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WP 01/2020

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The research for the paper was carried out by the author while he was Indian Council of Social Science Research (ICSSR) National Fellow hosted by the Institute for Human Development, New Delhi

Published by:

INSTITUTE FOR HUMAN DEVELOPMENT
256, 2nd Floor, Okhla Industrial Estate, Phase-III
New Delhi - 110020
Tel: +91 11 41064676, + 91 9871177540
E-mail: mail@ihdindia.org
Website: www.ihdindia.org

ISBN: 978-81-88315-68-0

Structural Transformation of India's Economy

AJIT K. GHOSE*

1. INTRODUCTION

Structural change – the process of reallocation of labour across economic sectors with different levels of labour productivity – is both an outcome of and a contributor to the growth process in an economy.[1] The pattern of labour reallocation reflects the pattern of growth. But labour reallocation, when it is from lower-productivity sectors to higher-productivity sectors, in turn, contributes positively to growth. This contribution, it has long been recognised, can be quite substantial in low-income economies where productivity differentials across sectors are typically large. Less well recognised and certainly less discussed is the fact that labour reallocation from lower-productivity sectors to higher-productivity sectors is also the principal route to improvement in employment conditions in low-income economies, where the employment problem manifests itself in the widespread prevalence of low-productivity work and underemployment rather than in the existence of high unemployment. Since development is "growth with employment", structural change has a critically important role to play in the process of development in low-income economies.

In the celebrated Lewis model[2], a low-income economy is seen to be composed of a small modern sector, which employs a small proportion of the labour force

* Honorary Professor, Institute for Human Development, New Delhi. The research for the paper was carried out by the author while he was ICSSR National Fellow.

1. Structural change can be defined more generally as reallocation of resources – land, labour and capital - across the economic sectors. In low-income economies, however, reallocation of land and capital are not of much significance. Defining structural change as reallocation of labour is also analytically advantageous as it allows us to focus simultaneously on growth and employment and thus on economic development.

2. Lewis (1954). We may note that recognition of structural change as an important source of growth came with the introduction of two-sector growth models and Lewis was a pioneer in the field. In single-sector growth models – the workhorse of growth analysis – structural change naturally has no place. In these models, growth in the economy is driven by investment and technological change, the latter represented by declining capital-output ratio or total factor productivity growth.

at a high level of productivity, and a large traditional sector, which employs a large proportion of the labour force at a low level of productivity and also holds a stock of surplus labour in the form of underemployment of many of the employed workers. The process of development is then conceptualised as a process of labour transfer from the traditional sector to the modern sector, made possible by capital accumulation in the modern sector (where capitalistic entrepreneurs invest what they save out of profits made in the past to make profits in the future). Growth of labour productivity in the modern sector, while this could occur as a result of investment, is not really essential to the process. For, so long as there is surplus labour, labour productivity in the traditional sector remains unchanged even while some workers move to jobs in the modern sector. Even if the labour productivity in the modern sector remains unchanged, therefore, the productivity-gap between the sectors remains large and stable. Thus, substantial economic growth can result purely from labour reallocation from the traditional sector to the modern sector till such time when the movement of workers out of the traditional sector has been large enough to reduce surplus labour to zero. At the same time, movement of workers from low-productivity employment in the traditional sector to high-productivity employment in the modern sector improves the overall employment conditions in the economy through two routes. First, labour-incomes and working conditions of those workers who move from jobs in the traditional sector to jobs in the modern sector improve. Second, the workers who remain in the traditional sector have work for longer time period than before so that underemployment (surplus labour) declines; the labour-income per worker then increases even while the labour-income per unit of time worked remains stable.

In the well-known Kuznets' framework[3], the economic sectors in a low-income economy are taken to be agriculture, with low labour productivity and large employment, and non-agriculture, with high labour productivity and small employment. Modern economic growth involves reallocation of labour from the low-productivity sector - agriculture – to the high-productivity sector - non-agriculture. Kuznets does not assume the existence of surplus labour in agriculture, nor does he seek to analyse the process of capital accumulation. He simply assumes that labour productivity is growing in both agriculture and non-agriculture though not at the same rate; it typically grows faster in the non-agricultural sector than

3. Kuznets (1966). A similar framework had earlier been used by Clark (1940).

in the agricultural sector even while labour steadily moves out of agriculture into non-agriculture. So, labour reallocation from agriculture to non-agriculture remains growth-enhancing for a very long time. Such labour reallocation also improves the overall employment conditions in the economy both because the workers who move from agriculture to non-agriculture effectively move to better jobs and because their movement adds to productivity growth in agriculture thereby increasing the quality of employment for the workers remaining in agriculture.

While the Lewis model has been the centrepiece of development theory, Kuznets' framework has been widely used in empirical analysis for the simple reason that much of the available statistical data are suitable for studying Kuznets-type labour reallocation but not for studying Lewis-type labour reallocation. However, the central argument relating to labour reallocation as a source of growth is the same in the two models. Indeed, the Lewis model can be easily reformulated by treating agriculture as the traditional sector and non-agriculture as the modern sector; the Fei-Ranis model represents precisely such a reformulation.[4] Kuznets-type labour reallocation then becomes indistinguishable from Lewis-type labour reallocation.

Detailed empirical analysis of structural change in history has yielded important insights into some key aspects of development. One such insight relates to the central role of manufacturing in economic development. Non-agriculture is a broad category that includes sectors such as manufacturing, services, construction, mining and utilities (electricity, gas and water). Analysis of past experiences of today's developed economies of Europe and North America shows that manufacturing played a key role in the growth process at early stages of development while services played a key role at later stages. Accordingly, the structural change associated with growth involved labour reallocation from agriculture to both manufacturing and services at early stages, and from both agriculture and manufacturing to services at later stages.[5] This is the classical pattern of structural change, which has also been observed in the late-developers of East Asia such as Japan, Korea, Malaysia and Taiwan. The process of structural change currently underway in China and Vietnam also conforms to the classical pattern.

4. Ranis and Fei (1961).

5. The stylised facts emerged essentially from the works of Clark (1940), Kuznets (1966) and Maddison (1980).

The fact that the classical pattern of structural change is observed in all countries that are now developed suggests a strong linkage between this pattern and economic development. The search for the economic logic underpinning this linkage led to the formulation of what have come to be known as Kaldor's *growth laws*.[6] These emphasize three special characteristics of manufacturing that enable it to play a key role in the process of development at early stages.

First, the growth of labour productivity is typically much faster in manufacturing than in agriculture or services. The main reason is that there are increasing returns to scale in manufacturing while agriculture faces diminishing returns and constant returns to scale prevail in services. Returns to scale in this context are to be understood as macroeconomic in nature; they are realised at the level of the sector rather than at the level of firms or farms. Thus, rising manufacturing output is associated with rising labour productivity because of growing division of labour, specialisation and skills of the work force (the learning-by-doing effect).[7] The scope for these developments is far more limited in agriculture and services.[8] Besides, the potential for technological learning and innovation is much greater in manufacturing than in agriculture or services. Indeed, it is manufacturing that incubates technological innovations for other sectors of the economy. Thus, the growth of manufacturing also induces productivity growth in agriculture, construction and services through technology spill-overs. Thus, the higher the growth of manufacturing, the higher is the overall growth of the economy.

Second, in a low-income economy, the demand for manufactures grows faster than that for agricultural products or services. One reason is that, when incomes are low, the income elasticity of demand for manufactured products is high, indeed

6. These were formulated by Kaldor (1967).

7. The argument goes back to Adam Smith but was theoretically developed by Young (1928) and empirically tested by Verdoorn (1949).

8. The point is not that labour productivity in agriculture or services never rises. It is that it does not rise just because of output growth. In the absence of technological breakthroughs, rising agricultural output is associated with declining productivity because the supply of land, a basic input, is fixed (land area either cannot be expanded or can be expanded only by bringing poor quality land under cultivation). And rising output of those services (such as distributive trade, transport and communication) for which output can be measured independently of input tends to be associated with stable productivity. In many services for which output cannot be measured independently of input (e.g., public administration and defence, health, education, financial and professional services), measures of output and productivity are somewhat meaningless; for, output is nothing other than the aggregate "wage bill" and productivity is nothing other than the average "wage".

substantially higher than that for agricultural products or services.[9] A second reason is that, since productivity in manufacturing increases faster than in other activities, the relative price of manufactures declines with output growth, which also stimulates the growth of demand for manufactures. A third reason is that expansion of production, not just in manufacturing but also in agriculture and services, requires investment and hence investment goods, which also are manufactured goods.

A third special characteristic of manufacturing is its ability to employ relatively low-skilled labour (migrating from agriculture) at a large productivity premium. There is also the fact that growth of manufacturing stimulates growth of industries such as construction and of services such as distributive trade and transport, which also employ low-skilled labour at a productivity premium. Hence, rapid growth of manufacturing induces speedy reallocation of labour out of low-productivity agriculture to high-productivity non-agriculture, which further enhances growth and rapidly improves employment conditions.

These special characteristics of manufacturing explain why it plays a key role at early stages of development. Interactions among the demand-side and the supply-side factors generate a virtuous cycle of growth in the case of manufacturing: production growth brings income growth and lower prices, which, given high income elasticity of demand, bring rapid growth of demand, which in turn stimulates production growth. Hence, in a low-income economy, growth of manufacturing can be both rapid and self-sustained, and can thus be the growth engine for the aggregate economy. When the economy is open to trade with the external world, another factor can come into play. As manufactures are far more tradable than agricultural products or services, external demand can also play a more important role in stimulating production growth in manufacturing.

Thus, in low-income economies, manufacturing-led growth is the fastest feasible and brings about the fastest possible improvement in employment conditions. Things change as economies develop and incomes increase. For one thing, the income elasticity of demand for manufactures declines while that for services increases. For another, precisely because labour productivity grows rapidly, the

9. Clark (1940) extended the Engel's Law to argue that as per capita income grows in a poor country, the income elasticity of demand for agricultural products (food), high to begin with, declines while that for manufactures becomes high and, then, it too declines while that for services becomes high. The economies under consideration here are those in which agriculture has already developed to a certain extent so that the income elasticity of demand for food has declined. Agricultural revolution has always preceded industrial revolution.

ability of manufacturing to absorb labour declines as growth takes place. The labour displacing effect of productivity growth eventually outweighs its price effect on demand. So, after a certain level of development has been achieved, the services sector takes over from manufacturing the lead-role in the growth process and labour reallocation increasingly occurs from both agriculture and manufacturing to services.

From this perspective, India's recent experience of rapid services-led growth at a rather early stage of development stands out as strangely anomalous. And the structural change that has accompanied this growth process naturally has not conformed to the classical pattern. In short, India's experience appears to defy Kaldor's *growth laws* and hence raises many questions. What explains India's unusual growth experience? In what ways does the structural change in India's economy differ from the classical pattern? To what extent does this non-classical structural change contribute to development? These are the questions that we seek to answer in this paper.

The structure of this paper is as follows. In the second section, we examine in some detail the classical pattern of structural change by looking into the past experiences of some of today's high-income countries. We then consider, in the third section, the relevance of two currently dominant narratives about structural change in the late developers, one of which suggests that the classical route to development through industrialisation is no longer available to today's low-income economies and the other suggests that a new route through services-led growth has now opened up. In the fourth section, we analyse the pattern of structural change associated with the services-led growth in India and contrast this with the contemporaneous classical pattern of structural change associated with the manufacturing-led growth in China to highlight the distinctiveness of India's experience. The final section presents the main conclusions.

The primary sources of data used in the study are the two databases developed and maintained by the Growth and Development Centre of the University of Groningen (GGDC) – the 10-Sector Database and the Historical Statistics Database.[10] Historical statistics have also been drawn from certain other sources, which are cited at appropriate places. The data for India aisdrawn from the national sources: Central Statistical Organisation (CSO) for National Accounts Statistics and National Sample Survey Organisation (NSSO) Surveys of Employment and Unemployment statistics on employment.

10. See Timmer et. al. (2015) and Bolt et. al. (2018) for information on these databases.

THE CLASSICAL PATTERN OF STRUCTURAL CHANGE

Analysis of past experiences of economic development yields four important stylised facts about the structure of low-income economies and its evolution in the course of development. *A first stylised fact* is that, at low levels of per capita income, a very large part of the working population is engaged in agriculture, a small part is engaged in services and an even smaller part is engaged in manufacturing. These features characterised today's developed economies in the years prior to the onset of modern economic growth (Appendix Table A.1) as much as today's developing economies in the 1950s and the 1960s (Appendix Table A.2).

A second stylised fact is that, at low levels of per capita income, output per worker is lowest in agriculture and highest in services. Again, these features characterised today's developed economies at early stages of their development as much as they did today's developing economies in the recent past (Appendix Table A.3). It should be said here that labour productivity is a meaningful notion only in some of the services. In the case of services such as distributive trade, transport, communication and information technology, output can be, and usually is, measured independently of input so that labour productivity can be meaningfully measured. But in the case of services such as public administration and defence, health, education and professional services, output cannot be measured independently of input so that the measured labour productivity is nothing other than the average salary or income earned by the persons engaged. Then there are services (e.g. financial services) in the case of which output can in principle be measured independently of input but often proves difficult to do so in practice. On the whole, comparing labour productivity in services with that in agriculture or manufacturing is a bit like comparing apples with oranges. We can do precious little to resolve this problem. Fortunately, the positive relation between measured labour productivity and labour-income (quality of employment) survives. We can legitimately say that, at low levels of per capita income, labour-income per worker is highest in services, lowest in agriculture and somewhere in the middle in manufacturing.[11] We can also say that labour reallocation from agriculture into manufacturing and services – indeed into non-agriculture in general – improves employment conditions.

A third stylised fact relates to the process of labour reallocation in the course of

11. The measured value added per worker is highest in services, second-highest in manufacturing and lowest in agriculture. And, then, the ratio of labour-income per worker to measured value added per worker is much higher in services than in manufacturing or agriculture.

development. As growth occurs and the per capita income rises, the employment share of agriculture steadily declines, the employment share of manufacturing moves along an inverted U-shaped trajectory and the employment share of services steadily increases. These tendencies are well illustrated by the pattern of change observed in a selection of today's developed economies (UK, USA, Netherlands and France) as shown by Figures 1A-1D (data in Appendix Table A.4). In all of these countries, which developed in the second half of the nineteenth century and the first half of the twentieth century, the employment share of agriculture persistently declined over time and that of services persistently increased. The employment share of manufacturing first increased up to a point and then started to decline; industrialisation was followed by de-industrialisation. Through the phases, population, employment and per capita income were all increasing in all of them (Appendix Table A.5). The trends continued through the second half of the twentieth century and early twenty-first century. At the end of the period, the employment share of agriculture was minuscule (2-3 per cent) and services accounted for a very large part (around 80 per cent) of total employment in all of them.

It is worth noting that the employment share of manufacturing had reached its peak at different points of time in different countries - in UK in 1871, in USA in 1920, in Netherlands in 1920 and in France in 1931 - and at different levels of per capita income (measured in 2011 international $) - 5684 in the UK, 8485 in the USA, 7593 in the Netherlands and 6967 in France. The peak employment share of manufacturing was also somewhat different in different countries: 34 per cent in the UK, 28 per cent in the USA, 26 per cent in the Netherlands and 27 per cent in France. The generalisable fact is that, in each of the countries, the employment share of manufacturing climbed to a fairly high level (25 per cent or more) before beginning to decline.

The classical pattern of structural change was very much in evidence in several East Asian economies that developed in the post-war period. The pattern of change observed in two of them - Japan and South Korea – provide good illustrative examples (Figures 2A and 2B; data in Appendix Table A.6). The process of change had begun in the pre-war period in Japan (but it was still a low-income economy in 1950) and the employment share of manufacturing peaked in the early 1970s. In South Korea, the process of change began only in the early 1960s and the employment share of manufacturing peaked in the late 1980s. The peak shares in the two economies were somewhat different: 25 per cent in Japan and 28 per

cent in South Korea. The per capita income (measured in 2011 international $) at which the employment share of manufacturing reached its peak - 17993 in Japan and 10509 in South Korea - was significantly higher than what it had been in the early developers (Appendix Table A.7).

Figure 1A
Employment Share, UK

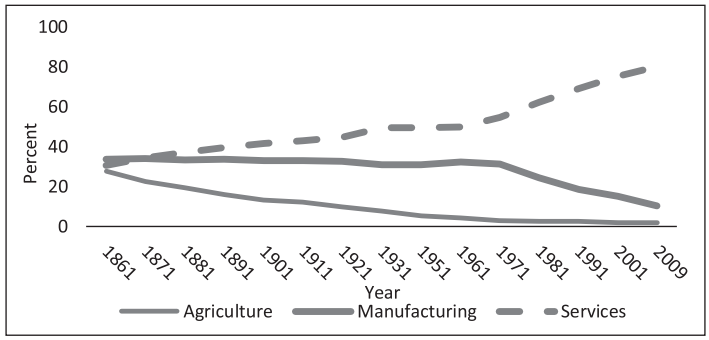


Figure 1B
Employment Share, USA

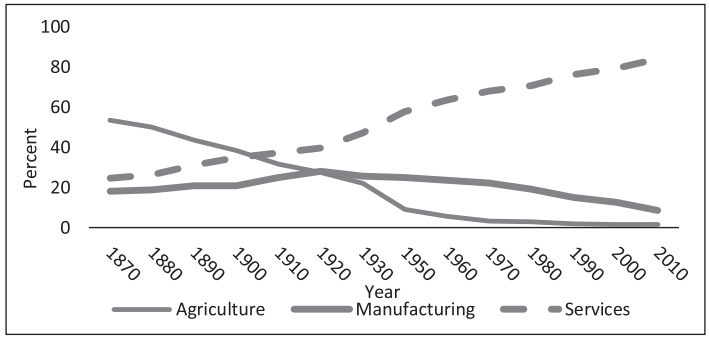


Figure 1C
Employment Share, Netherlands

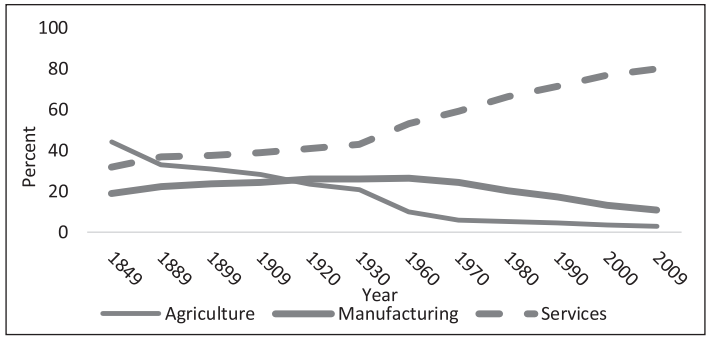


Figure 1D
Employment Share, France

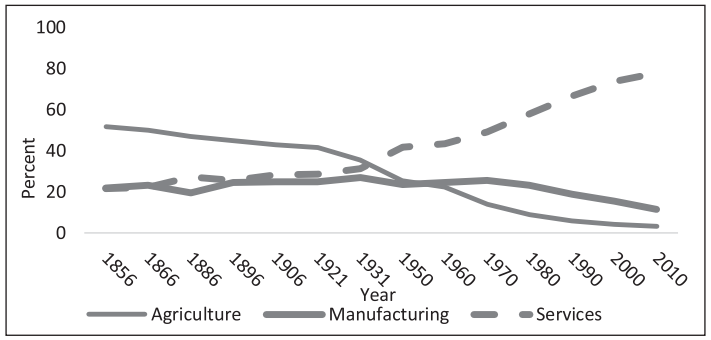


Figure 2A
Employment Share, Japan

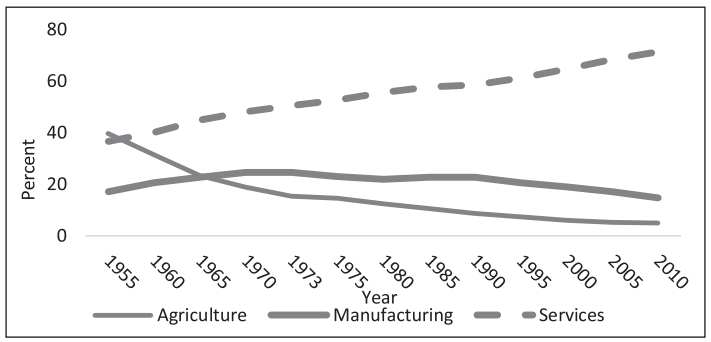
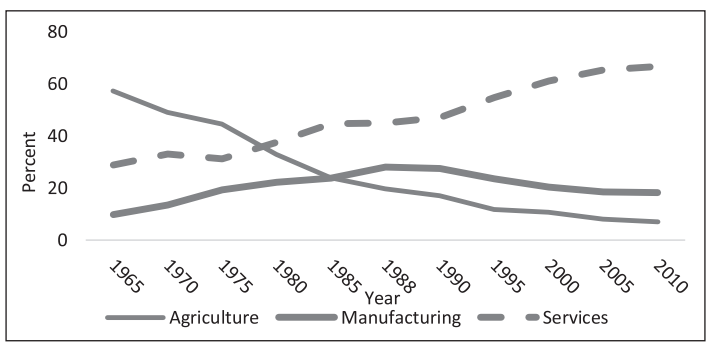


Figure 2B
Employment Share, South Korea



A fourth stylised fact is that as growth occurred, labour productivity increased in all economic sectors but at different rates. It always increased more rapidly in manufacturing than in services (Figures 3A-3F; data in Appendix Table A.8). Thus, the labour productivity in manufacturing, much lower than that in services to begin with, caught up with and exceeded the labour productivity in services as the economy developed. We observe this pattern in both the early developers and the late developers. On the other hand, productivity growth in agriculture, which reflected the combined effect of capital accumulation, technological change and decelerating employment growth, was faster than the productivity growth in manufacturing in the early developers but slower in the late developers. In all cases, however, labour productivity in agriculture remained lower than that in manufacturing.

Figure 3A
Productivity Ratios, UK

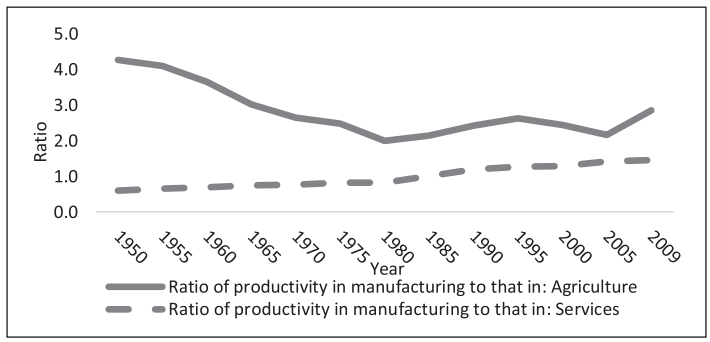


Figure 3B
Productivity Ratios, USA

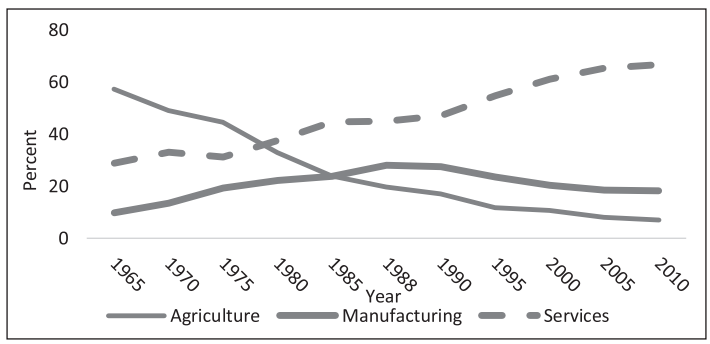


Figure 3C

Productivity Ratios, Netherlands

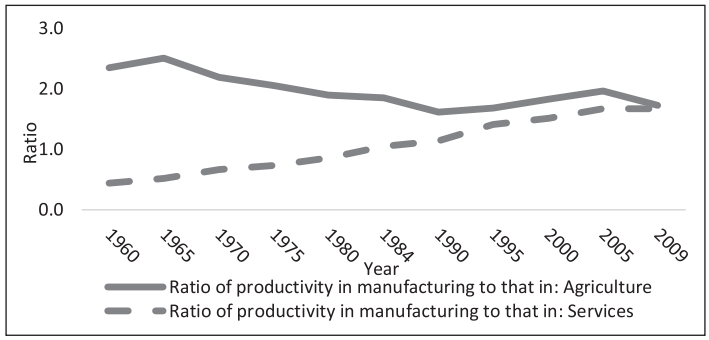


Figure 3D

Productivity Ratios, France

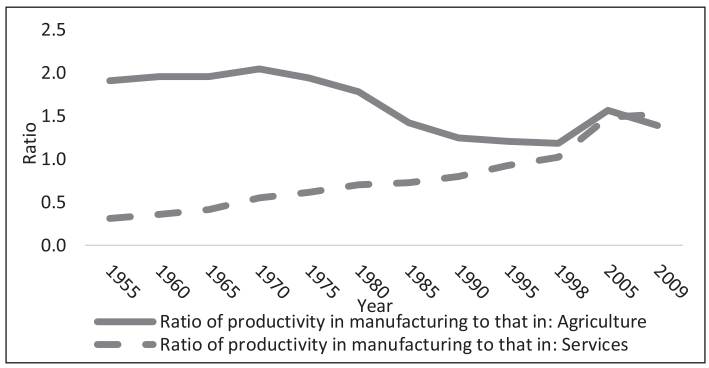


Figure 3E

Productivity Ratios, Japan

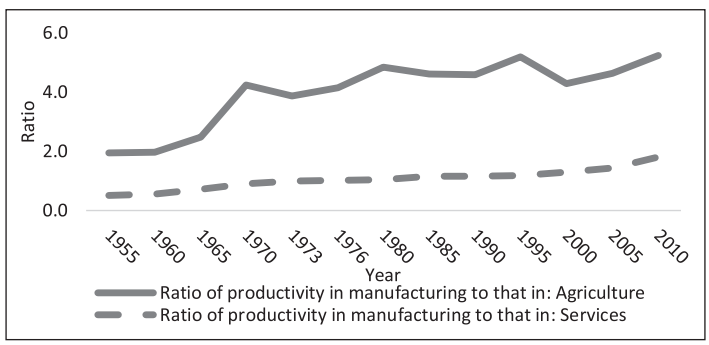
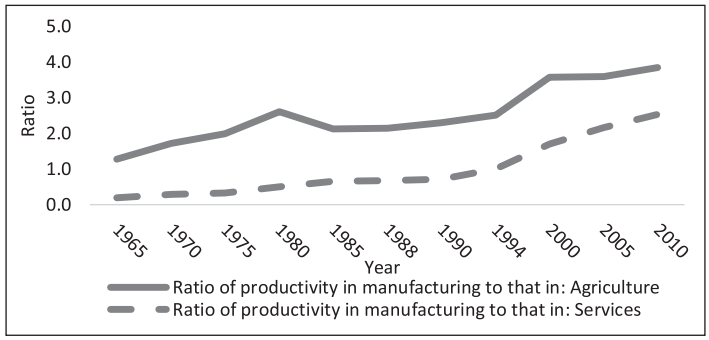


Figure 3F
Productivity Ratios, South Korea



One consequence of these patterns of productivity growth is that productivity and output growth in the aggregate economy slows down when labour begins to move out of manufacturing into services. For, labour reallocation then occurs from a higher-productivity and more dynamic sector to a lower-productivity and less dynamic sector so that structural change becomes growth-reducing.[12] The effect is countered to an extent by simultaneous reallocation of labour from agriculture to services (since this continues to constitute movement from a lower-productivity sector to a higher-productivity sector) but only for a while because the scale of such reallocation declines into insignificance rather quickly. Some evidence on growth slowdown is presented in Table 1 below, in which the periodisation reflects the transition from "labour reallocation from agriculture to manufacturing and services" to "labour reallocation from agriculture and manufacturing to services".

Table 1
Growth (per cent p.a.) of Real GDP

USA	1979-2010	2.6
France	1950-1974	4.3
France	1974-2010	2.1
Japan	1953-1973	8.7
Japan	1973-2010	2.4
South Korea	1965-1988	7.0
South Korea	1988-2010	4.7

Source: Author's estimates based on data from GGDC: 10-Sector Database

12. The point was first made by Baumol et. al. (1967) in accounting for the growth slowdown in the USA. See also Duarte and Restuccia (2010), Maddison (1987) and Rowthorn and Ramaswami (1997).

STRUCTURAL CHANGE IN THE LATE DEVELOPERS: TWO CURRENT NARRATIVES

Premature De-industrialisation

The low-income economies of today, according to a currently dominant narrative, are faced with the prospect of premature de-industrialisation; the peak employment share of manufacturing in these economies will inevitably be significantly lower than it had been in the early developers and will, moreover, be reached at a much lower level of per capita income.[13] In other words, industrialisation can no longer be the route to development for today's low-income economies as it once had been for today's high-income economies.

The narrative is based on empirical evidence rather than theoretical reasoning. As such, it appears odd in view of the fact that there are quite a few instances of low-income economies achieving development through industrialisation in recent periods. We know that the peak employment share of manufacturing in South Korea (a late developer) was as high as that in the USA or France (both early developers) and also that the per capita income associated with the peak was higher in South Korea than it had been in the USA or France. And South Korea is not the only low-income country to have had this experience in recent times; there are several others (as we shall see below).

On close scrutiny, it turns out that the thesis about the inevitability of premature de-industrialisation in the late developers has been derived from a flawed reading of a certain kind of empirical evidence, which is constructed by pooling together data on employment share of manufacturing and per capita income for relatively recent periods from all types of countries – countries that industrialised long ago and have been de-industrialising since the 1950s, countries that industrialised during 1960-1990 and have since been de-industrialising, countries that are currently industrialising and countries that have not even begun to industrialise.[14] A cross-sectional view of the observed employment (or GDP) share of manufacturing and per capita income for this set of countries in any given period only tells us about the highest share observed in that period (which is not necessarily the historical peak share for the country concerned) and the level of per capita income associated with that share.

13. See Dasgupta and Singh (2005, 2007), Rodrik (2016), Amirapu and Subramanian (2015), and Felipe et. al. (2018). Premature de-industrialisation is to be distinguished from natural de-industrialisation which is a characteristic feature of the developed economies.

14. See Rodrik (2016), Amirapu and Subramanian (2015), and Felipe et. al. (2018).

It is not difficult to see that in any year of the period 1950-1975, the highest employment (GDP) share of manufacturing would be observed for one of the developed countries, i.e., for one of the early developers. In these early developers, though the peak employment share of manufacturing had been attained in the first half of the twentieth century when their per capita incomes were in fact quite low, de-industrialisation was a very slow process stretched over a long period (during which their per capita incomes were steadily growing) and gathered speed only after 1975. In the UK, for example, the employment share of manufacturing reached its peak of 34 per cent in 1871 when its per capita GDP (in 2011 international $) was just 5864, declined very slowly to 31 per cent in 1971 when the per capita GDP was 17101 and then declined rapidly to just 10 per cent in 2009 when the per capita GDP was 34338.[15] The developing countries began to industrialise only in the 1960s and only some of them succeeded. A cross-sectional view of employment shares of manufacturing in the 1980s or the 1990s (when de-industrialisation had advanced in the high-income countries and some low-income countries had made substantial progress toward industrialisation) for the same set of countries would show the highest employment share to be associated with a late developer, which would be smaller than that observed for the earlier period. For the same reason, the per capita GDP associated with the highest share would be observed to be lower for the latter period than for the earlier period. These are perfectly predictable results. They cannot be interpreted to mean that both the peak employment share of manufacturing and the per capita income associated with this peak have been steadily declining over time and will inevitably be lower in today's low-income countries in the future than they had been in the early developers in the past.

A careful reading of the evidence on country experiences actually tells a rather different story (Appendix Table A.9). A large number of the low-income economies - Ethiopia, Kenya, Malawi, Nigeria, Senegal, Tanzania and Zambia are some of the examples – are yet to begin to industrialise. There are some countries – Bolivia, Colombia, Egypt, Ghana, Indonesia, Morocco, Peru and the Philippines are the most prominent examples – that can be said to have experienced premature de-industrialisation; the peak employment share of manufacturing was low (15 per cent or less) and the level of per capita income at which the peak had been reached was also low (mostly below 5000 in 2011 international $). Then there are countries – Brazil, Chile, Costa Rica, Mexico and South Africa are examples – that did experience early

15. Very similar trends are observed in the USA, the Netherlands and France. See Appendix Tables A.4 and A.5.

de-industrialisation but this was not unambiguously premature; the peak share of employment was relatively low (around 20 per cent) but the level of per capita income at which the peak was reached was not low (8000 or more in 2011international $). There also are late developers – Argentina, Japan, South Korea, Malaysia, Mauritius and Taiwan being the most prominent examples – that have experienced natural de-industrialisation; the peak employment share of manufacturing in these countries was as high as it had been in the early developers and this peak was in fact reached at a level of per capita GDP that is significantly higher than it had been in the early developers. Then there are countries – China and Vietnam are the most prominent examples - that are currently industrialising; in these countries, the peak employment share of manufacturing is yet to be reached. This evidence provides no basis for arguing that the late developers are fated to experience premature de-industrialisation regardless of their resource endowments and policies.

There is a recent finding that, in the global economy, the employment and GDP shares of manufacturing remained quite stable over a period of four decades (1970-2010).[16] Underlying this stability was a process of redistribution of manufacturing employment and output from the developed to the developing world. While the developed countries were de-industrialising, some of the developing economies (basically those in East Asia) were industrialising at a rapid pace. This evidence seems to suggest that only some of the low-income countries can industrialise at a time. However, we can legitimately ask: Was the observed stability of employment and output shares of manufacturing inevitable or does this perhaps simply reflect the failure of many low-income economies to industrialise? There surely is no iron law that imposes strict limits to employment and GDP shares of manufacturing in the global economy. The evidence points to a need to investigate why many of the low-income economies experienced non-industrialisation or premature de-industrialisation.[17]

Another recent finding is that there is unconditional (i.e., regardless of differences in geography, policies and institutions) convergence of labour productivity in

16. The employment share remained virtually constant at 14 per cent while the GDP share (constant prices) remained stable at 17 per cent. See Felipe and Mehta (2016). Lavopa and Szirmai (2015) and Haraguchi et. al. (2016) also report similar trends for the period 1970-2013.

17. Wood (2017) has argued that globalisation intensified the factor-endowment-related pattern of sectoral specialisation. In land-scarce developing East Asia, labour-intensive manufacturing expanded. In land-abundant Africa and Latin America, manufacturing stagnated or declined. And in land-scarce South Asia, "manufacturing was held back by low literacy and weak infrastructure".

manufacturing across countries while there is no convergence of labour productivity in agriculture or in services or in the aggregate economy.[18] This means that the growth of labour productivity in manufacturing (and in manufacturing alone) is faster in today's low-income countries than in today's high-income countries. Since the growth of labour productivity in manufacturing was accelerating over time in today's high-income countries, it follows that this growth is much faster in today's low-income countries than it was in today's high-income counties during the period of their industrialisation. An implication is that the employment share of manufacturing can be expected to reach its peak in a much shorter time-period in the late developers than it did in the early developers. In Japan, the employment share of manufacturing increased from 9 per cent to its peak of 25 per cent over a period of 83 years; in South Korea, this share increased from 10 per cent to its peak of 28 per cent in just 23 years (Appendix Table A.6). It is also to be expected that de-industrialisation will be a far faster process in the late developers than it had been in the early developers. In the UK, the employment share of manufacturing declined from 34 per cent to 31 per cent over a period of 100 years; in South Korea this share declined from 28 per cent to 18 per cent in 22 years.

But does unconditional convergence of productivity in manufacturing suggest that the peak employment share of manufacturing will be lower and will be reached at a lower level of per capita income in the late industrialisers than was the case in the early industrialisers? The answer is: we cannot tell. Theoretically, the overall effect of faster productivity growth in manufacturing than in other sectors on employment in manufacturing is ambiguous. On the one hand, less labour is required to produce a given volume of manufacturing output. On the other hand, the relative price of manufactures vis-à-vis agricultural products and services declines, which stimulates the demand for manufactures thereby increasing the volume of output. *Ceteris paribus,* the employment share of manufacturing will continue to rise so long as the demand-creating effect of lower prices outweighs the labour-saving effect of productivity growth. Besides, the growth of demand for manufactures derives not just from decline in relative prices but also from growth of income in the domestic economy and growth of net exports (positive trade balance in manufactured goods). So, the employment share of manufacturing will continue to grow as long as the combined effect of declining relative prices, growing incomes and changing trade balance on the demand for manufactured goods outweighs the

18. See Rodrik (2013), Duarte and Restuccia (2010) and Felipe et. al. (2018).

labour-saving effect of productivity growth. Eventually, of course, a point is reached at which the demand growth, and hence the output growth, begins to fall short of the productivity growth. The employment share of manufacturing will then have reached its peak and de-industrialisation will begin. Whether or not this peak will be lower than what it had been in the early industrialisers cannot be known *a priori*.

What can be said with a measure of certitude is that if the peak employment share of manufacturing is to be as high in the late industrialisers as it had been in the early industrialisers, the associated GDP share of manufacturing will have to be significantly higher in the former than it had been in the latter. This follows from the fact that the gap in labour productivity growth between manufacturing and the rest of the economy tends to be larger in the late industrialisers than it had been in the early industrialisers. For the very same reason, however, a given level of GDP share of manufacturing will be associated with a lower per capita GDP in the late developers than it had been in the early developers.[19] Thus, once again, we cannot know *a priori* if the peak employment share of manufacturing will be reached at a relatively low per capita GDP.

What emerges from this discussion is that there are no strong grounds for arguing that today's low-income economies cannot hope to achieve manufacturing-led development.[20] The characteristics of manufacturing that made it the growth engine for low-income economies in the past – rapid productivity growth, high income elasticity of demand for products, high tradability of products and ability to employ relatively low-skilled labour moving out of agriculture at a large productivity premium – still remain very much relevant. The fact that many low-income economies have experienced non-industrialisation or premature de-industrialisation does not tell us that the time-tested route to development no longer exists.

Premature Services-led Growth

Another in-vogue narrative is that, unlike in the past, services can now be the engine of growth in low-income economies of today. This seemingly complements the one

19. These conjectures are well supported by evidence from two currently industrialising economies: China and Vietnam (See Appendix Table A.9). In 2010, in China, an employment share (of manufacturing) of 19 per cent was associated with a GDP share of 36 per cent and a per capita GDP (in 2011 international $) of 9555. In the same year, in Vietnam, an employment share of 20 per cent was associated with a GDP share of 25 per cent and a per capita GDP of 4555.

20. Several other recent studies reach the same conclusion. See, for example, Szirmai and Verspagen (2015), Haraguchi et. al. (2016) and Wood (2017).

discussed above (that industrialisation can no longer be the route to development) by suggesting that a new route to development through services has now become available. The narrative has emerged essentially from efforts to make sense of India's premature (and hence intriguing) services-led growth of recent years, premature because it has come at a rather early stage of development without being preceded by a phase of manufacturing-led growth.

The main argument that is made in support of the proposition is that recent advances in digital technology have transformed certain services, which have now acquired at least some of the characteristics of manufacturing. Information technology, communication, financial and business services now enjoy increasing returns to scale in production and also are highly tradable. Indeed, trade in these services is now growing faster than trade in goods.[21] In these circumstances, it is claimed, services can lead the growth process in low-income economies of today just as well as manufacturing did in the early developers.[22]

That certain digitally transformed services have now become more like manufacturing is not in doubt. But we can hardly deduce from this that low-income economies can now develop by producing and exporting these services. In the first place, we have little reason to believe that low-income economies, given their resource endowments, have the capacity to produce these transformed services, which are highly skill-and-technology-intensive, on any substantive scale. Secondly, it is hard to imagine that the income elasticity of demand for such services can be as high as that for manufactures at low levels of income. In other words, we do not have good reasons to expect the domestic demand for these services to grow as rapidly as the domestic demand for manufactures in low-income economies. Thirdly, it is not obvious that a low-income economy can achieve a positive and sizeable trade balance in these skill-intensive services (in which they obviously cannot have a comparative advantage). Finally, unlike manufacturing, the digitally transformed services simply cannot employ the low-skilled labour migrating from agriculture at a large productivity premium; sustained services-led growth, even if this were possible, is most unlikely to bring substantive improvement in employment conditions.

Thus, it is hard to see how services-led growth can be regarded as the new route to development for today's low-income economies. It is not much of a surprise

21. Cf. Loungani et. al. (2017) and Wood (2017).

22. Cf. Dasgupta and Singh (2005, 2007) and Amirapu and Subramanian (2015).

that, to this day, India remains the only low-income country to have achieved rapid services-led growth for a couple of decades. Moreover, even India's services-led growth, on close scrutiny, shows up to have been somewhat fortuitous, an outcome of the confluence of special circumstances.[23] And this growth has not brought substantial improvement in employment conditions in the country (as we shall see in the next section).

What explains India's premature services-led growth? At first sight, growth does seem to have been driven by the digitally transformed services (information technology, communication, financial and business services). The share of these services in total services output increased from 13 per cent in 1994 to 18 per cent in 2000 and then to 30 per cent in 2012; their share in GDP increased from 6 per cent in 1994 to 8 per cent in 2000 and then to18 per cent in 2012.[24] In the period since 2000, the trade balance in these services has also been significantly positive; as share of GDP, the trade balance increased from 0.7 per cent in 2000 to 3 per cent in 2012. So, it looks like India's growth has been export-led except that the export items have been skill-intensive services rather than labour-intensive manufactures.

As we dig deeper, however, things begin to look different. The trade balance has been positive and significant only for software services, which accounted for less than 18 per cent of total services output in 2012. The trade balance in the other digitally transformed services (accounting for about 12 per cent of total services output in 2012) has generally been negative. So, only the growth of software services has been export-oriented; the growth of the transformed services other than software services has actually been supported by the growth of domestic demand. Moreover, the growth of non-traded services, which account for bulk of the services output (70 per cent in 2012) has also been rapid, though somewhat less rapid than the growth of the transformed services. It is clear that the rapid growth of services has been driven by domestic demand rather than by external demand.[25]

It is this rapid growth of domestic demand for services of all kinds in an economy such as India's that appears rather puzzling. For, it suggests that the income elasticity of demand for services in India has in fact been much higher than that for manufactures even though the per capita income is still rather low. Indeed, the

23. This is fairly well recognised. See, for example, Atolia et. al. (2018).

24. In comparison, the share of manufacturing in GDP was 15 per cent in 1994 and also in 2000 and increased to 16 per cent in 2012.

25. See, in this context, Nayyar (2012) and Ghose (2015).

available evidence shows the income elasticity of demand for services to have been significantly greater than unity.[26] But how is this to be explained? The only sensible answer is: by the rapidly growing income inequality that has been a prominent feature of India's economy in the post-1990 period (see Table 2), which has also been the period of rapid services-led growth. It was the spectacularly growing concentration of income at the hands of the richest 10 per cent of India's population that was driving the growth of domestic demand for services.[27] To explain India's services-led growth, therefore, we need to explain this spectacularly rising income inequality.

Table 2
Trends in Income Distribution

	Share of adult population			
	Bottom 50%	*Middle 40%*	*Next 9%*	*Top 1%*
Share (%) of income				
1990	22.4	44.1	23.0	10.5
1995	20.9	40.6	25.5	13.0
2000	20.6	39.5	24.0	15.1
2005	18.4	36.1	26.2	19.3
2010	16.0	31.8	31.0	21.2
2012	14.9	29.7	33.9	21.5

Source: World Inequality Database (wid.world/data)

The obvious proximate cause of the rapidly rising income inequality is that much of the incremental income was being generated in a few skill-intensive services that engaged a few highly educated persons who came from already rich households.[28] But income growth in these services was being driven largely by external transfers in the form of financial inflows (both FDI and non-FDI), much of which initially went into them.[29] Later, as the growing inequality began to create demand for non-traded services, bulk of the inflows went not just into the digitally transformed services but also into non-traded services, which were also being transformed (shopping

26. The income elasticity of demand for services has been found to be around 1.5. See, Rakshit (2007) and Nayyar (2012).

27. For the top 10 per cent of the population with high average income, the income elasticity of demand is expected to be very high (while it is close to zero for agricultural products and low for manufactured goods in general). Growing concentration of income in this group can only make the income elasticity higher.

28. The digitally transformed services accounted for just 1.4 per cent of total employment in the economy and for 8.3 per cent of real GDP in 2000; in 2012, they accounted for 2.7 per cent of employment and 17.5 per cent of GDP.

29. In the 1990s, FDI went into both skill-intensive services and high-end manufacturing such as automobiles and consumer electronics. See Sutradhar (2014). Non-FDI inflows, of course, went basically into services.

malls, supermarkets, multiplexes, e-commerce, luxury hotels and restaurants, luxury housing, commercial complexes, private education and healthcare, etc.) making them incrementally skill-intensive.[30] The inflows grew rapidly in the 2000s.[31] This is explained by three factors. First, there was a global surge in cross-border financial flows in the early 2000s and India became a favoured destination as it was being perceived as a potentially fast-growing large economy. Second, trade in skill-intensive services was growing rapidly. Third, unusually for a low-income country, India had a relatively large pool of high-skilled workers available for employment at wages relatively low by developed country standards but high by Indian standards.

Financial inflows generated something like a virtuous cycle of growth. By concentrating incremental incomes at the hands of the richest 10 per cent of the population, the flows ensured rapid growth of demand for services in general and for high-end manufactured goods. By generating credit boom in the domestic economy, the flows helped bring the supply response. And by making foreign exchange available, the flows eased imports. This was necessary because services-led growth was creating a growing imbalance between domestic demand for and supply of goods (including manufactures). Growth was associated with rapidly growing deficit in goods trade.[32]

This brief (and, of course, incomplete) account of India's premature services-led growth is intended to underline its distinctiveness. It has not been the kind of growth envisaged by those who argue that services-led growth is the new route to development for low-income economies. And it has not been the kind of growth that many other low-income economies could conceivably replicate. Even the sustainability of India's growth, which has been contingent upon inflows of foreign finance and consumer demand of the richest 10 per cent of the population, is not assured.[33] And even rapid services-led growth does not bring substantive improvement in employment conditions, and the Indian experience shows.

30. In the 2000s, bulk of the FDI also went into services while the non-FDI inflows continued to go into services. See Sutradhar (2014).

31. As per cent of GDP, foreign direct and portfolio investment increased from 1% in 2000 to 5% in 2008 and then fell to 3% in 2012.

32. As per cent of GDP, trade deficit in goods went from -1.4% in 1994 to -3.8% in 2000 and further to -10.4% in 2012. While trade surplus in services was growing (from 0.2% in 1994 to 0.9% in 2000 and then to 3.5% in 2012), this was far too inadequate to cover the deficit in goods trade.

33. Inflows could decline and the consumer demand from the top 10 per cent of the population could reach saturation point.

Services-led growth is not the new route to development for low-income economies of today.

STRUCTURAL CHANGE AND DEVELOPMENT: THE INDIA STORY

The Pace and Pattern of Structural Change

Structural change in India, which has been associated with premature services-led growth, naturally has not conformed to the classical pattern, which had been associated with manufacturing-led growth at Wearly stages of development. But what are the distinctive features of structural change in India? A good way of answering this question is by contrasting the structural change in India with that in China, which has been contemporaneous yet classical (having been associated with manufacturing-led growth). The relevant data for the two countries are put together in Tables 3 and 4.

Table 3
Changing Structure of Employment in India and China

	India			*China*		
	Agriculture	*Manufacturing*	*Services*	*Agriculture*	*Manufacturing*	*Services*
1955	77.6	11.2	9.5	83.8	6.5	8.2
1973	73.8	8.6	15.3	78.7	9.3	9.0
1978	71.1	9.9	16.6	70.5	13.2	12.1
1983	67.5	10.8	18.4	67.1	13.9	14.2
1988	63.6	11.3	20.1	59.4	15.7	18.2
1994	63.5	10.6	21.5	54.3	15.3	23.0
2000	59.5	11.4	23.7	50.0	14.5	27.5
2005	54.6	12.6	25.9	44.8	16.4	31.4
2010	51.3	11.5	26.7	36.7	19.2	34.5

Source: Author's estimates based on (i) data from the GGDC 10-Sector Database for China and (ii) data from Mahalanobis (1958) and NSSO Surveys of Employment and Unemployment for India.

The first and most striking difference between the two experiences is with respect to the time-trend in the employment share of manufacturing. In both countries, the employment share of agriculture declined and the employment share of services increased. But the employment share of manufacturing remained virtually constant in India while it recorded significant increase in China. Second, the pace of structural change has been much slower in India than in China. During the 55-year period 1955-2010, the employment share of agriculture declined by 26 percentage points in India while it declined by 47 percentage points in China. During the shorter but more relevant period 1978-2010 (the period of services-led growth in India and

manufacturing-led growth in China), the employment share of agriculture declined by 20 percentage points in India and by 34 percentage points in China. Third, except during 1955-1978, the employment share of services increased much faster in China than in India. This is remarkable since India's growth was services-led while China's growth was manufacturing-led. Even during 2000-2010, the period of rapid services-led growth in India, the employment share of services increased by just 3 percentage points (from 24 per cent to 27 per cent) in India while it increased by 7 percentage points (from 28 per cent to 35 per cent) in China.

A final noticeable difference is with respect to productivity growth (Table 3). Throughout the period 1978-2010, the growth of labour productivity in manufacturing was about the same as that in services in India; in China during the same period, productivity growth was significantly faster in manufacturing than in services. During the shorter period 1994-2010, productivity growth was actually slower in manufacturing than in services in India, while it continued to be significantly faster in manufacturing than in services in China.

Table 4
Ratio of Labour Productivity in Manufacturing to that in Agriculture (M/A) and to that in Services (M/S)

	India		*China*	
	M/A	*M/S*	*M/A*	*M/S*
1955	1.356	0.263	0.298	0.114
1973	2.890	0.658	2.557	0.638
1978	2.798	0.655	2.427	0.709
1983	2.581	0.623	2.336	0.676
1988	2.690	0.615	2.771	0.701
1994	3.311	0.687	4.478	1.256
2000	3.827	0.666	7.121	1.820
2005	3.616	0.568	7.479	1.770
2010	4.952	0.654	7.647	1.660

Source: Author's estimates based on (i) data from GGDC 10-Sector Database for China and (ii) data from NSSO Surveys of Employment and Unemployment and CSO National Accounts Statistics for India.

Thus, three distinctive features of structural change in India stand out. First, the employment share of manufacturing failed to increase, which tells a story of non-industrialisation. Rapid growth of services – the lead sector - seems to have restrained the growth of manufacturing.[34] Second, the pace of structural change has been much too slow, which suggests very slow improvement in employment conditions. Third, productivity growth in services has been faster than or at least as

34. In China, in contrast, rapid growth of manufacturing stimulated growth of services, as is to be expected.

fast as that in manufacturing. These trends are truly exceptional. It is hard to find another growing economy (either in the past or at present) in which the productivity growth in services has been faster than or even as fast as the productivity growth in manufacturing.

Structural Change and Employment

As already stated, structural change involving labour reallocation from agriculture to non-agriculture is the primary mechanism for improvement in employment conditions in low-income economies, where a large part of the workforce is typically engaged in very low-productivity activities in agriculture. Since labour productivity is much higher in non-agriculture, movement of workers from agriculture to non-agriculture means movement from lower-productivity jobs (that yield lower labour-incomes) to higher-productivity jobs (that yield higher labour-incomes). Movement of this kind also improves employment conditions in agriculture itself by reducing surplus labour in the sector, thereby contributing to productivity growth (and thus to growth of labour-income). Hence, the faster the pace of labour reallocation from agriculture to non-agriculture, the faster is the pace of improvement in employment conditions. The effect of economic growth on employment depends on the pace of labour reallocation from agriculture to non-agriculture that growth engenders.

To get an explicit view of the process of labour reallocation in an economy, we need to find a measure of the magnitude of labour reallocation in any given period. A simple measure is given by:

$$(LR)_i = (e_{it} - e_{i0}) * E_t$$

where

$(LR)_i$ is the quantity of labour reallocated from/to sector i in a period, e_{i0} is the fraction of total employment in sector i at the beginning of the period, e_{it} is the fraction of total employment in sector i at the end of the period, and E_t is total employment in the economy at the end of the period.

The idea underlying the measure is simple. Had there been no labour reallocation across the sectors, each sector's share in total employment would have been the same in initial and terminal years of a given period but employment in each sector would have increased reflecting the increase in total employment in the economy. So, ($e_{i0} * E_t$) would then have been the employment in sector i in period t, which we can call the "zero-reallocation" employment. If there has been labour reallocation, the actual employment in sector i in period t would be given by ($e_{it} * E_t$). The difference

between these two levels of employment can be regarded as the quantity of labour reallocated from/to sector i. When there is reallocation from sector i, $e_{it} < e_{i0}$ so that $(LR)_i$ is negative. When there is reallocation to sector i, $e_{it} > e_{i0}$ so that $(LR)_i$ is positive.

However, $(LR)_i$ is not comparable across countries because it depends on E_t, which varies across countries. But $(LR)_t$ can be expressed as a percentage of the "zero-reallocation" employment $(e_{i0} * E_t)$ to get a measure of the scale of reallocation from/to sector i that is comparable across countries:

$$S(LR)_i = [\{(e_{it} - e_{i0}) * E_t] / (e_{i0} * E_t)\}] * 100 = [(e_{it} - e_{i0}) / e_{i0}] * 100$$

Estimates of the magnitude and scale of labour reallocation from agriculture to non-agriculture in India and China are presented in Table 5. We have chosen to confine attention to developments since 1978; this was when growth was rapid and accelerating in both countries and also when India's growth was clearly services-led while China's growth was clearly manufacturing-led. The scale of reallocation was significant in both economies, but it was much smaller in India than in China in both periods. Between 1994 and 2010, for example, 20 per cent of the potential agricultural workers moved to jobs in non-agriculture in India while the corresponding figure for China was 48 per cent. Thus, the pace of transfer of workers from low-productivity jobs in agriculture to higher-productivity jobs in non-agriculture was much slower in India than in China. The slower pace of labour transfer also meant slower growth of labour productivity in agriculture in India. The pace of improvement in overall employment conditions was much slower in India than in China.

Table 5
Labour Reallocation (numbers in million) across Sectors

	India		*China*	
	1978-1994	*1994-2010*	*1978-1994*	*1994-2010*
Agriculture	-27.4	-59.7	-94.6	-115.8
Manufacturing	1.9	4.2	12.3	25.7
Construction	5.3	28.3	18.1	17.1
Other industries	1.5	0.9	0.6	-2.6
Services	18.8	26.3	63.6	75.6
Reallocation from agriculture: size (million)	27.4	59.7	94.6	115.8
Reallocation from agriculture: scale (%)	10.2	19.8	23.0	48.0

Source: Author's estimates.

The reasons why the scale of labour reallocation from agriculture was so much smaller in India than in China become clear from the differences in the pattern of absorption of the reallocated labour by different sectors within non-agriculture in the two economies particularly during 1994-2010 (Table 6). First, the manufacturing

sector was a rather insignificant employer of workers moving out of agriculture in India; in China, in contrast, manufacturing was a major employer of such workers. Second, the services sector was a far less important employer of transferred workers in India than in China. Finally, construction was a major absorber of reallocated labour in India but not so in China. Strikingly, construction was actually a more important absorber of the reallocated labour than services in India. It is also the case, as we shall see below, that labour productivity in construction recorded zero growth in India (but high growth in China). However, labour productivity in construction, despite its stagnation, still remained much higher in construction than in agriculture so that labour reallocation from agriculture to construction was both growth-enhancing and employment-improving.[35]

Table 6
Absorption of Reallocated Labour by Sectors (Percentage Distribution)

	India		*China*	
	1978-1994	*1994-2010*	*1978-1994*	*1994-2010*
Manufacturing	6.8	7.0	13.0	22.2
Construction	19.2	47.4	19.1	14.7
Mining and utilities	5.5	1.5	0.6	-2.2
Services	68.5	44.1	67.3	65.3

Source: Author's estimates.

It is clear that China's manufacturing-led growth was far more effective in improving the employment conditions than India's services-led growth. This was not just because, in China, manufacturing was a major destination for labour moving out of agriculture but also because services became increasingly important absorber of such labour. In India, in contrast, not only was manufacturing an insignificant absorber of labour moving out of agriculture but services also became progressively less important absorber of such labour. Had construction not become a major absorber of labour, the scale of labour reallocation from agriculture would have been significantly smaller than it actually was.[36]

The contrasting experiences of China and India show why manufacturing-led growth has served as the route to development over a long period and also why services-led growth, even when possible, is not really an alternative route. The employment outcomes of the two types of growth are very different. Manufacturing-

35. Even in 2010, the labour productivity in construction was three times that in agriculture.

36. Government job creation programmes played an important role in increasing employment in construction, particularly during 1994-2010.

led growth is associated with rapid transfer of low-skilled labour from agriculture not just to manufacturing but also to services and hence with rapid improvement of employment conditions. Services-led growth, in contrast, is associated with slow growth of jobs not just in manufacturing but also in services and hence with slow improvement of employment conditions.

Structural Change and Growth

Structural change, when it involves reallocation of labour from lower-productivity to higher-productivity sectors, positively contributes to growth of labour productivity in the economy and thus to economic growth.[37] Overall productivity growth then results partly from productivity growth within the sectors (which we can think of as the direct result of investment, technological change and worker skills in the sectors) and partly from labour reallocation across the sectors. And overall growth is the combined result of productivity growth and employment growth.

To empirically observe the contribution of structural change to productivity growth, we can employ the following decomposition of the aggregate growth of output per worker[38]:

$$g(y) = \Sigma_i \, l_i^0 . g(y_i) + s$$

where g(y) is average annual growth of overall output per worker in the economy,
$g(y_i)$ is average annual growth of output per worker in sector i,
l_i^0 is initial share of sector i in total employment in the economy, and
s is the residual.

The first term on the right-hand side of the equation measures the economy wide productivity growth that would have occurred had no reallocation of labour taken place, i.e., the within-sector productivity growth. The residual, then, gives a measure of the contribution of labour reallocation to aggregate productivity growth in the economy.[39] The overall output growth, of course, is given by: g(l) + g(y),

37. Structural change may involve reallocation of labour from high-productivity to low-productivity sectors, in which case it makes a negative contribution to growth. McMillan et. al. (2014) show that structural change in fact made a negative contribution to growth in several Latin American and African countries in the post-1990 period.

38. The decomposition has been widely used in the literature. See, for example, Bosworth and Collins (2008), McMillan et. al. (2014) and Timmer et. al. (2014).

39. The residual could be further decomposed into static (reallocation from a lower-productivity sector to a higher-productivity sector) and dynamic (reallocation from a lower-productivity-growth sector to a higher-productivity-growth sector) components, as is done by Timmer et. al. (2014). But it is not very clear how useful the extra information is.

where g(l) is average annual growth of employment in the economy.

The results of decomposition of aggregate productivity growth in India and China are shown in Table 7.

Table 7
Growth (% p.a.) of Output per Worker, Employment and GDP

	India			*China*
	1978-1994	*1994-2010*	**1978-1994**	**1994-2010**
Output per worker				
Agriculture	1.4	2.7	4.2	5.2
Manufacturing	2.3	4.9	7.1	8.1
Construction	-1.7	0.1	1.6	7.1
Other industries	2.1	2.4	4.5	13.2
Services	2.1	5.4	5.1	7.5
Economy	2.6	5.4	6.2	8.7
Within-sector	1.5	3.3	4.6	6.4
Structural change effect	1.1	2.1	1.6	2.3
Employment	2.3	1.4	2.5	0.8
GDP	4.9	6.8	8.7	9.5

Source: Author's estimates based on data (i) from GGDC 10-Sector database for China and (ii) from CSO and NSSO for India.

The growth of labour productivity was significant and was also accelerating over time in both economies. But productivity growth was higher in China by a large margin throughout the periods under consideration. The principal reason was the much higher within-sector productivity growth in China.[40] Quite remarkably, moreover, productivity growth was substantially higher in each of the sectors in China, even in services. In the case of India, two features are particularly noticeable. The first is the declining or stagnant productivity in construction, a sector that has been a major absorber of the low-skilled labour moving out of agriculture. The second is the relatively slow productivity growth in manufacturing, which has not absorbed much of the labour moving out of agriculture. During 1994-2010, productivity growth was slower in manufacturing than in services. It is tempting to attribute this to the growth of digital technology and trade intensive services.[41]

40. Several studies have found that, in rapidly growing economies, high aggregate productivity growth reflects high within-sector productivity growth. See, for example, Timmer et. al. (2015), McMillan and Rodrik (2011), McMillan et. al. (2014), Roncolato and Kucera (2017) and Kucera and Jiang (2018). However, the sectors considered are broad and there typically is heterogeneity of productivity across sub-sectors and across production units within each of the sector. The observed sector-level productivity growth thus actually incorporates a structural change effect.

41. Jorgenson and Timmer (2011) show that, in industrialised in recent periods, services such as telecommunication, finance, and distribution have recorded higher rates of productivity growth than manufacturing. See also Buera and Kaboski (2012).

But it is not the case that productivity growth in services was spectacular. As already noted, productivity growth in services was much higher in China than in India. But in China, productivity growth in manufacturing was still higher than that in services.

The contribution of structural change to overall productivity growth in the economy was positive and significant in both countries.[42] The magnitude of the structural change effect was larger in China during 1978-1994 and about equal during 1994-2010. Given that the pace of structural change was much slower in India, the fact that its growth-enhancing effect was similar in magnitude to that in China during 1994-2010 appears a little surprising. The explanation is that the gap in productivity between agriculture and non-agriculture has been and remains significantly larger in India than in China. The ratio of labour productivity in non-agriculture to that in agriculture was 4.5 in India against 3.9 in China in 1994, and 6.2 in India against 5.8 in China in 2010 (Table 8). This was not because the productivity in non-agriculture was higher in India; as a matter of fact, productivity was higher in both agriculture and non-agriculture in China

Table 8
Output per Worker in 2011 International $

	India			*China*		
	1978	*1994*	*2010*	*1978*	*1994*	*2010*
Agriculture	1720	2083	3192	2036	2728	4795
Non-agriculture	6828	9336	19676	6374	10615	27770
Manufacturing	4384	6467	15807	4922	12255	36763
Construction	14173	9843	9514	8239	8148	16862
Mining and utilities	17579	22788	38007	9982	15309	86245
Services	7081	10042	24027	7011	9635	22202
Economy	3185	4698	11228	3315	6332	19342

Source: Author's estimates based on data (i) on GDP in 2011 international $ from GGDC Maddison Historical Statistics Database; (ii) on GDP shares of sectors from GGDC 10-Sector Database for China and from CSO Database for India; and (iii) on employment shares from GGDC 10-Sector Database for China and from NSSO Database for India.

42. Similar findings are reported in Bosworth and Collins (2008), Bosworth, Collins and Virmani (2007), McMillan and Rodrik (2011), Krishna et. al. (2017) and Majid (2019). Majid (2019) considers 30 sub-sectors – 15 organised and 15 unorganised – in estimating the structural change effect; his estimate comes quite close to our estimate for the period 1994-2010 reported above. His most interesting finding is that, in India, labour reallocation from agriculture to non-agriculture occurred mainly within the unorganised part of the economy rather than between the unorganised and the organised sectors.

CONCLUDING OBSERVATIONS

Structural change in India, like its services-led growth, has been an exception to the rule. Labour reallocation has been occurring from agriculture to construction and services and not to manufacturing and services. Indeed, manufacturing has simply not been a part of the story. This explains why the pace of labour reallocation from agriculture to non-agriculture has been rather slow. But for the government's special employment schemes, which generated low-skill jobs in construction, job growth in the sector (which remained a stagnant-productivity sector) would have been lower than it was so that the pace of labour reallocation from agriculture to non-agriculture would have been even slower. The slow pace of structural change has meant slow pace of improvement in employment conditions. This stands in sharp contrast with the experience of China where the structural change was very much classical in character, having been associated with manufacturing-led growth. The pace of improvement in employment conditions, was much faster in China than in India.

However, the structural change in India has been growth-enhancing, indeed almost as growth-enhancing as that in China. The reason is that the productivity gap between non-agriculture and agriculture has remained large, larger than that in China. This is not because productivity in non-agriculture in India has been high; in fact, productivity in both agriculture and non-agriculture was higher in China than in India for much of the period. Productivity growth in agriculture remained low in India, in part because of the slow pace of labour reallocation. And productivity in non-agriculture remained high because of the growing weight of high-productivity services in output.

India's experience shows why services-led growth cannot be seen as a new route to development (i.e., as an alternative to manufacturing-led growth) for the low-income economies of today. The employment benefits of services-led growth are far too inadequate to translate growth into development. Manufacturing absorbs the relatively low-skilled labour moving out of agriculture at a productivity premium. Moreover, manufacturing growth stimulates growth of certain services, which also absorb the relatively low-skilled labour moving out of agriculture at a productivity premium. But services-led growth has to be based on growth of skill-intensive services, which cannot absorb the low-skilled labour moving out of agriculture. And growth of services does not seem to stimulate growth of manufacturing that can absorb the low-skilled labour moving out of agriculture.[43] Thus, services-led growth, even when possible, does not amount to services-led development.

43. This generates a growing anomaly between domestic absorption (consumption plus investment) and domestic production of manufactures and thus a growing trade deficit and a correspondingly growing need for foreign finance. See Ghose (2016) for elaboration of this argument.

It must also be recognised that services-led growth is not even a possibility for most of the low-income economies. For, this kind of growth must rely on growth of skill-intensive traded services and the low-income economies typically are skill-scarce and labour-surplus. India has been an exception to the rule in that it happened to have built a supply of skilled labour. Not surprisingly, it has also remained the only country to have achieved premature services-led growth.

Does manufacturing-led development still remain a possibility for low-income economies of today? The answer, our analysis suggests, is yes.[44] There are no solid grounds, empirical or theoretical, for believing that low-income economies of today are fated to experience premature de-industrialisation. A great merit of manufacturing-led growth is that it can be sustained by synchronous increases in domestic demand for manufactures (through growth of employment and income) and in domestic production of manufactures (under increasing returns to scale). Exports help by bringing additional demand and growth acceleration.[45] In contrast, services-led growth in a low-income economy (which happens to be endowed with skilled labour) has to be sustained by synchronous increases in income inequality and inflow of foreign finance; the former sustains the growth of domestic demand for services and the latter promotes the production of skill-intensive traded services.

Should India make a transition from services-led growth to manufacturing-led growth? The answer, again, is yes. And the main argument is that India needs much faster pace of improvement in employment conditions, i.e., much faster pace of structural change, which only manufacturing-led growth can engender.[46] We can add that sustainability of India's services-led growth is conditional on growing income inequality and continued inflow of foreign finance and hence is open to doubt. Growing concentration of income at the hands of the richest 10 per cent of the population cannot sustain rapid growth of domestic demand for services

44. It remains true, of course, that a certain level of development of agriculture is a pre-condition for manufacturing-led growth. This means that not all low-income countries are well-prepared to launch industrialisation at a point of time.

45. It is widely believed, quite mistakenly, that manufacturing-led growth has always been manufactures-export-led growth. In truth, employment and output growth in manufacturing has largely been sustained domestically. Export success adds to the growth but is not the main driver. In the latest case of manufacturing-led growth, that of China, the small-scale enterprises (called Township and Village Enterprises), catering exclusively to the domestic market, played a more important role than the large export-oriented enterprises located in the Special Economic Zones. See Ghose (2019) for a discussion.

46. A few other studies have also made this point. See, for example, Bosworth and Collins (2008), Bosworth, Collins and Virmani (2007), Kucera and Roncolato (2016) and Nayyar (2019).

for ever; a saturation point will inevitably be reached. Inequality growth itself is likely to become socially unsustainable. And continued inflow of foreign finance cannot be taken for granted.

A transition to manufacturing-led growth, it should be pointed out, does not require choking of the export-oriented growth of the services (e.g., software services) in which India has acquired a comparative advantage. In this sense, India can have both manufacturing and services as growth engines.

At this point, we need to take note of a current concern that the labour-saving technologies associated with the so-called Fourth Industrial Revolution (or Industry 4.0) – robotics, artificial intelligence, Internet of Things and 3-D printing – will make it increasingly difficult for low-income countries to develop manufacturing by drastically reducing trade in manufactures and thereby destroying prospects of manufactures-export-led growth. In parallel, the technologies will, it is feared, also destroy the job-creating potential of manufacturing by enabling near-complete automation. In short, future prospects of manufacturing-led development appear to look pretty grim. Amidst these fears and concerns, a view is emerging that, since the same technologies will keep increasing the tradability of services, it will now be possible for low-income economies to achieve services-export-led growth provided, of course, that they concentrate their energies and resources on building a skilled but low-wage labour force.[47]

While the concern cannot be dismissed as entirely baseless, it should not persuade the low-income countries to devote all their energies and resources to building of a high-skilled labour force and dissuade them from pursuing manufacturing-led development. If there is a day when manufacturing will employ only 'artificially intelligent robots' and no workers, that day is still far off. And it is difficult to see why there will not be a day when 'artificially intelligent robots' will be delivering all services. Speculations of this kind are not very helpful. What we do know at this point of time is that 'robotization' is of some importance in the traditionally capital-intensive industries. Labour-intensive manufacturing, in which the low-income countries have a comparative advantage, has not seen much use of robots.[48] It has also been found that increased 'robotization' in developed countries actually increases offshoring rather than reshoring.[49] Exports of labour-

47. The most recent and forceful proponent of these ideas is Baldwin (2019)

48. See Hallward-Driemeier and Nayyar (2018).

49. See Hallward-Driemeier and Nayyar (2019).

intensive manufactures from low-income to high-income countries will remain important in the foreseeable future. Moreover, manufacturing value chains and "trade in tasks" are not about to disappear. And manufacturing-led growth should not be taken to mean manufactures-export-led growth. As argued above, growth of manufacturing can be driven by synchronised forces of demand and supply in the domestic economy. Exports certainly help but need not, and usually do not, drive manufacturing growth. Most jobs are created in domestic-market-oriented manufacturing and not in export-oriented manufacturing.

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APPENDIX TABLES

Appendix Table A.1

Shares (%) of Sectors in Total Employment and Per capita GDP

		Agriculture	*Industry*	*Services*	*Per capita GDP* (in 2011 PPP $)
Canada	1881	52.0	28.0	20.0	3450
Denmark	1870	54.0	24.0	22.0	3599
Finland	1880	79.0	9.0	12.0	1870
France	1788	75.0	10.0	15.0	1871
France	1845	62.0	18.0	20.0	2435
Italy	1871	62.0	24.0	14.0	3073
Japan	1872	84.9	4.9	10.2	1174
Norway	1875	59.0	19.0	22.0	4555
Portugal	1890	65.0	19.0	16.0	1952
Spain	1900	67.0	14.0	19.0	3166
Sweden	1870	72.0	15.0	13.0	2272
UK	1700	38.9	34.0	27.1	2365
USA	1820	72.0	12.0	16.0	2080

Note: Industry includes manufacturing, mining and construction. Manufacturing accounted for bulk of the employment in industry in all countries.

Source: Employment shares: for UK, Broadberry et. al. (2015), ch. 9; for Japan, Bairoch et. al. (1968); for the rest of the countries, Kuznets (1957). Per capita GDP: GGDC Maddison Historical Statistics Database.

Appendix Table A.2

Shares (%) of Sectors in Total Employment and Per Capita GDP

		Agriculture	*Manufacturing*	*Industry*	*Services*	*Per capita GDP (in 2011 PPP $)*
Ethiopia	1961	96.2	1.3	1.5	2.3	604
Ghana	1960	60.7	10.9	16.7	22.6	2165
Kenya	1969	80.6	3.6	4.6	14.8	2026
Malawi	1966	84.4	2.8	5.9	9.7	622
Senegal	1970	73.3	5.6	7.4	19.3	2027
China	1962	82.1	6.0	8.0	9.9	738
India	1955	77.6	11.2	12.9	9.5	899
Indonesia	1971	65.8	7.8	10.0	24.2	2143
Korea	1963	61.9	8.3	11.8	26.3	1814
Thailand	1960	81.3	4.3	5.1	13.6	1504
Bolivia	1950	72.6	8.1	13.2	14.2	3178
Brazil	1950	64.4	11.5	16.5	19.1	2898
Colombia	1950	56.4	11.3	16.3	27.3	3414
Mexico	1950	58.6	11.8	16.0	25.4	4179
Peru	1960	54.5	12.1	17.4	28.1	3889

Note: Industry includes manufacturing, mining, utilities and construction.

Source: Author's estimates based on data (i) from Mahalanobis (1958) for India; and (ii) from GGDC 10-Sector Database for the rest. Data on per capita GDP are from GGDC: Maddison Historical Statistics Database.

Appendix Table A.3

Ratio of Labour Productivity in Manufacturing to that in Agriculture and Services

		Agriculture	*Services*
Netherlands	1889	1.322	0.695
UK	1861	1.048	0.556
Japan	1890	1.645	0.196
Ethiopia	1961	1.807	0.396
Ghana	1960	2.067	0.954
Kenya	1969	3.902	0.648
Malawi	1966	6.725	0.698
Senegal	1970	6.571	0.975
China	1962	1.181	0.355
India	1955	1.356	0.263
Indonesia	1971	2.749	0.975
Korea	1963	1.440	0.180
Thailand	1960	6.978	0.861
Bolivia	1950	5.733	0.573
Brazil	1950	7.757	0.529
Colombia	1950	4.244	0.848
Mexico	1950	6.835	0.519
Peru	1960	6.783	0.667

Source: Author's estimates based on data (i) from Bairoch et. al. (1968) and Smits et. al. (2000) for Netherlands; (ii) from Feinstein (1972) for UK; and (iii) from Bairoch et. al. and GGDC Historical National Accounts Statistics Database for Japan.

Appendix Table A.4

Time-trends in Employment Share (%) of Sectors, four Early Developers

	Agriculture	*Manufacturing*	*Services*		*Agriculture*	*Manufacturing*	*Services*
UK				*USA*			
1861	27.5	33.6	30.5	1870	53.5	18.1	24.6
1871	22.6	34.1	34.2	1880	49.9	18.8	26.3
1881	19.3	33.2	37.0	1890	43.4	21.0	31.0
1891	16.1	33.7	39.6	1900	38.3	21.0	35.0
1901	13.3	33.0	41.5	1910	31.7	24.8	37.2
1911	12.0	32.8	43.0	1920	27.6	27.9	39.5
1921	9.6	32.5	44.8	1930	22.0	25.6	47.1
1931	7.8	30.9	49.4	1950	9.1	25.0	57.7
1951	5.3	31.0	49.4	1960	5.7	23.6	63.5
1961	4.2	32.2	49.9	1970	3.2	22.2	67.9
1971	2.9	31.1	54.6	1980	2.8	19.2	70.7
1981	2.7	24.5	62.2	1990	2.0	15.2	76.0
1991	2.4	18.5	69.1	2000	1.6	12.7	79.1
2001	1.7	15.0	75.2	2010	1.5	8.7	83.9
2009	1.9	10.3	79.9				
Netherlands				*France*			
1849	44.2	19.0	31.8	1856	51.7	21.9	21.5
1889	32.9	22.2	36.9	1866	49.8	23.1	22.3
1899	30.8	23.5	37.6	1886	47.0	19.6	27.3
1909	28.3	24.2	38.9	1896	44.8	24.4	25.5
1920	23.6	26.0	40.8	1906	42.7	25.0	28.1
1930	20.6	25.9	42.8	1921	41.6	25.0	28.7
1960	9.9	26.2	52.9	1931	35.6	26.8	31.1
1970	5.8	24.3	59.0	1950	25.5	23.6	41.7
1980	5.1	20.1	66.1	1960	22.4	24.6	43.2
1990	4.4	17.2	71.3	1970	13.8	25.4	49.2
2000	3.5	13.0	76.7	1980	8.7	23.2	57.9
2009	3.0	10.9	79.8	1990	5.8	18.8	66.7
				2000	4.0	15.3	73.6
				2010	3.1	11.4	77.6

Source: For UK 1861-1931: Feinstein (1972); for USA 1870-1930, Netherlands 1849-1930 and France 1856-1931: author's estimates based on data from Bairoch et. al. (1968).

Appendix Table A.5

Employment, Population and Per Capita GDP (in 2011 PPP $), Four Early Developers

	Employment	*Population*	*Per capita GDP*		*Employment*	*Population*	*Per capita GDP*
UK				*USA*			
1861	10520	29128	4926	1870	12925	40241	3736
1871	11870	31685	5684	1880	17392	50458	4866
1881	13185	34935	6027	1890	23319	63302	5184
1891	14499	37802	6648	1900	29073	76391	6252
1901	16299	41538	7370	1910	37371	92767	7586
1911	18340	45268	7721	1920	42434	106881	8485
1921	19357	44072	6660	1930	48830	123668	9490
1931	21074	46074	8031	1950	62539	152271	15241
1951	24970	50290	11134	1960	70869	180671	18058
1961	26403	52807	13843	1970	86924	205052	23958
1971	26121	55907	17101	1980	105911	227726	29613
1981	25355	56383	19924	1990	127009	250132	36982
1991	25761	57671	25314	2000	147717	282738	45887
2001	26767	59373	32356	2010	144659	309978	49267
2009	27539	62544	34338				
Netherlands				*France*			
1849	1250	3076	4188	1856	14143	37060	2773
1889	1647	4485	6040	1866	15143	38080	3182
1899	1921	5070	6137	1886	16708	39858	3680
1909	2259	5862	6606	1896	19959	40192	4418
1920	2720	6848	7593	1906	20729	40942	4842
1930	3179	7884	10081	1921	21716	39240	5058
1960	4832	11486	14911	1931	21615	41860	6967
1970	5384	13032	21534	1950	19643	42518	8531
1980	5605	14144	26460	1960	19318	46584	12170
1990	6601	14952	31062	1970	20621	51918	18771
2000	7971	15926	43085	1980	21849	55110	24292
2009	8515	16530	43680	1990	22380	58168	29031
				2000	23828	60819	33967
				2010	24918	64880	36141

Source: GGDC Maddison Historical Statistics Database.

Appendix Table A.6

Trends in Employment Share (%) of Sectors, Two Late Developers

	Agriculture	*Manufacturing*	*Services*		*Agriculture*	*Manufacturing*	*Services*
Japan				*Korea*			
1872	84.9	4.1	10.2	1965	57.3	9.8	28.8
1880	82.3	5.6	11.1	1970	49.0	13.6	33.0
1890	76.2	8.7	13.5	1975	44.5	19.2	31.1
1900	70.0	11.4	16.2	1980	32.8	22.2	37.6
1910	63.0	14.1	19.3	1985	23.9	23.9	44.8
1920	53.8	16.5	25.4	1988	19.8	28.1	44.9
1930	49.4	16.0	29.8	1990	17.0	27.4	47.2
1953	41.9	16.8	34.4	1995	11.8	23.6	54.8
1962	28.3	21.8	41.1	2000	10.6	20.3	61.2
1973	15.3	24.6	50.5	2005	8.0	18.5	65.2
1982	11.6	21.7	56.7	2010	6.9	18.2	66.6
1992	8.0	22.7	58.9				
2002	5.4	17.8	66.5				
2010	4.9	14.5	71.3				

Source: Author's estimates based on data from Bairoch et. al. (for Japan 1872-1930) and GGDC 10-Sector Database.

Appendix Table A.7

Employment, Population and Per Capita GDP (in 2011 PPP $), Two Late Developers

	Employment (th.)	*Population (th.)*	*Per capita GDP*		*Employment (th.)*	*Population (th.)*	*Per capita GDP*
Japan				*Korea*			
1872	17074	34859	1174	1965	7997	28705	1981
1880	19542	36807	1359	1970	9415	32241	2989
1890	22583	40077	1592	1975	11620	35281	4360
1900	24768	44103	1856	1980	13548	38124	5674
1910	26169	49518	2052	1985	14869	40806	7820
1920	26966	55818	2668	1988	16805	42031	10509
1930	29341	64203	2912	1990	18003	42869	12004
1953	40732	87655	3894	1995	20398	45093	17095
1962	50262	95832	7516	2000	21136	47008	21420
1973	59540	108707	17993	2005	22830	48185	26331
1982	62690	118455	22154	2010	23879	49554	31321
1992	66899	124467	30620				
2002	63748	127503	33013				
2010	58053	127529	34990				

Source: GGDC Maddison Historical Statistics Database.

Appendix Table A.8

Trends in the Ratio of Labour Productivity in Manufacturing to that in Agriculture (M/A) and in Services (M/S)

UK			*USA*		
	M/A	*M/S*		*M/A*	*M/S*
1950	4.263	0.612	1950	2.686	0.435
1955	4.104	0.658	1955	2.525	0.457
1960	3.645	0.701	1960	2.208	0.451
1965	3.029	0.754	1965	2.361	0.519
1970	2.656	0.764	1970	1.971	0.517
1975	2.476	0.830	1975	2.168	0.573
1980	1.994	0.827	1980	2.364	0.606
1985	2.142	1.011	1985	1.729	0.727
1990	2.422	1.205	1990	1.831	0.815
1995	2.634	1.278	1995	2.419	0.986
2000	2.447	1.282	1999	1.910	1.022
2005	2.168	1.429	2005	1.755	1.266
2009	2.861	1.455	2010	1.585	1.314

Netherlands			*France*		
	M/A	*M/S*		*M/A*	*M/S*
1960	2.350	0.441	*1955*	*1.907*	*0.314*
1965	2.501	0.517	1960	1.958	0.356
1970	2.183	0.657	1965	1.958	0.414
1975	2.053	0.724	1970	2.048	0.550
1980	1.897	0.854	1975	1.943	0.613
1984	1.847	1.045	1980	1.776	0.704
1990	1.609	1.135	1985	1.419	0.730
1995	1.683	1.403	1990	1.249	0.794
2000	1.820	1.512	1995	1.205	0.929
2005	1.958	1.668	1998	1.185	1.025
2009	1.729	1.663	2005	1.568	1.484
Japan	M/A	M/S	2009	1.392	1.516
1955	1.945	0.494	Korea	M/A	M/S
1960	1.958	0.560	1965	1.276	0.195
1965	2.470	0.704	1970	1.709	0.281
1970	4.226	0.907	1975	1.989	0.333
1973	3.859	0.988	1980	2.615	0.497
1976	4.144	1.007	1985	2.121	0.649
1980	4.847	1.040	1988	2.146	0.674
1985	4.608	1.145	1990	2.296	0.718
1990	4.585	1.157	1995	2.517	1.003
1995	5.182	1.174	2000	3.571	1.693
2000	4.270	1.292	2005	3.582	2.156
2005	4.623	1.438	2010	3.841	2.535
2010	5.235	1.803			

Source: Author's estimates based on data from GGDC 10-Sector Database.

Appendix Table A.9
Structural Change in Late Developers

	Year of peak ME/E	*Peak ME/E*	*M/G*	*GDP per capita*	*Growth of GDP per capita, 1965-2010*
Non-industrialisation					
Ethiopia	2003	5.6	5.6	714	0.9
Malawi	2010	4.4	10.4	1087	1.4
Nigeria	1973	7.3	1.8	3287	1.6
Senegal	2010	9.9	14.6	2139	0.0
Tanzania	2010	3.2	10.2	2124	1.0
Zambia	1985	4.2	14.8	2198	-0.2
Premature de-industrialisation					
Bolivia	2002	14.0	13.9	4292	1.2
Colombia	1970	14.3	19.1	4908	2.2
Egypt	1972	14.7	22.3	3422	2.7
Ghana	1978	15.3	17.3	1979	0.7
Indonesia	1994	13.5	27.3	5557	3.6
Kenya	2008	13.0	12.4	2484	1.0
Morocco	1985	15.5	17.9	3882	2.5
Philippines	1971	12.6	31.3	3386	1.4
Ambiguous de-industrialisation					
Brazil	1986	15.4	19.7	10729	2.5
Chile	1973	22.1	22.8	6899	2.5
Costa Rica	1992	20.5	19.5	7818	2.0
Mexico	1980	19.9	19.1	8230	1.7
Peru	1971	14.7	19.3	6599	1.0
South Africa	1981	16.8	24.5	10631	0.7
Mature de-industrialisation					
Argentina	1958	27.7	29.8	10009	1.2
Japan	1973	24.6	25.4	17993	3.0
Korea	1988	28.1	23.8	10509	6.3
Malaysia	1997	24.9	27.7	14776	3.9
Mauritius	1990	32.2	25.4	7924	3.4
Taiwan	1987	33.7	38.6	12720	6.0
Continuing industrialisation					
China	2010	19.2	36.5	9555	5.1
Vietnam	2010	20.4	25.2	4555	2.8

Note: ME/E: employment share of manufacturing; M/G: GDP share of manufacturing; GDP per capita is in 2011 international $.

Source: Author's estimates based on data from GGDC 10-Sector Database and Maddison Historical Statistics Database.

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INSTITUTE FOR HUMAN DEVELOPMENT
256, 2nd Floor, Okhla Industrial Estate, Phase-III,
New Delhi - 110020
Tel: +91 11 41064676, +91 9871177540
E-mail: mail@ihdindia.org; Website: www.ihdindia.org