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**Deindustrialization, Tertiarization and Development in a ‘GVC-World’:
What do new trajectories of structural transformation
mean for developing countries?**

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ABSTRACT

The traditional pathway to economic development and structural transformation—industrialization—is becoming harder to start on and harder to sustain for developing countries as more countries compete over a place in fragmented global value chains (GVCs) or ‘GVC-world’. In fact, many middle-income developing countries are shifting to a new pathway, namely that of deindustrialization or tertiarization. The shift from traditional to new trajectories of structural transformation has implications for future economic growth, employment creation, inequality and poverty reduction in developing countries. And yet the subject is, to date, researched in the developing world only in a small number of non-comparable country case studies and a set of cross-country studies. In light of the above, this paper does the following: (i) discusses theories of economic development with reference to sectors and structural transformation; (ii) gives a brief history of structural transformation in the developing world by region; (iii) outlines empirically the new trajectory of deindustrialization and tertiarization in developing countries; (iv) discusses the literature on deindustrialization and tertiarization, and (v) outlines a new research agenda on the topic based on a set of core questions.

KEYWORDS

Structural Transformation; Economic Development; GVCs; Deindustrialisation;

About the GPID research network:

The ESRC Global Poverty and Inequality Dynamics (GPID) research network is an international network of academics, civil society organisations, and policymakers. It was launched in 2017 and is funded by the ESRC's Global Challenges Research Fund.

The objective of the ESRC GPID Research Network is to build a new research programme that focuses on the relationship between structural change and inclusive growth.

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THE DEVELOPER'S DILEMMA

The ESRC Global Poverty and Inequality Dynamics (GPID) research network is concerned with what we have called 'the developer's dilemma'.

This dilemma is a trade-off between two objectives that developing countries are pursuing. Specifically:

1. Economic development via structural transformation and productivity growth based on the intra- and inter-sectoral reallocation of economic activity.
2. Inclusive growth which is typically defined as broad-based economic growth benefiting the poorer in society in particular.

Structural transformation, the former has been thought to push up inequality. Whereas the latter, inclusive growth implies a need for steady or even falling inequality to spread the benefits of growth widely. The 'developer's dilemma' is thus a distribution tension at the heart of economic development.

1. Introduction

The traditional pathway to economic development and structural transformation—industrialization—is becoming harder to start on and harder to sustain for developing countries as more countries compete over a place in fragmented global value chains (GVCs) or 'GVC-world', meaning a world where industrial production is dominated by fragmented chains of production often across numerous countries (Felipe et al., 2014; Fischer, 2015; Mayer and Phillips, 2017; Phillips, 2017). This is not to say that developing countries cannot achieve structural transformation. Rather, it is likely to be harder than has historically been the case to achieve the 'traditional' pathway of structural transformation (industrialization) and newer pathways (tertiarization) may occur at lower levels of per capita income than earlier developers experienced, with implications for employment growth, real wage growth and value added.¹

In fact, many middle-income developing countries are shifting to such a 'new' pathway, namely that of deindustrialization or tertiarization though these umbrella terms include a variety of processes. In the first instance, these terms refer to the shrinking of manufacturing shares of employment and gross domestic product (GDP), typically accompanied by the expansion of services sector shares. The changes in supply chains and the shift to lower productivity economies have spread manufacturing jobs more thinly, making it harder for individual countries to sustain high levels of manufacturing employment, and this is happening at lower levels of GDP per capita than previously,

¹ Kaplinsky (2014, p. 112) refers to another kind of 'immiserizing growth' (in contrast to that of Bhagwati 1958; 1987) whereby developing countries could find an increase in economic activity – more output or more employment – could be associated with stagnant or falling real wages due to easy entry competition from developing countries in markets for ever lower value-added goods and accompanied by the falling prices of some developing countries manufacture exports. See also Kaplinsky and Readman (2005) for discussion. Developing countries may also be excluded from markets due to other developing countries success or dominance on specific markets. See Jenkins (2015a) for discussion of the 'China effect'.

leading to the label 'premature' deindustrialization (see Amirapu and Subramanian 2015; Dasgupta and Singh 2006; Felipe et al. 2014; Felipe and Mehta 2016; Palma 2005, 2008; Rodrik 2016; Tregenna 2009, 2014). The shift points to some big questions ahead related to how to make industrialization more viable or whether service sector-led growth can generate sufficient and well-paid employment and value added in developing countries. Technological change will likely accelerate such trends because middle-income developing countries are likely to be affected by automation trends in high-income countries, and are themselves trying to catch up with rapid automation. The kinds of jobs common in developing countries—such as routine agricultural or manufacturing work, are substantially more susceptible to automation than service jobs, which might require creative work or face-to-face interaction and which dominate many high-income economies. If more agricultural and manufacturing jobs are automated, workers will continue to move into the service sector, leading to a bloating of service-sector employment and wage stagnation (see discussion in Schlogl and Sumner, 2018).

In light of the points above, this paper sets out a new research agenda on deindustrialization and tertiarization in the developing world. Henceforth, this paper will generally use the term 'deindustrialization' as it is the well-known term for the process described above. However, in some instances, 'tertiarization' is a more appropriate term because the deindustrialization of employment may not be accompanied by the deindustrialization of value-added meaning a singular rather than an unambiguous or 'dual' deindustrialization of both employment and value-added. A deindustrialization of employment not accompanied by a deindustrialization of value-added could even be labelled as industrialization. Indeed, the relationship between labour productivity and deindustrialization is particularly important given that ever-increasing labour productivity in manufacturing could fuel the deindustrialization of employment. Furthermore, in some

cases deindustrialization is a transient process, shock-induced and potentially reversible. In other instances deindustrialization is long-run or chronic though premature (meaning at a lower level of income per capita and lower peak manufacturing shares than has historically been the case for other countries) and yet other cases deindustrialization is long-run or chronic and a sign of 'maturity' as in OECD countries.

The structure of the paper is as follows: Section 2 discusses theories of economic development with reference to structural transformation. Section 3 gives a brief history of structural transformation in the developing world by region. Section 4 considers empirically deindustrialization and tertiarization in developing countries. Section 5 discusses the literature on deindustrialization and tertiarization. Section 6 proposes a new research agenda on the topic based on a set of core questions. Section 7 concludes.

2. STRUCTURAL TRANSFORMATION AND THEORIES OF ECONOMIC DEVELOPMENT

2a. Do sectoral composition and structural change matter?

Different schools of thought attach importance or indifference to the sectoral composition of the economy. Palma (2005) identifies three broad schools of thought on economic development. There are two schools—the neoclassical and the neo-Schumpeterian—which are, in general, based on the assumption that an equilibrating process due to marginal returns leads to an optimal allocation of factors of production, at least in the medium to long term. These schools attach little importance to sectors, although the latter school is concerned with 'activities'. In contrast, a third school—a Lewisian or Kaldorian or even simply, the 'classical school', given its historic roots—is predicated on sectors and 'activity' specificity. This school argues that manufacturing is special because it has

increasing returns to scale (in direct contrast to the neoclassical theory of constant or decreasing returns to scale) and provides a host of spillovers. There is also a core premise that equilibrium may not prevail, and a structural imbalance in the sectoral distribution of factors of production, which is not optimal for economic development and growth, may persist, even in the long run.

The first school—neoclassical theory—is indifferent to sectors and specificity of economic activity. This school is represented by Solow convergence models (traditional and augmented), endogenous models based on increasing returns, and models based on market imperfections in technological change. Although the importance of the shift to higher productivity is not disputed in neoclassical economics, a one-sector model of economic growth has become standard in macroeconomics (Herrendorf et al. 2015). In this one-sector model of economic growth, there is no account of the process of intersectoral reallocation of economic activity or structural transformation as there is only one sector. This is because in the neoclassical growth model (of Solow 1956), growth is driven by incentives to save and accumulate physical and human capital. The neoclassical position is that poorer countries will grow faster than rich countries, and countries with the same technology will converge at a similar income level (see discussion in Sutirtha et al. 2016).

A second school—neo-Schumpeterian—like the neoclassical school, is also indifferent to sectors. However, the neo-Schumpeterian school is concerned with the specificity of economic 'activities'. This school is associated with Roemer and the neo-Schumpeterians who argue that research and development (R&D) matter, but that there is nothing special about manufacturing in terms of increasing returns to scale or positive spillovers, for example.

The third school is associated with Kaldor (1957, 1967, 1978) and many others

such as Lewis (see, for example, 1954, 1958, 1969, 1972, 1976, 1979), Chenery (1960, 1975, 1979), Furtado (1964, 1971), Hirschman (1958), Myrdal (1957a, 1957b, 1968), and Thirwall (1982, 2011). What binds this group together is that growth dynamics are dependent on the sectors and the activities being developed. Thus, issues such as technology, externalities, balance of payment sustainability, and convergence with advanced countries are a function of the size, strength, and depth of manufacturing.² Many such as Rodrik (2016) argue that most services are (i) non-tradable, and (ii) not technologically dynamic, and that (iii) some sectors that are tradable and dynamic do not have the capacity to absorb labour. That said, similar shortcomings may be observed about the manufacturing sector. A significant share of manufacturing is (i) non-traded (even though it is tradable), and (ii) in developing countries is not technologically advanced (at least in relative terms to other modern sectors), and (iii) even if technologically dynamic does not create much employment, as some service sectors do.

2b. Varieties of structural transformation: Good and bad

Multiple pathways of structural transformation (ST) are possible and not all are progressive (meaning rising productivity). If one focuses on four economic sectors alone, there are six potential modes of inter-sectoral ST: agriculture to non-manufacturing industry, agriculture to manufacturing, agriculture to services, non-manufacturing industry to manufacturing, non-manufacturing industry to services, and manufacturing to services. These can all be reversed and to this one could add four modes of intra-sectoral ST.

² One hybrid is Diao et al. (2017, 3–4) who seek to link the structural dualism of Lewis with the neoclassical model by arguing that the neoclassical model shows the growth process within the modern sector and the dual model shows the relationship between sectors. See also Diao and McMillan (2015) for a Lewis model framework that incorporates a modern sector that is split between a closed modern sector serving domestic markets or an 'in-between' sector in Lewis (1979), and an open modern sector based on serving the international market (i.e. exporting).

Empirically, McMillan and Rodrik (2011, 1), in taking sectoral and aggregate labour productivity data empirically, show that the transfer of labour and other inputs to higher productive activity is a driver of economic development, as Lewis hypothesized. However, they go on to emphasise good and bad structural transformation in that ST can growth-enhancing or growth-reducing, depending on the reallocation of labour. This is an important point and relates to the multiple modes of structural transformation and direction between sectors, which may be regressive as well as progressive in the sense of productivity gains or losses. They show how structural change has been growth-enhancing in Asia because labour has transferred from low to higher productivity sectors. However, the converse is the case for sub-Saharan Africa and Latin America because labour has been transferred from higher to lower productivity sectors and this has reduced growth rates.³

In a somewhat similar vein, Diao et al. (2017) argue that the most recent growth accelerations in the developing world, unlike East Asia's historical experience, have not been driven by industrialization but by within-sector productivity growth (in Latin America) and growth-increasing structural transformation, but this has been accompanied by negative labour productivity growth within non-agricultural sectors (in Ethiopia, Malawi, Senegal, and Tanzania). Others, such as Herrendorf et al. (2013) concur empirically with the argument that the sectoral composition of economic activity is key to understanding not only economic development but also regional income convergence, productivity trends, business cycles, and inequality in wages.⁴

³ McMillan and Rodrik (2011) find that countries with a large share of exports in natural resources tend to experience growth-reducing structural transformation and, even if they have higher productivity, cannot absorb surplus labour from agriculture. In a similar vein, Gollin et al. (2016), too, argued that natural resource exports drive urbanization without structural transformation because natural resources generate considerable surplus which is spent on urban goods and services, and urban employment tends to be in non-traded services. McMillan and Rodrik (2011) also find that an undervalued (competitive) exchange rate, which operates effectively as a subsidy on industry and labour market characteristics (so labour can move across sectors and firms easily), leads to growth-enhancing structural transformation.

⁴ There are a set of methodological questions too. Syrquin (2007) briefly identifies such questions and they include defining what is meant by 'sectors' and thus what structural transformation means (inter- or intra-depends on the breadth of definitions of sectors), and the blurring between 'services' and 'manufacturing'

2c. Nicholas Kaldor revisited

The special characteristics of manufacturing argument is predicated on the work of Nicholas Kaldor. Kaldor's (1966, 1967) set of empirical regularities which came to be known as 'Kaldor's growth laws' are framed around structural transformation (see for discussion, in particular, Storm 2015; Targetti 2005).⁵ Kaldor (1967) sought to explain the economic development of Western Europe through the development of manufacturing, which he argued was the engine of growth for every country at every stage of economic development. He posited that:

- a) economic development requires industrialization because increasing returns in the manufacturing sector mean faster growth of manufacturing output which is associated with faster GDP growth. This is because backward and forward input–output linkages are strongest in manufacturing and the scope for capital accumulation, technological progress, economies of scale, and knowledge spillover are strong. Further, there is a strong causal relationship between manufacturing output growth and labour productivity because of a deepening division of labour,

due to technological advances and outsourcing (see later discussion).

⁵ Targetti (1988) highlights Kaldor's contribution in cumulative or circular causation rather than timeless 'equilibrium', building on both Schumpeter's (1942) concept and Myrdal (1957, 12–13) who put it thus: 'The notion of stable equilibrium is normally a false analogy to choose when constructing a theory to explain the changes in a social system. What is wrong with the stable equilibrium assumption as applied to social reality is the very idea that a social process follows a direction—though it might move towards it in a circuitous way—towards a position which in some sense or other can be described as a state of equilibrium between forces. Behind this idea is another and still more basic assumption, namely that a change will regularly call forth a reaction in the system in the form of changes which, on the whole, go in the opposite direction to the first change. The idea I want to expound . . . is that, on the contrary, in the normal case there is no such tendency towards automatic self-stabilization in the social system. The system is by itself not moving towards any sort of balance between forces, but is constantly on the move away from such a situation. In the normal case a change does not call forth countervailing changes but, instead, supporting changes, which move the system in the same direction as the first change but much further. Circular causation tends to become cumulative and thus often gathers speed.'

specialization, and learning-by-doing, and the scope for productivity gains is large due to economies of scale;

- b) industrialization requires a basis in agricultural modernization to ensure that food supply and labour will transfer from other sectors to manufacturing. As manufacturing grows, productivity across the economy will rise even in agriculture and services, through positive spillovers such as technological knowhow and complementary markets in services. Kaldor argued that the agriculture and industrial sectors are not only connected by the Lewis labour transition (the elastic supply of labour is due to industry wages exceeding agriculture wages) but also because agriculture creates autonomous demand for the manufacturing sector and thus land reform is required if agriculture is not to hinder structural transformation;
- c) aggregate demand should be managed to ensure growth (e.g. policies on public investment, taxation, directed credit);
- d) as exports become increasingly important as a source of demand for the manufacturing sector as the economy grows, global competition requires temporary domestic industry protection accompanied by export-led growth policies.⁶

In sum, for Kaldor, the virtuous cycle or Myrdal's cycle of cumulative causation is that demand and output growth fuel productivity growth due to increasing returns to scale, which in turn fuels capital accumulation.

⁶ Kaldor also took a two-sector model to be applicable to trade between developing and developed countries through the export of agriculture products from the former, and import of manufactured goods from the latter. He argued that international trade could make developing countries poorer because liberalization would increase agriculture exports which are produced at decreasing returns, and that are not sufficient to compensate for the loss of manufacturing exports, which is a sector which produces increasing returns.

3. A BRIEF EMPIRICAL HISTORY OF STRUCTURAL TRANSFORMATION

In order to assess the empirical experience of economic development and structural transformation in the developing world since the 1960s/1970s, we first need to define in more detail a conceptualization of structural transformation that captures sectoral shifts and other aspects of structural transformation. We can say structural transformation has three discernible dimensions (drawing on Sumner 2018) framed around a shift towards higher productivity activities. These are sectoral, factoral, and integrative. The first dimension—the sectoral aspects of structural transformation—is about the inter- and intra-reallocation of sectoral activity towards higher productivity. The second dimension is the factoral aspects of structural transformation and is about the composition or drivers of economic growth in terms of a shift of factors of production towards higher productivity activities. Third are the integrative aspects of structural transformation. This is the extent of integration in terms of the global economy, and a shift from forms of incorporation—trade deficits and capital inflows that come with liabilities (for example, profit repatriation or debt repayment)—towards trade surpluses.

The Groningen Growth and Development Centre (GGDC) 10-Sector Database (version 2014) developed by Timmer et al. (2015) provides a long-run, comparable data set on value added, employment, and exports for ten economic sectors. The GGDC 10-Sector Database can thus be used to consider structural transformation over time in developing countries.⁷ The GGDC 10-Sector Database allows for analysis of changes in a set of 25 developing countries (four low-income developing countries, 21 middle-income

⁷ We construct regional aggregates as follows: East Asia includes China, Indonesia, Malaysia, the Philippines, Thailand; South Asia includes India; Latin America includes Argentina, Bolivia, Brazil, Colombia, Costa Rica, Mexico, Peru, Venezuela; sub-Saharan Africa includes Botswana, Ethiopia, Ghana, Kenya, Malawi, Nigeria, Senegal, South Africa, Tanzania.

countries) and potentially a further six countries which have become high-income countries since the 1970s. In contrast, the World Bank's World Development Indicators (WDI) data set provides data on 140 developing countries (with gaps), but only three sectors (and manufacturing employment is not disaggregated from industry).

One general limitation of the available data is as Fischer (2011, 2014) discusses, whether productivity can be accurately measured in a complex economy, given that measuring productivity relies on value-added account data, but that such data is a combination of output and prices/wages. Therefore, most measurements for productivity show price or wage differentials, not actual effort, output, or skill. This is an even bigger problem in the service sector as the comparability of services is more problematic because they are not physical goods that can be compared. Fischer (2014) also notes another problem that, because transnational companies (TNCs)—who dominate production and its coordination in global value chains—conduct practices such as transfer pricing and the transferring of profits from Southern subsidiaries to Northern HQs (for example, low-interest loans from subsidiary to parent company), such actions could make the subsidiary look less productive. These are clearly important issues that, although not easily resolved, should not be forgotten. They would point towards caution in the use of value-added data in the discussion deindustrialization in developing countries.

The specific limitations of the GGDC 10-Sector Database are discussed by Diao et al. (2017, 4–6) who note the following: (i) the data broadly include all employment regardless of formality or informality, but the extent to which the value-added data do so depends on the quality of national sources (see Timmer et al. 2015); (ii) the quality of data from poor countries and Africa in particular is questioned, though it is noted that Gollin et al. (2014) have shown high correlations between national accounts data and sectoral measures of consumption which is reassuring, and the African countries in the GGDC

data set are those with the strongest national statistical offices; (iii) the measurement of labour inputs is not by hours but number of employees in a sector. Thus, seasonality might lead to an underestimation of labour productivity in agriculture for example, though it is noted that Duarte and Restuccia (2010) find a correlation between hours worked and employment shares in a set of 29 developed and developing countries; and (iv) if labour shares differ greatly across economic activities, then comparing average labour productivity can be misleading.

We use the data here to give a broad brush of structural transformation in the developing world at a regional level. Figures 1 to 6 illustrate structural transformation in the developing world covering in turn, sectoral structural transformation, factorial structural transformation, and integrative structural transformation. Figure 7-10 focus on the relationship between productivity, value-added and employment.

First, sectoral structural transformation: we are interested in the extent and trajectory of structural transformation—in terms of sectoral allocations of GDP, and employment and exports. How one reacts to such graphs depends, in part, on assumptions made about privileging manufacturing in terms of productivity and employment generation potential vis-à-vis services. Figure 1 shows the sectoral structure of GDP and employment relative to GDP per capita (and one can also assess the relative labour or capital intensity of regional production by the position of the value-added and employment curves: if the employment curve is above the value-added curve then production in that sector and region is relatively more capital intensive). As is well known, the agriculture component is falling in share of GDP and employment in all regions and is very low in Latin America.

In East Asia, the declining shares of agriculture in GDP and employment over the period is notable relative to other regions. The rise in manufacturing shares in East Asia's

GDP over the period is particularly impressive, though this is less the case for employment shares. This suggests that capital intensity is higher relative to other regions, and consequentially that growth is capital accumulation-led rather than labour productivity-led. Shares in the service sector in East Asia also saw a substantial rise over the period. The regional manufacturing shares in Figure 1 are consistent with what has been labelled 'premature deindustrialization' (a term credited to UNCTAD 2003 and used by many others), in that developing countries have reached 'peak manufacturing' in employment and value-added shares at a much earlier point in per capita income than the advanced nations.⁸ In contrast to manufacturing shares, service shares of GDP and employment are on an upward trend in general, particularly so in South Asia with a caveat that South Asia is represented by India alone in this estimation.

Deindustrialization and tertiarization raise questions about the importance or otherwise of manufacturing as the driver of growth. In short, is manufacturing special as Kaldor outlined? Figure 2 estimates the sectoral sources of growth by region. These estimates are based on the method of Anand et al. (2014) and show the decomposition of growth by sector (and factor, which is discussed next). The total change in growth equals 100 per cent. Figure 2 shows that growth in East Asia has been driven by an intersectoral movement towards manufacturing and away from agriculture over time. The contribution of non-manufacturing industry and services has not changed much over the period. In contrast, services are a much more important contributor to growth in all other regions.

Figure 3 makes estimates of the decomposition of growth by factors of production.

⁸ Lewis (1979, 220) notes that 'the surest way to run into trouble is to have "de-industrialization" (industrial employment growing more slowly than the labour force), since this means that the reservoir of cheap labour will be filling instead of emptying. The political and social health of the community, no less its economic health, requires a continual transfer from the reservoir to the more productive sectors, rather than the relative expansion of the reservoir.' Kaldor, in his detailed empirical investigation on the relationship between manufacturing and growth, concluded that the UK was experiencing 'premature maturity'. This concept referred to an experience whereby manufacturing has 'exhausted its growth potential before attaining particularly high levels of productivity or of average per capita income' (Kaldor 1978 [1966], 102).

The figure shows that capital accumulation (physical capital stock) played a major role in East Asia, and that the role has been increasing over time, which suggests an increase in the capital intensity of growth. Initially, this was mixed largely with labour input and human capital stock but as this diminished over time, total factor productivity (TFP) took a more significant role in growth. In short, capital accumulation played a major role in East Asia over the entire period, whilst labour and human capital were gradually replaced with TFP from the mid-1980s onwards. In contrast, capital accumulation is relatively less important to growth in the other regions. In South Asia, capital accumulation becomes more important over time, whereas in sub-Saharan Africa it becomes less so. What is of interest here is the apparent either/or question of labour input and productivity. Growth is either physical capital plus labour absorption-driven or capital plus productivity-driven. This means that when TFP rises, the labour input share tends to shrink and vice versa.⁹

Figure 4 shows labour productivity over the period by sector. It is not surprising to find a large increase in labour productivity in East Asia's manufacturing sector, given the intersectoral shifts away from agriculture to manufacturing. However, the labour productivity gains in other sectors are also significant, certainly in contrast to other regions where productivity has grown less or even fallen over the period.¹⁰

Finally, integrative structural transformation: figures 5 and 6 show the composition of exports and the trade balance. Over the period, East Asia's exports show a dramatic

⁹ In the graphs, the labour and human capital accumulation contribution is smaller (or the physical capital contribution share is larger) than in Anand et al. (2014) because they assume (p. 22), as does Kaldor (1957), that the labour share is constant at two-thirds across all countries and all years. This is based on Cobb-Douglas (1928) who argued empirically (based on the USA) that labour shares are static, as labour is paid according to its own productivity (see Douglas 1976). However, when one takes the labour shares from the latest Penn World Tables we find that the labour share ranges substantially. For example, in 2005, from a minimum of 0.18 to a maximum of 0.89 and a mean of 0.52 in 2005. Thus, of the set of countries we use here, the labour share is much lower than the commonly thought two-thirds share for most years. Therefore, the labour share is a smaller contributor and the capital share is a bigger contributor, if one takes into account the actual labour shares.

¹⁰ This is an alternative view of the 'middle-income trap' debate. Rather than seek to plot a growth slow-down, the figure plots productivity growth versus GDP per capita, and demonstrates a middle-income trap as a productivity slow-down in Latin America in all sectors but agriculture.

change over time. There are large declines in shares of agricultural raw material exports and food exports, and very rapid rises in shares of manufacturing exports and shares of high-tech exports. However, the plateauing of shares of manufacturing exports, and the peak and subsequent fall of shares of high-tech exports is cause for some alarm, given the importance of such exports to the region's economic development. The trends are consistent with a deindustrialization pattern. Surprisingly, despite economic development, the import shares show that East Asia still has a high proportion of import shares in manufactures, although this has fallen from a peak of 80 per cent to approximately 60 per cent. This is related to the phenomenon of manufacturing exports with corresponding high import content. If one looks across the overall trade position, only in East Asia is there a surplus for much of the period. Latin America and sub-Saharan Africa both fluctuate from surpluses to deficits and back, and South Asia has a persistent trade deficit over the period.

If we consider the relationship between employment growth and productivity, Heintz (2009) notes how labour productivity improvements may have a negative impact on employment growth if, as Kaldor argued, output is not stimulated by the productivity rise. Additionally, in keeping with the Kaldor discussion earlier, if the GDP growth rates fall behind the productivity growth rate, employment growth will weaken. The declining employment elasticity of GDP has been extensively researched and linked to globalization and competitive pressures to reduce labour costs. As exports become a larger proportion of GDP, this is likely to exacerbate the situation.

Heintz (2009) examines employment growth and the productivity growth rate in 35 countries between 1961 and 2008 and finds that increases in the productivity growth rate slow down the rate of employment growth, and that this pattern is getting stronger over time. In the 1960s, a one percentage point increase in the growth rate of productivity

reduced employment growth by just 0.07 percentage points. However, in the 2000s, that same one percentage point increase in the growth rate of productivity reduced employment growth by a substantial, 0.54 percentage point.¹¹ Several possible explanations are as follows: (i) it could be that increases in productivity over time are reducing the employment elasticity of growth; (ii) it could be that increases in real wages, employer's social contributions, or strengthening labour institutions are raising unit labour costs and dampening employment creation, though this is ambiguous in empirical studies;¹² (iii) it could be simply that the proportion of wage labour is increasing.

Storm and Naastepad (2005) argue that East Asian countries were unique in the sense that they avoided any productivity–employment trade-off where productivity gains led to slower employment growth or even negative employment growth, in a unique way that is not visible in the data in any other developing country with data in their data set (24 countries) for the 1950–2003 period. They do find a weak negative correlation between productivity growth and employment that is not statistically significant, but if the set of East Asian countries in the data set (China, Malaysia, Singapore, South Korea, Taiwan, and Thailand) are removed, the association becomes statistically significant. In short, the trade-off does not apply to the East Asian countries but is evident in all other countries.

Figures 7-9 shows the association with the most recent GGDC 10-Sector Database. If one splits this between the periods between the 1960–1985 period (the period of what could be called 'pre-liberalization'), the 1985–1995 period (a period of

¹¹ World Bank (2013, 98) estimates (based on 97 countries over the last decade) show a positive relationship between GDP per capita (or household final consumption expenditure (HFCE) per capita) and employment growth per capita, and finds that 'the relationship is not very strong, but only in very few cases was growth truly jobless'. It notes that surges in TFP which drive growth are associated with a decline in employment in the same year.

¹² A meta-review of 150 studies of labour institutions (Betcherman 2012) found, for example, that the impact of minimum wages on employment is modest whilst also being equalizing overall for those in sectors covered, but potentially unequalizing between those covered and those not (or when the minimum wage is implemented or not, such as in free trade zones). It may also be that most minimum wages are set where impacts on employment and productivity are deliberately limited.

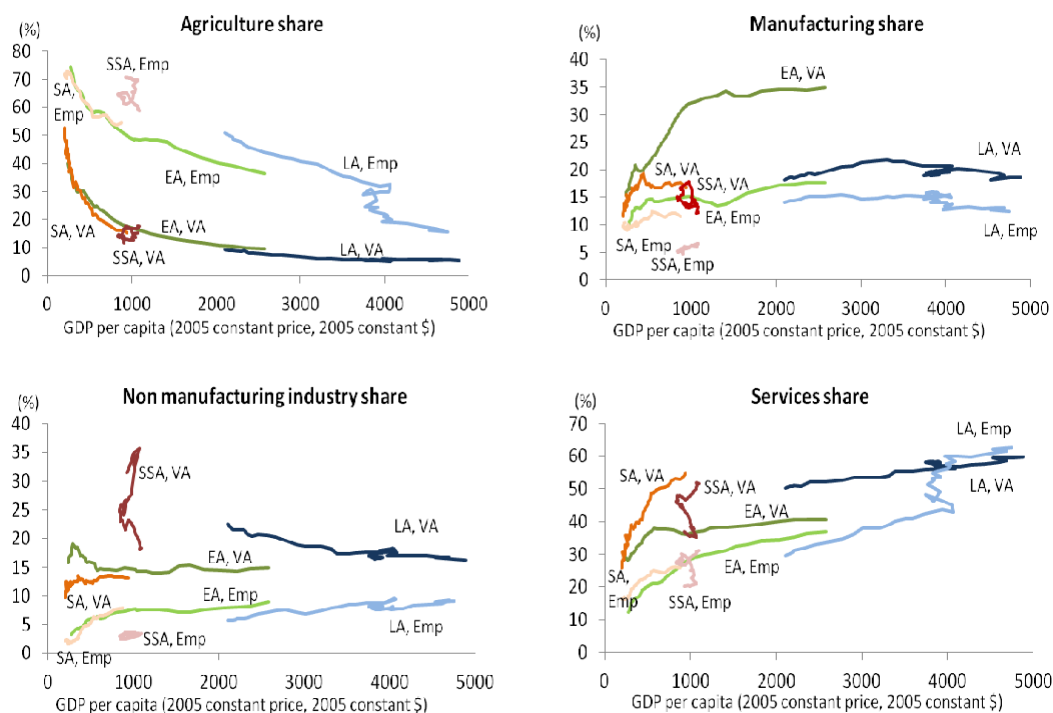
liberalization of economies), and the 1995–2011 period (the contemporary period), one can see different patterns. The 1960–1985 period shows a correlation between labour productivity growth and employment growth. However, the 1985–1995 and 1995–2014 periods show the opposite: labour productivity growth is associated with declining employment growth. To illustrate with an example: In the earlier two periods, the Southeast Asian countries of Malaysia, Indonesia and Thailand (respectively labelled M, I and T in the figures) are in a similar space and outliers to different degrees. However, in the most recent period, those countries move much closer to the line of best fit which itself changes shifts between the 1960–1985 period and after. The relationship between labour productivity and deindustrialization is particularly important given that ever-increasing labour productivity in manufacturing itself is fuelling the deindustrialization of employment.

How is value-added growth related to employment growth at a sectoral level? Figure 10 focuses on employment growth in relation to value-added growth by sector, specifically with employment creation per unit of GDP value added. The horizontal axis is the log of value added (GDP, \$m) and the vertical axis is the log of employment (thousands of jobs). This therefore illustrates the relationship between employment generation and GDP value added in terms of an employment elasticity. Of importance is the trend in observations (the line of best fit), either as converging or diverging from the 45-degree line at which additional value added equals additional jobs created. Above the 45-degree line, employment is greater than value added. Below the 45-degree line, value added is greater than employment.

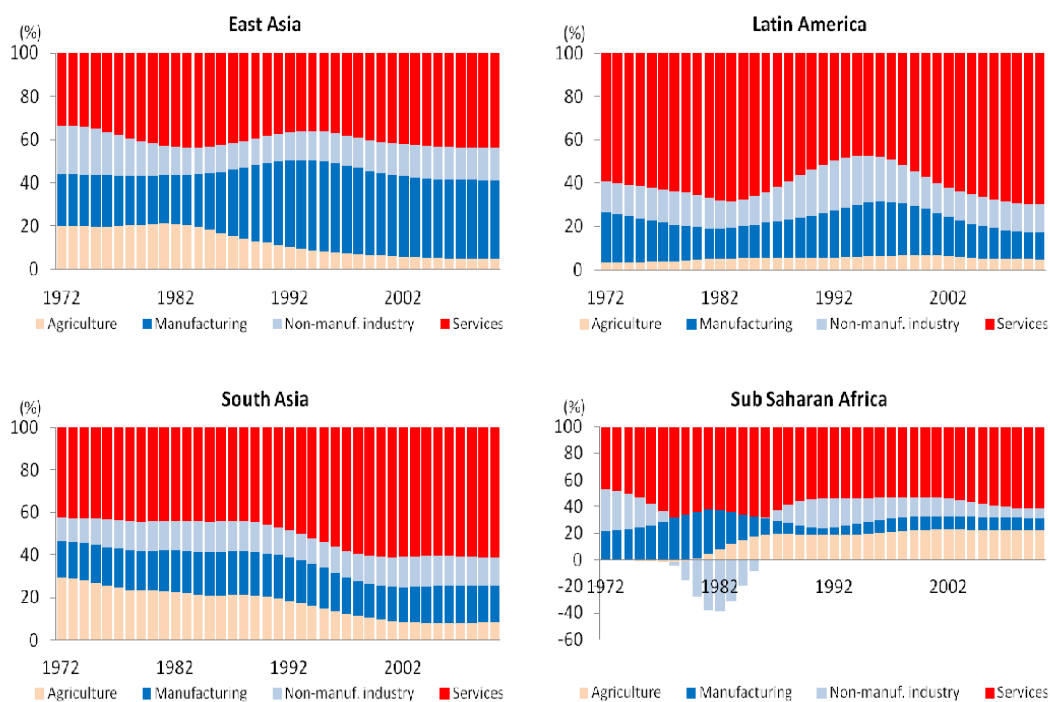
Furthermore, the gradient of the line of best fit itself, regardless of its convergence with the 45-degree line, is of significance in terms of the relationship between output and jobs created. For example, agriculture, with the exception only of Latin America, is above

the 45-degree line, meaning that employment growth is greater than value-added growth. What is notable for East Asia is the employment-insensitivity of agriculture during the time period. Though gradually moving towards the one-to-one line, agriculture has been a major source of employment creation. Furthermore, all other sectors were initially close to the one-to-one line in East Asia, suggesting substantial employment creation, at least at the outset, but diminishing over time as the line of best fit trends away from the one-to-one line. East Asia (and South Asia) are far closer to the one-to-one line in all sectors than Latin America and sub-Saharan Africa, suggesting that growth has been more inclusive in East Asia (and South Asia) than those regions.¹³

¹³ Sen (forthcoming) seeks to explain the extent to which the manufacturing sector does provide employment opportunities. He argues that the extent of employment creation in manufacturing is a function of a scale effect (how big the increase in manufacturing output is), a composition effect (whether the increase in manufacturing is labour or capital intensive), and a labour intensity effect (whether the increase is due to labour productivity), and the relative strength and direction of these three effects (while the scale is positive, the composition effect and the labour intensity effect may be positive or negative). Sen argues that the variation in manufacturing employment growth relates to trade, labour institutions, and human capital variations across countries. He finds that trade has a positive effect on employment via scale and composition, but a negative effect via labour intensity. Human capital is positive through scale but negative through labour intensity. And labour institutions have no effect via scale and composition and a negative effect through labour intensity.

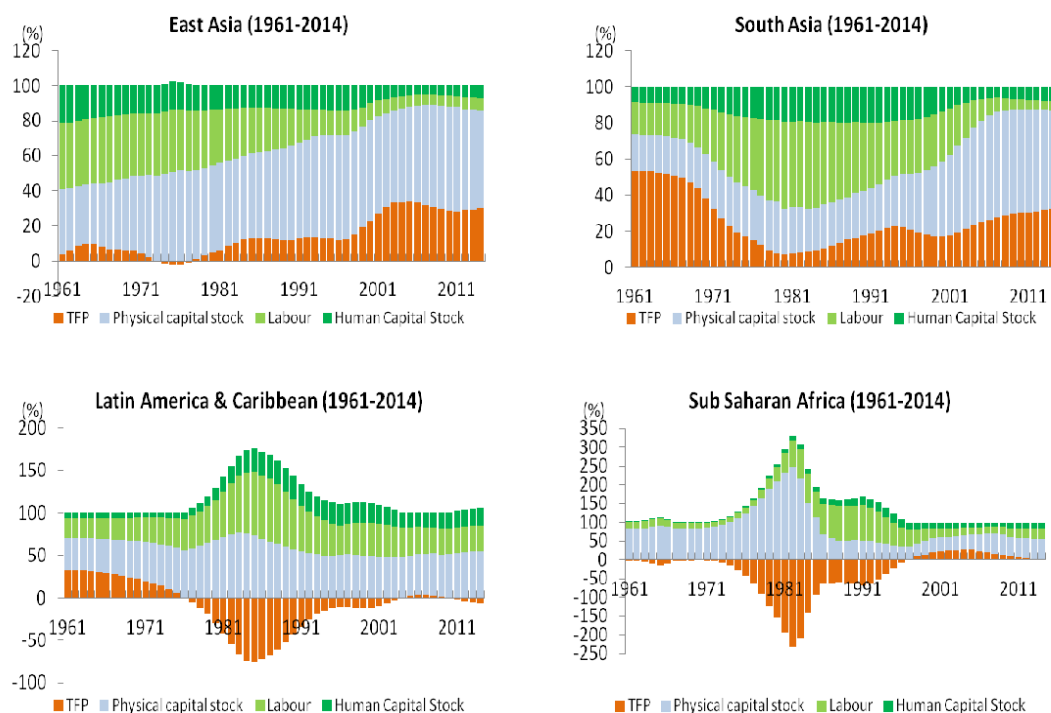
Figure 1 GDP and employment shares by region, 1960–present

Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

Figure 2 Growth decomposition by sector, by region, 1960–present (change in growth = 100)

Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

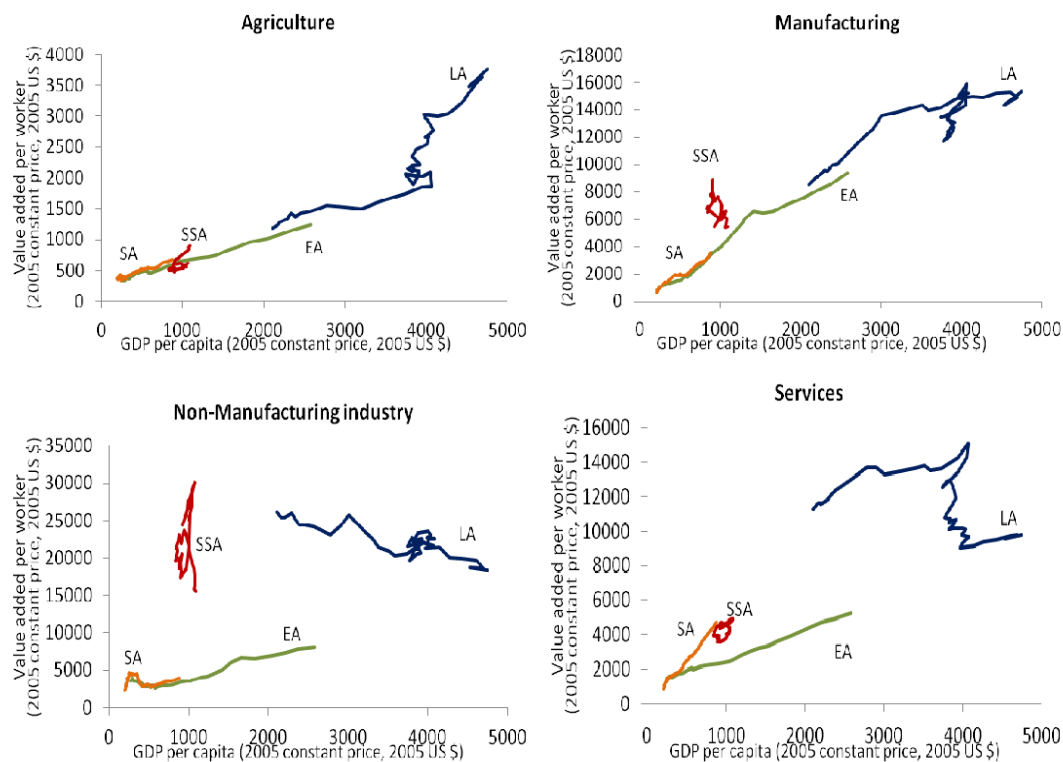
Figure 3 Growth decomposition by factor, by region, 1970–present (change in growth = 100)



Note: Components growth weighted by their share in regional output-side real GDP at current PPPs (in mil. 2011US\$).

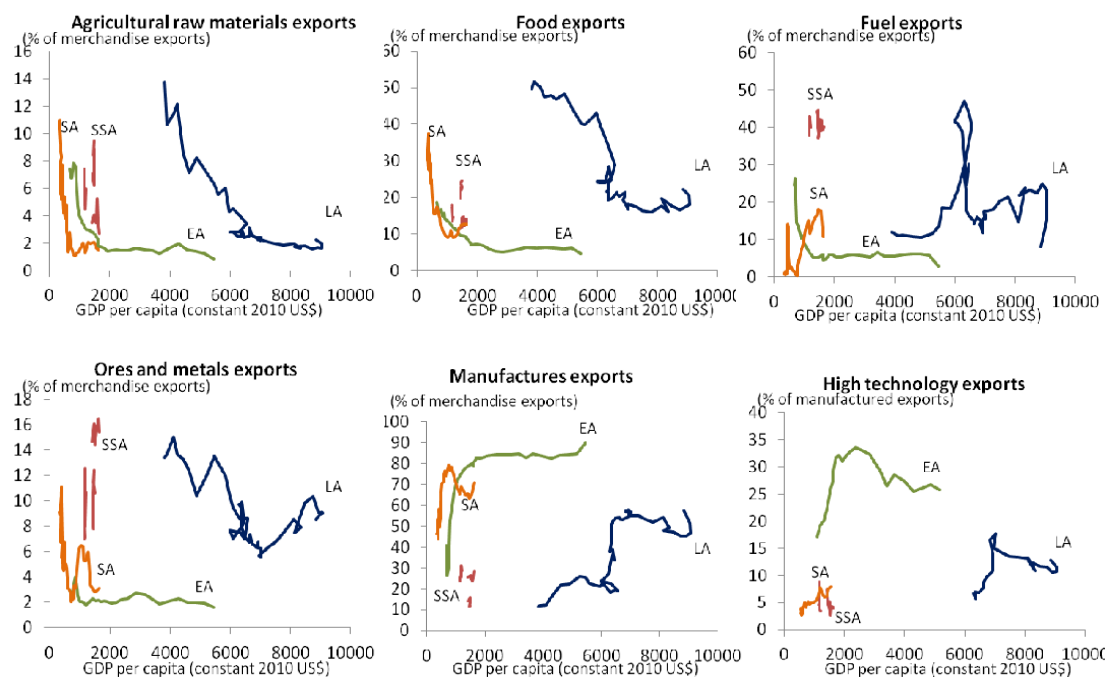
Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

Figure 4 Labour productivity versus GDP per capita, by region, 1960–present



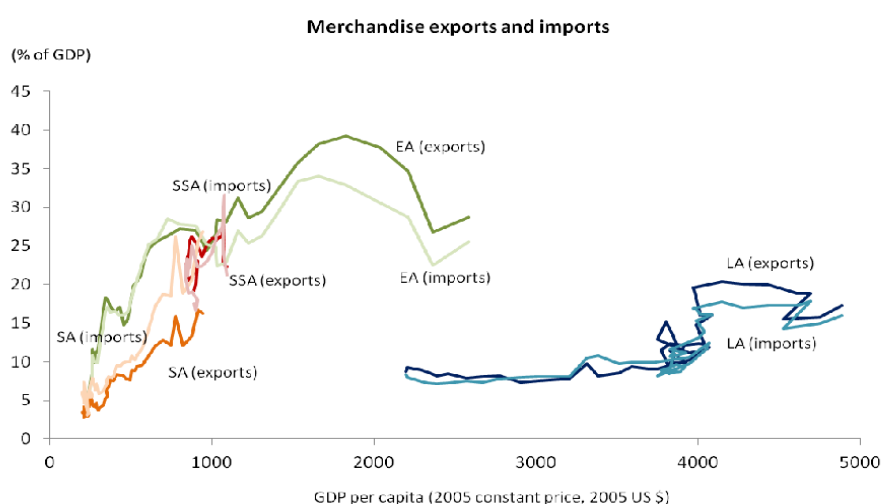
Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015b).

Figure 5 Composition of exports by regions, 1960–present



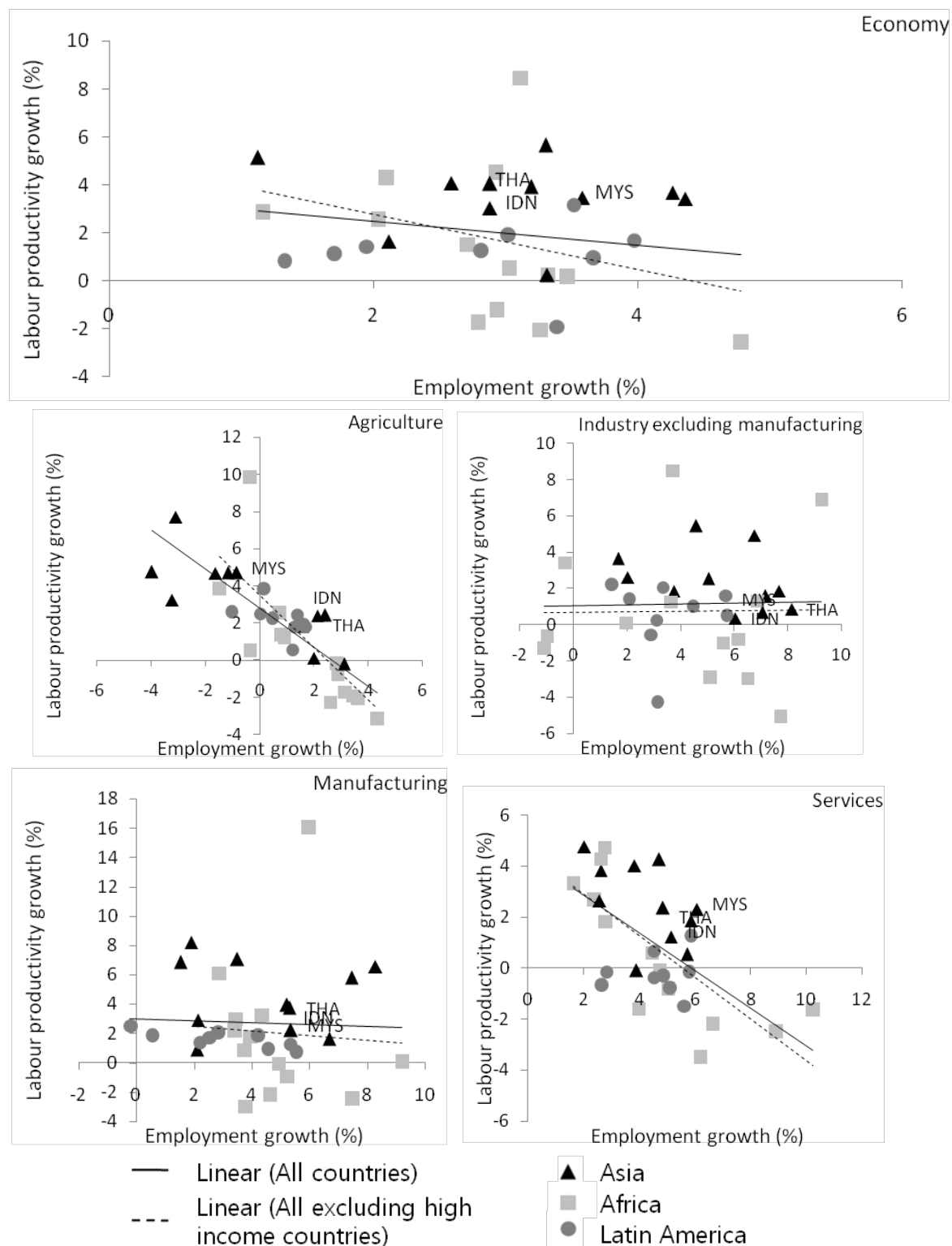
Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

Figure 6 Trade shares, 1961–present (or available years)



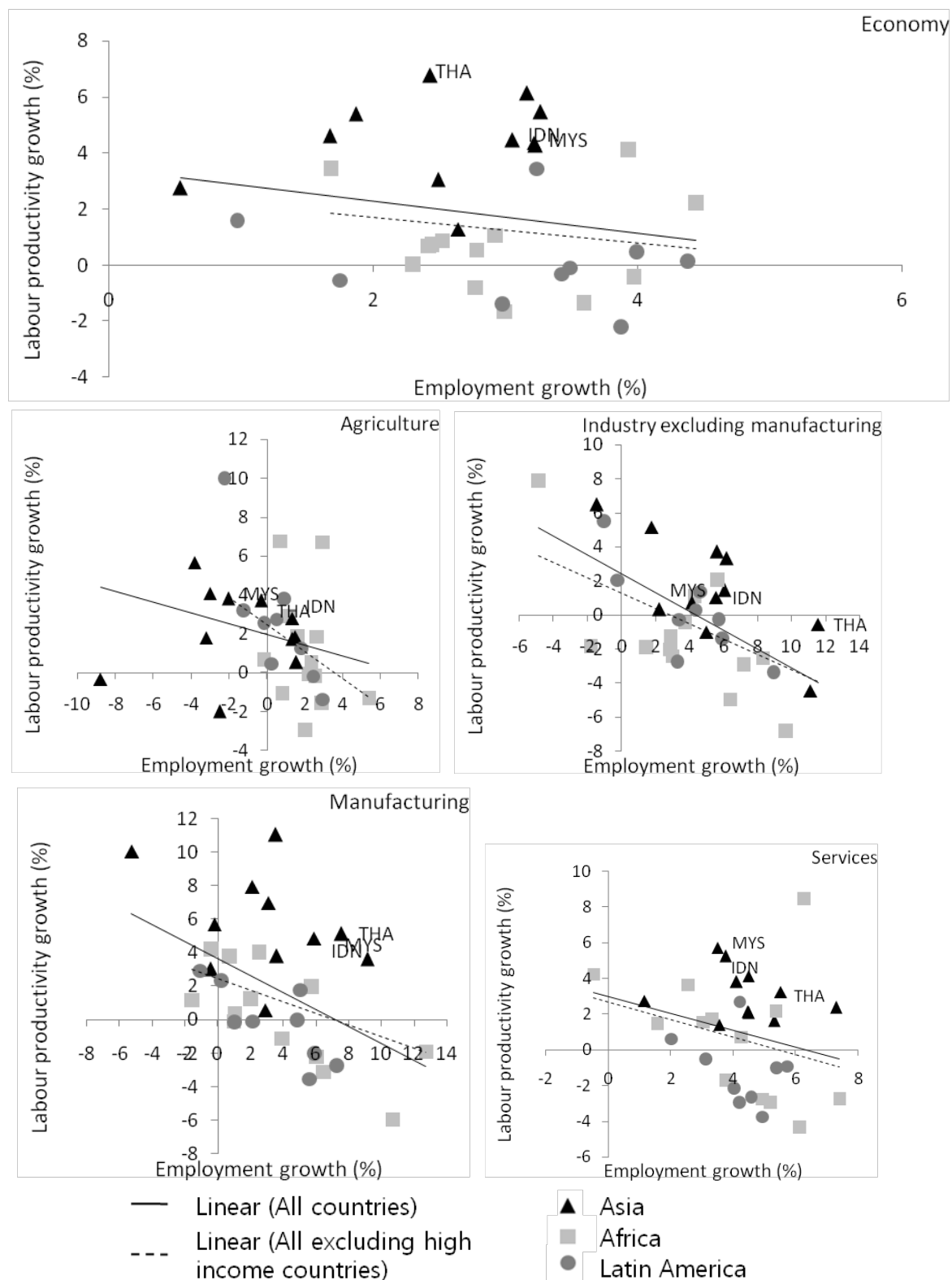
Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).^p

Figure 7 Annual growth rates of employment and labour productivity, 1960 (or earliest year)–1985



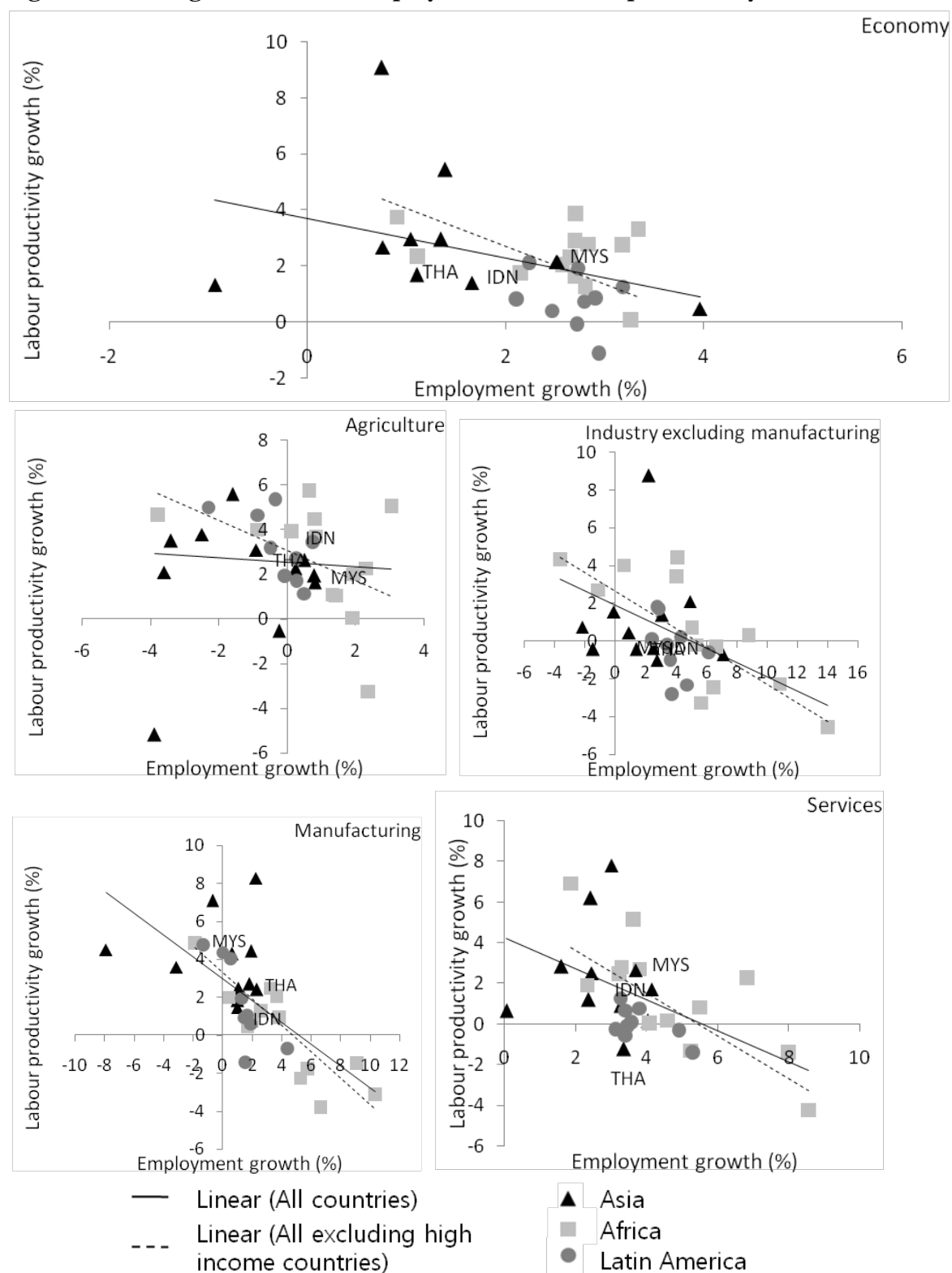
Note: Productivity is calculated by dividing real GDP by number of persons engaged.

Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

Figure 8 Annual growth rates of employment and labour productivity, 1985–1995

Note: Productivity is calculated by dividing real GDP by number of persons engaged.

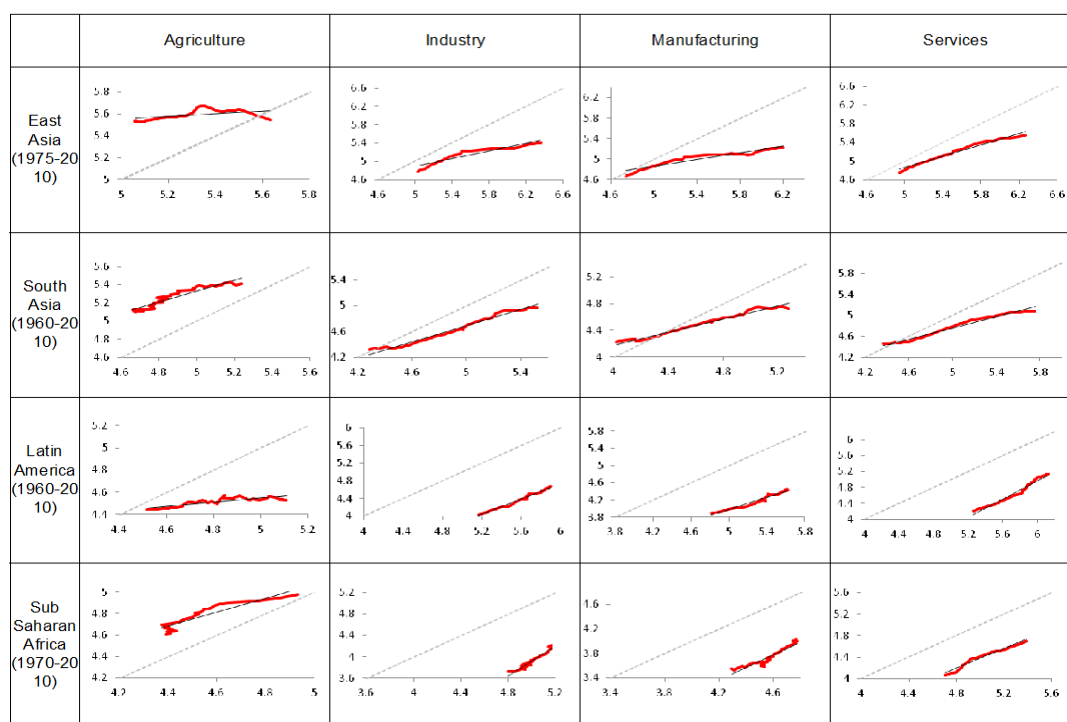
Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

Figure 9 Annual growth rates of employment and labour productivity, 1995–2010

Note: Productivity is calculated by dividing real GDP by number of persons engaged.

Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

Figure 10 Sectoral value added vs employment by region, 1960–present (unless stated)



Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

In sum, over the period since the 1960s, we can outline three stylized facts as follows: first, in all developing regions, agriculture shares of GDP and employment have fallen substantially, although—surprisingly—employment shares in agriculture can persist at 40 per cent of total employment up to \$4000 per capita. However, this may simply be disguised under- or unemployment (or a statistical artefact). The rise in manufacturing shares in East Asia's GDP over the period is dramatic, though this is less the case for East Asia's manufacturing shares of employment. Further, the regional manufacturing shares are consistent with deindustrialization in employment shares and value added, although it is more a case of a plateau than a substantial downturn, at least in the regional aggregates. It would appear that even within the developing world, the plateau is appearing earlier (\$3000–4000 per capita for Latin America versus \$1500 per capita for East Asia). And service shares of GDP and employment are very much on an upward trend in general.

Second, growth in East Asia has been driven by an intersectoral movement towards manufacturing but services have been a much more important contributor to growth in all other regions. In East Asia, capital accumulation (physical capital stock) played a major role and that role has been increasing over time, which suggests an increase in the capital intensity of growth. In contrast, capital accumulation is relatively less important vis-à-vis other factors of production to growth in the other regions.

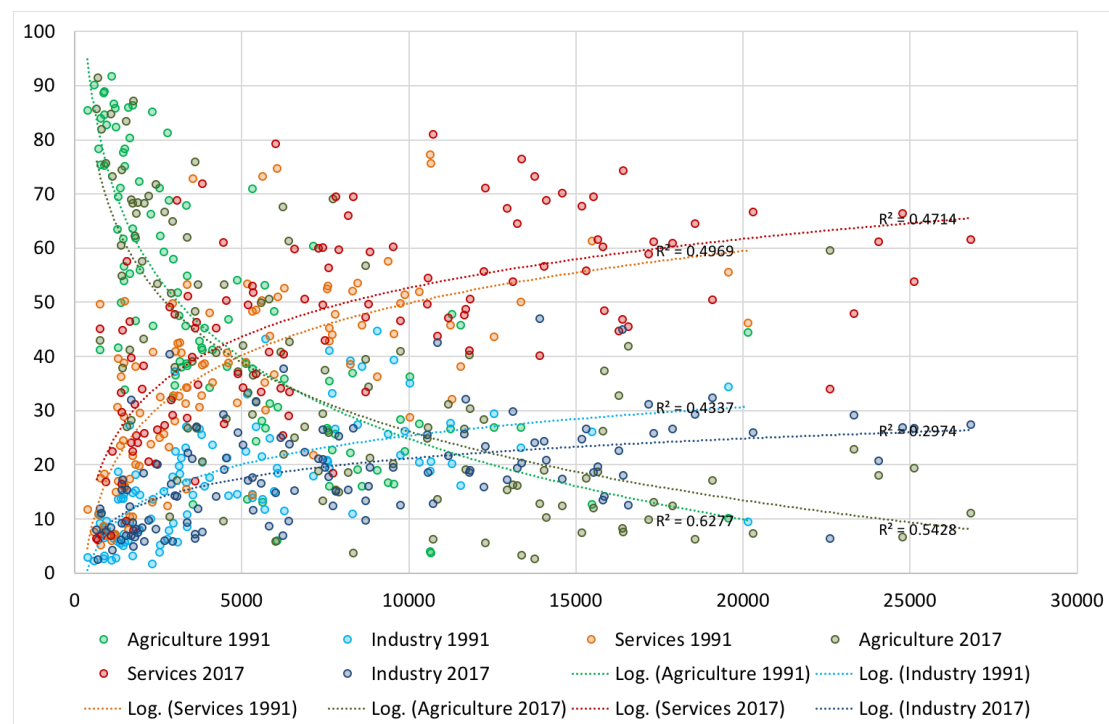
Third, while in East Asia there have been substantial changes in the composition exports—large falls in shares of agricultural raw material exports and food exports, and rises in shares of manufacturing exports and shares of high-tech exports—this is not the case elsewhere. That said, in East Asia, there is a visible plateauing of shares of manufactures in exports, and there is a peak and decline of shares of high-tech manufactures shares of exports. Persistent trade surpluses appear to be unusual outside East Asia. In both Latin America and sub-Saharan Africa, the trade position fluctuates from surpluses to deficits and back, and South Asia has a persistent deficit for the entire period under study.

4. NEW TRAJECTORIES OF STRUCTURAL TRANSFORMATION: DEINDUSTRIALIZATION AND TERTIARIZATION

The discussion thus far has been based on regions. To what extent are deindustrialization and tertiarization evident at country-level? Figure 11 shows the WDI employment data pooled for all developing countries, 1990–2017, vs GDP per capita in 2011 purchasing power parity (PPP). Figure 12 shows the data by country income groups. Figure 13 shows selected middle-income developing countries. Figure 11 shows the pattern of structural transformation when all the data is pooled, and shows how the industry curve has moved

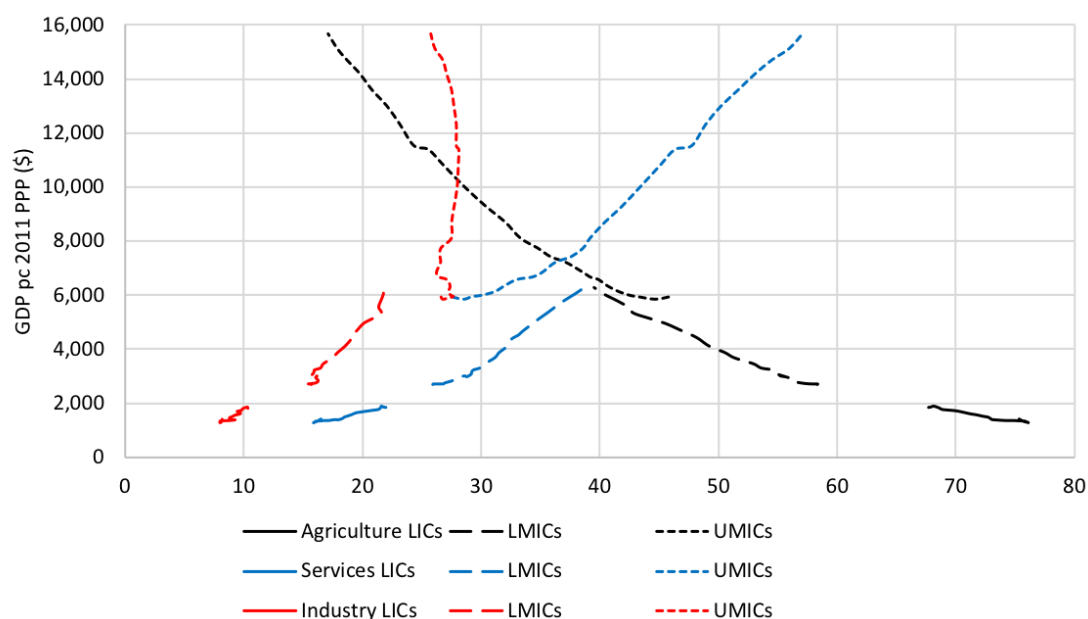
down if 1991 and 2017 are compared and the services curve has moved up. The agriculture curve has *twisted*, meaning it has been pulled down at lower per capita income (i.e. falling faster) but pulled up at higher income (meaning persistent or falling slower). When we consider country groupings (Figure 12), the upper middle-income country (UMIC) industry shares curve turns back on itself at about 25 per cent of employment. The lower middle-income country (LMIC) line is faltering. And the LIC plot has barely started. The pattern of tertiarization is clearer yet in the selected MICs shown in Figure 13. Pooled data for manufacturing alone from the GGDC 10-Sector Database shows quite a dispersal over the longer period (see Figure 14). The trend of tertiarization is clear for non-financial services (see Figure 15) though there is a dispersal at lower GDP per capita levels.

Figure 11 Sector shares of employment vs GDP per capita (2011 PPP), 1991–2017, pooled data, all developing countries



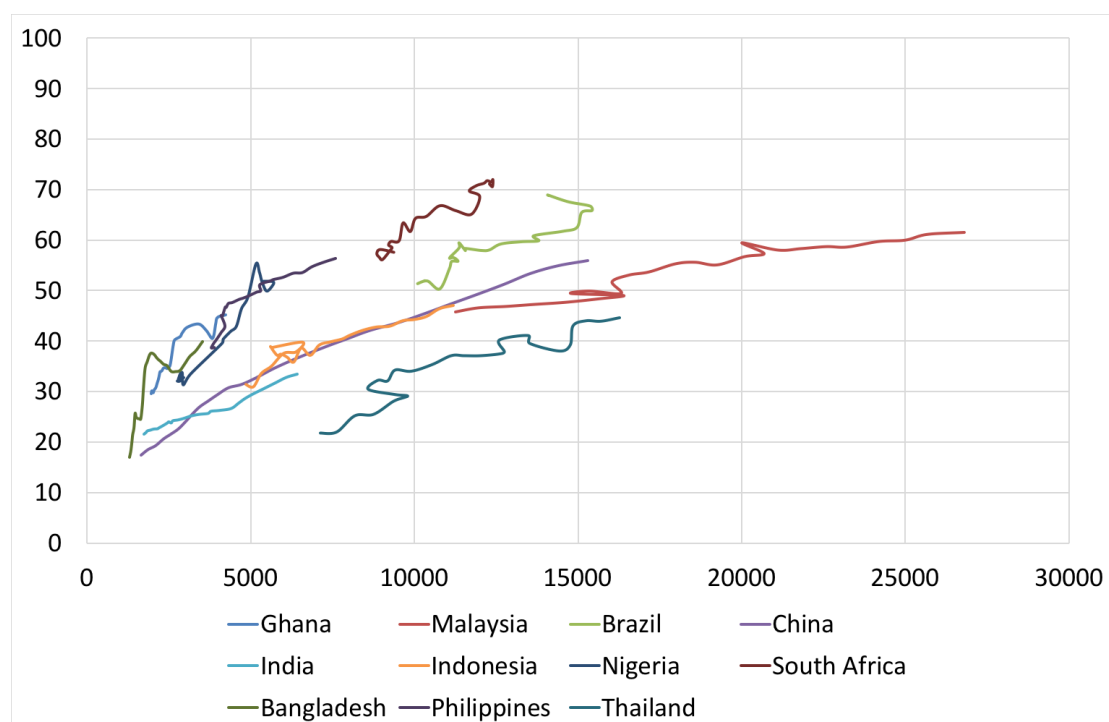
Source: Author's calculation based on World Bank (2018).

Figure 12 Sector shares of employment vs GDP per capita (2011 PPP), 1990–present, developing country income groups (current classification)



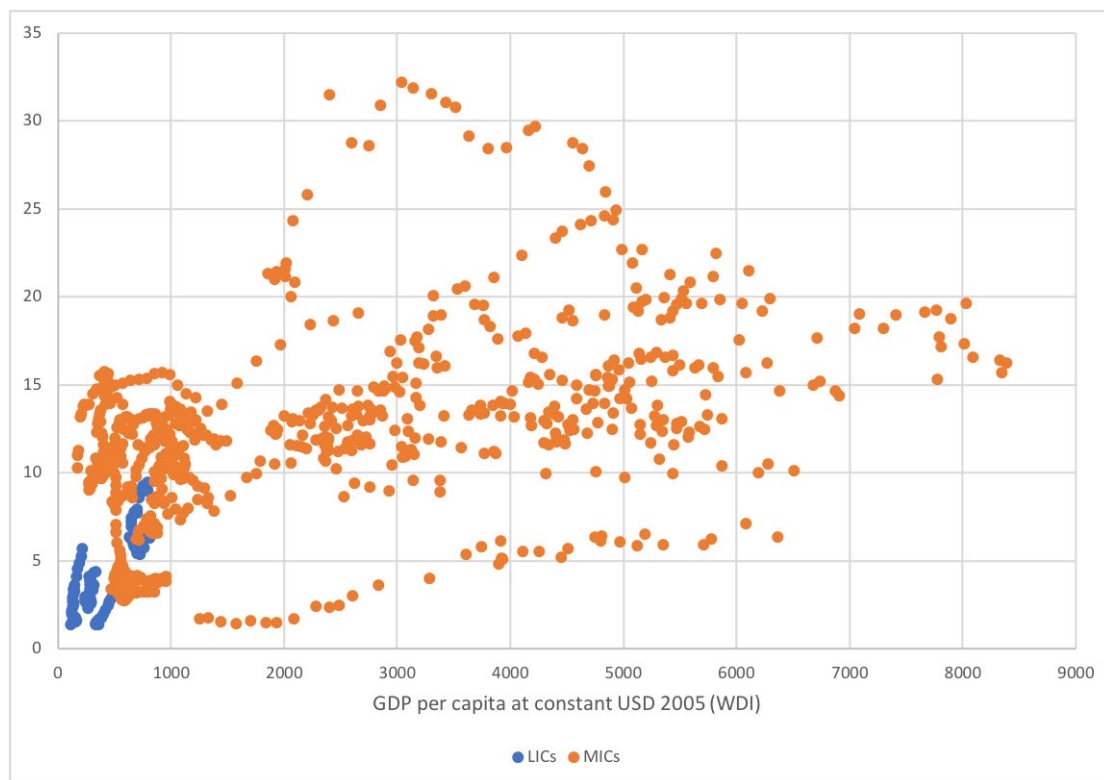
Source: Author's calculation based on World Bank (2018).

Figure 13 Sector shares of employment in services vs GDP per capita (2011 PPP), 1990–present, selected middle-income developing countries



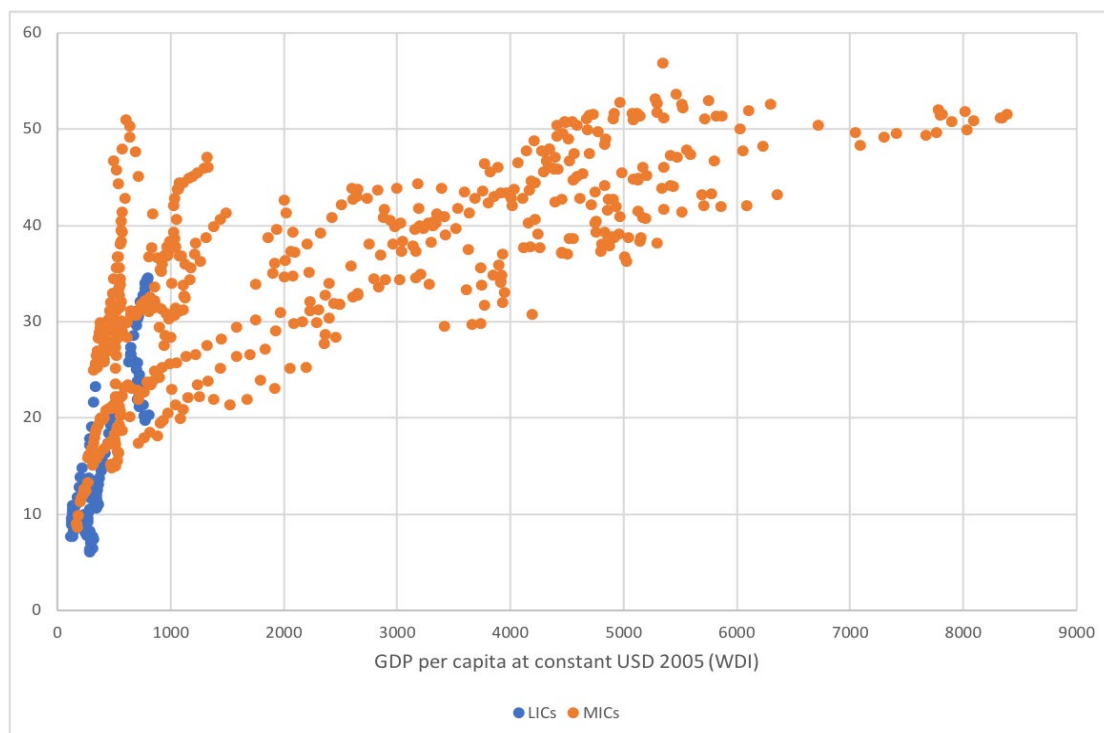
Source: Author's calculation based on World Bank (2018)

Figure 14 Sector share of manufacturing employment vs GDP per capita (constant 2005\$), 1975–present, pooled data, 25 developing countries



Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

Figure 15 Sector share of non-financial services employment vs GDP per capita (constant 2005\$), 1975–present, pooled data, 25 developing countries (log scale)



Source: Author's calculation based on GGDC 10-Sector Database of Timmer et al. (2015).

Many developing countries in the GGDC 10-Sector Database have experienced at least one episode of deindustrialization if defined – arbitrarily – as three successive years (or chronic deindustrialization episodes) of employment share contraction (see Table 1), or simply comparing 1970 and 2010 (see table 2). In the former, three successive years' definition, we find an episode of deindustrialization in all the 21 middle-income developing countries, with almost half remaining in a deindustrialization episode at or towards the end of the data set period in 2011 (see Table 1). The percentage point falls, however, differ between a deep, 6 percentage point deindustrialization to a shallow deindustrialization of 1 percentage point or less. The percentage fall overall ranges from 1 per cent to 33 per cent. Table 2 shows, using the latter definition of 1970 versus 2010, employment deindustrialization in half of the 25 countries. We chose not to consider GDP deindustrialization here because of the Fischer critique (see above). This is not to dismiss the use of value-added data. Rather that it would be the subject of greater investigation in the future research agenda (see below).

Table 1 Episodes of deindustrialization of shares of employment in manufacturing using three successive years' contraction, current MICs

	Start date	End date	Share, start date	Share, end date	PP fall in share	% fall in share
Bolivia	2002	2006	14.04	13.01	1.02	7.30
Botswana	2007	2009	7.10	6.27	0.83	11.68
Brazil	2008	2011	13.01	11.54	1.47	11.27
China	1997	2002	15.70	13.52	2.17	13.85
Colombia	2004	2007	11.93	11.13	0.81	6.78
Costa Rica	1999	2011	17.92	12.08	5.85	32.63
Egypt	1999	2011	13.82	10.68	3.14	22.69
Ghana	2006	2009	11.62	10.55	1.06	9.16
India	2008	2010	12.16	11.59	0.57	4.66
Indonesia	2005	2009	12.51	11.85	0.66	5.30
Kenya	2008	2011	13.00	12.72	0.28	2.19
Malaysia	2006	2009	21.19	17.54	3.65	17.23
Mauritius	2007	2011	22.45	18.53	3.92	17.47
Mexico	2004	2009	17.32	15.30	2.02	11.64
Nigeria	1991	1999	4.72	3.07	1.65	34.96
Peru	2007	2011	9.59	8.51	1.07	11.20
Philippines	2004	2009	9.76	8.25	1.50	15.40
Senegal	1971	1973	5.68	5.48	0.20	3.57
South Africa	2007	2011	13.31	11.62	1.69	12.70
Thailand	2009	2011	14.26	13.94	0.32	2.23
Venezuela	2007	2011	10.49	9.56	0.93	8.89
Zambia	1997	2005	2.84	2.82	0.03	0.93

Source: Data processed from Timmer et al., (2015).

Table 2 Manufacturing shares of employment, 1970 and 2010, current MIC

	Sectoral share in manufacturing (%)		PP change in share	% change in share
	1970	2010	1970-2010	1970-2010
Bolivia	9.26	13.40	4.14	44.73
Egypt	14.24	11.06	-3.18	-22.35
Ghana	12.08	10.80	-1.28	-10.60
India	9.44	11.59	2.15	22.74
Indonesia	8.24	12.13	3.88	47.13
Kenya	3.79	12.76	8.97	236.78
Nigeria	7.01	4.18	-2.83	-40.40
Philippines	11.84	8.43	-3.41	-28.80
Zambia	3.05	3.31	0.26	8.51
Botswana	1.47	6.49	5.01	340.90
Brazil	13.30	12.11	-1.19	-8.96
China	7.78	19.17	11.39	146.50
Colombia	14.25	11.25	-3.00	-21.08
Costa Rica	13.29	12.39	-0.90	-6.78
Malaysia	12.72	17.72	5.00	39.33
Mauritius	10.61	19.11	8.49	79.99
Mexico	17.98	15.65	-2.33	-12.96
Peru	13.61	8.86	-4.75	-34.91
South Africa	13.33	11.90	-1.43	-10.74
Thailand	5.36	14.07	8.72	162.65
Venezuela	14.61	9.75	-4.86	-33.24
Zambia	3.05	3.31	0.26	8.51

Source: Data processed from Timmer et al., (2015).

5. RESEARCH ON DEINDUSTRIALIZATION, TERTIARIZATION, AND DEVELOPMENT

Many books have been written on deindustrialization in the advanced countries, typically dating from the 1970s, and focusing on the US and UK or other Organization for Economic Co-operation and Development (OECD) countries (e.g. Alderson 1999; Bacon and Eltis 1976; Bazen and Thirlwall 1986, 1989, 1992; Blackaby 1981; Bluestone and Harrison 1984; Cairncross 1978; Groot 2000; Kucera and Milberg 2003; Rowthorn and Ramaswamy 1997; Saeger 1997; Thirlwall 1982) and more recently (Fontagné and Harrison 2017; Linkon 2018; Wren 2013). There are also a set of seminal papers (e.g. Rowthorn and Wells 1987; Rowthorn and Coutts 2004; Rowthorn and Ramaswamy 1997; Singh 1977, 1987) on the inverted U curve of manufacturing shares of employment.

It is important to note that deindustrialization—if defined as shrinking employment shares—could be experienced with an increase in the absolute number of jobs in manufacturing, as long as total employment growth is fast enough. And if defined as shrinking employment shares, deindustrialization could lead to an increase in total manufacturing output if manufacturing productivity rises sufficiently quickly. In sum, the experience of deindustrialization could be positive or negative. Rowthorn and Wells (1987, 5–6) noted that deindustrialization could be positive if unemployment does not rise as labour transferring out of manufacturing is absorbed in the service sector with new jobs. However, deindustrialization could be negative if labour is not reabsorbed, and unemployment rises.

Although much can be drawn from the research on developed countries, caution is needed as the effects of deindustrialization are likely to be different in developing countries, as the process is happening at a much lower level of income per capita (thus,

for example, a large working class that has political force to extract better pay and conditions may never evolve in developing countries to the same extent). Further, there are specific limitations of the literature above for developing countries which are as follows: (i) there is too much focus on the trends (or problems) and potential causes in advanced economies only, but little focus on public policy responses to deindustrialization; (ii) the policy implications promoted (e.g. raising education levels and freer movement of labour) are often abstract and are not sufficient in the current context of a 'global value chain world', meaning a world where industrial production is dominated by fragmented chains of production often across numerous countries; (iii) the labour market policy recommendations pay little attention to, or make limited links with, the structural global forces that will shape the future pattern of structural transformation; (iv) the studies say little on the state's role in supporting new sources of economic growth and job growth, and in strategically managing the country's position in a 'GVC-world'.

In the developing world, much has been written on industrialization, employment, and development (take for example, Andersson and Axelsson 2016; Cruces et al. 2017; Newman et al., 2016; Szirmai et al. 2013), and episodes of 'late' industrialization (e.g. Amsden 1989, 2001; Chang 1994, 2008 and Wade 1990). In contrast, deindustrialization in developing countries has, until recently, received limited attention. One exception is Williamson's (2013) coverage of the subject which is focused on a much earlier period of history, specifically, the 1700–1930 period. Another is Gemmell's (1986) study which focuses on the service sector in developed and developing countries using the case of Egypt.

In papers and articles, the comparative study of deindustrialization in developing countries has received some limited attention to date in a relatively small set of cross-country papers (e.g. Dasgupta and Singh 2006; Felipe et al. 2014; Frenkel and Rapetti 2012;

Herrendorf et al. 2013; Palma 2005, 2008; Pieper 2000; Rodrik 2016; Szirmai and Verspagen 2011; Treganna 2009, 2014), and in a non-comparative sense in single-country studies (see, for example, for Malaysia, Henderson and Phillips 2007; Rasiah 2011; Tan 2014; for Indonesia, Manning and Purnagunawan 2017; for Mexico, Cruz 2014; for Chile, Gwynne 1986; for Pakistan, Hamid and Khan 2015; and for Brazil, Jenkins 2015b; Cypher 2015).

Few of these studies have, however, analysed the issues of deindustrialization systematically with reference to economic development in a GVC-world. And yet deindustrialization and the GVC-world are likely to be interconnected through at least three channels: first, through the process of trade liberalization and the decline in the relative price of manufacturing goods. Second, through the internationalization of production networks and the fact that developing countries may be 'stuck' in low value-added sections of global value chains; and third, the spread of manufacturing activities thinner and thinner across an ever-increasing number of developing countries. Looking ahead, premature deindustrialization will become harder to reverse as technological change will be likely to accelerate such trends because middle-income developing countries are likely to be affected by automation trends in high-income countries, and are themselves trying to catch up with rapid automation. In short, premature deindustrialization in a 'GVC-world' is a trend which is likely to be here to stay and is a challenge to future economic development.

A range of UN and other international agencies have reports on deindustrialization, though with radically differing views on the drivers and consequences (e.g. see for a range of views, Hallward-Driemeier and Nayyar 2017; IMF 2017; UNDP 2015; UNIDO 2016; World Bank 2013, 2016). Indeed, it is UNCTAD (2003) who are credited with introducing the term 'premature deindustrialization'. The concept of 'premature deindustrialization'

used here and elsewhere has two aspects as noted by UNCTAD (2003), Dasgupta and Singh (2006), Palma (2005, 2008), Rodrik (2016), and Amirapu and Subramanian (2015). The first component is that 'peak manufacturing', in employment or GDP shares (or export shares), has been reached and the inverted U curve is now on the plateau or the downswing of the curve. The second component is that, with reference to developing countries versus developed countries, the inverted U curve has moved leftwards over time. This means that the point at which the inverted U turns is, on average, lower in per capita income terms now than in the 1990s, which was already lower than in the 1980s. In contrast to others, Felipe et al. (2014) argue that premature deindustrialization is evident in employment shares though less evident in GDP shares.

6. DEINDUSTRIALIZATION, TERTIARIZATION, AND DEVELOPMENT: A NEW RESEARCH AGENDA

6a. Varieties of contemporary deindustrialization in developing countries

What are the varieties of contemporary deindustrialization in the developing world and how do they differ from deindustrialization in the developed countries? And are the episodes best described as deindustrialization or tertiarization?

Deindustrialization has been studied with reference to the developed world, and typically defined as a shrinking proportion of industrial or manufacturing activity in employment and/or value added. What is needed in the developing world is a typology of deindustrialization based on empirical analysis of developing countries. A typology would be based not only on which (sub-)sectors contract, but which (sub-)sectors expand, and changes in relative productivity and employment between (and within) sectors.

The typology would consider the length, depth, and starting point (in per capita income and other measures) of the deindustrialization episode, which sectors expanded consequentially, and changes in relative productivity and employment between (and within) sectors. It would also consider relative and absolute deindustrialization; chronic and transient deindustrialization; dual and non-dual deindustrialization (the deindustrialization of both value added and employment or not); and deep and shallow deindustrialization. In short, this typology will bring to light different conceptual varieties of deindustrialization. Furthermore, the typology would discuss which forms of deindustrialization may be a positive or a negative experience, and in what sense.

6b. Theories of deindustrialization and economic development

What factors drive different varieties of deindustrialization and what is the institutional basis or social structure of each variety of deindustrialization?

How each school of economic development understands deindustrialization in developing countries in terms of the drivers and consequences for productivity and employment requires teasing out. Contemporary discussion has tended to list potential causes rather than situate these explicitly in the three schools. For example, Rowthorn and Coutts (2004) list four causes of deindustrialization in advanced countries. Specifically, outsourcing and thus a statistical artefact caused by the contracting out of manufacturing jobs to services (for example, cleaning or catering), though a recent and substantive empirical investigation into this largely dismisses its importance (see Nayyar et al. 2018); a fall in relative prices of manufactures (or a fall in the income elasticity of manufactures); international trade leading to higher competitive pressures to shift to higher labour intensity production to compete, or substitution of labour with capital; and decreases in the rate of investment, which

disproportionately affects manufacturing because most investment is in this sector. Palma (2005, 2008) adds Dutch disease due to natural resources-led growth; outsourcing globally, whereby manufacturing employment has fallen in OECD countries; changes in policy regimes in OECD countries away from Keynesianism; and technological progress.

Palma goes on to argue that countries that have a commodity export surge or policy shift away from Keynesianism have an 'additional degree' of deindustrialization. In contrast, Rodrik (2016) emphasizes trade liberalization over time and the impact of China's entry into manufacturing.

One could add (perhaps implicit in some of the above points) that ever-increasing labour productivity in manufacturing is itself fuelling the deindustrialization of employment. Felipe et al. (2014) go further and argue that premature deindustrialization is caused by the fact that large national increases in labour productivity have been counteracted by a shift of manufacturing jobs to lower productivity economies. In short, the changes in supply chains and shift to lower productivity economies has spread manufacturing jobs more thinly, making it harder for individual countries to sustain high levels of manufacturing employment. They note that global employment in manufacturing and GDP shares have changed very little in the last 40 years. What has happened is that international competition has spread manufacturing across more and more countries.

The institutional basis and social structure of varieties of deindustrialization requires analysis as part of the theoretical discussion drawing from the varieties of capitalism literature, and the institutional and social structure configurations that promote and sustain different varieties of capitalism in the literature emerging since Hall and Soskice (2001). This will also include those writing in that tradition in terms of 'varieties of state capitalism' (Musacchio and Lazzarini 2012, 2014), 'national business systems' (Whitley 1991, 1999), and 'varieties of institutional systems' (Fainshmidt et al. 2016). Additionally,

it includes those writing in a parallel stream of literature on the 'social structure of accumulation' (see Gordon 1978, 1980; Gordon et al. 1982, 1994, 1996; Kotz 1994, 2015, 2016; Kotz et al. 1994; McDonough 1994, 2008; Reich 1994, 1997; Wolfson and Kotz 2009).

6c. Varieties of contemporary deindustrialization and growth dynamics

What is the potential for service-sector-led growth to replace manufacturing in terms of value-added growth and employment growth, or what would make reindustrialization a viable economic development strategy?

The growth dynamics of different types of deindustrialization in the developing world and whether reindustrialization is a viable strategy are areas of useful enquiry differentiated by the typology of deindustrialization episodes developed previously. There is a central question of whether manufacturing is still 'special', and whether it has different characteristics to that of the services sector. Is this the case with reference to contemporary developing countries? Are Kaldor's arguments—manufacturing's backward and forward input–output linkages and scope for capital accumulation, technological progress, economies of scale, and knowledge spillover—valid with reference to contemporary developing countries? One recent contribution by Di Meglio et al. (2018) find qualified support for the argument that manufacturing is special and find that although business services are a contributor to aggregate productivity growth, other services slow down aggregate productivity growth and output growth.

6d. Varieties of contemporary deindustrialization and distribution dynamics

Who are the winners and losers in a relative and/or absolute sense and who 'captures' productivity growth (or what determines its distribution) in each variety of deindustrialization? And what is the role of the state and public policy in regulatory and distributional governance related respectively to deindustrialization?

The distribution dynamics of different types of deindustrialization in the developing world is a further area of enquiry worthy of investigation. The relationship between inequality and structural change is predicated on the work of Kuznets (1955). However, Kuznets studied the movement of labour during industrialization not deindustrialization. The area of enquiry would be assessed with reference to contemporary developing countries and deindustrialization, if as Kuznets (1955, 7–8) argued, inequality will rise as a result of an intersectoral shift that leads to income differences between sectors, as well as employment and productivity changes within sectors. It is important to note that inequality in the Kuznets dual sector economy is an aggregation of (i) inequality in each sector; (ii) the mean income of each sector; and (iii) the population shares in each sector. Thus, even the population shift itself could raise inequality, as Kuznets himself noted. So, although inequality may rise as a result of movement between sectors, that occurrence may be balanced or outweighed by what happens to the within-sector components and the shares of each sector. Initial inequality between and within sectors will also play a significant role. Further, public policy has the potential to counter-balance any increase in inequality.

With reference to deindustrialization, whether the shift would lead to rising inequality in the absence of public policy countervailing measures would be determined by inequality in the manufacturing and service sectors; the mean income in each sector as well as the population shares in each sector. Further, the initial inequality between and within each sector would contribute to the overall change in inequality. There has been a set of contemporary scholars building new theory in the Kuznetsian tradition, and such scholars

have developed theory with a focus on open economies and global commodity prices and interest rates (Galbraith 2011), agrarian liberalization (Lindert and Williamson 2001), the role of technology (Roine and Waldenström 2014), as well as aspects of national political economy (Acemoglu and Robinson 2002) and the distribution of land (Oyvat 2016).

Baymul and Sen (2017; 2018) use the GGDC 10-Sector Database and the (Baymul and Shorrocks, forthcoming) Standardised UNU-WIDER WIID and find that the movement of workers into services has no discernible overall impact on inequality, but increases inequality in 'structural developing countries' (where employment in the services sector is greater than in agriculture), and decreases inequality in 'structurally developed countries' (where employment shares in the manufacturing sector is greater than employment shares agriculture). One future avenue is a deeper analysis of comparative deindustrialization and inequality in a smaller set of populous middle-income developing countries—India, Indonesia, Brazil, Mexico, and China—which is possible using the GGDC World Input–Output Database which has sectoral data on workers' hours and remuneration by skill level (see for discussion Diao et al. 2017; Martorano et al. 2017).

6e. Future prospects amid technological change and the automation of economic development

How are deindustrialization and technological development related? How does automation impact different varieties of deindustrialization in terms of growth and distribution dynamics?

A broad range of international agencies have recently flagged issues relating to automation and the future of employment (e.g. ADB 2018; ILO 2017; IMF 2017; UNCTAD 2017; World Bank 2013, 2016). There is also significant interest in these issues in the scholarly community (e.g. Acemoglu and Restrepo 2017; Arntz, Gregory and Zierahn 2016; Grace,

Salvatier, Dafoe, Zhang, & Evans 2017; Mishel and Bivens 2017; Mokyr, Vickers and Ziebarth 2015; Roine and Waldenström 2014). Despite this increasing interest, the effects of automation in particular remain highly contested and understudied with respect to developing economies, given that most research has focused on high-income OECD countries such as the United States.

However, these are not just OECD country issues. Indeed, automation is likely to affect developing countries in different ways to how automation affects high-income countries because the poorer a country is, the more jobs it has that are, in principle, automatable. The kinds of jobs that are common in developing countries—such as routine agricultural and manufacturing work—are substantially more susceptible to automation than the service jobs. Automation is likely to have profound effects on structural transformation in developing countries. How developing countries should respond in terms of public policy is a crucial question, affecting not only middle-income developing countries, but even the very poorest countries, given the automation trends in agriculture. Concerns about the effect of technology on jobs is not new to automation. The current debate focuses too much on technological capabilities and automatability, and not enough on the economic, political, legal, and social factors that will profoundly shape the way automation affects employment. Questions about profitability, labour regulations, unionization, and corporate–social expectations will be at least as important as technical constraints in determining which jobs get automated, especially in developing countries.

7. CONCLUSION

Deindustrialization and tertiarization are emerging as the contemporary development trajectory for many developing countries. This paper has proposed a new comparative

research agenda on the topic based on the following questions. To recap: first, what are the 'varieties' (or types) of contemporary deindustrialization in the developing world and how do they differ from deindustrialization in the developed countries? And are the episodes best described as deindustrialization or tertiarization? Second, what factors drive the different varieties of deindustrialization in the developing world, and what is the institutional basis and social structure of each variety of deindustrialization? Third, what is the potential for service-sector-led growth to replace manufacturing in terms of value-added and employment growth, or what would make reindustrialization a viable economic development strategy? Fourth, who are the winners and losers in a relative and/or absolute sense and who 'captures' productivity growth (or what determines its distribution) in each variety of deindustrialization? And what is the role of the state and public policy in regulatory and distributional governance related respectively to deindustrialization? Finally, how are deindustrialization and technological development related? And how does automation impact the different varieties of deindustrialization in terms of growth and distribution dynamics?

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