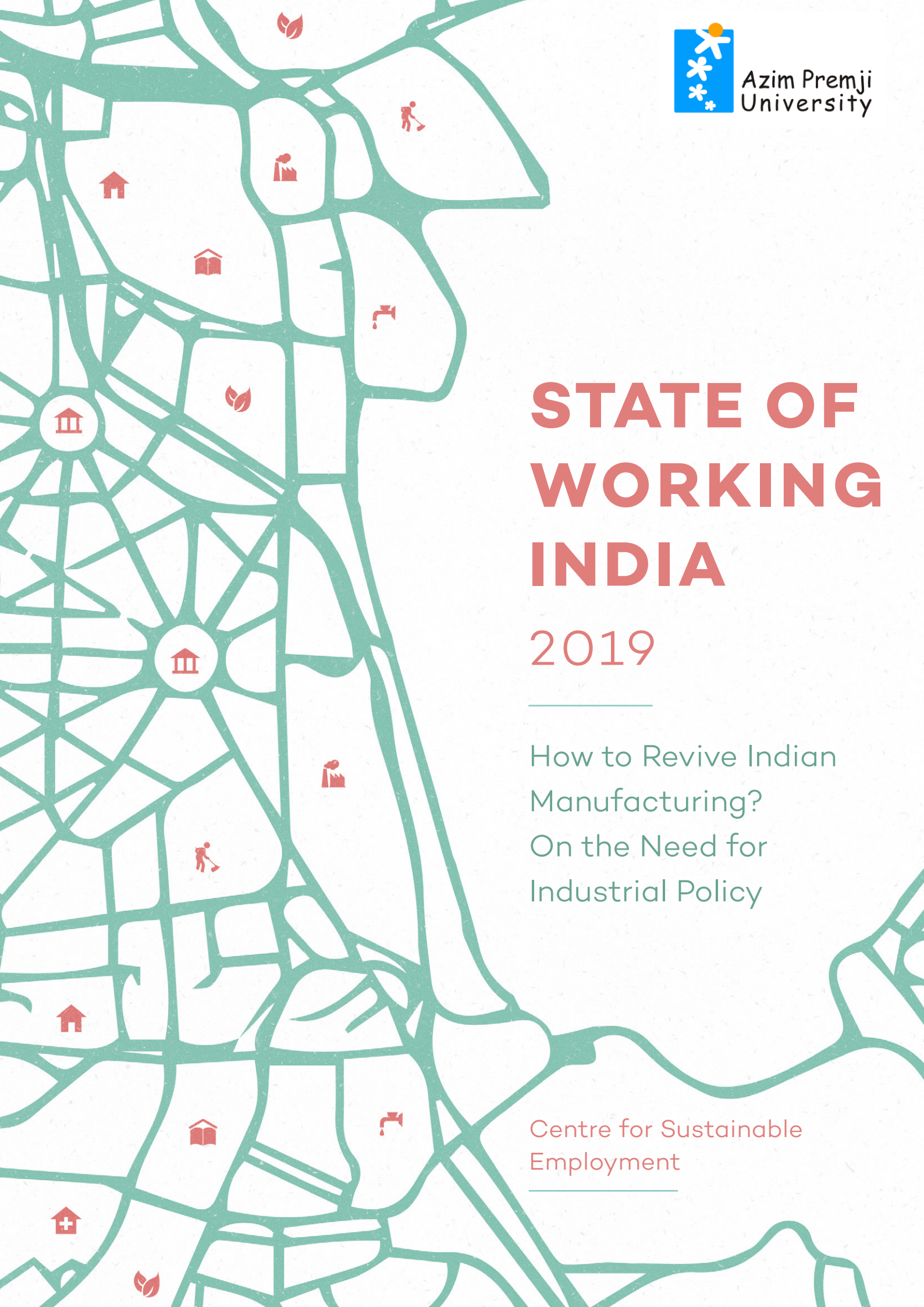

Azim Premji University

STATE OF WORKING INDIA

2019

How to Revive Indian Manufacturing? On the Need for Industrial Policy

Centre for Sustainable Employment

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How to Revive Indian Manufacturing? On the Need for Industrial Policy

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Executive Summary

1. This paper argues that the absence of a well-articulated industrial policy has been a major stumbling block in expanding manufacturing employment in the country.

2. State intervention has played a crucial role in the successes of the East Asian economies such as South Korea and Taiwan where the 'leading hand of the State' was instrumental in identifying potential areas of growth, as well as in guiding, promoting, and disciplining the private players.

3. The withdrawal of the State from industrial development in India after the 1990s has implied not only a marked deceleration in public investment but also the State's abdication from the sphere of industrial policy. This has been a crucial difference between the Indian and the East Asian industrialisation experiences.

4. After a long period out in the wilderness, State intervention in industrialisation has been making a comeback in scholarly and policy circles. There is now greater recognition of the fact that economic growth is delayed not just by government failures, but often more severely due to market failures. Recent discussions highlight the role of State as a leading player, especially in the creation of new technologies and in the setting up of sophisticated industries.

5. After 2004-05, while there has been a marked acceleration in the growth of factory employment in India, the growth of overall manufacturing employment decelerated, mainly due to the stagnation in employment growth in the small and informal sector firms. The 'spread effects' of the growth of the factory sector on small firms in the informal sector have clearly reduced after the 2000s.

6. At the same time, there has been growing informalisation within the factory sector during recent years. The shares in incremental employment of contract workers and other employees who are outside the purview of the labour laws have been rising sharply since the 2000s onwards. Also, as shares of gross value added in the factory sector, profits have been rising and wages declining during this period.

7. Given such a context, labour laws no longer appear to be a constraint on the growth of the manufacturing. Experiences from various industries show that

employers find different ways to circumvent the existing labour regulations, while the authorities adopt a lax attitude towards implementing them.

8. After 2011-12, the sharp decline of investment in the Indian economy has contributed to a slowing down in the growth of the factory sector. But the growth-retarding effects are likely to be much higher in the informal sector, especially in the aftermath of demonetisation of high value currency notes in November 2016 and the introduction of goods and services tax (GST) in July 2017.

9. The paper identifies the following key issues in Indian manufacturing, which a new comprehensive industrial policy should address.

a. Public investment: Investment rates in India had reached the levels achieved by China by 2007. However, the Chinese and the Indian rates began to diverge after that. In the aftermath of the global financial crisis, while the State in China responded with massive investments in infrastructure and new technologies, the Indian economy suffered due to stagnation in both public and private corporate investments.

b. Infrastructure: In India, electricity shortages have had a significant negative effect on the growth of output and revenues of manufacturing firms. The growth-retarding impacts of power shortages have been more severe on small industrial units, which cannot afford to install generators. Our field research in Coimbatore in Tamil Nadu confirms that power shortages have been the most serious constraint to growth in this industrial town between 2007 and 2014.

c. Finance: From the 2000s onwards, development banks in India as well as in many other countries began offering 'universal banking services', diluting their core strengths in long-term lending. With the crisis due to NPA and other problems affecting the banking sector, credit disbursed by the commercial banks to the industrial sector has declined sharply from 2014-15 onwards. Several owners of small and medium firms we spoke to highlighted the problem of relatively high interest rates.

d. Trade liberalisation: The weighted average of import tariffs in India on capital goods declined from 94.8 per cent in 1991-92 to 5.6 per cent in 2009-10. The tariff reductions have adversely affected the prospects of India's manufacturing firms, which are, as noted above, already disadvantaged by many supply-side constraints.

e. Capital account liberalisation: The gradual liberalisation of India's capital account from the 2000s onwards and the resultant increase in the inflows of foreign portfolio investments (FPI) into the country have created problems for the country's manufacturing sector. The volatility in FPI flows has led to wide fluctuations in exchange rates and also in the prices of several commodities (such as steel and cotton).

f. FDI: Recent studies show that the impact of FDI in promoting manufacturing growth in India, especially by bringing in new technologies and managerial capabilities, has not been very high.

g. Regional diversity: In India, industrial policies should reflect the priorities and requirements for industrial development across various regions. There are variations across states with respect to demographic structures, which also have important implications for their labour markets. This paper uses the example of Kerala to illustrate the importance of state-specific industrial policy.

h. Research and development: India requires technological advances that generate new economic opportunities and absorb — not displace — labour. It needs to be noted that innovations and technological interventions are needed in the case of traditional and labour-intensive industries as well.

i. Domestic Market: India should envisage an industrial growth that is driven more by the domestic market, which will benefit from an improvement in the wages and incomes of its rural and urban informal workers. In any case, the prospects for a growth strategy led by exports are rather bleak, given the continuing crisis and the uncertainities in the global economy.

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1 / Introduction

A striking feature of the Indian economy has been the relatively small contribution made by the manufacturing sector to the country's gross domestic product (GDP) and, more importantly, to employment. In 2017, manufacturing accounted for only 15.1 per cent of India's GDP, compared to 29.3 per cent in China.[1] In 2011-12, India's manufacturing sector provided employment to 61.3 million, which was only 13 per cent of the country's total workforce of 472.5 million.[2]

What explains India's relatively slow progress in industrialisation and industrial growth? This note argues that the absence of a well-articulated industrial policy has been a major stumbling block to expanding manufacturing employment in the country.

In India, manufacturing consists of the organised and unorganised (or registered and unregistered) sectors. The organised manufacturing sector is almost identical to the factory sector. The factory sector comprises factories that employ more than 10 workers and operate with the aid of electric power (as well as factories that employ more than 20 workers without the aid of electric power). Annual Survey of Industries (ASI) is the main source of data on the factory sector, and according to ASI, the factory sector employed 13.3 million workers in India in 2011-12 (and 14.9 million workers in 2016-17).

The National Sample Survey Office's (NSSO) household surveys on Employment and Unemployment (EUS) is the other major source of information on Indian manufacturing. According to the EUS conducted in 2011-12 (which is the latest publicly available survey), the size of India's manufacturing workforce (organised and unorganised combined) was estimated to be 61.3 million. This implies that factory workers (13.3 million) comprised 21.7 per cent of all manufacturing workers in India in 2011-12. At the same time, close to 80 per cent of all manufacturing workers in India are outside the factory sector, engaged in small, informal (or unregistered) enterprises.[3] It is notable that despite its low share in employment, the organised sector contributed 67.6 per cent of India's total manufacturing GDP in 2010-11 (GOI 2016).

2 / The role of state in Industrial development

There has been a long-standing debate on the extent to which interventions by States or governments, especially in the building of technological and institutional capabilities, contribute to the process of industrialisation. It is well known that State intervention in industrialisation has been extensive in the case of the former Soviet Union, China during its Maoist phase, and India during the planning years. In each of these industrialisations, the public sector played a dominant role, even in the operations of private firms which had been subjected to significant controls by the State. These experiments produced mixed results with respect to achieving industrialisation and economic growth.

According to many commentators, State intervention played a crucial role in the miraculous successes of the East Asian economies too, such as of South Korea and Taiwan (Amsden 1989; Chang 2007). Remarkably, in these countries, the role of State intervention was not in the setting up of public sector units. On the other hand, the 'leading hand of the State' had been instrumental in identifying potential areas of growth, as well as in guiding, promoting, and disciplining the private players (such as the chaebols in South Korea) (Amsden 1989).

Nevertheless, neoclassical economists and 'Washington institutions' such as the International Monetary Fund (IMF) and the World Bank have been arguing for a limited role for the government in industrial and economic development. They contend that the 'invisible hand of the market', in itself, will bring in economic development and that the government only needs to ensure that conditions exist for the free operations of the markets. Pointing to many instances of government failures (such as the inefficiency in public sector units in some countries), the IMF and the World Bank oversaw 'structural reforms' in several developing countries from the 1980s onwards. These reforms resulted in a retreat of the State from industrial and economic development.

However, a number of economists have challenged the neoclassical narrative on how industrialisation could be driven by market forces alone. Alice Amsden (1989) pointed out that the East Asian countries achieved their successes not by sticking to only those industries in which they had comparative advantages (such as labour intensive industries). On the contrary, they (South Korea, for instance) made bold forays into diverse and challenging areas such as shipbuilding and steel making. They managed to achieve this because the governments in these countries offered assistance, especially in the form of subsidies, to the deserving firms. In other words, Amsden (1989) argued that late-industrialising countries such as South Korea achieved success by 'getting relative prices wrong' (for instance, with subsidised credit, capital was being made cheap in a capital-scarce country) -- not by 'getting relative prices right' as the neoclassical economists contend (Amsden 1989).

In the case of the advanced economies of today, including Britain and the United States, Ha Joon Chang (2002) pointed out that the State intervened to nurture industries in these countries too, during their phases of industrialisation. Therefore, when institutions such as the IMF deny developing countries the opportunities for industrialisation with State support, they are, in fact, 'kicking away the ladder' for climbing the steps for development (Chang 2002; Chang 2007).

The voices favouring State intervention in industrialisation have been growing louder during recent years. First, there is now greater recognition of the fact that economic growth is delayed not just by government failures, but often more severely due to market failures, especially with the eruption of financial crises in many parts of the world. Secondly, the spectre of deindustrialisation is emerging as a threat to employment growth not just in the developed world but also in developing countries. According to Rodrik (2015), deindustrialisation refers to a situation in which countries '[run] out of industrialisation opportunities sooner and at much lower levels of income compared to the experience of early industrialisers.' Rodrik (2015) attributes this to globalisation and labour saving technological progress in manufacturing.

Given such a context, there is now a much greater appreciation for the role of industrial policy in aiding industrialisation. Mazzucato (2011) has highlighted the critical contributions made by the 'entrepreneurial State' towards achieving economic growth. She argues that State has been a leading agent – and not just a facilitator – in achieving innovative breakthroughs, including in the case of the internet, the computer industry and the pharma-biotech industry. The IMF, in a recent paper, seems to have finally admitted the role of what it describes as 'Technology and Innovation Policy' in fuelling economic growth. This paper points out how the East Asian miracle economies followed the 'moonshot' approach to development: the leading hand of the State directing domestic firms in these countries into technologically sophisticated industries (Cherif and Hasanov 2019).

The role of the State in financing industrial development is important too, as development banks played a vital role in the industrialisation of Germany (Gerschenkron 1962). Development financial institutions (DFIs) have been crucial for providing long-term finance for manufacturing growth in several countries including Germany, Japan, South Korea, Brazil, and India. Commercial banks suffer from a problem of maturity mismatch when it comes to lending for long-term investments, as they are dependent on short-term borrowings from depositors. While the decline of DFIs in India since the 2000s has hampered the country's industrial growth, the setting up of China Development Bank in 1994 has really boosted that country's industrialisation drive during the recent years (Nayyar 2018).

3 / State and industrialisation in india

As is well known, India had launched an ambitious programme of industrialisation led by the State and the public sector during the 1950s, which had indeed been a model for other developing countries too. Industrialisation in India during the 1950s through the 1970s had been characterised by large investments by the public sector in key, strategic areas, as well as by extensive control of the State over the activities of the private sector through the licensing regime.

Industrial development that occurred in India during the planning phase had been unsuccessful in generating adequately large manufacturing employment, particularly considering the vastness of the country's labour reserves. India's Second Five-Year Plan model emphasised the building of a capital goods sector, comprising machines that produce other machines. According to this model, greater allocation of investment to the capital goods sector would result in faster growth of savings, investment and output in the long run.

Investment into capital- and technology-intensive sectors during the planning years (including into areas such as space science and atomic energy) laid the foundations for India's diversified economic base. At the same time, however, the employment generating potential of the capital goods sector had been limited. Given such a context, it was believed (perhaps a little too naively) that handicrafts and the production of consumer goods in the small-scale sector would alleviate the problem of unemployment in the country.

Nevertheless, Indian planning did very little to remove the hurdles to the growth of agriculture and small-scale industries (SSIs). India's record during the post-Independence period in implementing land reforms and ensuring primary education for all has been rather unimpressive. As a result, the benefits from State-led development have so far reached only a minority of Indians. The slow growth of rural incomes and the persistence of high income inequalities have dampened the growth of industrial demand in the country, especially for mass-consumption goods (such as apparels or processed food).

India's economic development shifted from being State-led to increasingly market-driven from the 1980s onwards. The licensing requirements for private sector investments began to be liberalised from the 1980s itself. India inaugurated far-reaching market-oriented economic reforms in 1991. With the 1991 reforms, the Indian economy has become increasingly open for foreign trade and investment. Quantitative restrictions (QRs) on imports had been virtually removed by the early 2000s, and tariffs on most goods have been reduced drastically in the following years. The norms on foreign direct investment (FDI) had been liberalised. The reservation of certain sectors for the small-scale sector had been abolished in 1991. At the same time, with the reforms in the banking sector, credit received by micro and small industries as well as small agricultural cultivators has been on a decline.

Public investment in India has been declining sharply from the 1990s onwards. In fact, the capability of the State to undertake public expenditures has been undermined by its commitment to maintain fiscal discipline. With the opening of the capital account, increasingly from the 2000s, the Indian economy has been coming under the influence of highly volatile, short-term capital inflows. Given India's heavy dependence on the imports of oil (and in recent years electronic goods), the country's current account has been in a deficit thereby increasing the vulnerabilities on the external front.

It may be noted that the withdrawal of the State from industrial development in India after the 1990s has implied not only a marked deceleration in public investment but also the State's abdication from the sphere of industrial policy. This has been a crucial difference between the Indian and the East Asian industrialisation experiences. In fact, during the post-1991 period, state governments (in particular) in India have had very little autonomy with respect to investments and policies related to industrial growth. Given the imbalances in the nature of Centre-state fiscal relations in India, state governments do not have large enough financial resources at their command to make impactful interventions in the industrial sector. They are often compelled to compete with each other in attracting domestic private and foreign investments by extending tax and other concessions to the private industrialists.

4 / Trends in indian manufacturing

4.1 / Growth of indian manufacturing over the decades

According to estimates based on EUS, India's manufacturing employment was 32.2 million in 1983, 39.8 million in 1993-94, 55.2 million in 2004-05, and 61.3 million in 2011-12 (see Table 1 and Figure 1). The size of the manufacturing workforce relative to the country's total workforce remained steady at 10.6 per cent between 1983-84 and 1993-94, but rose to 12.1 per cent by 2004-05 and to 13 per cent by 2011-12 (see Table 1).

Despite the growth in the size of the overall manufacturing workforce, there had been hardly any significant change in the size of India's factory sector during the 1980s and 1990s. According to the ASI, factory sector employment in India was 8.2 million in 1983, 8.8 million in 1993-94, and 8.5 million in 2004-05. Factory sector employment as a share of total manufacturing employment in India declined from 25.5 per cent in 1983 to 15.4 per cent in 2004-05 (see Table 1 and Figure 1). The factory-based production of cotton and jute textiles suffered steep declines during the 1980s, with thousands of mill workers losing jobs in Mumbai, Kolkata, Ahmedabad, and other industrial centres.

The introduction of economic reforms in 1991-92 was followed by a surge in industrial investments in India. Almost all factory-sector industries experienced acceleration in the growth of output and employment from 1991-92 to 1995-96, and the star performers had been minerals and metals, machinery, automobiles, and chemicals and petrochemicals. However, the growth of output in India's organised manufacturing sector decelerated between 1996-97 and 2001-02, with several industries recording negative or very low rates of growth. Factory-sector manufacturing employment increased sharply, by 1.5 million, during the first half of the 1990s, and declined subsequently by 1.1 million, during the second half of the 1990s (see Figure 2 and Table 2).

Given the above-referred context, India's industrial growth during the 1980s through the first half of the 2000s has been described as 'jobless.' That is, despite the relatively fast growth of factory-sector output, the growth of factory-sector employment in the country has been stagnant during this period (see Figure 2). Some scholars have argued that labour regulations have restricted flexibility in India's labour market which slowed down the growth of factory employment in the country.

It is notable that despite the stagnancy in the growth of factory employment, total manufacturing employment in India (NSS-EUS) increased by 23 million (from 32.2 million to 55.2 million) between 1983 and 2004-05 (see Table 1). This suggests that the expansion of manufacturing employment in India during the early 1980s to the middle of the 2000s occurred largely in micro and small units in the unorganised sector.

4.2 / Manufacturing employment during a phase of fast growth : 2004-05 to 2011-12

The growth of employment and output of the organised manufacturing sector (as well as of overall GDP) in the country registered an impressive revival during the early 2000s. Factory sector employment in India increased from 8.5 million in 2004-05 to 13.4 million in 2011-12 (see Figure 2) – an increase of 4.9 million new jobs over this seven-year period. That was remarkable compared to the near 'jobless' growth that characterised this sector for the two-and-a-half decades since the 1980s.

The record of employment growth in the unorganised manufacturing sector, however, presents an altogether different picture. Between 2004-05 and 2011-12, NSSO EUS data shows that overall manufacturing employment in India increased from 55.2 million to 61.3 million – thus an increase of only 5.1 million new jobs. At the same time, as we have already seen, organised manufacturing employment had registered a sharp increase during this very period (4.7 million new jobs from 2004-05 to 2011-12). Thus, between 2004-05 and 2011-12, the growth of employment in the manufacturing sector (organised and unorganised sectors combined) decelerated, despite a revival in

employment growth in the organised sector. Clearly, this points to a sharp downward fall in the growth of employment in India's unorganised manufacturing from the mid-2000s onwards.

Between 1983 and 2004-05, employment in the relatively 'modern' industries – chemicals, petroleum, rubber and plastic products, minerals, metals, metal products, machinery, equipment, instruments, motor vehicles, and transport equipment – increased by approximately 6.3 million (NSS-EUS). During this period, the net increase in factory employment in the same set of industries was only 0.9 million (see Table 2). This suggests that for every new job in the factory sector, approximately six jobs had been generated in the unregistered sector in the above-referred set of industries during the years from 1983 to 2004-05.

The period between 2004-05 and 2011-12, however, presents a completely different picture. The net increase in factory employment during this period (according to ASI data) in the modern industries referred above was 3.2 million (thus a much better record compared to the corresponding increase of only 0.9 million between 1983 and 2004-05). At the same time, the NSS-EUS suggest that the net increase in overall employment in these industries during the 2004-12 period was also 3.2 million. This implies that there had been hardly any net increase in employment in the unregistered sector in a wide range of industries, including chemicals, plastic products, minerals, metals, metal products, machinery and equipment, and motor vehicles.

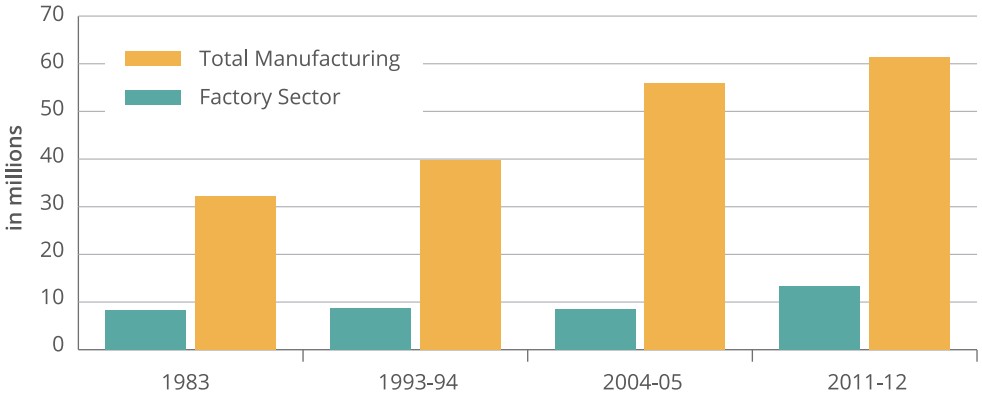
It is important to note that even within the factory sector, a substantial share of the incremental employment created after the 2000s has been in relatively large factories. Rakshit (2019) shows that factories that employ 200 or more workers accounted for 61 per cent of the total factory employment in India in 2014-15, up from 54 per cent only in 2000-01. In fact, 43 per cent of the incremental employment during the 2000-2015 period occurred in factories employing 500 or more workers (Rakshit 2019).

Table 1: Employment in the Factory Sector and Manufacturing in India, in million numbers and as % of total employment in the country

Years	Employment in million numbers			Manufacturing employment as % of total employment	
	Factory sector	Manufacturing, total	Total Employment (all sectors)	All workers	Urban male workers*
1983	8.2	32.2	303.4	10.6	
1993-94	8.8	39.8	374.4	10.6	
2004-05	8.5	55.2	457.8	12.2	
2011-12	13.4	61.3	472.5	13.0	16.7
2017-18	14.9**				15.6

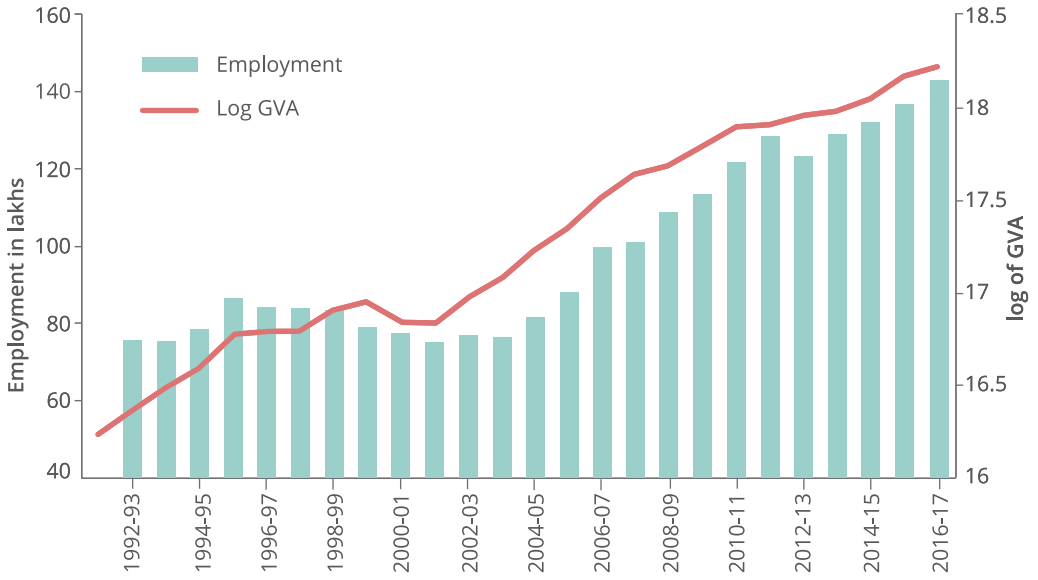
*Sources and notes: Author's estimations based on various rounds of EUS conducted by the NSSO (for manufacturing and total employment) and ASI (for factory sector employment). See Thomas and Johny (2018) for more details; *Jha (2019) based on the yet-to-be released Periodic Labour Force Survey (PLFS) conducted by the NSSO. Relates to working-age population only; ** relates to the year 2016-17.*

Figure 1: Employment in the Factory Sector and Manufacturing in India, in million numbers



Sources and notes : Author's estimations based on various rounds of EUS conducted by the NSSO (for manufacturing and total employment) and ASI (for factory sector employment).

Figure 2: Log of Gross Value Added and Employment in lakhs, India's Factory Sector: 1991-92 to 2016-17



Sources and notes : Annual Survey of Industries, various years

Table 2: Employment in the Factory Sector in India, industry-wise, numbers in 1000s

Industries	Increment to employment						Employment in 2016-17
	1973-74 to 80-81 (7 yrs)	1980-81 to 91-92 (11 yrs)	1991-92 to 95-96 (4 yrs)	1995-96 to 04-05 (9 yrs)	2004-05 to 11-12 (7 yrs)	2011-12 to 16-17 (5 yrs)	
Food products, beverages, tobacco products (10, 11, 12)	740	-35	207	1	406	100	2322
Textiles, garments, leather goods, footwear (13, 14, 15)	231	-160	377	6	821	404	3090
Wood products, furniture, jewellery, toys, precision devices (16, 31, 32)	10	4	67	50	105	121	515
Chemicals, petroleum, rubber and plastic products (19, 20, 21,22)	227	188	264	48	729	427	2325
Minerals, metals, metal products (23, 24, 25)	229	164	217	-108	1275	79	2775
Machinery, equipment, instruments (26, 27, 28)	153	139	181	-230	649	91	1543
Motor vehicles, transport equipment (29, 30)	96	61	143	-170	558	223	1304
All manufacturing (10:32)	1713	378	1524	- 471	4675	1435	14289
Average annual increment to employment, all manufacturing	245	34	381	-52	668	287	-

Sources and notes : Annual Survey of Industries, various years

4.3 / Growth of manufacturing employment after 2011-12

The growth of overall GDP and of manufacturing incomes in India had been at extremely fast rates (annual growth rates of above 8 per cent for both) during the years 2003-04 to 2007-08. However, the worldwide economic crisis, which became pronounced by 2008, affected Indian industries too, especially the export-oriented sectors including garments and engineering. The expansionary monetary and fiscal policies initiated in India to tide over the economic slowdown, which included greater lending by banks, helped to overcome the crisis to some extent.

Nevertheless, the Indian economy has been facing greater difficulties after 2011-12. First, there has been a slowdown in investment rates in the Indian economy. Gross capital formation as a proportion of the country's GDP was 39.5 per cent in 2012-13 but declined to 33.5 per cent by 2016-17. India's exports have slowed down in growth too, with a decline in the global demand conditions. India's current account deficit had dipped to very high levels by 2012-13 (touching 5 per cent of GDP in that year). The change in the base year for GDP estimations from 2011-12 onwards makes it difficult to compare the rates of growth before and after that year. However, certain points are worth noting. There has been a clear deceleration in the growth of agricultural incomes and rural demand in India after 2011-12 (compared to the years between 2003-04 and 2011-12). The construction sector which had been the most important source of employment in the country during the period from 2004 to 2012, experienced a noticeable slowdown in the growth of incomes after 2012-13. According to ASI data, the growth of value added and employment in India's factory sector decelerated markedly from 2011-12 onwards, relative to the growth during the 2004-11 period. The growth of value added had revived somewhat during the 2014-16 period but slowed down again in 2016-17. The slowdown in employment growth after 2011-12 in industries such as machinery, minerals, and metal products is of particular concern (see Figure 2).

As is well known, demonetisation of high-value currency notes in November 2016 and the introduction of goods and services tax (GST) in July 2017 have been landmark events with very serious implications for the economy and the labour market. Small units in the informal sector have been adversely affected by these policies. When informal sector units have been compelled to become part of the formal sector in the wake of demonetisation and GST, many of them may have possibly perished, causing severe loss of employment.

The employment situation in India has now reached a tipping point. An expansion of the country's working-age population, on the one hand, and the structural shift of the workforce away from agriculture, on the other, implies that new jobs will have to be generated in the non-agricultural sectors at a relatively fast rate. We have estimated that the potential workforce in India in industry and services grew at the rate of 14.7 million a year during the 2004-12 period. At the same time, the actual rate at which employment was created in industry and services in the country during the above-referred period was only 6.5 million per year -- or at less than half of the potential rate (Thomas 2015).

It is difficult to understand what may have happened to overall manufacturing employment growth in India during the recent years, given that the NSSO has not released any survey on employment and unemployment after 2011-12. The State of Working India 2018 report prepared by Azim Premji University, which examined evidence from Labour Bureau and other sources, and surveys conducted by the Centre for Monitoring of the Indian Economy (CMIE) has concluded that the growth of employment in India has clearly slowed down after 2011-12. It is learnt that the NSSO survey for the year 2017-18 has been completed, and some media outlets have published reports based on the yet-to-be-released data. According to these reports, the unemployment rate in the country had reached a record high level of 6.1 per cent in 2017-18 (Thomas 2019). These reports further suggest unimpressive growth in overall manufacturing employment. The share of manufacturing workers among all workers in the case of urban males (aged 15 years and above) declined from 16.7 per cent in 2011-12 to 15.6 per cent in 2017-18 (see Table 1).

5 / Industrial policy: parameters and considerations

5.1 / Labour rigidity argument: losing relevance?

The 'jobless' growth – stagnant growth of employment despite a relatively fast growth of value added – in India's factory sector between the 1980s and early 2000s has been the subject of scholarly debate. Some economists have argued that the slow growth of factory employment in India during the 1980s and in later decades has been mainly on account of the rigidity in the country's labour market. This rigidity has been attributed to the introduction of certain labour regulations in the country during the late 1970s, which, it is argued, made it difficult for the employers to retrench workers (Fallon and Lucas 1993; Besley and Burgess 2004). At the same time, some other scholars have questioned the argument that India's labour market is rigid, and even pointed to some of the problems in the methods used in studies that attributed jobless growth to labour regulations (Bhattacharjea 2009; see also the review in Thomas 2018a).

However, there are enough grounds to contest the above assessment, particularly in the context of the rising share of informal employment even within the formal segment of Indian manufacturing. Between 1999-2000 and 2014-15, directly employed workers accounted for only 33.5 per cent of the incremental employment in India's factory sector, while the rest were contract workers or other employees who are outside the purview of the labour laws (see Table 3). Annavajhula and Pratap (2012) find that contract workers are employed in almost every aspect of the production operation and they form 70-80 per cent of all workers in Maruti Suzuki's plants in Gurgaon and Manesar.

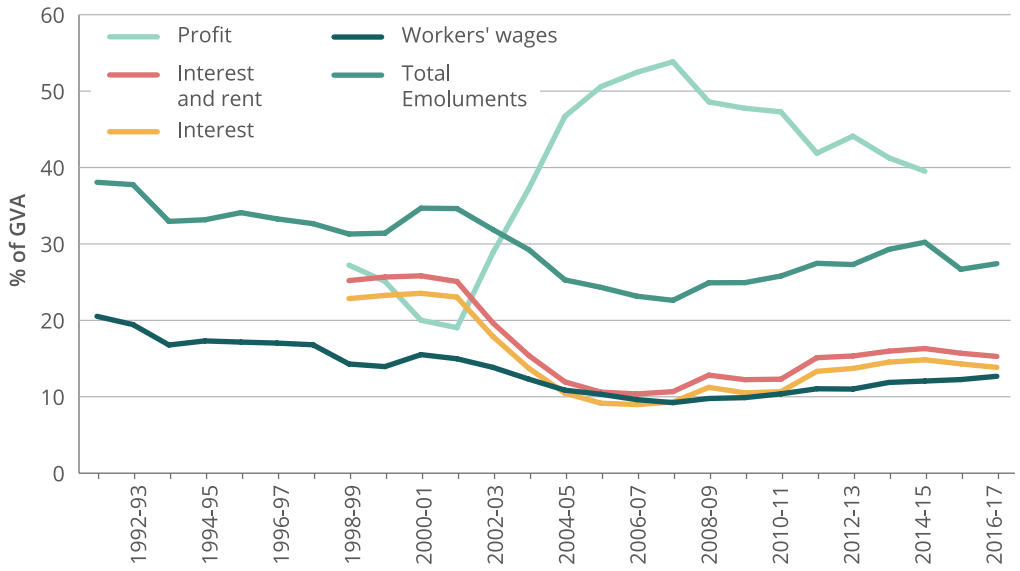
In recent years, trade union activism has declined in India, and the bargaining strength of labour relative to capital have substantially reduced. In India's factory sector, as a share of gross value added, profits increased sharply from 19.0 per cent in 2000-01 to 53.8 per cent in 2007-08, whereas workers' wages declined from 15.5 per cent to 9.2 per cent during the same period. Although profits as a share of gross value added declined afterwards (to 39.5 per cent in 2014-15), this decline was more due to the rise in interest charges and salaries for supervisors and managers (see Figure 3). Experiences from various industries show that employers find different ways to circumvent the existing labour regulations, while the authorities adopt a lax attitude towards implementing them (Dutta 2016). In a field study of women garment workers in Bangalore, Johny (2018) writes about the strategies adopted by the employers to avoid payment of gratuity benefits to workers (including persuading workers to terminate their current contract and re-join the same factory within a week or so on a new contract) (Thomas and Johny 2018).

Table 3: Distribution of employment in India's factory sector, by categories, 1999-2000 to 2014-15, as % of all persons employed

Category	1999-2000	2014-2015	Incremental employment, 1999-2000 to 2014-15
All Persons Employed	100	100	100
Workers	76.8	77.5	78.4
Directly employed	61.7	50.1	33.5
Men	50.9	40.1	24.7
Women	10.8	10	8.8
Employed through contractors	15.2	27.4	44.9
Employees other than workers	23.2	22	20.3
Supervisory and Managerial Staff	10	9.8	9.5

Source: Annual Survey of Industries, various years

Figure 3: Expenditures on Labour and Capital as % of Gross Value Added, India's Factory Sector, 1991-92 to 2016-17



Sources and notes : Estimates based on Annual Survey of Industries.

5.2 / Investment and industrial growth

In India, the growth of the industrial sector has been closely linked to trends in investment. Gross capital formation (GCF) as a proportion of GDP in India was 19.2 per cent in 1980-81, rose to 23.0 per cent in 1992-93, but following stagnation in investment after the mid-1990s, was still at 24.3 per cent in 2000-01 (all estimations using 2004-05 as the base). In fact, there has been a sharp fall in public investment in the Indian economy since the 1990s. Gross fixed capital formation (GFCF) in the public sector as a proportion of India's GDP peaked at 12.2 per cent in 1986-87, but subsequently declined to 6.6 per cent by 2002-03. Private corporate sector GFCF too was on a decline in the country from the middle of the 1990s.[4]

There has been a significant revival in investment and industrial growth in India since the early 2000s onwards. GCF as a proportion of GDP rose impressively to 38 per cent in 2007-08. This revival had been led by private corporate sector investments, which were financed largely by a notable rise in corporate profits and savings. However, after 2007-08, the private corporate sector GFCF has registered a decline in India. According to national income estimates with 2011-12 as the base year, GCF as a proportion of GDP in India was 39 per cent in 2012-13 but fell to 33.3 per cent by 2016-17.[5]

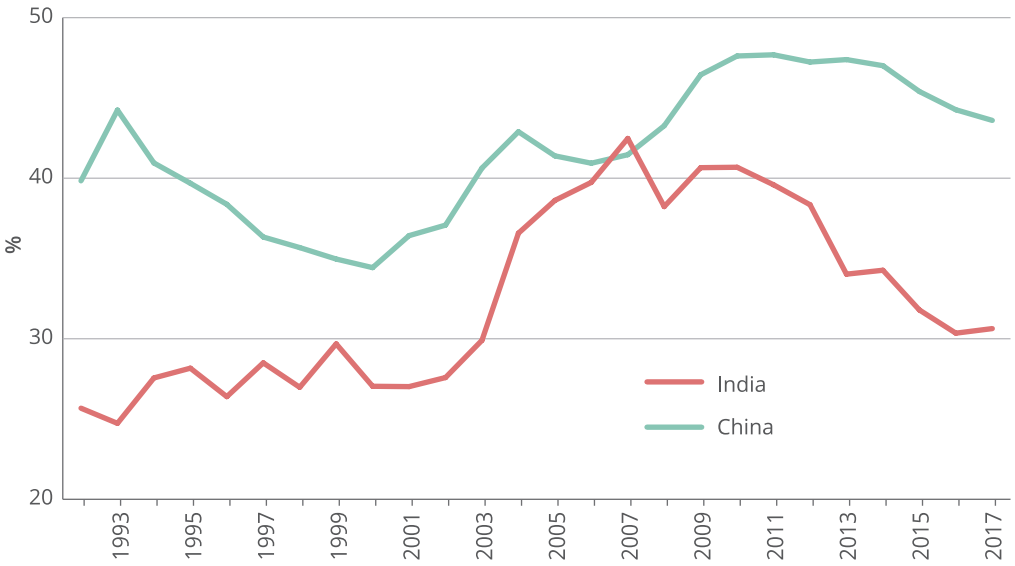
It is important to note that, as per the data compiled by the World Bank, investment rates in India had reached the levels achieved by China by 2007. However, the Chinese and the Indian rates began to diverge after that. By 2011, while GCF as a proportion of GDP was 39.6 per cent for India, this rate had risen to 47.7 per cent for China (see Figure 4). In the aftermath of the global financial crisis, while the State in China responded with massive investments in infrastructure and new technologies, the Indian economy suffered due to stagnation in both public and private corporate investments.

5.3 / Infrastructure challenges

In India, the growth of the infrastructure sectors such as electricity, roads, and ports have failed to catch up with the overall pace of economic growth. This has resulted in severe supply-side bottlenecks, adversely affecting the growth of the country's manufacturing sector. The constraints in the infrastructure sector raise the costs of Indian firms, especially the micro, small and medium units, and reduce the competitiveness of their products both in the domestic and export markets.

Estimates by the Ministry of Power show that the energy availability in India during 2011-12 was 857.9 billion units (or kilowatt hours), which was 8.5 per cent less than the energy required for that year. Power

Figure 4: Gross Capital Formation as % Gross Domestic Product, India and China: 1992 to 2017



Source: World Development Indicators

demand-supply shortages have been reported from every region of India and from a majority of Indian states in 2011-12 (CEA 2012, Annex II). By 2017-18, energy availability in India increased to 1203.6 billion units, and the deficit in energy availability was reduced to 0.7 per cent. The decline in deficit does not, however, confirm that the power situation has improved in the country. The reduction in the deficit could partly be a consequence of the slowdown in energy demand (which grew at an annual rate of only 3.2 per cent between 2013-14 and 2017-18), arising from a slow growth of demand from the industrial sector.[6]

It needs to be noted here that the power generation capacity in China was 2.4 times the power generation capacity in India in 2000 and 4.1 times the Indian figure in 2008. By 2017, electricity generation in China (in gigawatt hours) increased to 4.7 times the corresponding Indian level.[7] Public sector power utilities under the control of the Central or the state governments accounted for more than 80 per cent of the total energy generation capacity in India even in 2011-12 (and 53.9 per cent in 2019).[8] It is clear that investments by the public sector in power generation are crucial, especially given the long gestation nature of power projects.

Allcott et al. (2015) show that in India electricity shortages have had a significant negative effect on the growth of output and revenues of manufacturing firms. They further show that the growth-retarding impacts of power shortages have been more severe on small industrial units, which cannot afford to install generators. Our field research in Coimbatore in Tamil Nadu confirms that power shortages have been the most serious constraint to growth in this industrial town between 2007 and 2014. For instance, in January 2012, industrial units in Coimbatore suffered from six hours of power cuts on a daily basis, and as a result, several units were operating at 50 per cent or even less of their actual production capacities. The owner of a leading pump manufacturer in Coimbatore recounted the schedule of power cuts affecting his factory in January 2012: 10 am to 12 noon, 4 pm to 6 pm, 7.30 pm to 8.15 pm, and 9.45 pm to 10.30 pm.[9]

There are other forms of infrastructure bottlenecks that affect the growth of small industrial units. Consider, for instance, the case of agro- and food-processing industries. The prospects for the growth of such industries, especially in relatively small-scale units, are indeed very high in India. These industries will be beneficial for farmers and will also help provide cheap food for the general public. However, a major hurdle for the growth of such industries is the absence of the necessary infrastructure. Even facilities for storage and transport of fruits, vegetables and other agro-based products from the farm to the market (cold storages, for instance) are extremely poor in most parts of the country.

5.4 / Banking and credit

India used to have a relatively strong institutional mechanism for the long-term financing of industrial development, but this began to weaken from the 2000s onwards (Nayyar 2018). The development finance institutions (DFIs) in India included term-lending institutions such as Industrial Credit and Investment Corporation of India (ICICI) and Industrial Development Bank of India (IDBI); State financial corporations and State industrial development corporations; and institutions such as Life Insurance Corporation (LIC) and Unit Trust of India (UTI), which mobilised savings from households. Lending by DFIs as a proportion of GFCF by the private sector in the country climbed to 75 per cent by 2000-01 (Nayyar 2018).

However, from the 2000s onwards, development banks in India as well as in many other countries began offering 'universal banking services', diluting their core strengths in long-term lending. On the other hand, from the mid-2000s onwards, commercial banks in India increased their lending to large-scale industries, including units notably in the power and telecom sectors (Nagaraj 2013). Long-term lending by commercial banks to large-scale industries eventually led to the ballooning of their non-performing assets (NPAs).

During the pre-1990 years, targeting of bank credit to agriculture and SSIs was an important aspect of India's banking policies. The availability of subsidised credit made sizeable contributions to the growth of SSIs, for instance, the garment industry in Tiruppur (Chari 2000). However, the shares of agriculture and industry in the total allocation of credit by scheduled commercial banks in India declined from the 1990s onwards. As a proportion of non-food gross bank credit, advances to SSIs fell from 15.1 per cent in 1990-91 to 6.5 per cent in 2005-06, 5.7 per cent in 2010-11, and only 4.9 per cent in 2017-18 (see Figure 5). The number of loan accounts of the SSI sector in commercial banks had declined from 219 million in 1992 to 93 million in 2005. On the other hand, the share of personal loans and professional services in total outstanding bank credit in India increased from 9.4 per cent in 1990-91 to 27 per cent in 2005-06 and was 22.8 per cent in 2017-18 (Reserve Bank of India 2006; also see Figure 5).

It is important to note that with the crisis due to NPA and other problems affecting the banking sector, credit disbursed by the commercial banks to the industrial sector has declined sharply from 2014-15 onwards. The year-on-year growth of bank credit received by micro, small and medium industries had been negative during 2015-16 and 2016-17, and only marginal (only 0.5 per cent) in 2017-18. In comparison, the year-on-year growth of personal loans disbursed by scheduled commercial banks was above 15 per cent in each of these years (Reserve Bank of India).

Several owners of small and medium firms we spoke to highlighted the problem of relatively high interest rates. They say while they have to pay interest rates of 10-11 per cent in India, Chinese firms receive loans at much lower interest rates (say 4 per cent).[10] The high interest rates on working capital loans, in particular, are a heavy burden for the entrepreneurs. Typically, working capital requirements are relatively high during periods of recession, when firms are more likely to be burdened with the non-payment of dues from their customers (other firms, which may also be feeling the pains due to the recession). On the contrary, however, banks are reluctant to provide loans to firms during periods of recession due to the fear that they may default on the loans. Also, if a firm delays its repayment of a loan (which is more likely during a recession) by more than a certain period, banks begin to charge penal interest rates.[11]

At the same time, micro enterprises (mostly in the unregistered sector) receive very little credit from banks and other institutional sources. Typically owners of microenterprises depend on their own personal or family savings for investment in machinery.

5.5 / Trade liberalisation and rising import intensity of manufacturing

India has reduced the tariffs on the import of several manufactured goods into the country during the 2000s. The weighted average of import tariffs in India on capital goods declined from 94.8 per cent in 1991-92 to 28.7 per cent in 1995-96, 23.1 per cent in 2001-02, 9.5 per cent in 2005-06, and to 5.6 per cent in 2009-10. The tariff reductions have adversely affected the prospects of India's manufacturing firms, which are, as noted above, already disadvantaged by many supply-side constraints. Some of the industries that recorded fast rates of growth of imports into India from the 2000s onwards include machine tools, electrical and non-electrical machinery, electronic and computer goods, and transport equipment (see Figure 6).

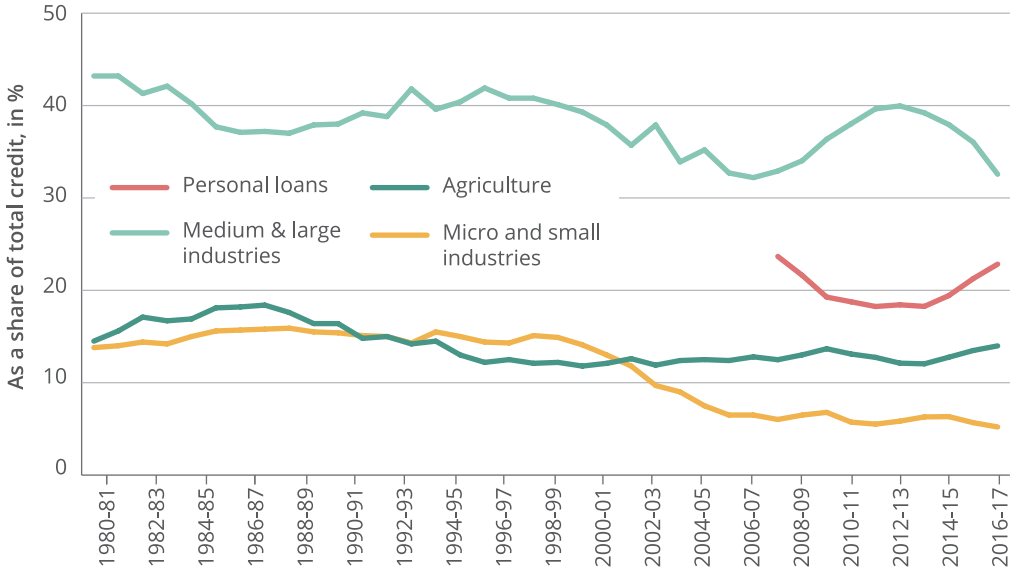
In the case of the electronics industry, India has been liberalising duties from the middle of the 1990s onwards, initially as part of its World Trade Organisation (WTO) requirements and later as a result of the Free Trade Agreements (FTAs) that India and some of the East Asian countries entered into. Given such an environment, domestic manufacturers of electronic components could not develop the technological capabilities needed to survive in this fast-changing industry. Despite being a major market for mobile phones, India is today a large importer of telecommunication products (Francis 2018).

Industrial growth that is increasingly based on imported components reduces the growth opportunities for the domestic industry and depresses the possible linkages between the large and the small-scale sectors. Typically, a substantial part of the production of ancillaries and components for machinery, and transport-equipment industries in India has been in the small-scale or the unorganised sector. With the rise in the import of components, such opportunities for production in the small-scale sector have been reduced.

5.6 / Exchange rate fluctuations

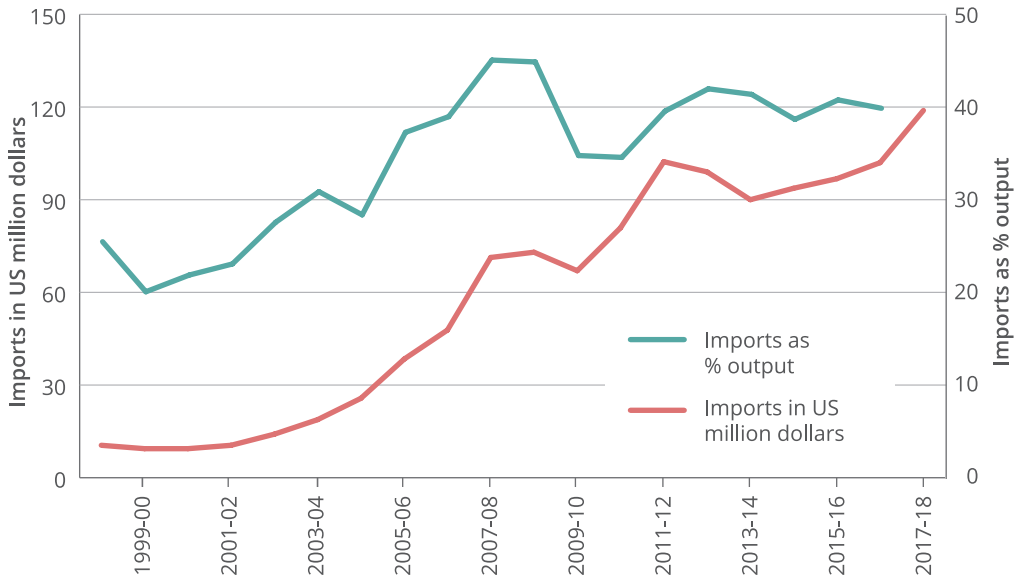
The gradual liberalisation of India's capital account from the 2000s onwards and the resultant increase in the inflows of foreign portfolio investments (FPI) into the country have created problems for the country's manufacturing sector. The volatility in FPI flows has led to wide fluctuations in exchange rates and also in the prices of several commodities (such as steel and cotton) (see Figure 7). It may be noted that unlike India, China has had strict controls on foreign capital movements across its borders to filter out volatile, short-term capital flows, which are often harmful to the economy. In the context of Brazil, Nassif et al. (2019) show how long-term industrial and technological policies have been weakened due to their incompatibility with short-term macroeconomic policies.

Figure 5: Shares of Industry and Agriculture in outstanding non-food gross bank credit in India, 1991-92 to 2016-17 in %



Source: Reserve Bank of India

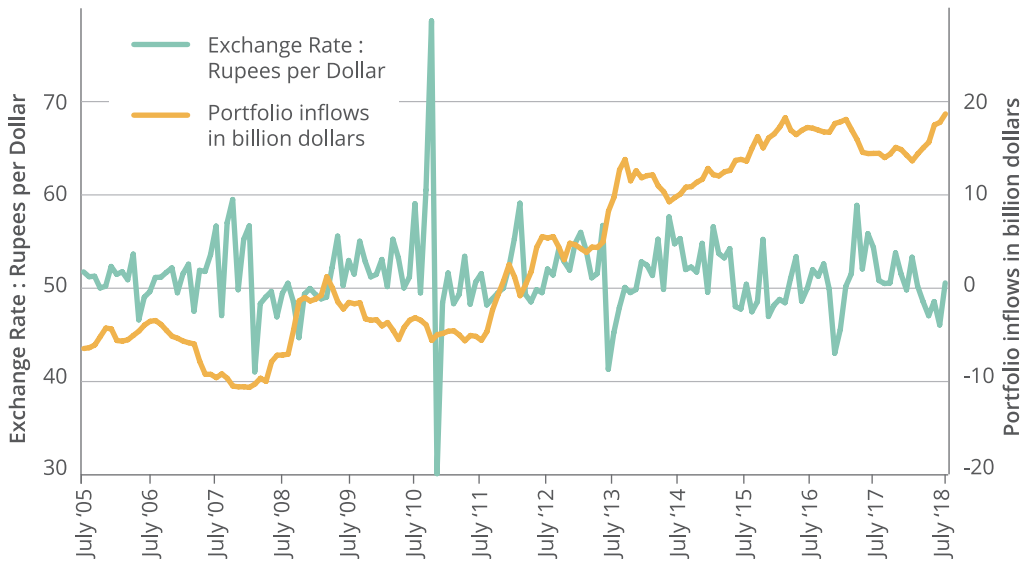
Figure 6: Imports of Machinery, Electronic Goods, and Transport Equipment into India, 1998-99 to 2017-18: in million dollars and as a share of Domestic Production of these Products in India



Sources and notes: Import data as reported in the Handbook of Statistics on Indian Economy, Reserve Bank of India; Output data from Annual Survey of Industries. Based on data on imports and output of the following goods: machine tools; machinery except electrical and electronic; electrical machinery except electronic; electronic goods; computer goods; transport equipment; and project goods.

The Rupee-Dollar exchange rate appreciated sharply between May 2007 and April 2008, resulting in a steep decline in the revenues and employment of export-oriented industries such as textiles, garments, leather, and engineering in India. At the same time, there has also been equally sharp depreciation of the Indian Rupee, such as during the second half of 2008 and again during the period from May 2011 to August 2013 (see Figure 7). During these periods of currency depreciation, imports of machinery and raw material become costlier. Also, many Indian firms, which have availed of foreign-currency loans, incur heavy losses when they are required to repay their loans in the depreciated rupee.

Figure 7: Rupee-Dollar Exchange Rate and Inflows of Foreign Portfolio Investment into India, July 2005 to August 2018



Source : Portfolio investment from RBI Website; Exchange Rate until April 2011 also from RBI; Exchange rate for other months from http://www.x-rates.com/d/INR/USD/hist2011.html

5.7 / Industrial policies for regional development

In India, industrial policies should reflect the priorities and requirements for industrial development across various regions. There are variations across States with respect to demographic structures, which also have important implications for their labour markets. In 2011, the population in the age group of 0 to 14 years as a share of the total population was 23.4 per cent only in Kerala and 40.1 per cent in Bihar (according to data from the Census of India). Within India, the largest additions of the working-age population over the coming years are going to come from some of the poorest regions, including states such as Uttar Pradesh and Bihar. At the same time, states such as Kerala and Tamil Nadu will see their population ageing.

Kerala has already started facing a severe shortage of unskilled workers, whereas, at the same time, educated workers from this state have been seeking employment opportunities elsewhere. According to an estimate by the state government, 1.4 million Keralites were working in various professions outside the country in 2011 (Pravasi Malayali Census 2011). At the same time, a rising stream of migrant workers from other states, including Bihar, West Bengal, and Odisha, meets the large demand for unskilled labour in Kerala. According to an estimate in 2011, migrant labourers in Kerala from the other Indian states numbered approximately 2.5 million, which was close to 20 per cent of the state's total workforce (12.7 million) at that time.

Given such a context, the Approach Paper for the Thirteenth Five Year Plan for Kerala (from 2017 to 2022) had suggested that the future industrial development of Kerala should focus on industries that build on the advantages of a skilled workforce. Kerala aims to make a mark in sectors such as biotechnology, life sciences, pharmaceuticals (thus furthering Kerala's expertise and advantages in the area of healthcare), electronics hardware, and knowledge industries in general.

Kerala is indeed making steady progress in some of these areas (a Life Sciences Park is being set up in Thiruvananthapuram). However, a relative shortage of financial resources is a big hurdle for the state in setting up research centres and other institutions that are crucial for the nurturing of knowledge industries. Central government public sector enterprises (PSEs) and research and educational institutions funded by the Central Government have a relatively small presence in the state (In 2013-14, Kerala's share in total investment by Central government PSEs was only 1.9 per cent, much less than Kerala's share in India's population, which was 2.8 per cent in 2011).

5.8 / Services v/s manufacturing

India's recent economic growth has been led by the services sector. The relatively fast growth of the services sector, especially of sectors such as information technology (IT) and financial services has, in fact, created some disadvantages for the manufacturing sector in India. Most importantly, services sector growth has pushed up the cost of land and also for skilled labour in the country. Entrepreneurs we talked to in different parts of the country (Gujarat, Kerala, Tamil Nadu, and Karnataka) have cited availability and cost of land as a key concern for them.[12] For instance, in Peenya industrial estate in Bangalore, the cost of one acre of land would be higher than Rs. 10 crores, according to some estimates in 2017. Therefore, for an entrepreneur, the cost of land would become a heavy drain on her financial resources even before she begins production.

Many engineers and other skilled professionals find the services sector more attractive (in terms of salaries and working conditions) compared to manufacturing. Manufacturing firms find it difficult to offer salaries comparable to those offered in sectors such as IT or financial services. Owners of manufacturing firms complain that even less skilled workers prefer to work in shopping malls or retail services rather than in factories.

5.9 / Small firms v/s big firms

In India, public sector units have facilitated the growth of small firms around them, typically as suppliers of inputs or as players in some stage of the value chain. For example, a number of industrial units in Peenya have been engaged in the aircraft industry, to a large extent due to the linkages built in this industrial area by Hindustan Aeronautics Limited (HAL), Bangalore. Similarly Bharat Heavy Electricals Limited (BHEL) in Tiruchirappalli and Indian Petrochemicals Limited (IPCL)

in Vadodara in 1969 had helped the emergence of clusters of small industrial units in these cities.[13]

However, in recent years, leaders of small-industry associations point out that they receive very little assistance from the bigger private firms, especially foreign-owned firms. For instance, small firms engaged in the power equipment industry note that multinational corporations (MNCs) in this sector (such as Hitachi or ABB) prefer to work with other foreign firms (as suppliers), and not with the small-scale Indian firms. They also point to how a major Indian private company in the power sector imported most of the machinery it needed while setting up its new plant thereby denying smaller Indian firms the opportunity to benefit from such a large demand.[14]

A major complaint of micro and small industries is that the charges they receive from the bigger firms for turning, milling or other machining operations (what are commonly referred to as 'job works') have hardly improved over the years. In fact, with the emergence of computerised numerical control (CNC) machines, the bigger firms have to depend less on the small firms for machining and other operations. Delay in payments from their buyers (which are typically bigger firms) is another major problem faced by the smaller firms. This increases the working capital needs of the small firms especially because they will have to make ready payments for purchasing their inputs.[15]

5.10 / Foreign investment and the 'Make in India' initiative

To promote the growth of manufacturing in India, the Union government, led by the National Democratic Alliance (NDA), has launched a 'Make in India' initiative. Previously, the United Progressive Alliance (UPA) government had rolled out the National Manufacturing Policy with the same objective. The thrust of both these initiatives has been to attract private investments, especially foreign investment, with the government acting as a facilitator for private investors. In recent years, rules relating to FDI have been liberalised to a great extent, with more and more sectors being put under the 'automatic route' for approval.

International experience suggests that FDI will contribute to development only if it brings in technologies and managerial capabilities, and not just capital, to the host nation. If the objective of the foreign investors is only to gain better access to the markets in the host nation, they could end up weakening, rather than strengthening, the domestic firms.

Given this context, there are concerns on the nature of FDI flows into India during recent years. Rao and Dhar (2018) show that about half of the total reported FDI inflows into India between 2004 and 2014 were not 'realistic' – these were investments made either by financial investors or by national investors investing in the domestic economy through the FDI route. They further show that the share of manufacturing in total FDI flows into India declined from 47.8 per cent during the period October 2012 - September 2014 to only 30.3 per cent during the period October 2014 - March 2017 (Rao and Dhar 2018). Further, an increasingly larger share of FDI flows into India is not in the form of 'greenfield' investments, but is achieved through the acquisition of shares of domestic firms (Nagaraj 2017).

Since 2011-12, investments in the country by domestic private firms have been on a low key. The possible reasons include the slowdown in demand at home and abroad, unutilised capacities of these firms, and their high levels of indebtedness. Given such circumstances, the expansion in public expenditures will be a critical component of any effort to promote economic growth and development in India.

5.11 / Guiding technological development

Technological changes in the manufacturing sector have been increasingly labour saving, and this brings in a new dimension to the challenge of employment creation.[16] New technologies such as of electric vehicles or of renewable energy sources will absorb much less labour than their earlier generation of technologies (compared to diesel or petrol engine vehicles, electric vehicles require much fewer components). Further,

India is highly dependent on imports in the case of many new technologies (for instance, in the case of electric vehicles, India is dependent on the import of lithium batteries).

Given such a context, it is important to invest in the creation of new technologies. India requires technological advances that generate new economic opportunities and absorb — not displace — labour. Consider, for instance, advances in biotechnology that may find new commercial applications for our agricultural products, or electric vehicles and renewable energy solutions that depend less on imported material (Thomas 2018b). Nevertheless, India's spending on research and development (R&D) has been rather inadequate. Nagaraj (2017) reports that in 2011, R&D spending as a proportion of GDP was only 0.8 per cent for India, compared to 1.8 per cent for China. In fact, China is gradually shifting its economic base from low-wage industries and is now emerging as a global leader in several new technologies, including artificial intelligence and renewable energy.

It needs to be noted that innovations and technological interventions are needed in the case of traditional and labour-intensive industries as well. Consider the case of the textile industry, which employs 9.3 million workers in India, out of which 84 per cent are outside the factory sector (in 2011-12) (Thomas and Johny 2018). Many of these workers are attached to handlooms or other traditional forms of production, with extremely low levels of productivity. For instance, in a major centre for handloom weaving in Kannur district of Kerala, a worker is able to weave only 5 to 6 metres of cloth in a day (and earn only around Rs.350-400 a day). On the other hand, in a newly set up high-tech weaving factory in the same district, a worker can oversee the production of up to 450 metres of cloth in a day.[17] It is clear that in handlooms and other traditional sectors, both technological and organisational innovations are needed to increase productivity, improve wages, and at the same time, avoid job losses.

6 / Concluding remarks

Given the growing size of the working-age population of India, the employment-challenge for India is possibly bigger than that faced by any other country (except China) in the world. At the same time, a large population also offers a sizeable market, which can be turned into a significant advantage for domestic manufacturers. In the Indian context, however, low levels of rural incomes and a high degree of inequality are constraints to realising the potential of the domestic market. In rural India, in 2011-12, the richest decile of households accounted for 55.7 per cent of the total consumption expenditure on durable goods (NSSO's surveys on household consumption expenditures). SSIs in the unregistered sector, which cater to the demand from the poorer sections of the population, have been trapped in a cycle of poor quality of production, outdated technologies, and low levels of profitability.

India should envisage industrial growth that is driven more by the domestic market, which will benefit from an improvement in the wages and incomes of its rural and urban informal workers. In any case, the prospects for a growth strategy led by exports are rather bleak, given the continuing crisis in the global economy, the growing tide of protectionism in the developed world, and competition from other labour surplus countries such as Bangladesh. Once the domestic market is seen as the anchor for its future growth, the Indian industry will realise that it is not in its interests to squeeze more labour. On the contrary, rising wages and labour incomes could provide the basis for a revival of mass demand, and fuel the growth of a range of industries including food, clothing, and consumer durables.

India's policymakers should realise that planning and industrial policies are not incompatible with markets and globalisation. In fact, the need for industrial policies is ever greater now given the uncertainties associated with technological changes and turbulence in the global economy. At the same time, there are huge investment needs in the country today in the areas of irrigation, electricity, rural and urban infrastructure, as well as in many areas of basic research. With greater investment and well-directed industrial policies, India should try to revive its manufacturing sector, fully tapping into the potential of its vast home market and also of its young workers and entrepreneurs.

Endnotes

1. Data obtained from the World Bank's World Development Indicators available at http://data.worldbank.org/indicator

2. According to data from the National Sample Survey Office (NSSO) on Employment and Unemployment Survey.

3. It needs to be highlighted, however, that NSSO's employment survey is a survey of households while ASI is a survey of enterprises. This difference in the nature of the two surveys is a limitation while making an estimate of employment in the unorganised manufacturing sector using a combination of data from the NSSO and ASI.

4. Data obtained from National Accounts Statistics, Ministry of Statistics and Programme Implementation, Government of India, available at http://www.mospi.gov.in/13-national-accounts-statistics

5. Data obtained from National Accounts Statistics, Ministry of Statistics and Programme Implementation, Government of India, available at http://www.mospi.gov.in/13-national-accounts-statistics

6. https://powermin.nic.in/en/content/power-sector-glance-all-india

7. Data obtained from World Development Indicators, World Bank.

8. Information from the Ministry of Power, Government of India reported in http://www.indiastat.com

9. Based on the author's field research on Coimbatore's industrial sector from 2008 onwards. See also Thomas (2009).

10. Based on the author's field research in Coimbatore, Peenya (Bangalore), and Kollam (Kerala) (all during 2017-2018).

11. Based on the author's field research at various industrial towns, including Coimbatore, Rajkot (2015-2016), and Kollam (2018).

12. Based on the author's field research in Coimbatore, Rajkot and Vadodara (2015-2016), Peenya, Bangalore (2017), and various industrial locations in Kerala.

13. Based on the author's field research in Vadodara (2015-2016), Peenya, Bangalore (2017), and Tiruchirappalli, Tamil Nadu (2018).

14. Based on the author's field research in Vadodara (2015-2016) and Peenya, Bangalore (2017).

15. Based on the author's field research in Coimbatore, Rajkot (2015-2016) and Tiruchirappalli (2018).

16. For instance, as of now, the Rourkela plant of a major public sector Steel company employs around 12,000 workers and produces 4.5 million tonnes of steel annually. Company sources suggest that, during the early 1990s, this plant had employed around 30,000 workers, although its production capacity then, had approximately been only one-third of the current level. Based on the author's field research in Rourkela (2018).

17. Based on the author's field research in Kannur, Kerala (2019).

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