Economic Liberalization and Indian Economic Growth:
What's the evidence?

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1. Introduction

By the end of the 1970's, India had acquired a reputation as one of the most protected and heavily regulated economies in the world. Starting in the mid-1970s and then later on in the 1980s, a few tentative steps were taken to liberalize the regulatory regime. In 1991, more extensive reforms followed. Since then there have been further policy changes in diverse sectors all aimed at opening up the economy to greater private sector entrepreneurship as well as to foreign trade and investment.

These two decades (1980-2000) have been quite special in the course of Indian economic development. The growth rate of GDP that had stayed around 3.5 % per annum for 20 years prior to 1980, shot up to about 5% in the eighties (1980 to 1989) and increased further in the nineties (1990 to 1999) to 6%.[1] Over the last few years, it has reached as high as 9%. Moreover, the growth in the post-reform period has also been stable. In the decade of the 1970s, the variance in GDP growth rate was 15.8. It came down to 4.6 in the 1980s (i.e., 1981-82 to 1990-91) and further down to 1.5 in the 1990s (1992 2002) (Panagariya (2004)[2]).

Most importantly, GDP growth has been accompanied by a poverty decline. The proportion of the population below the poverty line (at $1.08 a day in 1993 PPP USD) declined from about 44.5% in 1983-84 to 27.5% in 2004-05.[3] Consequently, India's growth performance has generated tremendous worldwide interest as attested by the titles of a spate of new books on India: India's Emerging Economy (Kaushik Basu,2004), India: Emerging Power (Stephen Cohen, 2001), India Arriving (Rafiq Dossani, 2008), India: The Emerging Giant (Panagariya, 2008), Propelling India (Virmani, 2006).

The fast and stable growth accompanied by a decline in poverty has also raised many questions: What triggered growth in India? What is the Indian model? Is it replicable in other developing countries? Is it sustainable? How does it compare with the East Asian model in its growth as well as distributional consequences? How does the growth process impinge on India's central problem – its mass poverty? Our objective in this paper is to take stock of what progress the literature has made in answering these questions and come up with a plausible story of Indian development during the period of 1980 – 2004.

India makes a fascinating case study. On the face of it, the improved growth performance in India seems to have been achieved by following the orthodox prescription of removing the constraints on entrepreneurship. However, Indian economic growth, during 1980-2004, seems to have little in common with the so-called 'Asian Model'. Its savings rate has improved over time but has not reached the East Asian level [4]. Its

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[1] GDP is measured on a rainfall corrected basis. Source: Table 1.3, Page 31, OECD Economic Survey (India), 2007.
[2] A corroborative account can be found in (Sinha and Tejani (2004)).
[3] According to the latest revised estimates based on new purchasing power poverty norms released by the World Bank, at the poverty rate of $1.25 (2005 PPP) a day, the poor as a share of the total population went down from 59.8% in 1981 to 41.6% in 2005.
[4] Gross domestic savings as a percentage of gross national income rose steadily from 15.1% in 1960's to 32.1% in 2004 while total capital formation rose from 16.9% to 33.2%. (Bosworth, Collins and Virmani (2007)).

growth so far has not been driven by manufactured exports. Nor has it attracted massive inflows of foreign investment. There is no industrial policy targeted toward developing specific industries. On the contrary, it is the service sector that has led the charge in the Indian growth experience. Another aspect of the Indian experience that makes it very different from that of other Asian countries is that despite a fast growing non-agricultural part of the economy, the share of agriculture in the total labor force has declined very slowly. In fact, the agricultural labor force in absolute numbers has increased since 1980's, dampening the process of poverty decline.

Why do we expect economic liberalization to produce growth? First, import liberalization provides domestic firms access to capital equipment embodied with new technologies, better intermediate inputs and expands their choice set to act. A freedom to invest and enter the market increases the extent of competition and puts pressure on the incumbents to upgrade their technologies often through imported machinery. With the entry of new firms in a more competitive market, the process of creative destruction goes to work. Efficient firms drive out inefficient firms, factors gets reallocated to more productive use increasing the overall productivity of factors in the economy. Due to technology transfer, productivity in industry and service sectors grows rapidly attracting labor from agriculture. The re-allocation of labor from agriculture to more productive sectors contributes further to growth. This process also makes the workers left behind in agriculture better off because the real wage rises as labor markets tighten in agriculture. Is this what has been happening in India? One might think so. But do we see this in the data? These are the motivating questions for this paper.

In Section 2, we highlight the structural features of the economy that are relevant for thinking about the growth process at work in India. We argue that these features justify attention towards a disaggregated picture of the Indian economy.

In Section 3, we outline the main constraints on entrepreneurs in the pre-reform period and the most significant of the reform measures that loosened them.

In Section 4, we present the growth performance of the Indian economy (at the aggregate level) over the last four decades and the debate about what may have triggered the growth acceleration in the eighties.

Sectoral growth rates of output and employment (agricultural, industry and services) are compared across sectors and time periods in Section 5. This section also pursues the impact of economic reforms on the manufacturing and services sector. It lays out the pattern of growth in the Indian economy and the features that distinguish it from other countries. The section also attempts to answer the question of why the fast growth in GDP in India has not been accompanied by fast growth in employment.

In Section 6, we examine how the growth process in India impinges on poverty decline in the economy.

Section 7 discusses the role of agriculture in the growth and poverty decline process.

Section 8 concludes by examining various hypotheses proposed in the literature to explain different aspects of the pattern of Indian growth experience since 1980 with a view to piece together a coherent story about the movement of the Indian economy from 1980 to 2004. Given the quality of the available data and the usual difficulties in establishing causality, the story can only be suggestive. Hopefully, it will throw up hypotheses spurring further research.

2. Why Disaggregation is Necessary: The Unorganized Sector

In a handbook chapter titled "Growth theory through the lens of development" Banerjee and Duflo (2005) argue against the aggregate production approach of growth theory to study development. They point out that such an approach presumes well functioning and complete markets while underdevelopment is synonymous with underdeveloped markets. Those with potentially high returns to capital may not have access to credit. Wage gaps can persist for a long time among workers with the same human capital across different occupations or different industries. For instance, even illiterate farmers growing food staples can earn much higher incomes in horticulture or animal husbandry but do not do so because of lack of access to credit or information. Workers with higher education may command considerably higher salaries and yet very few from amongst the poor are able to acquire higher education. Wage gaps can persist across different states without generating a substantial migration perhaps because of ethnic and linguistic gaps. In such an economy, the constraints on entrepreneurial freedom can stem not just from government over-regulation but also from the lack of well functioning markets and other institutions. Reforms that get rid of over-regulation will set free those who have access to the requisite factors. They will contribute to growth in a significant way but those lacking in access will not.

These observations of Banerjee and Duflo are relevant because a distinctive feature of the structure of Indian economy is the predominance of small production units including household enterprises. Under the law, factories greater than a certain size have to register themselves with the government and are subject to the Factories Act which regulates safety, health and work hours of employees at the workplace. This regulation does not apply to factories that either employ less than ten workers or employ less than twenty workers and do not use electricity in the manufacturing process. The factories not under the purview of the Factories Act are called unregistered or unorganized manufacturing while those subject to the law are called registered or organized sector manufacturing.[5]

Table 1 compares the organized and unorganized sectors of manufacturing at the end of the 1990s. In terms of enterprises and workers, most manufacturing is carried out in the unorganized sector. On the other hand, the organized manufacturing sector accounts for most of the output and credit.

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[5] Subsequent to registration under the Factories Act, some firms may shrink to less than ten workers. However, they continue to be classified as part of the registered manufacturing sector.

Table 1: Organized vs Unorganized Manufacturing

	Organized manufacturing	Unorganized Manufacturing
Year	1999-00	2000-01
Total # of enterprises (million)	0.13	17
Total # of workers (million)	6.2	37
Average enterprise size (# of workers)	52	2.2
Annual wages per worker (Rupees)	44842	4087
Total loans outstanding (Rupees billion)	25132	868
Value of output (Rupees billion)	87391	18718

Source: Nilachal Ray (2004).

In carrying over the distinction based on enterprise size to the rest of the economy, government statistics on employment define the organized sector as all establishments belonging to the government (and the public sector) and all non-agricultural establishments in the private sector employing ten or more persons. The rest constitute the unorganized sector. The national survey on employment estimated total employment at 457 million in 2004-05. Of this organized sector employment is about 27 million, i.e., about 6% of the total. [6] Virtually all employment in agriculture is within the unorganized sector. But even if agriculture is excluded, unorganized sector employment is as much as 83% of all non-farm employment. In terms of value-added, the unorganized sector contributes 58% of national domestic product and 45% of non-farm domestic product (Kolli and Hazra, cited in National Commission for Enterprises in the Unorganized Sector, 2008).

If liberalization led India to switch to a higher growth path, the conduit is likely to have been technology transfers from developed countries. Firms can import capital equipment and intermediate inputs that they did not have access to earlier. Having access to foreign technology and equipment and the freedom to use it, would give Indian firms an opportunity to first jump the technology gap and then grow at the rate at which TFP grows in the developed world. However, in the context of a large part of the economy being in the unorganized sector, the question arises whether such small firms also had access to superior technology. If not, how could they have gained from reform measures?

Banerjee and Duflo (2004) have shown that Indian bank managers show abnormal amount of risk aversion in lending to even medium sized firms. Many firms do not get adequate credit (i.e., the marginal product of capital exceeds the interest rate) and capital does not get channeled to where it could be best used. It is possible that this is so because of the existing incentive structure for the bank managers. Whatever the reason, the point

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[6] A different survey-based estimate pegs the organized sector employment (in 1999-00) higher at 54 million – i.e., about 14% of total employment (National Commission for Enterprises in the Unorganised Sector, 2008). The proportion is about the same for 2004-05.

to note is that if this is what medium sized firms have to face, how difficult it must be for tiny units in the unorganized sector to get credit.[7] A credit constrained unorganized sector may therefore not be able to take advantage of superior technology available off the shelf. What is likely to be the pattern of growth in an economy where the organized sector manages to improve its technology rapidly while the unorganized sector does not?

New imported technology is likely to be skill intensive. The investment in new technology is thus associated with an increased demand for skilled workers driving their wages up. Through collective bargaining the wages of the unskilled workers in the organized sectors may also rise. But how would the majority of the workforce employed in the unorganized sector benefit from reforms? There are several possible channels. First, the part of the unorganized sector that is able to absorb new technology benefits directly. For example, it is possible that even small units benefit from improved communications such as due to cell phones. Second, cheaper products from the organized sector increase the real wage of the workers in the unorganized sector who consume these products. Third, the increased incomes of those employed in the organized sector may spill over into demand for goods and services produced by the unorganized sector. The strength of this 'trickle down' effect would depend on the income elasticity of the relatively better off, for the unorganized sector goods and services. The parts of the unorganized sector for which the income elasticity is relatively high (e.g., trade, construction and transportation) would grow relatively fast. Note, however, that the growth in this case may not be associated with TFP growth; all inputs could increase as demand grows. However, even such a growth process in the unorganized sector will draw labor from the less productive sectors – especially, 'crop agriculture'. And moving labor to a sector with higher productivity makes a contribution to the overall growth in the economy. In fact, for a developing country with a large share of its labor force in agriculture, this is a major source of growth. If all the above channels are weak and if the growth is largely confined to the organized sector, the economy can still grow rapidly because the organized sector still accounts for 42% of the value added but it will have little impact on employment and hence on poverty.

This is why we need to examine the disaggregated picture. What processes were unleashed by the reform measures that would move labor to more productive activities? What are the skill intensities in the organized and unorganized sectors? What was the impact on unskilled employment? What is happening to the structure of the labor force? Is the educational system transforming unskilled labor into skilled labor at a fast enough rate?

An important caveat to our observations (and a challenge to subsequent analysis) is that the output statistics on the unorganized sector suffer from incomplete coverage, indirect estimation methods, frequently outdated benchmark surveys and unknown biases (Rangarajan, 2001), Shetty (2007)).

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[7] Priority sector lending – a government initiative that required nationalized banks to lend a certain proportion of their deposits to the rural and small scale sector was motivated by the desire to overcome this problem.

3. The License-Permit-Quota Raj and Economic Reforms[8]

The `license-permit – quota raj' is a short-hand description of the licenses and quotas that characterized Indian economic policies before 1991.[9] There were four major elements of the pre-reform regime that were addressed by the reforms starting in 1991.

(i) <u>Restrictions, in the form of tariff and non-tariff barriers on imports.</u> Import duties were among the highest in the world and rates above 200% were common (Ahluwalia, 1999). Table 2 displays the effective rates of protection for the period 1980-2000. There is a clear fall in the level of protection in the 1990s. The tariff revenue relative to import values fell from over 55% in the late 1980s to about 22% by the end of the 1990s and to close to 10% in 2005 (OECD, 2007).

Non-tariff barriers worked through import licenses which automatically restricted the amount that could be imported. Items that could be imported without a license were placed under the Open General License (OGL). Table 3 from Das (2007) displays the percentage of imports that were subject to non-tariff barriers over the period 1980-2000. Like tariffs, the non-trade barriers also began to fall in the 1990s. The import restrictions were first removed for the capital goods and intermediate goods sector in 1992. The quantitative restrictions on consumer goods were lifted only in 2000.

Despite the fall in both tariffs and non-tariff barriers, import penetration rates increased substantially only in the second half of the 1990s (Das, 2007).

Although the data in Tables 2 and 3 show substantial trade liberalization only in the 1990s, it has been pointed out that some amount of loosening occurred in the 1980s as well. The OGL, which was introduced in 1976, contained only 79 capital goods in 1976. By 1988, it covered 1170 capital goods and 949 intermediate inputs. By 1990, about 30% of imports happened through the OGL route (Panagariya, 2008).

The import policy in the pre-reform regime was supported by a policy of fixed exchange rates and administrative allocations of foreign exchange. The reforms of 1991 led to a transition to market determined exchange rates that came into being in 1993. The rupee became convertible on the current account in 1994 (Virmani, 2007). Restrictions on capital transactions, however, remain.

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[8] There is a great deal of literature that documents the License Raj and the subsequent reforms in detail. Some of these references include Ahluwalia, (1999), Ahluwalia, (2002), Basu (2004), OECD, (2007), Joshi and Little, (1996), Panagariya (2008), Parikh, (2006), and Virmani (2007). While this section is drawn from the literature, it is not comprehensive but is rather meant to give the reader a basic understanding of the restrictions on Indian entrepreneurs and the scope of the reforms.

[9] The phrase was coined by C. Rajagopalachari, a one-time political colleague and contemporary of Nehru, to convey his distaste for state planning mechanisms.

Table 2: Effective Rates of Protection for Manufactured Goods (%)

Industry group	1980-85	1986-90	1991-95	1996-2000
Intermediate inputs	147	149	88	40
Capital goods	63	79	54	33
Consumer goods	102	112	81	49

Source: Das (2007)

Table 3: % of Manufactured Imports subject to Non-tariff Barriers

Industry group	1980-85	1986-90	1991-95	1996-2000
Intermediate inputs	98	98	42	28
Capital goods	95	77	20	8
Consumer goods	99	88	46	33

Source: Das (2007)

(ii)   <u>Restrictions on both the domestic and foreign private sector.</u> Restrictions on the latter took the form of prohibition of foreign direct investment in many sectors of the economy. Where it was allowed, foreign equity in a company was capped at 40%. Permission was essential for higher stakes. The threshold level of foreign equity was first lifted to 51% in 1991 and later to 100% in most sectors. In addition, sectors such as mining, banking, insurance, telecommunications, airlines, ports, roads and highways and defense equipment were opened up to FDI.

Restrictions on the domestic sector were implemented via investment licensing by which Central government permission was needed for investment by incumbents as well as by prospective entrants. In addition, industrial groups that were designated as 'large' could not expand without permissions that had to be obtained under the Monopolies and Restrictive Trade Practices (MRTP) Act. Some industry segments were 'reserved' for production by small-scale units to protect them from competition from large-scale units. Price and distribution controls were often applied to industries such as steel, cement, fertilizers, petroleum and pharmaceuticals.

Selective exemptions from industrial licensing were granted even before 1991. In 1975 and then again in 1980, automatic expansion of capacity and changes in product mix were allowed to some industries. In 1985-86, further reform measures were undertaken under Rajiv Gandhi (Prime Minister between 1984 and 1989): broad-banding of licenses by allowing firms to switch between similar product lines, de-licensing of 30 industries, further relaxation of capacity constraints for larger firms, and raising of the ceiling on the asset size

in plant and machinery of small scale enterprises (Panagariya, 2008, p. 83). And of course, in 1991, there was comprehensive de-licensing and by the end of the 1990s, approval was only required for investment in certain sectors such as alcohol, tobacco and defense-related industries. The 1991 reforms also did away with special permission needed under the MRTP for large industrial houses. On the other hand, 'de-reserving' the industries set aside for small enterprises proceeded at a slower pace and it was only in 2002 that industry reservations were reduced substantially. The early 1990s also saw the abolition of price controls in several industries including iron and steel, coal, and phospatic and potassic fertilizers.

(iii) <u>State control of banking and insurance.</u> 14 leading private banks were nationalized in 1969 and six more banks were also taken over by the State in 1980. This was accompanied by a strategy of massive expansion of the banking network especially into rural unbanked locations, targets for lending to `under-banked' sectors such as agriculture, and extensive regulation of interest rates. In addition, bank deposits were substantially pre-empted by the State in the form of stiff stipulations on investment in government securities. Through the 1990s, reforms have sought to dilute or reverse these policies. In addition, banking licenses were granted to several private players.

(iv) <u>Public sector monopolies</u>. In the pre-1991 policy regime, eighteen important industries including iron and steel, heavy plant and machinery, telecommunications and telecom equipment , mineral oils, mining of various ores, air transport services, and electricity generation and distribution, were reserved for the public sector. With reforms, sectors reserved for public sector enterprises were reduced to atomic energy, defense aircrafts and warships, and railway transport.

The driving principle of the License Raj regime was 'self-reliance'. This meant anything that could be produced at home should not be imported irrespective of the cost. Consequently, strong incentives were given to capital intensive industrial sectors where India had no comparative advantage. The policy also had implications for the educational priorities. Educational expenditure was heavily biased toward post secondary education rather than toward primary education and mass literacy. As we will see later, this lopsided educational structure happened to play an important role in the mid nineties in the surprising development of the software and other high tech sectors in India. However, the undesirable consequence was perhaps the disappointing development of India's labor intensive manufacturing sector.

4. Growth Acceleration

Figure 1 presents five-year averages of annual GDP growth rates from 1951 to 2004.[10] Except for the period 1960-64 when average GDP growth is just below 5%, the period from 1951-79 saw average growth rates of less than 4%. In the period since 1980, however, the economy has shifted to a higher growth path. Five year average growth rates are higher than 5% in each of the sub-periods. During the entire period, GDP declined on three occasions – 1957, 1965 and 1979. Such contractions have not been observed in the post-1980 period.[11]

Figure 1: Growth in GDP 1950-2004
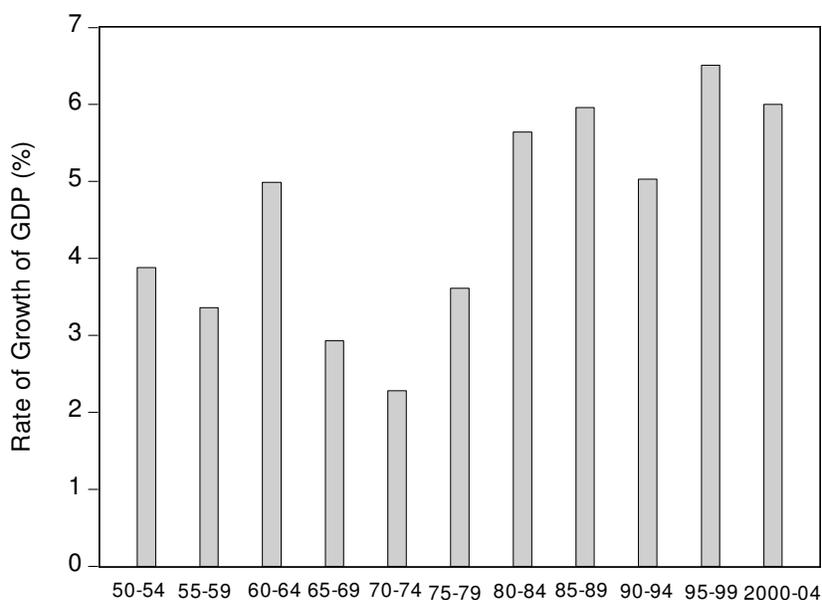
Source: Authors calculations using National Accounts Statistics.

The growth acceleration can also be seen from Figure 2. In this figure (inspired by De Long (2003)) GDP per capita is plotted for the period 1951-2005 together with the trend line in this variable from the period 1951-1980. The departure from the trend is clearly visible in the early 1980s.

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[10] The first period is the four year period of 1951-54.

11 The growth in the period up to 1980 was itself substantially higher than that achieved during the previous half-century (Balakrishnan, 2007, Panagariya, 2008). But it is the growth acceleration around 1980 that has received recent attention from scholars and others and which is of interest to us.

Figure 2: Growth Acceleration in GDP since the eighties
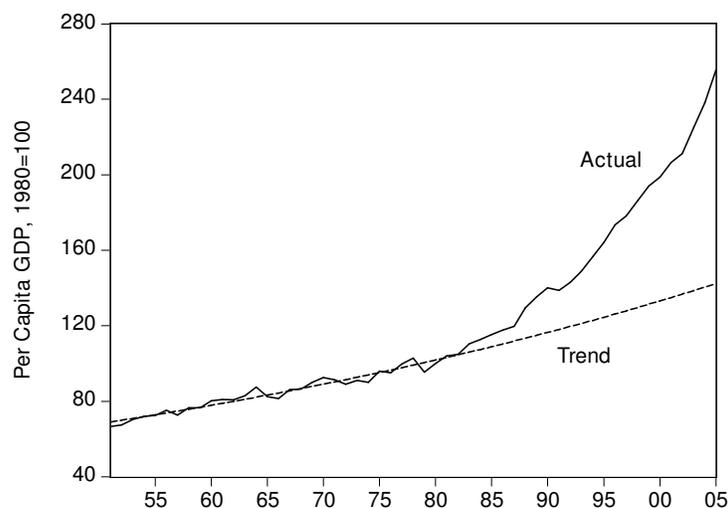
Source: Authors calculations using National Accounts Statistics

Formal econometric tests also indicate a structural break around 1980. Using an F-test, Wallack (2003) finds the highest value of the F-statistic in 1980. Rodrik and Subramanian (2004) use a procedure of Bai and Perron(1998, 2003) and they report a single structural break in 1979. Balakrishnan and Parameswaran (2007) also used the Bai and Perron procedure and they too locate a single structural break in GDP in 1978-79. The authors also estimate structural breaks for sectoral GDP. Their principal finding is that structural break in agricultural output occurs in the mid-1960s while it occurs in the early to mid-1970s for various sub-sectors of services.[12] On the other hand, the first positive structural break in manufacturing occurs after the GDP break in 1982-83.

Basu (2008) and Sen (2007), however, point out that GDP fell by 5.2% in 1979-80 (due to a combination of a drought and the second oil price shock). If this outlier is disregarded, then the trend break occurs in 1975-76. The average annual growth rate during the period 1975-78 is 5.8% - a rate more in line with the post-1980 experience than with the earlier period.

Is the timing of the structural break important? The discussion in the literature about the structural break takes place in the belief that it could offer clues about what policies led to the shift in the economy's growth rate. Such inference is problematic because statistical methods alone are unlikely to provide a precise timing. Judgments about outliers, the period of analysis, and the sectors that are considered, matter. An additional complication   is that policy measures do not have instantaneous results. The delay would be especially pronounced if the benefits flow from a structural change. It is therefore unwise to correlate the changes in economic variables to the policy changes that immediately preceded them. These caveats notwithstanding, the economy does seem to

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[12] They find multiple structural breaks for the service sub-sectors including in the late 1950s or early 1960s and as well in the 1990s.

have moved to a higher growth trajectory sometime in the mid to late 1970s or early 1980s, well before the economic reforms of 1991. What could have triggered the growth acceleration in the 1980s (or earlier) when extensive reforms such as the abolition of the industrial licensing system and trade liberalization happened only in 1991 and later? If liberalization leads to growth because it encourages competition and entrepreneurship, then what about the 1980s when reforms were so minimal that the business environment of entrepreneurs was hardly much freer than in the earlier two decades. Yet the average annual growth rate from 1980-81 to 1990-91 was not much different from that between 1991-92 and 2004-05 (5.8% and 6.1% respectively). What was driving growth in the 1980s? This is the puzzle, and the debate on Indian economic growth has thrown up various explanations.

Creeping Liberalization

Panagariya (2008) argues that policies in the period since 1975 were marked by a gradual retreat from the closed economy license raj model. The rigors of the industrial licensing system were moderated by policies in 1975, 1976, 1980 and 1984. Similarly, import controls on capital goods and on imports by exporters were made easier. These reforms were piecemeal and limited compared to what came later in 1991. Yet, Panagariya contends that they lifted business activity but in a modest manner appropriate to the piecemeal nature of reforms. In particular, he argues that the impressive growth performance of the 1980s stems only from the three-year period from 1988-89 to 1990-91 when economic growth averaged 7.6%. If this period is excluded, the average economic growth during 1981-88 is 4.8% - a rate which is higher than growth in earlier periods but much lower than the rate in the post-1991 period.

Fiscal Expansion

The period from 1984-1991 saw large fiscal deficits as government debt (internal and external) ballooned. By 1990-91, the gross fiscal deficit stood at 10% of GDP (not including the losses of public sector enterprises). Interest payments rose from 2% of GDP and 10% of government expenditure in 1980-81 to 4% of GDP and 20% of government expenditure in 1990-91. Joshi and Little (1994), Srinivasan and Tendulkar (2003), Bajpai and Sachs (1999) among others have pointed to fiscal expansion as a cause of unsustainable growth in the 1980s. Rodrik and Subramanian (2004) accept that the fiscal stimulus could have led to greater demand for domestic goods and services and hence economic growth but argue that this does not explain the sustained rise in total factor productivity that is also observed during this period (Bosworth, Collins and Virmani, 2007).

Changing Attitudes

For Rodrik and Subramanian (2004), the minor reforms of the 1980s were important for what they signaled – an "attitudinal change" on the part of the government in favor of private business. They date this change to 1980 when Indira Gandhi returned to a second stint as Prime Minister after losing power in 1977. As evidence, they show that states where governments were allied with the Central government grew faster than other states – a pattern not found in earlier periods. However, this finding could be consistent with other explanations as well – for instance when some states are favored over others for infrastructure investment.

But if attitudes were so important, why did such small changes lead to big shifts in growth? Here Rodrik and Subramanian draw on a cross-country regression of per capita income on its "deep" determinants – namely measures of geography, openness, economic or political institutions (but not both). They show that India is an outlier in the sense that India's income was about quarter of what it should be given its economic institutions. India is even more of an under-achiever with respect to political institutions. Its income is only about 15% of what is predicted by the regression. By unleashing the "animal spirits" of the private sector, and by exploiting the quality of its existing institutions, the attitudinal change was enough to shift the economy closer to the efficiency frontier.

Savings and Investment

Table 4 displays five-year averages of savings and investment rates over the period 1950-2004. In the 1970s, the savings rate jumped up substantially. Figure 3 shows household savings taking off in the early 1970s. Public savings also rise in the 1970s but the overall rise in the savings rate is driven by household savings. However, the methodology of computing savings in India is such that household savings is estimated as a residual and therefore contains the errors and omissions in the other components. Therefore the composition of savings is much less certain than the overall trend in savings.

Basu and Maertens (2007) conjecture that this could have been because of nationalization of major banks in 1969. Between 1971 and 1981, the number of bank branches nearly tripled. The population per bank branch declined from 65,000 in 1969 to 15,000 in 1984. Athukorala and Sen (2002) estimate that a 1% increase in bank density, resulted in a 0.03% increase in the private saving rate.[13] A related study is by Burgess and Pande (2005) who argue that the branch expansion did in fact decrease rural poverty. From 1977 to 1991, the central bank (Reserve Bank of India) followed a policy that forced banks to favor branch openings in areas that were unbanked. As a result, bank expansion during this period followed a pattern very different from what was observed when this regulation was not in effect. Burgess and Pande use this variation to analyze the impact on poverty outcomes. This impact presumably works through greater access to credit for

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[13] The increase in bank branches is also associated with an increase in bank deposits as a percentage of national income (from 15.2% to 37.9% of national income).

rural households and therefore this paper does not throw light on the mechanisms by which rural banking could have raised household savings.

Table 4: Saving and Investment as a % of GDP – 1950-2004

Period	Savings	Gross Capital Formation
1950-54	9.63	10.01
1955-59	11.16	13.89
1960-64	12.96	15.18
1965-69	13.97	15.60
1970-74	16.89	17.50
1975-79	21.11	21.30
1980-84	19.69	21.49
1985-89	22.12	25.75
1990-94	24.63	26.23
1995-99	25.77	26.79
2000-03	30.32	29.50

Source: Authors calculations using National Accounts Statistics.

Figure 3: Sectoral Saving Rates – 1950-2004
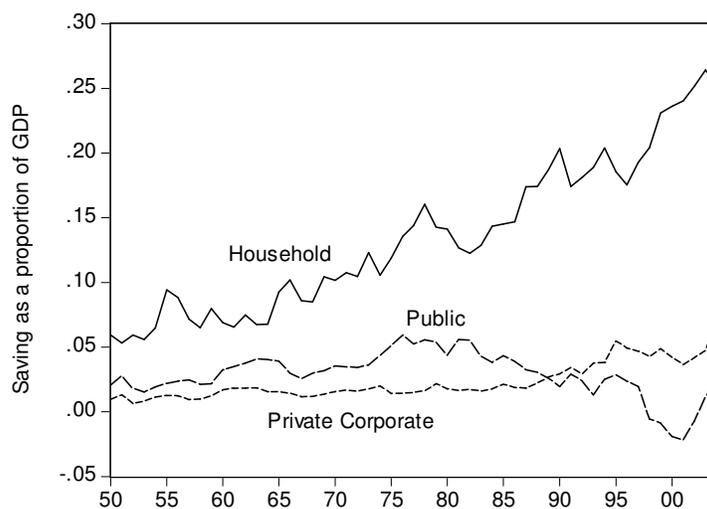
Source: Authors calculations using National Accounts Statistics.

The rise in the savings rate is closely matched by the rise in investment rates. Gross capital formation rises from 15.6% of GDP during the period 1965-69 to 21.5% in the

period 1980-84. As Figure 4 shows, it is public investment that picks up in the mid-70s while private corporate investment begins to shift up only in the early 1980s.

Sen (2007) shows that the increase in capital formation in the mid-1970s was due to a rise in equipment (machinery) investment. Till the late 1970s, the investment rate in structures was higher than in equipment. The relationship reversed in subsequent periods. The significance of this result is the conclusion from cross-country research that among different types of investment, it is equipment investment that matters most for economic growth (De Long and Summers, (1991)).

By estimating an investment function, Sen explains the increase in private equipment investment as due to (a) a fall in the relative price of capital equipment (b) financial deepening as measured by real domestic credit to the private sector, and (c) public investment (measured as a proportion of GDP). Sen attributes financial deepening to the banking expansion of the 1970s and 1980s. As banks were able to access household savings, they could also extend credit to households as well as to corporations. The fall in the relative price of machinery is explained by the limited trade liberalization of the 1980s. Relaxation of import controls increased access to imported machinery.

Figure 4: Sectoral Investment Rates – 1950-2004
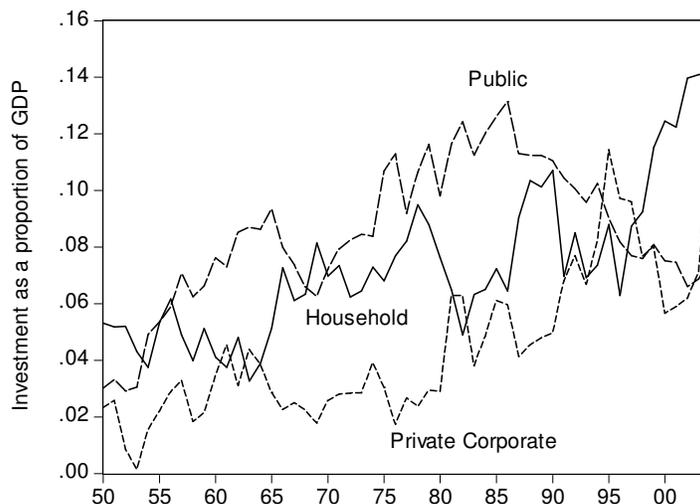
Source: Authors calculations using National Accounts Statistics.

Given that the informal sector forms such a large part of the Indian economy, it is important to know something about its sources of credit. Many of these are informal sources of credit for which micro-finance has emerged as a possible alternative. Since the mid-eighties, NABARD (National Bank for Agriculture and Rural Development) – a development bank set up by the Government of India and financed by the Reserve Bank of India -- has been actively engaged in a program to link mainstream banks with SHGs ('Self Help Groups'). Recently the funding for this program has gone up significantly in 13 priority states that account for 70% of India's poor. By March 2006, 2.2 million

SHGs had been linked to mainstream banks and 33 million poor households had gained access to microfinance. NABARD is also assisting other partner organizations like NGOs and co-operative banks in promoting SHGs. By 2006, a cumulative assistance of Rs. 334.6 million for the promotion of 250,000 groups has been granted by NABARD (http://www.nabard.org/).

Green Revolution

From about the mid-1960s, high-yielding fertilizer responsive varieties of wheat and rice (the principal food staples in India) diffused through the agricultural economy. This formed the basis for the Green Revolution. By 1992-93, the diffusion was complete **–** with about 90% of wheat area and 70% of rice area occupied by these high yielding varieties (HYVs). In the case of wheat, much of the diffusion had happened by 1975 when diffusion exceeded 60% (see Figure 5). In the case of rice, the diffusion was slower and similar thresholds were reached only in the early 1990s.

The productivity impact of these varieties has been much discussed in the literature (Evenson, Pray and Rosegrant, 1999, Lipton and Longhurst, 1989). As these varieties increased the productivity of inputs such as fertilizers and water, it was the combined impact of HYVs together with these inputs that led to higher yields. In the period since the mid-1960s, output growth in food crops has been powered by yield increases rather than area.

In a closed economy (as India was during the 1970s and 1980s), where low incomes are spent primarily on food staples (consistent with Engel's law) and where land is a constraint to food production, an increase in food productivity necessarily reduces food prices, increases agricultural wages and rents and increases the size of the non-farm sector through greater demand for its products. Could this have played a role?

Figure 5: Share Under High Yielding Varieties (%)
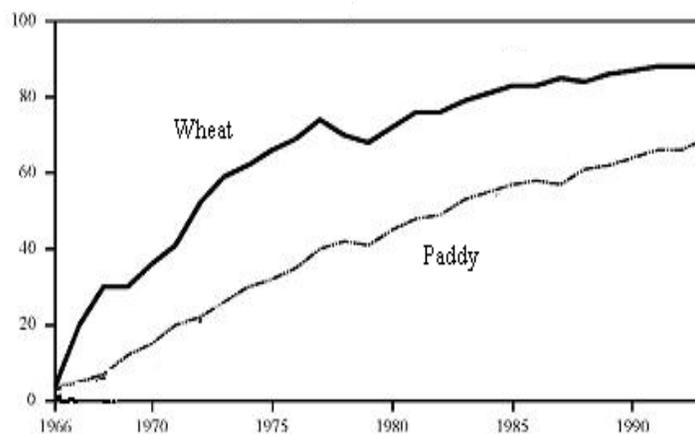
Source: Evenson, Pray and Rosegrant (1999),

Rodrik and Subramanian (2005) dismiss this possibility because the terms of trade for agriculture did not deteriorate in the 1980s. However, agricultural terms of trade did decline from about the early 1970s (when the Green Revolution's impact became apparent) to about the mid-1980s. More strikingly, relative prices of wheat and rice – the staple foods – declined from the mid-1970s to 1991 (see Figure 6). The decline is particularly pronounced for wheat which was the greater success story of the Green Revolution. The decline was not sustained beyond 1991 partly because of exhaustion of this source of technological change and also because of government interventions in the immediate pre-reform period that increased these prices.

Conclusion

Although it is clear that GDP growth rates increased sometime in the '70s or early '80s, the precise timing is hard to establish and depends on one's prior. Various explanations have been proposed and it is impossible to be sure which of these is the most important one. The economic orthodoxy would favor one that credits trade liberalization, limited as it was, that decreased the cost of capital equipment but it is hard to disentangle the effects of this from more heterodox factors such as public investment and rise in savings rate (due to bank nationalization), the diffusion of agricultural technology (entirely due to public research and dissemination) or indeed to rule out the role of political attitudes towards business. It is also indisputable that there was an unsustainable fiscal expansion through 1980's and any income growth resulting from it should be considered qualitatively different from the much more sustainable growth that occurred in the next decade.

Figure 6: Relative Price of Rice and Wheat – 1952-1998
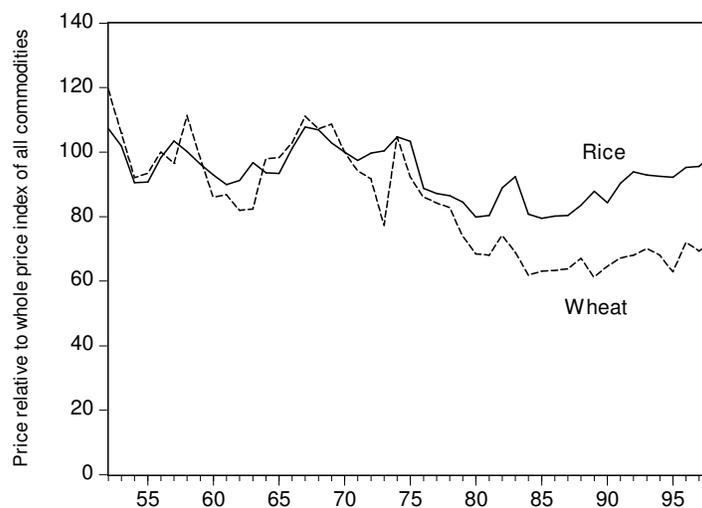
Source: Misra (2004),

5. The Impact of Reforms

The reforms that began in 1991 completely changed the direction of economic policies. As explained in Section 3, India moved away from a state-led closed economy framework in favor of greater integration with the world economy, lesser controls on private business activity especially in manufacturing, and substantially lower entry barriers to prospective entrants, whether domestic or foreign.

In principle, the removal of licensing and the barriers to trade, should allow greater competition as well as access to cheaper factor services. TFP should rise and as inefficient firms exit, factors should get reallocated to their most productive use further increasing TFP. Did this happen?

It should be noted that an entrepreneur in the pre-reform period was subject to many controls which operating together would have been more restrictive than the sum of the effect of any one of them separately. Therefore, the success of a reform measure that lifts a constraint depends crucially on the existence of other constraints that may still persist. The impact of liberalization of any one of the controls (say an industrial license) would be limited unless the other controls (such as import licenses) were relaxed as well. Similarly, lowering of tariff on inputs to a particular industry may not pay the same dividend if the industry is still under small scale reservation policy that disallows large manufacturing plants. According to the theory of second best, under certain circumstances even the coefficient of a reform measure could have a wrong sign. It is therefore important to consider the interaction among controls and their liberalization in analyzing the impact of reforms.

Manufacturing Sector

GDP and its components are depicted in Figure 7. It can be seen that since the 1980s, it is the services sector that is both the dominant sector as well as the fastest growing sector in the economy. Table 5 presents sectoral shares in value-added and employment while similar information for growth rates is displayed in Table 6. In 2004-05, manufacturing accounted for only 17% of value-added and 12% of employment not materially different from the scenario in 1993-94. Panagariya (2004) argued that the main reason why Indian growth was slower than in China was the lackluster performance of India's manufacturing sector. Kochhar et.al (2006) make the same point by examining the performance of manufacturing across two points in time – 1981 and 2002. They find that the share of manufacturing in GDP in India was higher in 1981 (although not strongly significant) than what would be predicted by a cross-country regression of the sectoral share on income and country size. Repeating the regression for 2002, the authors find the coefficient of the India dummy to be smaller than in 1981. However, in a regression of the change in the share of manufacturing (in value-added), on initial GDP and GDP growth rate, the India indicator is negative prompting the authors to conclude that "a pattern of a relative slowing in manufacturing growth is suggested by the data, ironically when reforms were removing the shackles in manufacturing". A similar

paradox comes through in TFP estimates. TFP growth rates in manufacturing are sensitive to a variety of measurement issues; however, estimates by different authors agree that TFP grew slower in the 1990s compared to the 1980s (Goldar, 2006).

Figure 7: Sectoral GDP, 1960-2004
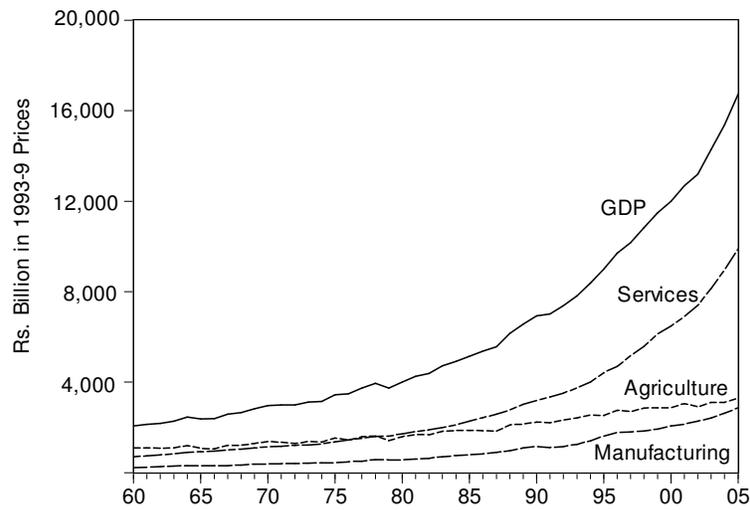
Source: National Accounts Statistics.

Table 5: Sectoral Shares in Value added and Employment, 1983-2004[14]

Year	Value Added as a % of GDP			% of Total Employment		
	Agriculture	Manuf	Services	Agriculture	Manuf	Services
1983-84	38.69	14.90	42.28	68.44	10.59	20.02
1993-94	30.97	16.06	47.97	64.87	10.44	23.60
1999-2000	24.99	16.71	53.45	62.03	10.50	26.63
2004-05	20.21	17.08	58.31	58.50	11.73	28.93

Table 6: Average Sectoral Rates of Growth 1973 – 2004

Period	Value Added			Employment		
	Agriculture	Manuf	Services	Agriculture	Manuf	Services
1973-83	2.48	4.72	4.80			
1983-93	3.02	6.11	6.48	1.61	2.01	3.85
1993-99	3.22	7.88	8.07	0.44	1.29	3.25
1999-2004	1.57	6.00	7.55	1.71	5.21	4.62
1993-2004	2.12	5.86	7.79	1.02	3.05	3.87

Notes to Tables 5 – 6:
GDP figures are at constant 1993-94 prices from National Account Statistics.
Employment figures are calculated using the usual primary plus subsidiary status from the employment surveys of the NSSO, adjusted for population.
Agriculture: agriculture, forestry and fishing.
Manufacturing: registered + unregistered (does not include electricity, gas and water).
Services: construction; trade, hotels & restaurants; transport, storage & communication; financing, insurance, real estate & business services; community, social & personal services.
GDP rates of growth are average trend growth over the relevant period.
Employment rates are annualized from the point to point rates of growth.

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[14] The reason for choosing these years and periods is that the employment figures are taken from NSSO (National Sample Survey Organisation) employment surveys. These surveys are carried out every five years and they are reliable for the years of the survey (e.g., 1983, 1987, 1993, 1999-00, and 2004-05). The data for the in-between years are based on 'thin rounds' (with smaller samples) and interpolation. Output figures are taken from National Accounts Statistics (NAS) and are more reliable for the organized sector than for the unorganized sector.. The data for the organized sector come from the annual reports filed by the firms in the organized sector (Annual Survey of Industries (ASI) data). However, about 44% of the value added and 88% of the employment in the non-farm sectors come from the unorganized sector (with fewer than 10 workers in a plant with power or 20 workers in a plant without power). The method by which the output in the unorganized sector is computed is a bit circuitous. Output per worker is taken from 'enterprise surveys' also conducted by NSSO once every few years. (The unorganized sector has no legal requirement to submit a report and it is widely believed that there is under reporting of the value added. CSO adjusts these figures upwards using its own rules of thumb and we do not know whether the available figures have an upward or downward bias.) Labor input is available for the NSS years. With those years as benchmark years, labor input in the in-between years is computed by interpolation. Output for those years is computed as a product of output per worker and labor input. It is needless to say that this computation procedure makes the output figures for the unorganized sector much less reliable than those for the organized sector. The numbers are relatively more reliable for the years of the quinquennial surveys since the labor input values are more reliable for those years. It is therefore preferable to look at changes across these points in time. However, often the time spans such as eighties and nineties are used in the literature partly for convenience and partly because some policy changes took place at the beginning of those decades. For example, the eighties began with the Industrial Policy Statement (July 1980) and of course 1991 was the year of the IMF induced reforms.

The less than sparkling performance of the manufacturing sector has provoked a literature seeking to explain it. Besley and Burgess (2004) examine the role of labor market regulation to explain manufacturing performance in Indian states between 1958 and 1992. Their basic regression is of the following form:

$$y_{st} = \alpha_s + \beta_t + \quad r_{st-1} + \xi\, x_{st} + \varepsilon_{st}$$

where s indexes the state and t indexes year, y is an outcome variable (such as output of organized manufacturing sector), α_s is a state fixed effect, β_t is a year fixed effect, r is the labor regulatory measure lagged by one year and x are other control variables. The regulatory measure is constructed on the basis of coding state-level amendments to a key central government legislation – the Industrial Disputes Act.[15] Each amendment is coded as being either neutral, pro-worker or pro-employer and assigned a numerical value of zero, one and minus one, respectively. The state level scores are cumulated to obtain a regulatory measure that evolves over time. Besley and Burgess (BB) find that registered manufacturing (which is the target of regulation) output is negatively affected by the regulatory measure. On the other hand, unregistered manufacturing output is positively affected by greater labor regulation suggesting that regulation encourages firms to remain small and be within the unorganized sector.

The BB study does not examine the impact of economic reforms on the manufacturing sector. However, the idea of BB to use variation in labor regulations across states to examine their influence on manufacturing output and employment has been carried forward in many studies. In these studies, manufacturing output or productivity (usually disaggregated at a three digit level) is regressed against a policy variable (industrial de-licensing dummy or trade tariffs) and other controls. Often the major point of interest is not the direct impact of labor regulation but the impact of economic reforms conditioned on labor market institutions. Therefore, the policy variable is interacted with a variable that measures labor market regulation.

Aghion, Burgess, Redding and Zilibotti (2003), study the impact of industrial de-licensing on output using data from the Annual Survey of Industries (ASI).[16] They estimate a regression of the form

$$y_{ist} = \alpha_{is} + \eta_{it} + \beta_{st} + \theta(d_{it})(r_{st}) + \varepsilon_{ist}$$

where i indexes industry (at 3-digit level), s indexes state and t indexes year (during the period 1980-97). y is log of output, α is a state-industry fixed effect, η is a industry-year

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[15] Under the constitution, both the central and state governments have the power of legislating labor laws. The Industrial Dispute Act (IDA) is a central government legislation and it provides the machinery and procedure for the investigation and settlement of industrial disputes. The IDA has been amended by the central government a number of times although none have occurred after 1984. A key amendment which is often cited as causing rigidity in the labor market was in 1976. This amendment specified that prior approval of the government was necessary in the case of layoffs, retrenchement and closure in industrial establishments employing more than 300 workers. The threshold level was later lowered to 100 by an amendment in 1982 (Anant et.al, 2006).

[16] The coverage of the ASI data is restricted to the organized manufacturing sector.

interaction, β is a state-year interaction, r is the labor regulation index and d is the de-licensing dummy. The de-licensing dummy takes the value 1 in the year that the industry is de-licensed and retains that value for subsequent years. The labor regulation measure is the BB index that is updated to 1997.[17] Note that the de-licensing dummy does not vary across states and the regulation index does not vary across industries. Hence their average impacts cannot be estimated in the above specification. Replacing the $\eta's$ and $\beta's$ by a year fixed effect and dropping the interaction terms between de-licensing dummy and the regulation index, Aghion et.al find that de-licensing and regulation have opposite and almost equal effects on the number of factories. Thus, de-licensing does have a positive effect on entry and competition but the effect is masked by labor regulation. This result motivates estimates of the general specification above. The coefficient on the interaction between de-licensing and labor regulation is negative. The regulation index is larger for legislation that is more favorable to workers. Therefore, a negative coefficient implies that industries in states with more pro-employer regulation experienced larger increases in output relative to those located in pro-worker states. The implication is that market reforms such as de-licensing work only with complementary institutions. Results similar to Aghion et.al are also reported by Bhaumik, Gangopadhyay and Krishnan (2006) who find that while entry by firms was related to industry level factors during the 1980s, unobserved state-level factors explain much of the entry during 1992-97. The authors conjecture that these state-level factors relate to `quality of governance' which presumably also includes labor market institutions.

The shortcomings of the BB measure of labor regulation have been pointed out by some researchers. Anant et al (2006) and Bhattacharjea (2006) point out that the application of the law has a greater bearing on labor outcomes than the written law. How the law works on the ground depends on how it is enforced and on judicial interpretation of its provisions. Bhattacharjea has also disputed how BB have coded some of the amendments and he shows that the procedure of assigning and cumulating numerical scores leads to several anomalies. Finally, both the Central and state governments have several other laws that matter to labor flexibility that are not captured by the index.

Hasan, Mitra and Ramaswamy (2007) propose a modified version of the BB index. Firstly, the authors consider a binary partitioning of states into those that have flexible markets (i.e., those are rated as anti-worker by the BB index) and those that have rigid markets (i.e., all other states). The BB index classifies the states of Gujarat and Maharashtra as pro-worker and the state of Kerala as pro-employer. This is at variance with the commonly held perceptions of these states and the authors point to a World Bank survey which highly rated the investment climate in Gujarat and Maharashtra but awarded a poor rating to Kerala. Therefore, the second modification is to classify Kerala as a state with rigid markets and the states of Gujarat and Maharashtra as states with flexible markets.[18] The result is their FLEX dummy that is one for the states with flexible markets.

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[17] The original index was computed for the period up to 1992.

[18] The danger with such ex-post classifications is that the FLEX dummy could be picking up other state characteristics that make Maharashtra and Gujarat excellent investment destinations and make Kerala a state with poor investment prospects.

Mitra and Ural (2007) use the FLEX dummy to investigate the impact of economic reforms on labor and total factor productivity in Indian manufacturing using ASI data. The labor productivity equation is of the following form:

$$y_{ist} = \alpha_i + \eta_t + \gamma_1 r_s + \gamma_2 x_{it} + \gamma_3 (r_s x_{it}) + \gamma_4 z_{st} + \gamma_5 (x_{it} z_{st}) + \varepsilon_{ist}$$

where i indexes industry (at 2-digit level), s indexes state and t indexes year (during the period 1989-2000). y is log labor productivity, r is the time-invariant labor flexibility dummy (FLEX), x_{it} is the time varying tariff rate for the i'th industry and z_{st} is the log of real per capita development expenditures. The coefficient on the tariff rate is negative, that on flex dummy is positive (but significant only in the base regression) and that on the interaction of tariff rate and FLEX dummy is negative (and significant). These results mean that lower tariffs increase productivity in all industries but the increase is larger in industries that are located in states with flexible labor markets. An extension of the results to de-licensing throws up a result similar to Aghion et.al (2003).[19]

The productivity impact of trade liberalization was also estimated by Topalova (2004). She computes firm-level TFP for a panel data set of publicly listed firms for the period 1989-2001. The firms in the panel account for 70% of the organized manufacturing sector. The productivity indices are regressed on lagged industry tariffs, firm characteristics, year dummies and industry fixed effects. The results suggest that a reduction in protection had a positive impact on TFP and this was driven not by the exit of inefficient firms but by an improvement in TFP of existing firms. Unlike the earlier papers, Topalova does not find any differences between states on the basis of labor regulation.

Surveys of managers in manufacturing firms show that taxation and infrastructure issues are the ones most frequently cited as being obstacles to growth. Access to finance is also seen as an important issue; however, labor regulations is not seen as a problem of primary importance.[20] This motivates Gupta, Hasan and Kumar (2008) to widen the search for factors that constrain Indian manufacturing. Using 3-digit industry data from ASI, they define industry characteristics along three dimensions: dependence on infrastructure, dependence on external finance and labor intensity. They estimate a regression of the following form:

$$Y_{it} = \alpha_i + \beta_t + \gamma d_{it} + \delta x_i d_{it} + \varepsilon_{it}$$

where i indexes industry, t indexes year, Y is log of value-added, α's and $\beta's$ are industry and year fixed effects, d is a dummy for de-licensed status and $x's$ are the set of industry characteristics. They find that the coefficient of the de-license dummy is

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[19] A related implication of trade liberalization is that competitive pressures working through different channels will make labor demand in manufacturing more elastic. Hasan, Mitra and Ramaswamy (2007) confirm this and show that it is related to trade liberalization. The increase is greater in states with more flexible labor market institutions.
[20] It is possible, of course, that the responses of prospective entrants are different from that of incumbents.

positive and significant but it is counteracted by the coefficients on the interaction terms, all of which are negative. In other words, industries that grow slowly in the de-licensed period are those that are either relatively more dependent on infrastructure, or more dependent on external finance or are more labor-intensive. The paper does not identify what factors constrain the growth of labor-intensive manufacturing firms.

The evidence from the disaggregated industry (and in some cases firm-level) data therefore shows significant impacts of economic reforms on manufacturing: in terms of greater firm entry, higher industry output, value added and productivity. However, it seems that weaknesses in infrastructure, lack of adequate financing and labor market rigidity have come in the way of faster growth of the manufacturing sector.

It should be noted, however, that these findings are based on the organized manufacturing sector alone. What about firms in the unorganized manufacturing sector? How have they been affected by economic reforms? These questions do not have good answers because there is no comparable time series data set on unorganized enterprises and their level of output and inputs, as exists for the organized sector[21]. There are, however, some clues about how the dynamics of organized manufacturing affect the unorganized sector.

Table 7 reports employment in organized and unorganized manufacturing and their rates of growth over the periods 1983 to 1993-94 and 1993-94 to 2004-05. Overall employment growth is greater in the 1990s and this happens despite a fall in employment in the organized segment. The 1990s are a period of robust employment growth in the unorganized sector. What could have happened to bring this about?

Table 7: Manufacturing Sector Employment: 1983-2004-05

	Employment (millions)			Annualized Growth rates (%)	
	1983	1993-94	2004-05	1983 to 1993-94	1993-94 to 2004-05
Organized manufacturing	7.82	8.71	8.38	1.08	-0.38
Unorganized manufacturing	23.8	29.9	45.3	2.30	4.26
Total manufacturing	31.6	38.6	41.7	2.01	3.36

Source: Authors calculations using ASI data for organized manufacturing employment and NSS data for unorganized manufacturing employment.

One plausible explanation for the low employment growth rate in the organized manufactured sector is that due to the Small Scale Reservation policy for labor intensive activities, a significant part of the organized sector in India has always been capital intensive. The post-reform expansion of the organized manufacturing is likely to have

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[21] One source of information on the informal sector is the set of surveys conducted by the National Sample Survey Organuzation in 1989-90 and 1994-95 as the follow up surveys to the Economic Censuses of 1980 and 1990 respectively. Nataraj (2009) uses these datasets to examine the impact of tariff cuts on productivity improvement in the manufacturing sector as a whole. She finds that overall productivity has risen mostly due to the productivity improvement in informal sector through the exit of the inefficient firms.

taken place in capital intensive production especially after the reforms made the imports of capital equipment cheaper. If the reforms opened up expansion opportunities to the larger firms that had access to key inputs such as credit and power that the small firms lacked, it is possible that the Small Scale Reservation Policy was responsible for the low rate of employment creation following the reform of 1991. It was simply that there were too few labor intensive firms in the group that was able to take advantage of the expanded opportunities[22].

 Figure 8 reproduced from Dougherty (2008), shows clearly how employment in the organized sector went down after 1997 while that in unorganized sector rose. One conjecture is that competition had intensified in India's manufacturing sector by the late 90's as a result of easier entry and declining tariffs through the decade. Firms looked for ways to cut costs and given the rigid labor laws, sub-contracting and use of contract labor afforded firms lower labor costs and greater flexibility.

Figure 8: Growth of Organized and Unorganized Sector Employment
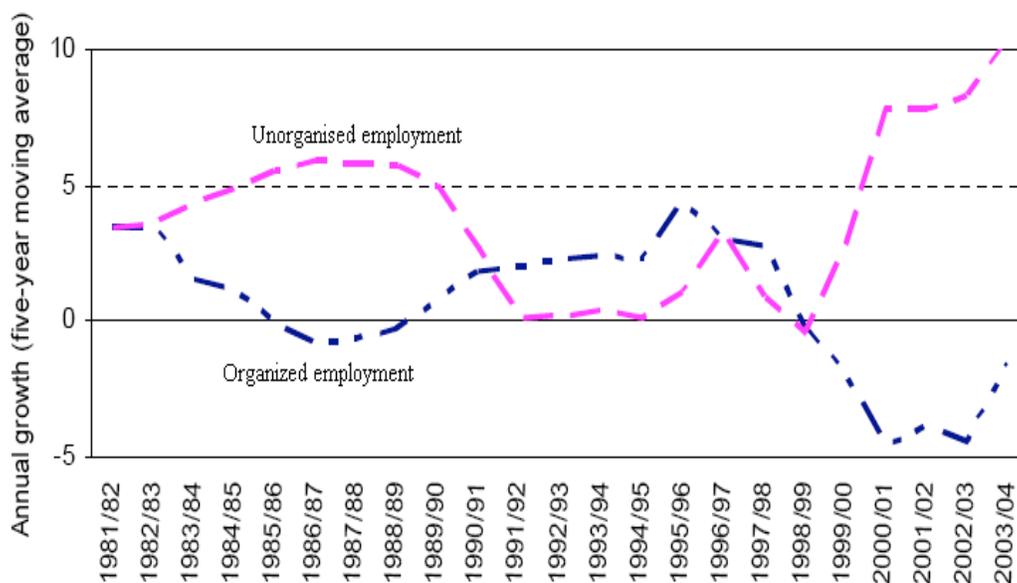
Source: Dougherty (2008).

Figure 9 shows that the period since 1997 was not one of contraction for the organized sector. Profits, output, material and service input all increased (relative to value added). Value added in constant prices increased by almost 6% per annum during the period 1997 to 2004-05. Yet, organized sector employment declined during this period. On the other hand, the organized manufacturing sector did increase the use of contract labor (not counted as part of regular workers).   Figure 10 plots contract labor as a percentage of

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[22] We thank an anonymous referee for pointing this out.

person days worked for the period since the late 1970s. While this proportion has been increasing throughout the period, the rise is sharp since the late 1990s.

Figure 9: Organized Manufacturing Ratios
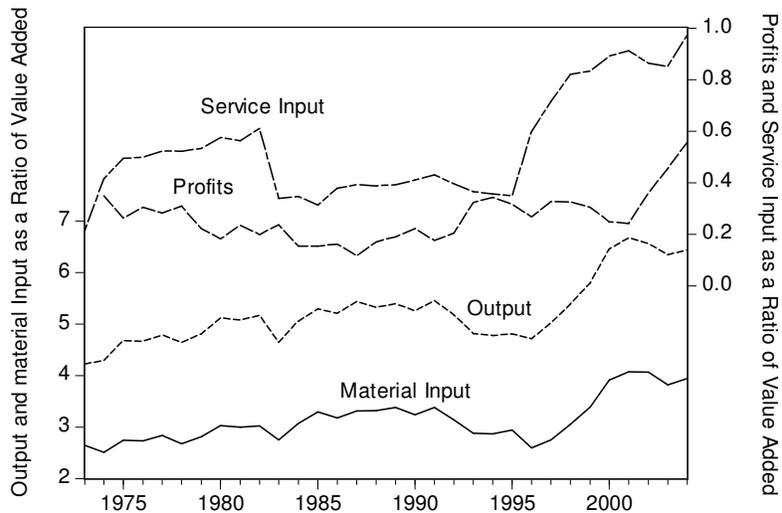
Source: Author's calculations using ASI data.

Figure 10: Contract Intensity in the Manufacturing Sector
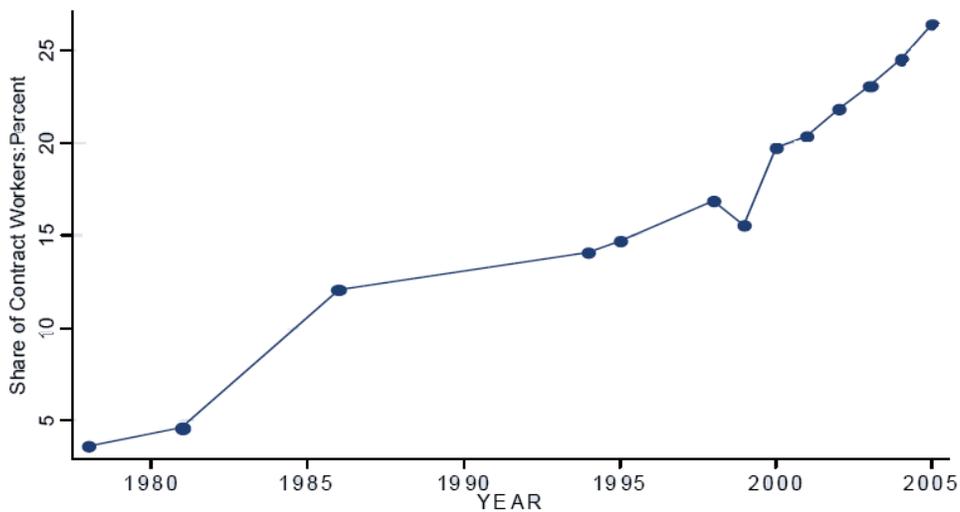
Source: Ramaswamy (2008).

Using plant level data from the ASI, Dougherty (2008) computes the job creation rate and job destruction rate at the three-digit industry level and five-digit industry level. The ideal measure would be at the plant level but ASI does not allow plants to be tracked over time. Therefore, these measures displayed in Table 8 are lower bounds.

Table 8: Job Flows in the Organized Manufacturing Sector

Year	Job creation rate	Job destruction rate	Turnover rate
	Based on three-digit industries		
Average, 1985-1988	5.3	-4.1	9.4
Average, 1999-2004	3.9	-5	8.9
	Based on five-digit industries		
1999-2000	18.9	-21.2	40.1
2000-01	11.4	-13.7	25.0
2001-02	8.0	-10.8	18.8
2002-03	16.5	-13.1	29.6
2003-04	15.8	-16.1	31.9

Source: Dougherty (2008)

The turnover rates in the 2000's are surprisingly high for a labor market where regulations are thought to restrain the ability of employers to dismiss workers. The key to the puzzle lies in Table 9 also from Dougherty (2008). The table shows that for large units (defined as those with more than 100 workers), the only category of workers that has seen an increase is contract labor. For small units (less than 100 workers and therefore exempt from the provisions of the Industrial Disputes Act), the net employment rate is positive for all worker types. Job flows are therefore concentrated on contract labor in large units and on all workers in small units. As the smaller units are characterized by lower capital intensity and lower productivity, Dougherty concludes that "Despite strong gains in employment across the economy in recent years, a dichotomy has emerged with net increases in employment occurring almost exclusively in the least productive, unorganized and often informal part of the economy."

Table 9: Job Flows by Size of Plant Workforce and Type of Worker
Average for 1999-2004 (for Organized Manufacturing Sector)

	Job Creation Rate		Job Destruction Rate		Net Employment Rate	
	Large	Small	Large	Small	Large	Small
All employees	11.5	24.2	-17	-8.4	-5.5	15.8
Workers	13.3	26.7	-18.7	-10.4	-5.4	16.3
Contract	26.7	31.0	-22.9	-13.7	3.8	17.3
Supervisors	16.8	27.8	-27.4	-14.6	-10.6	13.2
Others	15.9	31.5	-25.2	-13.7	-9.3	17.8

Note: Large plants have more than 100 workers, and small plants have 100 or less workers.
Source: Dougherty (2008)

Sub-contracting could be the other possible explanation for the inverse correlation between the growth in organized sector employment and unorganized sector employment. Sub-contracting is widespread in some industries such as for instance garments. Ramaswamy (1999) has estimates of sub-contracting in the 1980s and early 1990s but estimates for a more recent period are not available. He finds subcontracting practices to be concentrated in labor-intensive industries. It is possible that the dramatic improvements in telecommunications in the 1990s could have facilitated more efficient supply chains, greater specialization and more sub-contracting. However, we lack evidence on whether and how cell phones and better communications changed the way in which firms conduct business.

Services

Figure 7 and Tables 5 and 6 make it apparent that the service sector has grown faster than other sectors and is the dominant sector in the economy.[23] Within the sector, business services (which includes software and IT-enabled services), banking and communications have grown on average at more than 10% per year in the 1990s. On the other hand, some other services such as railways and public administration have grown more slowly (Chanda, 2007).[24] The other striking feature of Figure 7 and Tables 5 and 6 is the relatively slower growth of employment in the services sector. As a result, while the services share of GDP is nearly 60%, its share of employment is barely 30%.

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[23] In our three-fold division of the economy into agriculture, manufacturing and services, we include the following in services – trade, construction, transportation, communications, banking and financial services, public administration, personal services, education and health, business services, research and scientific services, and recreation and entertainment.

[24] The data quality on service sector output has been questioned. While the estimate for the public sector component is regarded as reliable, this is not equally so for the components relating to either the private corporate sector or the unorganized sector (Shetty, 2007).

Some of the service sectors clearly grew on account of domestic demand: trade (i.e., distribution of goods and services from producers to consumers), construction, transportation, public administration, education and health, personal services, and recreation and entertainment. However, the most noticeable feature of service sector growth has been the remarkable expansion of its exports which grew faster (at 17.3% annually) than either GDP (at 7.5%) or the services GDP through the 1990s (at 9.2%).[25] Between 1995 and 2000, India's services exports grew nearly six times faster than world exports of services (Chanda, 2007). In 2001-02, software accounted for about a third of all services exports. Until the most recent financial crisis, this sector has been growing at 35% per annum. Though as yet software sector is only a small part of the GDP and a negligible part of the total employment, it has been the most dynamic sector in India and has facilitated continuing growth by generating foreign exchange averting a financial crisis. From a growth accounting exercise, Eichengreen and Gupta (2010) conclude that domestic demand and exports are the major drivers of service sector growth (as opposed to intermediate demand from other sectors).[26]

The services sector has gained from reforms in two sorts of ways. The direct impact came from the opening up of several service sectors to the private sector and foreign direct investment. These include telecommunications, banking and insurance. The share of services in foreign direct investment rose from 10.5% in the early 1990s to nearly 30% in the second half of the decade (Chanda, 2007). However, FDI is still not permitted in some sectors, the most prominent of them being retail distribution. The indirect impact came about because of easier and cheaper access to factor services. Narayana Murthy (2004) cites import de-licensing (that permitted immediate purchase of imported computers), financial liberalization (that allowed firms to raise capital through public offerings that were market determined rather than by state regulators), and current account convertibility (that made it easier to travel, hire foreign consultants and establish sales offices abroad). Narayana Murthy also credits FDI by software majors as reasons why the industry adopted world-class quality processes, tools and methodologies. Improvement in telecommunications and the use of internet facilitated the off-shoring of IT services by US and European corporations to Indian firms. The difference in time zones between India and the US was used by Indian companies to offer a 24-hour virtual workday (Narayana Murthy, 2007).

During the earlier period (1983-93), there is little reason to believe that new technologies played any role in the service sector growth. The service sector was growing mostly due to the growing demand for it by the fast growing manufacturing sector or by other factors that did not even depend on policy reforms. For example, as mentioned earlier, there was a steady expansion of the banking system from 1975 through 1985 that slowed down in the late eighties. However, aggregate deposits and credit increased very fast due to the increased economic activity. Public administration is in a league of its own. When wages of public servants are revised upwards, the output figures reported in the statistics go up as long as the wage hikes exceed the cost of living index. Thus, the indicated

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[25] Chanda, (2007)
[26] Intermediate demand from manufacturing accounts for about one-third of value added in services which is down from about 40% in 1991.

output growth rate in 'public administration' can be somewhat fictitious. Trade, construction and transportation all grew in response to an increased demand. Education has two components: 'public' is autonomous while 'private' can move in response to a change in demand.

The beginning of the new communications era was made in 1992 when the government opened the sector to the private sector by relinquishing its monopoly control over the provision of communication services. The years between 1995 and 1999 saw a lot of churning in the telecom sector but during this period cell phones became more affordable to common people. In a country with poor infrastructure for communications, this development had an enormous impact[27]. After the arrival of cellular technology, the service sector in India took off. The two fastest growing sectors in the period 1993-2004 were business services (24.3%), and communications (20.7%).[28] If we examine a slightly later period of 2001-2007, we find further acceleration of these high-end services. Given that the growth acceleration of these activities in this period coincides exactly with the entry of information technology, it is very likely that the advent of IT is the main trigger for growth acceleration in these sectors. The coincidence of educated manpower and the presence of a huge international demand for IT services launched the Indian software industry. Software and services exports grew at an astronomical speed from USD 754 million in 1995-96 to USD 23,600 million in 2005-06 (Gangopadhyay, Singh and Singh (2008)).

An improvement in communication technologies has enormous externalities for other sectors, especially 'services'. 'Trade' includes distribution of goods and services from the producers to consumers and it is the largest component of the service sector in India. Its efficiency depends on the quality and timeliness of the information flows and the advent of new communications technology facilitated both. It is not a surprise therefore that there was a quantum jump in the growth rate of the service sector after the arrival of cell phones and internet. It also had an impact on banking, insurance and social services such as health and education. Interestingly, the ASI data show that the service sector input into the organized manufacturing sector went up considerably from 1997-98 to 2001-02 and so did the value of total input (Figure 9). This is consistent with our conjecture that improvement in the communications technology may have created incentives for sub-contracting to smaller specialized units in the unorganized sector.

Note that the fastest growing sector during the nineties, was business services, but it constitutes a relatively small part of GDP and therefore cannot be considered as having contributed significantly to the overall growth of GDP during 1993-2004. However, at the compound growth rate of 22.5% that it is growing, it is expected to rise over 7% of GDP in 2007-08. It will then certainly start having an impact on GDP. The sector that contributes the most to the overall non-farm growth is trade as it forms a sizeable part of GDP in 1993 (18%). This means that almost one fifth of the economy is engaged in trading and distributing goods and services produced in the economy. Its growth rate

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[27] See Jensen (2007) on how the use of cell phones by Kerala fishermen eliminated the price volatility in the fish market.
[28] These are average annual rates of growth over 1994-2004.

though not in the fastest 12 sectors nevertheless rose from 5.4% during1983-93 to 8.5% during the period 1993-2004. The expansion of trade also indicates increasing specialization and expanding markets.

Gangopadhyay, Singh and Singh (2008) study the impact of IT on the organized manufacturing sector in India[29]. They find that the penetration of IT in Indian manufacturing has been less than satisfactory. Some sectors like pharmaceuticals have adopted it much more than others. However, they also find that the use of IT has a positive impact on productivity as well as employment. It not only increases both skilled and unskilled employment but also increases the skill intensity of the workforce. Their most interesting finding is that the use of IT is subject to a coordination problem due to network externalities. A firm is more likely to use it if its suppliers and customers use it. They cite the example of the state of Haryana where a government subsidy had a strong impact on the spread of IT through the industries in Haryana.

Why services: The bias towards skill-intensity

Kochhar et al (2006) have argued that because of the prior emphasis on tertiary education and a diversified skill set developed during the long import substitution phase, skill-intensive services based on information technologies took root in India.[30] In addition, Indian engineers resident in the U.S. who had played an important role in the high tech sector there were induced to invest their human and financial capital in India by the reforms that relaxed controls on imports and investments. Of course, the advent of new technologies was felt by the whole world but it is possible that the reputation of Indian engineers in the U.S. helped them create a brand name that is normally not available for a developing country's foray into a new high tech activity. This sequence of fortuitous events launched India as a name to reckon with in software exports. The extra-ordinarily high growth rate of 24.3% for business services would not have been possible if a vast export market had not opened for custom designed software products. It also helped to have a large pool of English speaking young population with some education to provide other business services such as 'call centers'. All this is of course rather special due to India's historical background and therefore not quite replicable in other countries.

Kochhar et al (2006) compare the sectoral shares of GDP and employment in India with those in other comparable countries and examine whether India is an outlier in any respect. The most noteworthy statistic they present is the change in the employment share of agriculture from 1980 to 2000: China (68.7%), India (68.1%) and Thailand (70.8%) had very similar figures in 1980. By 2000, the picture had changed significantly: China (46.95%), India (59.3%) and Thailand (48.8%). As a result, the contribution in India (to the total growth rate) from the process of reallocating labor from the agricultural sector (characterized by low productivity) to industry and services (characterized by high

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[29] Also, Singh (2006) has pointed out many spillovers from information and communication technology to the rest of the economy and especially to the manufacturing sector. These crucial services reduce transaction costs and speed up innovation.

[30] Kochar et. al show that in 1981, the contribution of skill-intensive industries to total value-added in India was above the international norm (controlling for the country's GDP and size). This effect persists in 2000.

productivity) is extremely low compared to other Asian countries (Bosworth, Collins and Virmani (2007)).

The main reason for this is that the fast growing non-farm sectors are all skill intensive sectors while most of the labor in agriculture is unskilled. How little unskilled employment growth was created by the fastest growing sectors is clear from Figures 11 and 12 that plot the contribution to the overall (GDP) growth rate and to the overall skilled and unskilled employment growth rate for each of the 41 non-farm sectors during the eighties and the nineties.[31] The computations displayed in these figures use a very minimal definition of skill. All workers who have a middle-school education or higher are considered to be skilled. All others are unskilled workers. In the figures, the sectors are sorted in a descending order by their contribution to the rate of growth of GDP. We then plot the cumulative contribution of these sectors to the rate of growth of GDP, skilled and unskilled employment. Figure 11 shows these cumulative contributions for the 1983-93 period and Figure 12 for the 1993-04 period.

During the eighties (Figure 11) the fastest growing 14 sectors hardly provide any unskilled labor employment. In fact, they seem to be shedding unskilled labor. The initial dip in Figure 11 occurs because unskilled labor employment in textile products – the second fastest growing sector in the 1980s – dropped by 39%. Even if this sector is excluded, the ten fastest growing sectors in the 1980s accounted for only about 4% of the growth in unskilled employment. On the other hand, the sectoral contribution to GDP is very similar to their contribution to skilled employment. However, as far as unskilled employment is concerned there are just a few sectors that make abundant use of unskilled workers and much of the unskilled employment in non-farm sectors is clustered in three main sectors – trade, construction, and transportation. The three vertical segments of the graph correspond to these sectors.

As is clear, from Figure 12, 1993-04 is certainly a better decade from the point of view of employment generation for the unskilled as compared to the earlier decade. The main reason why the picture for 1993-04 looks more favorable to unskilled labor is because the sectors that used unskilled labor abundantly (e.g., trade and construction) grew faster in the 1990s. In addition, the labor-shedding seen in the earlier decade does not happen in the 1990s. As a result, the 1990s are better for the growth of overall non-farm employment as well. Between 1983 and 1993, non-farm employment increased by 35.59 million. The increase during 1993-04 was much larger at 60.20 million. In fact, two-thirds of the increase happened in the latter half of the decade – while the increase was 20.86 million during 1993-99, it was 39.34 million during 1999-04.

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[31] For value added and output there are two main sources of data — ASI and NAS. The level of disaggregation is much greater in ASI than in NAS. However, the ASI covers only registered manufacturing which constitutes less than 20% of GDP. More importantly it does not cover services which are not only dominant in GDP but also included some of the fastest growing sectors in the nineties. Therefore, for output we have no choice but to use NAS. For employment the only source is NSS and the recent rounds give data disaggregated up to 5 digit industry codes. However, as stated before NSS data are available only at five year intervals. On the other hand NAS gives a time series, but with very limited disaggregation – 41 non-farm sectors. Therefore, we are restricted to 41 non-farm sectors over the NSS time periods – 1983-93 and 1993-04.

**Figure 11: Contribution of the Fastest Growing Sectors to Employment: 1983 – 93**
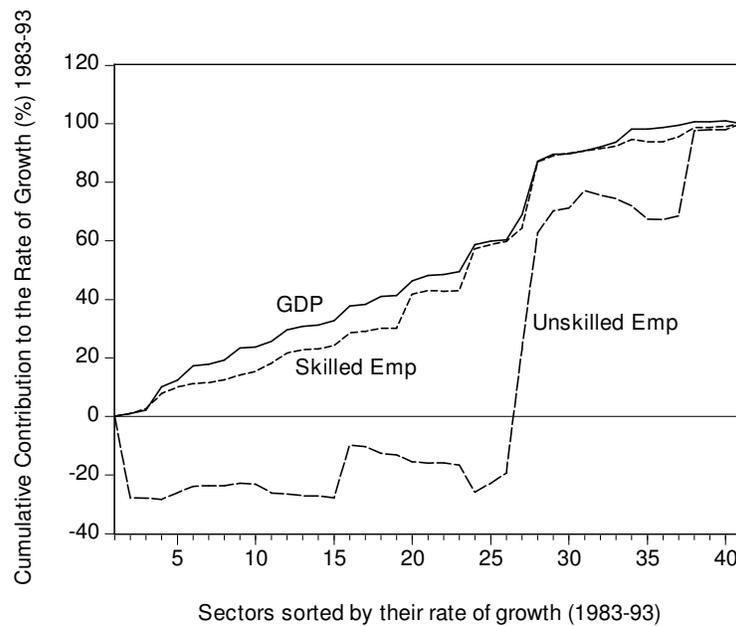
Figure 12: Contribution of the Fastest Growing Sectors to Employment: 1993 – 04
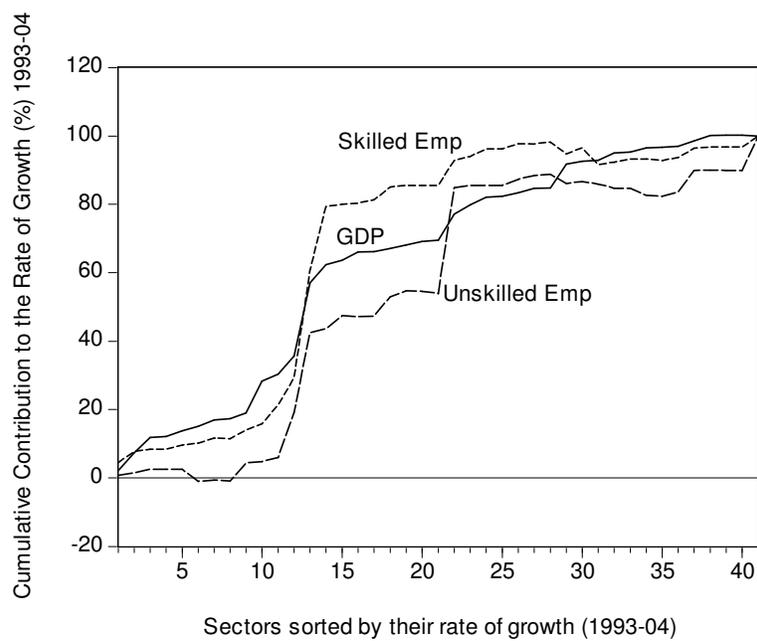
Source: Authors calculation using NAS and NSS data.

Why has Indian growth created much less employment in its non-farm sectors than have China and other Asian countries that also experienced fast growth? First, as the goal of `self-reliance' guided Indian industrialization in the pre-reform period, the principle of comparative advantage was deliberately sidestepped giving rise to capital and skill intensive growth. While this favored skill-intensive exports in the later liberalization phase, it also left a legacy of restrictive labor laws, prohibitions on large-scale units in labor intensive sectors (through the small scale reservation policy) and inadequate infrastructure that constrained the expansion of the corporate sector into labor intensive manufacturing.

The flip side is that much of India's labor force is in the unorganized sector. Reversing the regulatory impediments would aid the expansion of the organized sector in labor-intensive manufacturing. However, given that the unorganized sector employs 83% of the non-farm labor force, it is difficult to imagine that the present picture can change rapidly on the strength of organized sector expansion alone. The under-provision of infrastructural facilities and credit are the biggest impediments to overall entrepreneurial activity.

In sum, the fastest growing sectors in India are capital and skilled labor-intensive sectors. Despite the speeding up of employment growth in 1999-04, the labor share of agriculture has fallen at a relatively slower rate than other comparable countries as the increase in demand for unskilled labor by non-farm sectors has still not matched the increases in labor force during this period. This has obvious implications for poverty decline as we discuss in the next section.

6. Poverty Decline

Official poverty estimates in India are based on nationally representative consumer expenditure surveys conducted by the National Sample Survey Organization (NSSO). While such surveys are now undertaken every year, the so-called "thick rounds" which take place approximately every five years are regarded as more reliable. The official estimates of the head-count ratio of poverty are reported only for the thick rounds. These estimates are reproduced in Table 10.

The poverty ratio in both rural and urban populations has approximately halved over three decades from 1973-74 to 2004-05. About 61% of the decline in the rural head-count ratio occurred in the first 14 years of this period (1973-74 to 1987-88). On the other hand, the rate of decline in urban poverty has been more even – 46% of the reduction happened in the first 14 years and the remainder in the next 17 years. For the period prior to 1973-74, there is no officially released consistent series on poverty. However, from the estimates put together by researchers (Datt and Ravallion (2002)), it can be seen there is no trend in the poverty ratio during this period.

Table 10: Trends in Poverty, 1973 – 2004

	Head count ratio (%)			Number of poor (million)			Total population (million)
	Rural	Urban	Combined	Rural	Urban	Combined	
1973-74	56.4	49	54.9	261.3	60.0	321.3	585.25
1977-78	53.1	45.2	51.3	264.3	64.6	328.9	641.13
1983	45.6	40.8	44.5	252.0	70.9	322.9	725.62
1987-88	39.1	38.2	38.9	231.9	75.2	307.0	789.20
1993-94	37.3	32.4	36.0	244.0	76.3	320.4	890.00
2004-05	28.3	25.7	27.5	220.9	80.8	301.7	1097.09

Source: Planning Commission, Government of India.

The poverty lines used in the official estimates have often been criticized for not corresponding adequately to a desired caloric norm, for not capturing non-food subsistence and for the use of incorrect price deflators across survey years.[32] Figure 13 displays the all India empirical cumulative distribution of per capita consumer expenditure for the years 1983 and 2004-05. As the 2004-05 distribution dominates the 1983 distribution by first-order stochastic dominance, the choice of a poverty line would not alter the finding of a decline in poverty. However, the choice matters in other ways. In the figure, we draw vertical lines at a per capita expenditure level corresponding to the poverty line and twice the poverty line. While the fall in poverty is substantial when measured by the poverty line, the decrease in the proportion of population below twice the poverty line is very modest. Furthermore, even in 2004, this proportion was as high as 0.8.

Table 10 also contains numbers on the absolute number of the poor in rural and urban populations. While the number of rural poor has dropped by about 40 million, the number of urban poor went up by 20 million between 1973 and 2004. So the net gain is only about 20 million. However, these changes happened at a time when the population nearly doubled from 585 million to 1.1 billion. If the poverty ratio had not dropped below its levels in 1973-74, India would have more than 600 million poor people. Against this counter-factual, economic growth has lifted about 300 million out of poverty. Clearly, however, other counterfactuals can be constructed.

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[32] Deaton and Kozel (2005) is a good reference for a recent survey of measurement issues.

Figure 13: Distribution of Consumer Expenditure
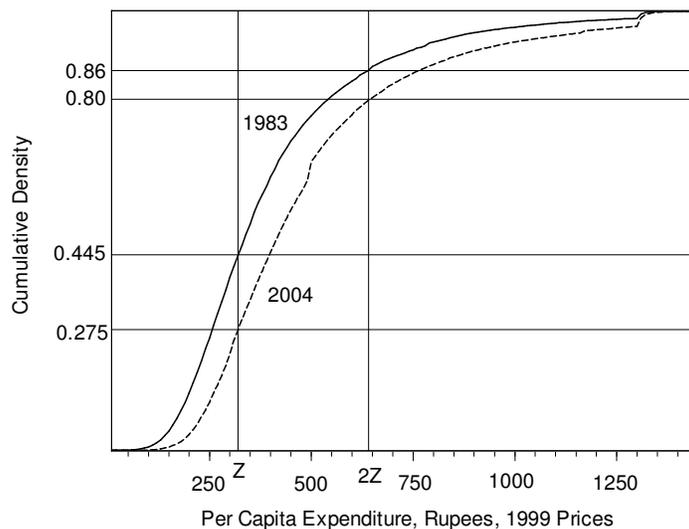
Source: Authors calculations using NSS data.

Like the growth story then, the decline in poverty also dates to the 1970s. The leading candidate among rival explanations is agricultural growth. The plausibility of this is illustrated by the Figure 14 which graphs crop yields and the head count ratio measure of poverty for the period 1949-98.

Figure 14: Crop Yields and Poverty in India, 1949-98
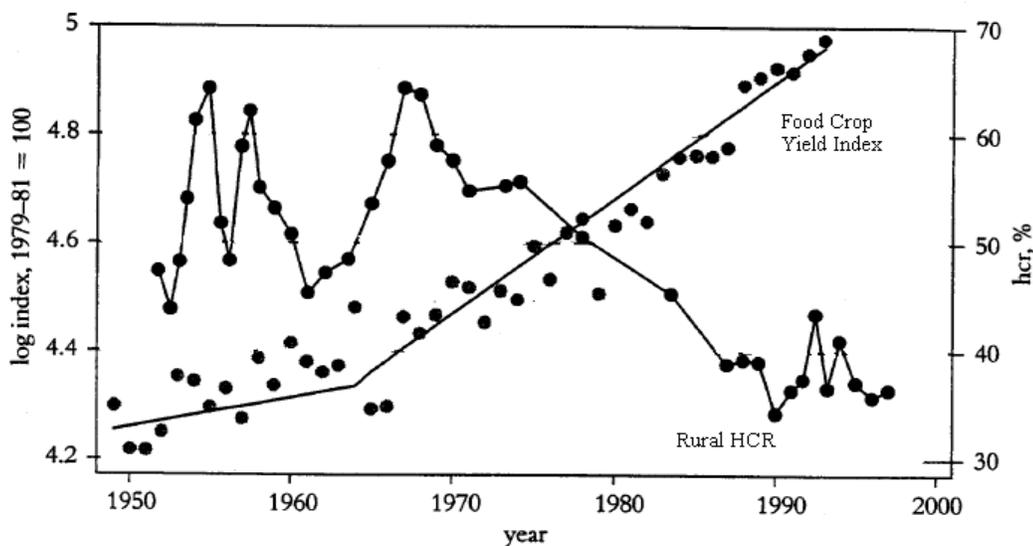
Source: Palmer-Jones and Sen (2006)

In a series of papers, Datt and Ravallion (DR) used time-series data to examine the correlates of poverty decline (Datt and Ravallion, 1998 and 2002; Ravallion and Datt, 2002)[33, 34] Their principal findings were the following:

(i)   While both urban and rural poor gained from rural growth, the rural poor did not benefit from urban growth. Rural to urban migration is not a major driver of poverty decline in India.
(ii)   Similarly, primary and tertiary sector growth mattered much more to poverty than secondary sector growth (primarily manufacturing).
(iii)   Higher farm yields increase real agricultural wages and reduce rural poverty.
(iv)   Rural non-farm output also reduces rural poverty; however its impact varies across states depending on initial conditions. The impact is lower in states with initially low levels of farm productivity, low rural living standards relative to urban areas, poor basic education and high infant mortality.

In a cross-sectional analysis, Palmer-Jones and Sen (2003) related rural poverty (in the late 1980s and early 1990s) to agricultural growth and several control variables. Their results confirm the DR finding of a strong positive correlation between agricultural growth and poverty decline. Palmer-Jones and Sen emphasize the role of agro-ecological conditions in determining agricultural growth suggesting that agriculture driven poverty reduction is not available to all regions.

A contrary finding is from Foster and Rosenzweig (2003, 2004) who model a village economy as consisting of three sectors: a traded agricultural sector, a non-traded service sector and a traded factory sector. Capital is mobile and is used by the factory sector alone. As capital seeks villages with low wages, a key prediction of their model is that rural industrialization may bypass regions with high agricultural productivity (and, therefore, high wages). The model is estimated for a panel of villages and households over the period 1982-1999.[35] The important findings of their empirical application are (i) agricultural productivity negatively affects the factory sector but positively affects the non-traded sector (ii) both agricultural productivity and factory sector growth have had positive impacts on rural wages but the size of the latter effect is larger. This result emerges from the impressive growth in the rural factory sector during this period. The percentage of villages with factories increased from 17 to 51% and the average number of factory workers per village increased ten-fold from 5.6 to 56.7. The clear implication is that a dynamic non-farm sector increased rural wages and rural poverty in the sample of villages studied in the paper.

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[33] The data was drawn from Ozler et.al (1996) who assembled poverty measures from 21 household expenditure surveys of the NSSO for the period 1957-58 to 1990-91.

[34] Palmer-Jones and Sen (2006) survey the older studies prior to Datt and Ravallion that also address the impact of agricultural growth on poverty.

[35] The panel consists of 250 village surveyed twice – in 1982 and in 1999. The survey is conducted by NCAER (National Council of Applied Economic Research).

It should be noted, however, that the nationally representative NSS data do not show even a modest rise in the relative share of the non-farm sector in rural employment. In the period from 1987-88 to 1999-00, this ratio fluctuates between 26% and 29% (Kijima and Lanjouw, 2005). It is unclear how the non-farm sector would be largely responsible for increasing the agricultural wage without causing a substantial increase in non-farm employment.

In a land constrained agricultural economy, a rapidly growing non-farm sector can draw labor from land, increase labor productivity and agricultural wages and thus reduce poverty.   For the 15 major Indian states, Figure 15 (from Eswaran et.al, 2009) plots the average real daily wages (in 1999 rupees) in agriculture against the labor-land ratio (days per hectare of gross cropped area) for 1983 and 2004. It can be seen that, for all but four states (Kerala, Haryana, Punjab and Rajasthan), the labor use per hectare of land has increased over this period. Yet, in all states, real wages have increased during this period. At the all-India level, real daily wages increased by 74% between 1983 and 2004. Quite clearly, if either farm TFP or agricultural inputs such as fertilizers had not increased during this period, agricultural wages would have declined.

Figure 15: Agricultural Earnings & Labor-Land Ratios: 1983-04
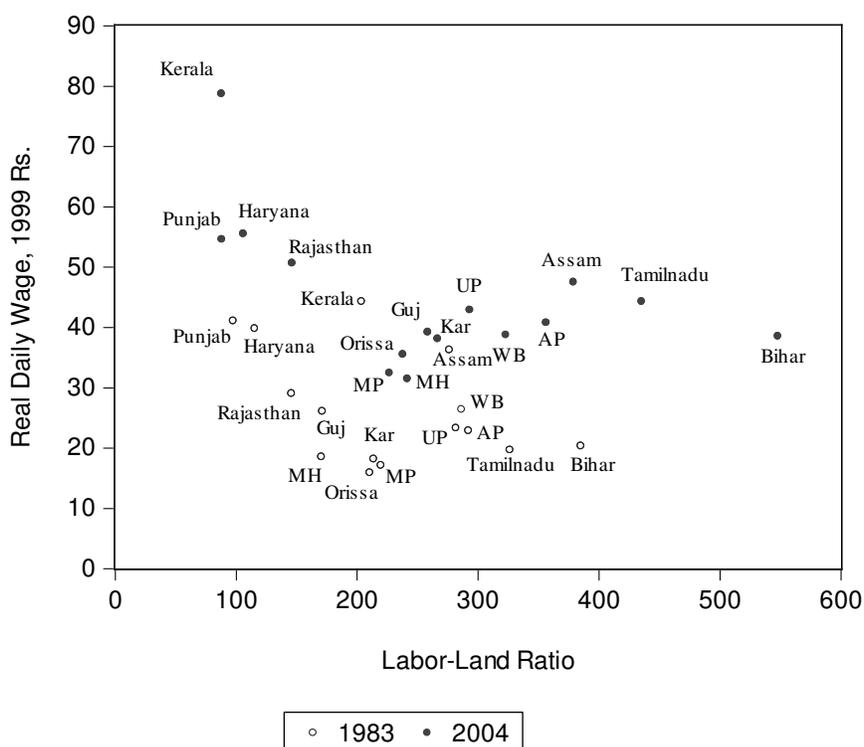
Source: Eswaran, Kotwal, Ramaswami and Wadhwa (2009).

It becomes interesting, therefore, to ask how much the non-farm sector growth has contributed to the growth of agricultural wages. The extent of wage increase due to non-farm TFP growth would depend, of course, on the amount of labor drawn away from agriculture. Because of the limited extent to which non-farm employment has grown (relative to the agricultural work force), Eswaran et.al (2008) estimate that non-farm sector TFP growth could not be responsible for more than 22% of the wage growth during 1983-99.

The analysis of Eswaran et. al (2009) also shows that it is the younger and more educated male cohorts that are most mobile across sectors.[36] Older males and females of all ages are directly affected by a slowdown in agricultural growth. The stock of labor force already locked into agriculture is large (relative, in particular, to new employment opportunities in other sectors) and so non-farm employment would have to grow substantially faster if it has to make a dent into poverty. It seems reasonable to suppose that agricultural productivity would have to continue to increase for improving the living standards of much of the rural poor.

For the young and mobile, access to education would determine their prospects of non-farm jobs. Ravallion (2009) points out that educational inequalities in India are much worse than in comparable large countries such as Brazil and China. It is only in 2005 that India's enrollment and literacy percentages have equalled or surpassed China's record at the beginning of its reform period (1981).

Recent work (Collins et al, (2009)) has revealed how important consumption smoothing is for the poor who seldom have a steady source of income. When we are considering the wellbeing of the poor, it is not enough to take their wages or daily earnings into account. It is also necessary to ask if they have access to any means of consumption smoothing. The poor may also save for this purpose or may resort to locally available informal credit. Patron-client relationships in which workers take loans from their employers or from the local rich survive precisely because of the informal insurance arrangements they make possible. Micro-finance has emerged as a possible alternative. Even though it originated as a tool to facilitate creation of self-employment for the poor, it is now well accepted that the poor use it for various purposes including for insuring themselves against consumption contingencies (Karlan and Morduch, 2009). Moreover, micro-finance is much more than micro-credit. The poor also put a great deal of value on having access to a safe way to save.

In India, some NGOs are engaged in micro-finance schemes in rural communities as well as urban slums and often the results are encouraging. Banerjee et al (2009) performed a randomized experiment on one such NGO engaged in group-lending in the slums of Hyderabad. The impact on the borrowers was positive, though not necessarily through an increase in their average consumption. There was greater investment in business durables as well as an increase in new businesses started. By necessity, such studies are

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[36] Education and access to non-farm jobs are strongly correlated. For a recent analysis, see Kijima and Lanjouw (2005).

micro-studies of particular cases. We are not aware of any study that has tried to evaluate the overall role of micro-finance in the Indian economy.

7. Determinants of Agricultural Growth

The change in labor productivity in agriculture is the sum of change in land productivity (yields) and the land-labor ratio. Figure 16 summarizes the changes in all three variables (for crop agriculture) from the mid-60s to mid-90s. This picture shows that despite continuous decline in the land-labor ratio, labor productivity has registered positive growth driven by land productivity. The adverse movement in the land-labor ratio reflects the limited absorption of unskilled labor by the nonfarm sector. At the aggregate level, this pictue is an explanation of the wage trends oberved in Figure 15.

In the period from early 60s to early 70s, the rate of growth of labor productivity was miniscule (0.26% per annum) as land productivity increase (1.6% per annum) was almost neutralized by the adverse change in land-labor ratio (-1.3% per annum). The land productivity growth was slightly higher in the 1970s and much higher in the 1980s. The land-labor ratio continues to decline through all three decades but the rate of decline is highest in the 1980s. However, because of a substantial step-up of yields in the 1980s, this is also the period with the highest rate of increase of labor productivity.

Figure 16: Agricultural Productivity: 1962-95
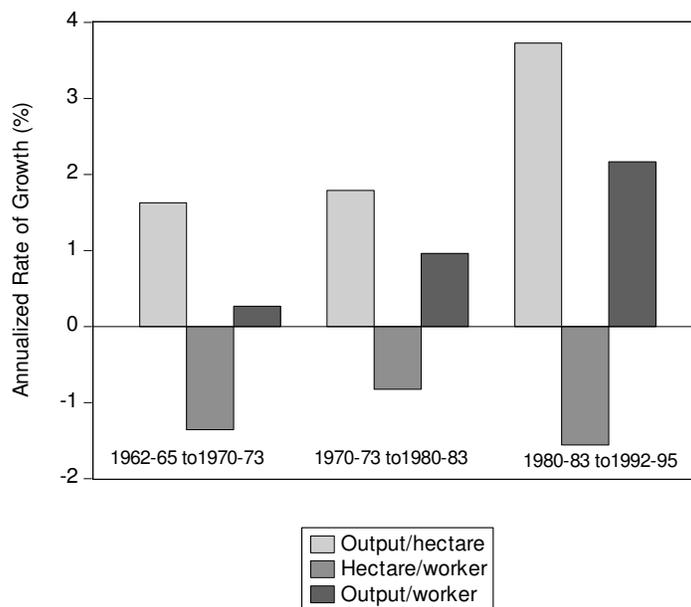
Source: Authors calculations using data in Bhalla and Singh (2001).
Crop output is measured in terms of 1990-93 prices and workers refer to male workers in crop agriculture.

Joshi, Birthal, and Minot (2006) decomposed the change in value of crop output into changes in crop area, crop yields, crop prices, shifts in crop output (towards higher value crops) and a residual term. Figure 17 present their results for the 1980s and 1990s. In both periods, the value of crop output grew at roughly the same rate (3.5%). The figures show that output growth owes very little to area expansion. So these figures could also be interpreted as accounting for the change in land productivity. In the 1980s, the major sources of higher land productivity were technology (higher crop yields) and diversification (shift to higher value crops). In the 1990s, technology, diversification and real price changes are all about equally responsible. Since crop output grew at the same rate in both these decades, the figures imply that growth due to technology has slowed in the 1990s. This is corroborated by the levelling of yields in rice, wheat, cotton and sugarcane. The slowdown is particularly marked after 1995 (Chand, Raju and Pandey(2007)).[37]

Figure 17: Decomposition of Crop Output Growth
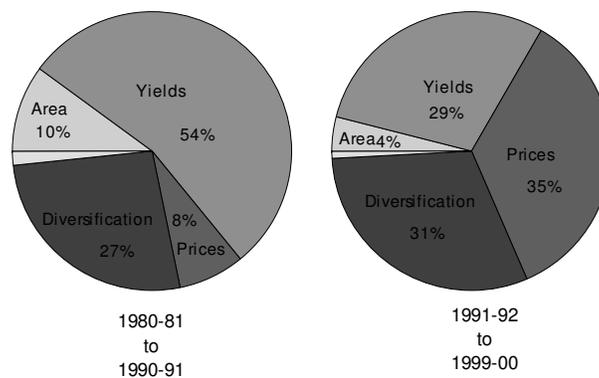
Source: Joshi, Birthal, and Minot (2006).

Rising urban incomes and the diversification of diets towards fruits and vegetables explains the diversification component of crop output growth in both periods. The share of fruits and vegetables in crop output rose from 13.7% in 1982-83 to 20.5% in 1999-00. Although the diversification is component is larger in the 1990s, this process was well underway in the 1980s as well.[38]

Public spending on agriculture has consisted of public investments in technology, (especially the high yielding seed varieties of the Green Revolution), irrigation and infrastructure (roads, markets) as well subsidies on irrigation and electricity charges and

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[37] Even crop output growth is slower in this period.
[38] Although exports are rising, it is domestic demand that is primarily driving diversification (Kumar and Mruthyunjaya, 2003).

fertilizer prices.[39] Subsidies for fertilizers, canal irrigation and electricity have grown over time and now account for nearly 10% of agricultural GDP (Vyas, 2007).   About 73% of subsidy expenditure is because of subsidies to electricity. Figure 18 plots the movement of public and private investment in agriculture and that of input subsidies. Compared to the economy wide rate of investment of 27% in the late 1990s, investment in agriculture is only about 16% of agricultural GDP of which on-farm investment is only about 6% and the remainder is in agriculture-related activities (Gulati and Landes, 2004). Public investment has been a declining force since the 1980s while private investment picked up in the late 1980s. Input subsidies on the other hand have moved smoothly upwards throughout the period. This has led many to argue that it is the rising subsidies that have led to declining allocations for public investment (Landes and Gulati, 2004, Rao,2003).   On the other hand, input subsidies have encouraged certain kinds of private investment in agriculture.[40]

Figure 18: Investment in Agriculture – 1980 – 2004
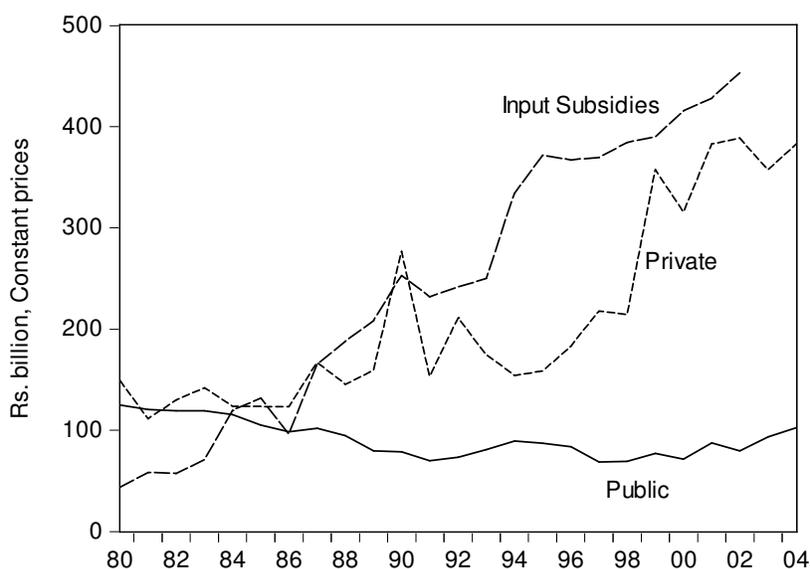
Source: National Accounts Statistics – public and private investment in 1999-00 prices.
Mullen, Orden and Gulati (2005) – input subsidies in 2000-01 prices.

Yet, private investment cannot fully substitute for some forms of public investment. Besides infrastructure investments such as roads and market facilities, many agricultural technologies are themselves public goods. The best instance of this are the Green Revolution seed varieties. Among seeds, an important distinction is between hybrids and open-pollinated varieties. Once the seeds of open-pollinated varieties have been

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[39] The modern Green Revolution varieties achieve their high yields because they are more responsive to fertilizers than traditional varieties. Increasing fertilizer use is therefore a cornerstone of increasing crop yields.
[40] For instance, subsidies to electricity charges have encouraged investment in tube-wells and pumpsets to extract groundwater.

distributed, they can be reproduced for several generations by farmers without serious loss of quality. The dissemination of these seeds can therefore take place rapidly through informal exchange of seeds between farmers. For this reason, the private sector has little interest in developing new open-pollinated varieties. Like in the rest of the world, the Indian private seed sector works mostly on hybrid varieties. These seeds cannot be reproduced without a loss in yields and hence provides the seed company with some measure of protection for its innovation. However, hybrids are unimportant for the major food staples of rice and wheat and as well as for many other field crops.[41]

Among other areas that must be addressed by public investments are initiatives to combat degradation of land resources (soil erosion, salinity and water logging some of which occurs because of negative externalities from poorly planned canal irrigation projects), measures to harness and conserve water resources to reverse the depletion of underground aquifers and immunization programs to control disease in the livestock sector.

Paucity of resources is not always the constraint, however. Studies point to poor governance as well. A case in point is the public sector research system. Although expenditures on research have not grown as rapidly in the 1990s as in the earlier decades (Balakrishnan et.al, 2008; Jha and Pal, 2008), there is no precipitous decline and the expenditure as percentage of agricultural GDP at the end of the 1990s was higher than at any point earlier. Nonetheless, there is evidence that the productivity of the research system has declined. For instance, according to government estimates (Planning Commission, 2007), an index of yields of new varieties of the major field crops has shown no change between 1996-97 and 2005-06 after growing at about 3% per year from 1980-81 to 1996-97. The review by Jha and Pal (2008) highlights poor financial management, the proliferation of bureaucratic procedures, and the absence of accountability in R&D projects.[42] The problem of low quality institutions has also been cited in many other areas of public investment and spending including the construction and management of canal irrigation systems and in the provision of agricultural extension services (Iyer, Raju and Wang, 2008; Raabe, 2008; Shingi et.al, 2004; Vaidyanathan, 1999)

The wide ranging economic reforms of the 1990s and the limited policy changes preceeding it were principally directed at trade, industry and financial markets. It has been argued that since it was industry that was protected during the earlier regime, the dismantling of tariffs (and the associated exchange rate devaluation) was primarily responsible for the improvement in the terms of trade for agriculture and hence the sizeable price effect in the 1990s seen in Figure 17 (Ahluwalia 2002, Balakrishnan,Golait and Kumar, 2008; Landes and Gulati, 2004). It should be noted, however, that the early 1990s also saw sharp increases in government support prices for rice and wheat and so the movement in terms of trade in favour of agriculture cannot be entirely attributed to trade liberalization. Indeed, the terms of trade begin to move against agriculture after the

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[41] The major hybrid seed markets are in vegetables, cotton, maize, sorghum and pearl millet.
[42] Despite these problems, the median rate of return to agricultural research investments was 58% in the 28 studies reviewed by Byerlee and Pal (2003). The payoff from institutional reforms is large.

mid-90s even though import tariffs on non-farm goods were falling right through the decade. For this reason, the price effect identified in the Joshi et.al study is unlikely to have lasted beyond this decade.[43]

The principal contribution of economic reforms to agricultural growth is likely to have been the diversification effect as rising incomes have led consumers to demand more of edible oils, milk, fruits and vegetables than of staple food cereals.[44] The technological component of agricultural growth is, however, determined by the internal dynamics of the sector – by public spending on investment and subsidies and by the capacity of public institutions to manage investments and push technologies effectively. The economy wide reforms have left this aspect of the agricultural economy largely untouched.

8. What is distinct about India's experience?

It is clear from the earlier sections that the growth episode in India since the 1980's is not another instance of State driven growth in Asia. Instead, it is the co-incidence of the ready availability of new technologies and having the skilled manpower that would be necessary to take advantage of these new technologies. Technology transfers in the 1980s and early 1990s took place mostly through easier and cheaper access to imported machinery that was made possible by trade liberalization. Improved communications (especially cell phones) and the diffusion of internet were other technologies that played a big role in driving growth from the mid-1990s on. It is inconceivable that without the breakup of government monopolies and the advent of competition in the communication sector, there would have been a revolution in communication technology in India. And, without such a revolution, the fastest growing sectors (e.g., business services) would not have taken off in India. The sustained growth that we have seen since the mid 1990's would clearly not have been possible without the liberalizing reforms of 1991.   The importance of liberalization measures can be appreciated by imagining the counterfactual that India had stayed in its pre-reform state of constraints on entrepreneurial freedoms to invest and import. New technologies would not have diffused at such a speed and growth would have been much slower.

At the same time, as stressed by Kochhar et al (2006), it should be acknowledged that some aspects of the earlier economic regime played a positive role in the pattern of development later. For example: the creation of a diverse set of skills through import substitution, an emphasis on tertiary education creating a pool of university graduates for sophisticated service sector jobs and a government induced expansion of banking network that helped in mobilizing savings. The initial conditions and their interaction

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[43] This is confirmed by an updated analysis from Birthal et. al (2008). This paper compares the period 1981-82 to 1995-96 with the period 1995-96 – 2004-05. Crop output growth decelerates from 3.8% in the first period to 2.1% in the second period. In the first period, about 62% of output growth is due to rising yields, 20% due to diversification and 12% due to the price effect. In the second period, these figures are 45%, 43% and 7%, respectively.

[44] In the decade of the 2000s, several Indian states carried out reforms of their agricultural marketing sector that allowed new marketing institutions including contract agriculture. These reforms are particularly helpful to the horticultural sector.

with the fortuitous arrival of new technologies created a distinctive pattern of growth that would have been hard to predict at the time of liberalization.

Another distinctive feature of the Indian growth experience is the dominance of the service sector. In East and Southeast Asia, it was the manufacturing sector. One could look at this in several different ways. If we compare China with India, it is indeed the manufacturing sector that grew the fastest in China and vice versa in India. However, both sectors grew faster in both countries than in the rest of the world and both sectors grew faster in China than in India. Yes, even services grew faster in China than in India. The main distinction is in terms of what comprised their exports. Here it is services for India and manufacturing for China. Indeed, it is the software exports to the developed countries that spread the word that India was unique as a developing country to have developed a comparative advantage in high-end services. In a curious way, this was the reason for it being accepted as a development success story despite the fact that it continues to house more of the world's poor than any other country.

What are the implications of the fast growing component of the exports being high-end services as opposed to manufacturing? For one thing, manufacturing uses unskilled labor more intensively. In the Indian context, this is especially true of unorganized manufacturing and it is conceivable that manufacturing exports would have generated a great deal of sub-contracting to the unorganized sector. This, in turn, would have drawn labor out of agriculture to a greater extent.

Indeed, one major feature of India's development pattern is that the share of agriculture in employment has not come down rapidly. In fact, the absolute amount of labor in agriculture has risen continuously in India while it fell in all countries now developed during their comparable development phases. An important component of growth – moving labor from low to high productivity activities – has been conspicuous by its absence in India. Also, as the labor to land ratio grows, it becomes that much more difficult to increase agricultural wages and reduce poverty.

There has been much discussion in the literature as to why the manufacturing sector has not grown faster in India. Inadequate infrastructure, restrictive labor laws and small scale reservation policy have been identified as the main reasons (e.g., Panagariya (2008)). It is very possible that these factors reduced the possibility of India emerging as an exporter of labor intensive manufacturers – a possibility that would have hastened the decline in poverty. Finding export markets in high-income countries makes the choice set of production activities independent of domestic demand composition. The growth in domestic demand will depend on the composition of income growth. In other words, if the growth in incomes is skewed in favor of high skilled and therefore high-income groups, it will be the kind of goods and services catered to by the rich that will be found lucrative by investors. Few of them will be unskilled labor intensive. As a result, the trickle down to the unskilled (and hence the poor) will be weak.

One possible bottleneck for the Indian pattern of growth is 'educated workforce'. Given that the educational premia have been rising rapidly, it does seem like a real possibility.

Most of the fast growing sectors are completely dependent on skilled manpower. If they run into a serious bottleneck, growth may get choked. A related question is that of quality. According to a report by the McKinsey Global Institute (2005), "India's vast supply of graduates is smaller than it seems once their suitability for employment by multinational companies is considered." The report stresses that the government must "adjust the country's educational policy to ward off the looming squeeze on talent". McKinsey estimates that India has 14 million young university graduates (those with seven years or less of work experience). This pool is 1.5 times the size of China's and almost twice that of the United States. Every year 2.5 million new graduates are added to this pool. However, according to the report, while the numbers seem encouraging at first glance, a closer look reveals that India is likely to face a talent crunch in the coming years.

The problem might get further exacerbated with the current state of primary schooling in India. ASER (Annual Status of Education Report) (2010), a unique survey of learning in rural India, estimates that about 47% of rural Indian children in class 5 cannot read a simple class 2 level text. Even, in class 8, about 17% children cannot read a class 2 level text. Many of these children may never reach university, but those who do not go to university will join the labor force and ASER's results are indicative of the future quality of the labor force. The Right of Children to Free and Compulsory Education Act, which was passed by the Parliament in April 2010, makes sure that no child will be held back till the age of 14 (approximately class 8), regardless of how they perform. This will mean that children could easily pass middle school (class 7/8) without being tested on any learning indicators. Even if they drop out after class 8, they would enter the skilled labor force (by our definition) and could be potentially unemployable. Therefore, it is quite possible that the so called demographic dividend may disappear if the quality of the labor force is not improved, even if the non-farm sector creates sufficient jobs to absorb the increase in labor force.

A larger point is that India's economic growth is not accompanied by an equally fast improvement in the functioning of India's institutions such as the legal system, the governance and the educational system (Subramanian, 2007). Indeed, it is easier and faster to transfer technology and bring about productivity improvements. But it is harder and slower to bring about institutional improvements for sustaining and stabilizing the growth process.

One important lesson from the Indian experience and especially from its comparison with other Asian countries is that a country can neglect agriculture at its own peril. The growth process in India was accompanied by a reduction in poverty at the lower level (Rs. 356 per capita per month or approximately $1.08 per day). If we consider double the poverty level ($2.16 per day), a staggering 80% of India's population was poor in 1983 and the number is about the same in 2004. This is a startling fact and indicates that there are two Indias: one of educated managers and engineers who have been able to take advantage of the opportunities made available through globalization and the other – a huge mass of undereducated mass of people who are making a living in low productivity jobs in the informal sector – the largest of which is still 'agriculture'. The most direct

impact on the second India could only come about through improvements in agricultural productivity. But unfortunately, agriculture is dependent on well functioning rural institutions. In general, the productivity improvements in the informal sector depend crucially on access to credit, knowhow and skills and therefore on the quality of institutions. India's future will depend a great deal on how these institutional improvements shape up.

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