What to Make in India? Manufacturing or Services?[1]

07 CHAPTER

"Since the industrial revolution, no country has become a major economy without becoming an industrial power."

Lee Kuan Yew, delivering the Jawaharlal Memorial Lecture in New Delhi, 2005

7.1 Introduction

Echoing the Sage of Singapore, Prime Minister Narendra Modi has elevated the revival of Indian manufacturing to a key policy objective of the new government, identifying this sector as the engine of long-run growth. "Make in India" is now a flagship initiative not to mention a catchy campaign. But the question arises "What should India make?"

Early development thinking, exemplified most famously (though not exclusively) in the two-sector model of Lewis (1954) was fixated on the idea of sectoral transformation: moving resources from the agricultural/traditional sector to the manufacturing/ non-traditional sector. There was never any doubt about the hierarchy (the latter was unquestionably superior) and hence no doubt about the desirability of the structural transformation.

Although development thinking over the last two decades has moved away from discussions about sectoral transformation and towards a more explicit growth perspective, the importance of structural transformation is starting to be rehabilitated – but without abandoning the growth perspective. Rodrik (2013 and 2014) provides the clearest exposition of this marriage of the two perspectives.

Consider the following equation:

$$\hat{y} = \beta(\ln y^*(\theta) - \ln y) + (\pi_M - \pi_T)d\alpha_M + \alpha_M\pi_M\beta_M(\ln y_M^* - \ln y_M)$$

The equation has three parts. First, growth of gdp per capita (denoted by $\hat{y}$) can be viewed in a conventional conditional convergence perspective, with catch-up to the frontier ($y^*(\theta)$) depending on a number of fundamentals (policies, human capital, openness, institutions, etc). But this is a slow process because by definition fundamentals are slow to change. Moreover, this conditional convergence framework is inadequate because it has difficulty explaining growth miracles or accelerations—China being the classic outlier with many of these fundamentals.

Hence this framework needs to be supplemented with explicit structural transformation elements. These are captured in the second and third terms of the equation. The second term captures structural change from low productivity traditional sectors (T) to high productivity modern sectors (M), where π_i denotes productivity in sector *i* and α_M denotes the share of employment in the modern sector. This is the classic dualism model, which suggests that economic development is by definition a process of shifting resources from low to high productivity sectors, thereby raising economy-wide levels of productivity.

[1] Since this chapter was written, the CSO has published new estimates of the size of manufacturing and other sectors in India. They suggest and increased in the level of manufacturing's share in GDP, although for the three years for which new estimates have been provided, there is still a decline in this share. Even the level increased owes more to statistical than 'underlying' reasons. We thus expect the results in this chapter to remain broadly valid but cannot be definitive until the analysis is replicated for the new data.

The third term is new and captures the phenomenon of unconditional convergence in the high productivity sector. Essentially, once resources move into this sector, they then experience unconditional or "automatic" catch-up due to rising productivity (represented by the convergence growth rate of the modern sector). This further increases economy-wide levels of productivity.

In other words, there are two gains to shifting resources from the traditional to the new sectors: first, a compositional gain, which is a gain in economy-wide productivity achieved by shifting the weight of the economy from low to high productivity sectors; second, a subsequent dynamic gain as these resources experience rapid productivity growth. The contribution of Rodrik (2013) is to show empirically that the manufacturing sector does indeed exhibit this rapid growth or unconditional convergence toward the frontier: that is, manufacturing in poorer countries and less productive manufacturing activities grow faster over time.

No sooner than having adopted this framework, the question poses itself: *are these compositional and dynamic gains restricted to manufacturing?* In other words, whereas the first phase of thinking about structural transformation was informed by certitude about the hierarchy of sectors, today there is less ground for that certitude because the comparison is not between agriculture and manufacturing but between manufacturing and services (or at least certain service subsectors).

This chapter is a modest initial attempt at shedding some light on the new structural transformation question, and in particular comparing manufacturing and services.

7.2 Desirable Features of Sectors that can Serve as Engines of Structural Transformation

India is taken up as a case study for addressing this question due to the poor performance of manufacturing in India and the relatively strong performance of services – which in some ways mirrors the performance of many Sub-Saharan African countries (Ghani and O'Connell, 2014).

Lee Kuan Yew was clearly on to something when he challenged the Indian model of development. Historically, there have been three modes of escape from under-development: geology, geography, and "jeans" (code for low-skilled manufacturing). In recent years West Asia, Botswana and Chile, and further back in time Australia and Canada, exploited their natural resources endowed by geology to improve their standards of living. Some of the island successes (Barbados, Mauritius, and others in the Caribbean) have exploited their geography by developing tourism to achieve high rates of growth.

In the early stages of their success, East Asian countries (China, Thailand, Indonesia, Malaysia etc) relied on relatively low-skilled manufacturing, typically textiles and clothing, to motor economic growth. Later on they diversified into more sophisticated manufacturing but "jeans" offered the vehicle for prosperity early on. No country has escaped from underdevelopment using relatively skill-intensive activities as the launching pad for sustained growth as India seems to be attempting.

Put differently, India seems to have defied its "natural" comparative advantage, which probably lay in the "jeans" mode of escape because of its abundant unskilled and low-skilled labor. Instead, it found or created—thanks to historical policy choices and technological accidents—such advantage in relatively skilled activities such as information technologies and business process outsourcing (Kochhar et. al., 2007).

The Indian experience, still a work-in-progress, raises the question of whether structural transformation necessarily requires manufacturing to be the engine of growth. But before we compare manufacturing with alternative sectors in terms of their potential for structural transformation, it is worth elaborating on the desirable attributes of such sectors.

In fact, building upon the Rodrik (2013) framework, it is argued that there are five attributes that allow a sector to serve as an engine of

structural transformation and thereby lead an economy to rapid, sustained and inclusive growth:

1. *High level of productivity:* As described above, economic development is about moving from low productivity to high productivity activities.

2. *Unconditional Convergence* (i.e. faster productivity growth in lower productivity areas): This too has been discussed earlier. Recall that convergence ensures that the relevant sector acts as an "escalator" which automatically leads to higher levels of sectoral and economy-wide productivity. In fact one can distinguish between two types of unconditional convergence:

   A. Domestic convergence: In large countries such as India, China, Brazil, and Indonesia, one would ideally like to see convergence *within* a country. That is, productivity growth should be faster in richer than poorer parts. Otherwise severe within-country regional inequality may arise.

   B. International convergence: whereby less-productive economic units (firms, sectors or entire economies) in all countries catch-up with units at the international frontier (i.e. those in the most productive countries).

3. *Expansion:* To ensure that the dynamic productivity gains from convergence spread through the economy, it is necessary that the sector experiencing convergence absorbs resources. Convergence accompanied by contraction will fail to ensure economy-wide benefits, because the country's resources that are outside the sector in question will not experience higher, convergent productivity growth. Convergence, in the case of the industrial sector, should be accompanied by natural industrialisation and not premature de-industrialisation, if it is to lead to truly inclusive growth.

4. *Alignment with comparative advantage:* To ensure that expansion occurs and the benefits of fast-growing sectors are widely shared across the labor force, there should be a match between the skill requirements of the expanding sector and the skill endowment of the country. For example, in a labour abundant country such as India, the converging sector should be a relatively low-skilled activity so that more individuals can benefit from convergence.[2]

5. *Tradability:* Historically, countries that had growth spurts enjoyed rapid growth in exports, typically manufacturing exports (Johnson, Ostry and Subramanian (2010)). Rapid growth has seldom been based on the domestic market. Part of the reason for this might be that trade serves as a mechanism for technology transfer and learning, which may have spillovers on related industries (Hausmann, Hwang, and Rodrik (2007)). Perhaps a more important part is that trade and exports in particular provide a source of unconstrained demand for the expanding sector. This is particularly important for a country of India's size because of the possibility that its expansion can run up against the limited political and economic ability of trading countries to absorb Indian exports and/or to turn the terms of trade against itself.

The two sectors—manufacturing and services (including services disaggregated by subsector)—are now evaluated, in succession, along these five dimensions in the Indian context.[3]

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[2] There may be concerns that a country's pattern of specialization (in skilled or low-skilled activities) may in turn effect the skill endowment of the country. In particular, Blanchard and Olney (2013) show that increasing exports of low-skill products tends to lower average levels of human capital attainment through a Stolper-Samuelson effect. Nevertheless, in this chapter we take the position that the aforementioned mechanism is likely to be a second-order effect in the development process. Indeed, the experience of East Asia shows that it is possible for countries to start by specializing in low-skill but dynamic activities and subsequently move to more skill intensive production once the growth process has picked up steam.

[3] NB: for information on the data sources used in this chapter, please consult the working paper- Amirapu and Subramanian (2015).

7.3 The Manufacturing Scorecard

7.3.1 Productivity Level

Table 7.1 compares productivity (measured simply as value added per worker) levels in the various Indian sectors – including manufacturing – for two time periods: 1984 and 2010. Several features stand out. First, in India it is highly misleading to speak generally of manufacturing because of the clear difference between *unregistered* manufacturing – which is a very low productivity activity – and *registered* manufacturing – which is an order of magnitude (7.2 times) more productive. It is *registered* manufacturing, not manufacturing in general, which has the potential for structural transformation.

Second, the level of productivity in registered manufacturing is not only high relative to unregistered manufacturing, it is high compared to most other sectors of the economy and it is even high in an absolute sense, at US$ 7800 at market exchange rates and nearly three times as much at PPP exchange rates. If the entire Indian economy were employed in registered manufacturing, India would be as rich as say Korea.

Third, these differentials between registered manufacturing and the rest of the economy were already prevalent (if not to the same extent) in 1984 – fast productivity growth over the period (about 5 percent per year) has only exacerbated the differences.

Thus, on the first criterion of high levels of productivity, registered manufacturing scores spectacularly well.

7.3.2 Domestic convergence

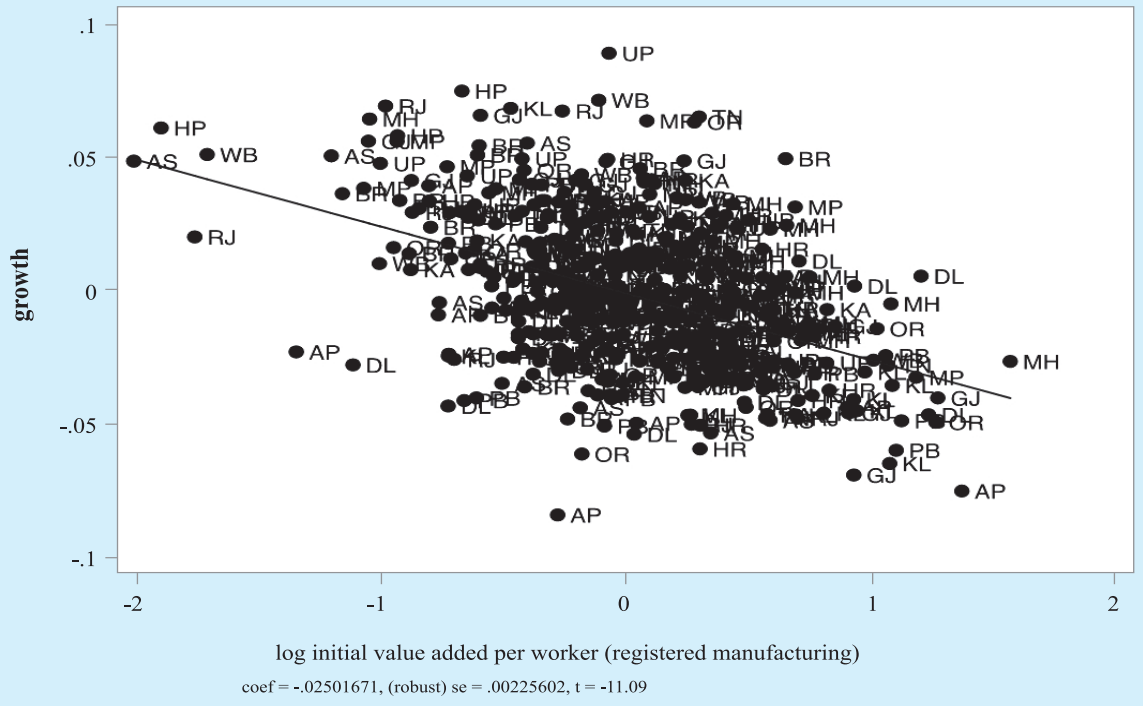
Figure 7.1 provides evidence that registered manufacturing is characterised by unconditional domestic convergence. Here the unit of observation is the State-Industry level, but almost identical results are derived when looking at more aggregated levels (across major states in India)

Table 7.1 : Labor Productivity in the Indian Economy by Sector over Time

	Level (constant 2005 Rs.)		Growth (percent)	
	1984	2010	1984-2010	2000-2010
Services	61,978	213,014	4.9	6.3
Manufacturing	48,817	125,349	3.7	4.2
Registered manufacturing (MOSPI)	117,984	360,442	4.4	5.4
Unregistered manufacturing	28,548	50,312	2.2	1.2
Services Subsectors				
Trade, Hotels, and Restaurants	56,284	144,108	3.7	7.3
Transport, Storage and Communications	68,823	172,058	3.6	4.5
Financial Services and Insurance	198,584	706,297	5.0	-1.6
Real Estate and Business Services, etc	1,012,017	875,073	-0.6	3.2
Public Administration and Defense	41,154	231,109	6.9	7.0
Construction	62,773	95,866	1.6	2.1

Source **: Amirapu and Subarmanian (2015).**

Figure 7.1[4]: Domestic Convergence in Registered Manufacturing - State-Industry level with 3 Digit Industry Fixed Effects, 1981 - 2008.



***Source*: Amirapu and Subarmanian (2015).**

and less aggregated levels (across factories).[5] Broadly a regression coefficient on log of initial productivity of about (-) 2.5 percent suggests that a state that is twice as rich as another has an average growth rate of productivity that is 2.5 percent slower – a considerable amount given that the average growth rate of productivity over the period 1984-2010 was about 4.4 percent.

7.3.3 International Convergence

With respect to registered manufacturing, it seems that states and firms within India are converging to the Indian frontier but that could mean little unless they are also converging to the international manufacturing frontier. Are they?

Rodrik (2013) shows that there is unconditional convergence across countries and sectors in manufacturing. But India is a negative outlier in the relationship in two senses: first, on average, manufacturing sectors in India exhibit labour productivity growth that is 14 percent less than the average country's manufacturing sector. Second, Indian industries converge at a much slower rate than average (0.005 percent)—almost not at all. In contrast, China is a positive outlier, posting faster labour productivity growth than average and converging faster to the global frontier.[6] Registered

[4] Note that the figure is a "partial residual plot": it graphically displays the relationship between two variables while controlling for other variables when appropriate (in this case three-digit industry fixed effects).

[5] Our results are also robust to different (shorter) time periods and different measures of productivity. These results and many others are reported in Amirapu and Subramanian (2015). It also worth noting that unregistered manufacturing does not exhibit unconditional convergence across the states in India.

[6] More formally, when an India dummy and a China dummy are added separately, and each interacted with the convergence coefficient, the coefficient on the India dummy is -.14 (t-statistic of 1.97), and that on the India dummy interacted with the convergence term is .017 (t-statistic of 2.05). The corresponding coefficients for China are .166 (t-statistic of 2.65) and -.011 (t-statistic of 1.4). We are grateful to Dani Rodrik for providing these results.

manufacturing in India has thus not been a strong performer.

7.3.4 Expansion or Pre-mature non-Industrialisation?

It is a stylised fact that the process of development includes stages of industrialisation followed by de-industrialisation: a country first experiences a rising share of resources – especially labour – devoted to the industrial sector, after which the services sector becomes more important, so that the share of employment in the industrial sector declines from its peak. In recent years, however, "de-industrialisation" seems to be taking place prematurely. That is, poor countries seem to be reaching their peak levels of industrialisation at lower levels of industrialisation and income (Rodrik, 2014; Amirapu and Subramanian, 2015).

What about India? The phenomenon of de-industrialisation is particularly salient for India for three reasons. Looming ahead is the demographic bulge, which will disgorge a million youth every month into the economy in search of employment opportunities. Rising labour costs in China create opportunities for low-skilled countries such as India as replacement destinations for investment that is leaving China. And a new government that has assumed power offers the prospect of refashioning India in the image of Gujarat—one of the few manufacturing successes.

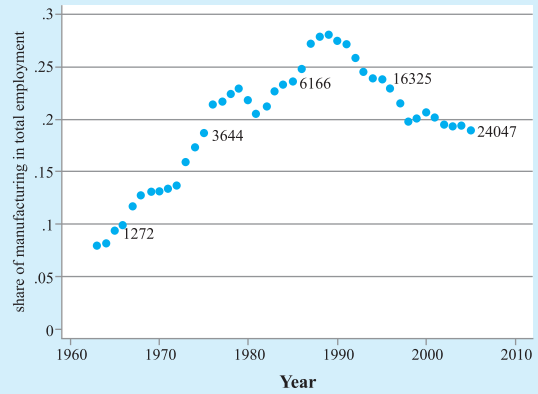
But the sobering fact is that India seems to be de-industrialising too. In fact, to call the Indian phenomenon de-industrialisation is to dignify the Indian experience, which is more aptly referred to as premature non-industrialisation because India never industrialised sufficiently in the first place.

To make the point first consider Figure 7.2, which plots the share of manufacturing in total employment over time for South Korea, a poster child for manufacturing-led growth. South Korea's GDP per capita in 2005 PPP dollars is also shown alongside the series for several years. The figure displays the typical shape: share of employment in manufacturing starts very low at around 5 percent and rises over time to almost 30 percent before starting to decline after a fairly high level of GDP has been reached.

In contrast, Figure 7.3 illustrates the Indian experience. The Figure shows India's share of registered manufacturing in total output and employment over time (on the same axes as the graph for Korea). The general trend is constant with a downward trend over the last few years for which data are available. In other words, the pronounced inverted U shape that characterises the cross-section and Korea is notably absent in India.

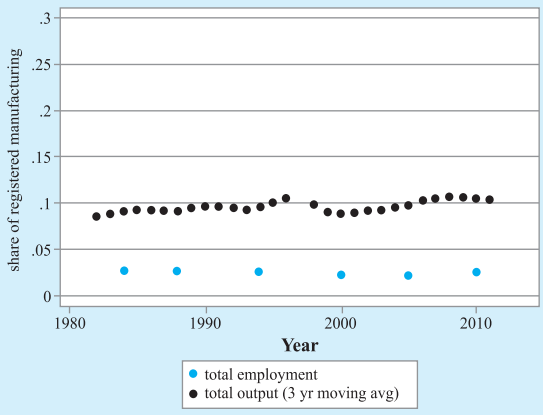
But what has been the counterpart development among Indian states? Tables 7.2A and 7.2B show

Figure 7.2: Share of Manufacturing in Total Employment over Time, 1960-2010: South Korea (GDP per capita in 2005 PPP $ show for select years)



Source: Amirapu and Subarmanian (2015).

Figure 7.3: Share of Registered Manufacturing in Total Output and Employment over Time, 1980-2010: All India



Source: Amirapu and Subarmanian (2015).

the year in which the share of registered manufacturing peaked (in first value added and then employment terms), the peak share of registered manufacturing (in value added or employment), and the per capita GDP associated with peak registered manufacturing levels.

From the tables, a few points are striking. Gujarat has been the only state in which registered manufacturing as a share of GDP surpassed 20 percent and came anywhere close to levels achieved by the major manufacturing successes in East Asia. Even in Maharashtra and Tamil Nadu, manufacturing at its peak accounted for only about 18-19 percent of state GDP. The peak shares in employment terms are even less significant: no major Indian state has achieved more than 6.2 percent of employment from registered manufacturing in the last 30 years, and many major states peaked at less than half that. Even in Gujarat, employment in registered manufacturing has only been about 5 percent of total employment, while annual growth in registered manufacturing employment has been 1.8 percent between 1984 and 2010 (slower than the growth rate of total employment over the period: 2.4 percent).

Second, in nearly all states (with the exception of Himachal Pradesh and Gujarat), registered manufacturing as a share of value added is now declining and, for most states, has been doing so for a long time. The peak share of manufacturing in output for many states was reached in the 1990s (Andhra Pradesh and Tamil Nadu) or even in the

Table 7.2A : Premature Non-Industrialisation among Indian States (by Value Added)

State	Year in which registered manufacturing in value added peaked	Share of registered manufacturing in value added at peak (percent)	NSDP per capita at peak (2005 INR)	GSDP per capita at peak (2005 USD PPP)
Gujarat	2011	22.7	52,291	5,357
Maharashtra	1986	18.9	15,864	1,400
Tamil Nadu	1990	18.1	15,454	1,417
Haryana	2003	17.3	32,869	3,309
Himachal Pradesh	2011	16.4	46,207	4,733
Karnataka	2008	14.7	34,752	3,523
Bihar	1999	13.6	9,215	905
Madhya Pradesh	2008	12.5	18,707	1,897
West Bengal	1982	12.3	9,348	909
Orissa	2009	12.0	22,779	2,353
All India	2008	10.7	30,483	3,091
Punjab	1995	10.5	25,995	2,506
Kerala	1989	10.3	14,418	1,322
Andhra Pradesh	1996	10.0	16,904	1,641
Uttar Pradesh	1996	10.0	11,679	1,134
Assam	1987	10.0	12,904	1,164
Delhi	1994	8.5	39,138	3,742
Rajasthan	2001	8.3	15,816	1,522

***Source*: Amirapu and Subarmanian (2015).**

Table 7.2B : Premature Non-Industrialisation among Indian States (by Employment)

State	Year in which registered manufacturing in value added peaked	Share of registered manufacturing in employment at peak (percent)	NSDP per capita at peak (2005 INR)	GSDP per capita at peak (2005 USD PPP)
Tamil Nadu	2010	6.2	44,033	4,633
Delhi	1988	6.1	31,531	2,989
Haryana	2010	6.1	54,861	5,773
Punjab	2010	5.4	44,611	4,694
Gujarat	1984	5.4	15,167	1,343
Maharashtra	1984	4.8	15,212	1,347
West Bengal	1984	4.7	10,371	919
Himachal Pradesh	2010	3.8	42,998	4,524
Kerala	1994	3.3	18,926	1,809
Karnataka	2010	3.3	36,214	3,811
Andhra Pradesh	2010	2.8	36,228	3,812
All India	1984	2.7	11,800	1,045
Assam	1984	2.5	13,238	1,172
Uttar Pradesh	1988	1.6	9,372	888
Bihar	1988	1.5	4,768	452
Rajasthan	2010	1.4	23,908	2,516
Madhya Pradesh	1994	1.4	13,191	1,261
Orissa	2010	1.4	22,677	2,386

Source **: Amirapu and Subarmanian (2015).**

1980s (Maharashtra). Interestingly, peak *employment* shares seem to be following a slightly different story, with less marked declines observable for most states. Nevertheless, most states have *not* been experiencing secular growth in employment shares over time (the only exceptions are Himachal Pradesh, Tamil Nadu, Haryana and – possibly – Karnataka). Many of the states that do exhibit peak years in 2010 (such as Andhra Pradesh, Rajasthan and Orissa) seem to have employment shares that have been mostly flat, reflecting neither relative growth nor decline.

Third, and this is perhaps the most sobering of facts, manufacturing has even been declining in the poorer states: states that never effectively industrialised (West Bengal and Bihar) have started de-industrialising.

Some comparisons are illuminating. Take India's largest state Uttar Pradesh. It reached its peak share of manufacturing in output at 10 percent of GDP in 1996 at a per capita state domestic product of about $1200 (measured in 2005 purchasing power parity dollars). A country like Indonesia attained a manufacturing peak share of 29 percent at a per capita GDP of $5800. Brazil attained its peak share of 31 percent at a per capita GDP of $7100. So, Uttar Pradesh's maximum level of industrialization was about one-third that in Brazil and Indonesia; and the decline began at 15-20 percent of the income levels of these countries.

Thus far, we have shown that, for all but a few states, Indian manufacturing is certainly not growing and is probably shrinking. One possible

consequence of manufacturing failing to satisfy requirements 2b and 3 is that, in contrast to China, there is no evidence of convergence between states in India in overall per capita GDP. For Chinese provinces, the poorer the initial level of per capita GDP, the faster the subsequent growth, so that poorer provinces start catching up with richer ones. In India, there is no convergence, because poorer states are not likely to grow faster than richer ones on average (Amirapu and Subramanian 2015). Regional disparities have thus persisted within India.

Had manufacturing attracted resources while exhibiting domestic convergence in productivity, the sector would have expanded in poorer states increasing overall levels of income in these states and contributing to a narrowing of the income distribution across India. Instead it seems that manufacturing has failed to be such an escalator of progress.

Several explanations are possible for why manufacturing has not been this escalator in India. They fall under four broad categories: distortions in labour markets; distortions in capital markets; distortions in land markets; and inappropriate specialisation away from India's natural comparative advantage and toward skill intensive activities. Amirapu and Subramanian (2015) provides some evidence in support of the last explanation.

7.3.5 Alignment with Comparative Advantage

As argued earlier, in order for a sector to offer transformational possibilities, it must not only be characterised by high levels and growth rates of productivity, it must also absorb resources from the rest of the economy. But in order to do so, the sector's use of inputs must be aligned with the country's comparative advantage. That will allow the abundant factor of production (usually unskilled

Table 7.3: Average Skill Level by Subsector in the Indian Economy (NSSO 2004-05)

Sector/Subsector	Share of Employees with at least Primary Education	Share of Employees with at least Secondary Education
Agriculture, forestry and fisheries	0.445	0.139
Mining	0.501	0.221
All manufacturing	0.628	0.248
Registered manufacturing (workers in factories with >10 workers)	0.768	0.432
All Services	0.778	0.478
Transportation and communications	0.715	0.330
Wholesale and retail trade	0.721	0.346
Financial services and insurance	0.976	0.836
Real estate and business services	0.935	0.775
Public administration and defense	0.897	0.665
Education	0.963	0.888
Health and social work	0.924	0.767
Electricity, gas and water	0.856	0.558
Construction	0.518	0.144

Source **: Amirapu and Subarmanian (2015).**

labour) to benefit from productivity growth and convergence, and in so doing make growth not only rapid and sustainable but also inclusive. In other words, the dynamic sector must at least initially be relatively unskilled labour intensive. Is this true of India manufacturing? Kochhar et. al. (2006) found that Indian manufacturing was unusually skill labour intensive. Another simple metric for assessing the alignment of dynamism with comparative advantage is the relative skill intensity of manufacturing relative to other sectors. Table 7.3 presents some numbers. From the 2004/5 NSSO Employment and Unemployment Survey, the share of employees with at least primary and secondary education for major sectors (and subsectors) of the Indian economy is computed.

It turns out that registered manufacturing is a sector that *is* relatively skilled labor intensive. As table 7.3 shows, the share of workers with at least secondary education is substantially higher in registered manufacturing than in agriculture, mining or unregistered manufacturing and also greater than in several of the service subsectors. In some ways, this should not be surprising. High labour productivity in this sector (Table 7.1) is at least in part a consequence of higher skills in the work force. What it does suggest, however, is that registered manufacturing does not really satisfy requirement number four. The skill intensity of the sector is not quite aligned with India's comparative advantage.

7.4 The Services Scorecard

The scorecard analysis can be repeated for the services sector in India. But before that is done, it is important to recognise that services in the aggregate is not a useful category of analysis because it is an amalgam of different and disparate species of economic activity, from government services and construction that are non-tradable to finance and business services that largely are tradable; from certain activities that are labour intensive and others such as telecommunications that are highly capital and skill labor intensive. Any meaningful analysis of services must distinguish between different service subsectors—although the degree of disaggregation will of course be determined by data availability.

We work with the six different subsectors shown in Table 7.4 and repeat the analysis undertaken above for registered manufacturing.

7.4.1 Productivity Level

Table 7.4 provides comparative data on the level of productivity for these service subsectors as well

Table 7.4: Growth in Employment Shares of Economy Subsectors, 1984-2010

	Initial Level of Productivity	Employment Shares		Annual Growth (percent)
	1984	1984	2010	1984-2010
Registered Manufacturing	117,984	0.027	0.026	-0.2
Aggregate Services	61,978	0.201	0.219	0.3
Trade, Hotels, and Restaurants	56,284	0.074	0.093	0.9
Transport, Storage and Communications	68,823	0.028	0.038	1.2
Financial Services and Insurance	198,584	0.006	0.007	0.7
Real Estate and Business Services, etc	1,012,017	0.002	0.011	7.1
Public Administration and Defense	41,154	0.030	0.018	-1.9
Construction	62,773	0.031	0.080	3.7

Source **: Amirapu and Subarmanian (2015).**

as for manufacturing (both registered and unregistered). The first point to note is the astounding variation within services, reinforcing the case for disaggregation. In 1984 for example, the level of productivity in the real estate and business services sectors was 25 times as much as in public administration (essentially government) and close to 20 times as much as in retail. The productivity levels in two—financial services and business services—out of six service subsectors exceed that of registered manufacturing.

7.4.2 Domestic convergence

The issue of whether there was unconditional convergence within India for service subsectors over the last 3 decades is now examined. Notably, unconditional domestic convergence is found in nearly all the service subsectors, and across many time horizons (not reported here). In fact, the speed of domestic convergence for most service subsectors is found to be similar to that in registered manufacturing (about 2 percent) and, in some cases, substantially higher. For example, real estate and business services seem to converge at double the rate at which registered manufacturing converges.

7.4.3 International Convergence

Rodrik (2013) provides evidence using UNIDO data that industries in the (organized) manufacturing sector consistently exhibit global convergence in labour productivities, although Indian manufacturing industries converge to the global frontier much more slowly than the average, if at all. What about the service subsectors?

Using data on sectoral productivities from the World Bank's World Development Indicators (WDIs), Ghani and O'Connell (2014) argue that services in the aggregate have also exhibited convergence to a similar or even greater degree than manufacturing – at least for recent time periods (approximately 1990 to 2005). This is an interesting finding, but for this analysis in particular services should be disaggregated as we might well expect convergence behaviour to vary by subsector due to significant differences in sectoral characteristics such as tradability.

Table 7.5 : Unconditional Convergence in Service Subsectors across Countries (1990-2005), regressions include productivity growth against log of initial productivity

Log of initial productivity	Trade, Hotels and Restaurants	Transport, Storage and Communication	Finance, Insurance, and Real Estate	Community, Social and Personal Services	Construction
	(1)	(2)	(3)	(4)	(5)
Trade, Hotels and Restaurants	-0.007 (0.005)				
Transport, Storage and Communication		-0.00 (0.008)			
Finance, Insurance, and Real Estate			-0.031*** ((0.007)		
Community, Social and Personal Services				-0.030*** ((0.008)	
Construction					-0.026*** (0.008)
Constant	0.061 (0.053)	0.105 (0.083)	0.325*** ((0.076)	0.315** (0.094)	0.269*** (0.085)
Observations	27	27	27	9	27

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source:* Amirapu and Subarmanian (2015).

Table 7.5 reports international convergence results by service subsectors over the period 1990 to 2005 using data from the Groningen Growth and Development Centre (GGDC). Although the set of countries in the analysis is severely limited due to data availability,[7] the results are still interesting. We see that some service subsectors (Finance, Insurance, and Real Estate; Community, Social and Personal Services; and Construction) do seem to exhibit strong international convergence, while others (Trade, Hotels and Restaurants; Transport, Storage and Communication) do not. Surprisingly, the set of sectors exhibiting convergence seems to include even some apparently non-tradable sectors, such as construction.

The conclusion thus far seems to be that many– but not all – service subsectors satisfy the requirements of high productivity growth, domestic convergence, and international convergence.

7.4.4 Expansion of Services?

Evidence that the share of output and employment from manufacturing in India had hardly changed in 30 years has already been presented. In the Tables below analogous evidence for services in India – both in aggregate and for particular service subsectors is presented.

In contrast to registered manufacturing – the share of output from aggregate services rose dramatically over the last 30 years, from about 35 percent to more than 50 percent of GDP. The share of aggregate services in employment, in contrast, increased in a far more modest fashion (see Table 7.6). But there is nevertheless a distinct contrast with registered manufacturing. Aggregate services employment grew faster than that in registered manufacturing and a number of service subsectors—transport, real estate and construction—registered substantially faster employment growth. In other words, services are becoming an ever more important source of wealth, and while they have not delivered rapid employment growth, a number of service sub-sectors have generated more rapid employment growth than manufacturing.

7.4.5 Alignment with comparative advantage?

We argued above that, in a low-skilled labour abundant country like India, a sector must make use of this dominant resource in order to offer the greatest possibilities for expansion and structural transformation. We also saw that registered manufacturing was a fairly skill-intensive sector with high average educational attainment.

The same table also shows that services in aggregate are no less skill-intensive: on average, 78 percent of workers in the service sector have at least a primary education (77 percent in registered manufacturing), and 48 percent have at least a secondary education (43 percent in

Table 7.6 : India—Services vs Manufacturing Scorecard

	Feature	Registered Manufacturing	Trade, Hotels, Restaurants	Transport, Storage and Communi-cations	Financial Services and Insurance	Real Estate Business Services, etc.	Construc-tion
1.	High productivity	Yes	No	Not really	Yes	Yes	No
2A.	Unconditional domestic convergence	Yes	Yes	Yes	Yes	Yes	Yes
2B.	Unconditional international convergence	Yes, but not for India	No	No	Yes	Yes	Yes
3.	Converging sector absorbs resources	No	Somewhat	Somewhat	No	Somewhat	Yes
4.	Skill profile matches underlying endowments	Not really	Somewhat	Somewhat	No	No	Yes
5.	Tradable and/or replicable	Yes	No	Somewhat	Yes	Somewhat	No

Source : Amirapu and Subarmanian (2015).

registered manufacturing). Furthermore, a large number of service subsectors – including 1) Banking and Insurance, 2) Real Estate and Business Services, 3) Public Administration, 4) Education, and 5) Health and Social Services – have significantly higher educational attainment (90 percent or more of workers have at least primary education) than registered manufacturing. What this implies is that most service subsectors (precisely the high productivity, high growth subsectors, for the most part), have a limited capacity to make use of India's most abundant resource, unskilled labor. This may explain why the share of employment from services has risen so modestly, even while the share of output from services has grown so spectacularly.

7.5 Summary Scorecard and Conclusions

Table 7.6 below provides a summary scorecard comparing registered manufacturing and selected service subsectors. Before proceeding further, let us make clear a few important points. First, we compare service sectors with only the *registered* (i.e.: formal) manufacturing sector, because unregistered manufacturing is one of the lowest productivity sectors in the Indian economy– apart from agriculture – and so offers little promise for transformation. So, when there is talk on the transformational potential of manufacturing in India the focus must be exclusively on registered manufacturing.

Second, another contribution of this chapter is to offer an alternative way of thinking about transformational sectors beyond the traditional distinction based on manufacturing versus services. We have taken the position of comparing sectors based on their easily observable underlying properties. To be sure, there may be less tangible differences between manufacturing and services that are left out in our analysis.

For example, our present analysis does not consider the extent to which certain sectors (such as registered manufacturing) may be more likely to induce learning spillovers to other sectors of the economy, which may be important. Other missing dimensions include the political one: Dani Rodrik has suggested that manufacturing may play an indirect role in the political development of young nations by providing a forum in which citizens learn to practice compromise in a democratic context through the struggle between labour and capital "on the manufacturing shop floor" (Rodrik, 2013b). Though our analysis leaves out such channels, we believe they are second-order in comparison with the 5 desirable features laid out earlier.

Proceeding to the comparison, there does not seem to be anything distinctive or superior about registered manufacturing when compared with certain other service subsectors. Like manufacturing, several of the service subsectors also exhibit high productivity and convergence – both domestic and international. However, they also share the shortcoming that these sectors are highly skill intensive in their resource requirements, which is out of kilter with the skill profile of the Indian labor force. Their potential to generate widely shared or inclusive growth is thus likely to be limited – and indeed seems to have been so given the lack of expansion observed earlier (and which is recorded in the scorecard).

One sector that markedly stands out from the others in the table below is construction: it appears to exhibit both types of convergence, does not require high education levels and has grown significantly in its resource use over the last three decades. However, the sector is not tradable and in any case is low productivity, so that moving labor resources to the sector does not considerably improve overall welfare.

So, in some ways, the choice for India is not manufacturing versus services but comparative advantage *deifying* (unskilled-intensive) sectors versus comparative advantage *defying* (skill-intensive) sector development. This is both a positive and a policy question.

While India's skill-intensive pattern of development has no doubt been costly, there has been a significant upside. Myron Weiner, among others,

has drawn attention to the disappointing post-Independence performance of the Indian state in delivering education, reflected in very slow improvements in literacy rates, especially amongst women. While the supply of educational services by the state was inadequate, the puzzle arose as to why there was not greater demand for education and hence greater pressure on the state to meet this demand.

One answer to this puzzle is that the private returns to literacy and basic education must have been low. There is now evidence that the increasing opportunities that are spurring economic growth also contribute to raising these returns, leading to a greater demand for educational services—public and private—and hence improvements in educational outcomes (Munshi and Rosenzweig, 2003). This has put pressure on the supply of education. The government's failures to provide good schools are well-known, but growth has changed the picture dramatically, largely because it has increased the returns from education—and hence the demand for it.

Evidence is provided by the work of economists Kartik Muralidharan and Michael Kremer who show that private schools are mushrooming in rural India (many prominently advertising "English Medium") because of teacher absenteeism in public schools. One also hears of companies creating training centers to build skills in the cities (such as the Infosys institute in Mysore) because institutions of higher education are notoriously inadequate. This endogenous increase in human capital could be one of the offsetting benefits of the comparative advantage-defying, skill-intensive growth model.

The policy question is the following. *Insofar as the government retains influence over shaping the pattern of development, should it try to rehabilitate unskilled manufacturing or should it accept that that is difficult to achieve, and create the groundwork for sustaining the skill intensive pattern of growth?* Attempting the former would be a history-defying achievement because there are not many examples of significant reversals of de-industrialisation. A lot would have to change in India—from building the infrastructure and logistics/connectivity that supports unskill-intensive manufacturing to reforming the panoply of laws and regulations—or perhaps addressing corruption in the manner of their enforcement—that may discourage hiring unskilled labor and achieving scale in the formal sector.

Sustaining a skill-intensive pattern on the other hand would require a greater focus on education (and skills development) so that the pattern of development that has been evolving over time does not run into shortages. The cost of this skill intensive model is that one or two generations of those who are currently unskilled will be left behind without the opportunities to advance. But emphasising skills will at least ensure that future generations can take advantage of lost opportunities.

In some ways, the choice confronting India is really about how to make it a Lewisian economy that has unlimited supplies of labor. India can either create the conditions to ensure that its existing unlimited supplies of unskilled labor are utilisable. Or, it can make sure that the currently inelastic supply of skilled labor is made more elastic. Both are major challenges.

What the analysis suggests is that while Make in India, which has occupied all the prominence, is an important goal, the Prime Minister's other goal of "Skilling India" is no less important and perhaps deserves as much attention. Make in India, if successful, would make India a Lewisian economy in relation to unskilled labor. But "Skilling India" has the potential to make India a Lewisian economy with respect to more skilled labor. The future trajectory of Indian economic development could depend on both.

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