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# Structural Transformation and Growth without Industrialisation

Background Paper

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## Introduction

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Economic growth has historically been accompanied by a process of structural transformation in which labour and other resources move from agriculture to manufacturing and then to services over the course of the growth process. Evidence for this historical pattern of transformation is clear (Herrendorf, et al., 2014). Agriculture is the dominant sector in most low-income countries, and agriculture's share of employment and output declines strongly with economic growth. The service sector share of economic activity, conversely, is very small in poor countries and rises monotonically with income per capita. Manufacturing (or industry, a sector that is generally defined as lumping together manufacturing with mining and construction) is generally thought to follow a hump-shaped pattern, growing with income at early stages of development, but falling away as countries get rich.

Much of the literature on growth and development strategies has extrapolated from this historical experience to argue that a manufacturing or industrial stage is a necessary – or nearly necessary – condition for growth. In the growth strategy debates of the 1980s and 1990s, advocates of 'outward orientation' and 'import substitution' quarrelled over policies for development; but both sides implicitly accepted the idea that industrialisation would be an essential step in the growth process. The arguments were, in effect, about which policy would promote industrialisation more effectively. The contemporary writings of Justin Lin (2012), (2013) and Ha-Joon Chang (2002), (2003) disagree on multiple points but share a view that industrialisation lies on the road to development. Most policy discussions of development assume, implicitly or explicitly, that the process is intimately linked with industrialisation.

However, more recent waves of transformation do not conform neatly to this process. In particular, today's developing countries seem to be experiencing a transformation process that involves a much briefer and more limited period of industrialisation than was common in historical times (Rodrik, 2016). Many poor countries seem to be transitioning directly from agriculture to non-tradable services with little or no industrialisation (Gollin, et al., 2016). More generally, the continuing decline of manufacturing in rich countries, measured in shares of gross domestic product (GDP) and employment, has led some observers to worry that the prospects for global growth are poor. A perception has arisen that manufacturing as a sector is declining globally, due to further mechanisation and the emergence of robots that displace labour. To the extent that our theories of growth and development rely on industrialisation, the disappearance of manufacturing would seem to remove a critical rung in the development ladder.

A world with few manufacturing jobs might be one in which poor countries will struggle to escape poverty. This viewpoint leads to serious concerns about the prospects for future development. If today's poor countries are unable to generate manufacturing jobs and to export low-wage manufactured goods (as advocated by Lin 2012, 2013), what will be the mechanisms that poor countries use to generate growth?



The situation raises a number of questions:

- What are the pathways of transformation for developing countries in a post-industrial world?
- Are there alternative pathways to prosperity, other than those based on the export of manufactured goods?
- Can countries achieve modern economic growth without industrialisation?
- Will service exports fill the role that exports of manufactured goods has played for the growth miracles of the past half century?
- Or will developing countries grow without trade? Can agricultural productivity growth serve as an alternative mechanism of transformation and growth?

In short, what replaces a development strategy based on growth through the export of manufactures? This paper argues that there is weak evidence for a causal link between industrialisation and development. The historical patterns of growth do not logically imply causality. Arguments for a causal relationship typically invoke ill-defined externalities associated with manufacturing and industry. Economic growth theory has imagined that manufacturing lends itself to 'learning by doing' or some kind of knowledge-related externalities, but empirical evidence for these externalities is weak.

I will argue in this paper that there is little reason to imagine that these externalities arise in manufacturing but not in services. In particular, I will argue that the past century has blurred previous distinctions between production activities in manufacturing and services. Increasingly, these two sectors involve similar modes of organisation. The historical pattern – in which services were artisanal activities producing bespoke and often intangible outputs, with little scope for economies of scale or learning – no longer characterises the service economies of rich countries. In modern economies, services are standardised and mass-produced. Consequently, the service sector now has taken on many of the beneficial characteristics historically associated with manufacturing. Not coincidentally, productivity improvements in services have been a key source of growth in rich countries for the past half-century or more. This has allowed productivity growth in today's rich countries to remain essentially constant, even as economies have moved from industry to services. Beyond that narrow point, I will argue that growth theory and empirics are relatively agnostic as to the sectoral pathways of development. The sources of long-run growth in productivity and income are probably not restricted to particular sectors of production or patterns of trade. Although manufacturing exports have been an important source of growth for the 'miracle' economies of the late 20th and early 21st centuries, there is little reason to believe that this is an exclusive pathway to growth and poverty reduction.

This paper proceeds by addressing a series of questions and deploying empirical evidence and arguments from growth theory. Section 1 seeks to establish a set of facts about the relationship between structural transformation and growth. What is the historical relationship between growth and sectoral patterns of employment and production? What is the evidence for a global decline in manufacturing employment in the most recent period? What is the evidence on productivity growth in manufacturing as opposed to services? Section 2 addresses more theoretical questions.

What do standard theories of growth say about the role of different sectors? What does modern growth theory say about the centrality of trade (and manufacturing exports, in particular) for growth? Drawing on the answers to these questions, Section 3 discusses policy issues and prescriptions for development. In this section, I will pose questions about potential alternative pathways to development. Perhaps the modern economy has changed in ways that reduce the centrality of manufacturing; perhaps there are pathways to growth and development that do not depend on the creation of millions of jobs in low-wage manufacturing. Although this section of the paper is necessarily speculative, it seeks to characterise some alternative visions for future transformation and development.

## Section 1: Empirical evidence

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The basic facts of growth and transformation have been well documented. Herrendorf et al. (2014) assemble and analyse a great deal of evidence from historical statistics on the sectoral composition of output and employment for a range of countries. Their work, along with related work from the Groningen Growth and Development Centre, provides clear evidence on sectoral patterns across countries and over time.

### **What is the historical relationship between growth and industrialisation?**

As noted above, the evidence is strong for a declining relationship between income per capita and agriculture's shares of employment and output. Similarly, the evidence is strong for a positive relationship between income and service sector activity. However, the evidence is substantially weaker on the relationship between manufacturing activity and levels of income or growth rates. The hump-shaped pattern of manufacturing shares of employment and output is more ambiguous and depends, to some degree, on the ways in which data from different countries are spliced together. This partly reflects the difficulty in finding data from individual countries that cover sufficiently long time spans (or sufficiently large spans, in terms of income per capita) to give rise to the hump-shaped pattern within any single country. We observe some poor and middle-income countries with rising manufacturing shares, and other middle-income and wealth countries with declining manufacturing shares, but very few countries for which the entire hump-shaped trajectory is visible.

The reasons for the hump-shape in manufacturing employment and production are not entirely clear. Herrendorf et al. (2014) note that manufacturing consumption data do not obviously display this pattern, and they also note that, in the cross-country data, manufacturing's share of consumption does not display any discernible relationship to income per capita. For Korea, a country observed over a substantial range of income, they note that the manufacturing share of consumption is more or less flat. The different patterns for production and consumption data point to the complexity of the structural transformation process. Shifts in the consumption shares of different sectors may reflect non-homotheticities in preferences, in combination with income growth, or they may reflect non-unitary elasticities of substitution, in combination with shifting prices – as in (Ngai & Pissarides, 2007). In a closed economy setting, changes in sectoral patterns of consumption will necessarily translate into corresponding shifts in production. But in an open economy setting, consumption and production are not necessarily linked, so sectoral shares of production and employment may arise from trade and comparative advantage.

Does the hump-shaped pattern of manufacturing in production and employment arise from preferences – which are often thought to be relatively permanent and universal – or does it reflect the historical patterns of comparative advantage and trade, which may be more susceptible to change? Our evidence is weak in explaining the hump-shaped patterns for manufacturing, either on the production side or the consumption side. The data are consistent with multiple models and interpretations.

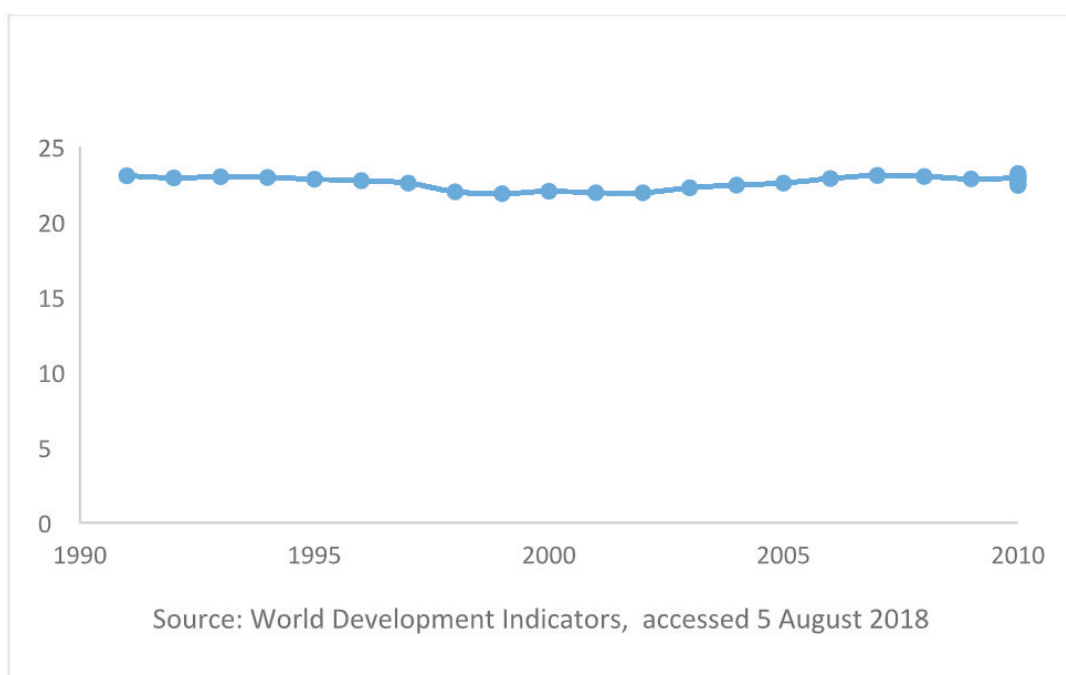
Nevertheless, there is considerable evidence that in most economic 'miracle' countries for which we have data, the manufacturing sector has been relatively large during some key periods in the growth trajectory. Manufacturing's share of hours worked reached as high as 0.4 in Korea, and historical employment shares in manufacturing show similar peaks for today's rich countries. However, the evidence also shows steadily falling shares of manufacturing employment in rich countries – even as these countries have continued to grow at a steady pace over the period 1970-2007 (Herrendorf, et al., 2014, p. 13).

This leaves open a set of questions about the causal relationship – if any – between manufacturing sector activity and growth. If manufacturing is key to growth, then why have today's rich countries continued to grow steadily over the past half-century, when they have seen declines in manufacturing? Why do we see relatively little connection between per capita income and manufacturing consumption shares? Does the structural transformation depend on particular alignments of comparative advantage and global trading regimes? In short, what inferences can we make about a causal relationship between manufacturing and growth?

### What is the evidence for a global decline in manufacturing employment?

The decline in manufacturing employment in OECD countries is clear from the data, and this pattern has encouraged observers (mostly based in rich countries) to predict the demise of manufacturing employment globally. The data, however, do not support the view that manufacturing employment has collapsed at the world level. According to International Labour Organization estimates used for the World Development Indicators, world manufacturing employment (as a share of total employment) has stayed approximately flat for the past 20 years, with very minor fluctuations. (See Figure 1.) Declines in manufacturing in rich countries have offset comparably sized increases in the manufacturing workforce in poor and middle-income countries. This is not to deny the potential for long-term trends in global manufacturing jobs, but simply to say that the best available data challenges the idea that such a decline has already taken place.

Figure 1: World manufacturing employment as share of total employment.





The data do suggest, however, that it is premature to declare the end of manufacturing or the global takeover of robots and mechanisation. The manufacturing sector continues to employ large numbers of humans, who work in various capacities – often complementary to machines. Relative to robots, humans are remarkably inexpensive, versatile, and flexible in a workplace. They can be easily instructed and directed, even by relatively unskilled managers; and they can be ‘installed’ quickly and easily through simple hiring processes and with very low upfront costs. For all these reasons, we should not expect the use of humans in manufacturing to disappear soon.

The relatively flat trend in manufacturing’s share of global employment is particularly interesting because, in rich countries, there is some evidence that the *measured* shares of manufacturing employment are biased downward by a long-term trend towards outsourcing of non-production activities by manufacturing firms. When a lawyer or a cleaner is employed directly by a manufacturing firm, he or she is typically counted as a manufacturing worker – that is, the sector in which individuals work is defined by the sector of the firms for which they work. In the past two or three decades, however, there has been a tendency for many large firms to seek efficiencies through outsourcing of many activities unrelated to their core business. In keeping with the example above, manufacturing firms might outsource their legal departments and their cleaning services. They might even outsource key components of their business, such as supply chain management or distribution. To the extent that this kind of outsourcing has taken place, it may make the decline in manufacturing employment seem artificially large in rich countries. A few studies (Duernecker & Herrendorf, 2018) have sought to examine this process by looking closely at occupational patterns, but the data offer limited insight. However, to the extent that the decline in rich-country manufacturing reflects an outsourcing process rather than a real change in economic activity, it is possible that the global data might actually reflect a rising share of manufacturing labour, rather than a flat trend.

Certainly, the evidence does not point strongly (yet) to a global decline in manufacturing employment. There may be reasons to contemplate a future in which the decline happens, but this future has not yet arrived.

### **What is the evidence on differential productivity growth across sectors? Is manufacturing ‘better’ from a growth perspective?**

In many policy discussions – and in some academic conversations – there is a widely held perception that productivity growth is higher in manufacturing than in other sectors. This perception is used to justify a policy focus on manufacturing – most notably in the area of industrial policy. What is the evidence that productivity growth is highest in manufacturing?

Detailed sector-level data are not widely available across countries. The US Bureau of Labor Statistics estimates from the KLEMS database of sector-level changes in multifactor productivity (MFP) – also called total factor productivity (TFP) – for the 30 years from 1987 to 2016. These data show that manufacturing MFP growth was slower over this period than the MFP growth in agriculture, mining, wholesale and retail trade, transportation, and a number of other sectors. (See Table 1, noting that the BLS category of “Services” is not for the entire sector but only for those not specifically listed.) Over this time period, there is no evidence to support the idea that manufacturing is a particularly

vital sector in terms of its ability to generate growth in the wider economy, nor is there evidence that service sectors are especially poor in terms of productivity growth potential. In short, these data do not necessarily support the view that the manufacturing sector is intrinsically a 'better' sector for productivity growth.

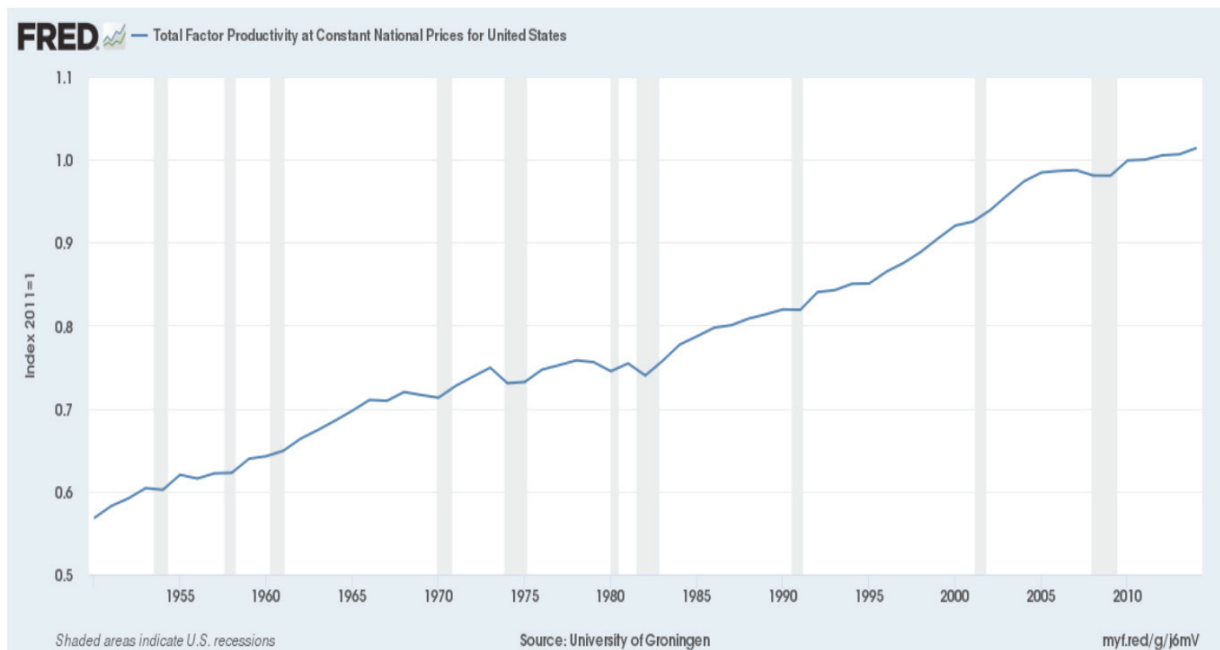
Table 1: Multifactor productivity growth rates by sector, 1987–2016

<b>Sector</b>	<b>Average annual productivity growth</b>
Agriculture, Forestry, and Fishery	1.53%
Mining	1.20%
Utilities	0.60%
Construction	-0.94%
Manufacturing Sector	1.09%
Trade	1.29%
Transportation and Warehousing	0.99%
Information	1.03%
Finance, Insurance, and Real Estate	0.18%
Services	0.02%

Source: US Bureau of Labor Statistics, KLEMS Manufacturing and Non-Manufacturing At-A-Glance Database. Accessed 5 August 2018 from: [www.bls.gov/mfp/special\\_requests/klemscombinedbymeasure.xlsx](http://www.bls.gov/mfp/special_requests/klemscombinedbymeasure.xlsx)

Although these detailed sectoral productivity growth figures are not available for a longer time span, suggestive evidence comes from the consistent pattern of productivity growth in the US. For the half-century with available high-quality data, TFP growth in the US has been relatively constant, in spite of considerable changes in the sectoral composition of output. Figure 2 shows TFP growth from 1950–2014, with the linearity of the index implying relatively constant growth in TFP over time. This linearity strongly suggests that there cannot have been large differences across sectors in TFP growth rates; otherwise, we would have seen changes in TFP growth to accompany the structural changes in the economy.

Figure 2: Total Factor Productivity Growth in the US, 1950-2014



Source: University of Groningen and University of California, Davis, Total Factor Productivity at Constant National Prices for United States [RTFPNAUSA632NRUG], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/RTFPNAUSA632NRUG>, August 4, 2018.

Although these data are for the US, sectoral data from the EU and other countries seem to point to similar conclusions. Quite consistently, the data show that TFP growth in manufacturing is not particularly high and does not appear, in an arithmetic sense, to drive overall economic growth.

In short, to justify a policy emphasis on promoting manufacturing, we must find other rationales.

## Section 2: theoretical insights

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These empirical observations should not come as a particular surprise, given the theoretical literature on economic growth. Most growth theories have relatively little to say about the advantages or disadvantages of different sectors for growth. In Solow's canonical model of exogenous growth (Solow, 1956), the economy is modelled as having a single sector. Long-run growth comes from technological progress that is not associated with any particular sector or activity. The same is true of the early endogenous growth models of Romer (1986), Romer (1990), Lucas (1988), Lucas (1993), Rebelo (1991), Aghion and Howitt (1992), and Aghion and Howitt (2009), among others. Both exogenous and endogenous growth theories are fairly agnostic about the sectoral sources of growth. Although the early endogenous growth frameworks identified human capital accumulation and learning-by-doing as potential sources of growth, these were not explicitly linked to particular sectors. Long-run growth models – for example, Hansen and Prescott (2002), Galor and Weil (2000), Laitner (2000) – typically have abstracted from sector-level issues and have modelled economies as producing a single good. In these models, the issue to be explained is how economies shift from a regime of low growth to a regime of high growth, and sectoral details are ignored.

### **What do standard theories of growth say about the role of different sectors?**

One of the earliest models of structural transformation was that of Lewis (1954), which envisioned growth as arising from the movement of the economy from a low-productivity sector to a high-productivity sector. For Lewis, this sectoral movement was itself the source of growth; he did not focus on within-sector growth, except through the mechanism of capital accumulation. But Lewis was also somewhat vague about specific sectors: in his view, the key difference was between a subsistence sector and a capitalist sector, with the fundamental distinction being precisely the extent to which economic activity was "fructified with capital". For Lewis, this definition was essentially orthogonal to the standard definitions of sectors. The capitalist sector could include agriculture and service activities as well as industry; and he would have had no difficulty in identifying some kinds of rudimentary manufacturing as belonging to the subsistence sector.

One of the earliest multi-sector studies to identify manufacturing as a key sector for growth was Matsuyama (1992), who used a two-sector model with a learning-by-doing externality in the manufacturing sector to examine the importance of comparative advantage for growth in an open economy. In this paper, Matsuyama assumed, without empirical basis, that manufacturing generates learning-by-doing effects. This assumption has frequently been made in subsequent multi-sector papers, but with little effort to match data or facts. A few calibrated models, such as Ngai and Pissarides (2007) or Alvarez-Cuadrado and Poschke (2011), tend to fit the data when productivity growth is assumed to be slower in agriculture than in other sectors. However, this is a fairly loose empirical basis for making inferences about the importance of manufacturing. Herrendorf and Valentinyi (2012) find that TFP differences between rich and poor countries are biggest in equipment, construction and food, rather than in manufacturing – implying that manufacturing is not the sector where poor countries most need to catch up to rich countries.

It is worth noting that separate literature in agricultural economics has argued for 50 years that productivity growth in agriculture – rather than manufacturing – is the key to growth and structural transformation. This literature, dating back to Johnston and Mellor (1961) and revived in works by Mellor (1995), Mellor (2017), Timmer (1988), Timmer (2002), and others, holds that poor economies are constrained by low productivity in agriculture from moving into other sectors. Formalisations of these models (Gollin, et al., 2007) show that, in closed economies, this mechanism can be a powerful one for growth – although long-run growth depends more heavily on productivity growth in non-agriculture. Dercon and Gollin (2014) point out that this model is not appropriate for more open economies that can easily meet their food needs from imports. But, for some countries (and some regions within countries), an agriculture-centred growth process will surely be important.

To sum up, the growth literature offers little evidence for manufacturing as a key sector for productivity growth or economic growth. Although the centrality of industry is often taken as given, the evidence is relatively sparse. Perhaps the strongest argument is an indirect one: Rodrik (2013) finds that unconditional convergence holds in manufacturing though not in other sectors; however, he notes that data limitations restrict this finding to the formal manufacturing sector.

### **What does modern growth theory say about the centrality of trade (and manufacturing exports, in particular) for growth?**

The growth literature is also surprisingly silent on the role of international trade in economic growth. This is in stark contrast to the old empirical literature on development strategy, which contrasted 'outward orientation' with 'import substitutions'. This empirical literature did not have very strong theoretical foundations and struggled to deal with problems of causal identification and small samples. This debate has persisted in contemporary arguments over the efficacy and desirability of industrial policy and the role of the state in developing economies – for example, Chang (2003), Chang (2002), Lin (2012), Lin (2013), Wade (2004), Rodrik (2004), Rodrik (2009), and others. This literature depends heavily on case studies and contested readings of individual country histories. The debates here tended not to question the importance of manufacturing for growth; the question has been whether industrialisation will occur faster and better (and whether it will ultimately lead to better outcomes) when it is driven primarily by market forces than when it is led by the state. Much of the literature has focused on interpreting the success of the East Asian 'miracle' economies. Some authors have viewed the East Asian growth experience as evidence of the superiority of export-led manufacturing and relatively laissez-faire economic policy. Others have viewed East Asia's success as exemplifying the virtues of intelligent state planning.

However, as noted above, the classic exogenous and endogenous growth models are one-sector closed economy models that abstract from international trade. Relatively few papers have sought to link manufacturing exports specifically to growth. Along with the Matsuyama (1992) paper mentioned above, Grossman and Helpman (1991) introduce the notion of firm-level innovation and Schumpeterian growth, which they see as more likely in the manufacturing sector than in other sectors. Modern trade models with differentiated products – in the spirit of Romer (1994), Eaton and Kortum (2002), Bernard et al. (2003), or Melitz (2003) – tend to treat the economy as a single sector



with differentiated products, or as an economy with one sector producing differentiated products and another producing an unspecified homogeneous good. Recent literature, however, casts doubt on the centrality of trade to growth or welfare (Arkolakis, et al., 2008). In fact, under reasonable assumptions and specifications, the welfare effects of trade are likely to be small for most economies (Arkolakis, et al., 2012).

Beyond this literature, there is a reasonably compelling set of research that is suggestive of a learning impact of trade that relates to growth. Key papers in this literature include Hausmann and Klinger (2006), Hausmann et al. (2007), and Hidalgo et al. (2009). These papers have linked the complexity of a country's exports to its income level. Poor countries tend to export relatively narrow ranges of goods – often primary products or simple manufactures – where richer countries produce and export more specialised or a broader range of products. What is unclear from this literature is whether the relationship is causal – and if so, in which direction the causality runs. It is also unclear whether this relationship implies a necessary sequence of production. Does it matter for its ultimate trajectory whether a poor country produces manufactured goods at an early stage, or is it possible for the country to become rich and then to move into the production of more complex and specialised goods?

The point remains that the growth literature does not insist on the importance of either trade or manufacturing, much less on the confluence of the two. Growth economists are, in principle, open to the possibility that growth can emerge from any sector. Manufacturing is not seen as intrinsically better or essential. Nor does contemporary trade economics find clear pathways from international trade to growth. On the contrary, modern trade literature has begun to emphasise the importance of domestic market integration, as opposed to international trade. Recent research finds that domestic market integration appears to have important impacts on welfare<sup>1</sup>. But this arguably shifts priorities away from international trade and the export of manufactured goods, towards a more general set of issues relating to market integration.

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<sup>1</sup> Some recent papers on this topic include Donaldson (2018), Donaldson and Hornbeck (2016), Atkin and Donaldson (2017).

## Section 3: Policy issues and concerns

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If manufacturing is not essential for growth, what is the potential for other sectors to deliver growth? It is sometimes argued that we have no examples of rapid growth experiences that are not based initially on the export of manufactured goods produced by low-skill workers. If this is true, we should at least ask what aspects of manufacturing production or exports are important for growth.

### Can service-based economies generate growth?

One view is that manufacturing production processes are not themselves superior, but that there are essential characteristics of manufacturing production that create the conditions for growth and have led to the relatively rapid and constant rates of productivity growth in 'miracle' economies. Export manufacturing jobs may not themselves require greater skills or generate learning externalities, but perhaps the need to produce standardised goods at high levels of quality leads economies to expand their capabilities and generates growth.

If so, it is important to ask whether these features are limited to the manufacturing sector. The production of services in the modern economy looks increasingly similar to manufacturing – not only in sophisticated services (finance, real estate, insurance, or call centres) but also in food service and other low-end activities. Like manufacturing, service production is concentrated in cities, contributing to agglomeration externalities. Modern services draw heavily on technology and knowledge spillovers; some service sectors are dense in foreign direct investment, with the corresponding potential for technology transfer and capital investment. Although some elements of the service sector remain essentially artisanal and informal, growing components of this sector are large, formal, and organised. Modern fast-food restaurants are not much different from factories; modern transportation and retailing are increasingly organised and formalised.

Perhaps this is the reason there does not seem to be much loss in per capita income associated with pathways of urbanisation without industrialisation. Gollin et al. (2016) show that today's resource-dependent developing economies seem to experience similar patterns of urbanisation and income growth as those economies that have undergone urbanisation along with industrialisation. There does not seem to be an obvious cost (in terms of GDP levels and growth rates) for countries that are urbanising through resource exports and non-tradable services, as opposed to transformation based on manufacturing exports. There is some evidence that cities in resource-based economies are less attractive places to live, but the effects are not necessarily strong.

There is no particular reason to doubt that service-based economies can experience growth through some combination of technological progress (Solow growth), specialisation and market expansion (Smithian growth), and competition-driven creative destruction (Schumpeterian growth). None of these processes is obviously limited to manufacturing, nor is trade necessary for an economy to participate in these processes.

Today's advanced economies have continued to grow, even as they have transformed into service economies; there is no reason to doubt that poor countries can also grow while being heavily dependent on services.

Having said this, we should not overstate the likely dependence on services. Although it is difficult to anticipate the future, there are reasons to believe that manufacturing employment will remain substantial, particularly in poor countries. Most manufacturing will surely continue to take place in factories in low-wage countries – not in homes in rich countries, despite the diffusion of 3-D printing. Nor is automation likely fully to displace human labour.

### **Is a world with low manufacturing employment bad for development?**

If manufacturing sector employment shrinks over the coming decades, is this necessarily a dangerous prospect for today's developing countries? Will a low manufacturing trajectory necessarily limit the growth potential of poor countries? I argue that, on the contrary, a world of low manufacturing employment is likely to be a world with high manufacturing productivity and therefore low prices for manufactured goods. This suggests that poor countries will be able to import manufactures in return for some mix of exports – services, agricultural goods, and natural resources. Many rich countries already operate economies with very small fractions of manufacturing employment and low shares of manufacturing in GDP. The availability of inexpensive manufactured imports generates consumer benefits in rich countries. There is no reason to think that those benefits will not also be large in today's poor countries as they grow.

### **Can there be good jobs without manufacturing?**

There is a common tendency across all countries to view manufacturing jobs as 'good jobs' and to worry that jobs in other sectors are inherently worse. It is unclear precisely why manufacturing jobs are thought to be 'good'. In a functioning and competitive labour market, manufacturing jobs should pay the same (adjusted for human capital) as jobs in any other sector. One possibility is that manufacturing jobs are socially desirable because they reward skill more than jobs in other sectors, thus creating incentives for skills accumulation in the economy. Another possibility is that manufacturing jobs allow for more effective labour organisation and collective bargaining, so that workers can claim a greater share of value added, relative to other sectors. Manufacturing jobs may also be more likely to fall into the formal sector, because production facilities are highly visible. Since these jobs fall under the gaze of the state, manufacturing jobs are perhaps more likely to benefit from the protections of labour laws, in terms of working conditions, job security, minimum wages, and other regulations.

Most of these characteristics of manufacturing jobs could be extended, however, to other sectors. Jobs in formal services can carry the same kinds of protections as jobs in manufacturing, and they can reward skills just as effectively. It is important not to conflate the characteristics of 'good jobs' with characteristics of the sector. Manufacturing jobs in unregulated sweatshops or foundries can be as dangerous and unpleasant as jobs in agriculture or informal services. Without sufficient protections (and the corresponding enforcement of regulations), manufacturing jobs may expose workers to a range of harms they are imperfectly protected against: workplace safety and health concerns, occupational stress, sexual harassment, and abuse. These hazards are present in other sectors as well; but there is nothing intrinsic in manufacturing that makes jobs in this sector better.

If manufacturing jobs are 'good' primarily because of their historical connection with labour organisation, then the implication is not necessarily that we need more manufacturing jobs – but instead, that labour organising and/or state protection need to be extended to other sectors. Perhaps developing economies do not need more factories, so much as they need better government policies and increased social mobilisation. Provision of amenities and public goods can increase living standards directly; this may be more effective than reliance on the indirect approach of trying to raise living standards by increasing manufacturing employment.

We should be careful, then, not to assume that manufacturing jobs and industrial employment are essential to development. One striking feature in many of today's developing countries is that urbanisation has progressed rapidly, even without industrialisation (Gollin, et al., 2016). This suggests that individuals continue to find it attractive to move from rural areas and from agriculture into cities where they work primarily in the (informal) service sector. But by many measures, urban life offers higher standards of consumption, better living conditions, and greater life satisfaction than the alternative – which, for many people, is a rural livelihood based on subsistence agriculture. Contrary to widely held policy narratives, urban living standards tend to be systematically higher than rural living standards (Gollin, et al., 2017).

### **What will developing countries export without manufacturing?**

A common concern is that a transformation process that bypasses manufacturing could leave developing countries unable to export anything of value to the rest of the world. This is of course a fallacy that confuses comparative advantage with absolute advantage. As Ricardo showed 200 years ago, countries may have an absolute disadvantage relative to the rest of the world in the production of all goods, but they will still necessarily have a comparative advantage in some goods. If poor countries prove uncompetitive in manufacturing (which is by no means a given), they will produce and export other goods – whether agricultural goods, or other primary products, or services.

The potential for exports of services is not limited to high-end services (such as finance and insurance), nor is it restricted to services that reward only highly educated workers (such as call centres). In fact, a considerable range of services can be exported directly or indirectly. Some (such as cleaning services, food preparation, or construction) are primarily exported indirectly through emigration; individuals move from poor countries to rich countries and perform services, with remittance income flowing back to the country of origin. This should be seen as effectively an export of services from developing countries to developed countries. Other services (such as tourism, including hotel and restaurant work) are 'exported' from developing countries, even though the services are actually provided within the national boundaries. In other cases, the blurring of manufactured goods with services creates opportunities for developing countries. For instance, food preparation and processing (a service activity) in rich countries can be partly or entirely replaced with packaged food exports (a manufacturing activity) from developing countries<sup>2</sup>.

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<sup>2</sup> An example of this might be the export from Kenya of chopped vegetables, in packages, to UK restaurants and hotel chains; or the export to the US, from Vietnam and China, of filleted fish and other processed seafood. The same work that would be treated as a service if carried out in a fishmonger's shop, supermarket, or restaurant, becomes a manufactured export.

Given this, we should not underestimate the potential for developing countries to expand their production and export of services or service-substituting manufactures. Nor should we undervalue the continuing importance of primary product production and exports. When well-managed, the returns from primary exports can contribute effectively to development.

Finally, it is worth noting that a world in which manufacturing becomes highly mechanised and highly productive – with robots and 3-D printing undermining the process of industrialisation in developing countries – is also a world where manufactured goods are inexpensive. As the prices of manufactured goods fall, terms of trade should shift in favour of countries that export services and primary products. It is not clear why this should prove disadvantageous to developing countries. A world of cheap manufactured goods is not obviously bad for developing countries.



## Conclusion

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This paper has argued that structural transformation and growth are possible in today's poor countries even without industrialisation. There is little in growth theory or trade theory to suggest that industrialisation is necessary for development. Although the historical pattern of growth for today's rich countries (and for the recent 'miracles') has involved an extended period of manufacturing, often for export, there is no obvious reason why growth and development could not occur without industrialisation. Economic growth has continued at a steady pace in today's rich countries, even as they have transitioned into service-dominated economies; developing countries should similarly be able to achieve growth without industrialisation.

Policymakers worry about the jobs of the future, in both developed and developing countries. But history suggests that we do poorly at predicting future patterns of employment, even in advanced economies. Today's advanced economies employ large numbers of people in job categories that were not imagined (or were of minor importance) 20 years ago: social media managers, app developers, and coffee shop baristas, to name a few. What will the jobs of the future look like in today's developing world? Many fewer people (at least proportionally) will be subsistence farmers living in rural areas. But beyond that, we should hesitate in making predictions.

In fact, policymakers – in developing country governments and the development industry – should worry less about precisely which jobs people will do, or which goods countries will produce and export. The bigger – but arguably more tractable – challenge is to ensure that countries make necessary investments in physical infrastructure, education, health, and public amenities. Governments can also work to support well-functioning institutions and regulatory frameworks, and they can seek to reduce frictions in labour markets. Under those conditions, markets can plausibly do an effective job of allocating labour across tasks and sectors.

To conclude, it is by no means certain that manufacturing jobs are disappearing globally, or that the process of industrialisation will bypass today's poor countries. But to the extent that structural transformation in the future may be less dependent on manufacturing, this does not necessarily pose a threat to today's developing countries. There are other pathways to growth and development. Pessimism in this regard arises more from a lack of imagination than from a lack of opportunity.

## 6. References

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