trend was observed for railways. Within the 1990s also, there was a decline in the real gross capital formation in sectors like electricity, gas and water supply, and the railways between the first and the second half. In contrast, communication witnessed an improvement in the reform period following the market based pricing of services and better regulatory framework. The investment in infrastructure sector as a whole has shown clear decline of one percentage point of GDP between the first and the second halves of the 1990s. This decline can be attributed to declining government investment on infrastructure - a fall out of the prevailing fiscal situation – which was a major contributing factor for the economic slowdown in the latter part of the 1990s.

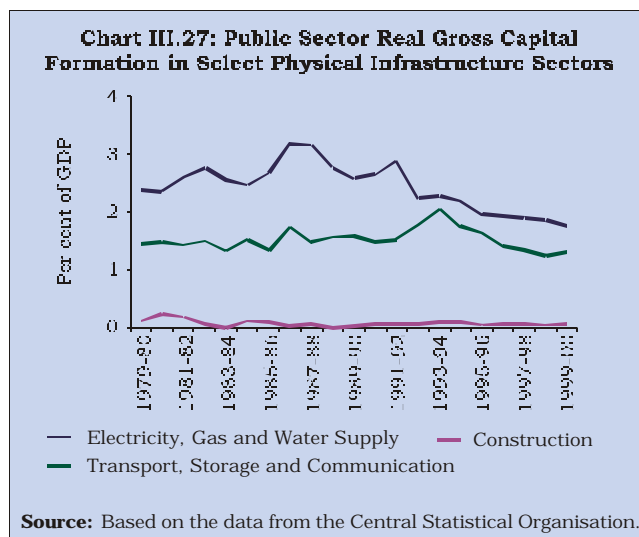
Table 3.19 : Real Gross Capital Formation in Infrastructure Sectors

(Per cent of GDP)

Period Averages	Electricity Gas and Water Supply	Construction	Transport, Storage and Communication	Of which: Railways	Communi- cation	Total Infras- tructure	Total Gross Capital Formation
	1	2	3	4	5	6	7
1980-81 to 1984-85	2.8	0.5	2.5	0.6	0.4	5.8	25.5
1985-86 to 1989-90	3.1	0.4	2.9	0.7	0.5	6.4	25.4
1990-91 to 1994-95	2.9	0.4	3.0	0.6	0.7	6.3	24.7
1995-96 to 1999-00	2.3	0.4	2.6	0.4	0.7	5.3	25.8
1980-81 to 1989-90	2.9	0.5	2.7	0.7	0.4	6.1	25.4
1990-91 to 1999-00	2.6	0.4	2.8	0.5	0.7	5.8	25.2

Source : National Accounts Statistics, Government of India.

3.98 The pace of public investment in infrastructure slowed down substantially during the reform period on account of rising fiscal imbalances of the Government, both at the Centre and the States. As a result, public investment in major infrastructure sectors declined in real terms during the reform period (Chart III.27). The rates of return from infrastructure services extended by the Government continue to be abysmally low, constraining the ability to generate internal resources for investment. For instance, the rate of return on investment for the State power sector deteriorated from (-)12.7 per cent in 1991-92 to (-)32.8 per cent in 2001-02. These essentially indicate lack of required structural reforms in the power sector in India, notably the near absence of market based pricing.



3.99 Contemporaneously, response of the private sector to the reform process has not been adequate to offset the declining public investment on account of inadequate institutional reforms, lack of clarity regarding infrastructure development priorities, non-transparency in project outsourcing processes, and numerous time consuming clearances. In the absence of rationalisation of user charges, the infrastructure sectors such as railways, public transport, power continue to suffer from the levy of inadequate user charges, thereby putting off potential private participation. Keeping in view the long gestation period for infrastructure projects, the issue of initial risk sharing by the Government assumes importance, given the inability of the private sector to assess the long-term risks.

3.100 The cost of power and energy is an important element in the total cost of manufacturing in India and a higher cost structure of power for the industrial sector adversely affects its price competitiveness. During the 1990s, electricity tariff charged from industrial/commercial users is significantly higher than the average cost of supply. During the 1990s, the tariff charged from the industrial sector, on an average, remained 26 per cent above the average cost of supply of State Electricity Boards (SEBs) and electricity departments, reflecting on the higher input costs for the industry (Table 3.20). The higher cost of electricity is also borne out by the fact that annual variation in WPI for electricity has been higher than that of WPI for manufacturing for the entire period (Chart III.28). During latter phase of the reforms, the cost of power for the industry has risen at a rate much faster than the rise in the prices of manufacturing products. For instance, during the period 1996-97 to 2001-02 (*i.e.*, the period of industrial slowdown), while the average tariff charged from industry increased on an average by 7.7 per cent, the manufacturing prices rose by 2.9 per cent. Thus, the distinct rise in the cost of power for the industry has impacted on industrial competitiveness.

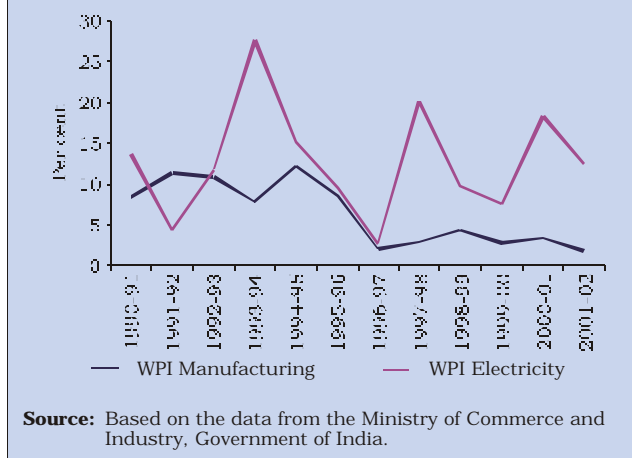
Table 3.20 : Average Electricity Tariff for Industry

Year	(Paise/Kwh)			
	Average Cost of Supply of Electricity	Average Tariff Charged from Industry	Index for Average Tariff for Industries	WPI for Manufacturing
	1	2	3	4
1992-93	128.2	171.50	86.5	97.8
1993-94	149.1	198.20	100.0	100.0
1994-95	163.4	219.90	110.9	112.2
1995-96	179.6	245.50	123.9	121.9
1996-97	215.6	276.89	139.7	124.4
1997-98	239.7	314.63	158.7	128.0
1998-99	263.1	324.33	163.6	133.6
1999-00 (P)	305.1	343.37	173.2	137.2
2000-01(RE)	327.3	368.37	185.9	141.7
2001-02(AP)	349.9	381.14	192.3	144.3

P = Provisional Estimates, RE= Revised Estimates,
AP= Advance Estimates.

Source : Planning Commission, Government of India, 2002c.

Chart III.28: Wholesale Prices of Electricity vis-à-vis Manufacturing (Annual Variations)



3.101 In the context of reducing the unit cost of power to the industry as also to ensure stable supply in the event of rising industrial demand, the issues of pricing, cross subsidy, ownership and the regulatory issues have emerged to the forefront. The major challenges to the sustainable growth of power sector in India continue to emanate from poor recovery of SEBs' dues and transmission and distribution losses, subsidies to the agricultural and domestic sectors, and a lack of restructuring. As the financing of power projects poses a daunting task and requires a long-term solution, resource generation within the sector through prompt and efficient collection of appropriate user charges across the consumer categories should precede the efforts at attracting private investments. The poor response of the private sector is indicated by the fact that even after a decade of opening up of the power sector, private sector accounts for only 10 per cent of the present generating capacity. More recently, regulatory reforms and reforms in the transmission and distribution sectors have been emphasised to improve the efficiency of the power infrastructure and raise the level of revenue realisation. In the Indian context, as power is in the Concurrent List of the Indian Constitution, measures for reforming this sector have been undertaken by a number of State Governments (Box III.5).

Box III.5 Power Sector Reforms in Indian States

An early but notable exercise in power reform was carried out by a committee of the National Development Council way back in 1994. Following a series of Chief Ministers Conferences in late 1996, a 'Common Minimum National Action Plan for Power' was agreed upon based on the following points: independent regulatory commission, rationalisation of tariffs and private sector participation in distribution. Accordingly, the regulatory reform started off in 1996 with the establishment of State Electricity Regulatory Commission (SERC) in Orissa, followed by Haryana in 1998 prior to the Central enactment, namely the Electricity Regulatory Commission Act, 1998. The Central Electricity Regulatory Commission (CERC) was set up in 1998 as an independent regulatory body.

Twenty-two States have so far either constituted or notified the constitution of State Electricity Regulatory Commission (SERC), of which 13 have already issued tariff orders. State Electricity Reforms Act has been enacted by nine states e.g., Orissa, Haryana, Andhra Pradesh, Uttranchal, Uttar Pradesh, Karnataka, Rajasthan, Madhya Pradesh and Delhi. Of these, State Electricity Boards have been corporatised for all except Madhya Pradesh. Though separate state-owned generation, transmission and distribution companies were established with an ultimate aim of privatising it, most of them have made progress in that regard only to a limited extent (e.g. corporatisation but not privatisation). In fact, though generation has improved in some states, transmission and distribution units have seen

further mounting of losses.

States such as Andhra Pradesh, Orissa, Haryana, Karnataka, Rajasthan and UP have completed unbundling of their respective SEBs into separate entities for generation, transmission and distribution. Orissa and Delhi are the only States so far to have privatised their distribution. In Orissa, distribution is presently carried out by four companies. Besides, 49 per cent disinvestment has taken place in its thermal power company with a similar plan on the agenda for its hydro-power generation company. Financial stress of the Grid Corporation of Orissa, with an estimated liability of Rs.1,160 crore in 2000-01, has been mitigated with concerted efforts. Andhra Pradesh Government plans to privatise its distribution activity by 2002. In Gujarat, the reform programme has emphasised on metering of all categories of consumers with a cap on agricultural subsidy.

During the reform period, though the demand-supply gap in power supply has narrowed down to some extent, it still persists and the financial position of most of the SEBs has further deteriorated. However, it is noteworthy that major problems such as recovery of receivables, settlement of past dues, metering of all consumers, reduction in subsidies to the agricultural and domestic sectors, reduction in Transmission and Distribution (T&D) losses, improvement in Plant Load Factor (PLF) and restructuring of SEBs have been identified, and remedial measures have been initiated by the Central as well as State Governments to tackle these problems in the medium term.

Against this backdrop, some SERCs have clearly identified governance as the primary issue. The governance issue arises because of the complicated structure, inadequate information flows from the field offices to the management, lack of action by the senior management against the non-performing executives and staff, undefined role of the political executive, absence of guidelines and norms for personnel policies, lack of transparency and finally, outdated work processes that are not in tune with the commercial status of the Electricity Corporations (Government of Uttar Pradesh, 2002). It is, therefore, crucial for the States to have a vision, work out a credible strategy of power development and lay down implementation milestones.

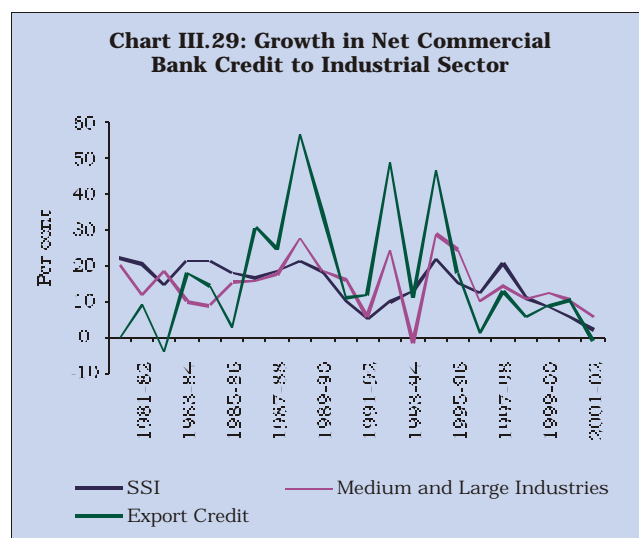
3.102 The above developments reveal that there has been compression in investment on infrastructure leading to inadequate availability and deterioration in the quality. At the same time, cost of infrastructure, particularly the cost of power for industry, has relatively risen in the late 1990s. Further, there has been a relative increase in the real interest cost for the industrial sector. These factors together, have reduced the competitiveness of the industry and caused the persisting slowdown.

Industrial Performance and Credit Growth

3.103 The provision of credit is considered an essential input to industrial activities. The credit delivery mechanism plays an important role, especially in developing economies with credit market imperfections. A major finding of the literature in this regard is that small firms are largely dependent on bank credit to meet their financing requirements while the big firms have alternative sources of finance (Gertler and Gilchrist, 1993; Olinear and Rudebusch, 1995). Therefore, small firms usually get affected more on occasions of tightening of bank credit. Not only the credit availability, but also the cost of credit has a significant impact on the production decisions of firms. Contextually, credit delivery system continues to be a major focal point of the on-going financial reforms in India since the early 1990s. The objective is to meet the credit requirements of the productive sectors and, more so, of the weaker bidders in the credit market.

3.104 The credit off-take from scheduled commercial banks to the commercial sector indicated a declining trend during the 1990s, barring an uptrend in the mid-1990s. At the disaggregated level also, there was a slowdown in credit growth for the various segments such as exports, Small Scale Industries (SSIs), medium and large industries, particularly in the second phase of the reform period (Chart III.29). Export credit growth declined substantially to about 6.5 per cent

during the second half of the 1990s from 31.3 per cent in the first phase. The deceleration in export credit while reflecting the slowdown in exports, can also be attributed to other forms of financing by exporters, such as, Exchange Earners' Foreign Currency Account and availability of funds at sub-PLR.



3.105 The slowdown in the credit growth was more pronounced for the SSIs *vis-à-vis* the medium and large industries. The credit needs of SSIs were largely met in the 1980s and earlier as part of the promotional policies for the SSIs under the priority sector lending by banks. During the period 1990-91 to 2001-02, the growth in credit to SSIs decelerated to 11.6 per cent from 19.4 per cent in the 1980s (Table 3.21). Moreover, credit to SSIs as a percentage of non-food gross bank credit indicated a decline from 14.4 per cent in 1995-96 to 11.8 per cent in 2001-02. It may be noted that while the concessional element in lending rates for the SSIs stands largely withdrawn during the 1990s, financial vulnerability of State level institutions in view of poor recovery and other inherent inefficiencies also raises concerns regarding the prospects of credit flows to the SSI sector. This decline in credit flow to the SSI sector has to be seen in the context of falling productivity in the SSI sector as a whole in the 1990s as against the 1980s with the index declining to 34 in 1994-95 from 50 in 1984-85 (SIDBI, 2001). However, within the SSI sector the productivity in the modern segment remained higher than the traditional/tiny segment. Thus, a key issue for the SSI reforms is to enhance the credit assessment capability of the financial institutions so that the small scale as a whole is not equated with high risk for credit disbursement.

Table 3.21 : Growth in Sectoral Non-Food Credit

Period	(Per cent)		
	SSIs	Medium and Large Industries	Exports
	1	2	3
1980-81 to 1989-90	19.4	16.7	18.8
1990-91 to 2001-02	11.6	13.7	15.7

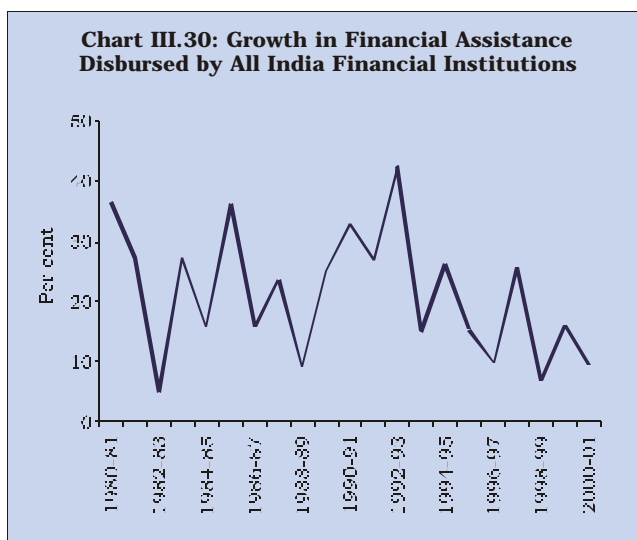
3.106 An analysis of credit to major industrial subgroups within the manufacturing sector reveals that during the reform period a substantial shift has taken place in favour of industries such as iron and steel, electricity, food processing, cement, gems and jewellery and petroleum (Table 3.22). Infrastructure sector improved its share to 6.5 per cent in March 2002 from 2.0 per cent in March 1998. The industries that recorded a decline in their respective shares were metal and metal products, engineering, cotton, jute and other textiles, paper and paper products, chemicals, leather and leather products and construction. The highest decline was noticed for the engineering industry with its share in gross bank credit declining from 22.6 per cent in 1991 to 10.5 per cent in 2002. The cotton, jute and other textiles together also witnessed shrinkage in their share from 13.2 per cent in 1991 to 11.3 per cent in 2002, reflecting partly the rising incidence of sickness in such industries.

Table 3.22 : Industry-Wise Deployment of Gross Bank Credit – Share of Major Groups (Outstanding os on Last Reporting Friday Of March)

Industries	1985-86 to	1991-92 to	1996-97 to
	1990-91	1995-96	2001-02
	1	2	3
Iron and Steel	5.1	6.4	9.2
Other Metals and Metal Products	3.5	3.5	3.2
All Engineering	23.9	21.4	12.6
Electricity	2.0	1.9	3.5
Cotton, Jute, Other Textiles	14.2	12.7	12.5
Sugar	1.5	2.0	2.0
Food Processing	1.9	2.1	2.8
Paper and Paper Products	2.5	2.1	1.7
Rubber and Rubber Products	1.6	1.5	1.2
Chemicals, Dyes, Paints <i>etc.</i>	12.3	12.7	11.3
Cement	1.5	1.5	1.6
Leather and Leather Products	1.5	1.7	1.4
Gems and Jewellery	0.7	2.2	2.5
Construction	1.6	1.9	1.6
Petroleum	0.4	0.5	4.0
Infrastructure	–	–	4.1

Note : Infrastructure has been included as a separate category from 1998 onwards .

3.107 Another important source of finance for industry is the financial assistance disbursed by the All India Financial Institutions (AIFIs) mainly for investment operations in medium to long-term horizon. In keeping with the trend in bank credit, the growth in disbursements by AIFIs increased from 21.8 per cent in the pre-reform decade to 24.7 per cent in the first phase of the reform period. Subsequently, however, disbursements witnessed a distinct slow down to 7.9 per cent in the second phase of the reform period (Chart III.30). This is indicative of a slow down in the investment demand, particularly for the green-field projects and expansion activities in the industrial sector.

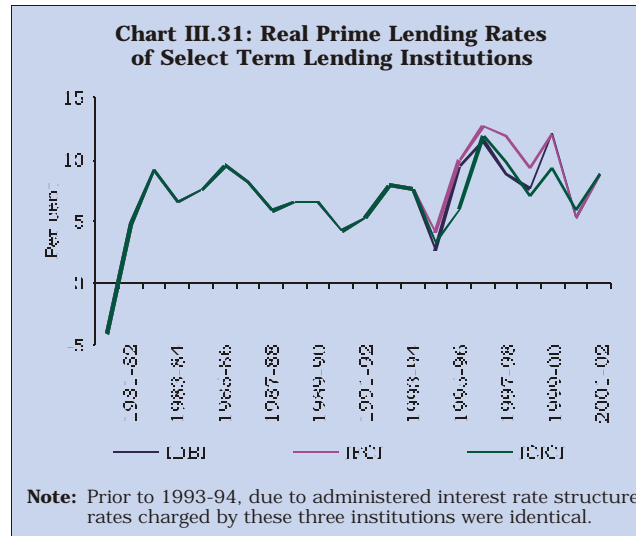


3.108 The slowdown in the credit flows from banks and financial institutions may be evaluated in the context of the behaviour of the prime lending rates (PLRs) charged by them. In real terms, the PLR of AIFIs (IDBI) ruled, on an average, 9.11 per cent during 1995-96 to 2001-02, which was higher than 5.52 per cent prevailing during the period 1990-91 to 1994-95 (Chart III.31 and Table 3.23). The real PLR of banks (weighted average lending rates of Scheduled Commercial Banks) also increased to 12.5 per cent from 6.8 per cent over the same period. Such high real interest rates on medium to long-term borrowings for the industrial sector work as a constraint in undertaking investment decisions. Persistence of high interest cost adversely impacts on the capacity buildup and upgradation. Over a medium-term, the high interest rate effect is ultimately reflected in lower output growth. An assessment of the present trends in the real interest rates for the industrial sector and the real output growth seems to indicate weakening sustainability of the investments. While during the period 1996-97 to 2001-02 growth of real output from industrial sector averaged to 4.9 per cent, the real PLRs remained distinctly high at around 9 per cent. Given the downward rigidity of medium and long-term real interest rates, industrial investment is rendered unviable when such rates are higher than the rate at which the industry is growing.

Table 3.23 : Average Real Lending Rates of Select Term Lending Institutions

Period	(Per cent)		
	IDBI	IFCI	ICICI
	1	2	3
1980-81 to 1984-85	4.71	4.71	4.71
1985-86 to 1989-90	7.34	7.34	7.34
1990-91 to 1994-95	5.52	5.82	5.67
1995-96 to 2001-02	9.11	9.99	8.38

Note : Represent *ex-post* real interest rates. The real rates are computed by subtracting the Inflation rate (WPI) from nominal Prime Lending Rates.



3.109 The decelerated credit off-take by industry from banks and AIFIs needs to be interpreted keeping in mind the alternative sources of finance that are available to industry in the reform period.¹³ A comparative analysis of financing patterns of select non-financial public limited companies indicates an increasing recourse to internal sources of financing as against the borrowed sources of funds, particularly since the late 1990s. Among the borrowed sources of funds, financing through debentures, and loans and advances declined from 11 per cent and 13.5 per cent, respectively, during the period 1985-86 and 1989-90 to 5.7 per cent and 11.5 per cent during the second phase of the reform period (Table 3.24). The declining share of credit from banks and financial institutions has been evident particularly in the second phase of the reform period when their share in total sources of funds raised by the corporate sector declined to 17.4 per cent in 2000-01 from 23.8 per cent in 1995-96.

Table 3.24 : Sources of Funds of Selected Public Limited Companies

(Percentage share in total funds raised)

Period	Internal Sources		External Sources				Trade Dues & Other Current Liabilities	Total		
	Paid-up Capital	1	Borrowings		Total	6				
			Debentures	2					Loans and Advances	
									Banks	Fis
5	7	8								
1985-86 to 1989-90	31.8	7.2	11.0	13.5	8.7	37.9	22.8	68.2		
1990-91 to 1994-95	29.9	18.8	7.1	8.2	10.3	32.7	18.4	70.1		
1995-96 to 2000-01	41.2	12.1	5.7	11.5	9.2	32.1	14.2	58.9		

Source : Selected Financial Statistics - Public Limited Companies, RBI.

3.110 The reduced role of conventional financing for the corporate sector such as bank credit and financial assistance from AIFIs should be seen in the context of increasing recourse to private placements of debt and equity on account of less stringent disclosure norms, low cost of issuance, ease of structuring instruments and reduced time lag in issuance. Resource mobilisation through this route increased sharply from Rs.13,361 crore in 1995-96 to Rs.64,950 crore in 2001-02. Nevertheless, the high cost of credit in real terms from banks and AIFIs seems to have gone against the conventional sources of financing, inhibiting the growth of investment demand and capacity build-up in industry. The reduced industrial credit can also be seen as an outcome of the

risk-based prudential requirements, such as capital adequacy and provisioning norms implemented for banks and financial institutions as part of the financial sector reforms (Nag and Das, 2002). As a result, bank funds have been largely deployed in Government securities, relatively risk free assets, which account for around 39 per cent of their net demand and time liabilities, far exceeding the minimum statutory liquidity requirement of 25 per cent.

3.111 It may be difficult to clearly distinguish as to what extent the lower credit growth to the commercial sector from banks and the financial institutions is attributable to the sluggishness in demand or to the heightened risk aversion arising from tighter supervisory/regulatory norms. While the present slowdown in the industrial demand seems to have contributed to the slowdown in the credit growth, both for working capital requirements and long-term investments, the possibility of high lending rates impacting on the credit demand of certain segments, particularly small enterprises having limited access to alternative sources of funds has been a matter of concern. Since large corporates can access alternative cheaper sources of funds, the burden of adjustment in the financial sector seems to have fallen relatively more on small and medium enterprises due to segmentation of credit markets. The problem seems to have been accentuated on account of lack of adequate credit risk assessment regarding small and medium enterprises emanating from poor credit information base on such enterprises. In view of these concerns, the credit delivery system has been a major focus of reforms since the 1990s with the objective of augmenting the total volume of institutional credit while securing an equitable distribution of credit, particularly for weaker bidders in the credit markets, including small enterprises. Besides improving the volume and terms of credit, policy efforts have been directed towards simplifying the procedures.

Productivity Trends in the Manufacturing Sector

3.112 Productivity plays a major role in sustaining the industrial growth since it is the principal determinant of cost, price and trade competitiveness of firms and industries. Notwithstanding the differences of views on measurement issues, there is a near unanimity in the empirical literature on productivity growth in the Indian manufacturing sector. It is recognised that there was a decline in total factor productivity growth (TFPG) till 1980, with a turnaround taking place in mid-1980s following the reoriented trade and industrial policies and improved infrastructure performance (Brahmananda, 1982; Ahluwalia, 1985, 1991).¹⁴ In fact, the significant shortfall in the target for industrial output till about the Sixth Plan can be attributed to the negligible TFPG in manufacturing. The later studies covering the period up to mid-1990s have found evidence of a positive TFPG (Balakrishnan and Pushpangadan, 1994; Majumdar, 1996; Rao, 1996; Pradhan and Barik, 1999) (Table 3.25). Thus, there seems to be turnaround in the productivity growth in the mid-1980s.

Table 3.25 : Productivity in the Indian Industry : A
Summary of Empirical Estimates

	Period Covered	TFPG (SD)	TFPG (DD)
	1	2	3
Brahmananda (1982)	1950-51 to 80-81	-0.2	—
Ahluwalia (1985)	1959-60 to 79-80	-0.6	—
Goldar (1986)	1959-79		1.06 to 1.31
Ahluwalia (1991)	1959-60 to 85-86	-0.4	—
Balakrishnan and	1970-71 to 88-89	0.5	3.1

Pushpangadan (1994)			
Dholakia and Dholakia (1994)	1970-71 to 88-89	-0.11 to 0.06	0.9 to 1.74
Majumdar (1996)	1950-51 to 92-93	1.7*	—
Rao (1996)	1973-74 to 92-93	1.3@	2.2
Pradhan and Barik (1999)	1963-64 to 92-93	0.6	
Trivedi <i>et al</i> (2000)	1973-74 to 97-98	1.95	3.7
NCAER (2001)	1980-81 to 96-97	-0.05 to 0.04\$	
Unni <i>et al</i> (2001)	1978-79 to 94-95	-0.1	

* The estimates are reported only for the sub-period 1973-74 to 1992-93, out of the total period of the study spanning 1950-51 to 1992-93.

@. Growth rate of TFP is obtained indirectly from the estimates of TPG

\$ Represents different estimates of TFPG based on the firm level panel data set.

SD = Single deflation method, DD = Double deflation method.

3.113 The role of the reform process in terms of its impact on manufacturing productivity continues to be debatable. While a positive rate of growth in productivity is noticed in the post-1985 period, the level of labour productivity is found to be abysmally low and its convergence to the international standards seems to be a difficult proposition in the near future (Trivedi *et al*, 2000). The low labour productivity appears to have offset the comparative advantage in terms of low labour cost (CII-World Bank, 2002). NCAER (2001) has observed a decline in productivity growth in 1990s (up to 1997-98) in relation to the 1980s. Besides, the mean technical efficiency of all firms taken together seems to have declined in 1990s as compared to the pre-reform period. Unni *et al* (2001) also provide evidence of a declining productivity growth in the first half of 1990s. Productivity growth in the SSIs also witnessed a decline, with the labour productivity growth decelerating to 3.7 per cent during 1990-96 from 6.2 per cent during 1980s and the capital productivity growth declining to (-)1.6 per cent from 2.6 per cent during the same period (SIDBI, 2000). Regarding trend in productivity in the unorganised manufacturing sector, Unni *et al* (2001) have observed a rapid decline in the TFPG to (-)3.1 per cent during the reform period (1990-95) from 11.4 per cent in the latter half of 1980s. The TFPG for the entire period of study, *i.e.* 1978-95 is estimated at (-)2.5 per cent. This reflects, *inter alia*, low technological change in the unorganised sector in the reform period.

3.114 Broad assessment of partial factor productivity for the industry can be based on an analysis of the changes in input intensities. The material intensity of the manufacturing sector which remained high during the 1980s and the first half of the 1990s, witnessed a sharp decline in the latter half (Table 3.26). This is indicative of a shift away from material inputs as also the rationalisation of the production process, ensuring efficiency in use of material inputs. The labour intensity index (at constant prices), in contrast, witnessed almost a secular decline from the peak of 114.5 per cent in 1980-81 to 73.6 per cent in 1990-91 and further to 40.8 per cent in 1999-2000. A similar trend is discernible in the labour intensity index at current prices, though the extent of decline has been less. This can be attributed to the relatively high increase in the CPI of industrial workers than in the prices of manufacturing goods. On the other hand, the capital intensity has significantly risen during the 1990s as compared with the 1980s.

Table 3.26 : Indices of Input Intensity in the Indian Manufacturing Industry

Year	Current Prices				Constant Prices			
	Mat Inpt/ Output	Cap/ GVA	Prod Cap/ GVA	Labour/ GVA	Mat Inpt/ Output	Cap/ GVA	Prod Cap/ GVA	Labour/ GVA
	1	2	3	4	5	6	7	8
1970-71	100	100	100	100	100	100	100	100
1975-76	95.9	81.9	88.5	105.8	114.7	80.3	86.7	109.1
1980-81	97.8	92.6	99	98.7	107.9	90.8	97	114.5
1985-86	105.2	93.1	96.4	89.8	119.7	85.7	88.7	94.1
1990-91	102.7	93.1	90.9	74.9	106.3	82.9	81	73.6
1995-96	101.3	91.7	88.9	62	92.4	83.9	81.4	58.4
1999-00	95.6	91.4	85.2	70.4	94.1	88.7	82.7	40.8

Mat Inpt = Material inputs, Cap = Fixed capital, Prod Cap = Productive capital, GVA = Gross value added

3.115 The productivity growth in the manufacturing sector seems to have declined during the 1990s and, more so, in the latter phase of the reform period, primarily as a sequel to the faltering pace of implementation of structural reforms, the binding infrastructure constraints, and the lack of required industrial restructuring – all impinging on the competitiveness of the Indian industry. The input intensity indices show that the production process in the manufacturing sector has become more capital intensive, possibly in view of the adoption of capital-intensive new technologies in response to the inflexibilities that characterise the labour market. The efficiency in use of material inputs has, however, shown improvement in the latter part of 1990s.

Summing Up

3.116 The industrial sector in the reform period (1992-93 to 2001-02) reported a slowdown in all its major segments. The manufacturing slowdown noticed since the latter part of 1996 had its origin in the cyclical slowdown of exports and subdued agricultural performance. The slowdown persisted in the subsequent period due to inadequate industrial restructuring and the resultant loss of competitiveness. The lack of institutional and structural reforms, which affected the pace and content of industrial restructuring operates as the major binding constraint on manufacturing growth in a liberalised trade regime. The manufacturing slowdown has possibly been reinforced by the observed decline in productivity growth in the 1990s and the cyclical downturn in demand, both in the domestic and external markets.

3.117 Industrial performance continues to be hampered by physical infrastructure bottlenecks with demand-supply imbalances persisting during the reform period. The deteriorating infrastructure services have been a direct fall-out of shrinkage in infrastructure investment in the context of inadequate availability of internal resources of public infrastructure entities and dwindling Plan outlay earmarked for infrastructure. The declining public investment in infrastructure has not been offset by the private investment on account of inadequate institutional reforms. There are, however, signs of improvement in a few sectors, like communication.

3.118 The credit flow from the banking system has significantly slowed down for SSIs and medium and large industries in the second phase of the reform period. The deceleration has been more pronounced for the SSIs. Besides, disbursements from the all India financial institutions (AIFIs) to industry have witnessed a considerable slowdown. Such developments on the credit front need to be assessed in the context of increasing recourse to internal resources and private

placement by corporates, high real cost of credit coupled with its downward inflexibility, and prudential requirements such as capital adequacy and provisioning norms for banks and financial institutions, as well as the existing structure of the credit delivery system. The high real interest rate for industrial sector, ruling above industrial growth rate, also seems to have inhibited investment and capacity build-up in industry.

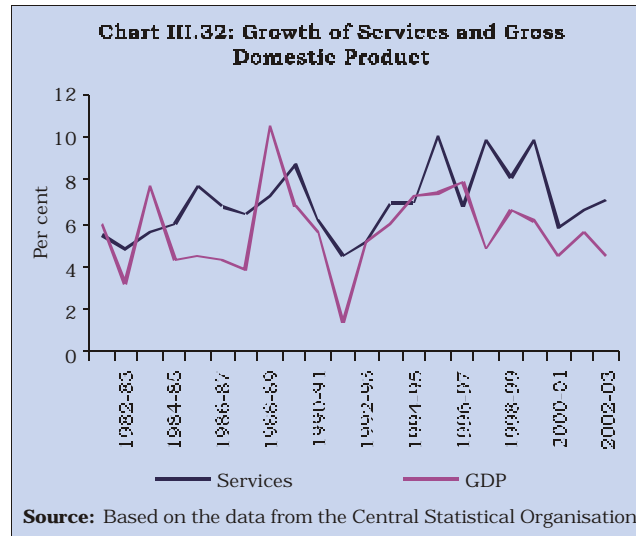
3.119 The increase in competition resulting from the reform measures *viz.*, delicensing, opening up of trade has had a mixed impact on the industrial sector. This is evidenced amply in the fact that the manufacturing inflation in the late 1990s was around 3 per cent as against 10 per cent in the early 1990s. The sharp decline in the manufacturing prices has impacted adversely on the profit margins of companies. Further, inadequate industrial restructuring has hampered industrial growth. Adequate flexibility in industrial restructuring involves more rapid bankruptcy procedures, easier reallocation of capital, faster transformation of urban land use and flexibility in labour use.

3.120 The reservation for SSI producers has created an anomalous situation where foreign producers irrespective of size are able to bring in reserved products but existing SSI producers are not allowed to expand investment and scale to economically efficient levels to compete with imports. Therefore, there is a need for dereservation in select products with strong export potential (Government of India, 2001).

3.121 Increase in competition denotes that any rise in the input costs is difficult to cope with. The dwindling public investment on infrastructure in the latter half of the 1990s, caused by deterioration in Government capital expenditure, has clearly impacted on the availability as well as the quality of infrastructure services. Simultaneously the high cost of infrastructure, particularly power and railways freight, has been loaded on to the industry. Together, the prevailing high real interest rates have adversely impacted the price competitiveness of the industrial sector. Exchange rate appreciation witnessed in the late 1990s increased further pressure on the competitiveness. Generally exchange rate adjustments compensate for the rise in input costs, but the large capital inflows into the Indian economy during the late 1990s have prevented such an adjustment.

IV. SUSTAINABILITY OF SERVICES GROWTH¹⁵

3.122 Since the 1980s, growth process in India has been marked by a robust performance of services sector. While this is partially in line with the experience of developed countries, the Indian experience is somewhat unique in the sense that the sectoral shift in favour of services sector accompanied almost stagnant share of industry and reduced share of agriculture. The momentum continued during the 1990s; in fact, it was the growth performance of the services sector that provided a modicum of resilience to the overall growth of the economy, particularly in times of adverse agricultural shocks and industrial slowdown (Chart III.32).



3.123 The set of economic reform measures initiated since 1991 also impacted on the performance of the services sector. First, reforms in the domestic industrial environment which resulted in rising manufacturing growth provided synergies to the services sector in the form of increased demand for producer services. Second, the liberalisation of the financial sector provided an environment for faster growth of the financial services. Third, reforms in certain segments of infrastructure services also contributed to the growth of services. Consequently, the services sector posted a much higher growth during the reform period as compared with the pre-reform period with its share touching nearly the 50 per cent mark. Finally, the rapid growth in services sector appears to have benefited from external demand; the typical example of which is the software industry and call centres. Interestingly, the decelerating trend in manufacturing and overall GDP seems to have been much less pronounced in case of services. Nevertheless, there are apprehensions about its sustainability in view of the contribution of “public administration and defence” to growth in services.

3.124 Against the above backdrop, the present section broadly looks into the following two issues: First, the performance of the services sector and second, the sustainability of services growth. After analysing the relative performance of the services sector in the reform period, the supply-side sources of services growth are examined followed by a discussion on the decomposition of services into three segments, *viz.*, producer services, consumer services and Government services.

Performance of the Services Sector

3.125 Since the 1980s, services sector has come to occupy a position of dominance in the composition of GDP. The average share of services sector increased to 45.4 per cent during the reform period as against 38.9 per cent in the pre-reform period. In terms of growth, services sector posted a higher growth of 7.8 per cent during the reform period as against 6.7 per cent during the preceding period. However, services sector is actually an amorphous entity; on the one hand, it includes sectors like ‘public administration and defence’, largely independent of the level of economic activity, and on the other, it has sectors like ‘trade, hotels and restaurants’. At the sub-sector level, ‘trade, hotels and restaurants’ continued to be the major segment in terms of

its share in services. The growth performance improved for all segments during the reform period barring 'financing, insurance, real estate and business services'. However, the 'financing, insurance, real estate and business services' improved its share during the reform period when all other segments witnessed shrinkage in their respective shares, which seems to be the result of the financial sector reforms that led to emergence of new participants, instruments and markets. The poor performance of the non-banking sector, among others, has been the cause for the deceleration in growth of this sector. Nevertheless, the relative contribution of this sub-sector to the services growth has been maintained across the periods (Table 3.27).

Table 3.27 : Share and Growth of Sub-Sectors of Services

Sector	1981-82 to 1990-91		1992-93 to 2001-02		Growth during the three phases of 1992-93 to 2001-02		
					1992-93 to 1993-94	1994-95 to 1996-97	1997-98 to 2001-02
	1	2	3	4	5	6	
	Share	Growth	Share	Growth	Growth	Growth	Growth
Trade, hotels and restaurants	32.2	5.9	30.7	8.1	6.6	10.9	7.1
Transport and communication	16.1	5.6	15.8	8.9	5.9	9.7	9.6
Financing, insurance, real estate and business services	21.0	9.9	26.1	7.8	9.6	6.9	8.1
Community, social and personal services	30.7	6.1	27.3	7.1	4.0	5.8	9.1
Services	100.0	6.7	100.0	7.8	6.5	8.2	8.1
	(38.9)		(45.4)				

Note: Figures in brackets are share of services in GDP.

Source: Central Statistical Organisation.

Factors underlying the Services Growth

3.126 Growth of services stemming from capital productivity/total factor productivity could be seen as an encouraging development in a capital scarce economy like India. The gross value added from services registered a higher growth in the reform period even though the trend growth of Gross Capital Formation (GCF) in services decelerated to 5.7 per cent from 5.9 per cent in the pre-reform period. This could imply an improvement in capital productivity and/ or total factor productivity in services. There is a broad consensus that the recent surge in services has been contributed, among others, by the skill-intensive and high productivity activities such as Information Technology (IT) services, which have emerged as one of the fastest growing segments in the 1990s. The labour productivity in software services is estimated to be twice that of the manufacturing sector (Arora and Athreye, 2001). The ascendancy of services can also be seen as an outcome of the economic liberalisation and encouragement of private investment in industry and infrastructure (Government of India, 2002c). Besides, increased expenditure on public administration and defence, social services and rural extension services has had a positive impact on the services growth in the 1990s.

3.127 Given the inter-sectoral linkages of services sector with other sectors, particularly industry, performance of the commodity producing sectors has implications for the growth performance of services sector. To explore such inter-linkages, a demand function for services sector has been estimated using GDP from industry, exports of services and prices of services as

explanatory variables. The estimates reveal a significant positive impact from the industrial sector as is evident from its elasticity at 0.11. Export of services also has a positive effect on the services demand with its elasticity at 0.02 while the impact of services prices turns out to be negative, as expected. ¹⁶

Composition of Growth in the Services Sector

(i) Intermediate versus Final Consumption of Services

3.128 For a meaningful analysis, the issue of absorption of services as intermediate *vis-à-vis* final consumption is examined by classifying them into producer, consumer and Government services. Their relative roles can provide insights as regards the sustainability of services growth. Activities like ‘trade, ‘transport, storage and communication’, ‘financing, insurance, real estate and business services’, which are more of intermediate nature, are taken as producer services. Activities like ‘hotels and restaurants’ and ‘other services’, having the nature of final consumption, are classified as consumer services whereas ‘public administration and defence’ (PAD) are treated as Government services.

3.129 The stylised facts on intermediate *versus* final consumption of services along with Government services during the pre-reform and reform period are presented in Table 3.28. While producer and consumer services have recorded a higher growth in the reform period, the Government services have witnessed a marginal decline. This has implications for growth dynamics, not only for services sector but also for the overall growth process.

Table 3.28 : Growth of Gross Value Added in Services Sector

Services	(Per cent)			
	1981-82 to 1990-91	1992-93 to 1994-95	1995-96 to 2001-02	1992-93 to 2001-02
	1	2	3	4
1. Producer Services	7.0 (67.6)	7.9 (70.1)	8.2 (71.0)	8.1 (70.7)
2. Consumer Services	5.8 (18.1)	4.9 (16.8)	9.3 (16.9)	8.0 (16.9)
3. Government Services	6.5 (14.3)	2.9 (13.0)	7.8 (12.1)	6.3 (12.4)

Note : Figures in the brackets are the shares of sub-sectors in GVA of services.

(ii) Producer Services

3.130 The increased share of producer services in total services in the reform period can be explained by, *inter alia*, the phenomenon of increasing relevance of outsourcing by the Indian industry. Peripheral service-oriented activities, which were carried out earlier in-house, are being contracted out to the outside agencies in order to focus on core competencies in an increasingly competitive environment in the reform period. Furthermore, the increasing share of producer services reflects the growing complementarity between services and manufacturing (RBI, 2002). The expansionary potential of services can be viewed from the fact that 50 per cent of the industries are directly or indirectly services-intensive (Bhowmik, 2000). The major demand for producer services emanates from the manufacturing sector as well as exports. The estimates of

demand function for the producer services show that a rise in manufacturing output drives up the demand for producer services (elasticity 0.18). The export growth also leads to a rise in demand for producer services (elasticity 0.06). Increase in the price of producer services expectedly has a negative impact on demand (elasticity -0.24)¹⁷. However, as some of the producer services such as ‘transport, storage and communication’ are used as input for industrial production, a bi-directional relationship between industry and services sector cannot be ruled out.

Consumer Services and Private Final Consumption Expenditure

3.131 An upward trend was observed in consumer services, which recorded a growth of 8.0 per cent in the reform period as compared with 5.8 per cent in the preceding period. The increased growth in consumer services in the reform period has been accompanied by a similar growth pattern in private final consumption expenditure (PFCE) on services. The share of services in PFCE has moved up to 24.9 per cent in the reform period from 18.0 per cent in the preceding period. A disaggregated analysis of PFCE on services shows that medical care and hotels have recorded significant increases in growth during the reform period while growth in transport and communication has slowed down over the same period.

(iii) Government Services

3.132 Government services, comprising PAD is often singled out for the high growth in services since increased expenditure of the Government in the form of wage bill gets directly reflected in its value added even without any addition to services. An examination of the issue of faster growth of this sub sector in the 1980s showed that the tertiary sector growth was not solely due to increase in the growth of GDP originating from PAD (Nagaraj, 1990; Kumar, 1992). The steep wage hike in 1990s in line with the Fifth Pay Commission’s recommendations brought back the issue into focus once again (Acharya, 2002). It is also observed that one percentage point of growth of 5.0 per cent in GDP for 1997-98 is attributed to the 20 per cent increase in real value added in the PAD sub sector arising chiefly from pay increases to Government servants (Government of India, 1999).

3.133 The growth in PAD, during the period 1997-98 through 1999-2000, has been far higher than growth in services excluding PAD and therefore PAD undoubtedly contributed to the overall growth of services. During the reform period as a whole, an assessment of services excluding PAD, however, contradicts the perception that PAD alone is responsible for higher services growth. Although the Fifth Pay Commission related pay increases might have distorted estimates of GDP originating from services for a few years, they do not affect the trend growth which remains at 8.2 per cent during the reform-period even if Government administration is excluded altogether. The log-linear trend growth of services with and without PAD has been broadly the same during the reform period (Table 3.29). On the whole, the services sector growth appears to have accelerated in the reform period, with the impetus coming from sources other than PAD.

Table 3.29 : Growth in Public Administration and Defence (PAD)

Year	PAD	Services Sector	Services
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	without PAD		Sector
	1	2	3
1992-93	4.9	5.4	5.1
1993-94	2.6	8.5	7.1
1994-95	1.3	8.0	6.6
1995-96	6.8	11.0	9.5
1996-97	4.1	7.6	6.7
1997-98	14.5	9.1	8.9
1998-99	10.3	7.9	7.6
1999-00	12.2	9.3	8.8
2000-01	2.5	6.9	6.5
2001-02	2.9	7.3	6.8
1992-93 to 2001-02*	7.2	8.2	8.0
1981-82 to 1990-91*	7.4	6.7	6.8

* Log-linear trend rate of growth.

Source : Central Statistical Organisation.

External Demand for Services

3.134 The growing role of tradable services in international trade and exchange has come to be recognised with the General Agreement on Trade in Services (GATS). India's share in world exports of commercial services has doubled from 0.6 per cent in 1990 to 1.2 per cent in 2000, while the share in world merchandise exports has gone up marginally from 0.5 per cent to 0.7 per cent during the same period. Interestingly, there has been a consistent surplus on account of trade in services. The compositional shifts in foreign trade in favour of services in the reform period has helped in the emergence of new sources of earnings in India's balance of payments. Earnings from software exports have increased from negligible levels in early 1990s to a level of US \$ 7.5 billion in 2001-02. These are likely to surge by 30 per cent during 2002-03 as per the NASSCOM estimates. Thus, while the 1980s was dominated by tourism earnings, the second half of 1990s witnessed an unprecedented jump in India's earnings from new economy activities like software services exports and other information technology related skill intensive exports. The services exports thus, provided some element of stability to the external balance of the country and also positively impacted on the overall demand in the services sector.

Summing Up

3.135 The services sector has exhibited a strong trend component that has provided an element of stability to the growth process. The sector seems to have grown in the reform period, sustained by an increasing demand for producer and consumer services coupled with the external demand. The role of public administration and defence appears to have been limited in the growth process. The emergence of producer services as an important source of services growth reflects strong inter-linkage with commodity producing sectors of the economy. Apart from providing inputs, services contribute to the outward shift of the industrial sector's production frontier by enhancing productivity growth. Conversely, services growth could be sustained provided adequate demand impulses are generated in industry or agriculture. Given India's comparative advantage in information technology, services growth momentum can be sustained by exploiting new opportunities in international trade in services, particularly, in the area of communication and information services, technology transfer and software.

V. CONCLUDING OBSERVATIONS

3.136 The heuristic description of the growth experience of the Indian economy since the initiation of the reform measures in the early 1990s brings out a number of empirical regularities. At a broad aggregate level, there is evidence of a distinct, but not necessarily substantial improvement in growth of the economy during the reform period. Nevertheless, the silver lining of improved growth loses some of its gloss in view of the deceleration in the growth witnessed since the mid-1990s. The achievement of higher economic growth hinges on the attainment of both higher saving and investment. While saving in general and household saving in particular have exhibited rising trend during the reform period partly emanating from relatively higher income growth (despite the downward alignment of interest rates), public sector saving has fallen dramatically and has become negative. It is the poor performance of the public sector saving as a whole that has eroded the investment capacity of the country for generating higher economic growth. The deteriorating saving has led to erosion in public sector investment and deterioration in the availability and quality of public infrastructure services including transport, railways and electricity. Thus, the major challenge to economic growth in future is the reversal of the public sector dis-saving to achieve the level of saving recorded in the late 1980s. This requires action on two fronts. First, a major improvement has to come about in the tax-GDP ratio which has deteriorated during the 1990s. Second, large-scale improvement in the operation of the public enterprises would be required by rationalising user charges on the services rendered. It would then be possible to invest adequately on provision of such infrastructure services which are necessary for higher growth. Another concern for achieving higher growth emanates from the indications of declining productivity growth in the latter half of the reform period (as reflected in the ICOR). This reinforces the need for accelerating the pace of structural reforms.

3.137 The growth performance of the commodity producing sectors is critical for improving overall growth rate of the economy. It is apparent that the agricultural sector in the 1990s witnessed slowdown but at the same time recorded unprecedented accumulation of foodstocks due to persistent price distortions. While there have been successive increases in MSPs of rice and wheat, their international prices have witnessed declining trend, thus reducing the export competitiveness of Indian rice and wheat. These factors together have led to higher procurement. As against higher procurement, the off-take has remained low due to rise in CIPs on the one hand and shifts in the consumption pattern away from cereals to non-traditional food items, on the other. The cumulative impact has been burgeoning food stocks, with attendant fiscal and monetary implications. This predicament of mounting foodstocks has occurred despite a deceleration in agricultural growth. It is quite possible that the problem would have been more serious in terms of piling of stocks, had there been higher growth in agricultural production. Notwithstanding the current reduced export competitiveness of Indian cereals and the piling up of foodgrain stocks, Indian cereals could still be competitive, provided the AMS in the US and European countries is reduced. The subdued growth of agricultural sector could be attributed to limited reforms directly affecting this sector. Furthermore, within the limited reforms in this sector, while the foreign trade was liberalised, the inter-state restrictions prevailed. This reflects the lack of proper sequencing of reforms. At the same time, lack of technological improvements is manifested in plateauing of yield gains across crops.

3.138 A higher growth in agriculture, thus, needs a comprehensive revamp of agriculture policy with reorientation towards rapid diversification of this sector. A progressive correction is

required in the incentive structure for agriculture so that the excessively high minimum support prices do not continue to distort resource allocation in agriculture. This will ensure that farmers diversify towards high value added segments of agriculture in response to the new demand structure. As the non-foodgrain commodities have inherent heterogeneity, policies regarding these have to be regionally more dispersed and market responsive. Agriculture growth will be hampered further unless the current approach to input subsidies, particularly relating to fertiliser, power and water is reoriented. Rationalisation of subsidies and economically viable user charges would be required to augment resources for productive investment in rural infrastructure. The lack of adequate storage facilities acts as a major bottleneck in the development of food processing industry. Furthermore, lack of standardisation of product quality hampers export competitiveness. The supportive rural infrastructure can be best developed in a decentralised private sector framework which would need appropriate policies and financing facilities.

3.139 Responding to the structural reforms introduced in the industrial sector during the initial years of the 1990s, the industrial sector grew at a remarkable rate. However, there was marked deceleration since the mid-1990s. The package of reforms carried over the past decade was expected to lead to significant restructuring in the industrial sector. The slow pace of industrial restructuring and the resultant loss of competitiveness in a liberalised trade environment, thus, led to current protracted manufacturing slowdown. The signs of reduced competitiveness are thus, observed in declining productivity growth, more particularly in the latter part of the 1990s. An overall growth impulse in the industrial investment, exports and employment can be generated provided coordinated reform measures are taken allowing rapid bankruptcy procedures, faster transformation of urban land use and flexibility in labour market. Further, existing restrictions on small scale sector in the form of size and scale of operation need to be removed to ensure new investments and technology upgradation in this segment to withstand competition.

3.140 It is apparent that the industrial performance continues to suffer from physical infrastructure bottlenecks with demand-supply imbalances persisting during the reform period. The deteriorating infrastructure services have been a direct fall-out of shrinkage in infrastructure investment in the context of inadequate internal resources of public infrastructure entities and dwindling Plan outlay for infrastructure. The declining public investment in infrastructure has not been offset by private investment, primarily on account of inadequate institutional reforms; there are, however, signs of improvement for a few sectors, like communication. The adequate response of the private sector in basic infrastructure would primarily require economically efficient user charges to ensure the reasonable return on investment.

3.141 Apart from infrastructure, lack of adequate credit is often cited as a factor behind the slowdown. While the nominal interest rates have fallen, the real lending rates continue to remain high. The development has adverse implications for the industrial sector as interest cost-sales ratio remains much higher as compared to many emerging economies. Given the downward rigidity of medium and long-term interest rates and real GDP growth from industry falling much below the real interest rates, industrial investment becomes increasingly unsustainable over a longer horizon. It may be noted that in a liberalised interest rate scenario, policy measures have limited role to influence the cost of credit. While the credit flow to industry from both the banking system as well as the AFIs has significantly slowed down in the recent past, it is not clear whether the reduced credit flow is an outcome or the cause of industrial deceleration.

Notwithstanding the unsettled status of the alleged “credit constraint” facing the industry, there are some concerns about the credit delivery mechanism. All these continue to pose challenges for achieving the much needed higher growth in the economy.

3.142 The services sector stands in a somewhat isolated position. Not only did it improve its performance during the reform period, to a large extent, it withstood the onslaught of deceleration. Furthermore, a sector-wise analysis of growth in the services sector has revealed that much of the alleged misgiving about its unsustainability is misplaced, as its growth performance was indeed robust and not necessarily dependent on ‘Government services’, like ‘public administration and defence’. Nevertheless, the emergence of producer services as an important source of services growth, reflecting strong inter-linkages with commodity producing sectors, raises questions about the continuance of services growth, in the absence of an industrial revival. Although the services sector can continue to grow at higher rates, the acceleration in the overall growth rate of the economy over a medium term would necessitate a distinct improvement in the growth performance of the commodity producing sectors from their present levels.

12. Potential growth rate here refers to the underlying growth rate obtained by filtering the original series applying H-P Filter.

13. The neoclassical theory of investment known as the Modigliani-Miller (1958) theorem, however, assumes that as long as the firm has profitable investments with returns above the cost of capital, it can obtain sufficient funds to undertake such investments. Thus, internal and external finance can be viewed as substitutes, and firms could use external finance to smoothen investment when internal finance fluctuates.

14. A major measurement issue is the conversion of nominal value added into the real value added done either with single deflation or double deflation method. In the case of single deflation method both nominal output and nominal material inputs are deflated by output price index, while under double deflation method, the nominal output is deflated by output price index and nominal material input is deflated by input price index. It is evident from the above studies that the factor productivity growth obtained through the single deflation approach is lower than the double deflation approach, implying that the relative prices of inputs and output have increased over time.

15. While in the discussion of growth in Section I, “construction” is included under the services sector, for a detailed sectoral analysis, “construction” is excluded from services in this section.

16. Demand Function for Services Sector (Sample 1970-71 to 2000-01)

$$Y_{scy} = -1.246 + 0.1142 L_{yind} + 0.018 L_{xser} - 0.138 L_p$$

(4.17) (1.947) (-4.309)

$$R^2 = 0.63 \quad DW = 1.71 \quad F = 11.29$$

where, Y_{scy} = Cyclical demand component of services, L_{yind} = Log of industrial output, L_{xser} = Log of services export, L_p = Log of prices of services.

17. Demand Function for Producer Services (Sample 1970-71 to 2000-01)

$$Y_{ps} = 0.065 + 0.18 L_{mfg} + 0.055 L_{xser} - 0.236 L_p$$

(2.22) (1.864) (-3.56)

$$R^2 = 0.53 \quad DW = 2.0 \quad F = 6.90$$

Where, Y_{ps} = Growth of GDP from producer services, L_{mfg} = Log of manufacturing output, L_{xser} = Log of services exports and L_p = Log of prices of services.