CHAPTER 4

Services Growth in India

A Look Inside the Black Box

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INTRODUCTION

It is now widely recognized that the pattern of growth in India in recent years has been an unconventional one. Virtually all labor-abundant developing countries—such as Taiwan, South Korea, and China—saw the shares of manufactures in GDP and employment rise and those of agriculture fall during their high-growth phases. In contrast, during its recent high-growth phase, India has witnessed the share of manufactures in GDP stagnate despite a decline in the share of agriculture in it. Moreover, the movement of workers out of the agricultural sector has been extremely piecemeal, with the absolute number of workers in agriculture still rising due to the rising size of the workforce. An additional difference between the experiences of countries like Taiwan, South Korea, and China and that of India has been with respect to labor-intensive manufactures. While the former set of countries saw these products' share of GDP and employment rapidly rise, India experienced no such change during the high-growth phase. In India, services have grown more rapidly than manufactures.

The somewhat exceptional pattern of growth in India poses several puzzles. First, why have manufactured goods in general and labor-intensive products in particular responded sluggishly to the liberalizing reforms since 1991? Second, why have services grown more rapidly in the post-reform period? And finally, why has the transition from a primarily agrarian and rural to an urban and modern structure been slower in India? Specifically, why has the movement of labor out of agriculture into industry been slower than in other fast-growing developing countries?

To be sure, economic reforms, including opening to trade and foreign investment and freeing up domestic controls, have helped improve the

performance of both industry and services. In particular, capital-intensive manufacturing sectors (automobiles, auto parts, and petroleum refining) and skilled labor-intensive service sectors (the software industry, telecommunications, pharmaceuticals, and banking and finance) have grown very rapidly during the high-growth phase. These sectors have been impacted directly by increased openness to trade and foreign investment and relaxed domestic entry conditions.

The key to the first puzzle lies in explaining why the abolition of investment licensing, the massive trade reforms and foreign investment liberalization failed to stimulate rapid growth of unskilled labor-intensive manufactured goods such as apparel, footwear, and light consumer goods—products in which India has a clear comparative advantage. Until recently, the poor performance of these sectors was to be attributed to the policy of small-scale industries (SSI) reservation. This policy required virtually all labor-intensive manufactures to be produced exclusively by small enterprises whose total investment remained capped below $100,000 initially and later $250,000. This left the labor-intensive manufacturing sector in India populated by very small enterprises, largely catering to highly localized markets. Smallness of the enterprises combined with the absence of foreign competition due to prohibitive trade barriers also resulted in poor product quality.

Though the SSI reservation was effectively eliminated and international trade considerably liberalized by the early 2000s, truly large-scale firms in the labor-intensive sectors such as apparel and footwear have not emerged. In all likelihood, the reason for this is the existence of other regulations that have come to bind since the effective relaxation of the SSI reservation: stringent labor laws that asymmetrically punish large-scale manufacturing firms in labor-intensive sectors. With labor costs accounting for less than 10 percent of their total costs, large firms in the capital-intensive sectors (such as automobiles) are able to absorb the costs of stringent labor laws without undue impact on profitability. In contrast, for sectors such as apparel, whose labor costs could be as high as 80 percent of total costs, the extra cost of satisfying these laws renders large-scale operation unprofitable.[1]

The slow growth of labor-intensive manufacturing also explains to some degree the sector's slow growth in general. Labor-abundant countries can typically expand manufacturing at a rapid pace by capturing the vast world markets for labor-intensive products. It is more difficult to rely on this strategy by expanding the capital- and skilled-labor-intensive products because of the at best limited cost advantage developing countries enjoy over developed countries in these products. Therefore, growth in these products is often bottled by the growth in the domestic market. For example, automobiles and two- and three-wheeler vehicles have grown rapidly in India in the post-liberalization phase, but so far these products have had limited success in the world markets. In addition, the limited availability of skilled labor required to produce

these goods can quickly exhaust the country's cost advantage in them. As the sectors producing these products expand wages for skilled workers are rapidly bid up, thus dissipating the cost advantage—a phenomenon India has witnessed in recent years.

Turning to the second puzzle, the rapid growth of services is to be partially explained by the liberalizing reforms themselves. For example, the end of public monopoly in the telecommunications and airline industries introduced new dynamism in these sectors as they were opened to private entrepreneurs. India went from having just five million telephones at the end of 1990 to adding more than fifteen million phones per month in 2010. The financial sector received a similar boost by the easing of regulations governing the entry of private and foreign banks.

But this explanation is insufficient to account for the acceleration in growth in services that had no direct connection to liberalization. For example, transport services other than air transport, education, and health services were subject to no major direct liberalizing measures. Indeed, the same also applies to software services that are exported and were therefore not impacted by import protection in a direct way. How do we explain the growth acceleration in these services in the post-reform era? We conjecture that two factors are behind this acceleration.

First, slow growth in the goods and services that directly benefited from liberalization kept the demand for the non-traded services low. Many non-traded services are bought by enterprises in traded sectors so that the growth in the latter has a direct bearing on the growth of the former. Equally, the demand for non-traded services bought by individuals depends on the level of expenditures incurred by them. For example, demands for passenger travel, telecommunications, fax and courier services, tourism, restaurant food, real estate activity, beauty parlors, education, medical services, nursing and veterinary services, and garbage collection rise with consumer expenditures. Low growth in the economy in general means low growth in the demand for these non-traded services as well.

The second reason why non-traded and export-oriented services did not take off prior to the reforms is that the efficiency of production crucially depends on the availability of quality tools and equipment. For example, the information technology industry needs access to state-of-the-art hardware and software. Similarly, firms in the transport sector need access to high-quality cars, buses, and trucks. Taxi services cannot grow without access to high-quality cars in the necessary quantities. Courier services require high-quality motorcycles and other means of transportation. Travel agencies, stock brokers, and independent accountants need computers and access to the Internet. Even small shops providing phone, fax, and photocopying services require proper equipment that provides high-quality output without frequent breakdowns. Those in the communications industry need telephones, fax machines, and

computers. Those engaged in repair jobs need top-quality tools. Restrictions on international trade and domestic economic activity greatly limit the access to top-quality tools and equipment in adequate quantities—with adverse effects on productivity.

Our hypothesis is that the reforms helped release both constraints. Growth in traded goods and services increased the demand for non-traded services directly as well as through increased incomes. External and internal deregulation also opened the door to state-of-the-art equipment in adequate volume through imports as well as improved quality of domestic output. For instance, high-quality automobiles, buses, trucks, motorcycles, computers, cell phones, and equipment of all kinds are more easily available today than in the pre-reform era. Increased demand allowed fuller use of workers' time, while the availability of high-quality equipment helped raise the efficiency of the work performed. Both factors contributed to productivity growth.

Finally, we turn to the third puzzle relating to the slow movement of the workforce from agricultural to non-agricultural sectors. At one level, the slow growth of labor-intensive manufactures explains this phenomenon. But one must also answer why the rapid growth in services has not delivered rapid growth in employment as well. Our conjecture here is that the services sector in India operated like a subsistence economy in the nineteenth century in the sense that it had large volumes of underutilized labor. Workers were hired because they were needed for certain tasks but were underemployed due to either insufficient demand or unavailability of proper equipment. The slack in labor use was perhaps even more pronounced among the self-employed. This situation allowed many services sectors to grow rapidly by employing the underemployed workers more fully. Some indirect evidence favoring this hypothesis can be found in the rapid expansion of services output without a commensurate expansion in labor employment.

To date, formal analyses of economic reforms in India using detailed enterprise-level data have remained confined principally to manufacturing. Scientific analyses of services, mainly by Poonam Gupta with various coauthors, have relied exclusively on sectoral data provided by the National Accounts Statistics.[2] While this is a good starting point for developing an understanding of the growth and transformation under way in India's services sector, it is extremely limiting. Firms providing services vary considerably in size, ranging from those that employ no workers to very large ones with tens of thousands of workers. They also vary considerably in ownership structure, ranging from proprietorship to cooperative to partnership to corporate. To understand the sources of growth impulses, we need to study services at the level of the firm.

Until recently, data at the level of the firm in services sectors that would allow analysis over time were not available. Such data have recently become available, however. The National Sample Survey Organization (NSSO) of the

Central Statistical Organization (CSO) has produced two very large surveys covering a substantial subset of services for 2001–02 (July 1–June 30) and 2006–07. These surveys provide systematic data on 244,376 enterprises in 2001–02 and 190,282 enterprises (including 438 very large enterprises under the list frame as detailed below) in 2006–07. With one possible exception, discussed later, the surveys follow a uniform sample design and the questionnaires are comparable across rounds. Geographically, the surveys cover the entire country, with rural and urban enterprises separately identified. They also distinguish among own-account enterprises (OAEs) which hire no regular workers, those that hire workers but nevertheless remain small, and those with a formal corporate structure.

Although India had begun to grow at a 5–6 percent annual rate in the late 1980s, the shift to the 8–9 percent range took place in fiscal year 2003–04 (April 1–March 31). This latter shift followed the reforms during 1998–2003 under the National Democratic Alliance. Those reforms were wide-ranging; they touched virtually every aspect of the economy, except labor laws and higher education. Therefore, the two surveys give us observations from the pre- and post-reform eras that also coincide with pre- and post-growth-acceleration periods.

In this chapter, we present the first analysis of the services sector that uses these enterprise-level surveys. The data allow us to study not just growth in output but also in employment and enterprises by sectors and by states. While we touch on some of the themes discussed above in this chapter, we address some others in our future work. For example, in a forthcoming paper, we propose to formally test the two hypotheses relating to the growth of non-traded services that may not have directly benefited from the liberalization since 1991. In Chapter 10 of this volume, we go further and discuss entrepreneurship among the socially disadvantaged groups vis-à-vis the better-off groups.

The chapter is organized as follows. In the next section, we describe the broad contours of the two surveys on which this chapter is based. In the third section, we situate within the broad economic context both the services in general and those covered by the two surveys in particular. In the fourth section, we set out the distinction between formal and informal sector firms within the services sector. In the fifth section, we describe the characteristics of enterprises as revealed by the surveys. A key finding here is that while output is concentrated in larger urban enterprises, more than half of the workforce is employed in tiny OAEs that employ no hired workers on a regular basis. This pattern translates into much higher per-worker and per-enterprise output in the large enterprises than in the smaller ones. In the sixth section, we summarize the pattern of growth across enterprises, states, and different service sectors. We show that though growth can be seen in all enterprises, sectors, and states, it is heavily concentrated in the largest enterprises, some key services sectors such as communications and business services, and some key states

such as Maharashtra and Karnataka. Uneven growth that usually characterizes rapid growth across broad sectors and regions of the economy also characterizes the growth within services. In the seventh section, we estimate productivity growth. Consistent with our conjecture that the opening up of the economy has led to fuller use of previously underutilized labor, our results here show very substantial growth in productivity. In some states, it reaches as high as 5 percent per year. In the final section, we conclude the chapter.

SOME PRELIMINARY OBSERVATIONS ON THE SURVEYS

To explain the broad contours of the two surveys we analyze, it is best to begin with an introduction to the National Industrial Classification (NIC) 2004, which serves as the basis of identification of various sectors of the economy.[3] This classification initially divides the economy into seventeen "sections" identified by alphabetical letters A, B, . . . , Q. Table 4.1 lists these sections. On the one hand, these sections can be combined into a smaller number of broader sectors, while on the other, they may be disaggregated into much narrower categories referred to as "divisions" in the NIC 2004. The broader sectors are frequently called agriculture, industry, and services such that agriculture includes sectors A and B; industry includes sectors C, D, E, and F; and services includes sectors G thru Q. The narrower "divisions" in the classification are defined using two- or higher-digit numerical codes. Appendix table 4.A1 exhaustively lists all two-digit divisions within each alphabetical section.

The 2006–07 services survey, the second of the two surveys we analyze in this chapter, covered Sections H thru O (minus L), with some narrower divisions within these broad sections excluded. Full listing of the two- or higher-digit divisions covered and a detailed description of the services within each of the latter can be found in NSSO (2009, 7–10).[4] Within the divisions covered, the following enterprises were excluded from the survey: (i) all government and public sector enterprises, (ii) government-aided educational institutions defined as institutions in which the entire salary of all teaching and non-teaching staff was borne by the government, and (iii) service enterprises registered under the Factories Act of 1948 and covered by the latest (2004–05) Annual Survey of Industries frame. The 2001–02 survey covered the same sectors as the 2006–07 survey with two exceptions: (i) it did not cover the financial intermediation sector (NIC Section J), and (ii) it did include divisions with codes 601 (non-mechanized transport activities related to transport via railways) of Section I and 911 (community activities of business, employers and professional organizations) of Section O, which the 2006–07 survey did not cover. Throughout this chapter, our analysis excludes Section J to make the two surveys comparable. The differences between the surveys due to the exclusion of divisions 601 and 911 in the 2006–07 surveys are tiny.

Table 4.1 BROAD SECTORS IN NATIONAL INDUSTRIAL
CLASSIFICATION (NIC) 2004

Section	Description
Agriculture:	
A	Agriculture, hunting, and forestry
B	Fishing
Industry:	
C	Mining and quarrying
D	Manufacturing
E	Electricity, gas, and water supply
F	Construction
Services:	
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
H	Hotels and restaurants
I	Transport, storage, and communications
J	Financial intermediation
K	Real estate, renting, and business activities
L	Public administration and defense; compulsory social security
M	Education
N	Health and social work
O	Other community, social and personal service activities
P	Activities of private households as employers and undifferentiated production activities of private households
Q	Extraterritorial organizations and bodies

Source: Ministry of Statistics and Program Implementation

The surveys cover all twenty-nine states (including Delhi as a state) and six union territories in the country.[5] The sample is highly stratified, with rural and urban areas clearly distinguished. The first stage units (FSUs) are villages in rural areas and urban frame survey blocks in urban areas. These units are first identified and the ultimate stage units, called enterprises, sampled out of them. Enterprises are divided into two types: OAEs, which do not employ any hired workers on a regular basis, and establishment enterprises, which employ one or more hired workers on a regular basis.

One important difference exists between the 2001–02 and 2006–07 survey designs. The former includes all establishment enterprises, whether large or small, in the area frame. The latter takes the view that this approach results in under-representation of the large enterprises, which account for a disproportionately large volume of gross value added (GVA) and assets. It therefore introduces a separate "list frame" for the largest enterprises in the private corporate sector. It identified 998 large service sector companies

distributed throughout India for this frame but, after excluding some of them for reasons of public ownership and registration under the Factories Act of 1948, narrowed down the relevant universe of eligible list frame enterprises to 626. For a variety of reasons, the survey was able to sample only 438 of the 626 enterprises. When estimating the GVA, number of workers, assets, and other variables, it imputed the values based on the enterprises actually sampled. This is the only substantive difference in the sample design between the 2001–02 and 2006–07 surveys. While its likely effect is to correct for the under-representation of large enterprises in the 2001–02 survey, it may also lead to an upward bias in the growth of variables such as GVA and assets of establishment enterprises. We comment on this issue in greater detail later.

The 2001–02 survey selected a total of 15,869 FSUs, of which 41 percent were rural and the remainder urban. Altogether, 244,376 enterprises within these FSUs were surveyed—37.85 percent in rural areas and 62.15 percent in urban areas. The 2006–07 survey selected 13,271 FSUs, of which 42 percent were in rural and 58 percent in urban areas. It surveyed 189,844 enterprises (not counting the 438 list frame units), with 43.82 percent in rural and 56.18 percent in urban areas. The union territory of Lakshadweep accounted for the minimum number of enterprises covered in each survey: 171 in the 2001–02 survey and 187 in the 2006–07 survey. State- or union-territory-level estimates of variables such as value added, workers employed, and assets are likely to be associated with large standard errors when the number of sampled enterprises is small.

Before considering further details of the surveys, it is now useful to situate the services sectors covered by them within the overall economy.

SITUATING THE SERVICES COVERED BY THE SURVEYS WITHIN THE ECONOMY

Table 4.2 reports the breakdown of GDP and employment among three broad sectors of the economy: agriculture, industry, and services. As noted in the previous section, the first of these sectors includes agriculture, forestry, and fisheries (Sections A and B of NIC 2004). Industry is defined to include mining and quarrying; manufacturing; gas, electricity, and water supply; and construction (Sections C through F). Services include Sections G thru Q. The data on GDP shares in table 4.2 are from the National Accounts Statistics (NAS), and those on employment are from the NSSO Employment-Unemployment Surveys.

Recall that the two services firm surveys we propose to analyze were conducted in 2001–02 and 2006–07. Accordingly, we report the output shares of the three sectors in these two years and their growth rates over the five-year

Table 4.2 SHARES OF BROAD SECTORS IN THE GDP AND EMPLOYMENT

Sector	Share in GDP (2001–02)	Share in GDP (2006–07)	Growth (2001–02 to 2006–07)	Employment Share (2001–02)	Employment Share (2007–08)
–1	–2	–3	–4	–5	–6
Agriculture and allied activities	24	18.5	2.5	60.8	57.3
Industry	25	26.7	9.2	17	18.7
Services	51	54.7	9.3	22.1	24
Services covered by the surveys	24	27.3	10.6	9.9	11.9
GDP in billion rupees (columns 2 and 3) or total workers in million (columns 5 and 6)	19726	28643	7.8	417	408
Absolute number of workers in services covered by the surveys (million)				41	48

Source: Authors' calculations using the data from the CSO and NSS

period in columns 2, 3, and 4 of table 4.2. The employment-unemployment survey is available for 2001–02 but not 2006–07. Therefore, for the latter year, we substitute the employment shares from the survey report for 2007–08. To give the reader an idea of the approximate relative size of the services covered by our surveys, we report in the fourth row of table 4.2 the approximate output and employment shares of these services as reported in the NAS GDP data and NSSO employment-unemployment survey reports. As previously noted, most but not all NIC divisions and enterprises within these categories are covered by the surveys. In particular, any public sector enterprises—including the railways, the largest single employer in the world—are not included in the surveys. Therefore, the true GDP and employment shares of the sectors covered in the surveys are slightly below those reported in the fourth row of table 4.2.

Though agriculture and allied activities accounted for just 24 percent of the GDP in 2001–02, they employed 60.8 percent of the workforce. An examination of the shifts in the output and employment shares of agriculture over time shows that the former has evolved much faster than the latter. Migration of workers out of agriculture in India has been painfully slow despite rapid economic growth.

Industry accounted for a quarter of the GDP but employed only 17 percent of the workforce in 2001–02. Services accounted for 51 percent of the GDP in the same year and employed just 22.1 percent of the workforce. Even at the highly aggregated level of table 4.2, it is evident that the services sector has

a higher average output per worker than both industry and agriculture. This turns out to be even truer of the services covered by the surveys that are the object of the analysis in this chapter. The ratio of output share to employment share in 2001–02 was 2.5 in these latter services. In comparison, the same ratio was 2.3 in services as a whole, 1.5 in industry, and 0.4 in agriculture. The services in the fourth row of table 4.1 also grew more rapidly than services as a whole between 2001–02 and 2006–07.

We may note that the number of workers employed in the sectors as reported in the surveys themselves were 26.6 million in 2001–02 and 27.7 million in 2006–07. These numbers are smaller than those shown in the last line (columns 5 and 6) of table 4.2 for several reasons. First, the surveys entirely exclude public enterprises, which employ large numbers of workers in sectors such as education and health. Second, the coverage of the surveys across NIC two- or higher-digit divisions within the covered sections and across enterprises is not exhaustive. For example, the surveys entirely exclude the railways from the transportation sector. Finally, some difference may have also resulted from sampling errors. The coverage of the specific sectors we consider here in the employment-unemployment surveys is likely to have been less exhaustive than in the surveys under analysis.

Table 4.3 provides some details on services in terms of the NIC sections. The relevant NIC section code is shown in parentheses following the description of the sector. Several exclusions from the above list in the surveys under analysis may be noted here. First, neither of the surveys includes Section G, which represents retail and wholesale trade and repair services for cars, motorcycles, and household appliances. This is a sizable sector in terms of output as well as employment.

Second, as already noted, while the 2006–07 survey covers banking and insurance (Section J), the 2001–02 survey does not do so. Because one of our key objectives is to analyze the change observed between the two surveys, our analysis excludes this sector.

Third, the surveys also exclude NIC categories L, P, and Q. Category L, which employed 1.8 percent of the workforce in 2007–08, represents public administration and defense and is part of the public sector. Category P represents activities of private households as employers and accounted for 0.7 percent of the total employment in 2007–08. This category is clearly a part of the private services sector, but the surveys do not cover it. Category Q stands for extraterritorial organizations and bodies and registered zero shares in employment in both 2001–02 and 2007–08 employment-unemployment surveys.

Finally, railway and air transport (NIC 2004 categories 601 and 62) and transport via pipelines (NIC 2004 category 603) are also excluded from the surveys. Railways are in the public sector. Air transport contains both private and public sector firms.

Table 4.3 DETAILED SERVICES SECTORS

Services Sectors	Share in GDP (2001–02)	Share in GDP (2006–07)	Growth (2001–02 to 2006–07)	Employment Share (2001–02)	Employment Share (2007–08)
Trade and auto and household appliance repair (G)	13.6	13.9	8.3	9.4	8.9
Hotels and restaurants (H)	1.3	1.5	10.5	1.2	1.4
Transport, storage, and communication (I)	8.2	11.4	15.3	3.4	4.2
Banking and insurance (J)	5.7	6.7	11.3	0.5	0.7
Real estate, ownership of dwellings, and business services (K)	7.5	7.6	8.2	0.6	1.2
Public administration and defense (L)	6.5	5.6	4.7	2.4	1.8
Other services (education, health, other community services, etc.) (M, N, O, P and Q)	8.2	8	7.1	4.6	5.8
All services	51	54.7	9.3	22.1	24
Services included in both surveys (H, I, K, M, N, O with some exclusions)	24	27.3	10.6	9.9	11.9

Source: Authors' calculations using the CSO and NSS data.

A NOTE ON FORMAL VERSUS INFORMAL SECTOR SERVICES

Defining the informal sector services is always a challenge. In India, the term *informal sector* is often identified with the "unorganized" sector. As we explain immediately below, this is not a bad approximation when it comes to manufacturing. But the issue is more complex when considering services.

In India, the organized sector typically includes all enterprises and employees in the public sector and firms registered under the Factories Act of 1948. All firms engaged in manufacturing must register under the act if they employ ten workers and use power, or if they employ twenty workers regardless of

the use of power. This places all private sector manufacturing enterprises with fewer than 10 workers and those with fewer than 20 workers but not using power in the unorganized sector. For most purposes, we can reasonably identify these enterprises with the informal sector. In principle, it is conceivable that a highly automated large-scale plant could escape registration under the Factories Act, but it is unlikely in practice.

The problem in services arises from the fact that firms in this sector are not required to register under the Factories Act unless they also happen to be engaged in manufacturing activity. Therefore, most private sector services enterprises, whether small or large, are officially in the unorganized sector. For instance, large private sector banks such as the ICICI Bank and the HDFC Bank and software export giants such as Infosys, Wipro, and Satyam are officially in the unorganized sector.

In carrying out its "unorganized" sector surveys, the NSSO works with this definition. This means that its unorganized services sector surveys include enterprises of all sizes as long as they are in the private sector. This is true of the two surveys we study. As previously mentioned, the surveys broadly divide enterprises into OAEs and establishment enterprises, with the former referring to enterprises that do not employ any hired workers on a regular basis and the latter referring to those that do. While the OAEs clearly belong to the informal sector, the establishment enterprises include both informal and formal sector enterprises. In principle, it is possible to identify and exclude all limited liability companies or enterprises with workers exceeding a certain threshold to distinguish between formal and informal sector enterprises, but there is some arbitrariness in doing so. Therefore, our analysis categorizes enterprises according to several alternative criteria, which we specify below.

SOME BASIC CHARACTERISTICS OF THE ENTERPRISES

We are now in a position to report some basic economic characteristics of the enterprises. The sectors common to the two surveys are estimated to have fifteen million enterprises and 27.75 million workers in 2006–07. The vast majority of the enterprises are tiny OAEs that do not hire any outside workers on a regular basis. In other words, the majority of workers are employed in these small enterprises. This makes the separate study of growth and productivity in the small and large enterprises important from a social welfare standpoint.

The top part of table 4.4 reports the composition of value added at current prices, workers, and enterprises across OAEs and establishment-type enterprises in rural and urban areas at the national level as per the 2006–07 survey.[6] The lower part of the table reports the value added per worker and

Table 4.4 VALUE ADDED AND WORKERS ACROSS ENTERPRISES
AND REGIONS (2006–07)

Enterprise Type	Rural	Urban	All India
Percent share in the total GVA			
OAE	11	10.3	21.2
Establishment	6.9	71.9	78.8
Total	17.8	82.2	100
Percent shares in the total number of workers			
OAE	36	22.7	58.8
Establishment	11.9	29.3	41.2
Total	48	52	100
Percent shares in the total number of enterprises			
OAE	52.3	32.7	85
Establishment	5.4	9.6	15
Total	57.7	42.3	100
GVA per worker in 2006–07 rupees			
OAE	21415	31753.3	25417.2
Establishment	40494.9	172693.7	134440.6
GVA per enterprise in 2006–07 rupees			
OAE	27264.6	40827.6	32494.1
Establishment	166193.6	977715.9	685383.2

Source: Authors' calculations from unit level data in round 63, NSS services survey

value added per enterprise in OAEs and establishment enterprises in the
rural and urban areas in 2006–07. A key observation that jumps out of the
table is that output is heavily concentrated in urban establishment enter-
prises (71.9 percent), while the majority of the workers (58.8 percent) work
in OAEs. This translates into a much higher value added per worker and per
enterprise in urban establishment enterprises relative to the remaining
categories.

In addition to accounting for a large proportion of output, urban estab-
lishment enterprises employ 29.3 percent of the workers. This makes a
careful study of the urban establishment enterprises crucial. At the same
time, because the majority of the workers are employed in OAEs, these
enterprises require close attention as well. On average, value added per
enterprise is 1.3 times the value added per worker in OAEs. On average
there are 1.3 workers per OAE; in many cases (indeed modally), the owner
is the only worker.

Perhaps the most important conclusion that follows from table 4.4 is that
a very large proportion of the services labor force remains employed in enter-
prises with very low average productivity. The transformation problem India
faces with respect to the movement of the vast workforce out of agriculture
into more productive activities is also present within services. A majority of

Table 4.5 DISTRIBUTION OF VALUE ADDED AND WORKERS ACROSS
ACTIVITIES (2006–07)

Sector and Approximate NIC Section	GVA	Workers
Hotels and restaurants (H)	14.5	18.5
Transport, storage, and communication (I)	22.4	30.2
Real estate and business services (K)	34.6	11.2
Education and training (M)	12	14
Health and social work (N)	9.3	7.9
Other service activities (O)	7.2	18.3
Total	100	100
Total (GVA in billion rupees and workers in million)	1952	28

Source: Authors' calculations from unit level data in round 63, NSS services survey

the services workforce is in small, informal enterprises with relatively low output per worker. We will see in the next section that smaller enterprises are also subject to relatively low growth. As such, the gap in labor productivity is widening rather than narrowing.

We next consider the composition of services output and workers across various NIC sections. Table 4.5 provides the distribution of value added and workers according to NIC sections for 2006–07. Because different sectors employ various factors of production in different proportions, it is no surprise that employment and value added do not go hand in hand. While transport, storage, and communications (NIC Section I) account for the largest share in employment, real estate, renting, and business activities (NIC Section K) generate the largest share in value added.

Finally, in table 4.6, we show state-by-state shares in nominal GVA and workers for both the fifty-seventh and sixty-third rounds in sectors common to the two surveys. The states are arranged in order of declining share of value added in the sixty-third round conducted in 2006–07. Four observations follow. First, between the two surveys, the concentration in the GVA shares at the top end has risen dramatically. Whereas the top three states in 2001–02 accounted for 31 percent of the GVA, they accounted for 50 percent of the GVA in 2006–07. Second, by 2006–07, the degree of concentration at the top end had reached a very high level. The top three states alone accounted for half the services output of the country in the categories covered. Just two states—Maharashtra and Karnataka—account for as much as 41.3 percent of the countrywide GVA. Third, the shares in workers employed in the covered sectors tell a somewhat different story. The shifts between the two surveys are much smaller. And the shares are also far less concentrated. Finally, the state with the largest number of workers by far, Uttar Pradesh, ranks just seventh in terms of the GVA in 2006–07. While it had a 14.1 percent share

in the workforce, its share in the GVA was only 5.5 percent that year. Taken together, these facts point to a dualistic structure *within* the covered services whereby more productive firms seem to be concentrated in a very small number of states.

THE PATTERN OF GROWTH: 2001–02 TO 2006–07

We are now in a position to consider the changes between 2001–02 and 2006–07, which can be partially attributed to the reforms that took place in the late 1990s and early 2000s. Because the surveys provide data on all values at current prices, our first task is to convert them into a common base using appropriate deflators. For this, we use the NAS GDP data, which provide the values of sectoral outputs in various states for each financial year at both current and constant 1999–2000 prices. The current and constant price magnitudes for a given sector in a given state in a given year implicitly define a deflator that converts the current price magnitude into a constant, 1999–2000 price

Table 4.6 STATE-WISE SHARES IN NOMINAL GVA AND WORKERS

State	Percent share in GVA		Percent share in workers	
	57th round	63rd round	57th round	63rd round
Maharashtra	15.1	23.2	9.8	10.2
Karnataka	7.9	18.1	5.2	5.4
Andhra Pradesh	6.1	8.5	9.6	10
West Bengal	6.8	7.3	8.8	9.7
Tamil Nadu	7.6	5.5	8	7.8
Kerala	5.7	5.5	4.6	5.7
Uttar Pradesh	10.3	5.5	15.7	14.1
Gujarat	7.7	5.4	5	4.2
Chandigarh	0.3	4.4	0.2	0.8
Rajasthan	3.6	2.6	3.9	4.2
Punjab	3	2.1	2.5	2.8
Madhya Pradesh	2.9	1.5	3.6	3.4
Bihar	4.9	1.5	6.7	4.7
Assam	1.7	1.4	2.1	3
Haryana	2.1	1.3	1.7	2.1
Orissa	1.9	1.1	4.3	3.1
Jharkhand	1.2	1	1.6	2.2
Delhi	6.2	0.9	2.3	1.2
Other*	5	4.6	3.2	5.2
Total	100	100	100	100

*These include 12 smaller states and 5 Union Territories.
Source: Authors' calculations from unit-level data, rounds 57 and 63, NSS services surveys

magnitude. This deflator can be used to convert a current price value in a given sector in a given state in a given year into a corresponding value at constant 1999–2000 prices. We follow this procedure as closely as the data allow.

Growth and Composition by Enterprise Type

In table 4.7, we show the total growth over five years and the associated annual compound growth rate in the real GVA, number of workers, and number of enterprises associated with various enterprise types between 2001–02 and 2006–07. To track the changes in the composition of output produced by this growth, table 4.8 shows the shares in the total national GVA, workers, and enterprises in the relevant sectors in 2001–02 and 2006–07.

Six features of the changes reflected in these tables are noteworthy. First, the overall growth in the services covered by the surveys has been far higher than that observed in the NAS. In current rupees, GVA rose from 747.82 billion

Table 4.7 GROWTH RATES BY ENTERPRISE TYPE

Enterprise Classification	Five-year growth			Annual compound growth		
	GVA	Workers	Enterprises	GVA	Workers	Enterprises
All enterprises	113.5	4.5	3.6	16.4	0.9	0.7
OAE	18.5	2.9	5.5	3.5	0.6	1.1
Establishment	181.3	6.8	–6.1	23	1.3	–1.2
Urban OAE	18.9	6.6	7.8	3.5	1.3	1.5
Rural OAE	18.2	0.8	4.2	3.4	0.2	0.8
Urban establishment	252.2	23.9	7.9	28.6	4.4	1.5
Rural establishment	–3.3	–20.3	–23.6	–0.7	–4.4	–5.2
Fewer than five workers	24.4	1.6	4	4.5	0.3	0.8
Five or more workers	246.8	13	–3.9	28.2	2.5	–0.8
Urban: less than five workers	35	7.4	7.9	6.2	1.4	1.5
Urban: five or more workers	316.3	31.8	7.3	33	5.7	1.4
Establishment: non-corporate	41.6	–1	–5.7	7.2	–0.2	–1.2
Establishment: corporate	540.9	52.2	–11.1	45	8.8	–2.3

Source: Authors' calculations from unit-level data, rounds 57 and 63, NSS services surveys

Table 4.8 SHARES OF VARIOUS ENTERPRISE TYPES IN THE NATIONAL TOTAL

Enterprise classification	GVA		Workers		Enterprises	
	Round 57	Round 63	Round 57	Round 63	Round 57	Round 63
OAE	41.7	23.1	59.6	58.8	83.5	85
Establishment	58.3	76.9	40.4	41.2	16.5	15
Urban OAE	19.6	10.9	22.3	22.7	31.4	32.7
Rural OAE	22	12.2	37.3	36	52.1	52.3
Urban establishment	42.1	69.5	24.7	29.3	9.2	9.6
Rural establishment	16.2	7.3	15.7	11.9	7.3	5.4
Less than five workers	59.9	34.9	74.8	72.8	95.3	95.6
Five or more workers	40.1	65.1	25.2	27.2	4.7	4.4
Urban: Fewer than five workers	30.4	19.2	31	31.8	37.8	39.3
Urban: Five or more workers	31.4	61.3	16	20.2	2.9	3
Establishment: Non-corporate	42	27.9	34.5	32.7	15.6	14.2
Establishment: Corporate	16.3	49	5.9	8.6	0.9	0.8

Source: Authors' calculations from unit-level data, rounds 57 and 63, NSS services surveys

rupees in 2001–02 to 1952.11 billion rupees in 2006–07. This amounted to 161.0 percent growth over the five-year period or a compound growth rate of 21.16 percent per year. Once we apply price deflators to convert the nominal magnitudes into real, the two growth rates come down to 113 and 16.4 percent, respectively. The latter is well above the 10.6 percent growth in the NAS data for the same services.

Second, GVA growth rates are dramatically higher for the larger enterprises, which often operate in the formal sector. OAEs, which employ no hired workers on a regular basis, grew just 3.5 percent annually compared with a much larger 23 percent for establishment enterprises, which include all enterprises hiring one or more workers on a regular basis. Only rural establishment enterprises showed a decline in GVA, but this reflects a decline in their numbers as well as the number of workers they employed. Enterprises with five or more workers grew 28.2 percent annually, while those with four or fewer workers grew 4.5 percent. Both enterprise types grew faster in urban areas. Finally, corporate establishment enterprises grew the fastest, at an annual rate of 45 percent compared with 7.2 percent for non-corporate enterprises.

Third, in relation to the growth in GVA, growth in workers employed has been extremely slow. The annual employment growth in all enterprises has been a negligible 0.9 percent. Only corporate enterprises showed a significant growth in workers at the annual rate of 8.8 percent. The slow growth in workers means that the real GVA per worker has shown very impressive growth. At the aggregate level, GVA per worker grew 15.5 percent per annum. In corporate enterprises, this growth has been a phenomenal 36.2 percent. These observations lend indirect support to the hypothesis that considerable slack in labor use allows for substantial increases in productivity with just a marginal expansion of the workforce through more effective use of existing labor resources.

Fourth, the total number of establishment enterprises declined. In terms of the composition of this decline, two features are of interest. First, taking the four-part split across OAEs and establishment enterprises on the one hand and rural and urban on the other, rural establishment enterprises accounted for the entire decline. And second, within subcategories, it is interesting that even the number of corporate enterprises declined between the two surveys. This suggests some degree of consolidation in the corporate sector.

Fifth, the composition of output shifted considerably in favor of larger enterprises between the two survey years. For example, the share of corporate enterprises rose from 16.3 percent in 2001–02 to 49 percent in 2006–07. Alternatively, the share of urban establishment enterprises with five or more workers jumped from 31.4 to 61.3 percent over the same period. Finally—and rather remarkably, when we consider the four-part division of enterprises into OAEs and establishment on the one hand and rural and urban on the other—the share of urban establishment enterprises gained at the expense of all three remaining categories, rising from 42.1 to 69.5 percent.

Finally, the differences in per-worker output across enterprise types call for a close study of the reasons. Some differences, no doubt, reflect the differences in skill levels and per-capita capital used. The corporate enterprises are likely to be more capital intensive than their non-corporate counterparts. On average, the same is likely to be true of urban enterprises relative to the rural ones. A large proportion of corporate workers is also likely to be among the most skilled. Even so, the differences appear to be too large to be explained by these factors alone and suggest considerable scope for productivity increases as modernization proceeds and the formal sector expands to absorb informal sector workers.

Is the GVA Growth Real?

No matter how we look at the data, the overall GVA growth—especially in the large enterprises—is extremely high. At the aggregate level, the NAS data show a growth of only 10.6 percent compared to the 16.4 percent implied by the survey data. In the case of corporate enterprises, the growth rate is

an astounding 45 percent. Is this growth real or the result of measurement error?

To be sure, some degree of measurement error cannot be ruled out. Recall that the sixty-third round made special effort to capture the contribution of large enterprises through the list frame, which it had not done in the fifty-seventh round. By itself, this would mean that the contribution of large enterprises was undercounted, shrinking the base over which our growth rates are calculated. The particularly high growth rate of corporate enterprises noted above reinforces this point.

Yet, this is not the entire story for at least three reasons. First, the undercount of large enterprises in the fifty-seventh round can be easily overstated. While it is true that this round did not create a separate list frame for those enterprises, it did make a special effort to capture their contribution. This is explicitly brought out in Appendix B of NSSO (2003) report 482 on the fifty-seventh round. Describing the sample design, the appendix notes:

> After determining the boundaries of the sample FSU, all big non-agricultural enterprises having 200 or more workers in the entire FSU and having operated at least one day during the last 365 days preceding the day of survey (hereinafter to be called as big enterprises for brevity) were listed. All the listed big enterprises constituted segment 9 of the selected FSU. All big enterprises under coverage listed in segment 9 were surveyed separately in addition to the required number of smaller enterprises under coverage in the other segments of the selected FSU as per normal procedure. (B6)

Second, going by the numbers in table 4.8, we notice that the number of corporate enterprises fell by 11.1 percent in 2006–07 relative to 2001–02. Ceteris paribus, an undercount in 2001–02 should have led to an increase in the number of enterprises in 2006–07. Because the condition "ceteris paribus" is not valid, this by itself is not compelling evidence against undercount; however, taken in conjunction with the previous point, the sharp decline somewhat undermines the possibility of a large undercount in 2001–02.

Finally, there is some evidence of the larger enterprises growing extremely rapidly during these years. While we have not collected this evidence systematically, we checked on just one enterprise that we know grew rapidly during the last decade: Infosys. This enterprise had 9,831 employees at the end of 2000–01 (March 31, 2001) and 72,241 by the end of 2006–07. Total nominal revenues rose from 19.6 billion rupees during 2000–01 to 138.9 billion rupees in 2006–07. This revenue growth works out to an annual compound rate of 38.6 percent. Infosys is, of course, not alone in experiencing such growth. Several large companies grew at comparable rates. Therefore, our conclusion

Table 4.9 FIVE-YEAR AND ANNUALIZED COMPOUND GROWTH RATES BY NIC SECTIONS

NIC Section	Five-year growth			Annual compound growth		
	GVA	Workers	Enterprises	GVA	Workers	Enterprises
Hotels and restaurants (H)	63.4	0.9	–4.5	10.3	0.2	–0.9
Transport, storage, and communication (I)	88.8	14.6	16.9	13.6	2.8	3.2
Real estate and business services (K)	404.6	27.4	10	38.2	5	1.9
Education and training (M)	77.6	–7.8	–17.8	12.2	–1.6	–3.9
Health and social work (N)	60.4	0.1	–18.6	9.9	0	–4
Other service activities (O)	26.9	–4.9	2.1	4.9	–1	0.4
All Sections	113.5	4.5	3.6	16.4	0.9	0.7

Source: Authors' calculations from unit-level data, rounds 57 and 63, NSS services surveys

is that while the numbers reported in table 4.7 are on the high side, they are indicative of substantial real growth, which probably exceeds that indicated by the NAS numbers.

Growth and Composition by Industry Sections

We next consider growth across NIC sections. Table 4.9 shows the proportionate growth rates over five years and the corresponding annual compound growth rates of GVA, workers, and number of enterprises. Looking at the fourth column of numbers, we note that except "other service activities," which represent a mixture of activities, GVA in each service section has grown at the annual compound rate of nearly 10 percent or more. The section experiencing the fastest GVA growth is real estate and business services (NIC Section K) followed by transport, storage, and communications (NIC Section I). This is no surprise since communications, real estate, and business services have been known to be very rapidly growing sectors in the economy.

Two of the fastest growing sections in GVA terms also account for the highest growth rates of worker employment—5 percent annualized growth in Section K and 2.8 percent growth in Section I. Other sections show either

a small growth or decline in worker employment. Enterprise growth follows the same broad pattern; transport storage and communications register the highest growth, followed by real estate and business services.

It is also instructive to consider briefly the composition of the covered services across NIC Sections. This is presented in table 4.10. The pattern here shows heavy and rising concentration: rapid growth in Sections K and I has concentrated GVA, employment, and enterprises in these sections. By 2006–07, these sectors together came to account for 59 percent of GVA, 41 percent of employment, and 51 percent of enterprises in the covered services.

Growth by States

We finally present growth in GVA, workers, and enterprises by states. To economize on space, we exclude eleven smaller states and five union territories, which together account for less than 5 percent of GVA, workers, and enterprises. The five-year and annual compound growth rates of GVA, workers, and enterprises for twenty-two states (counting Delhi as a state) and Chandigarh are shown in table 4.11. We arrange the states in a declining order of GVA shares in 2006–07.

Table 4.10 COMPOSITION OF SERVICES ACROSS NIC SECTIONS

	GVA		Workers		Enterprises	
NIC Section	Round 57	Round 63	Round 57	Round 63	Round 57	Round 63
Hotels and restaurants (H)	17.5	13.4	19.2	18.5	14.9	13.7
Transport, storage, and communication (I)	31.8	28.1	27.5	30.2	37.1	41.8
Real estate and business services (K)	13.1	31	9.2	11.2	8.8	9.3
Education and training (M)	13.7	11.4	15.8	14	8.8	6.9
Health and social work (N)	12.1	9.1	8.2	7.9	9.3	7.3
Other service activities (O)	11.8	7	20.1	18.3	21.2	20.9
Total	100	100	100	100	100	100

Source: Authors' calculations from unit-level data, rounds 57 and 63, NSS services surveys

Table 4.11 GROWTH BY STATES

State	Five-year growth			Annual compound growth		
	GVA	Workers	Enterprises	GVA	Workers	Enterprises
Maharashtra	228.6	8.7	13	26.9	1.7	2.5
Karnataka	356.4	8.2	–1.8	35.5	1.6	–0.4
Andhra Pradesh	191.3	9.6	4.4	23.8	1.8	0.9
West Bengal	132.1	15.9	23.1	18.3	3	4.2
Kerala	118.3	31.2	28.1	16.9	5.6	5.1
Tamil Nadu	66.2	2.2	–3	10.7	0.4	–0.6
Gujarat	62.6	–11.1	4.2	10.2	–2.3	0.8
Uttar Pradesh	11	–5.7	–11.3	2.1	–1.2	–2.4
Chandigarh	3186.4	376.6	28.7	101.1	36.7	5.2
Rajasthan	63.2	13.2	4	10.3	2.5	0.8
Punjab	53.5	18.8	24.4	8.9	3.5	4.5
Assam	98.2	52.7	43.6	14.7	8.8	7.5
Madhya Pradesh	16.7	0.2	–5.3	3.1	0	–1.1
Bihar	–36.6	–27.1	–27	–8.7	–6.1	–6.1
Haryana	33.6	26	44.2	6	4.7	7.6
Orissa	30.3	–24.9	–19.2	5.4	–5.6	–4.2
Jharkhand	97.8	49.5	51.7	14.6	8.4	8.7
J&K	117.2	28.4	27.1	16.8	5.1	4.9
Delhi	–67.8	–46.9	–40.8	–20.3	–11.9	–9.9
India	113.5	4.5	3.7	16.4	0.9	0.7

Source: Authors' calculations from unit-level data, rounds 57 and 63, NSS services surveys

Two points may be made with respect to the growth rates in the states. First, growth rates in many states have been extremely high. Moreover, the states with the highest level of services GVA, which are in the top part of the table, have also experienced some of the highest growth rates. Leaving aside Chandigarh, which is a small centrally administered city, the five largest states by GVA in the covered services (accounting for 61 percent of the GVA in 2006–07) are also the five fastest growing states. To some degree, the story of growth in services in India may well be the story of growth in Maharashtra, Karnataka, and Andhra Pradesh. Beyond the five biggest states in the covered services and Chandigarh, all other states exhibited growth rates below the national average. The state with the most workers in the covered services—Uttar Pradesh—did poorly, exhibiting just 2.1 percent annual growth rate.

The second point relates to some striking anomalies in the data. Chandigarh shows exceptionally high growth in GVA, workers, and enterprises. While it is true that based on the NAS data, Chandigarh saw annual growth of 11.2 percent during those five years, a growth rate of 101 percent in GVA in the

services covered by the surveys is still difficult to explain. In a similar vein, Delhi shows a declining growth rate in GVA of 20.3 percent and correspondingly high declining rates of workers and enterprises. There is no obvious explanation for these declining rates either.

PRODUCTIVITY GROWTH

The analysis in the previous section focuses entirely on growth. The survey data include information on various inputs used by the enterprises and can be used to estimate productivity growth between the two survey years. We caution that, as usual, we must work with some variables in *value* terms rather than physical quantities, which poses an interpretation problem. To make this point explicit, the conventional production function is written:

$$(1)\ X(t) = A(t)[K(t)]^{\alpha}[L(t)]^{\beta}[M(t)]^{\gamma}.$$

Here X stands for output, K for capital, L for labor, M for intermediate inputs, and t for time. Term $A(t)$ measures the level of productivity. Letting PX, PK, and PM stand for the price of X, K, and M, respectively, we can rewrite this equation as:

$$(2)\ P_X(t)X_X(t) = \frac{P_X(t)A(t)}{[P_K(t)]^{\alpha}[P_M(t)]^{\gamma}}[P_K(t)K(t)]^{\alpha}[L(t)]^{\beta}[P_M(t)M(t)]^{\gamma}.$$

Letting V stand for value, this equation can be rewritten as:

$$(3)\ V_X(t) = \frac{P_X(t)A(t)}{[P_K(t)]^{\alpha}[P_M(t)]^{\gamma}}[V_K(t)]^{\alpha}[L(t)]^{\beta}[V_M(t)]^{\gamma}$$

A long-recognized difficulty in estimating equation (3) is that any time-invariant firm-level unobservable input (for example, managerial skill) will be absorbed into $A(t)$. A standard solution is to use longitudinal data: two (or more) observations per firm allow us to difference out the firm fixed effect. Taking logs on both sides and differentiating with respect to time, we obtain:

$$(4)\ \hat{V} = \hat{A} + [\hat{P}_X - (\alpha\hat{P}_K + \gamma\hat{P}_M)] + \alpha\hat{V}_K + \beta\hat{L} + \gamma\hat{V}_M$$

Here we use "^" over a variable to denote the proportionate change in that variable. Because we use output values at constant prices, we can think of PX as being constant, in other words, $\hat{P}_X = 0$. This means that total factor productivity (TFP) growth, which equals $\hat{A}$, would be underestimated by the weighted sum of

the proportionate change in the prices of capital and intermediate input prices. Unfortunately the NSS data provide us with repeated cross sections of firms rather than a panel. Consequently we create a panel of synthetic firms by collapsing the data into cells defined by two-digit NIC, state, and survey round, which yields 560 state × year × two-digit NIC observations. Thus, we are assuming that, within a given state, year, and two-digit industry, firms use identical technology.

A further challenge in estimating the production function is that unobserved productivity shocks are likely to lead to both increased output and input use. A number of solutions to this simultaneity have been proposed in the recent literature. We implement the Levinsohn and Petrin (2003) estimator, which uses intermediate inputs as proxies for productivity shocks. Intermediate inputs are more likely to respond simultaneously and smoothly to unobserved productivity shocks.

Finally, it is important to note that our estimates of total and TFP growth correspond to the average growth in value added at the industry-state level, rather than the growth in the total value added across all industries. To the extent that growth is highly skewed across industries, our estimates of average growth at the industry-state level will tend to be lower than the growth in total value added. Our production function estimates are presented in table 4.A2.

In figure 4.1, we break productivity growth down into factor growth and TFP growth, with the sum of the two categories corresponding to total growth. Our numerical estimates on which figure 4.1 is based are reported in table 4.A3. India-wide, TFP growth is 18 percentage points out of a total growth in services of 31 percent; hence, productivity growth explains approximately 60 percent of total growth. The fastest growing states are Maharashtra, Karnataka, Goa, Andhra Pradesh, Gujarat, and Goa, with total growth ranging from over 80 percent to just over 50 percent and TFP accounting for 15 percent or more of growth.

According to figure 4.1, as one would expect, the contribution of TFP growth varies considerably across states. An interesting feature of the numbers is that in states where the value added has grown rapidly, the relative contribution of TFP growth is low. In contrast, productivity growth makes a much larger contribution in states such as West Bengal, Orissa, and J&K, where overall growth has been low. One speculative interpretation of these results is that TFP growth tends to be highest in states where the services sector was relatively undeveloped as of 2001–02.

A potentially important element of TFP in India has been the shift within the services sector to the fast-growing industries. In figure 4.1 this would be subsumed within our TFP estimates; this is appropriate in the sense that shifts to more productive activities are a legitimate increase in factor productivity. Nonetheless, it is interesting to consider how factor productivity has increased within industry, as this is more likely to capture actual technological improvements. The results presented in figure 4.2, with the numerical estimates relegated to table 4.A4, show that this predictably reduces the contribution of productivity gains, though it still
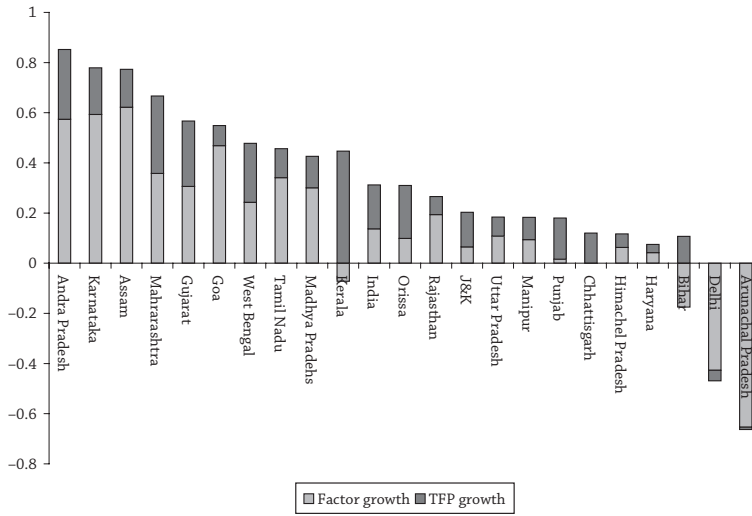
Figure 4.1
Contribution of Productivity Growth to the Total Industry-State Growth in Services in 22 Large States Based on Levinsohn-Petrin Estimator
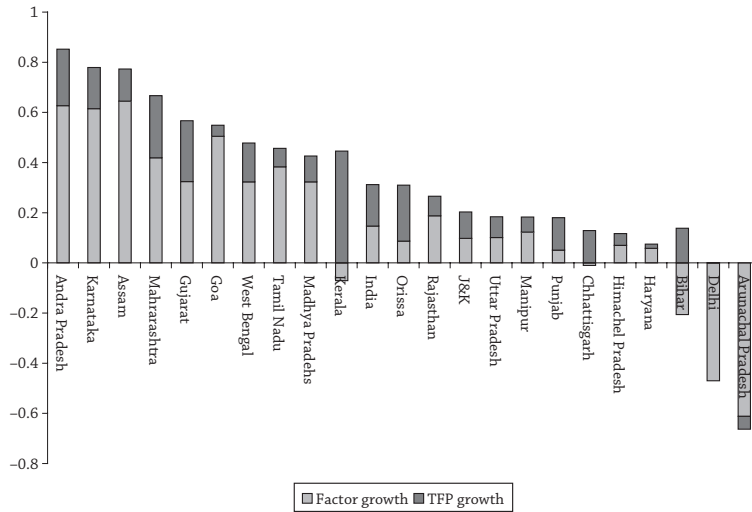
Figure 4.2
Contribution of Productivity Growth to the Total Industry-State Growth in Services in 22 Large States Based on Levinsohn-Petrin Estimator Corrected for Industry Fixed Effects

remains substantial—especially in some of the states—and underlines our view that TFP growth is a significant part of the story of the growth in services.

We conclude this section with the observation that no matter how we estimate it, productivity growth remains a far greater proportion of the predicted growth for most states than is commonly observed. This result cannot be attributed to the upward bias in measurement due to the better capture

of data for the large, list-frame enterprises. This is because such bias must impact not just output but also input usage. Our own hypothesis is that the large contribution is due to more effective utilization of labor. We noted in the introduction that prior to liberalization, the services sector in India operated like a nineteenth-century subsistence economy in the sense that it had large volumes of underutilized labor. As liberalization proceeded and the demand for services grew, this labor came to be utilized more and more fully.

CONCLUDING REMARKS

In this chapter, we have taken a first stab at analyzing the growth of services in India using firm-level data. For this purpose, we have used the data collected by the NSSO during 2001–02 and 2006–07 employing broadly comparable sample design. The main variation in the sample design is that the second survey makes a special effort to capture the output of the largest enterprises, which turn out to contribute as much as 38 percent of total services output covered by the survey, despite employing only 2 percent of the workforce. Because the output of these same enterprises may not have been captured as well in the first survey, the absolute growth in services implied by the two surveys is potentially biased upward.

Nevertheless, the surveys offer the first glimpse into the performance of enterprises of different sizes. In these concluding remarks, we wish to emphasize four main findings. First, while services output is heavily concentrated in urban establishment enterprises, more than half of the workers are employed in OAEs, which do not employ any outside workers at all. If we included enterprises with fewer than five workers among smaller enterprises, the contrast between the concentration of output and workers in large and small enterprises becomes even stronger. The smaller enterprises, no matter how we choose to define them, exhibit much lower output per worker, output per enterprise, and growth in output over time than larger enterprises. This means that the transformation to a modern economy would require not just the movement of workers from agriculture to industry—as another author has emphasized in a number of his writings (for example, see Panagariya 2008a, 2008b)—but also a movement of workers from the smaller to the larger services enterprises or, alternatively and minimally, modernization of OAEs.

Second, services output and growth are highly concentrated in a handful of states. Maharashtra and Karnataka alone account for almost half of the services output covered by the second survey, which includes financial sector services. These same states also account for by far the highest growth in the services common to the two surveys. In contrast, Uttar Pradesh accounts for the most workers in the services covered in the second survey, but it ranks eighth in terms of output value. At first glance, leading states such as Maharashtra and Karnataka exhibit higher output per worker in services than lagging states such as Uttar Pradesh.

Finally, our calculations suggest a very substantial contribution of productivity growth to overall growth in services. This finding is consistent to some degree with that of Bosworth et al. (2006–07), who undertake a growth accounting exercise across agriculture, industry, and services at the national level using macroeconomic data. They find a much larger contribution of productivity growth in services than in industry. Our calculations yield annual compound productivity growth rates of 3 percent or more in a number of states, with Maharashtra, Gujarat, Kerala, and Andhra Pradesh exhibiting rates in excess of 4.5 percent. Given the dominant role of services in India's growth, these findings suggest that its growth has relied less on factor accumulation and more on productivity improvements. We have hypothesized that this productivity growth has resulted at least in part from more effective use of previously underutilized labor.

ACKNOWLEDGMENT

APPENDIX

Table 4.A1 NIC 2004 TWO-DIGIT CLASSIFICATION

Sections/ Divisions	Description
Section A	Agriculture, hunting, and forestry
Division 01	Agriculture, hunting, and related service activities
Division 02	Forestry, logging, and related service activities
Section B	Fishing
Division 05	Fishing, aquaculture, and service activities incidental to fishing
Section C	Mining and quarrying
Division 10	Mining of coal and lignite; extraction of peat
Division 11	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction
Division 12	Mining of uranium and thorium ores
Division 13	Mining of metal ores
Division 14	Other mining and quarrying

Table 4.A1 Continued

Sections/ Divisions	Description
Section D	Manufacturing
Division 15	Manufacture of food products and beverages
Division 16	Manufacture of tobacco products
Division 17	Manufacture of textiles
Division 18	Manufacture of wearing apparel; dressing and dyeing of fur
Division 19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harnesses, and footwear
Division 20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
Division 21	Manufacture of paper and paper products
Division 22	Publishing, printing, and reproduction of recorded media
Division 23	Manufacture of coke, refined petroleum products, and nuclear fuel
Division 24	Manufacture of chemicals and chemical products
Division 25	Manufacture of rubber and plastics products
Division 26	Manufacture of other non-metallic mineral products
Division 27	Manufacture of basic metals
Division 28	Manufacture of fabricated metal products, except machinery and equipment
Division 29	Manufacture of machinery and equipment not elsewhere classified
Division 30	Manufacture of office, accounting, and computing machinery
Division 31	Manufacture of electrical machinery and apparatus not elsewhere classified
Division 32	Manufacture of radio, television, and communication equipment and apparatus
Division 33	Manufacture of medical, precision, and optical instruments, watches and clocks
Division 34	Manufacture of motor vehicles, trailers, and semi-trailers
Division 35	Manufacture of other transport equipment
Division 36	Manufacture of furniture; manufacturing not elsewhere classified
Division 37	Recycling
Section E	Electricity, gas, and water supply
Division 40	Electricity, gas, steam, and hot water supply
Division 41	Collection, purification, and distribution of water
Section F	Construction
Division 45	Construction
Section G	Wholesale and retail trade; repair of motor vehicles, motorcycles, and personal and household goods
Division 50	Sale, maintenance, and repair of motor vehicles and motorcycles; retail sale of automotive fuel
Division 51	Wholesale trade and commission trade, except of motor vehicles and motorcycles
Division 52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods

(*Continued*)

Table 4.A1 Continued

Sections/Divisions	Description
Section H	Hotels and restaurants
Division 55	Hotels and restaurants
Section I	Transport, storage, and communications
Division 60	Land transport; transport via pipelines
Division 61	Water transport
Division 62	Air transport
Division 63	Supporting and auxiliary transport activities; activities of travel agencies
Division 64	Post and telecommunications
Section J	Financial intermediation
Division 65	Financial intermediation, except insurance and pension funding
Division 66	Insurance and pension funding, except compulsory social security
Division 67	Activities auxiliary to financial intermediation
Section K	Real estate, renting, and business activities
Division 70	Real estate activities
Division 71	Renting of machinery and equipment without operator and of personal and household goods
Division 72	Computer and related activities
Division 73	Research and development
Division 74	Other business activities
Section L	Public administration and defense; compulsory social security
Division 75	Public administration and defense; compulsory social security
Section M	Education
Division 80	Education
Section N	Health and social work
Division 85	Health and social work
Section O	Other community, social, and personal service activities
Division 90	Sewage and refuse disposal, sanitation, and similar activities
Division 91	Activities of membership organizations not elsewhere classified
Division 92	Recreational, cultural, and sporting activities
Division 93	Other service activities
Section P	Activities of private households as employers and undifferentiated production activities of private households
Division 95	Activities of private households as employers of domestic staff
Division 96	Undifferentiated goods-producing activities of private households for own use
Division 97	Undifferentiated service-producing activities of private households for own use
Section Q	Extraterritorial organizations and bodies
Division 99	Extraterritorial organizations and bodies

Source: Ministry of Statistics and Program Implementation

Table 4.A2 PRODUCTION FUNCTION ESTIMATES

VARIABLES	OLS	OLS	OLS	OLS	OLS	Levinsohn-Petrin GMM	Levinsohn-Petrin GMM	Levinsohn-Petrin GMM
	Time Fixed Effects	Time Fixed Effects	state x time FE	state x time FE	state x time FE & industry FE	Time Fixed Effects	Time Fixed Effects	Time Fixed Effects & industry Fixed Effects
Average TFP	11.816***	4.168***						
	[0.058]	[0.160]						
Average TFP growth	0.312***	0.187***					0.175***	0.165***
	[0.081]	[0.025]					[0.030]	[0.028]
log Labor		0.447***		0.455***	0.335***	0.359***	0.370***	0.232***
		[0.032]		[0.033]	[0.046]	[0.040]	[0.035]	[0.055]
log Capital		0.080***		0.082***	0.075***	0.108	0.128	0.132
		[0.014]		[0.015]	[0.017]	[0.129]	[0.085]	[0.098]
log Intermediate inputs		0.580***		0.559***	0.643***	0.437**	0.410**	0.425***
		[0.014]		[0.014]	[0.022]	[0.187]	[0.173]	[0.157]
Observations	555	555	555	555	555	555	555	555
p value for CRS		0.000025		0.00026	0.13	0.31	0.43	0.017

Standard errors in brackets

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 4.A3 COMPARING TOTAL AND TFP GROWTH IN SERVICES

State/Country	Factor growth	TFP growth	Total growth	Total growth
Andra Pradesh	0.574	0.278	0.852	0.852
Karnataka	0.593	0.186	0.779	0.779
Assam	0.622	0.151	0.773	0.773
Mahrarashtra	0.358	0.309	0.667	0.667
Gujarat	0.306	0.261	0.567	0.567
Goa	0.469	0.08	0.549	0.549
West Bengal	0.243	0.235	0.478	0.478
Tamil Nadu	0.341	0.116	0.457	0.457
Madhya Pradesh	0.301	0.125	0.426	0.426
Kerala	−0.072	0.447	0.375	0.375
India	0.137	0.175	0.312	0.312
Orissa	0.099	0.211	0.31	0.31
Rajasthan	0.194	0.072	0.266	0.266
J&K	0.065	0.138	0.203	0.203
Uttar Pradesh	0.108	0.076	0.184	0.184
Manipur	0.094	0.089	0.183	0.183
Punjab	0.016	0.164	0.18	0.18
Chhattisgarh	−0.001	0.12	0.119	0.119
Himachel Pradesh	0.063	0.054	0.117	0.117
Haryana	0.042	0.033	0.075	0.075
Bihar	−0.175	0.107	−0.068	−0.068
Delhi	−0.427	−0.042	−0.469	−0.469
Arunachal Pradesh	−0.654	−0.009	−0.663	−0.663

Table 4.A4 COMPARING TOTAL AND TFP GROWTH CONTROLLING FOR
INDSUTRY–FIXED EFFECTS IN SERVICES

State/Country	Factor growth	TFP growth	Total growth
Andra Pradesh	0.627	0.225	0.852
Karnataka	0.615	0.164	0.779
Assam	0.645	0.128	0.773
Mahrarashtra	0.419	0.248	0.667
Gujarat	0.324	0.243	0.567
Goa	0.505	0.044	0.549
West Bengal	0.323	0.155	0.478
Tamil Nadu	0.383	0.074	0.457
Madhya Pradesh	0.323	0.103	0.426
Kerala	−0.071	0.446	0.375
India	0.147	0.165	0.312
Orissa	0.087	0.223	0.31
Rajasthan	0.188	0.078	0.266
J&K	0.098	0.105	0.203
Uttar Pradesh	0.101	0.083	0.184
Manipur	0.123	0.06	0.183
Punjab	0.051	0.129	0.18
Chhattisgarh	−0.01	0.129	0.119
Himachel Pradesh	0.07	0.047	0.117
Haryana	0.058	0.017	0.075
Bihar	−0.206	0.138	−0.068
Delhi	−0.47	0.001	−0.469
Arunachal Pradesh	−0.612	−0.051	−0.663

NOTES

1. To give just one example, the Industrial Dispute Act of 1948 makes it virtually impossible for a manufacturing firm with one hundred or more employees to legally lay off workers under any circumstances. Even if the firm goes bankrupt, it must pay the workers their regular salary. Capital-intensive firms get around this law by giving overly generous packages to workers they want to lay off. Because labor costs are a small proportion of the total costs, these firms can afford to pay such golden shake hands. The same option is not available in sectors where 80 percent or more of the cost is accounted for by labor.
2. See Gordon and Gupta (2004) and Eichengreen and Gupta (2011).
3. Table 4.A1 in the Appendix exhaustively lists two-digit NIC 2004 sectors. Further disaggregation going down to three, four, and five digits can be found at http:// mospi.nic.in/Mospi_New/site/inner.aspx?status=2&menu_id=129 (accessed on May 10, 2012). Concordances are available between earlier classifications and NIC 2004. For example, the 2001–02 services survey employed NIC 1998 classification, but it can be readily converted into NIC 2004.

4. The excluded subsectors are: transport by railways (NIC 601), transport via pipeline (NIC 603), and air transport (NIC 62) in Section I; monetary transactions (NIC 651) in Section J; activities of business, employers, and professional organizations (NIC 911), activities of trade unions (NIC 912), and activities of political organizations (9192) in Section O.
5. The only exclusions are the districts of Leh in Ladakh and Kargil, Punch, and Rajauri in Jammu and Kashmir, plus some interior villages in Nagaland and Andaman and Nicobar Islands.
6. Value added is defined as the total revenue minus the costs of intermediate inputs and approximately represents the payments to primary factors of production and taxes, if any.

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