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CAN “MAKE IN INDIA” MAKE JOBS?
THE CHALLENGES OF MANUFACTURING GROWTH
AND HIGH-QUALITY JOB CREATION IN INDIA

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INTERNATIONAL ECONOMICS

Abstract

A new “Make in India” campaign to “transform India into a global manufacturing hub” aims to use manufacturing as a vehicle for job growth. Is this strategy realistic? This paper helps answer the question by describing the job growth potential of the Indian economy. Formal-sector manufacturing demonstrates the most potential for job growth under a more supportive policy regime. The paper models future employment paths for India for the next 20 years. Assuming sufficient reforms to generate East Asia-style manufacturing growth, the impact on employment and output is substantial, even if the campaign target of 100 million new manufacturing jobs remains difficult to achieve. The paper then describes a set of reforms sufficient to unleash such a manufacturing growth boom.

1. Introduction

India has a jobs problem. The country’s economic growth, even at the impressive rates of the last decade, has not produced meaningful jobs for its expanding working-age population. Dead-end rural construction jobs have offered the only area of expansion. Millions too many families depend on low productivity agriculture for a living as a result.

The jobs issue is also politically salient. The 10 states that elected the most members of parliament for Prime Minister Narendra Modi’s party, the Bharatiya Janata Party (BJP), have significantly higher fertility rates—and therefore more new job seekers—than the rest of India.¹

Modi’s headline-grabbing response has been a “Make in India” campaign to “transform India into a global manufacturing hub” and thereby use manufacturing as a vehicle for job growth. The plan includes a variety of measures from easing the regulatory burden to establishing special economic zones to awaken India’s latent manufacturing power.

Yet many economists consider labor-intensive manufacturing to be a futile goal given India’s internal hurdles and external competition.² They suggest that India stick with its service sector orientation and focus on improving job creation potential there.

Is Modi’s strategy realistic? This paper helps answer the question by describing the key barriers to job growth and assessing the job growth potential of the Indian economy.

Developing a strategy for job growth requires careful identification of sectors with true potential. Of course, examining the economy at the level of manufacturing and services skims over important detail, including many types of firms and industries that bear little potential. Choosing the path forward is further complicated by the fact that past performance provides a poor indicator of true potential. A sector hobbled by an adverse environment could look completely different with appropriate policy interventions.

Finer distinctions and anticipation of policy impacts will allow policymakers to plot a course for optimal job growth. This paper finds that the modern service sector and the formal manufacturing sector (both described in detail below) are the true growth sectors for India. Both

have exhibited moderate job creation on a low base. Formal-sector manufacturing, however, has the most potential for transformation under a more supportive policy regime.

This paper models future employment paths for India for the next 20 years. The best case scenario anticipates sufficiently supportive policy changes to generate sustained 14 percent growth of formal-sector manufacturing. That scenario could create more than 100 million additional jobs. Of those jobs, almost 70 million would come from high-productivity sectors, or a shift of 8 percent of the workforce. Although such a change implies missing the Make in India target of 100 million new manufacturing jobs, it would still put the share of employment and output of Indian manufacturing in the range of East Asian countries like Indonesia, Malaysia, and China in the next two decades.

The incremental approach to reform taken thus far by the Modi government has not yet removed enough barriers to manufacturing growth to initiate such a best case scenario. In subsequent sections the paper reviews policy measures necessary—labor reforms, general business climate, provision of public goods, and institutional reforms—to achieve meaningful change. More ambitious reforms will be needed to overcome the significant barriers to competitive labor-intensive manufacturing in India.

2. The Need for More Jobs

One of the highest priorities of the Indian government is economic inclusion —bringing more citizens into the modern, productive economy. This is critical for meeting poverty alleviation targets and improving many related health and education indicators. The most effective route to improving economic outcomes is through formal sector jobs, which pay regular—and generally higher—wages. They provide economic stability for families, allowing greater predictability and planning in other aspects of their lives. In India only about 14 percent of the workforce has such a formal sector job.

Formal sector jobs were the main vehicle by which China lifted 500 million people out of poverty over the past 25 years. While poverty measurement in India is a controversial topic, India has likely made half of China’s poverty reduction progress.³ It has at least as far to go to reach Chinese poverty rates of 6 percent.

Demographic Headwinds

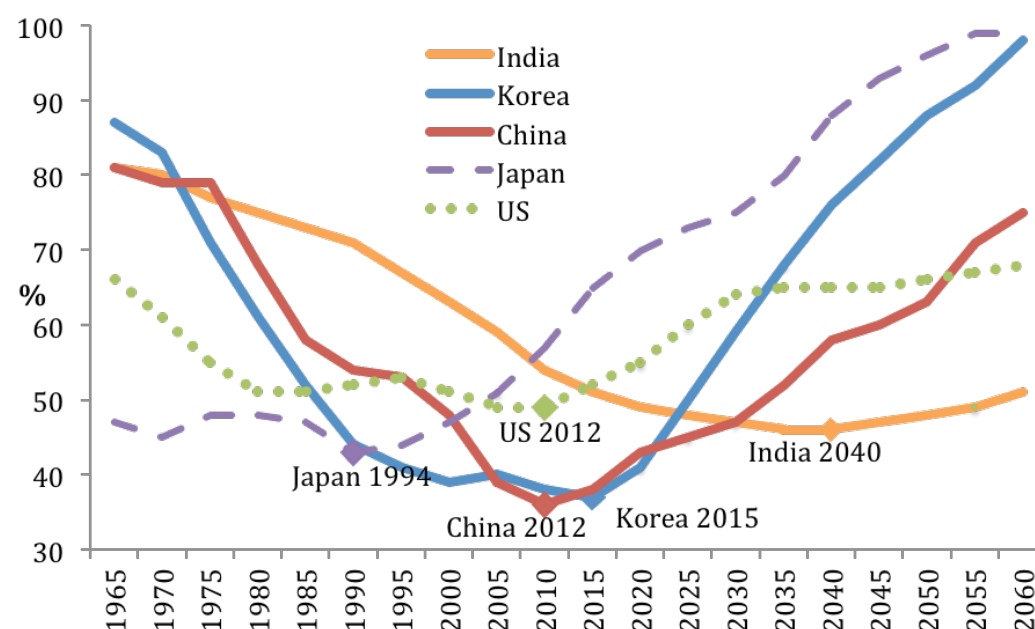
The time is right for an all-out effort to create more high-quality jobs. Current demographic trends offer India a one-time boost in its economic potential. The country’s young population and declining fertility levels are causing the workforce to grow faster than the population as a whole. This is represented in the dependency ratio—the ratio of nonworking-age people to working-age people— which has been declining for several years (Figure 1).

A declining dependency ratio is often referred to as a “demographic dividend” because a higher proportion of workers implies higher per capita income, assuming wages at least remain constant. Rising per capita income creates a virtuous circle with higher disposable incomes, greater consumption, and therefore faster growth. In addition, domestic savings rise, producing a larger pool of capital to finance investment and development.

The U.S. and Japan experienced a fertility decline decades ago and have already reaped the benefits. Positive demographic forces also helped propel the miracle economies of East Asia to sustained high growth rates. India’s dependency ratio started its decline around the same time as Korea and China, but the decline has been much slower. While the extra boost to East Asia has largely ended, India can expect many more years before the dependency ratio bottoms out.

Figure 1. Population Dependency Ratio

Percent nonworking age/working age, with low point indicated



Source: Population Division of the Department of Economic and Social Affairs of the UN, *World Population Prospects: The 2012 Revision*, esa.un.org/unpd/wpp.

India only has until roughly 2040 to take advantage of these headwinds. If India can create more high productivity, higher wage jobs, the demographic dividend will support higher growth levels than would ordinarily be possible.

Winds Can Blow Both Ways

The other side of rapid labor force growth is immense pressure to produce the jobs linked to the demographic dividend. India's labor force will grow by almost 10 million workers per year for the next 10 years.⁴ In addition, agricultural employment has been falling at a rate of about 5 million workers per year for the past decade. At the rate that nonagricultural enterprises have created jobs since 2000 (GDP has grown almost three times faster than employment), India will require economic growth rates of 14 percent per year outside of agriculture to meet the need for jobs.

What happens if the private sector is not ready with jobs for this demographic dividend, if it does not produce jobs that pull workers into higher income, higher productivity jobs than

previous generations? A large population of underemployed or unemployed young people is a typical ingredient for political discontent and social unrest. The demographic dividend becomes a demographic nightmare.

The recent past does not provide much hope that the current economic structure will succeed in producing a demographic dividend without significant changes. Between 2005 and 2012, despite respectable nonagricultural economic growth of 9.5 percent, India added new nonagricultural jobs at a rate of only about 7 million per year.⁵ Half of those were dead-end jobs in rural construction in the four big states with the highest fertility rates.⁶

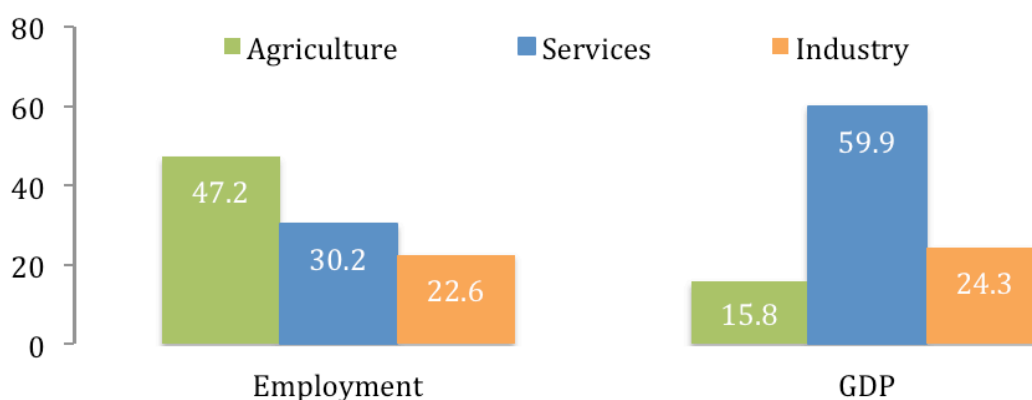
Furthermore, the increase in construction jobs largely came from government work schemes, not private sector activity.⁷ As a result productivity rates in construction have declined because surplus labor is merely spilling over from one fallback activity (agriculture) to another. This is not a phenomenon exclusive to the rural poor, either. Some estimates project India producing twice as many graduates as its job growth can absorb.⁸

India holds big potential for poverty reduction through economic growth, but not without a major break from the status quo. The current trend will continue to leave most of the country behind. This is an outcome India neither wants nor can afford.

3. Structural Problems

The story behind India’s lack of progress on higher-productivity job creation can be summed up in one graph. Figure 2 illustrates how employment and GDP are split between the three major sectors of the economy. Agriculture possesses most of the labor force, but services produce most of the output. Industry ranks behind services in both categories, playing a relatively minor role in the economy.⁹ Clearly a re-alignment of the labor force toward more productive activities would yield large benefits.

Figure 2. Sectoral Contribution to the Economy in 2010 (percent)



Source: 68th Round of the National Sample Survey and National Accounts, Ministry of Statistics.

Global Comparisons

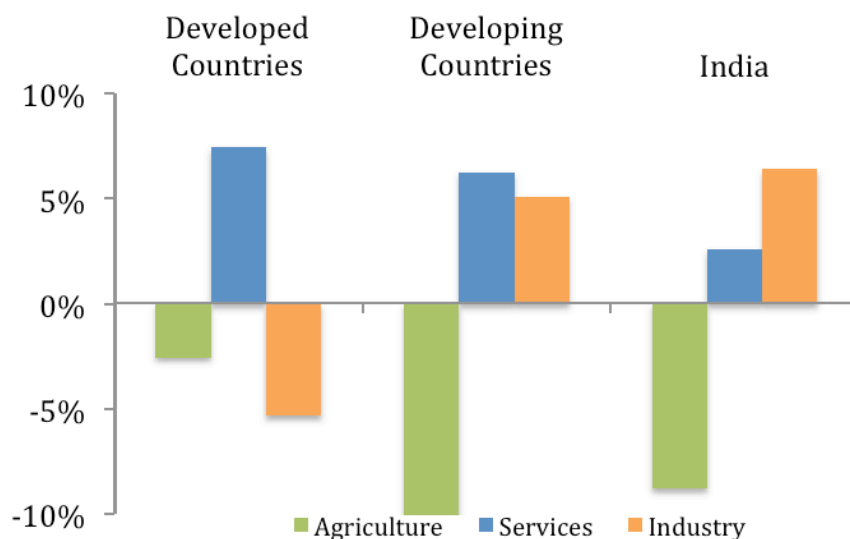
For India’s level of development, this economic structure does not fit the usual pattern seen elsewhere.¹⁰ One of the many contributions of Nobel Prize-winning economist Simon Kuznets was to document the typical pattern of economic development through the evolution of the agriculture, industry, and services sectors.¹¹ Today’s rich economies took a development path that transitioned from the dominance of agriculture to large-scale manufacturing for both employment and GDP. Only at higher levels of per-capita income did their service sectors come to dominate the economy, becoming post-industrial economies.

The classic pattern of structural change continued in the last half of the 20th century among successful developing countries. Most East Asian and Southeast Asian countries that have achieved sustained high growth rates experienced industrialization prior to the rise of the service sector.

In the new century, the pattern is beginning to evolve as some of the more advanced developing countries in Asia begin their shift toward service sector growth.¹² Developing countries as a group are looking more post-industrial. The next set of figures present the new patterns in both employment and GDP.

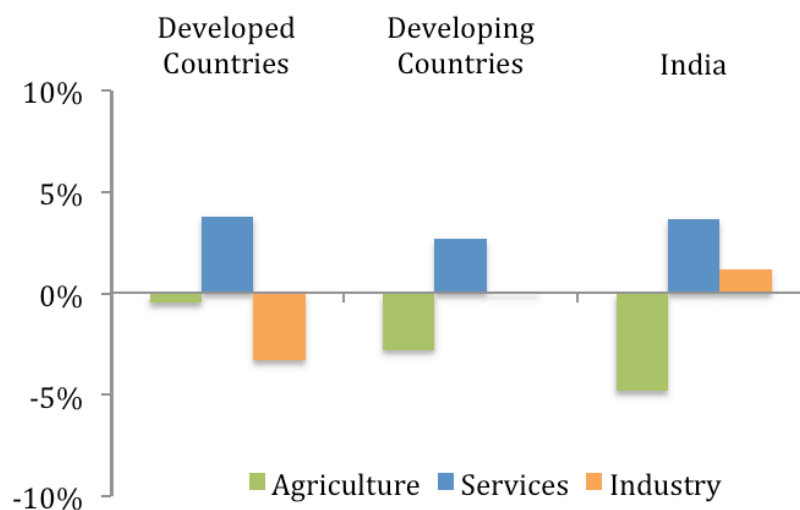
Looking across all developing countries in recent years, the share of employment in industry continued to grow while agriculture employed fewer workers (Figure 3). The share of the service sector grew fastest, however. Developed countries have lost manufacturing jobs overall as their economies automate further and rely on services for employment.

Figure 3. Global Change in Share of Employment, 2000–2010



Source: World Development Indicators, World Bank.

Figure 4. Change in Share of GDP, 2000–2010



Source: World Development Indicators, World Bank.

In terms of GDP, the service sector in developing countries grew fastest, gaining output share, while agriculture fell behind (Figure 4). Industry hit the middle, maintaining a constant share of GDP. In developed countries industrial output actually shrank, indicating their post-industrial status.

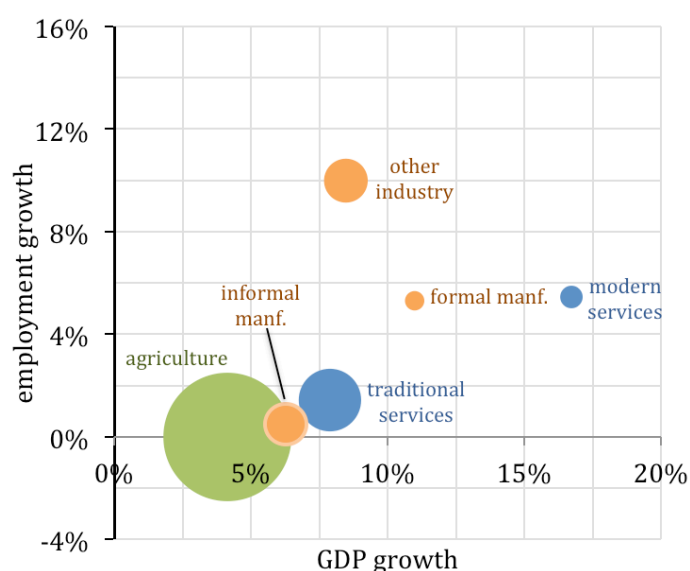
For India, on the other hand, industry has added jobs faster than even services.¹³ A further distinction for India is that it saw growth in industry’s share of GDP, mostly due to growth in manufacturing. Yet the service sector share of GDP grew faster, furthering India’s service sector dominance. So while the service sector has always eclipsed industry in terms of GDP growth, manufacturing is more robust in India than in most developing countries.

India’s Economic Structure in Detail

Walt Rostow, eminent economist and former national security advisor, stated, “without appropriate disaggregation the study of growth is ... [like] playing piano while wearing mittens.”¹⁴ This is certainly true in India, as Figure 5 demonstrates. There are a few high-performance pockets of the economy, and large laggards.

Figure 5. Performance of Sub-sectors, 2005–2012

Bubble size indicates workforce size



Source: 68th Round of the National Sample Survey and National Accounts, Ministry of Statistics.

To some degree, the point of this policy paper is to identify which bubbles India should target with supportive policies, and how. The aim is to create large bubbles in the northwest corner of the graph. The next few sections explain Figure 5 in detail, providing sector-specific context to illustrate how they have contributed to employment and GDP growth in India.

Agriculture

India’s labor force is languishing in low-productivity agriculture. Although agriculture provides the majority of India’s jobs, the sector contributes little to GDP. It is the default employment option for millions of rural residents with poor job opportunities, with families dividing farms into ever-smaller plots with each generation.

There is scope for improving productivity in agriculture through improved infrastructure, investment in irrigation and cold storage technology, removing restrictions on marketing agricultural products, and easing land acquisition. Nonetheless, no productivity improvement will likely increase demand for agricultural labor. Rather, the opposite is more likely.

The current lack of productivity means that the Indian economy is underutilizing its labor abundance. Shifting workers out of agriculture into urban manufacturing and services holds tremendous potential. India’s Ministry of Finance calculates that a manufacturing worker is four times as productive as his or her counterpart in agriculture; a services worker is almost seven times more productive.¹⁵

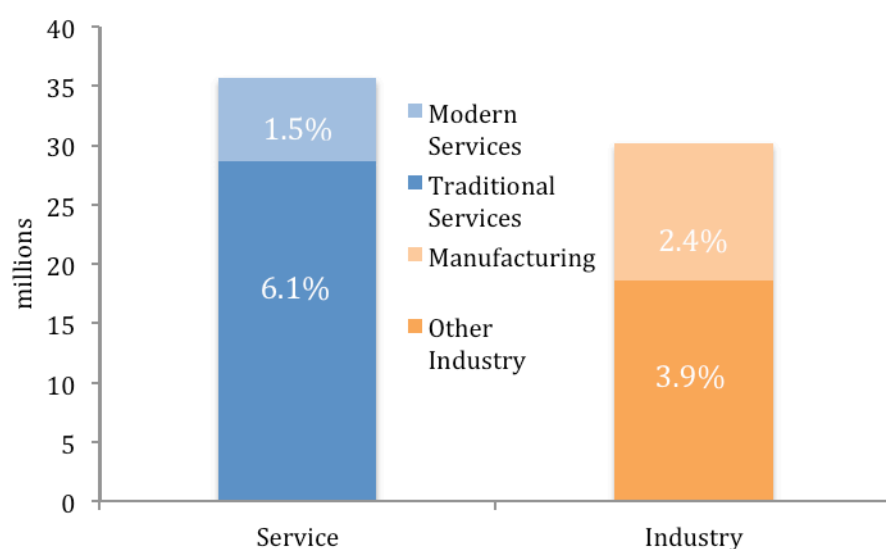
A transfer from agriculture to a more productive sector would also benefit workers. The McKinsey Global Institute has estimated that an illiterate worker who moves from agriculture to light manufacturing can expect a wage increase of 40 percent. A worker with basic literacy can expect even better: a wage increase of 70 percent should he move from agriculture to heavy manufacturing.¹⁶ Other studies show similar results regarding moves from rural areas to urban centers, finding that urban households make two to three times more annually than comparable rural households.¹⁷

Services

Since colonial days India’s service sector has defied the classic development pattern, as services have exceeded industry as a share of GDP since at least 1901.¹⁸ It has historically been a source of formal jobs, meaning jobs with a work contract, performance-linked incentives, benefits, better physical working conditions, and training, and it still is today (Figure 6).¹⁹

Figure 6. Formal Sector Jobs, 2012

Millions and percent of total employment



Source: 68th Round, National Sample Survey, Ministry of Statistics.

The service sector also defied conventional wisdom by fueling India’s growth from 1994 to 2008.²⁰ It avoided many of the constraints faced by manufacturing because it does not rely as heavily on infrastructure and land. Further, regulations on labor and competition largely do not apply to services, and the tax burden is lighter. So once technology allowed the export of software and business services efficiently, India’s service sector developed rapidly.²¹

Service sector output growth has not translated into significant employment growth in the last 10 years, as shown in Figure 3 above. Despite service sector economic growth of 9.7 percent per year from 2005 to 2012, employment grew a meager 2.5 percent.

The overall story of the service sector consists of slow job growth, but improvement in availability of jobs for high-skill educated workers. Indeed, service sector employment has been good to certain segments. Service sector growth has been associated with substantial improvements in employment conditions in the economy, in particular a substantial increase in the number of quality jobs with benefits.²²

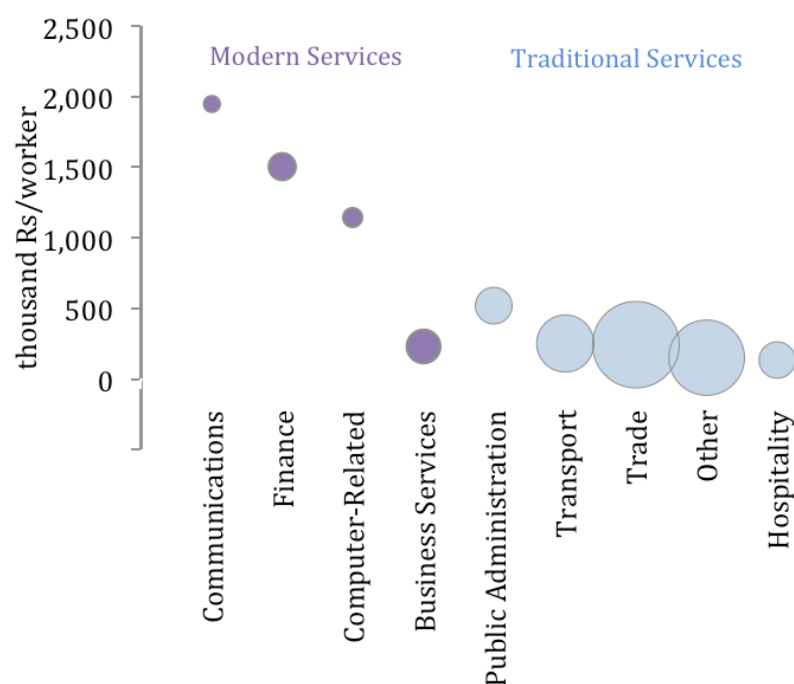
A much clearer understanding of the service sector can be gained by dividing it between “modern” and “traditional” services. Modern services are technology-enabled, transportable, and tradable. They include financial intermediation, computer services, business services, communication, and legal and technical services. Because of technology and trade, modern services perform much more like manufacturing, characterized by fast productivity growth and potential to leverage export markets for growth.

Strikingly, India’s exports of modern services have grown faster than goods exports from East Asia over the main takeoff period of 1996-2006. Modern services now constitute two-thirds of all service exports and one-fifth of overall exports from India. This export intensity exposes them to global competition, forcing rapid improvements in efficiency and quality.

Modern services—plus education, health care, and hospitality—explain the sustained output growth in India’s service sector.²³ What distinguishes the modern service sector more than growth rates is productivity (Figure 5). Communications, finance, and computer-related services yield five or more times the output per worker than most traditional services.²⁴

Figure 7. Service Sector Productivity: GDP per Worker, 2012

Bubble size indicates workforce size



Source: 68th Round of the National Sample Survey and National Accounts, Ministry of Statistics.

Productivity means getting more done with fewer workers, so related to high productivity is a limited impact on employment. The bubble sizes in Figure 7 indicate that the high-productivity sectors do not employ nearly as many workers as the low-productivity sectors. As Ejaz Ghani of the World Bank put it, “The service sector has contributed more strongly to growth than to employment. The rapidly growing high-skilled service sector can only provide employment to a very small percentage of the growing labor force.”²⁵

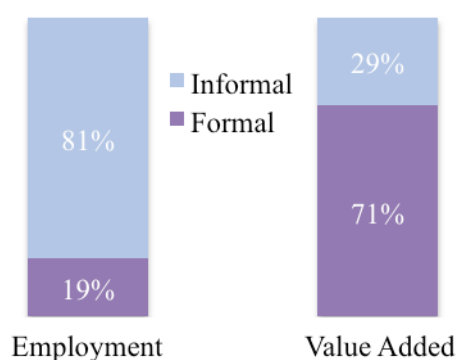
Manufacturing

India has a dual economy, and when discussing manufacturing, it is absolutely necessary to distinguish between its formal and informal sectors.²⁶ The formal manufacturing sector would appear familiar to a developed country observer. These firms incorporate, pay taxes, have legal utility hookups, make some effort to comply with the regulatory structure, and theoretically have

access to the formal financial system. Informal firms, on the other hand, are much less integrated into government-linked activities and tend to be very small.²⁷

This distinction matters because employment in informal manufacturing is sizeable, but its contribution to the economy is not proportional. Formal manufacturing follows the opposite pattern. Figure 8 presents the specific breakdown between the two segments according to shares of employment and value added.²⁸ The share of firms is even more skewed than employment, with 87 percent of manufacturing firms in the informal sector.²⁹

Figure 8. Manufacturing Contribution to the Economy, 2012 (percent)



Source: 68th Round of the National Sample Survey and National Accounts, Ministry of Statistics.

The ratio of value added per employee from Figure 8 gives a simple indication that the productivity of the formal sector is much higher than the informal sector. A more careful comparison using micro data, controlling for amount of capital investment, technology, industry, region, and firms' age, indicates that productivity is about twice as high in firms with more than 250 employees than in those with only up to 10 employees.³⁰ Higher productivity accordingly links to higher wages.³¹

Observers rightly praise informal manufacturing for its entrepreneurial spirit—think of the often-cited figure of \$1 billion in annual output from Mumbai's Dharavi slum. But that can-do spirit does not belie low productivity, or the preference of those workers for a formal sector job with better working conditions. Rather, informal manufacturing largely developed due to

restrictions on formal manufacturing. Some 85 percent of informal manufacturing firms and slightly less than half of informal manufacturing employment consist of single-person microenterprises.³² Comparing education and income, these sole proprietors look much more like casual laborers than entrepreneurs, suggesting little propensity to grow.³³ Informal manufacturing—while an admirable expression of *jugaad*, a local word for clever work-arounds—should not be actively promoted.

There are other segments of “industry” besides manufacturing that operate in the formal sector. Formal-sector construction firms employ large numbers of workers. Indeed, formal-sector construction jobs have grown just as much as informal ones in the last decade, together making “other industry” the highest growing sub-sector in Figure 5.

Yet productivity in construction is low and dropping. As noted above, informal construction jobs represent little more than a spillover from agriculture, where productivity can be insufficient to support a livelihood. With such a low wage threshold to beat, construction projects can add still more workers to a site though they add very little value.

The formal manufacturing sector presents a much more hopeful picture. It provides more formal sector jobs than modern services (Figure 6). Output has been growing rapidly at 11 percent per year from 2005 to 2012. Only modern services experienced faster output growth (Figure 5).³⁴

Because the difference between the formal and informal sectors is so great, and because the informal sector employs so many workers, conclusions drawn about Indian manufacturing as a whole misrepresent the reality of the formal sector. For instance, manufacturing as a whole has not seen much employment growth in the last decade. Employment in formal manufacturing, on the other hand, has also grown impressively in the same period. An annual employment growth rate of 5.3 percent is more than 1.5 times that of the non-agricultural economy as a whole. Indeed, the manufacturing buoyancy depicted in Figures 3 and 4 derives almost entirely from formal sector firms.

Realistically, formal manufacturing suffers two critical shortcomings as an engine of mass job creation. First, it is too small, and second, it is overly focused on capital-intensive methods of production. The first point is straightforward. If manufacturing as a whole is too small in terms of GDP and employment, the formal sector is even smaller, at 11 percent and 3 percent respectively.

The second point is more complex. Low employment implies high productivity in formal sector manufacturing, but also reflects that Indian manufacturing has relied more heavily on capital than labor for its growth. Indian firms operate in more capital-intensive industries than predicted from the experience of other countries with similar labor supplies, development levels, and institutional quality.³⁵ For instance, the four largest manufacturing industries by output—comprising over half of all manufacturing output—are also the four least employment-intensive.³⁶ Within the same industry, they use more capital and less labor than comparable firms in other countries.³⁷ At least through 2004, India’s labor intensity was declining, in contrast to several other Asian economies.³⁸

The reasons for the small size and capital intensity of formal-sector Indian manufacturing have been widely documented.³⁹ Among the most salient are inflexible labor regulations, poor infrastructure, unhelpful government, and difficulty acquiring land (see Box 1). Hence, the formal manufacturing sector has been constrained by many forces other than innate capabilities and endowments of skill, labor, and capital. This suggests the capital-intensity is an adaptation to unique factors in India, not best practice.

Box 1. Outsourcing within India—Understanding Capital Intensity

One story behind capital intensity comes from research indicating that successful capital-intensive formal-sector manufacturers often outsource many labor-intensive activities to informal-sector firms.⁴⁰ This allows them to keep workers off their books to avoid exposure to further regulatory interference.

Another insight comes from the firm Teamlease, a special temp agency that provides a permanent supply of contract workers to formal sector firms. The employees officially work for Teamlease but work on the premises of the contracting firm. Similar to arrangements with informal firms, Teamlease allows its clients to keep official headcounts low. It has grown to one million employees, approximately equal to the number of employees in firms engaged in processing meat and vegetables. (Note: food processing should be a labor-intensive industry, but instead has below average labor intensity relative to other Indian manufacturing segments.)

The owner of Teamlease, Manish Sabharwal, says his firm “should not exist” because such services should not be needed.⁴¹ When labor regulations are relaxed, large firms presumably absorb the activities (and labor) of their informal firm partners and contract employees, to everyone’s benefit.

4. Where Is the Job Growth Potential?

From a macroeconomic and demographic perspective, policymakers should aim for two job market outcomes. The first is to accommodate the continued shift of workers out of agriculture. In this regard, almost any job they take will increase their productivity and income. Thus far the economy has supported sufficient low-end jobs to sustain employment. The lack of prospects for productivity growth in these uncompetitive, largely untraded sectors means this objective alone is insufficient for the long-term health of the economy.

The second objective is to shift the job structure to more competitive industries. Unlike construction, for instance, manufacturing faces global competition. The necessity to improve efficiency drives productivity growth and hence wages. When these industries obtain the size to impact broader labor markets, they pull up wages and incomes across the economy. For this reason growth economists label them “elevator industries.” They are an essential component of the development process.

Once this quality was thought to belong exclusively to the formal manufacturing sector. Countries like India have led the way in proving, however, that modern services can operate as elevator industries in the same manner. As productivity improves, the gain is typically shared through rising wages. These jobs should provide a path to future wage growth.

Firms in these sectors are also more likely to use formal employment arrangements, including benefits. Relative to informal, low-end jobs, these jobs provide a greater degree of stability.⁴² For the poor, who face many sources of uncertainty, job stability can bring tremendous benefits in terms of planning and access to credit.

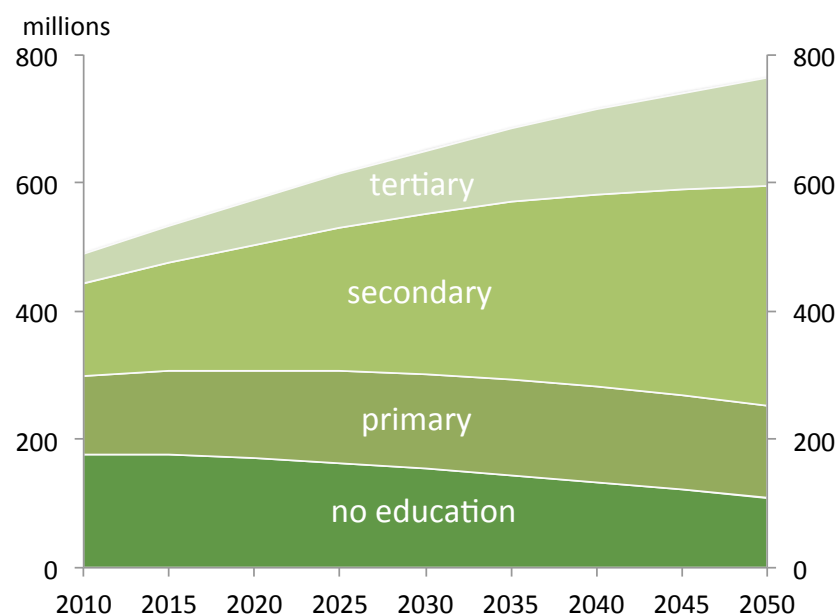
As mentioned at the start, economists have debated whether to promote services or manufacturing to meet these two objectives. Further, India’s service sector has overshadowed manufacturing for more than 100 years. Is there scope for change? Where should policymakers focus their attention? Fortunately, this is not a zero-sum game. Both sectors hold some potential, as reviewed below.

Services

As illustrated above, the modern services that offer the best jobs have not done so in large quantities. Even formal sector jobs in traditional services, the largest source of those jobs, constitute only about 6 percent of all jobs in the economy (Figure 6). Furthermore, almost half of formal sector jobs in traditional services come from public administration and education, neither likely to drive major productivity gains.

Perhaps most important in the context of growing demographic pressure, job growth has been much slower than output growth, and has been concentrated in segments requiring high-skill, educated workers. If India is able to follow global trends in education progress, in 20 years it should see a doubling of the number of people with the post-secondary education necessary to be qualified for a professional job in the modern service sector (Figure 9). That would mean roughly one-third of workers who enter the labor force between now and 2035 would be highly educated.⁴³ They will certainly not all find jobs in the modern service sector.

Figure 9. Indian Labor Force by Educational Attainment



Note: This projection assumes India follows global educational trends and that the labor force participation rate by education stays constant.

Source: Wittgenstein Centre for Demography and Global Human Capital, *Wittgenstein Centre Data Explorer Version 1.1*, 2014, <http://witt.null2.net/shiny/wittgensteincentredataexplorer/>.

Looking forward at future job growth potential, four factors will impact the service sector's potential expansion: Domestic and export markets, reforms, and demographics.

1. Domestic market capacity

First and most importantly, India's domestic market is the primary consumer of services, and it remains largely undeveloped. Almost 80 percent of service sector growth from 2000 to

2010 came from domestic final demand.⁴⁴ As income levels rise and India’s middle class develops, many new large markets for more sophisticated services will open wide. India’s extremely fast growth of mobile phone services provides an excellent example. India’s demand for services has grown faster than one-for-one with rising income. Globally the share of income spent on services continues to rise, suggesting the trend in India will only persist.⁴⁵

Further, the capacity for expansion of technology into the Indian service sector is immense, from providing high-tech logistics support in the trade and transport sector to computerizing government operations. This will give the modern service sector a particularly fertile market for expansion as the traditional economy matures. However, the net impact on employment from this sort of expansion is questionable, since technology may displace workers.

2. Export market capacity

The export markets that earned software programmers and call centers their reputations will determine the ability to leverage global markets for service sector growth. The US and Europe (the market for about 90 percent of their exports, according to trade group Nasscom) are saturated, growing slowly and courting competitors from countries like the Philippines, Nigeria, and Mexico. Efforts thus far to diversify into new markets have not shown promise.

Despite weakness in export markets, modern services are the only sectors that have maintained high growth rates during the economic malaise of the last two years. Extending the trend of export-led growth may prove challenging in the future without significant change, but the sector has beaten the odds thus far.

3. Reform impact

Modern services are the miracle sector that grew despite the adverse business environment, so presumably their potential to benefit from further liberalization is lower than other sectors. That is not to say that areas of finance could not benefit from policy change. Proposals by the Modi government to abolish laws preventing women from working night shifts could

improve hiring by call centers and other businesses working on foreign time zones. But no policy barrier holds the potential to unleash a major new wave of growth.

Traditional services are another story. Improvements in the provision of core public sector goods like infrastructure, law enforcement, and education could dramatically improve transportation, trade, hospitality, and health care. Some efficiencies may be labor-reducing. Presumably, however, the overall quality improvements that could be enabled would give a big boost to overall growth.

4. Demographics

An adequate supply of skilled labor poses one potential limitation on growth. Despite the education forecast cited above, the Confederation of Indian Industries’ *India Skills Report 2014* cites research showing that the information technology industry will face a shortage of 3.5 million skilled workers by 2022.⁴⁶ Wage costs in modern services have generally risen faster than inflation, indicating difficulty acquiring adequate staffing.

However, modern services have proven many previous forecasts of labor shortages wrong. Large employers have managed to develop the employees they need through in-house training programs and collaboration with private educators. Further, the analysis above suggests plenty of new educated workers will graduate in the next 20 years. Another way to approach the question is through growth rates. The additional workers with post-secondary education coming onboard over the next 20 years represents a 3 percent annual growth rate. Over the past decade, modern services output grew at about three times faster than its workforce. If the relationship between output and employment holds, the supply of educated people can support a 9 percent growth rate in modern services output.

Overall, future services output growth will likely be driven by domestic growth. It may continue to rise in share of GDP, as spending on services rises faster than one-for-one with income. That is compatible with a falling share of agriculture in GDP. However, export markets are unlikely to provide as much leverage as in the past, and little room exists for policy change to unleash a new

wave of growth. Service sector growth is less likely to significantly exceed overall economic growth. In this sense, the Indian service sector will look less like an outlier unless manufacturing growth continues to underperform.

Manufacturing

The core policy debate on job growth in India centers on the potential of manufacturing to provide large-scale quality jobs. The argument begins back with Simon Kuznets and the fact that every developed country went through a period when manufacturing dominated output and employment. In the last century manufacturing-led growth in Japan, South Korea, and Taiwan was characterized by high investment ratios, small public sectors, export orientation, labor market competition, and government intervention in economic matters.⁴⁷ No other path to a fully developed economy has been blazed, and those currently making the best progress, like China, are following the same route.

Despite the fact that only one well-worn path exists, India sits so far off the path that it can be difficult to imagine how it can reach it. Economies with a dominant service sector have not seen manufacturing return to dominance. Further obscuring the vision of a manufacturing-led path for India is the common mistake of examining India’s whole manufacturing sector, rather than limiting the analysis to the formal sector. Since the inception of the Industrial Revolution, competitiveness in manufacturing has meant scale, both in size and sophistication of firms. India’s informal manufacturing sector holds little promise for the kind of rapid growth needed for structural transformation. But as argued in Section 3, omitting informal firms from the calculation completely changes the picture.

The strongest argument in favor of pursuing the manufacturing path is India’s labor force. Most the economies that relied on manufacturing for development began with relatively poorly educated, predominantly agricultural workforces. They started by developing labor-intensive industries like textiles, toy making, and low-end electronics assembly, which capitalize on the large, cheap, low-skill labor force.

Indeed, India’s labor force appears well-suited to manufacturing employment at the bottom of the value chain. About 33 percent of the labor force has no education, and therefore probably remains unemployable for factory work. This proportion is expected to decline over time. On the other hand, those with primary and secondary education—the prime labor pool for manufacturing—should remain about 60 percent of the labor force for the foreseeable future (Figure 9).

To capitalize on a labor force primed for large-scale, low-value chain manufacturing, labor-intensive manufacturing will need to become much more competitive than it stands today. Manufacturers will need to build large-scale operations tied into global supply chains.

Two major types of constraints face the formal manufacturing sector. The first is the policy environment. As noted in Section 3, formal manufacturing is significantly more exposed to adverse policies than the modern service sector. Further, it is much more reliant on the government delivery of public goods like infrastructure. Presumably, removing these obstacles could facilitate vigorous growth (see Box 2).

Box 2. Case Study: The Beneficial Impact of Removing Production Restrictions

Plenty of academic evidence indicates that measures like removing labor market restrictions or improving infrastructure quality help firms grow faster.⁴⁸ One study in particular illustrates not just faster growth, but what that growth may look like for the structure of industry.

Since the 1960s India has “reserved” certain products for small-scale industries by restricting their production to firms below a certain asset size. Researchers Leslie Martin, Shanti Nataraj, and Ann Harrison measure the impact of removing reservations for different products between 1997 and 2007.⁴⁹ They found that rather than allowing ...

small-scale industries to grow, larger firms expanded in their place to produce those goods and drove out the inefficient small-scale industries. But instead of a tale of woe, the research found that districts more exposed to de-reservation experienced higher employment and wage growth.

The survey data used in much of this paper would likely classify small-scale firms as part of informal manufacturing. Interpreting the study the language used here, workers benefited when reform allowed high-productivity formal-sector manufacturers to replace low-growth, low-productivity informal firms.

Does this mean existing garment manufacturers, for instance, will vanish? Most reservations for garment manufacturing have been removed. Despite operating at a small, relatively inefficient scale, they compete in a global marketplace just like large firms do. They thrive because they have found a niche in small-batch garments requiring handwork like embroidery that is not easily done on a mechanized assembly line.

There is no intrinsic reason domestic large-scale garment factories would pose any greater threat to them than large operations in other countries. Rather, improvements in the business climate—like fewer regulatory hassles or better infrastructure—would only improve their advantage against direct competitors in other countries.

The second constraint is the adverse environment for new entrants to the global manufacturing supply chain. Many observers argue the window for serious manufacturing growth in India has closed for several reasons.

- One large advantage that competitors who have already established significant market share enjoy over India is a highly favorable capital-labor ratio. The large amount of capital investment East Asia received was a leading factor in its development of

manufacturing. It has also accumulated years of invaluable experience India cannot so easily replicate. Countries such as South Korea (40 years of manufacturing experience) and China (25 years) have refined their processes in order to deliver a quality product at a competitive price.⁵⁰ Skeptics argue India would require a major shift in the amount of FDI flowing into manufacturing to acquire both the capital and know-how to jump-start a large export industry.

- Another advantage for established exporters is global supply chains, though the arguments run in both directions. On one hand, some argue today’s exporters are already well integrated in a way that makes new entry difficult. On the other hand, global supply chains make manufacturers more nimble, able to shift operations quickly to the next market to offer rock-bottom wages. Hence, in the absence of rapid development of infrastructure and skills, manufacturing will prove fickle and fleeting.
- There is concern that the success of the service sector will impede the competitiveness of manufacturing. For instance, Raguram Rajan and Arvind Subramanian (incidentally, now both senior Indian government officials) worried back in 2006 that wages for skilled workers have been driven too high.⁵¹ Nicknaming the phenomenon the “Bangalore Bug,” they argued manufacturers cannot compete in low-skill industries with razor-thin margins if they must pay high wages for their senior employees.
- Finally, manufacturing may no longer be the global growth engine it once was. Services have been growing, not just as a share of global GDP, but also as a share of trade.⁵²

These skeptics of the Indian manufacturing takeoff essentially argue that the gains from pursuing greater manufacturing will not be as great as hoped. Fortunately, there are good reasons to believe they can be overcome.

First, the basic premise of a manufacturing-led growth strategy is removing constraints to the point that labor-intensive manufacturing becomes competitive. With the large, low-wage semi-skilled labor force at hand, presumably that is not impossible. Once competitive, investment, both foreign and domestic, should follow. Vietnam and Bangalore have recently succeeded on exactly that basis.

The flexibility of supply chains works in India’s favor as a new entrant. It must start off as the low-wage leader to steal market share. As Chinese manufacturing becomes more expensive, firms are looking for new, cheap labor forces.

Perhaps most importantly, India possesses an advantage that no other country besides China can compete with: its potentially massive domestic market. Shifting operations to India not only allows access to its labor force, but also provides a privileged position from which to access the domestic market. For instance, the attractiveness of servicing the domestic auto market is a large reason why many auto parts firms operate (capital-intensive) export-oriented operations from India despite a difficult business climate. This bonus will help India cross cost thresholds more easily, potentially overcoming other disadvantages like the Bangalore Bug.

Overall, improvements in the business climate through improved infrastructure development and regulatory reform could dramatically change the viability of large-scale low-value manufacturing. Hence, formal manufacturing could see a sharp rise in both output and employment growth. As seen above, however, this is starting from a tiny base. Is it conceivable that formal manufacturing could grow fast enough to provide meaningful help to India’s jobs problem? The next section attempts to answer this question by simulating forecasts of several scenarios.

5. Simulations

The sector with the most potential to provide quality jobs in the future—formal sector manufacturing—employs relatively few workers. The same is true for the next best option, modern services. Even if a wave of reform unleashes the full growth potential for formal-sector manufacturing, will that help India supply enough jobs for its workers? Can a large enough share of workers expand in high-productivity sectors to push India up the ladder of development? The answers to these questions are critical for helping Indian policymakers set realistic goals and choose between competing policy priorities.

A simulation can attempt to frame an answer by making simple assumptions about the future evolution of the economy. The simulation presented here starts with a set of basic output growth rates. It maintains a fixed relationship between output growth and employment growth to yield employment growth. Beyond these two critical items, the simulation provides a glimpse at how output and employment might be divided between sectors, as well as the impact of that division on productivity growth.⁵³

The first assumption to make regards output growth in each sector. As argued in the section above, the formal manufacturing sector stands to gain more than others if appropriate policy changes occur. Hence, it is reasonable to assume that output growth in that sector would rise above its average since 1994 of 8.7 percent.

To guess at what might be possible, India can look at other Asian economies that experienced a 20-year boom in manufacturing growth (see Table 1). The historical experience helps provide context to gauge the simulation results. For comparison, the table includes the Indian experience of the past 20 years, although no significant boom occurred.

The growth rates and share of GDP reflect the entire manufacturing sector, not just the formal sector, for which data are unavailable outside India. Korea initiated its boom with manufacturing holding a very low share of GDP. It may therefore have had a much smaller informal manufacturing sector than the other countries, making it a better model for predicting India’s formal manufacturing sector. China has the strongest match with the story of a major wave of reform opening new sectors to export-oriented growth. Malaysia and Thailand have more recent experience with expanding manufacturing. Hence, there are reasons why each country’s experience might be relevant for India.

Table 1. Manufacturing Sector Performance, Selected Asian Nations

	Annualized Growth Rate (percent)			Share of GDP (percentage points)		
	Start	10-year	20-year	Initial	10-year	20-year
	year	rate	rate	share	change	change
Korea	1963	19	16	4	7	15
China	1978	11	13	20	2	15
Indonesia	1978	11	10	13	10	13
Malaysia	1985	13	10	15	10	13
Thailand	1985	13	9	21	8	15
India	1994	10	8	15	1	0

Note: As in the rest of the paper, growth rates in the table are compound annual growth rates.

Source: Marcel P. Timmer, Gaaitzen de Vries, and Klaas de Vries, *Patterns of Structural Change in Developing Countries*, GGDC Research Memorandum (University of Groningen, July 2014), <http://www.ggdc.net/publications/memorandum/gd149.pdf>; Indian National Accounts data.

Notably, these countries sustained double-digit growth rates across 20 years. Other sectors in these economies did not grow so fast (although services grew as fast in China as in India), allowing manufacturing to pick up 13-15 percent of GDP across that period.

Scenario 1: National Manufacturing Policy

Scenario 1 focuses on the goal set forth by the Make in India campaign.⁵⁴ This policy seeks to raise manufacturing (formal and informal) to 25 percent of GDP and to create 100 million manufacturing jobs by 2022.

The scenario begins by assuming that every sector except formal-sector manufacturing grows at the same rate that it did from 1994 to 2012 (See Table A1 in the Appendix for details).⁵⁵ Several sectors might be expected to grow slower than their historical growth pattern. Informal manufacturing may do so because it will face stronger competition from formal manufacturing, and modern services may do so for the reasons elaborated in the previous section, such as slowing export potential. However, both would benefit from greater domestic demand if formal

manufacturing accelerates. Without a strong reason to expect the positive or negative factors to dominate, the simulations maintain the historical pattern.⁵⁶

By running these growth rates forward until 2022, the simulation produces GDP for every sector except formal-sector manufacturing. Then it is simple to back out the growth rate for formal-sector manufacturing necessary to meet the goal of a 25 percent share of GDP. Therefore, Scenario 1 attempts to answer how fast formal manufacturing must grow to hit the Make in India goal.

The scenario also produces employment figures assuming historical relationships between output and employment. The one exception is formal manufacturing. The scenario assumes the high level of manufacturing growth comes from reforms that unlock growth. Accordingly, reform is assumed to help labor-intensive industries more than existing capital-intensive ones, causing manufacturing growth to boost its employment-generating capacity.

Under the assumptions of the simulation, the manufacturing sector reaches 25 percent of GDP by 2022 if the formal side of the manufacturing sector grows 21 percent per year (Table A2 in the Appendix). That means the total manufacturing sector must grow at 18 percent per year. Clearly this exceeds the growth experience of the set of manufacturing booms in Asia and the Make in India manufacturing growth target of 12–14 percent. It may therefore not be realistic. In addition, employment does not come close to the goal of 100 million new manufacturing jobs, reaching only 26 million.

The source of the Make in India campaign targets, the National Manufacturing Policy of 2011, allowed India 11 years to reach them. Since the boom has yet to begin, it might be sensible to reset the clock to allow 11 years from 2014 for India to achieve the goals. The next scenario presents a second simulation with the timetable revised accordingly.

In this case, formal manufacturing can push the total manufacturing share of GDP to 25 percent by maintaining an average growth rate of 19 percent until 2025 (Table A3 in the Appendix).

Korea achieved a 19 percent growth rate in the first 10 years of its boom, so this rate lies within historical experience. However, manufacturing employment growth is only 38 million additional jobs, so the employment goal remains a distant dream. Further, this scenario requires India’s aggregate economy to grow at 11 percent per year, which exceeds even China’s exceptional experience.

The conclusion of this simulation is that the Make in India goals—remaining silent for the moment about how to achieve them—appear unrealistic. Even if the timetable is reset to be achieved 11 years from now, the Make in India output goals push the boundaries of plausibility. The employment goals are utterly beyond reach. Further, it would require manufacturing growth to jump within the next year. It remains to be seen how such a large acceleration can be initiated so rapidly.

Scenario 2: Comparison to No Reform

Another approach is to simulate a reasonable scenario for how the economy would evolve without significant reforms. Comparing this to a reasonable reform scenario helps illustrate the potential impact of reforms that promote a successful labor-intensive formal manufacturing sector.

The starting point for a no-reform scenario is aggregate growth. IMF researchers estimate that potential growth for the Indian economy in recent years lies in the 6–7 percent range. That is, the economy can continue to grow at that rate under current conditions without provoking higher inflation rates. The no-reform scenario therefore assumes the Indian economy will follow the central value of 6.5 percent growth for the next 20 years.

To identify how that breaks down across sectors, the scenario assumes each sector will grow in proportion to the 20-year historical rates (Table A1), but scaled down to match the new aggregate growth rate.⁵⁷ The no-reform scenario also maintains the historical relationships between output and employment for all sectors, including formal manufacturing. Agriculture is

assumed not to shed workers as fast as in the past 10 years, since the economic forces pulling workers into other sectors would weaken.

The reform scenario begins with historical growth rates—not scaled down as in the no-reform scenario—for all sectors except formal manufacturing. Again, unorganized manufacturing and modern services have factors that might push them either way, so the historical pattern is maintained. Other industry and other services are almost exclusively domestically driven, however, and do not compete directly with formal manufacturing. The assumed higher growth of formal manufacturing will almost certainly benefit them. To account for this, the scenario includes a factor to allow their growth rates to converge toward the national average.

Recognizing that Scenario 1 produced unrealistic results, this simulation tones down formal-sector manufacturing growth slightly. It assumes an initial growth rate of 16 percent. This is the highest 20-year growth rate observed among the East Asian booms. Within India, going as far back as the 1960s, the fastest-growing 20-year period for formal manufacturing was the most recent at 8.7 percent average growth, and the fastest-growing sub-component of manufacturing was also in the most recent period: electrical machinery at 13.2 percent average growth. To find an Indian example of such fast growth, one must look at modern services, where business services and communications experienced 16 percent and 21 percent average growth over the past 20 years respectively. So assuming 16 percent growth constitutes an ambitious, but conceivable, assumption.

The simulation again compresses all sectors’ growth over time to maintain a constant aggregate growth rate of 9.4 percent. Manufacturing as a whole then experiences an average growth rate of 12.7 percent, with the range of the Make in India goal of 12–14 percent growth. These assumptions are on the high end of the Asian experience described above, but still below the maximum values observed historically.

Running the simulation out 20 years produces dramatic differences between the no-reform scenario and the reform scenario (Table 2). Relatively higher growth rates in formal

manufacturing yield a substantial rise in its proportion of GDP. Overall GDP is double what it might be without reform. Productivity (which should correlate with wages) also grows faster with reform. Not only does each sector expand productivity, but because employment shifts toward higher-productivity sectors, aggregate productivity also expands faster than any individual sector.⁵⁸

Table 2. Scenario 2: Difference Between Reform and No Reform

	formal manufacturing	informal manufacturing	other industry	modern services	other services	agriculture & mining	total
average GDP growth rate 2014-2035	9%	1%	3%	3%	3%	0%	4%
GDP share 2035	17%	-1%	-1%	-7%	-5%	-3%	
GDP ratio 2035 reform/no reform	5.4	1.2	1.7	1.6	1.7	1.1	2.0
new jobs 2014-2035 mil	63	2	98	5	24	-33	158
employment share 2035	7%	-1%	8%	0%	-2%	-12%	
productivity ratio 2035	1.4	1.2	1.0	1.4	1.4	1.3	1.6

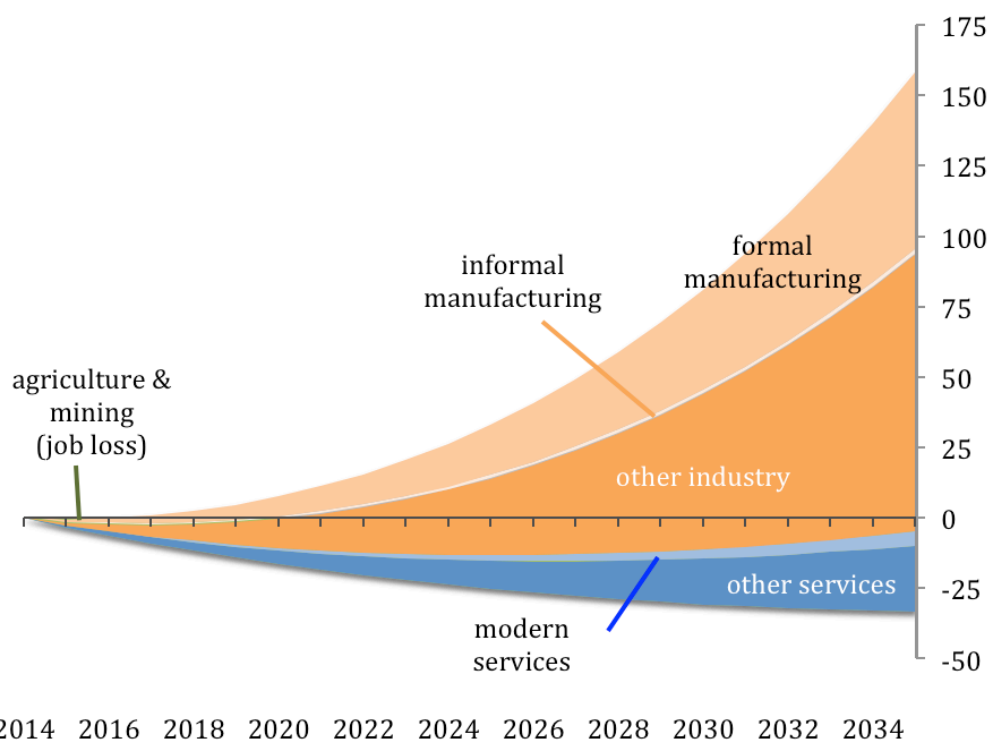
Perhaps most importantly, job growth would be substantially higher if reforms are adequately implemented (Figure 10). Formal manufacturing employment would grow to exceed informal manufacturing. The two together, however, only add 65 million new jobs. So in a realistic but ambitious growth scenario for the economy, where manufacturing growth lies within the level sought by the Make in India goals, the employment goal of 100 million new manufacturing jobs remains unattainable even after 20 years.

Other industry—mostly construction—has a very high need for manpower, so it also would expand rapidly. Agriculture sheds jobs, but the other sectors of the economy would have plenty of capacity to absorb those workers. In particular, Section 2 above describes the need to create 10 million new jobs each year on top of what is needed to recoup manpower shedding in agriculture. The Indian economy does not currently meet that mark, creating a job gap that pushes people

into fallback employment and underemployment. With adequate reforms, the projection shows the economy will completely cover that job gap (and the cumulative historical gap) in 14 years.

Figure 10. Additional Job Growth with Reform, 2014–2035

Millions of new jobs



As indicated in the Appendix (Table A5), total employment in high-productivity, high-wage sectors could reach 15 percent of employment by 2035 with adequate reforms, from 5 percent today. That is a substantial improvement, though it is difficult to say whether it would be enough. While an extra 33 million workers would escape agriculture in this projection, 85 percent of the workforce would remain in low-wage, low-productivity activities. As a comparison point, the education forecast in Figure 9 suggests almost half the workforce will have finished high school by 2035. It is inconceivable that the Indian economy will provide high-productivity, high-wage jobs to half of the workforce.

6. Adequate Reforms

Having explored the economic potential that could be attained if “adequate reforms” occur, defining what constitutes “adequate” must be the next task. Fortunately, the components of adequate reform have been described many times over by various esteemed committees, organizations, and individuals, with remarkable agreement. The list below highlights the four most critical components for the sake of establishing priorities, but does not dive into the analytical detail available elsewhere.

While all components listed below would help improve the business climate, they would do so over different horizons. Some are more ready to implement, with changes of a finite number of laws and regulations. Others require deeper changes to well-established governmental relationships and processes, necessitating finesse, persistence, and intimate knowledge of the bureaucratic machinery. The reforms suggested here are presented in order of “shovel-readiness” or how quickly they could be implemented if political barriers were not an issue.

Reducing Labor Regulation

Labor reform stands out as such a singular impediment to manufacturing job growth that it deserves particular attention. India has among the strictest labor regulations in the world. There are four dozen central laws and hundreds of state laws governing labor issues, making reform a complex topic.

Labor regulation does not stand out only because of its complexity or stringency. It stands out because it links so directly to job creation. Of all the typical explanations for the failure of labor-intensive manufacturing to take off in India, excess labor regulation has the largest body of evidence establishing causality.⁵⁹ Evidence also exists that reducing regulations increases creation of formal-sector manufacturing jobs.⁶⁰

The OECD has done arguably the best job of organizing the various rules into themes like hiring, disputes, inspections, union rules, etc. It identified 50 broad reforms that need to be

carried out across central and state governments.⁶¹ The compliance and inspection burden could also be eased without reducing the effectiveness of existing regulations.

Labor regulation deserves to be singled out also because of the unified and powerful political forces pushing to preserve it. The great challenge here is not identifying the reforms or writing new rules, but the political art needed to carry them out. Many compromises will be required to implement the agenda without inciting heavy opposition.

Facilitation of Land Acquisition

Infrastructure and manufacturing are particularly exposed to land acquisition problems due to their land-intensive nature. Three key factors make the private market for land particularly difficult in India.

Land records in India are inaccurate, outdated, and not comprehensive—several states have not revised cadastral surveys since colonial days—leading to tremendous confusion and conflict when transferring ownership. This difficulty, like inadequate infrastructure, impacts every layer of society. For instance, local governments cannot use their land banks as collateral to borrow for capital expenditure because they have no accurate records of their large holdings.

Further, excessively rigid land-use restrictions hamper the efficient use of land. In urban areas, highly restrictive zoning essentially impacts small-scale projects only as a cost for bribery, but large projects that would attract public scrutiny (and hence cannot buy official forbearance) can be deterred altogether. In rural areas, the conversion of agricultural land to other uses faces tight scrutiny that prevents the use of land for its most productive purpose.

Finally, tax administration encourages “black money”—unofficial side payments to avoid stamp duties on the purchase of land. Failure to perform independent tax assessment means the officially recorded transaction value never gets questioned. This creates uncertainty about the market value for land. Without a reliable source of price comparison, unsophisticated landowners

bear inordinate risk when selling to large, sophisticated counterparties. The disputes that commonly ensue risk lengthy legal uncertainty and politicization.

The solutions to these three problems appear much more straightforward than they are. One complication is that land is such a widely held asset that policies surrounding it quickly become politicized. For instance, the Land Acquisition, Rehabilitation and Resettlement Act of 2013 attempted to address these issues. Political compulsions limited its measures to a series of workarounds rather than applying direct fixes. Unable to force states to fix land records, it takes a broad approach to compensation and adds layers of conflict management processes. The process of converting agricultural land gains some clarity under the act, but under conservative restrictions. The act applies an overly simplistic pricing scheme to address the uncertainty about true land prices. The net result is to greatly increase the cost of land acquisition, and hence further hamper the development of manufacturing and infrastructure.

In a less politicized environment, the solutions would include copying best practices from states that have utilized technology to record and digitize land records. Land use regulations would be rationalized to balance the needs of existing landowners with the long-term needs of the communities and regions affected. Ideally, that rationalization would take place at the state level with local participation, rather than a single nationwide policy. Finally, reflecting the points below on business-government relations and accountability, effective government processes would be established to enforce land-use regulations consistently and to implement independent tax assessment processes to prevent circumvention of land value taxes.⁶²

Of course, this idealized, less politicized environment does not exist, and further, each of these issues involves multiple layers of government. Hence, land acquisition will likely remain one of the thorniest problems facing the Indian economy.

Improvement of Business–Government Relations

The current regulatory regime—even outside labor regulations—smothers business in red tape. Despite major reforms in 1991, the complex web of laws and statutes regulating trade in India

still imposes a large burden. According to recent World Bank rankings comparing the ease of doing business in various countries, India registers as the 158th best place to start a business, 186th best for contract enforcement, and 142nd overall.⁶³

A country’s business climate results from a complex ecosystem of private sector operators interfacing with the government at many points. Reducing the friction of business-government interactions requires a multifaceted approach.

- The tax burden can be lightened by introducing a single, nationwide goods and services tax. This will also facilitate trade across states.
- Interaction with bureaucracies requires faster uptake of online processing options, reduction of points of contact through single-clearance windows, and winnowing of outdated regulation.
- Corruption must be met with aggressive approaches like the Aam Admi Party’s anti-graft helpline or Modi’s reported personal enforcement promises in Gujarat.⁶⁴

Overall, the government must dive into the weeds of its administration and relentlessly hunt for the pain points where it obstructs business. Top leadership must pressure bureaucrats to seek solutions, align incentives, and restore integrity. (See Box 3 for a case study of this approach.) Some reforms will be easy to implement—indeed the Modi government has already made a good start⁶⁵—but others will require investigation, creativity, and persistence to identify business-friendly procedures that still meet necessary public policy objectives.

Box 3. Case Study: Streamlining the Approach to Oil and Gas Exploration and Production (E&P)⁶⁶

Oil and gas E&P presents a good example of the potential to facilitate business and improve outcomes. Exploration companies must partner with the government to drill. Afraid of giving away the family jewels, bureaucrats micromanage their private drilling partners and fret over the right contract structure to protect the “government take.”

...

This yields the government approximately \$1 billion per year. Meanwhile, exploration interest is declining, and the nation spends \$150 billion per year importing oil and gas.

In place of this loss-making bureaucracy-intensive contract structure, R.N. Choubey, former head of the Directorate General of Hydrocarbons, proposed a clean royalty program perhaps with a windfall tax for price surges. This would eliminate the need for most government interference in private oil and gas production, shifting any scrutiny of business decisions to the normal ex-post review done by tax authorities. The proposal may lower the \$1 billion currently earned, but it should improve domestic production and so offset the loss.

Not every obstacle should be removed. For instance, only the government can intermediate the tension between economic development and environmental protection. But even there, an emphasis on expeditious and predictable processes to mediate conflict can dramatically help businesses anticipate outcomes and proceed with confidence.

Provision of Public Goods

Only the government can efficiently provide certain goods. Most of these have historically been woefully insufficient in India, so a focus on getting the job done would benefit the masses who cannot afford their own personalized security force or private hospitals. The legacy of sustained effort to improve government output in these areas suggests no easy solutions exist. But the need is so great that even marginal improvements will have first-order impacts. Here we focus on the three most important for manufacturing: judicial reform, education, and infrastructure.

1. Judicial Reform

The judicial system enjoys generally high esteem for the integrity of its decisions, but earns popular disdain for its lassitude. The courts are understaffed, underfunded, and unable to cope with their enormous workload. Currently, they have a backlog of 50 percent of the annual caseload. Some 60 percent of those are more than one year old and 40 percent more than five years old.⁶⁷

As the old saw goes, justice delayed is justice denied. Judicial backlogs hinder contract enforcement and undermine the deterrent of law enforcement. Indian firms display remarkable creativity in working around these constraints. Nevertheless, the frequent flouting of contractual obligations, and the cost of building arrangements to address it, deters many firms from growing.

Unlike almost every other serious problem in India, the solution to judicial challenges appears to be simple: more. More resources to pay for more manpower, more training, and more specialized courts. The Law Commission of India recently collected data indicating high courts need 48 percent more judges and lower courts need 77 percent more judges in order to clear out existing backlogs in three years.⁶⁸ Accountability must improve as capacity improves, with incentives for high-caliber work.

2. Education

In order to attain its growth goals, India must make headway toward improving education. The difficulty of finding qualified workers routinely lands atop surveys of businesses’ biggest gripes. In particular, factory workers should have better than basic literacy, and foremen need a high school diploma. Currently, education quality is typically low, yielding lower employability than a job applicant’s educational attainment would suggest.

The projections of educational attainment presented above (Figure 9) are not a certainty. Rather, the demographers that calculated them consider the projections optimistic compared to current trends in India.⁶⁹ Roadblocks include familiar complaints like rigid curricula, inadequate resources, and teachers unions that block reform.

No single policy can unlock better education. Rather, the central government should encourage experimentation at the ground level with—most critically—an emphasis on measuring outcomes. A shift to outcome-based funding will necessitate major mindset and administrative changes. It would also require significant deregulation to free state-level governments to adapt their approach, for instance, to a heavier investment in vocational education.

3. Infrastructure

The Gordian knot of infrastructure development must be addressed before growth can return. By some estimates logistics costs for manufacturing firms exceed their entire wage bill.⁷⁰ Studies have shown the unreliability of electricity has handicapped productivity.⁷¹ Such statements ring true when observing the sorry state of infrastructure.

India’s Ministry of Road Transport and Highways estimates only 53.8 percent of the nation’s roads are paved.⁷² The notoriously underfunded Indian Railways has numerous stalled expansion projects and an outdated railcar fleet. Telecommunications, ports, and airports all lag behind international standards. Perhaps worst of all is India’s spotty power grid. Government interference in fuel production, power generation, transmission, and distribution means one-third of the country has no power, and the other two-thirds suffer frequent outages.

These dysfunctions are manifestations of more complicated, deeper problems. For instance, poor land registries precipitate confusion at the state level over what land is available for building. Population density in India means social and environmental concerns can mount a legitimate case against most rural and semi-rural infrastructure projects. Legal disputes—highlighted above—can stall projects for years.

Energy sector failures are largely due to incessant government meddling from upstream to the final consumer. Major decontrol must occur to meet future power needs. Finally, in the many areas where the government must remain involved, it should recognize that the social returns to infrastructure completion are immense. Excessive concern about up-front costs is penny-wise and pound-foolish. Better to err on the side of outcome quality, even if that means some subcontractors make big profits, and let the traffic flow.

Institutional Reform

Institution building is equivalent to investing in capital stock. Most factories can produce more from existing capacity for a short period, but long term, sustainable growth requires investment.

India’s government has been working off of the same institutions for decades, and there is a limit to how much even the best manager can squeeze out of it. India needs a government that is significantly more capable, which will only happen with institutional reform.

These recommendations do not meet a specific need of the manufacturing sector, but rather help ensure that all other recommendations can be carried out effectively. Priority must be given to building accountability mechanisms, privatization, and civil service reform, each of which would help the government stay on track and achieve its many goals, including private sector job creation.

Like any investment, these will take time to pay off. Yet improved government performance pays dividends for decades.

1. Accountability

Accountability is the Achilles’ heel of the Indian government. Lant Pritchett drew on his years in India with the World Bank to describe the government as a “flailing state,” with sophisticated ideas in Delhi unable to translate into action on the ground. Somehow, accountability has never been seriously built into the fabric of Indian government. Laws are drafted with no concern for the administrative capacity to carry them out. Agencies are often established with multiple vague objectives, hampering mission focus and evaluation. Little effort goes toward follow up. For instance, the Ministry of Statistics and Programme Implementation produces no noticeable statistics on program implementation.

Accountability should become the organizing principle around which the Modi government builds all of its activities. Accountability requires clear lines of authority. This means reorganizing ministries and regulators to avoid overlapping responsibilities. It also requires clear objectives and regular reviews of progress. Fortunately, Modi is an administrator renown for his ability to enforce accountability with CEO-like leadership. Anecdotal reports about management of bureaucrats in Delhi suggest he aims to replicate his success in Gujarat on a larger stage.

2. Privatization

India’s state-owned enterprises (locally known as Public Sector Undertakings or PSUs) face excessive government meddling—as do their counterparts around the globe. As a result, they are bloated, inefficient, and sometimes corrupt relics of socialist India.⁷³

PSUs suffer from two major defects related to accountability. First, their compensation structure largely reflects public sector salaries with little performance incentive. While no better system may exist for bureaucrats, PSU staff performance would markedly improve with private sector-style human resources (HR) systems. Second, PSUs themselves face weak or conflicting incentives because their major shareholder does not seek to maximize profit. Rather, political prerogatives mix policy and business objectives. When goals of maintaining employment or subsidizing clients comele with profit motives, loss-making activities persist.⁷⁴

It can be very difficult for private sector firms to compete against firms that can operate indefinitely at a loss or that receive subsidized credit or favorable access to permits. Scaling back government participation in PSUs will open the way for the increased private sector activity that will benefit India in the long run.

As an added incentive, privatization would raise revenue from the sale and reduce the drain PSUs have on the fiscal budget. By removing the distraction of PSU management, a great deal of energy in the government can be repurposed toward implementing programs within a more traditional government purview.

Though privatization is essential, it nevertheless faces strong impediments. Indeed, fear of political backlash dictates that even the word privatization be avoided, using “disinvestment” in its place. Disinvestment offers the hope that the government will not lose control.

Organized labor, for one, deeply opposes any threat to government job security and benefits. One-third of formal-sector jobs (not including the government itself) come from state and

central government PSUs.⁷⁵ When New Delhi privatized its power distribution company, one-third of employees were eliminated. Though only one anecdote, this figure provides a sense of the magnitudes of cuts that might result from privatization. Thus far, for most PSUs the fear of public outrage has prevented disinvestment to the point that government control weakens.

PSUs’ utility as tools of party patronage adds an additional barrier. Although Modi proclaims himself an opponent of big government bureaucracy and corruption, his obligations to his party may help keep these institutions in place. He has instead emphasized reforming PSUs to improve performance.

If PSUs were successfully reformed and became totally professional and competitive (i.e., devoid of policy interference), what would be the point of government ownership? By retaining control, the government maintains the option of interfering in the future. The reality is that well-intentioned efforts to professionalize and revive PSUs only last as long as the good intentions do. The temptation to use PSUs as an off-budget tool of public policy is great, and leadership inevitably changes.⁷⁶

3. Civil Service Reform

Prominent India observers like Pratap Bhanu Mehta and Arun Maira frequently lament the low capacity of the Indian government to impact the country it nominally rules. While a good portion of the responsibility lies with poor accountability mechanisms, having capable, motivated staff can make a tremendous difference. Civil service reform is needed to develop the depth of subject-matter expertise that modern governments require. It must also aim to improve the incentive structure to reward strong performance.

Almost all political factions agree on the necessity of administrative reform of the central government. The bad news is that they have agreed on the issue for 65 years and have made minimal progress. Only two serious attempts at reform have been attempted since 1966, with the second, the 2005 Second Administrative Reforms Commission (ARC), awaiting action on most items related to the civil service.

India essentially needs to update its HR policies for bureaucrats. Needs include increased openness to mid-career entry, more domain-specific career tracking (fewer generalists and less frequent rotation), better matching of salaries to the private sector for professional positions, and better structuring of accountability (fewer harsh punishments for mistakes, but longer tenures for better alignment of incentives). Promisingly, some initiatives have begun to facilitate mid-career entry of specialist staff on par with career civil servants.

Political Realities

As governor of the state of Gujarat, Modi was noted for his successes in managing the state’s complex bureaucracy while maintaining positive relations with business. Business leaders applauded his ability to make business-government interactions relatively seamless, uniform, and efficient.

At the Centre, Modi has prioritized manufacturing growth through the Make in India campaign. His government has already enacted some moderate labor reform legislation and has made a concerted push for the Goods and Services Tax. But overall the main strategy appears to be applying the Gujarati approach at the Centre. This approach focused on marginal improvements rather than “big bang” reforms. The National Democratic Alliance (NDA) government has so far largely worked to improve processes and reduce inefficiencies within the existing legal and regulatory framework rather than overhaul the government approach to key issues.⁷⁷

The small-but-steady approach may reflect the political reality that big bang reforms require cooperation from many competing players to succeed in a sustainable fashion.⁷⁸ Despite having the largest majority in 30 years in the lower house of Parliament, the NDA needs outside support in the upper house to pass legislation.

The cooperation of state governments will prove even more critical. For instance, two-thirds of regulations affecting manufacturing are at the state level.⁷⁹ In practice, land acquisition is almost

entirely a state and local government issue. The massive undertaking of infrastructure improvement relies heavily on state and local governments.

Neither the difficulty nor the importance of obtaining state-level reforms can be overstated. This fact belies the attention given to the new Modi government as a potential game-changer for manufacturing growth. Though the BJP picked up two more state governments this fall, that only gives it five of 28 states. Even with the benefit of his experience leading a state government, Modi’s ability to directly secure major reforms in states will likely remain limited. Indirect pressure, either through tied funding obligations or simply interstate competition, provides other weak channels of influence. Moreover, state and local governments suffer even more than the Centre from outdated institutions, poor accountability frameworks, and inadequate human resources.

7. Conclusion

The Modi government is right to prioritize creation of high-quality jobs as a key to economic inclusion. India needs to achieve two objectives: creating new jobs and shifting more workers into high-productivity sectors. Meeting both can provide large economic headwinds to the Indian economy for several decades.

The current trend will not meet the goal. The status quo implies the preponderance of the labor force languishing in low-productivity sectors. This includes not only agriculture, but also construction, informal manufacturing, and traditional services.

Modern tradable, technology-enabled services have driven the Indian economy during its growth acceleration of the last 20 years. Conversely—and contrary to popular conception—services have grown mostly on the back of domestic demand. In the modern service sector, this growth came with high productivity levels and high-quality jobs. Compared to the size of the labor force, however, the number of those jobs is quite small.

In the future, the service sector is unlikely to transform into a substantial, high-quality job producer. It may grow well if the broader domestic economy performs well—export markets do not look as promising as in the past—but there is no argument to suggest that it will increase its employment intensity. It is more reasonable to expect a continuation of the same pattern of the past 20 years.

Formal-sector manufacturing, on the other hand, has played the dark horse of the Indian economy. It so often gets bundled together with its low-growth, low-productivity competitors in the informal sector that it has not received the attention it deserves. Formal-sector manufacturing has exhibited remarkable dynamism in output and employment despite a relatively inhospitable business environment. In response to that business environment, manufacturing has specialized in capital-intensive production techniques, which limit its impact on employment. Despite its dynamism, however, it remains a small portion of the economy.

There are two main reasons to remain hopeful that formal-sector manufacturing could provide a new, labor-intensive acceleration to the economy. The first is that India’s massive low-skilled labor force is ripe for application to that purpose. It is growing and education levels are improving. The second is that formal manufacturing has not yet had a chance to meet its potential. More than almost any other sector of the economy, it has been artificially constrained by India’s particular mix of adverse policies. Removing the constraints could transform manufacturing.

While manufacturing may not hold as much promise as a driver of economic development as it used to—whether due to changing global consumption patterns or slower global growth—India has a trump card over any other nation looking to expand its manufacturing engine: India has a large domestic market of its own. Close access to the domestic market will make India a preferred destination to locate factories for both domestic and foreign firms, just as China was 15 years ago.

But since the modern service sector is not a big employer and formal-sector manufacturing is just not very big, the question remains whether these two main sources of high-quality, high-productivity jobs can make much of an aggregate impact. To answer this question, the paper provides simulations of the economy under various scenarios.

The simulations first indicate that the Make in India campaign may have set unrealistically high goals for manufacturing growth and job creation. Even giving the campaign an extra three years to hit its targets would require unrealistically high growth rates. And no scenario presented here produces 100 million new manufacturing jobs—even in the next 20 years.

Sticking to more realistic, yet still ambitious, growth assumptions does not ruin the outcome, fortunately. A plausible outcome from sufficiently removing barriers to labor-intensive formal-sector manufacturing growth is that India’s manufacturing sector performs as well as East Asian countries did during their 20-year manufacturing booms.

Compared to a no-change scenario, the 20-year projections indicate very large benefits to East Asia-style labor-intensive manufacturing growth. Overall GDP is double what it might be without reform. Productivity (which should correlate with wages) also nearly doubles. Over 100 million additional jobs would be created above the no-change scenario—though not in manufacturing alone. Both the ratio of manufacturing output-to-GDP and the manufacturing share of employment would end up in the same range as the East Asian booms did, despite assuming continued strength in India’s modern service sector.

There is no escaping, however, the small starting point for employment in high productivity sectors. Even after 20 years of exceptional growth, formal-sector manufacturing and modern services would together only employ 15 percent of the workforce after 20 years, compared to the forecast that half the workforce will hold a high school degree by that point. Perhaps that comparison suggests the growth scenario is not bold enough. Say’s law suggests that when barriers are removed, the economy will find a way to utilize a strong labor force.

A hopeful scenario predicated on adequate reforms demands identification of “adequate” reforms. The paper suggests a number of critical reforms—reducing labor regulation, facilitation of land acquisition, improvement of the business-government interface, provision of public goods, and institutional reform. With the exception of the latter, these items commonly take prominent positions on the reform wish-lists of eminent economists and policymakers, including many in the current government. The novel item is institutional reform, without which the machinery of the Indian government will not be up to the task of successfully implementing most of the rest of the list.

It should not be said that the list of reforms suggested here must be implemented in full to enable the big advance in labor-intensive manufacturing simulated in Section 5. Many combinations would surely be sufficient, though it would be impossible to predict which in particular will work. Each reform impacts the decision of formal-sector firms to open, invest, and hire by reducing the cost of doing business and making success more likely.

Neither should the simplicity of presenting a high-reform scenario be interpreted to imply that the reform process will be easy. Despite all the advantages Modi possesses in terms of Parliamentary majority and electoral momentum, the task remains daunting. Two factors in particular stand out. The first is the necessity to reform the very institutions needed to implement further reform. This makes compromise that weakens the potency of reform much more likely. The second is the centrality (pun intended) to the reform process of layers of government outside the Centre’s control. Modi’s limited power to achieve state-level reform will probably cause years of more delay, with progress occurring at first only among a few like-minded state governments.

The scenarios are not forecasts, because the future depends so heavily on a hard slog of major reform. They are mere projections. Overall, the conclusions of this paper about the potentially high impact of an acceleration of formal-sector manufacturing should serve as motivation for the Indian government at all levels to push hard toward the goal.

Appendix: Simulation Details

Table A1. Baseline of Sectoral Analysis: India in 2014

	formal manufacturing	informal manufacturing	other industry	modern services	other services	agriculture & mining	total
growth rate 1994-2012	9%	6%	8%	14%	8%	3%	7%
GDP 2014 share Rs tril	11%	5%	10%	22%	36%	16%	100% 100.4
employment share 2012 mil	2%	10%	11%	3%	24%	49%	100% 473
employment elasticity	0.7	0.1	1.0	0.3	0.3	-0.5	0.1
productivity 2014 Rs thou/worker	958	95	186	1490	326	71	212

Table A2. Scenario 1A: Achieving a Manufacturing Share of GDP by 2022

	formal manufacturing	informal manufacturing	other industry	modern services	other services	agriculture & mining	total
average GDP growth rate 2014-2022	21%	6%	9%	14%	9%	3%	11%
GDP share 2022	22%	3%	8%	26%	31%	9%	100%
new jobs 2014-2022 mil	23	3	49	6	23	-27	77
employment share 2022	6%	9%	18%	4%	25%	38%	100%
productivity 2022 Rs thou/worker	1,463	140	186	2,911	526	103	416
productivity growth 2014-2022	5%	5%	0%	9%	6%	5%	9%

Table A3. Scenario 1B: Achieving a Manufacturing Share of GDP by 2025

	formal manufacturing	informal manufacturing	other industry	modern services	other services	agriculture & mining	total
average GDP growth rate 2014-2025	19%	6%	9%	14%	9%	3%	11%
GDP share 2025	23%	3%	8%	29%	30%	8%	100%
new jobs 2014-2025 mil	33	5	78	9	33	-36	120
employment share 2025	7%	9%	22%	4%	24%	33%	100%
productivity 2025 Rs thou/worker	1,626	162	187	3,742	628	118	518
productivity growth 2014-2025	5%	5%	0%	9%	6%	5%	8%

Table A4. Scenario 2A: No Reform

	formal manufacturing	informal manufacturing	other industry	modern services	other services	agriculture & mining	total
average GDP growth rate 2014-2035	5%	3%	5%	9%	5%	1%	6%
GDP share 2035	10%	3%	8%	41%	31%	6%	100%
new jobs 2014-2035 mil	10	5	94	13	37	-1	159
employment share 2035	3%	8%	23%	4%	24%	37%	100%
productivity 2035 Rs thou/worker	1,532	168	187	5,067	688	90	525
productivity growth 2014-2035	2%	3%	0%	6%	4%	1%	4%

Table A5. Scenario 2B: Reform

	formal manufacturing	informal manufacturing	other industry	modern services	other services	agriculture & mining	total
average GDP growth rate 2014-2035	14%	4%	8%	12%	8%	2%	9%
GDP share 2035	27%	2%	7%	34%	26%	3%	100%
new jobs 2014-2035 mil	73	7	193	18	61	-35	316
employment share 2035	11%	7%	31%	4%	22%	25%	100%
productivity 2035 Rs thou/worker	2,130	200	187	6,992	994	115	833
productivity growth 2014-2035	4%	4%	0%	8%	5%	2%	7%

Figure A1. Scenario 2A: Evolution of Employment without Reform

Millions of workers

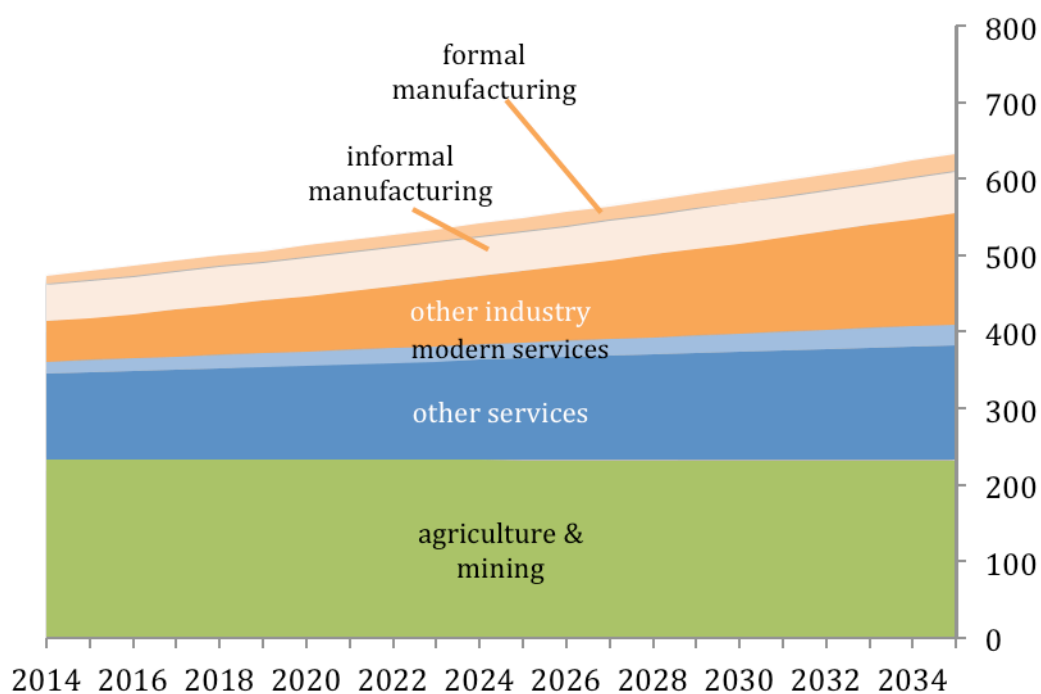
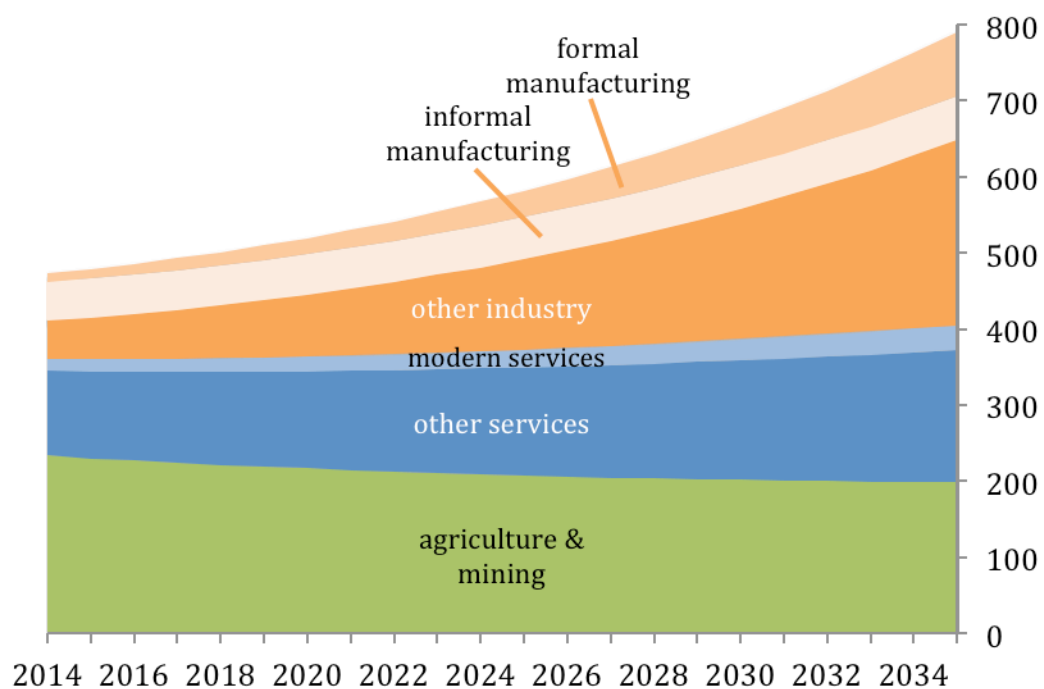


Figure A2. Scenario 2A: Evolution of Employment with Reform

Millions of workers



Endnotes

¹ The 10 states with the most BJP members of parliament have a total fertility rate of 3.1 compared to a below-replacement level fertility rate of 2.0 for the rest of India’s states.

² See, for instance, Amrit Amirapu and Arvind Subramanian, “India Must Reverse Its Deindustrialization,” *Business Standard*, May 9, 2014; Saugata Bhattacharya, “It’s Not Just Manufacturing,” *Financial Express*, July 3, 2014; Economist, “Arrested Development,” October 4, 2014, <http://www.economist.com/news/special-report/21621158-model-development-through-industrialisation-its-way-out-arrested-development>; Howard Pack, “Should South Asia Emulate East Asian Tigers?,” in *Accelerating Growth and Job Creation in South Asia*, ed. Ejaz Ghani and Sadiq Ahmed (Washington, DC: World Bank, 2009).

³ Differences in poverty estimation techniques—and the estimates—recommended by multiple expert committees have become politicized because of the importance of poverty reduction.

⁴ Based on National Statistical Sample Organization survey data on labor force participation combined with population estimates from the Population Division of the Department of Economic and Social Affairs of the UN (2012).

⁵ All multi-year average growth rates in this paper are compound annual growth rates.

⁶ Jayan Jose Thomas, “The Demographic Challenge and Employment Growth in India,” *Economic and Political Weekly* 49, no. 6 (January 31, 2014): 15–17.

⁷ McKinsey attributes most of the boom in construction jobs to the Mahatma Gandhi Rural Employment Guarantee Act scheme. Rajat Gupta et al., *India’s Path from Poverty to Empowerment* (McKinsey Global Institute, February 2014), http://www.mckinsey.com/insights/asia-pacific/indias_path_from_poverty_to_empowerment.

⁸ Economist, “India’s Demographic Challenge: Wasting Time,” May 11, 2013, <http://www.economist.com/news/briefing/21577373-india-will-soon-have-fifth-worlds-working-age-population-it-urgently-needs-provide>.

⁹ Industry is broader than manufacturing, also consisting of mining, construction and utilities. In India, manufacturing contributes 55 percent of industry GDP and employment. The shares for manufacturing are not meaningfully different, but using industry allows comparability across figures.

¹⁰ Kalpana Kochhar et al., “India’s Patterns of Development: What Happened, What Follows,” *Journal of Monetary Economics* 53, no. 5 (2006): 981–1019. The article illustrates India’s outlier status in 2000 along several parameters.

¹¹ See Simon Kuznets, *Economic Growth of Nations: Total Output and Production Structure* (Belknap Press of Harvard University Press, 1971), but also Hollis B. Chenery, “Patterns of Industrial Growth,” *The American Economic Review* 50, no. 4 (1960): pp. 624–54; Hollis Burnley Chenery and Moises Syrquin, *Patterns of Development, 1950–1970* (Oxford University Press for the World Bank, 1975).

¹² China, Indonesia, Malaysia, and Thailand stand out in this regard.

¹³ Although, as noted above, most of that represents dead-end construction jobs, not manufacturing jobs.

¹⁴ Walt Whitman Rostow, *The Economics of Take-Off into Sustained Growth*, ed. Walt Whitman Rostow (London: Macmillan, 1963).

¹⁵ Ministry of Finance, *Economic Survey 2010–11*, 2011.

¹⁶ Gupta et al., *India's Path from Poverty to Empowerment*.

¹⁷ Rajesh Shukla, *How India Earns, Spends and Saves* (New Delhi: Sage Publications, 2010).

¹⁸ S Sivasubramonian, *The National Income of India in the Twentieth Century* (New Delhi: Oxford University Press, 2000).

¹⁹ In Figure 6, formal jobs refer to the share of jobs in formal-sector firms, as measured in the 66th Round of the National Sample Survey, applied to overall employment measured in the 68th Round. While a job in a formal sector firm is the standard metric for a formal job, T.S. Papola and Partha Pratim Sahu, *Growth and Structure of Employment in India: Long-Term and Post-Reform Performance and the Emerging Challenge* (New Delhi: Institute for Studies in Industrial Development, March 2012), point out that half of jobs with formal sector firms do not include the typical attributes of a job contract, benefits, etc., that distinguish them from informal sector jobs.

²⁰ Barry Eichengreen and Poonam Gupta, *The Service Sector as India's Road to Economic Growth*, Working Paper (National Bureau of Economic Research, February 2011), <http://www.nber.org/papers/w16757>.

²¹ Russell Green, *Limits of the Juguad Growth Model: No Workaround to Good Governance for India*, Baker Institute Policy Report (Houston, TX, March 2012), <http://bakerinstitute.org/files/2702/>.

²² Ajit K. Ghose, *India's Services-Led Growth* (New Delhi: Institute for Human Development, 2014).

²³ Ibid.

²⁴ The call center workers represented in business services are far outnumbered by security guards and errand boys, with productivity that compares more closely to hospitality workers.

²⁵ Ejaz Ghani, ed., *The Service Revolution in South Asia* (New Delhi: Oxford University Press, 2010). The NSSO 68th Round indicates workers with post-secondary degrees (in all sectors of the economy) constituted about 11 percent of the labor force.

²⁶ The same may be even more important for the service sector, but the data on the informal service sector is much more limited. For a first pass at making this distinction, see Rajiv Dehejia and Arvind Panagariya, “Services Growth in India: A Look Inside the Black Box,” in *Reforms and Economic Transformation in India*, ed. Jagdish N. Bhagwati and Arvind Panagariya, Studies in Indian Economic Policies (New York: Oxford University Press, 2013).

²⁷ Statistics distinguishing the formal and informal sector use a more specific definition: an informal firm employs fewer than ten workers and is unincorporated.

²⁸ Note that while formal manufacturing employment is presented in both Figure 6 and Figure 8, the denominator in Figure 6 is total employment, while the denominator in Figure 8 is manufacturing employment.

Substituting number of firms for employment would produce a similar formal/informal split.

²⁹ Sean M. Dougherty, Richard Herd, and Thomas Chalaux, “What Is Holding Back Productivity Growth in India? Recent Microevidence,” *OECD Journal: Economic Studies* 2009, no. 1 (January 13, 2009): 1–22.

³⁰ Ibid.

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- ³¹ Rana Hasan and Karl Robert L. Jandoc, “Labor Regulations and Firm Size Distribution in Indian Manufacturing,” in *Reforms and Economic Transformation in India*, ed. Jagdish N. Bhagwati and Arvind Panagariya, Studies in Indian Economic Policies (New York: Oxford University Press, 2013).
- ³² Author’s calculations based on NSSO data.
- ³³ Hasan and Jandoc, “Labor Regulations and Firm Size Distribution in Indian Manufacturing.”
- ³⁴ The period was chosen to match the employment data available from periodic NSSO surveys, but extending it back another 10 years would not meaningfully change the pattern.
- ³⁵ Rana Hasan, Devashish Mitra, and Asha Sundaram, “What Explains the High Capital Intensity of Indian Manufacturing?,” *Indian Growth and Development Review* 6, no. 2 (November 4, 2013): 212–41.
- ³⁶ From largest to smallest, transport equipment, basic metals, electrical equipment, and chemicals and pharmaceuticals, according to 2012 NSSO and national accounts data.
- ³⁷ Hasan, Mitra, and Sundaram, “What Explains the High Capital Intensity of Indian Manufacturing?”
- ³⁸ Kochhar et al., “India’s Patterns of Development”; Deb Kusum Das, Deepika Wadhwa, and Gunajit Kalita, *The Employment Potential of Labor Intensive Industries in India’s Organized Manufacturing*, ICRIER Working Paper (New Delhi: Indian Council for Research on International Economic Relations, June 2009), <http://icrier.org/pdf/WorkingPaper236.pdf>.
- ³⁹ Kochhar et al., “India’s Patterns of Development.” The paper discusses all of them, though the literature has continued to add further evidence.
- ⁴⁰ Asha Sundaram, Reshad N. Ahsan, and Devashish Mitra, “Complementarity between Organized and Unorganized Manufacturing in India: The Role of Policies and Institutions,” in *Reforms and Economic Transformation in India*, ed. Jagdish N. Bhagwati and Arvind Panagariya, Studies in Indian Economic Policies (New York: Oxford University Press, 2013).
- ⁴¹ Vikas Bajaj, “For India, Outsourcing Does the Job at Home, Too,” *The New York Times*, November 30, 2011, <http://www.nytimes.com/2011/12/01/world/asia/for-india-outsourcing-does-the-job-at-home-too.html>. Statistics on food processing employment intensity are from the 68th Round of the National Sample Survey and National Accounts, Ministry of Statistics.
- ⁴² For instance, Arpita Mukherjee and Tanu M. Goyal, “Employment Conditions in Organised and Unorganised Retail: Implications for FDI Policy in India,” *Journal of Business & Retail Management Research* 6, no. 2 (April 2012): 26–37. The report documents the difference between formal and informal employment conditions in the retail sector.
- ⁴³ India’s education system has not been able to follow global trends in education progress for many years. Assuming constant labor force participation by education, the share of new workers with post-secondary education is 28 percent (14 percent of all workers) in 2035, although in practice people with post-secondary education have higher participation rates.
- ⁴⁴ Ghose, *India’s Services-Led Growth*.
- ⁴⁵ On India’s demand for services, see Ghose, *India’s Services-Led Growth*. On global trends, see Arvind Subramanian and Martin Kessler, *The Hyperglobalization of Trade and Its Future*, Peterson Institute for International Economics Working Paper (Washington, DC: Peterson Institute for International Economics, July 2013), <http://www.iie.com/publications/wp/wp13-6.pdf>.

⁴⁶ Confederation of Indian Industry, *The India Skills Report 2014* (Gurgaon, India, December 13, 2013).

⁴⁷ Paul W. Kuznets, “An East Asian Model of Economic Development: Japan, Taiwan, and South Korea,” *Economic Development and Cultural Change* 36, no. 3 (April 1, 1988): S11–43.

⁴⁸ Recent evidence on labor market regulation includes Dougherty, Herd, and Chalaux, “What Is Holding Back Productivity Growth in India? Recent Microevidence”; Hasan and Jandoc, “Labor Regulations and Firm Size Distribution in Indian Manufacturing”; Hasan, Mitra, and Sundaram, “What Explains the High Capital Intensity of Indian Manufacturing?” Evidence on the impact of infrastructure includes Dave Donaldson, “Railroads of the Raj: Estimating the Impact of Transportation Infrastructure,” *American Economic Review*, forthcoming, <http://www.nber.org/papers/w16487>; Charles R. Hulten, Esra Bennathan, and Sylaja Srinivasan, “Infrastructure, Externalities, and Economic Development: A Study of the Indian Manufacturing Industry,” *The World Bank Economic Review* 20, no. 2 (January 1, 2006): 291–308; Robert Jensen, “The Digital Provide: Information (Technology), Market Performance, and Welfare in the South Indian Fisheries Sector,” *The Quarterly Journal of Economics* 122, no. 3 (August 1, 2007): 879–924; Juan Pablo Rud, “Electricity Provision and Industrial Development: Evidence from India,” *Journal of Development Economics* 97, no. 2 (2012): 352–67.

⁴⁹ Leslie A. Martin, Shanthi Nataraj, and Ann Harrison, *In with the Big, Out with the Small: Removing Small-Scale Reservations in India*, Working Paper (National Bureau of Economic Research, September 2014), <http://www.nber.org/papers/w19942>.

⁵⁰ Pack, “Should South Asia Emulate East Asian Tigers?”

⁵¹ Raghuram Rajan and Arvind Subramanian, “India Needs Skill to Solve the ‘Bangalore Bug,’” *Financial Times*, March 17, 2006, <http://www.ft.com/intl/cms/s/0/3be07ab4-b55a-11da-aa90-0000779e2340.html#axzz3GKPSti6L>.

⁵² Subramanian and Kessler, *The Hyperglobalization of Trade and Its Future*.

⁵³ For details on the simulation methods and assumptions presented here, please see Russell Green, *Structural Change Forecasts for India: How Big of a Bang Can a Big Bang Have?* (Houston, TX: Baker Institute for Public Policy, forthcoming). A similar exercise was undertaken by Gupta et al., *India’s Path from Poverty to Empowerment*, with a different breakdown.

⁵⁴ The Make in India campaign is described at www.makeinindia.com. It borrows goals from and refers readers to Department of Industrial Policy & Promotion, *National Manufacturing Policy*, Press Note (New Delhi: Ministry of Commerce & Industry, Government of India, October 25, 2011), http://dipp.nic.in/english/policies/national_manufacturing_policy_25october2011.pdf.

⁵⁵ This period captures the bulk of the post-reform period, but omits the most recent slump.

⁵⁶ The only exception is that the growth rates of other industry and other services are allowed to converge up toward the aggregate growth rate, as they tend to do in practice. Green, *Forecasting Structural Change in India: How Big a Bang Can a Big Bang Have?*

⁵⁷ Without scaling down, the economy would gradually grow faster, even with constant sectoral growth rates, because of compositional changes. Sectors growing faster than average become a larger share of the economy, and so pull up the average rate.

⁵⁸ Please see Table A4 and Table A5 in the Appendix for more details.

⁵⁹ See Box 1.

⁶⁰ Bishwanath Goldar and Suresh Chand Aggarwal, “Informalization of Industrial Labor in India: Effects of Labor Market Rigidities and Import Competition,” *The Developing Economies* 50, no. 2 (June 1, 2012): 141–69.

⁶¹ OECD, *OECD Economic Surveys: India, 2007*, 2007/14 (Paris: OECD Publishing, 2007).

⁶² For a much more detailed discussion of the land acquisition and potential solutions, please see 3iNetwork and Infrastructure Development Finance Company, *India Infrastructure Report, 2009: Land – a Critical Resource for Infrastructure*. (New Delhi: Oxford University Press, 2009), http://www.iitk.ac.in/3inetwork/html/reports/IIR2009/IIR_2009_Final_July%2009.pdf.

⁶³ World Bank, *Doing Business 2015: Going Beyond Efficiency* (Washington, DC, October 29, 2014), <http://www.doingbusiness.org/reports/global-reports/doing-business-2015>.

⁶⁴ Anecdotally, Modi requested investors to report back to him personally any experience with corruption, so that he could deal with it directly.

⁶⁵ Already, the notoriously slow Ministry of Environment and Forests has announced the intention to introduce time-bound clearance processes to limit unnecessary project delays. The Ministry of Labour has reduced and eased both the report-filing and inspections process for businesses.

⁶⁶ The case study relies heavily on Kelkar Committee, *Report of the Committee on Roadmap for Reduction in Import Dependency in Hydrocarbon Sector by 2030, Part I* (Ministry of Petroleum & Natural Gas, Government of India, December 2013), petroleum.nic.in/docs/kelkar.pdf.

⁶⁷ National Court Management Systems Committee, *National Court Management Systems (NCMS) Policy and Action Plan* (New Delhi: Supreme Court of India, September 27, 2012), <http://supremecourtfindia.nic.in/ncms27092012.pdf>.

⁶⁸ Law Commission of India, *Arrears and Backlog: Creating Additional Judicial (Wo)manpower*, Report (New Delhi: Government Of India, July 2014), <http://lawcommissionofindia.nic.in/reports/Report245.pdf>.

⁶⁹ Wolfgang Lutz and Samir Kumar C., *Demography and Human Development: Education and Population Projections*, UNDP-HDRO Occasional Papers (New York, July 8, 2013), http://hdr.undp.org/sites/default/files/hdro_1304_lutz_kc.pdf.

⁷⁰ Victor Mallet, “India Is a Nation in Need of a Trade Deal with Itself,” *Financial Times*, November 3, 2014, <http://www.ft.com/intl/cms/s/0/647d1630-5ec5-11e4-be0b-00144feabdc0.html?siteedition=intl#axzz3I1czzajF>.

⁷¹ Hunt Allcott, Allan Collard-Wexler, and Stephen D. O’Connell, *How Do Electricity Shortages Affect Productivity? Evidence from India*, Working Paper (National Bureau of Economic Research, March 2014), <http://www.nber.org/papers/w19977>; Hulten, Bennathan, and Srinivasan, “Infrastructure, Externalities, and Economic Development.”

⁷² Ministry of Road Transport and Highways, *Basic Road Statistics of India 2008-09, 2009-10 & 2010-11* (New Delhi: Government Of India, August 2012), <http://www.indiaenvironmentportal.org.in/files/file/basic%20road%20statistics%20of%20india.pdf>.

⁷³ For an illustrative example of meddling and inefficiency at ONGC, a major PSU, see Krishn Kaushik, “Rigged,” *The Caravan*, July 2014, <http://www.caravanmagazine.in/reportage/rigged>. Political interference in PSU bank lending is documented in Shawn Cole, “Fixing Market Failures or Fixing Elections? Agricultural Credit in India,” *American Economic Journal: Applied Economics* 1, no. 1 (2009): 219–50.

⁷⁴ This is sometimes referred to as a soft budget constraint. See János Kornai, Eric Maskin, and Gérard Roland, “Understanding the Soft Budget Constraint,” *Journal of Economic Literature* 41, no. 4 (December 2003): 1095–1136.

⁷⁵ Ministry of Labour & Employment, *Annual Employment Review, 2011* (New Delhi: Government of India, 2013).

⁷⁶ A good example of how economists think about this problem can be found in Andrei Shleifer and Robert Vishny, “Politicians and Firms,” *Quarterly Journal of Economics* 109, no. 4 (1994): 995–1025.

⁷⁷ Tax policy fortunately constitutes an exception to the general approach of marginal improvement.

⁷⁸ In the last UPA government, the unsustainability of both the US-India Nuclear Deal and the Retail FDI reform represent the risk of passing measures that do not enjoy broad-based support.

⁷⁹ Planning Commission, *Survey on Business Regulatory Environment for Manufacturing – State Level Assessment* (New Delhi: Government of India, March 2014), http://www.planningcommission.gov.in/reports/genrep/rep_enf0705.pdf.