DISCUSSION PAPER

Is Manufacturing Dead?

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Introduction

Since the Industrial Revolution, economic development is associated with industrialisation, which can be defined as the emergence and expansion of manufacturing sectors. Even successful examples of late industrialisation, such as Japan and South Korea, followed the same path in the 20th century and developed their economies primarily through manufacturing. However, recent trends in the global economy have challenged the vision that manufacturing is the driving force of capitalism. Recently, there has been an acknowledgement that the economic primacy of manufacturing has been shrinking in line with the emergence of the so-called 'knowledge economy' (Drucker, 1993).

Some argue that this trend marks the beginning of a post-industrial age for developed economies in which the importance of manufacturing, once the key sector of the economy, has become negligible (Bell, 1973). According to this discourse, rich countries now enjoy the benefits of knowledge-based economies driven by services such as engineering, design, finance, architecture, consulting etc., and outsource less sophisticated manufacturing to developing countries such as China, Vietnam, or Thailand. Advocates of this discourse argue that developing countries can simply skip industrialisation altogether and develop their economies on the basis of high-productivity knowledge-based services. Countries like India, Singapore and Hong Kong are often held up as examples of this, where software engineering or business services are more developed than most other developing countries.

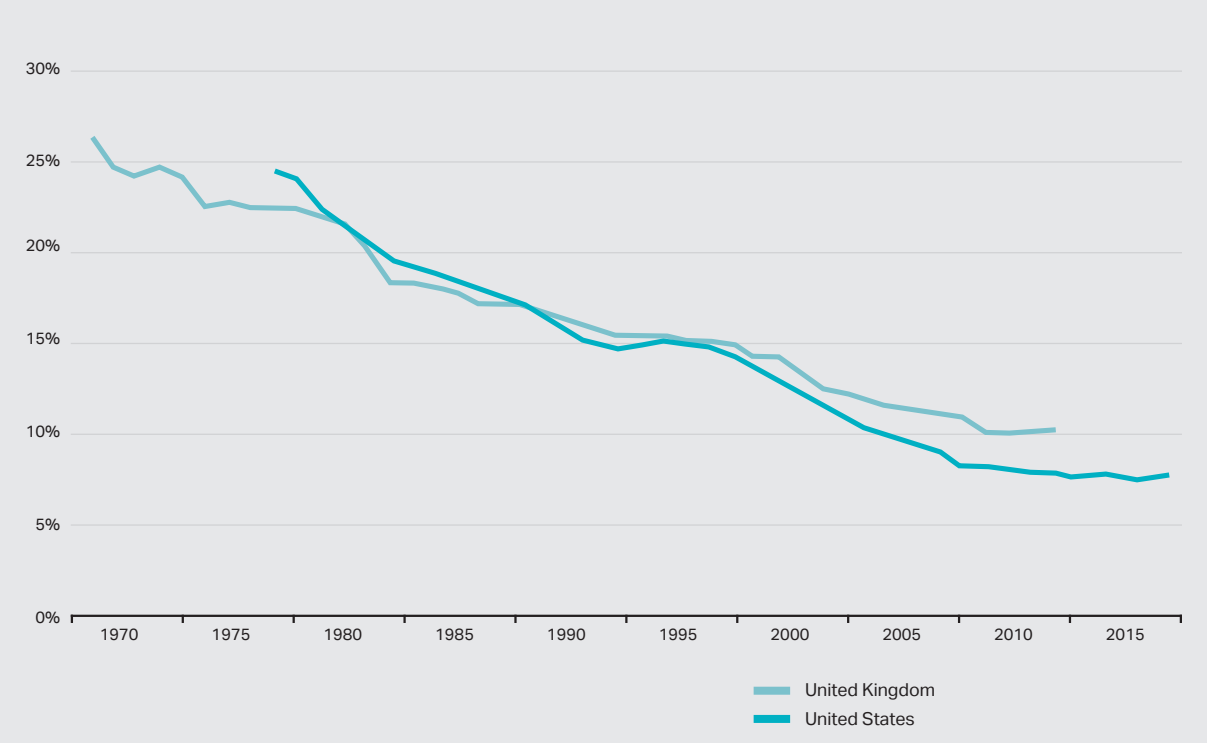
There is also a counterargument in this discussion. Some development economists have pointed out that the use of data to claim a decline in the economic importance of manufacturing is misleading (Timmer, de Vries, and de Vries, 2014). The use of real values instead of nominal values produces a different result. It is further argued that early (i.e. pre-mature) deindustrialisation has negative impacts on the growth trajectories of the developing countries because without manufacturing, productivity growth is slower. Manufacturing contributes to the overall productivity of developing countries, which helps them break with primary sectors such as agriculture and specialise in more promising high-tech sectors instead. Moreover, manufactured goods are more easily exportable and earn higher revenue, which developing countries need to finance their investments. In contrast, services are more often based on domestic demand and consumption patterns.

In this paper, I summarise the discussion of whether manufacturing has lost its significance for economic development in favour of knowledge-based services. A case analysis of Turkey is provided in a separate section. Turkey is a revealing example in the sense that both services and manufacturing sectors played a crucial role in its economic growth. Furthermore, there is an ongoing discussion about whether Turkey is overly dependent on construction and service-led sectors while its manufacturing sector has not developed enough to spur productivity and create more jobs for its young population in recent decades.

Patterns of Deindustrialisation

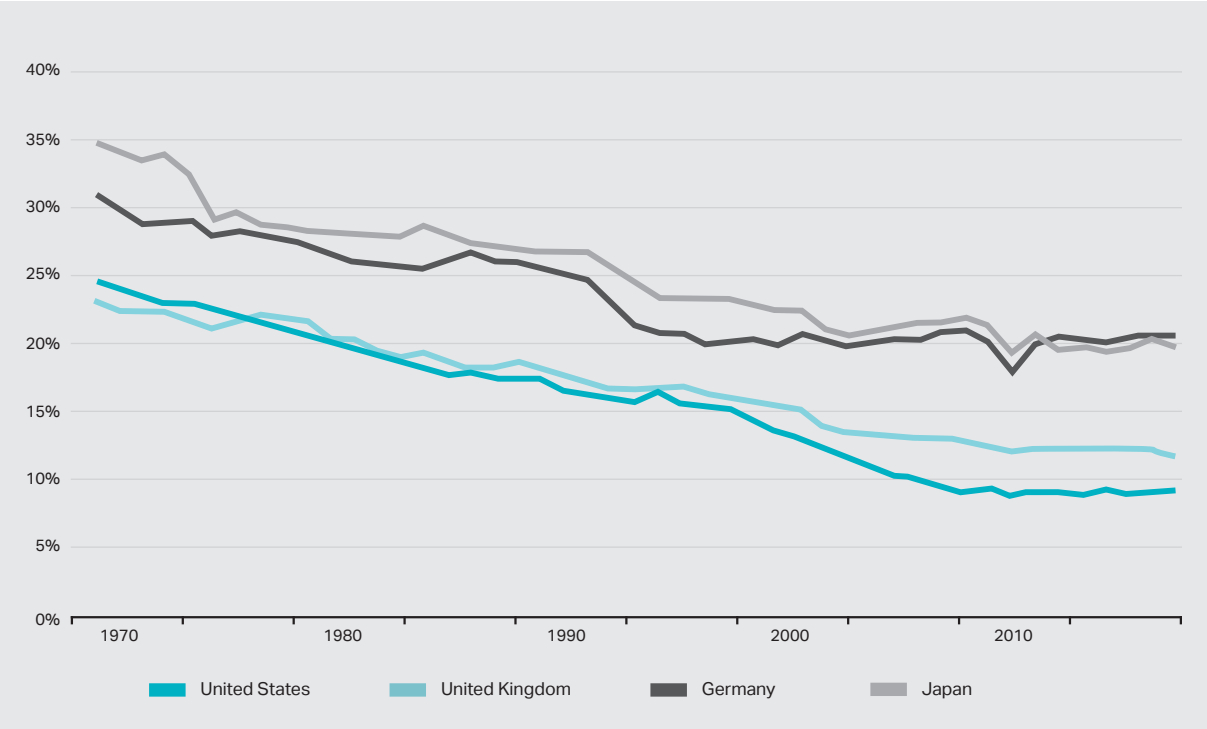
Many have argued that there has been a noticeable trend in recent decades towards deindustrialisation in most developed economies, and at the global level more generally (Nickell, Redding, and Swaffield, 2008: Buera and Kaboski, 2009). A number of empirical observations have been used to substantiate this claim. First, in many developed countries, the labour force has shifted from manufacturing towards services. As can be seen in figure 1, in the US manufacturing accounted for only 10.2% of total employment in 2012 compared to 26.4% in 1970. Similarly, in the UK the share of total employment in manufacturing has more than halved since 1980 and dropped to 7% in 2017. One explanation accounting for this trend is increased automation in manufacturing via technological advancements, which has substantially reduced the labour requirements of the manufacturing sector. Whatever the cause, it is clear that today there is a

***Figure 1:** Share of manufacturing in total employment*



***Source:** UK ONS and US BLS*

Figure 2: Share of manufacturing in GDP at current prices - USD



Source: *UN data*

much smaller share of total labour force employed in manufacturing compared to a few decades ago.

Further evidence for deindustrialisation is provided by the fact that manufacturing's share of GDP has been shrinking rapidly. For instance, as can be seen in figure 2, between 1970 and 2016 the value-added by manufacturing as a share of nominal GDP fell from 23.3% to 11.7% in the US, and from 31.4% to 20.6% in Germany. The trend is similar in the UK and Japan as well. The evidence seems to suggest that the contribution of manufacturing to total production, both at the global level and by specific country-groups, is getting smaller when compared to other sectors. This has been used to suggest that developed countries are allocating less resources (i.e. labour) to manufacturing production and getting less out of it in the form of contributions to GDP.

The empirical evidence leaves little room for disagreement that there is a process of deindustrialisation occurring in developed countries that is visible both in nominal contribution to the GDP and employment share of manufacturing in the global economy. Many attribute this pattern to the natural evolution a country goes through in the course of economic development; namely, that developing countries first invest in manufacturing, but

undergo a process of deindustrialisation as they reach more mature stages of economic development and specialise in knowledge-based services that are driven by innovation and creativity. In other words, a country first moves from elementary sectors like agriculture to industrial sectors such as textiles and automobiles, and then finally to services such as software engineering, finance and industrial design. This implies a hump-shaped relationship between industrialisation and the level of economic development; so manufacturing share (both in employment and output) first rises and then decreases (Tregenna, 2009; Kucera and Milberg, 2003).

However, this theory does not account for why some developing countries have also been experiencing deindustrialisation in recent decades. This process, referred to as "premature deindustrialisation" first by Dasgupta and Singh (2006), is more puzzling in terms of both its causes and effects. Developing countries today start to deindustrialise at much lower per-capita income levels than past examples of economic growth (Rodrik, 2016). One argument is that this is the consequence of the changing nature of global economy. That is, just like production technologies went through a major revolution at the beginning of the modern age (i.e. industrial revolution), we are now in the midst of another revolution that is technology and knowledge driven. Daniel Bell, for instance, in his 1973 book *The Coming of Post-Industrial Society*, not only predicted the decline of manufacturing in favour of service-based sectors but also argued that blue-collar jobs and technical know-how will lose their importance and theoretical knowledge and professions such as law and programming will dominate.

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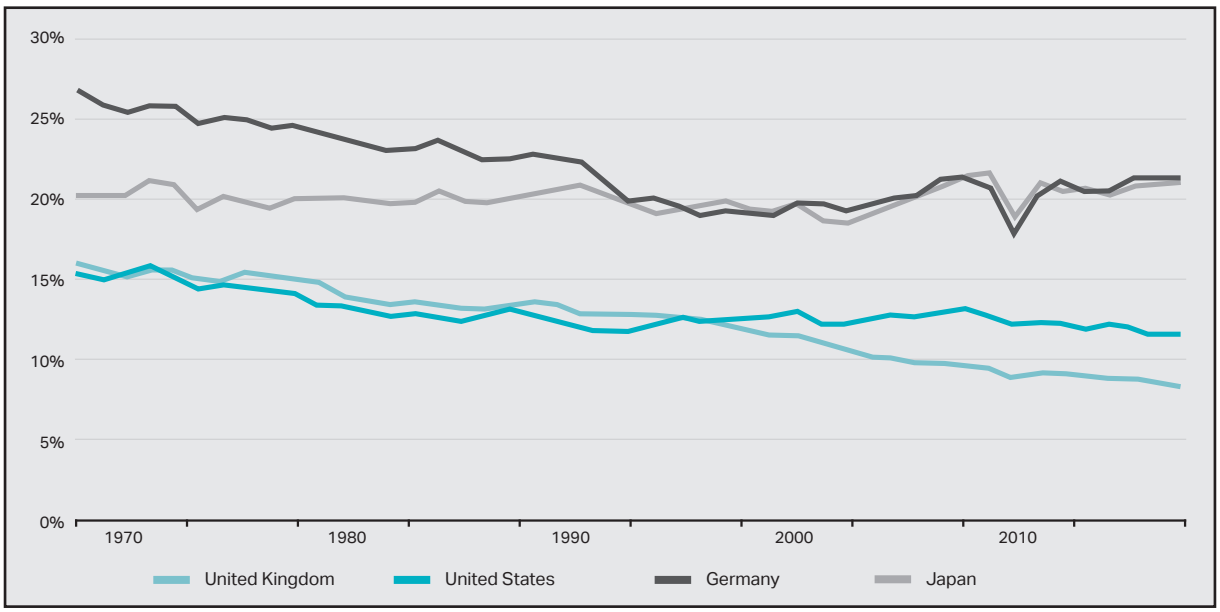
Two decades later, Drucker (1993) asserted that we have already entered a new stage of post-capitalist development, where it is no longer ownership of physical capital but innovation and creativity that holds the key to the competitive advantage of countries. According to Drucker, the prosperity of countries – not only those with developed economies- comes from intellectual capital. Here, there is a case for moving away from manufacturing in developing countries as well; developing countries need no longer to invest in machinery and manufacturing capacity but should rather invest in education, R&D, and hence the intellectual capital of the society. For instance, it is the design and software programming and not the actual production of iPhones that generates value. Following this line of thinking, unexpected early deindustrialisation of developing countries, unlike most previous examples of economic development, should be celebrated and encouraged rather than generate concern. Dasgupta and Singh (2006) indeed make the case that services may grow faster than manufacturing in today's world and replace manufacturing as the engine of growth in countries like India and Taiwan.

The Counterargument: "manufacturing is still important"

There is also a counterargument in this debate, which asserts that manufacturing is still central to economic growth, especially in emerging economies. To begin with, the empirical evidence in favour of deindustrialisation of developed countries has been challenged by a number of statistical observations. On the one hand, the transition of the labour force from manufacturing to other sectors can be accounted for due to increasing productivity rather than declining importance of manufacturing in the economy. Real value-added per worker in manufacturing is higher than other sectors and this gap has been widening through time thanks to robotisation and the use of more advanced technologies in manufacturing (Lawrence and Edwards, 2013). The dynamism of manufacturing in terms of productivity gains has been a key driver of lowering work force requirements of manufacturing production, which in turn led to shrinking in the share of manufacturing in the total labour force.

On the other hand, the decline of manufacturing share in the nominal GDP is to a large extent explained by the relative price decline of manufactured goods. Productivity growth in manufacturing has been much faster compared to other sectors. Accordingly, prices of manufactured goods has gradually declined over the last few decades in comparison to other goods and services. Figure 3 clearly

***Figure 3:** Share of manufacturing in GDP at constant prices - 2010 USD*



***Source:** UN data*

shows that manufacturing value added remains mostly the same as a share of GDP in developed countries when one keeps prices constant, with the exception of the UK. Thus, there is no evidence of deindustrialisation in real terms. The exceptional case of the UK is problematized by Ha-Joon Chang, who argued that "the neglect of manufacturing and over-development of the financial sector is the cause of the economy's decline" in the UK (Guardian, 18 May 2016). It should also be mentioned that while the price of manufactured goods has declined, the quality and diversity of manufactured goods has increased. In other words, the manufacturing sector has succeeded in providing consumers with better products for lower prices.

These two basic observations demonstrate why manufacturing is still important for global economic development but fail to provide a convincing argument for why developing countries should continue to invest in manufacturing instead of (or more than) services. If manufactured products are cheapening globally, then developing countries can import these products and invest their limited resources in well-paying services instead. However, critics of early deindustrialisation claim that this argument is also flawed. Firstly, increased productivity is much faster in manufacturing compared to services, so manufacturing plays a key role in driving the overall productivity of a country. If deindustrialisation is happening only in nominal terms due to decreasing prices (and hence increasing productivity), this may not be a problem, but if a country is deindustrializing in real terms, the possibility exists that specialisation in services may lead to lower rates of growth. Even though some services (e.g. programming, design) may be more productive, these sectors require very costly long term investments while the fruits of manufacturing are readily available to be picked up for developing countries (Rodrik, 2016).

> *...developing countries that experience deindustrialisation too early are saddled with low productivity service sectors that are mostly non-exportable*

Secondly, deindustrialisation is even more problematic considering the limited exportability of services. Most services target domestic demand and are usually traded when the supplier and demander are in the same location. Hence, the share of services in international trade has been very low compared to manufactured products for a very long time. Therefore, developing countries, which specialise in services early on have less export earnings, leading to a deterioration in balance of payments. Combined with the low productivity growth mentioned above, a deterioration in the balance of payments demonstrates the problematic nature of premature deindustrialisation. This pattern contrasts sharply with the classic East Asian growth experience, such as in South Korea and Japan, in which productivity gains in manufacturing contributed strongly to export-driven growth.

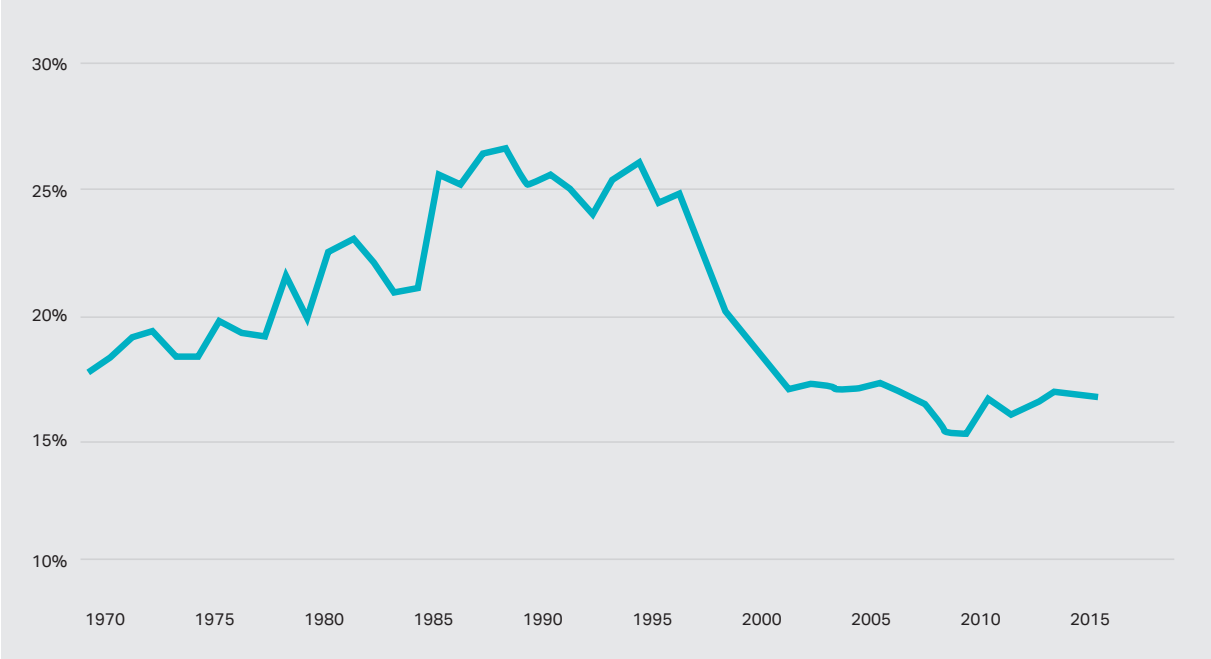
The main idea here is that the deindustrialisation of developing countries in real terms may deprive them of the benefits of the manufacturing sector in terms of economic growth. Manufacturing requires reduced labour inputs in developed countries and produces cheaper goods thanks to labour-saving technological advancements, but still drives the engine of productivity. Without the growth in productivity made possible by mechanisation and automation in manufacturing and the accompanying technological progress, it is not possible for developing countries to catch up economically with more developed economies (Rodrik, 2012). Thus, developing countries that experience deindustrialisation too early are saddled with low productivity service sectors that are mostly non-exportable.

The Case of Turkey

Turkey, as a developing country, has been a laboratory for structural transformation throughout its modern history. Since the 1960s, the country slowly and gradually transformed its labour force from agriculture to manufacturing, which enabled its economy to grow modestly but without major breaks. Today, there is an ongoing discussion about whether Turkey, especially in the last two decades, has shifted its focus away from manufacturing to services and construction. Some have argued that such a trend makes the Turkish economy less productive and overly dependent on domestic demand because neither services nor construction are export-friendly (Siklar and Tonus, 2007). Consequently, the argument goes, Turkey's growth comes at the expense of a growing current account deficit that is manifested in excessive foreign borrowing (Esiyok, 2018; Tepav, 2006).

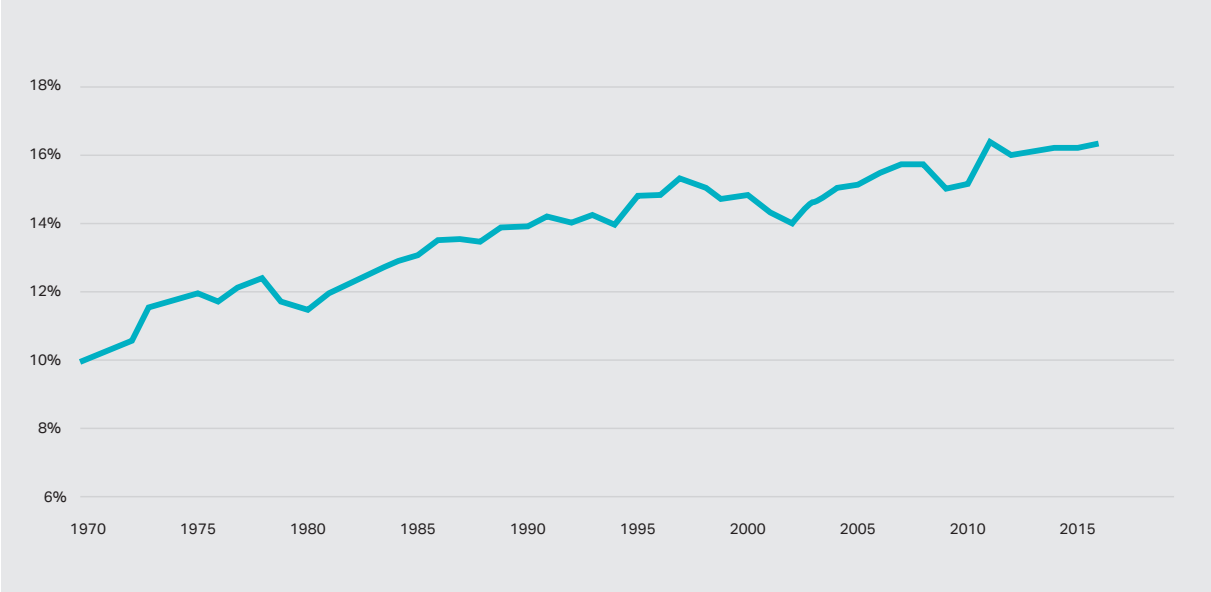
However, the assumption that Turkey is in reality moving away from manufacturing is not backed up by the data. As it can be seen in Figure 5, the share of manufacturing in GDP continues to grow at constant prices, if not in current prices. Turkey has experienced drops in its manufacturing share for respectively short episodes including the 1994 currency crisis in which the output fell by 6%; the 1999 earthquake which hit Turkey's most industrial region; the 2001 banking crisis which completely crashed Turkey's credit market; and finally the 2008 global financial crisis. However, the overall trend is clearly upwards in the long run, so for better or worse, it cannot be said that Turkey as of yet has experienced deindustrialisation.

***Figure 4:** Turkey's share of manufacturing in GDP at current prices - USD*



***Source:** UN Data*

***Figure 5:** Turkey's share of manufacturing in GDP at constant prices - 2010 USD*



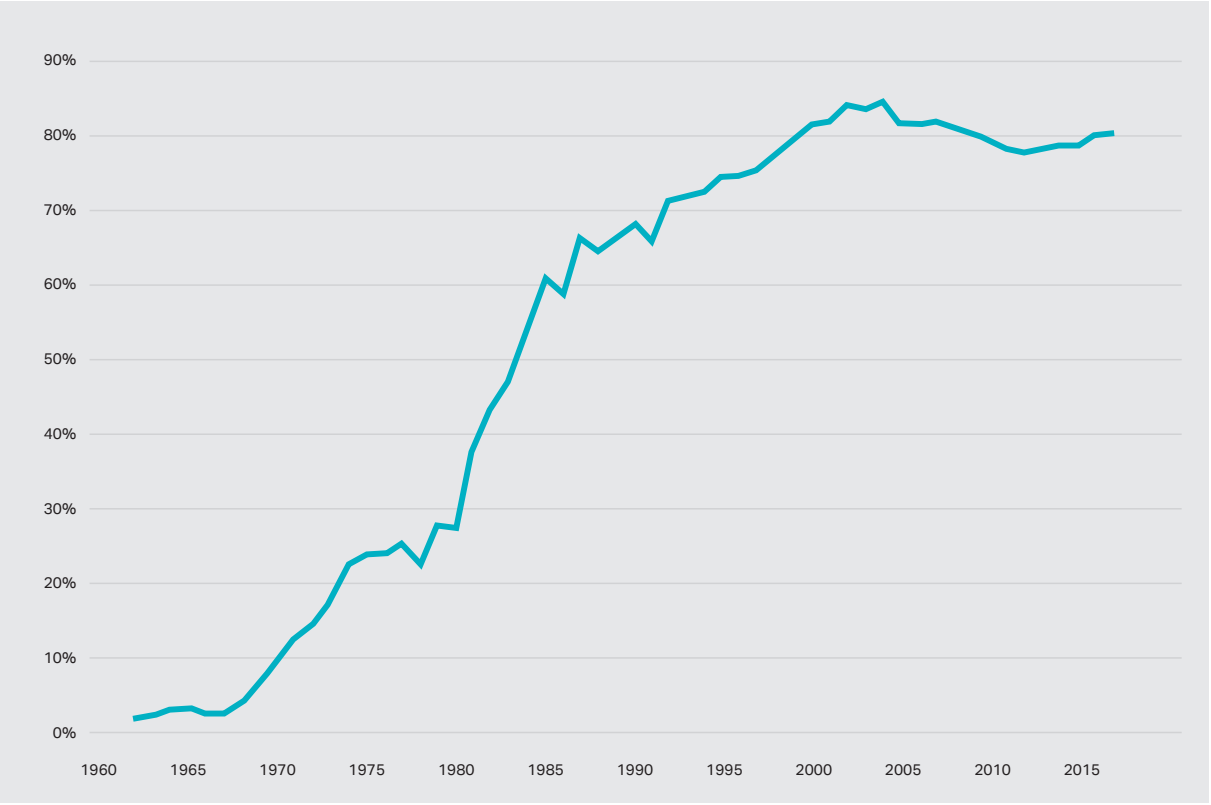
***Source:** UN Data*

This trend in and of itself does not prove that Turkish economy is on the right path in terms of its sectorial composition. As it can be seen in figure 6, the export of manufactured goods as a percentage of GDP has almost steadily declined since 2004 as a result of decreasing prices of manufacturing output. To put it differently, even though the share of manufacturing in GDP terms has continued to grow at constant prices, its contribution to Turkey's export revenue has declined in last two decades. In this respect, Turkey represents a perfect example of the nuanced nature of the manufacturing discussion. In Turkey's open economy, price effect matters a great deal for trade balance. Increasing the contribution of manufacturing to real GDP may be important for providing a greater variety and quality of consumption goods and hence better living standards, but it should also be considered that decreasing export revenue means a larger trade imbalance, higher account deficit and therefore growing external debt.

Overall, it is not a question of where people work but whether they create more value or not. Therefore, a more meaningful distinction for Turkey is the one between low-value-added versus high-value-added production.

One conclusion to derive from this analysis is that Turkey needs to reconsider its sectorial composition and reform its economy towards high value-added sectors, whether in manufacturing or otherwise. Considering Turkey's stubbornly high unemployment rate, manufacturing may be advantageous because it has the capacity to absorb more labour. High-tech manufacturing sectors such as pharmaceuticals, aerospace, defence etc. provide a great opportunity for Turkey to improve its production technologies towards higher value-added production. On the other hand, services such as software programming, finance, design etc. are also good ways to create more value and overcome the problem of trade imbalance without spending huge amounts of initial fixed costs on land, buildings and machinery. Overall, it is not a question of where people work but whether they create more value or not. Therefore, a more meaningful distinction for Turkey is the one between low-value-added versus high-value-added production.

Figure 6: Turkey's share of manufactures in merchandise exports



Source: *World Bank*

Conclusion

It is clear from the data that developed countries are deindustrialising, at least in regard to manufacturing's share of the total labour force. Needless to say, the shift in employment patterns away from manufacturing has enormous economic and sociological implications. However, unlike what many suggested, this should not be taken as symptomatic of the declining importance of manufacturing for economic development, but rather as a consequence of rising productivity due to automation and technological advancements. Rising productivity in manufacturing also leads to cheapening of manufactured goods, which is the primary reason why the share of manufacturing value-added in nominal GDP has been steadily decreasing in recent decades, while it has remained the same at constant prices. Overall, thanks to rising value-added per worker in manufacturing, people in developed countries consume more diverse and much cheaper manufactured goods even though less people are employed in manufacturing jobs.

It is also clear that there is an ongoing process of deindustrialisation in some developing countries as well, which runs against the historical patterns of structural change observed in today's developed countries. The question is whether this is more beneficial or detrimental with respect to economic growth in developing countries. My contention is that if these economies can reallocate resources, especially labour, to service-based sectors such as programming and finance that are both very productive and tradable, then declining share of manufacturing may not pose a problem for economic growth as the case of India seems to demonstrate (Aggarwal and Kumar, 2015). However, if these countries deindustrialise in favour of non-dynamic and non-exportable services, then this will lead to slower economic growth limited by domestic demand. This is the condition of most developing countries in Latin America and Sub-Saharan Africa today (Tregenna, 2015). In both case however, countries face the problem of job creation because service based sectors of both types do not have the capacity to absorb a large labour force.

When it comes to Turkey, the position that Turkey has experienced premature deindustrialisation is not tenable because manufacturing's share of GDP has in fact risen at constant prices even though, at current prices, it has decreased. However, an argument can be made that Turkey has spent too many resources on service sectors and a non-tradable low-value-added sector such as construction. Had Turkey invested more in manufacturing, the growth rate might have been more sustainable in the long run. More importantly, as manufacturing prices go down, the value of manufacturing exports also decreases. Thus, manufactured goods earn less export revenue, contributing to Turkey's current account deficit problem. Turkey needs to transform its economy towards high-value-added sectors, manufacturing or not, in order to solve its account deficit problem and prevent its external debt stock grow further.

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