FRIEDRICH NAUMANN FOUNDATION For Freedom.
Pakistan

E A G ECONOMIC ADVISORY GROUP

PRIME ECONOMIC THINK TANK

STICK-IN-THE-MUD: WHY PAKISTAN IS FALLING BEHIND?

A Case of Missing Transformation

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Executive Summary

Why is Pakistan falling behind? What is the role of dismal labour productivity growth in hindering meaningful transformation? Can overallocation of resources in some sectors at the expense of others due to political economy reasons explain Pakistan's poor economic performance? This report attempts to answers these questions through the lens of structural transformation.

The report starts with documenting the phenomenon of missing structural transformation in the case of Pakistan. Specifically, unlike regional peers, agriculture's share in both total employment and value added has decreased by significantly less over the past several decades. Moreover, changes in the composition of both the export and the import baskets also point to limited economic transformation. We also find that the limited transformation Pakistan has undergone has been towards sectors with low productivity growth thus undermining the country's future growth prospects. One of the key reasons behind the lack of transformation is that labour productivity in both the overall economy and the agriculture sector has increased by the least in the case of Pakistan relative to the regional economies. As a result, unlike in most other countries, there is limited incentive for labour to move from agriculture to non-agricultural sector.

But what is behind the dismal increase in labour productivity? We find that, contrary to popular belief, a critical reason for this is the lack of capital deepening. In fact, capital-to-output ratio has been declining since late 1970s such that today Pakistan has one of the lowest levels of capital-to-output ratio across the list of 183 countries included in the PWT dataset. We think that high macroeconomic uncertainty due to irresponsible macroeconomic policies, including low foreign reserve buffers, are critical for understanding the persistent decline in capital-to-output ratio and, as a result, low growth in labour productivity.

The second half of the report starts with documenting differences in labour productivity across sectors. This is important since it has the potential to open doors for policymakers where reallocating resources from less productive to more productive sectors can increase overall productivity in the economy. Consistent with the rest of the literature, we find that the agriculture sector has one of the lowest labour productivity in Pakistan. Labour productivity in the agriculture sector is 47% that of the non-agriculture sector. We consider if differences in wages and production technology across the agriculture and the non-agriculture sectors can explain the difference in labour productivity between the two. However, we find that these factors cannot explain the observed differences, pointing to an overallocation of resources in the agriculture sector due to reasons which are related to government policies and market failures such as frictions in the credit markets.

Since an increase in labour productivity is critical for meaningful transformation, the report goes on to explore how an increase in integration in the Global Value Chains can help increase overall productivity in the economy. We document that the level of participation in the GVCs is one of the lowest for Pakistan. Surprisingly, and contrary to what we find for other fast-growing economies, the GVC participation in Pakistan is lower for the export sector than it is for the non-export sectors. We conclude the discussion with showing that an increase in GVC participation can go a long way towards increasing the productivity growth and, as a result, facilitate the transformation process.

The discussion in this report centres around the allocation of resources across the economy. However, we note that the challenge of resource misallocation as in the case of Pakistan is not just a challenge of technical knowledge and administrative expertise but also has power-relations between the ruling elites and the effectively disenfranchised masses at the core of it. What is considered economically inefficient could very well be maximising the economic rents for the elites. Therefore, we are unlikely to achieve meaningful progress without bringing these power-relations to the forefront of any discourse on reforms.

1 Introduction

Over the last three decades, Pakistan's labour productivity has increased at an annual average growth rate of only 1.29%. Additionally, Pakistan's economy has seen limited transformation in its structure as measured by the change in the share of agriculture sector in total employment and the nature of products being exported and imported. Our analysis further shows that whatever transformation Pakistan has undergone has been towards sectors with limited potential to grow. In contrast, together with undergoing significant economic transformation, average labour productivity for Bangladesh, India, and China has increased by 3.75%, 4.55%, and 8.2%, respectively, over the same period.

Why is Pakistan falling behind? What is the role of dismal labour productivity growth in hindering meaningful transformation? Can overallocation of resources in some sectors at the expense of others due to pollical economy reasons explain Pakistan's poor performance as highlighted above? While these questions are interrelated, the latter also brings to the forefront the nature of interaction between the political process and the institutions such that it undermines development. As Jones (2013) notes, *"misallocation is the equilibrium outcome of a political process interacting with institutions and the distribution of resources ... It is, evidently, not in the economic interests of the ruling elite to improve the allocation of resources, despite the potentially enormous increase in the size of the economic pie that is possible in the long run."*

A large body of literature has attempted to answer the question on differences in income levels across countries through the lens of structural transformation and factors which may prevent this (Restuccia et al., 2008; see Herrendorf et al. (2014) for an overview). This is generally defined as reallocation of labour from the agriculture sector to the non-agriculture sector. Herrendorf and Valentinyi (2012) specifically point to large differences in labour productivity for agriculture and equipment sectors across advanced and developing countries which play an important role in explaining variation in income levels across countries. In similar spirit, Hayashi and Prescott (2008) point to institutions which prevented

labour from relocating from the agriculture sector as the key reason for why economic transformation in Japan did not take place sooner. Another group of researchers have also studied how restrictions to international trade may hinder the transformation process (Matsuyama, 1992; Dio et al., 2002; Uy et al., 2013; Betts et al., 2017; Gollin et al., 2014a and 2014b; Teignier, 2018).

This study follows in the tradition of focusing on reallocation of resources across sectors to document and understand the phenomenon of missing economic transformation observed in the case of Pakistan. Since economic transformation is closely linked to both improvements in labour productivity and misallocation of resources across sectors, the report analyses in detail trends in labour productivity both at the aggregate level and across sectors to shed light on why a significant fraction of economic resources remain concentrated in the agriculture sector. Importantly, and unlike in the case of other developing countries, we draw attention to the reversal of capital deepening since the 1970s as the key factor responsible for low labour productivity growth in the case of Pakistan. Moreover, in the context of Pakistan, we confirm the finding in the literature that labour productivity in the agriculture sector is indeed significantly lower than in the rest of the economy thus pointing to the overallocation of resources in the agriculture sector. Finally, we analyse the extent and the nature of Pakistan's participation in Global Value Chains (GVCs) and ask if trade reforms which help increase GVC participation can improve overall productivity in the economy and facilitate the process of structural transformation.

We start with documenting that in the three decades since 1990, the decrease in the share of agriculture in total employment was one of the lowest for Pakistan compared to the 51 countries for which comparable data is available. The employment share decreased by only 10 percentage points. In decades preceding the 1990s, the speed of transformation was once again much lower than that observed for the fast-growing economies at the time such as South Korea. An important reason for this is that labour productivity in both the overall economy and the agriculture sector has increased by the least in the case of Pakistan relative to the regional economies. As a result, unlike in most other countries, there is limited incentive for labour to move from agriculture to non-agricultural sector.

When analysing the reasons for dismal growth in labour productivity at the aggregate level, we find that a critical reason for this is the lack of capital deepening. In fact, capital-to-output ratio has been declining since late 1970s such that today Pakistan has one of the lowest levels of capital-to-output ratio across the list of 183 countries included in the PWT dataset. While Pirzada (2023) point to higher level of macroeconomic uncertainty as the primary reason for this trend, more work is needed to understand this in detail.

Another important reason for limited structural transformation in the case of Pakistan is the overallocation of resources in the agriculture sector. In line with the findings in this literature, we document that the agriculture sector has one of the lowest levels of labour productivity in Pakistan. When we aggregate sectors into agriculture and non-agriculture sectors, we find that labour productivity in the agriculture sector is only 47% of that in the non-agriculture sector. Under certain assumptions, this should imply higher wage in the non-agricultural sector and, as a result, should lead to the reallocation of the labour from the agriculture to the non-agricultural sector. This should happen until the point when both wages and labour productivity are once again equal across the two sectors. But this is not the case. While labour productivity differs across agriculture and non-agriculture sectors, we find wages to be roughly similar. This suggests that the limited economic transformation we observe in Pakistan is not only due to dismal improvement in labour productivity but also due to a combination of policies and market failures such as those in credit markets which incentivise overallocation of resources in agriculture sectors at the expense of more productive sectors in the economy.

Since an increase in labour productivity is suggested as an important driver underlying structural transformation, we conclude with exploring how an increase in integration in the Global Value Chains can help increase overall productivity in the economy. We document that the level of participation in the GVCs is one of the lowest for Pakistan when compared with other fast growing developing economies. Moreover, the limited participation in the GVCs comes from exporting raw materials and intermediate inputs to countries which processes these for further export. We further note that, unlike regional countries, the export-oriented sector in Pakistan scores even worse than the non-export-oriented sector in terms of both the level and the nature of GVC participation. We conclude with showing that an increase in GVC participation can go a long way towards increasing the productivity growth and, as a result, facilitate the transformation process in Pakistan.

The approach to understanding economic transformation in this report is different from a parallel body of literature which uses firm level data to study the extent to which resources are misallocated across firms (Restuccia and Rogerson, 2008; Hsieh and Klenow, 2008). More recently, in a 2022 World Bank report focusing on Pakistan, Gonzalo Varela and his team use firm level data for 410 publicly listed firms for the period 2012-2017. Their sample covers 11 sectors and accounted for 13% of Pakistan's GDP in 2017. Varela et al. (2022) find that the productivity of these firms remained largely stagnant during this period. The report further noted that foreign-owned or exporting firms had higher productivity growth than other firms in the sample. Notably, the report also sheds light on the negative implications of high import duties on the productivity of firms operating in the downstream industries.

In other work focusing on Pakistan, Wadho and Chaudhry (2018) highlight the positive influence of product innovation at the firm level on both the level and the growth of labour productivity. They find *"vertical knowledge flows from foreign clients and suppliers"* as key determinants for firms willingness to innovate. In subsequent work, Wadho et al. (2019) use survey data covering a sample of firms operating in the textile and apparel sector to study the effect of innovation of employment growth. They find that innovation indeed leads to increase in employment at the firm level. Wadho et al. report this to be particularly true for young firms. Wadho and Chaudhry (2022) find considerable variation in how different types of innovation affect labour productivity, with organizational innovation having the largest effect. This is followed by process innovation. The further report, *"Foreign competition has a negative effect on product innovation and a positive effect on organizational innovation."* Earlier, Haseeb and Chaudhry (2014) use firm level data from census for manufacturing industries for Punjab to study the extent of misallocation within the manufacturing sector.

In a compendium published by PIDE under the title *Sludge*, Haque et al. (2022, 2023) identify regulatory and bureaucratic barriers within different sectors ranging from agriculture to services which increase the cost of undertaking economic activities in Pakistan. In another study published by PIDE, Ahsan Pirzada and his co-authors specifically look at the laws and regulations which govern the sugar industry in Pakistan and how these may sustain inefficiencies in the agriculture sector (Pirzada et al., 2023). A body of work funded by RASTA PIDE attempts to understand these issues at a micro level in detail.

Earlier, the Economic Advisory Group (EAG) in its *Vision Document* gave a broad overview of what factors can potentially explain the missing transformation in the case of Pakistan (EAG, 2021). The EAG Vision Document also proposed policies which could help the country *"progress beyond its outdate and ossified structure."* The policies included *"revisiting pricing regimes which currently govern agriculture and commodities sectors; revamping of the education system with the aim to introduce and mainstream pathways for vocational training at the level of higher and postsecondary education; reduction in tariff and non-tariff trade restrictions and greater integration with regional trade blocs; and, finally, rethinking industrial policy with special emphasis on moving away from picking winners to rewarding innovators, improving land-use within cities, and simplification of the tax code."*

The rest of the report is structured as follows. Section 2 provides a brief overview of the literature on economic transformation and discusses the nature of transformation observed at different stages of economic development. The section then presents data for Pakistan which highlights the limited economic transformation Pakistan has experienced over several decades. Section 3 proceeds with the discussion on what drives the transformation process. The section compares trends in labour productivity both across countries and across sectors within each country. In section 4, we attempt to better understand the factors driving changes in aggregate labour productivity for Pakistan by decomposing it into capital deepening, human capital accumulation, and technical efficiency. Section 5 turns to the challenge of

misallocation of resources. It particularly focuses on analysing if there is indeed an overallocation of resources to the agriculture sector, in line with what the literature finds for the rest of the world. Section 6 looks at the extent and the nature of Pakistan's participation in global value chains. The section considers this for both export-oriented industries and non-export-oriented industries separately and compares what we find for Pakistan with regional countries. We then proceed to section 7 where we study if an increase in participation in the GVCs can help increase the overall productivity and, as a result, facilitate economic transformation. Section 8 steps back from the technical details discussed throughout this report and offers brief recollections on why the power relations between the ruling elites and the effectively disenfranchised masses must be at the core of any discussion around economic transformation and the allocation of resources across the economy if we are to make progress towards a prosperous society. Finally, section 9 concludes.

2 Structural Transformation

As countries develop, they also undergo a large-scale change in the structure of their economies in a process known as structural transformation. According to Kuznets (1973), structural transformation is one of the six key characteristics of modern economic growth. It is commonly understood as the reallocation of resources across broad sectors of the economy. Over the course of development, this reallocation generally involves a decline in both the share of labour force engaged in the agriculture sector and the sector's share in the overall economy. While there is considerable agreement on the role played by technological progress in driving this process, it is less clear if this happens due to an increase in productivity in non-agricultural sectors or the agriculture sector. The former represents technological process which *pulls* resources away from agriculture, whereas the latter represents the process which pushes resources away from agriculture. Alvarez-Cuadrado and Poschke (2011) find evidence in favour of the *pull* factors during the early stages of structural transformation while suggesting that it is *push* factors which dominate during the later stages.

Historically, the nature of economic growth has been closely tied to the process of structural change. The era preceding the Industrial Revolution, for instance, marked a phase of slow economic growth and minimal structural (Maddison, 2003). Economies were primarily agrarian, with limited diversification and industrialization. However, with the onset of the Industrial Revolution in the eighteenth century, a paradigm shift occurred. Economies began to witness accelerated growth rates, primarily driven by the rapid expansion of the industrial and manufacturing sectors (Ocampo et al., 2009). Kuznets (1966) was seminal in articulating this transformation. He highlighted the role of industrialization in elevating economies onto higher growth trajectories. The substantial influx of labour and capital into manufacturing was propelled by the sector's economies of scale, high-income elasticity for its goods, and immense potential for productivity catch-up (Rodrik, 2011; Weiss, 2011). Europe, Japan, and the United States exhibited pronounced shifts from primary goods production towards manufacturing and services during

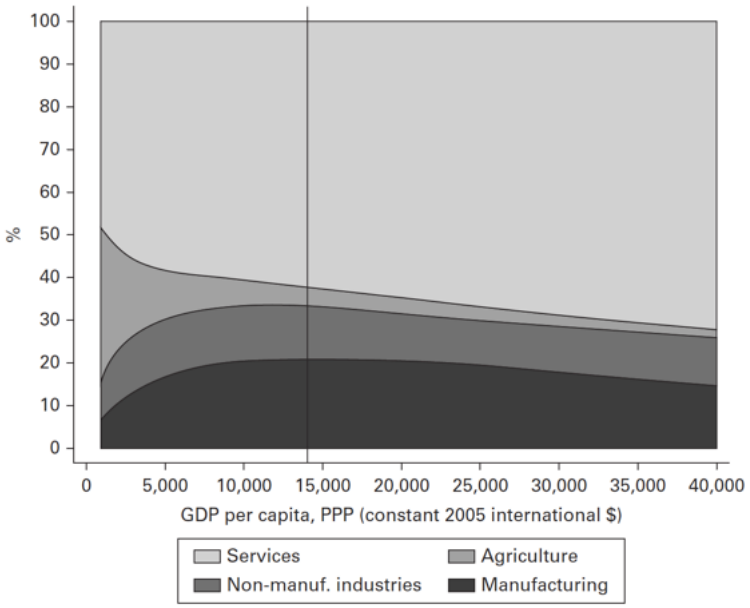


Figure 2.1

GDP Composition by Income and Sector, 1963-2007. *Source: Haraguchi*

the post-war period, further underscoring the global nature of this transformation (Denison, 1967; Maddison, 1987). Figure 2.1 shows the in the agriculture sector's share in total employment observed over time in both the United States and Japan. In 1840, the U.S. had more than 60% of its workforce employed in agriculture, reflecting the economy's agrarian nature during that period. However, over the span of 160 years, by 2000, this number had dramatically reduced to a mere 2.4%. A parallel trend is evident in Japan. Around 1870, a staggering 85% of Japan's total labour force was engaged in agriculture. But just like the U.S., Japan also witnessed a substantial decline in agriculture's share in total employment over the years, However, the speed with which structural transformation took place in Japan and across several other developed and developing economies during this period has been much greater than what was previous observed for the US and the UK. This transformation is also reflected in the decline in agriculture's share in value-added in both nations.

Figure 2.2 is taken from Haraguchi (2015). Haraguchi uses panel data for 100 countries spanning over a 45-year period from 1963 – 2007, to study the nature of structural change at different stages of economic development. The figure shows a significant decline in the share of agriculture in the GDP along the development path. This decline is most pronounced at the initial stages of development. Agriculture's share in GDP decreases from more than 30% during the early stages of development to less than 10% as the country reaches middle-income status. Concurrently, there is a noteworthy rise in the manufacturing sector's contribution to the GDP. This rise in

manufacturing sector's share in GDP underscores its vital role in bolstering economic development during the early and intermediate stages of development. As countries transition from the lower-middle income bracket to the upper-middle income bracket, the pace at which the manufacturing sector expands decelerates. It then stabilises before declining thereafter.

What drives this transformation process? Technological progress remains a pivotal factor underlying structural change across countries. It primarily manifests at the industry level, inducing heterogeneous trends in productivity improvements across sectors (de Vries et al., 2016). The heterogeneity in technological advancement effectively reallocates resources such as capital, labour, and land across different sectors. The recent emphasis on differences in productivity growth rates in market services sectors, such as retail trade and financial services, underscores the multifaceted nature of structural change (Timmer et al., 2010; Jorgenson and Timmer, 2011).

Focusing on sectoral differences in productivity across developed and developing countries, Herrendorf and Valentinyi (2012) note that it is the equipment, construction, and food sectors where productivity in developing countries is disproportionately lower relative to the levels observed in developed countries. For countries which are at the 10th percentile of the distribution, the productivity gap in these sectors can be 2-3 times as large as the gap observed at the aggregate level between developed and developing countries. The productivity gap is largest for the equipment sector. In contrast, while productivity gap for the manufactured consumption sector is similar to that observed at the aggregate level, the productivity gap for the services sector is smaller between the two sets of countries.

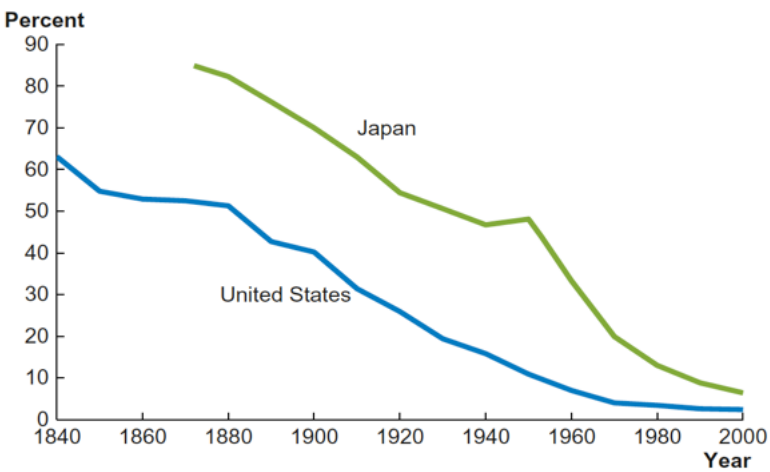


Figure 2.2

Employment in Agriculture as a Share of Total Employment. *Source: Jones (2016)*

The findings in Herrendorf and Valentinyi (2012) raise important policy questions. Should developing countries import equipment and food where possible and specialise in sectors where the productivity gap is relatively smaller? Hayashi and Prescott (2008) appear to agree. In trying to understand why the Japanese economic miracle did not take place before the World War II, they point to the barriers and institutional arrangements in place which prevented economic resources from moving from the less productive agricultural sector to the more productive manufacturing sector.

In what follows, we document the nature of structural transformation in the context of Pakistan.

a. Pakistan: From past to the present

We start with a brief overview of the structural change Pakistan experienced during the first few decades and how it compares with the rest. This is followed by a detailed discussion covering the period from 1990 – 2018. For the latter, we use the *UNU-WIDER Economic Transformation Database* (ETD) database. The ETD is a prominent open-access database which is developed by the GGDC and UNU-WIDER. The database includes comprehensive data for the period 1990 – 2018 and covers 51 countries. This includes 20 economies from Asia, 9 from Latin America, 4 from the Middle East and North Africa (MENA), and 18 from sub-Saharan Africa. ETD provides disaggregated data segregatedon value-added, and the number of people engaged across 12 of the sectors of which make up the economy.

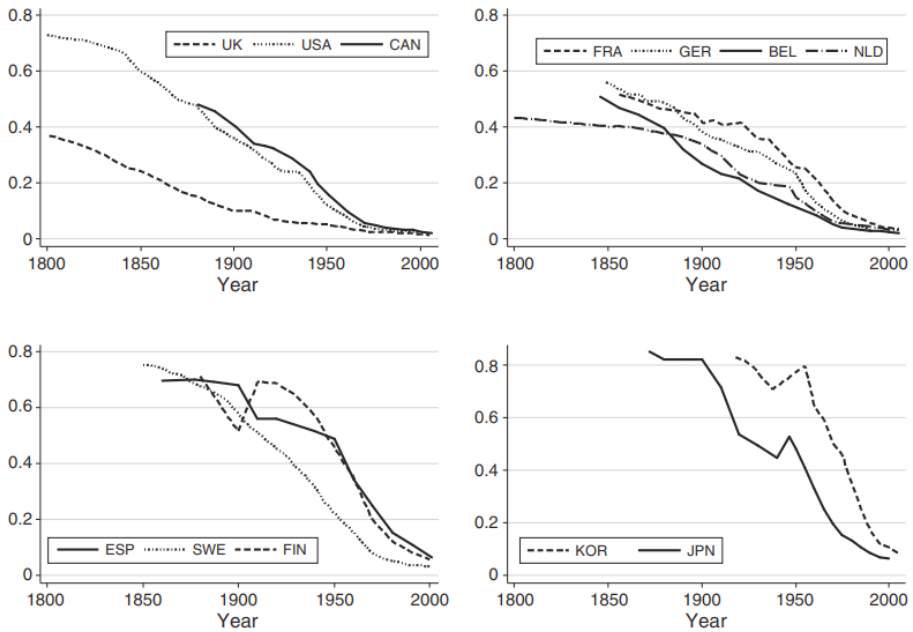


Figure 2.3

The Employment Share of Agriculture. *Source: Alvarez-Cuadrado and Poschke, 2011*

In discussing the social and economic impact of colonial rule in India, Angus Maddison notes, "the area which was to become Pakistan had practically no industry at all." In 1951, the share of agriculture in total employment stood at 67.5% (Guisinger, 1980). Over the next decade, the share decreased to 59.9%. It remained almost unchanged between 1961 – 1972. In the two decades between 1951 – 1972, the share of manufacturing increased by 4 percentage points during the first decade but fell again 6 percentage points during the second decade. The services sector saw a 6 percentage points increase during this period. In 2000, the share of agricultural sector in employment was still as high as 50%, suggesting very little structural transformation during the first five decades after independence.

The share of agriculture in total employment for several of the advanced economies was already quite low by the 1950s. Some of these economies include the US, the UK, Canada, France, Germany, Belgium, Netherlands, and Sweden. These economies had a share of close to 20% or lower. However, in the next five decades, this decreased even further to less than 5%. The speed of economic transformation for many of the fast-growing developing economies was even more impressive. The share of agriculture fell by significantly more and from a much higher level. For example, the number for South Korea fell from 80% is 1950 to about 10% by 2000s. The same for

Japan fell from close to 50% to less than 10% during the same period. The decrease in the share of agriculture in total employment for Finland and Spain was similar to that of Japan. Figure 4.2 is taken from Alvarez-Cuadrado and Poschke (2011) and plots these trends for a much longer period.

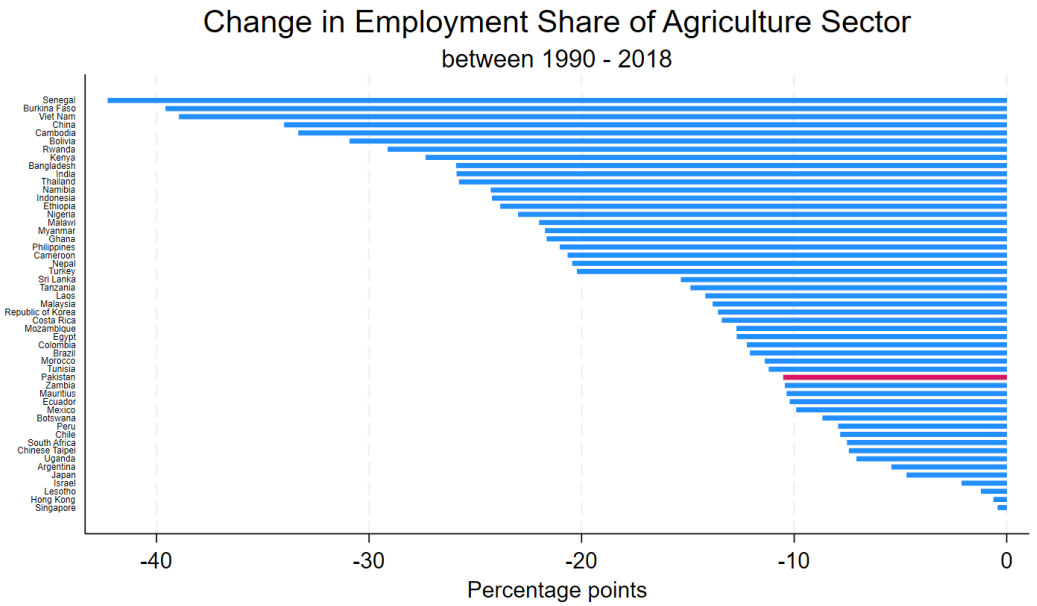


Figure 2.4

Change in Share of Agriculture in Total Employment.

We now turn to the ETD database and discuss the nature of structural change specifically over the last three decades i.e. 1990 – 2018. The key variables included in the ETD database are nominal and real value-added across the 12 sectors and number of people engaged in each of these. The dataset allows us to look at the share of agriculture in both total value-added and total employment over this period and compare it both across countries and with non-agricultural sectors within the country. The objective is not only to understand Pakistan's unique trajectory but also to assess its position in the larger narrative of economic transformation as seen across different geographies and developmental stages.

Figure 2.4 compares the employment share of agriculture across 51 countries included in the ETD dataset. Compared to most other countries, the share for Pakistan has decreased by considerably less. Since 1990, the share has fallen by almost 40 percentage points for Viet Nam and China, and between 20 to 30 percentage points for countries such as Bangladesh, India, Thailand, Indonesia, Turkey and Sri

Lanka. While some of these countries had a higher share to begin with, the speed of transformation has been considerably faster. For example, while it has taken Pakistan seven decades to achieve a 30 percentage points decrease in the share of agriculture in total employment, it has taken China, India and Bangladesh only three decades or less. The few countries which rank below Pakistan already have a low agriculture share in total employment except Botswana, Lesotho, Uganda, Zambia.

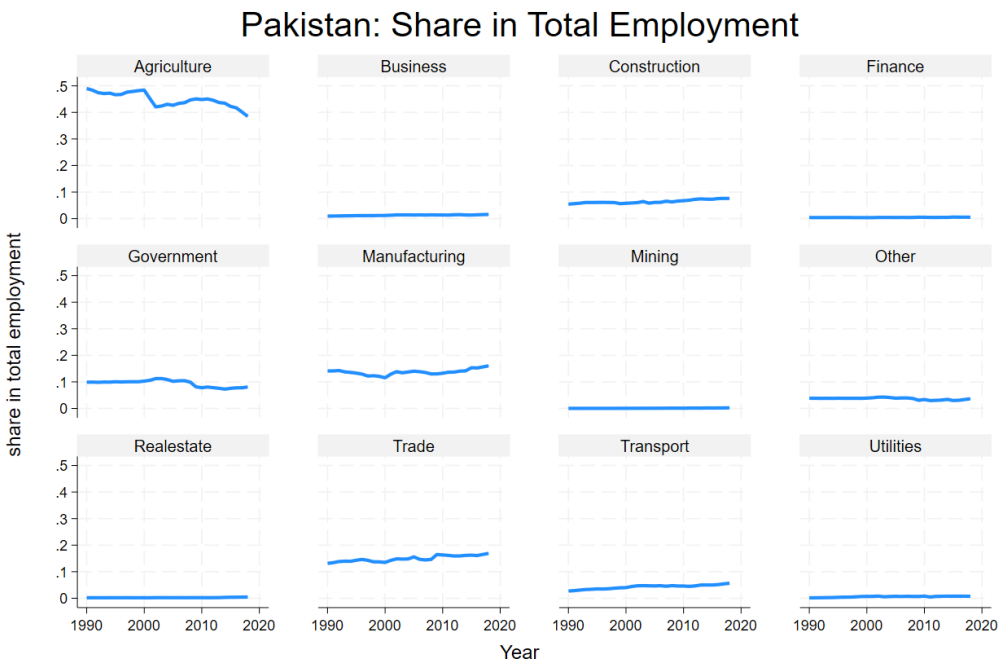


Figure 2.5

Change in Employment Share across Sectors.

What about changes across sectors? Figure 2.5 plots the share of different sectors in total employment for Pakistan. After remaining stable at close to 49% during the 1990s, the share of agriculture fell by 10 percentage points from 2000 onwards. The share of government sector has also decreased from 10% to 8.1% over the same period. Meanwhile, the share of construction, trade and transportation sectors increased from 5.4%, 13.1%, and 2.7% in 1990 to 7.6%, 16.8%, and 5.7% in 2018, respectively. This reflects an earlier trend that was also documented by Guisinger. The three sectors also benefited from the decline in the share of agriculture between 1951 – 1972.

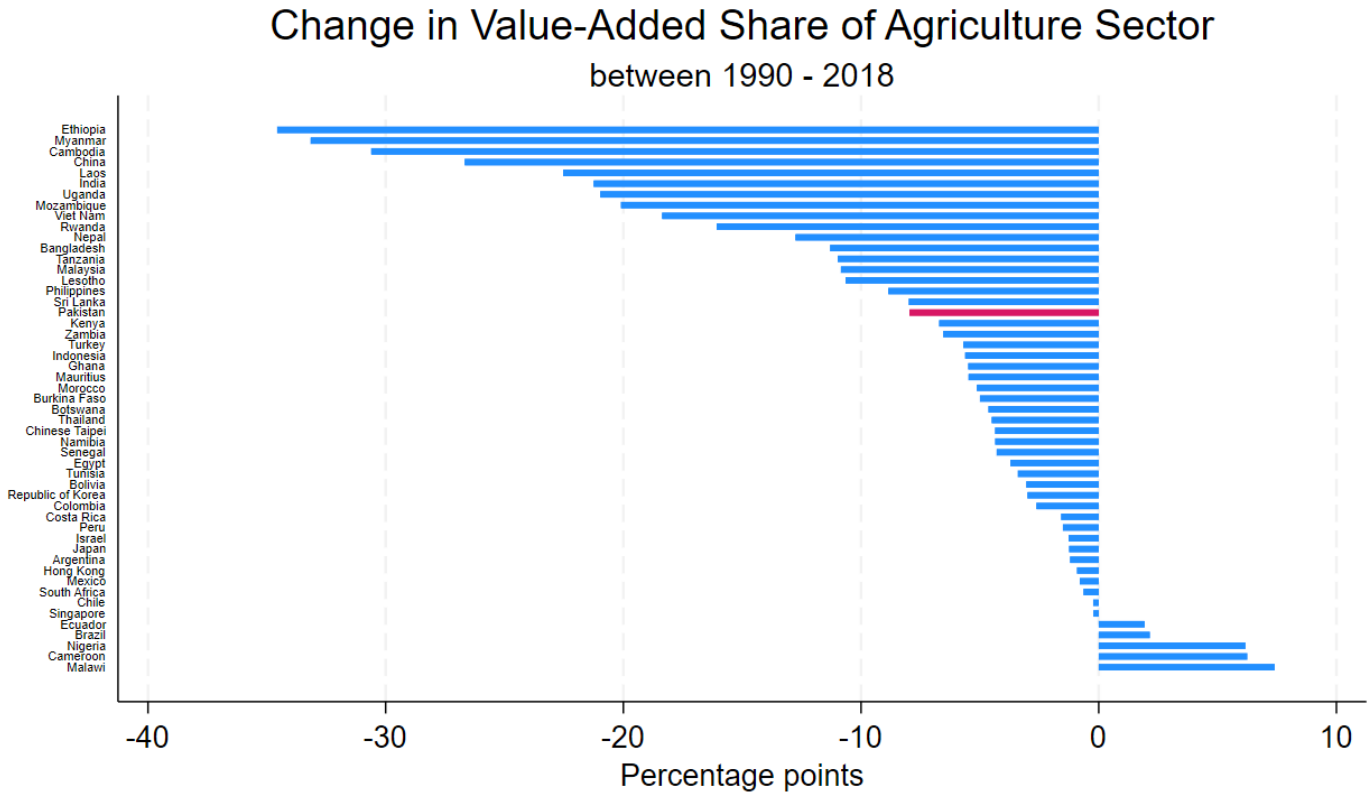


Figure 2.6

Change in share of Agriculture in total value-added.

Contrary to popular belief that the country has seen deindustrialisation, the share of manufacturing has also increased from 14.1% in 1990 to 16.1% in 2018. Nonetheless, this remains far from impressive. The manufacturing share in total employment increased from 10% in 1951 to 14% in 1962 before decreasing again to 8.3% in 1972 (Guisinger, 1980). Today it is close to what it was in 1962.

The evidence for economic transformation is disappointing even when we consider the share of agriculture in total value-added. Figure 2.6 plots the change in the value-added share of the agricultural sector across countries for the period 1990 – 2018. While Pakistan ranks slightly better relative to its position when considering the share of agriculture in employment, the decrease in the value-added share over the three decades is still quite low at only 8%. In contrast, China, India and Bangladesh saw a bigger decline despite having a comparable value-added share in 1990. Sri Lanka, which had a value-added share of only 16% in 1990, saw a similar decline to that of Pakistan in the following three decades. Like before, many of the countries which rank below Pakistan already have a value-added share which is significantly less than that of Pakistan in the 1990.

b. Evidence from international trade

In the discussion above, we have looked at the share of agriculture in total employment as the metric for economic transformation. An important limitation of this approach is that it overlooks transformation within different sectors of the economy. While this is not the focus of this report, we discuss this briefly in this section. We look at micro data on international trade to understand the nature of economic transformation over the last three decades. Focusing on international trade is useful for this purpose as it sheds light on the nature of economic transformation conditional on becoming internationally competitive.

We use data on international trade from the second release of the *International Trade and Production* database (Borchert et al., 2022). The database includes data on bilateral trade for 265 countries and 170 product categories for the period 1986-2019. The 170 product categories cover 28 product categories belonging to the agriculture sector; 7 belonging to Mining & Energy; 118 to Manufacturing; and 17 to services. Data on services is only available for the period 2000-2019. Together, the dataset includes 72.5 million observations.

We start with considering how the composition of Pakistan's export basket has changed between 1990-2018. Since data for services exports is only available from 2000, we drop services from the dataset. Figure 2.7 plots the share of the remaining product categories in the export basket. The horizontal axis reports the share for the year 1994 whereas the vertical axis includes the share for the year 2018. The upward sloping red line is the 45-degree line. If a product category falls on this line, its share in the export basket remained unchanged between 1990 and 2018. We take three year moving averages to remove changes in the export share which may be due to

short term fluctuations in domestic or international economic conditions. The green diamonds represent product categories for which the export share has changed by more than 2 percentage points over this period.

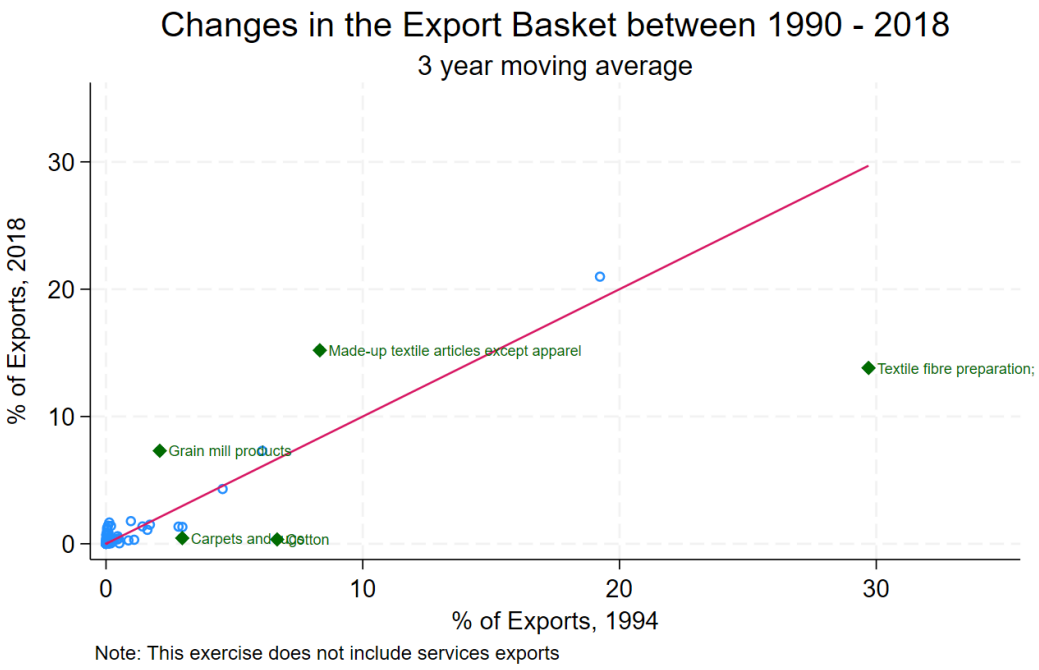


Figure 2.7

Changes in the composition of the export basket.

Two facts stand out. First, almost all the product categories are concentrated around zero and, thus, contribute little to total exports. Second, there are only 5 product categories for which the share in the export basket has changed by more than 2 percentage points over the last three decades. Export share decreased for three of these five categories. These include *textile fibre, carpets, and cotton*. In contrast, export share increased for *grain products* and *made-up textile articles*. In contrast, export share increased for grain products and made-up textile articles. In the appendix, we also report the change in the absolute value of exports across product categories and export destinations.

What about imports? In the case of Pakistan, it is worth emphasising that the country saw a sharp increase in remittances during the period under consideration. Remittances increased from only $2 billion in 1990 to $22 billion in 2019 thus affecting households' purchasing power in a significant way.[6]

Figure 2.8 repeats the same exercise as in figure 2.7 but for imports. Almost all the product categories fall close to the 45-degree line suggesting no change in their share in the import basket between 1994-2018. However, there are eight product categories for which the import share has changed substantially. Import share has decreased for five of these, whereas it has increased for the remaining three. The categories for which the share has increased include petroleum products and iron and steel. In contrast, the share has decrease for machinery, automobiles, aircrafts, wheat, and vegetable oil.

6 In an exercise which we do not report here, we use the panel data on trade to estimate a fixed effects model where the growth rate of imports depends on the growth rate of exports and other global and domestic macroeconomic variables. We allow for product specific fixed effects, a time trend and cross-sectional dependence. The results confirm that while the increase in GDP growth rate increases the growth rate of imports for the manufacturing sector, the relationship is not statistically significant for the non-manufacturing categories. The result is robust across different specifications. This is in line with the suggestion that the increase in income levels does indeed increase the demand for industrial product more than the non-industrial products

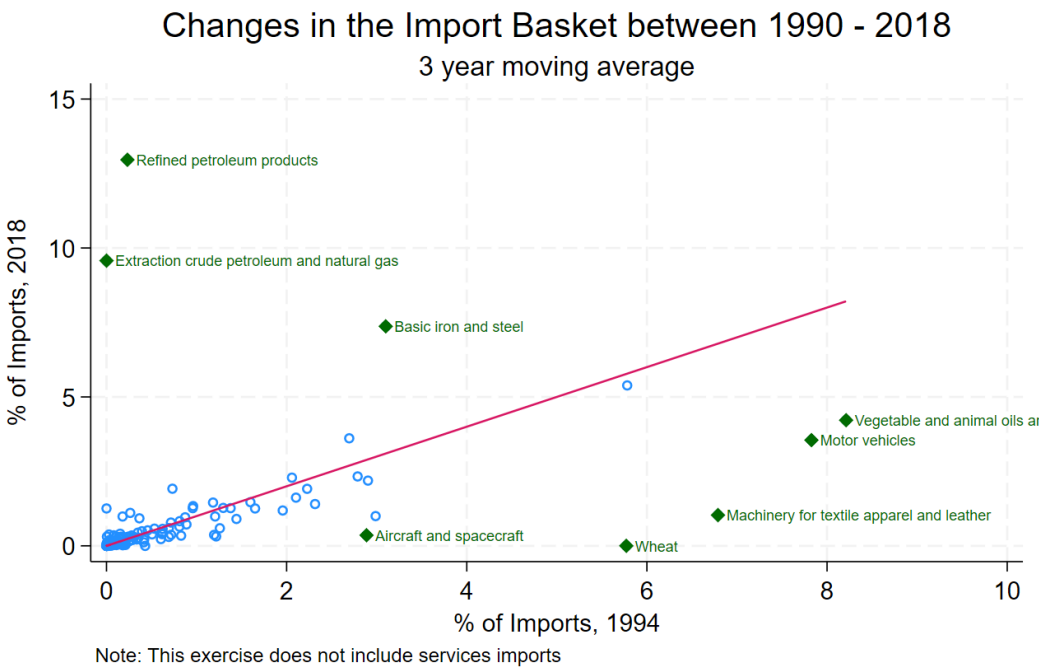


Figure 2.7

Changes in the composition of the export basket.

Both figure 2.7 and 2.8 lend further support to the conclusion above that Pakistan has not undergone any meaningful economic transformation over the past several decades even when we look at the structure of the economy at a more micro level. In section 3.b, we show that the limited transformation that has taken place has also been towards sectors with low *growth* in labour productivity. While the limited scale of transformation did have a positive effect on labour productivity, the nature of transformation has not been conducive for high growth in the future.

3 The Role of Dismal Labour Productivity Growth

Section 2 demonstrated that Pakistan's economy has undergone limited transformation and that too at a very slow speed compared to other fast growing developing countries. The share of agriculture in total employment is relatively higher for Pakistan and has largely remained stable over several decades. Analysing changes in trade patterns both across different product categories and trading partners also leads to a similar conclusion. Later, in section 3.b.ii, we will see that even the limited transformation that has taken place over decades has been towards sectors with low growth in labour productivity.

This raises a critical question: what prevents transformation from happening in the case of Pakistan? The discussion at the start of section 2 already points to the debate on whether it is productivity improvements in the agriculture or the non-agriculture sector which play a predominant role in driving economic transformation during the early stages of development. In both cases, the improvement in productivity is nonetheless of critical importance.

In this section, we turn to looking at this in the context of Pakistan. However, there are several points to keep in mind before proceeding further. First, motivated by the literature on structural transformation, an increase in labour productivity is important for there to be any meaningful economic transformation. Second, whether it is productivity improvements in the agriculture sector or the non-agriculture sector which lead the transformation process has important policy implications. If it is improvements in the non- agricultural sector which lead the process, then the policymakers are better-off concentrating their energy on implementing reforms which improve the productivity of the non-agricultural sector. This is not to say that the other sector should be completely ignored. Third, the focus on growth in labour productivity as the source of economic transformation implicitly assumes that markets are perfectly competitive, and labour is perfectly mobile. What this implies is that an increase in labour productivity in any given sector will lead to an increase in wages in the sector and cause labour to relocate

to that sector until wages are once again equal. If, however, an increase in labour productivity is matched by an increase in market power of the firms within the sector, the transmission channel will break down. The increase in labour productivity will not translate in higher wages for the sector which in turn will prevent the transformation from taking place. Alternately, if labour cannot relocate due to geographical barriers, loss of social networks and poor social security, or high cost of living in places where production takes place, higher wages will once again not lead to transformation. In section 5 we consider to what extent frictions in labour market or elsewhere can explain the missing transformation in Pakistan.

a. Labour productivity: a regional comparison

We start with documenting how Pakistan compares with regional countries in terms of the level of labour productivity. Comparing the level of labour productivity across countries is less important from the point of view of answering the question on economic transformation we focus on in this paper. However, it is still useful to note that labour productivity in Pakistan is comparable to regional countries. Inklaar et al. (2023) provide data on relative prices, value added output, and people employed across the 12 sectors for 84 countries (PLD 2023). The PLD database includes data for 2005, 2011 and 2017. We use the dataset to calculate labour productivity at both the aggregate level and for each of the 12 sectors after adjusting for differences in prices across countries.

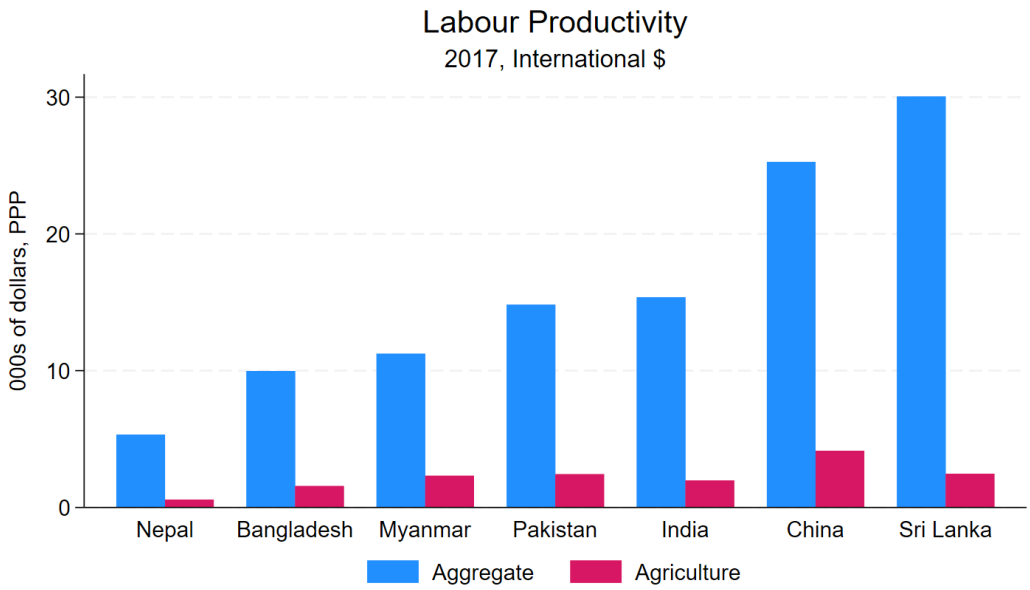


Figure 3.1

Labour Productivity across South Asian Economies.

Figure 3.1 plots the level of labour productivity for the South Asian economies for the year 2017. While there are substantial differences across countries, labour productivity in Pakistan was comparable to labour productivity in India as of 2017. It was considerably higher than that in Nepal, Bangladesh, and Myanmar. Nonetheless, it is interesting to note that, despite having a considerably higher level of labour productivity, Pakistan's GDP per capital was significantly lower and almost equal to that of Bangladesh in 2017. As of 2021, labour productivity in Pakistan was still higher but Bangladesh surpassed Pakistan in terms of GDP per capita. The large difference in labour productivity and GDP per capita in Pakistan is due to low labour force participation rate which is largely explained by extremely low levels of female labour force participation. Figure 3.1 also shows that aggregate labour productivity is several times greater than labour productivity in the agriculture sector for all South Asian economies. Finally, figure 3.2 compares labour productivity in Pakistan with the 54 countries in our dataset both at the aggregate level and for the agriculture sector.

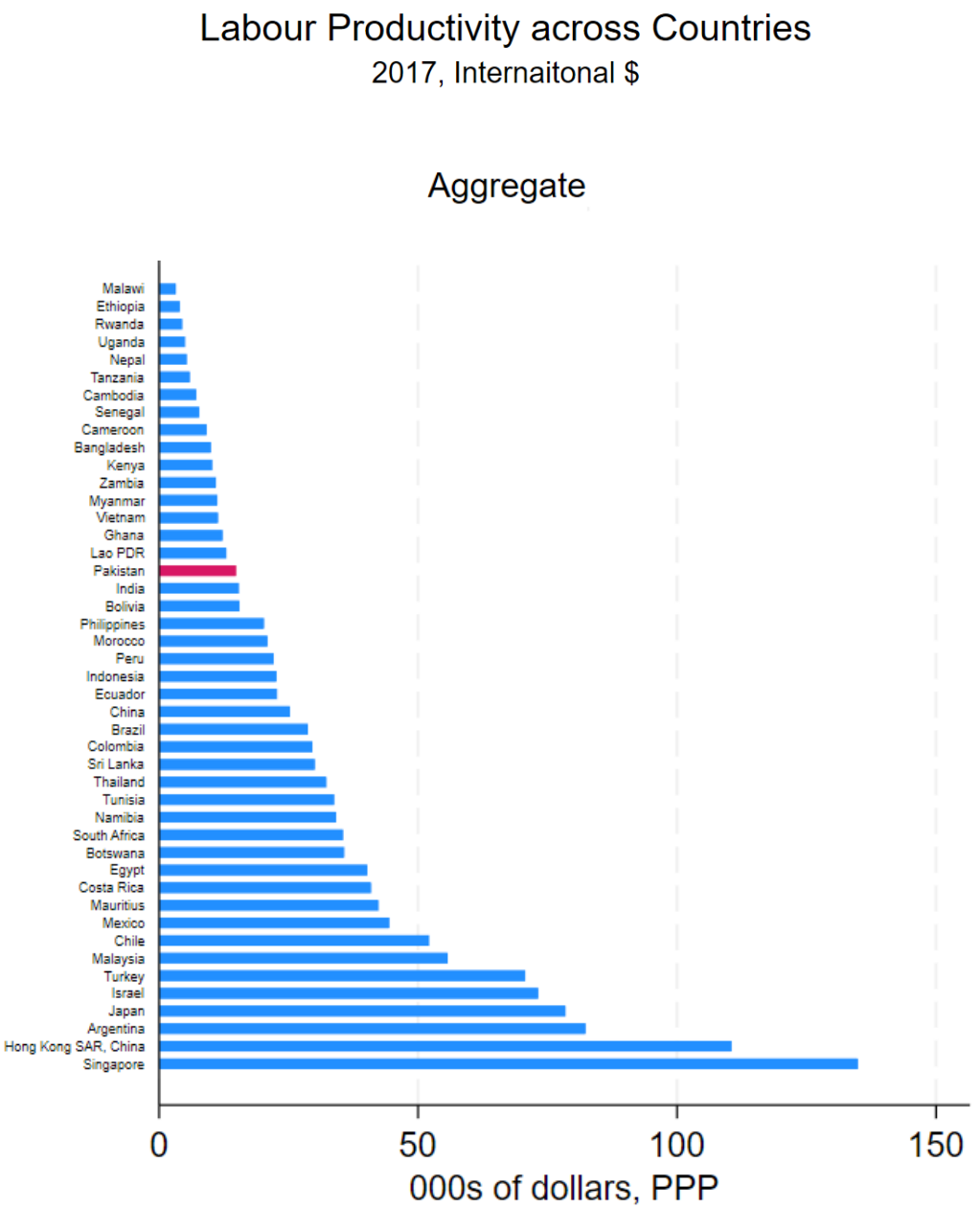


Figure 3.2 a

Labour Productivity across countries

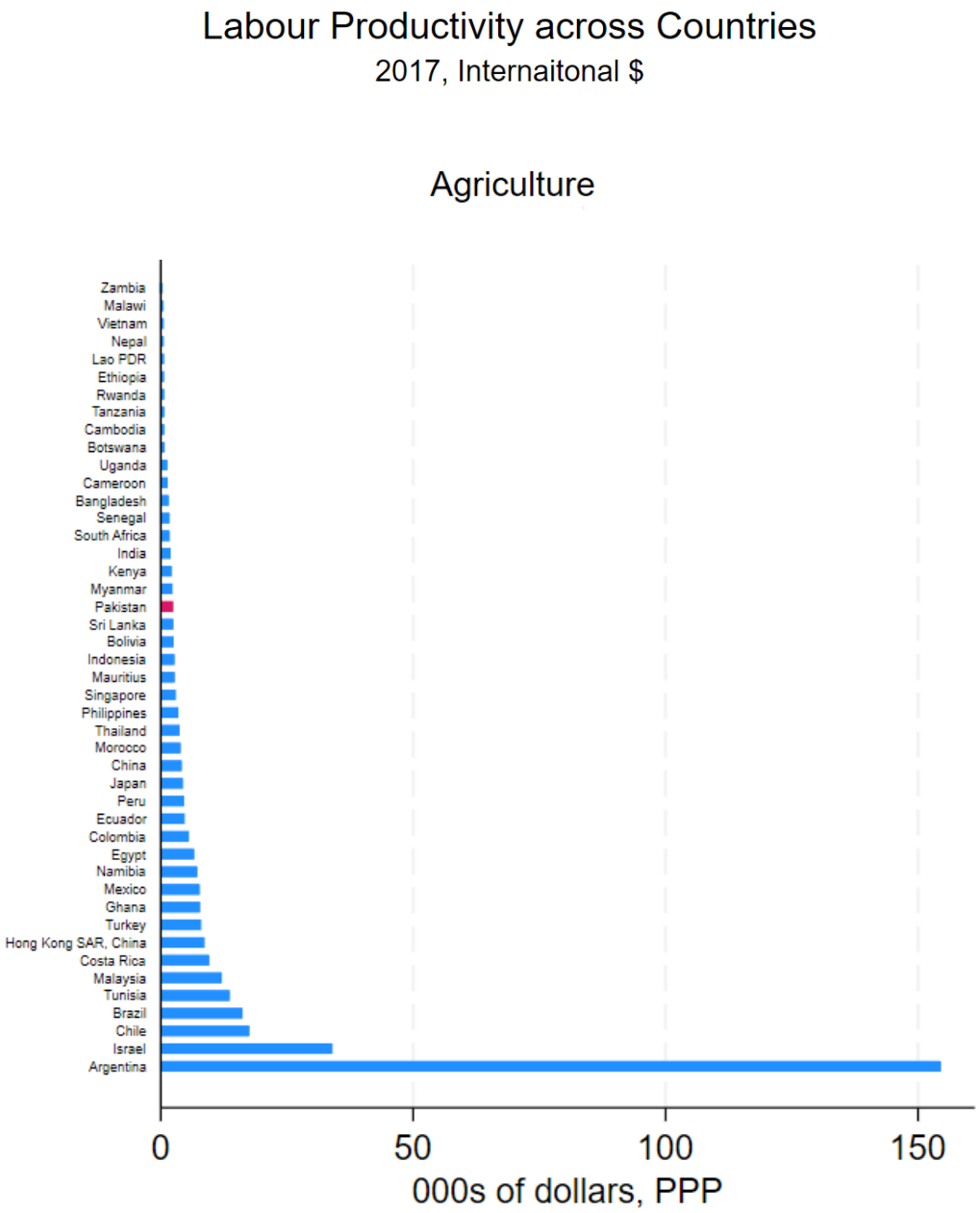


Figure 3.2 b

Labour Productivity across countries

b. Dismal growth in labour productivity

We noted earlier that, under certain assumptions, it is the *growth* in labour productivity which drives the process of economic transformation in a country. We now consider this in more detail.

While growth in labour productivity affects the process of structural transformation, it is equally important to note that structural transformation can itself influence labour productivity as well. For example, if labour relocates from sectors with low *levels* of labour productivity to sectors with high *levels* of labour productivity, the overall labour productivity in the economy will increase. This is because the sectors with high levels of labour productivity will expand, whereas those with low levels of labour productivity will contract. Note that this increase in labour productivity is driven by the process of structural transformation itself i.e., due to labour relocating from less productive to more productive sectors. Therefore, to understand how changes in labour productivity affect transformation, it is important to focus on changes which are not due to structural transformation itself. In other words, we need to focus on changes in labour productivity within sectors which are due to capital accumulation, technological changes, or changes in misallocation across plants. Following the literature, we will refer to this as *within*-sector changes in labour productivity.

In the rest of this section, we attempt to provide an answer to three specific questions. First, how has labour productivity changed over the last three decades? Second, how much of the increase in aggregate labour productivity was due to within-sector improvements in labour productivity as opposed to the process of structural transformation itself. Finally, to the extent that Pakistan has undergone some structural transformation, what can it tell us about the country's future growth prospects under business-as-usual scenario? To provide an answer to the third question stated here, we decompose structural transformation into static and dynamic reallocation and consider how Pakistan compares with rest of the South Asian economies. The results from this exercise are insightful.

i. Trends in overall labour productivity

Unfortunately, the PLD dataset only provides data for the year 2005, 2011 and 2017. As a result, while the dataset allows for comparing labour productivity across countries, it does not allow for analysing changes in labour productivity over time. For this, we turn to the *UNU-WIDER Economic Transformation Database* (ETD) constructed by Kruse et al. (2022). ETD includes data on value added output at both current and constant prices and on people engaged in each of the 12 sectors for the period 1990 – 2018. The database includes data for 54 countries. However, unlike PLD database, ETD does not include data on sector specific relative prices which makes it difficult to compare the *level* of labour productivity across countries. Nonetheless, we can still use data on value added (in constant prices) and people engaged in each of the sectors to calculate how labour productivity has changed over time across sectors.

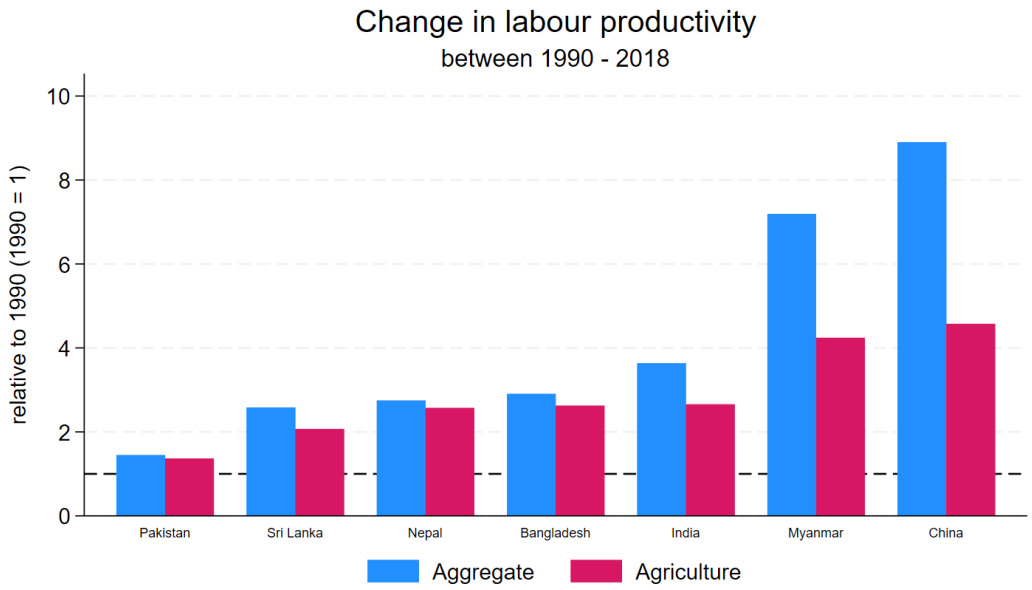


Figure 3.3

Change in Labour Productivity, between 1990-2018

Figure 3.3 reports how labour productivity has changed between 1990-2018 relative to labour productivity in 1990 for all the South Asian economies. The figure reports the change in labour productivity both at the aggregate level and for the agriculture sector. The horizontal dash line represents a ratio of 1 which means that labour productivity has not changed over the relevant period. In contrast, a ratio of 2 means that the labour productivity has doubled over the same period.

Figure 3.3 makes clear that labour productivity has changed by the least in the case of Pakistan, increasing by only 45% between 1990 – 2018. This is equivalent to an average annual growth rate of only 1.29%. In contrast, labour productivity in all other South Asian economies has more than doubled. Specifically, labour productivity in Bangladesh and India has increased by 191% and 263%, respectively. Labour productivity in China has increased by more than 8 times over the same period. These numbers imply an average annual growth rate of 3.75% for Bangladesh, 4.55% for India, and 8.2% for China.

The dismal improvement in labour productivity is also reflected in data for average annual growth rate for GDP per capita. Figure 3.4 uses data from *World Development Indicators* database and plots average annual GDP per capita growth rate for different countries and regions for the period 1990-2018. Once again, the figure shows Pakistan's underwhelming performance over the past three decades when compared with other developing economies. The average annual growth rate equals only 1.8% for Pakistan which is less than half of the 4.1% for South Asia.[7] Likewise, when compared with the average growth rate for the *low and middle income and upper-middle income countries,* Pakistan continues to fall behind by a considerable margin.

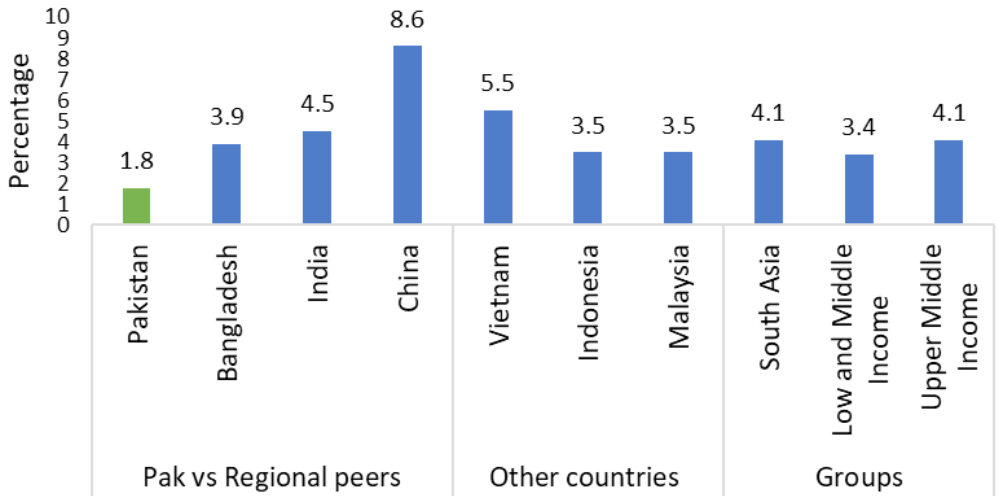


Figure 3.4

Real GDP per capita growth, average, between 1990-2018

Finally, it is not just South Asia where Pakistan is falling behind in terms of improving its labour productivity. Figure 3.4 shows that Pakistan performs poorly compared to almost all the 54 countries included in the ETD database. This is true both for the aggregate labour productivity and labour productivity in the agriculture sector.

7 The relatively higher growth rate for GDP per capita than for labour productivity is because the growth rate in labour force has been higher than that in total population during this period.

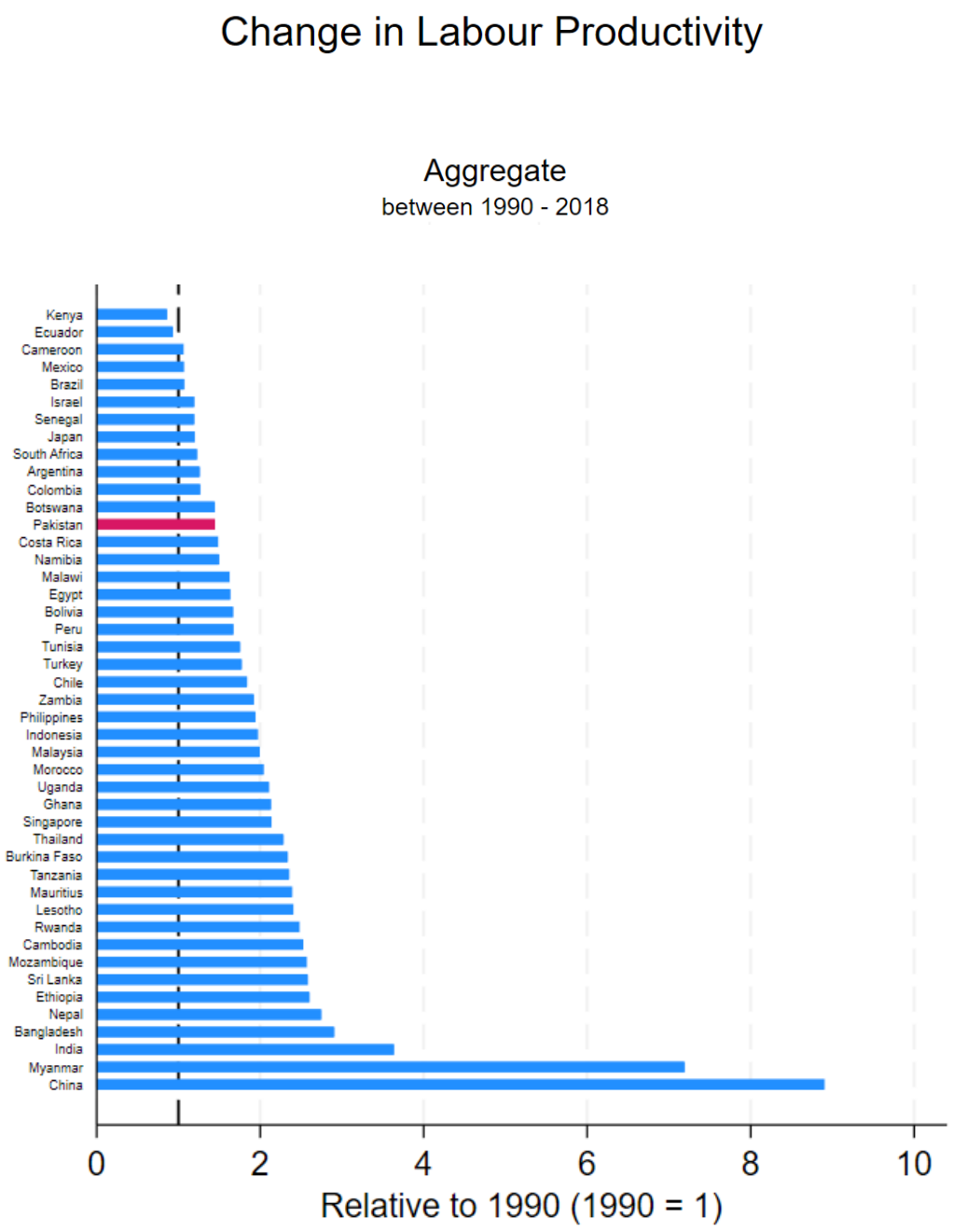


Figure 3.5 a

Changes in Labour Productivity, 1990-2018

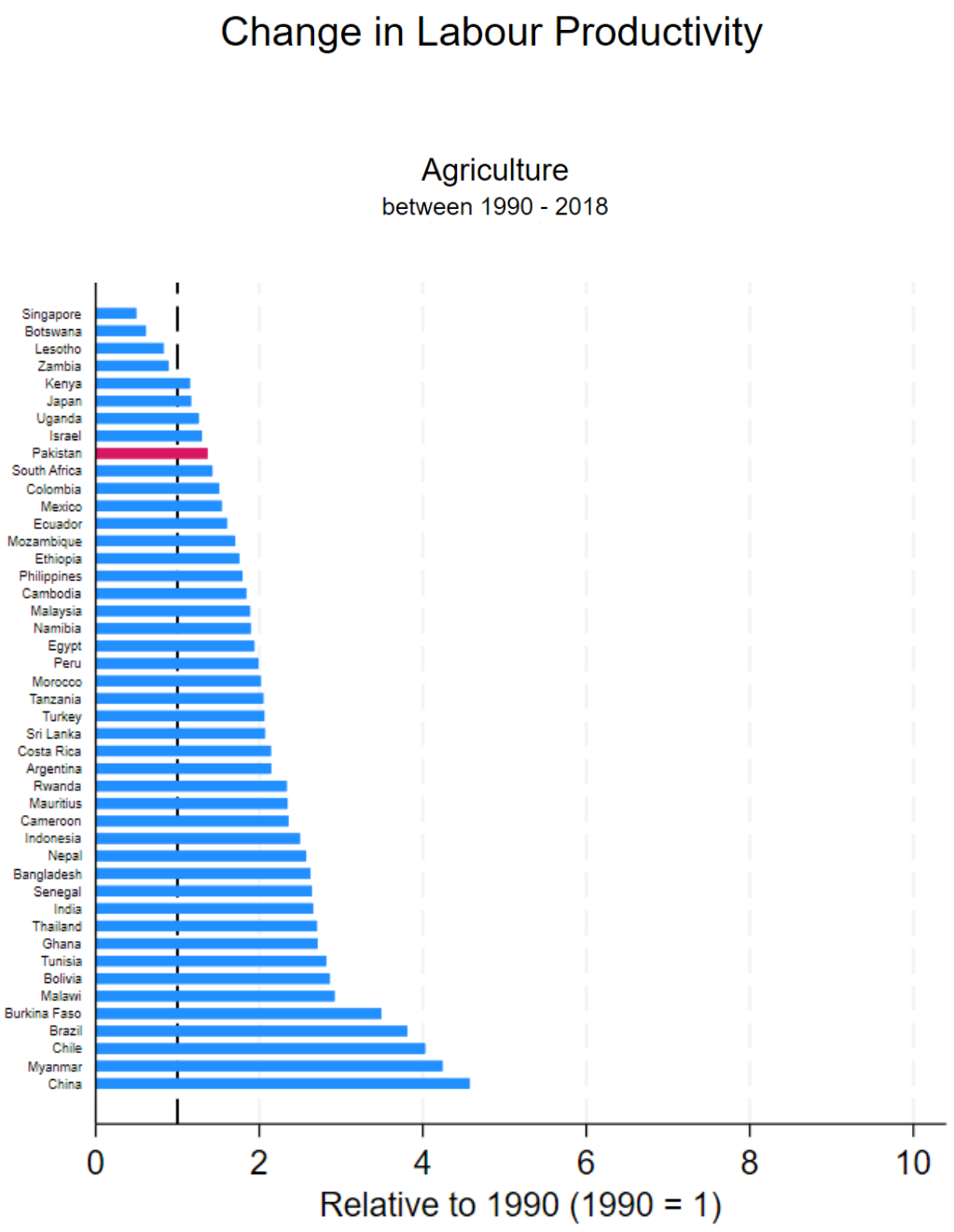


Figure 3.5 b

Changes in Labour Productivity, 1990-2018

The evidence presented so far partly explains why Pakistan has undergone only limited structural transformation. The low growth in both aggregate labour productivity and labour productivity in the agriculture sector implies that there is little incentive for resources to get reallocated across the economy. However, this is only scratching the surface. Recall that the improvement in labour productivity discussed so far also includes the improvement due to structural transformation. What happens when we only consider improvements which are not due to the process of structural transformation but due to physical and human capital accumulation, technological progress, and reduction of misallocation across plants? Recall that it is the improvements in labour productivity within the sectors which are important for understanding the process of structural transformation. We now turn our attention towards this.

ii. Labour productivity growth due to structural transformation

As hinted earlier, looking at the overall growth in labour productivity to analyse the transformation process can be potentially misleading. This is because changes in labour productivity may themselves be driven by the transformation process. For example, if labour moves from less productive to more productive sectors, the overall labour productivity in the economy will increase. Likewise, as labour moves out of certain sectors of production, labour productivity in those sectors may increase due to relatively less labour producing the same or only slightly less output. Such improvements in labour productivity are driven by the transformation process itself. To study the extent to which overall growth in labour productivity is driven by the transformation process, we follow the methodology in Timmer et al. (2015) and de Vries et al. (2015) and decompose the overall productivity growth into growth due to within-sector improvements and due to the reallocation across sectors. Formally, the decomposition exercise takes the following form,

$$\frac{\Delta y}{y^0} = \overbrace{\sum_i \frac{(y_i^T - y_i^0)}{y^0} s_i^0}^{within\ effect} + \overbrace{\underbrace{\sum_i (s_i^T - s_i^0)\frac{y_i^0}{y^0}}_{static} + \underbrace{\sum_i \frac{(y_i^T - y_i^0).(s_i^T - s_i^0)}{y^0}}_{dynamic}}^{net\ reallocation\ effect}$$

where y is aggregate labour productivity, y_i is labour productivity in sector i, s_i is sector i's share in total employment, T *and* 0 represent the last and the first period in the sample. The left-hand side of the expression represents the growth in aggregate labour productivity over the relevant period. The first term to the right captures the growth in aggregate labour productivity due to improvements within the sectors, whereas the second and the third term to the right capture the increase in aggregate labour productivity due to the static and the dynamic reallocation effect, respectively. The sum of the static and the dynamic reallocation effect gives us the net reallocation

effect which is the increase in aggregate labour productivity due to labour moving from one sector to another.

Figure 3.6 presents results from this decomposition exercise for aggregate labour productivity growth for each of the South Asian economy. Specifically, the figure reports the percentage points increase in aggregate labour productivity which is due to the *within*-sector improvements in labour productivity and the net reallocation effect (i.e., structural transformation). The sum of the two equals the growth in aggregate labour productivity for the period 1990 – 2018.

The figure shows that the increase in aggregate labour productivity due to improvements in labour productivity within sectors is less than the overall increase in aggregate labour productivity across South Asian economies. On average, within-sector improvements in labour productivity contribute around two-third of the increase in overall labour productivity. This number is even lower for Pakistan where only 55% of the overall increase in aggregate labour productivity is due to within-sector improvements. This is equivalent to an average annual growth rate of only 0.79%. The average annual growth rate due to within-sector improvements for Bangladesh, India, and China equals 2.57%, 3.86%, and 7.05%, respectively. The disappointing growth in aggregate labour productivity due to improvements in labour productivity within sectors is critical for understanding the phenomenon of missing transformation in Pakistan.

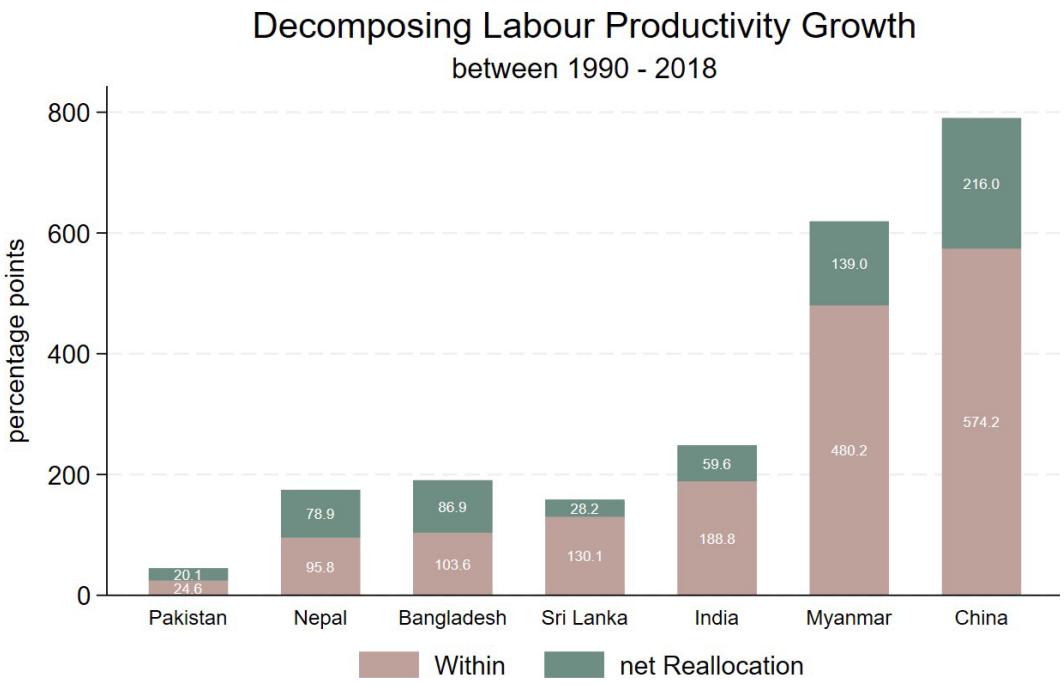


Figure 3.6

Labour productivity growth due to within-sector improvements and reallocation, between 1990-2018.

The flip side of the discussion in this section is the contribution of structural transformation towards increasing aggregate labour productivity in the economy. The figure shows that the reallocation effect is positive for all the countries considered here. On average, one-third of the increase in aggregate labour productivity across countries is due to the labour relocating from sectors with low levels of labour productivity to sectors with high levels of labour productivity. Whether the reallocation effect is positive or negative is often presented as evidence for whether the structural transformation over the period under consideration has been growth enhancing or growth reducing (McMillan and Harttgen, 2014; McMillan and Rodrik, 2011).

However, the net reallocation effect masks important qualitative differences across countries. Specifically, it masks whether labour is relocating to sectors with high or low growth potential. To unmask this, Timmer et al. (2015) and de Vries et al. (2015) further decompose the reallocation effect into static and dynamic reallocation effects. The static reallocation effect is positive if labour is moving from sectors with low *levels* of labour productivity to sectors with high levels of labour productivity. Different from the static effect, the dynamic effect is positive if labour is relocating from sectors with low growth in labour productivity to sectors with high *growth* in labour productivity. The sectors with high growth in labour productivity generally include manufacturing

and tradable services. In contrast, the sectors which are generally associated with low growth in labour productivity include non-tradable services and manufacturing activities concentrated in the informal economy. De Vries et al. find that while the static effect is positive for all the regions considered in their study, the dynamic effect is close to zero for Asia but negative for both Africa and Latin America.
Figure 3.7 repeats the exercise in de Vries et al. for the South Asian economies, including Pakistan. The figure reports the contribution of both the static and the dynamic reallocation effects to the growth in overall aggregate labour productivity for the period 1990 – 2018. The sum of the two equals the contribution of the net reallocation effect as reported in figure 3.6.

There are two key takeaways from figure 3.7. First, the static reallocation effect is positive for all the countries considered here. This implies that workers generally move from sectors with low levels of labour productivity to sectors with high levels of labour productivity. Therefore, as sectors with high *levels* of labour productivity expand, the overall labour productivity in the economy increases. Second, while the dynamic effect is positive for China, India, and Myanmar, it is negative for Pakistan, Bangladesh, and Sri Lanka. The negative dynamic effect suggests that, while workers are relocating to sectors with high levels of labour productivity, these sectors also happen to be the ones which are experiencing low *growth* in labour productivity. Together, and as reported in figure 3.6, the net reallocation effect is positive for all the South Asian countries.

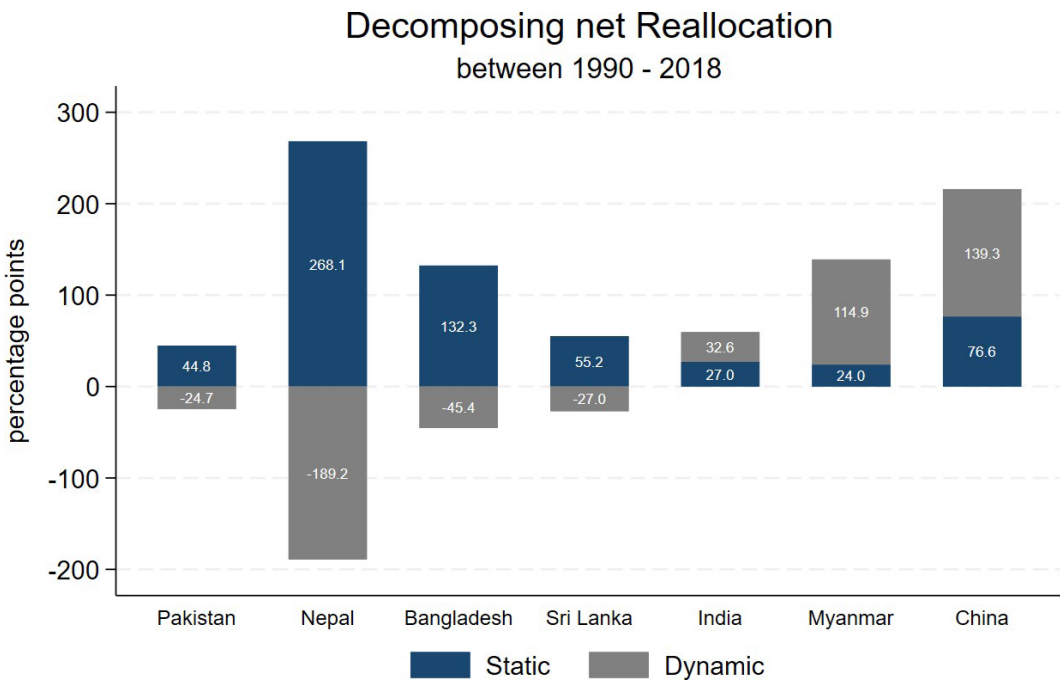


Figure 3.7

Decomposing the reallocation effect into static and dynamic components, between 1990-2018.

The decomposition of the net reallocation effect into static and dynamic reallocation effects is important. A combination of a positive static and a negative dynamic effect means that while there may be short term gains from the reallocation of labour from low productivity to high productivity sectors, these gains may not be sustained as the labour is relocating to sectors with limited potential to grow. This is indeed the case for Pakistan. While the static reallocation effect still contributed 44.8 percentage points to the overall increase in aggregate labour productivity, our decomposition exercise also suggests that this reallocation happened towards sectors such as non-tradable services and manufacturing activities in the informal economy with limited potential to grow. As a result, the net reallocation effect decreased to only 20.1 percentage points.

This finding presents a further challenge for policymakers in Pakistan. It is not just the case that the within-sector growth in labour productivity has been disappointing to say the least but the contribution coming from the limited structural transformation that has taken place is also driven by reallocation towards sectors with low productivity growth thus undermining future growth prospects. While we don't address this question here, it is important to explore what are the underlying factors

which result in the dynamic reallocation effect to be negative in the case of Pakistan, unlike in several other fast-growing economies.

c. Agriculture or non-agriculture?

The discussion in section 3.b focuses on better understanding changes in aggregate labour productivity and how this was affected by the structural transformation process itself. We now turn to analysing how labour productivity changed across sectors for the few select countries, including Pakistan.[8] Particularly, we want to explore if it was changes in agriculture or the non- agriculture sector which predominantly influenced the transformation process across countries. Figures 3.3 and 3.5 already show that Pakistan does poorly even when we compare the growth in labour productivity for the agriculture sector with other economies. We now consider this in more detail.

i. Comparing agriculture with other sectors

We start with comparing the overall increase in labour productivity across different sectors of the economy. This includes the increase in labour productivity both due to improvements within the sector and due to the transformation process itself. Figure 3.8 looks at changes in overall labour productivity across all the twelve sectors in our dataset. The figure reports these statistics for Pakistan, Bangladesh, and India. This gives us an overview of how the overall growth in labour productivity in agriculture sector compares with that in other sectors of the economy. Figure 3.9 plots the same for China.

The left panel of figure 3.8 plots the growth in labour productivity for Pakistan across different sectors. The figure reveals that labour productivity has in fact decreased for 5 out of 12 sectors considered here. These sectors include *mining, utilities, transport, real estate, and construction*. The growth in labor productivity in the agriculture sector has been positive but lower than in sectors such as *manufacturing, business, finance, government, and others*. The biggest increase in labour productivity is for *government services*. According to the technical notes explaining the ETD dataset, government services include, *"public administration and defence; compulsory social security; education; human health and social work activities."* The interpretation of labour productivity in this sector requires caution. This is because, unlike other sectors, the value of government services is not measured using output prices but using input prices such as salaries. As a result, it is possible that an increase in the cost of running the government will show up as an increase in labour productivity even when there is no corresponding improvement in the quality or quantity of services provided. Nonetheless, we report data on government services to ensure transparency.

8 It is important to note that, unlike in section 3.a., these numbers are not adjusted for purchasing power parity and, therefore, cannot be directly compared across countries.

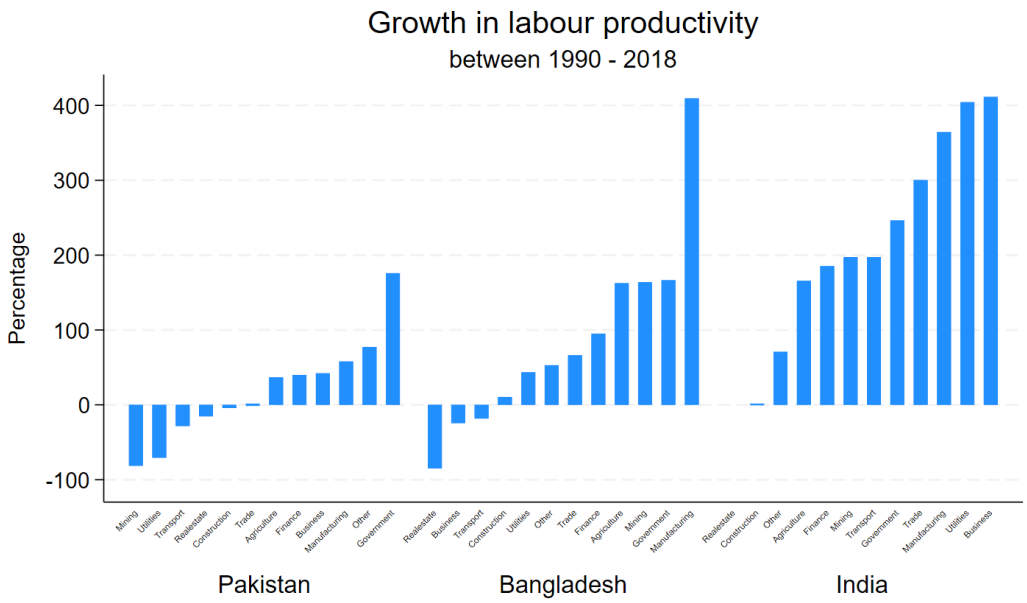


Figure 3.8

Growth in Labour Productivity across Sectors in Pakistan, between 1990-2018.

The second panel of figure 3.8 presents the same for Bangladesh. Labour productivity decreased for 3 of the 12 sectors which include real estate, business, and transport. In contrast, labour productivity in the agricultural sector increased by 162%. This may suggest that much of the economic transformation in the case of Bangladesh over the last three decades was due to improvement in productivity in the agricultural sector. However, it is also important to note that labour productivity in the manufacturing sector increased by substantially more - i.e., 409% - thus providing a strong incentive for resources to move out of the agriculture sector. Nonetheless, the dynamics of economic transformation appear more complex. The increase in labour productivity in the manufacturing sector does reflect in an increase in the share of manufacturing in total value added of about 10 percentage points. However, the increase in manufacturing's share in total employment is less impressive at only 1.9 percentage point. The shift in resources toward low growth rather than high growth sectors once again points to the dynamic reallocation effect being negative even in the case of Bangladesh. This is indeed what we found in section 3.b.

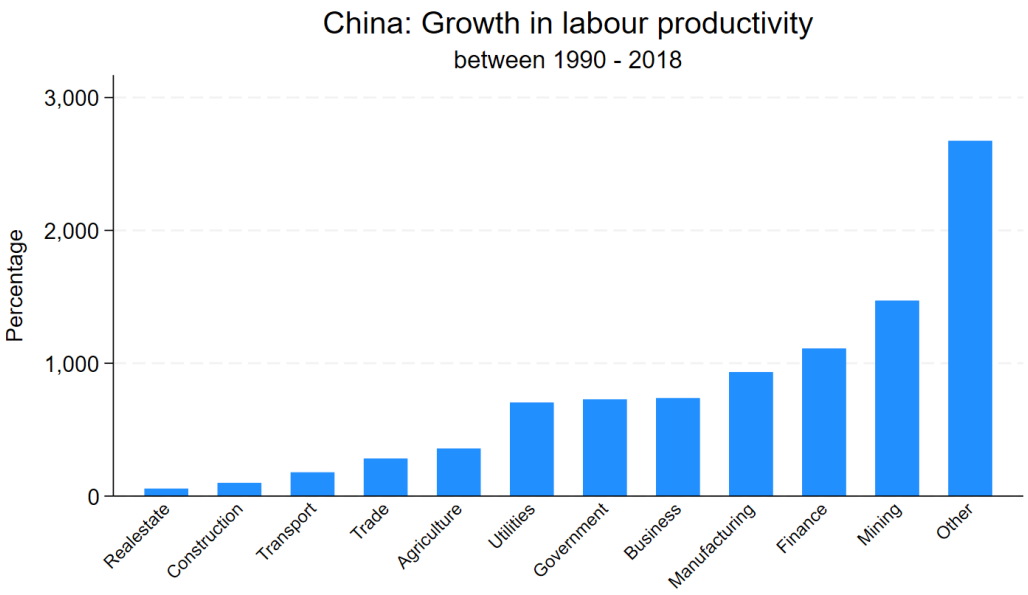


Figure 3.4

Growth in Labour Productivity in China, between 1990-2018

The right panel of figure 3.3 presents results for India. The first thing that stands out is that labour productivity did not decline across any of the sectors except that it remained almost constant for the construction sector.[9] While labour productivity in the agriculture sector increased by 166%, labour productivity in 8 of the 12 sectors increased by considerably more. Most sectors saw an increase in both the value-added share and the employment share at the expense of the agriculture sector. The story for China is not too different except that the magnitude of the increase in labor productivity across sectors is significantly greater than other South Asian economies (see figure 3.9). In section 3.b we found the dynamic reallocation effect to be positive for both these economies suggesting that resources have indeed moved from low-productivity sectors to high-productivity high-growth sectors.

9 The database does not include employment data for the real estate sector for India.

ii. Stripping away the effect of structural transformation

At the surface, the discussion above suggests that the agriculture sector may have played a significant – even if not a dominant role – in the transformation process. However, recall, our focus on the overall increase in labour productivity across sectors does not account for the fact that some of that increase in labour productivity may simply be due to the process of structural transformation itself. For example, if labour relocates from agriculture to non-agriculture sectors, labour productivity in the agriculture sector may increase due to less workers producing relatively more output than before. Since all the economies considered here saw the share of labour working in the agriculture sector decrease over time, it is likely that a significant fraction of the improvement in labour productivity in the agriculture sector is due to the transformation process itself.

This suggests that not accounting for the effect of the transformation process may lead us to overemphasise the role of improvements in labour productivity in the agriculture sector in driving the transformation process. To adjust for this, we calculate the within sector improvement in labour productivity in the agriculture sector by assuming that the share of labour working in the agriculture sector remained the same between 1990-2018. Figure 3.10 reports the within- sector improvement in labour productivity both at the aggregate level and in the agriculture sector. The results for the within-sector improvement at the aggregate level are similar to those reported in figure 3.6.

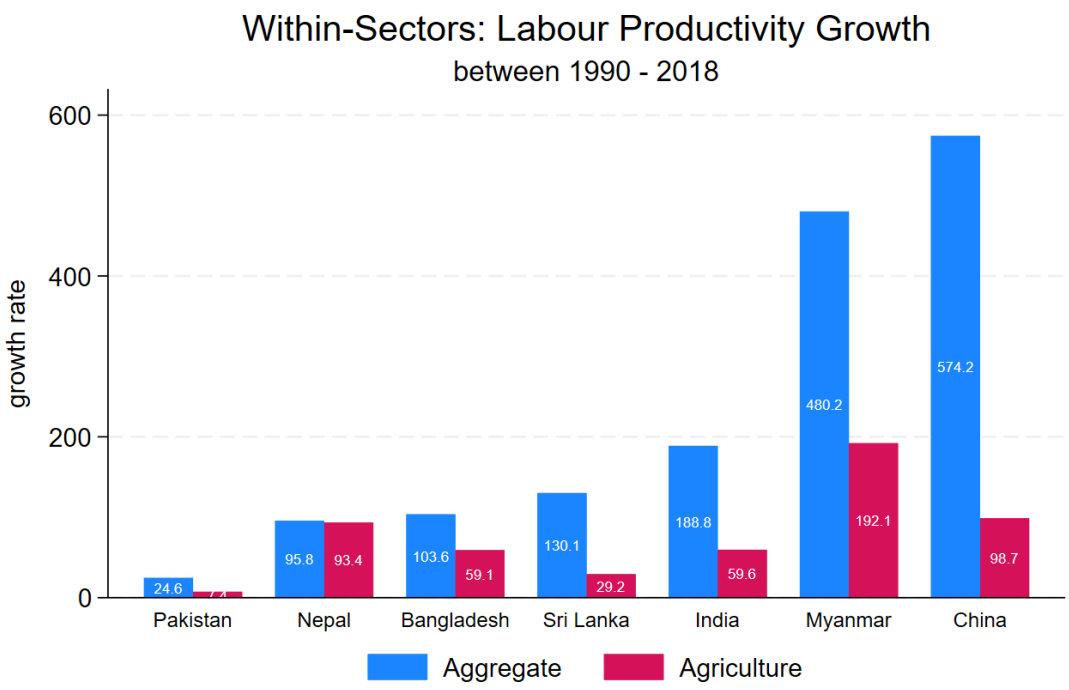


Figure 3.10

Growth in Labour Productivity after Adjusting for the Reallocation Effect, between 1990-2018

Figure 3.10 clearly shows that within-sector improvement in labour productivity at the aggregate level is several times more than the within-sector improvement in the agriculture sector for most countries. The only exception is Nepal where the within-sector improvement is the same at both the aggregate level and in the agriculture sector. For Pakistan, within-sector improvement in the agricultural sector is only 7.4% over a period of almost thirty years. This equals an average annual growth rate of only 0.26%. This is only one-third of the average annual growth rate of 0.79% for the within-sector improvement in aggregate labour productivity over the same period.

These results suggest that it is the improvements in labour productivity in the non-agriculture sector which have played an important role in driving the transformation process both in Pakistan and across rest of the South Asian economies except Nepal.

iii. Additional evidence: relative prices

Figure 3.10 already sheds light on the question whether economic transformation is mostly driven by productivity improvements in agriculture or non-agricultural sector across the regional countries. At least in the case of South Asia, the improvement in labour productivity in agriculture sector is always less than the improvement in non-agricultural sector.

For more conclusive evidence, Alvarez-Cuadrado and Poschke (2011) write a model with non-homotheticity in household preferences and perfectly competitive markets to show that *"decreases in the relative price of manufactures are unambiguously associated with faster technological change in the non-agricultural sector."* Specifically, based on their model, Alvarez- Cuadrado and Poschke find that the relationship between the price of agriculture and non-agriculture goods, and the productivity growth in the two sectors is given by,

$$\hat{p} = \hat{A} - \widehat{M} + \underbrace{\dot{L}^{A}[.]}_{>0} > \hat{A} - \widehat{M}$$

where $\hat{p}$ is the growth rate of the price of non-agricultural good expressed in terms of agricultural goods, $\hat{A}$ is the productivity growth in the agriculture sector, $\widehat{M}$ is the productivity growth in the non-agricultural sector, and $\dot{L}^{A}[.]$ is a term which takes a positive value.

An increase in both agriculture and non-agriculture productivity will lead to a change in $\hat{p}$. This is because $\hat{p}$ depends on $\hat{A}$ and $\widehat{M}$. However, the reason why focusing on $\hat{p}$ is useful is because it reveals which of the two forces – productivity improvements in agriculture or non-agriculture sector – is dominating the transformation process. The equation shows that $\hat{p}$ will fall only if the productivity growth in the non-agriculture sector is greater than the productivity growth in the agriculture sector by more than $\dot{L}^{A}[.]$. They document that this was indeed the case for many of the advanced economies during their early stages of economic transformation. Specifically, for the US, the relative price of manufacturing goods was declining for most of the period between 1800-1950. They use this as evidence to argue that it was the increase in the productivity growth in the manufacturing sector that was the key driver for the decrease in the share of agriculture sector in total employment during this period.

For comparison, we repeat the exercise in Alvarez-Cuadrado and Poschke (2011)

and find that whatever limited transformation Pakistan has experienced since 1950s is also due to *"faster technological change in the non-agricultural sector."* Figure 3.11 plots the price of consumption basket relative to the price of food basket for Pakistan. The relevant data on the CPI and the food price index comes from the *Handbook of Statistics 2020*. The figure shows that the relative price of non-agricultural goods declined significantly between 1950-1970 and then between 2000-2010.[10] Perhaps surprisingly, this aligns very closely with the two rounds of limited transformation in Pakistan's economic history when the share of agriculture in total employment decreased by close to 10 percentage points. Recall that the share of agriculture in total employment decreased from 67.5% in 1951 to 59.9% in 1971. It decreased again from 48.4% in 2000 to 38.5% in 2018. The decline between 1971 and 2000 appears to have been sluggish.

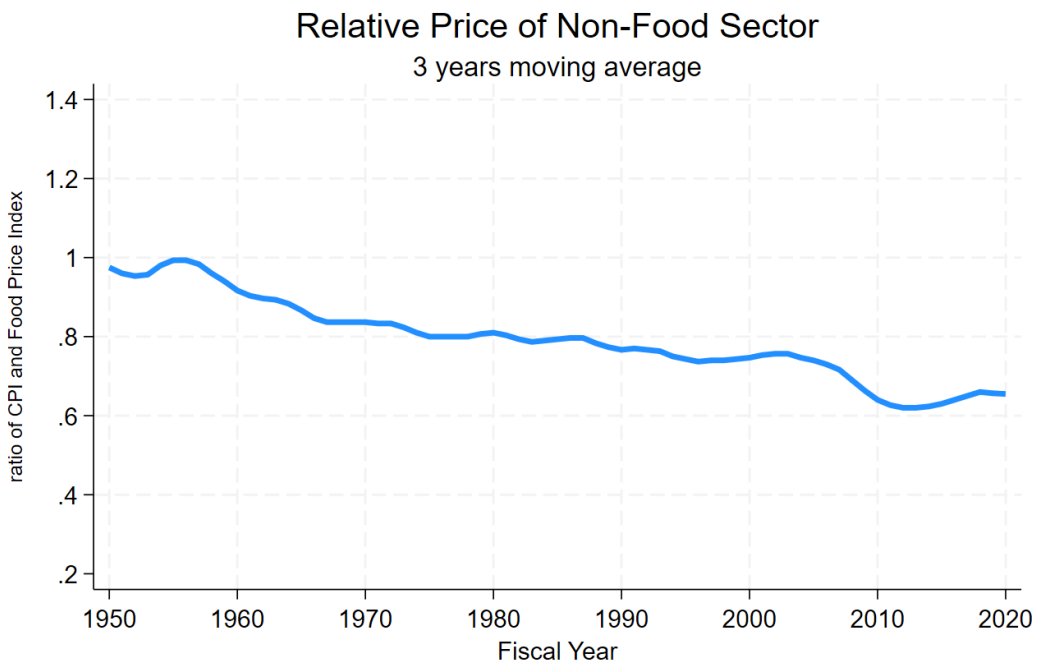


Figure 3.11

The price of non-food goods relative to the consumption based for Pakistan.

10 We take 3 years moving average to smooth out fluctuations which may be due to domestic and global shocks.

To conclude, Pakistan's dismal performance in terms of increasing its labour productivity both in the agriculture and the non-agricultural sector primarily explains the phenomenon of missing transformation documented in the previous section. The average annual within-sector improvement in labour productivity at the aggregate level equals only 0.78%, whereas within-sector improvement in the agriculture sector has been as low as 0.25%. To put differently, the relatively small increase in labour productivity across both agriculture and the non-agricultural sector in the case of Pakistan explains why economic resources did not get relocated out of the agricultural sector at the same speed as for other countries. In section 4 and 5, we consider in detail the reasons behind the lackluster increase in labour productivity in Pakistan.

4 Determinants of Labour Productivity

Section 3 demonstrated that labour productivity in Pakistan has increased by significantly less when compared to regional economies. Importantly, this is true for all the sectors across the economy. Why is this the case? To answer this question, we turn to the literature on growth accounting and decompose labour productivity into various components. We then reflect on each of the component and discuss how these have changed over time relative to the regional economies.

Specifically, we follow Jones (2016) in decomposing labour productivity into capital-output ratio, human capital per worker, and the level of total factor productivity (TFP). This is given by the following expression:

$$\frac{Y_t}{L_t} = \left(\frac{K_t}{Y_t}\right)^{\frac{\alpha}{1-\alpha}} \frac{H_t}{L_t} . Z_t$$

where Y_t is GDP, L_t is labour supply, K_t is capital stock, H_t is human capital stock, Z_t is total factor productivity (TFP), and α is the output elasticity of capital. α also determines the share of income going to capital in the economy. Note that an improvement in TFP can also increase returns on investment. This in turn will increase capital stock in the economy (i.e. capital deepening). Ignoring this link between the level of TFP and capital deepening will result in overestimating the contributions of capital accumulation to labour productivity. However, the above formulation addresses this shortcoming by keeping the contributions from both changes in capital deepening and TFP separate.

In the rest of this section, we turn to data from the Penn World Table database (version 10.01) to better understand how different components of labour productivity as defined by the equation above have changed overtime.

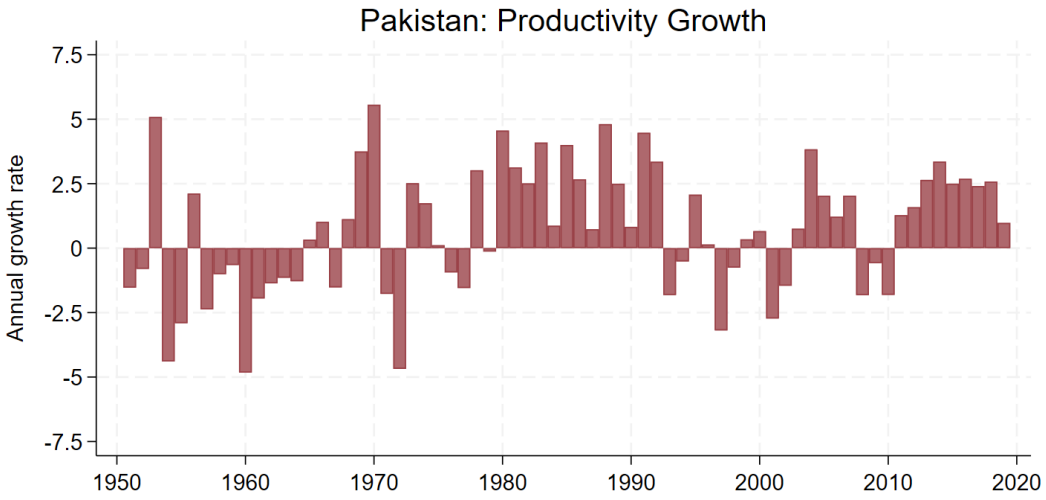
a. Productivity growth

We start with analysing the role of technical efficiency, TFP.[11] Towards this end, we use data from Penn World Table 10.01. However, the PWT dataset does not report data on TFP for Pakistan and several other economies. This is because the TFP measure in PWT 10.01 uses data on capital services and on labour share for each year to calculate the series for TFP. It turns out that the database does not have this data for several countries which presents a challenge for any meaningful analysis which is comparable with what is reported for other countries.

To overcome this, we make two simplifying assumptions which we believe should not affect the analysis as long we don't focus on any particular year. First, we use data on capital stock rather than capital services for these countries. Second, we assume the labour share to be fixed at 50%. Using capital stock in place of capital services is consequential if the researcher is interested in drawing conclusions for specific years. Instead, we focus on the broader trend in our measure for TFP for the rest of the analysis. We use the methodology in Inklaar and Timmer (2013) to estimate TFP for Pakistan. This is similar to the method used in PWT to construct the measure for TFP except that they use capital services and data on labour shares which vary over time.

Figure 4.1. plots the growth rate for the TFP which we obtain by following the procedure described above. On average, the productivity growth was negative during much of the 1950s and the 1960s. This resonates with the research being published at the time which pointed to the inefficiencies that were prevalent across the economy (Power, 1963; Soligo and Stern, 1965; Lewis and Guisinger, 1968). The productivity growth rate increased during 1980s; decreased to close to zero in the 90s; and turned positive for the period after except for the years spanning the 2008 financial crisis.

11 The discussion in section 4.b. implicitly points to TFP as an important source of variation in labour productivity for Pakistan.



Source: Economic Advisory Group (EAG)
Note: based on the methodology in *Feenstra et al. (2013)* and *PWT 10.0* dataset

Figure 4.1

Pakistan: productivity growth

The average annual productivity growth for Pakistan for the period 1980-2019 equals 1.4%. Average productivity growth equals 0.9% and 1.13% for the period 1990-2019 and 2000-2019, respectively. These numbers are almost similar to the average annual growth rate observed in labour productivity over a similar period thus suggesting that almost all of the increase in labour productivity observed in the case of Pakistan is driven by the growth in TFP. Recall that the average annual growth in labour productivity for Pakistan for the period 1990-2018 was 1.29%.

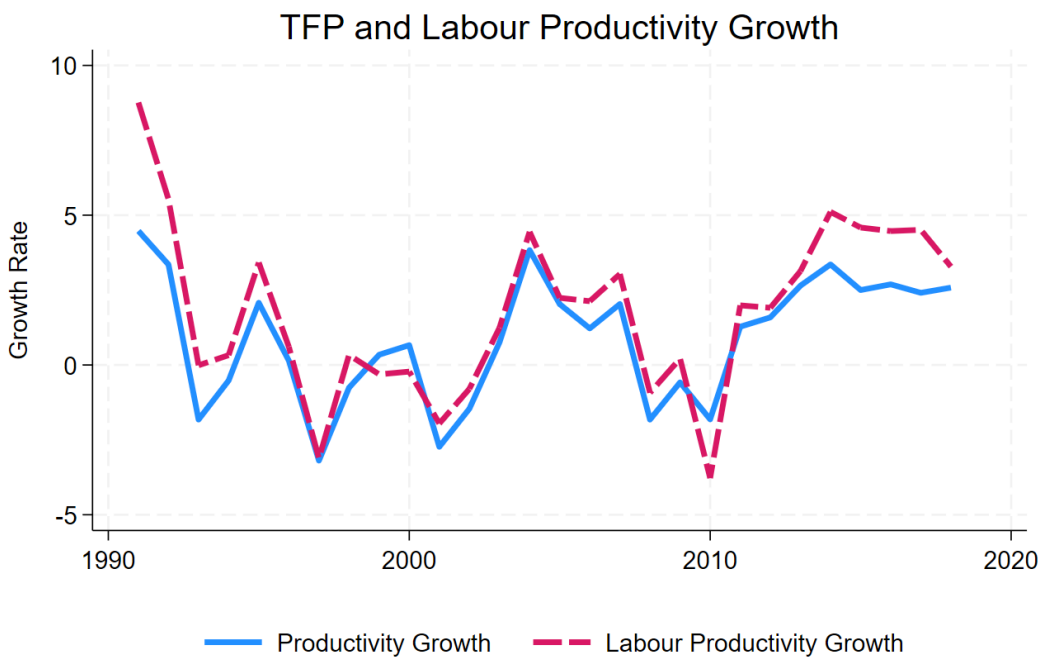


Figure 4.2

TFP and Labour Productivity Growth

Figure 4.2 plots the growth rate of labour productivity and the growth rate of TFP for Pakistan. The figure confirms what is also reported in table 4.1 below. Almost all the variation in labour productivity in the case of Pakistan is explained by variation in TFP. This also means that, without any meaningful contribution coming from the capital accumulation, the growth in labour productivity will continue to average below 2%.

While there is potential to implement reforms which help increase the TFP growth rate, it is important to note that a significant fraction of growth in the case of fast-growing emerging economies has come from capital deepening as illustrated in table 4.1. Importantly, as low as it might first appear, the average productivity growth in Pakistan is not too different from what is observed for the rest of the world. For example, since 1990, the average annual productivity growth in the case of India has been 1.96% according to the same dataset. A more comprehensive study for India based on the recently constructed KLEMS dataset points to an even lower annual TFP growth rate of 1.16% (Bishwanath et. al, 2017). During the high growth years of 2003 – 2015, the contribution of TFP growth to the overall economic growth for India was about 23%. Figure 4.3 plots annual TFP growth for the period 1990-2018 across countries. While there are countries which have experienced an average TFP growth of 2% or higher, average TFP growth in Pakistan is comparable to the rest of the world.

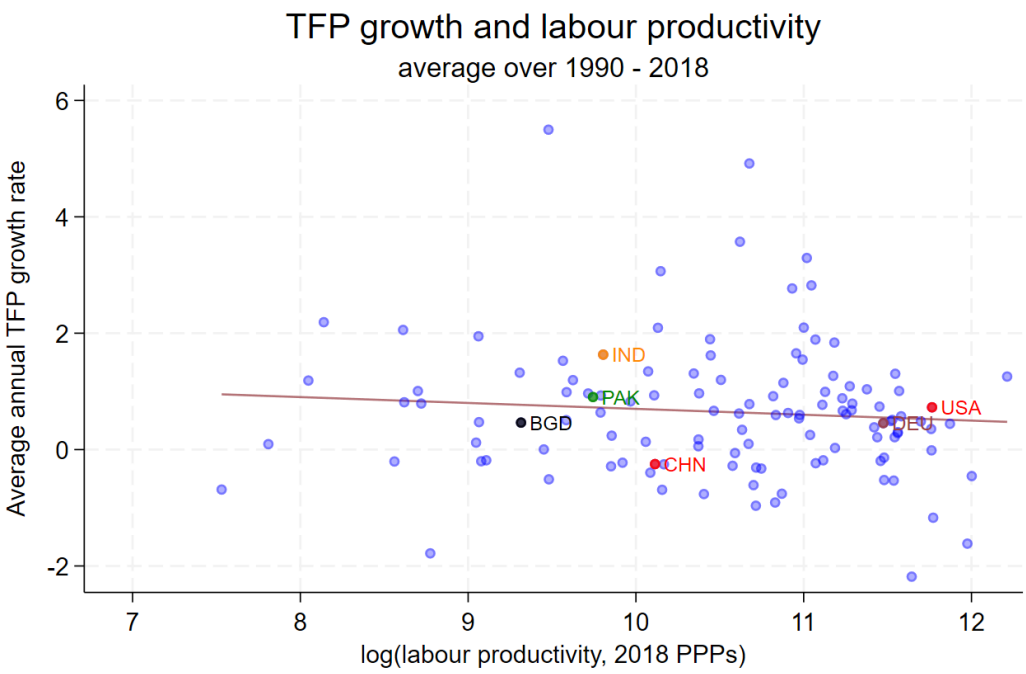


Figure 4.3

Average annual TFP growth across countries

This begs an important question: if Pakistan is comparable to the rest of the world and many of the fast-growing economies when it comes to the TFP growth then what explains the low growth in labour productivity in Pakistan? After all, labour productivity in almost all the economies we considered in section 3 increased by significantly more than what we see for Pakistan. We now turn to answering this question.

b. Capital deepening and human capital accumulation

Figure 4.4 plots a scatter plot with capital-output ratio on y-axis and (log of) income per capita on the x-axis for countries across the world and for the year 2018.

What stands out is that the capital-output ratio for Pakistan is one of the lowest in the world. The same for India and Bangladesh is almost twice that of Pakistan. Importantly, even for similar levels of income per capita, Pakistan exhibits lowest capital-output ratio. The figure also shows an upward trend in capital-output ratio as countries become richer.

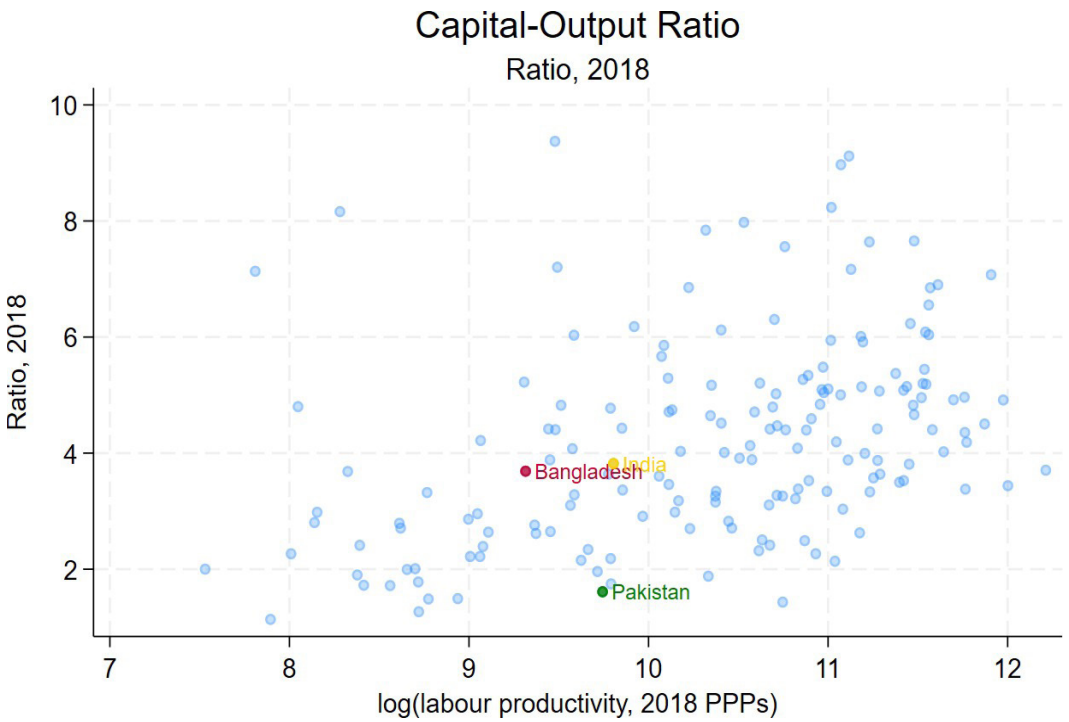


Figure 4.4

Capital-Output Ratio across Countries

	Labour prod. i.e. $\frac{Y_t}{L_t}$ (PPP, 2017 US$)	Capital-Output ratio i.e. $\frac{K_t}{Y_t}$	Human capital index i.e. $\frac{H_t}{L_t}$	Variation in $\frac{Y_t}{L_t}$ due to inputs – 1980-2019 (%)
United States	128,643	3.37	3.74	7.89
Pakistan	17,050	1.61	1.77	6.22
China	24,682	4.71	4.71	37.74
India	18,122	3.81	2.15	55.02
Bangladesh	11,106	3.68	3.69	79.57
Sri Lanka	34,396	2.83	2.86	33.16
Viet Nam	12,754	2.64	2.82	92.19
South Korea	79,685	5.07	3.72	49.21
Egypt	46,509	1.43	2.64	84.52
Turkey	78,785	4.42	2.48	70.09

Table 4.1

Evidence on Labour Productivity and Capital Deepening across Countries

Table 4.1 reports labour productivity in chained PPPs (2017 US$) and the values for different components of labour productivity for Pakistan and for some of the regional economies for the year 2018. The table also includes United States for comparison. As mentioned in section 3, an important point to note is that Pakistan ranks higher in terms of labour productivity compared to the ranking based on GDP per capita. This is due to the low levels of labour force participation in Pakistan. However, despite the slightly better ranking in terms of labour productivity, it must be remembered that the growth in labour productivity has been disappointing in the case of Pakistan as discussed before.

The table shows that, unlike almost all other countries, both capital-output ratio and human capital have acted as a drag on Pakistan's labour productivity. Figure 4.5 plots how these have changed over time. The left panel of the figure plots the trend in capital-output ratio. In the case of Pakistan, the capital-output ratio has

decreased from the peak of 3 at the end of 1970s to only 1.61 in 2018. In contrast, for the regional economies, the ratio has either increased or remained stable during this period. These results suggest that, unlike Pakistan, capital deepening has been an important part of the growth story in these economies. The critical question to ask here is what has prevented capital deepening in Pakistan? More precisely, what factors have disincentivised the similar increase in investment in Pakistan relative to what we observe across regional economies? While Pirzada (2023) point to higher level of macroeconomic uncertainty as the primary reason for this trend, future work must explore this in more detail.

The second panel of figure 4.2 plots the human capital index which is taken from PWT and is constructed using data on average years of schooling from Barro and Lee (2013) and an estimate for the rate of return on education based on Psacharopoulos (1994). Generally, while the level of human capital has increased in Pakistan, it has continued to remain below that of regional economies for almost all this period.

Section 4.a suggested that almost all the variation in labour productivity is explained by variation in TFP growth. We now quantify that claim. Specifically, we ask how much of the variation in labour productivity is explained by both the variation in capital-output ratio and human capital per worker? For context, it is generally understood that a significant fraction of growth in labour productivity in developing countries comes from the growth in factor inputs i.e. both physical and human capital. In contrast, in the later stages of development, countries must rely more and more on improvements in TFP to achieve further improvements in labour productivity.

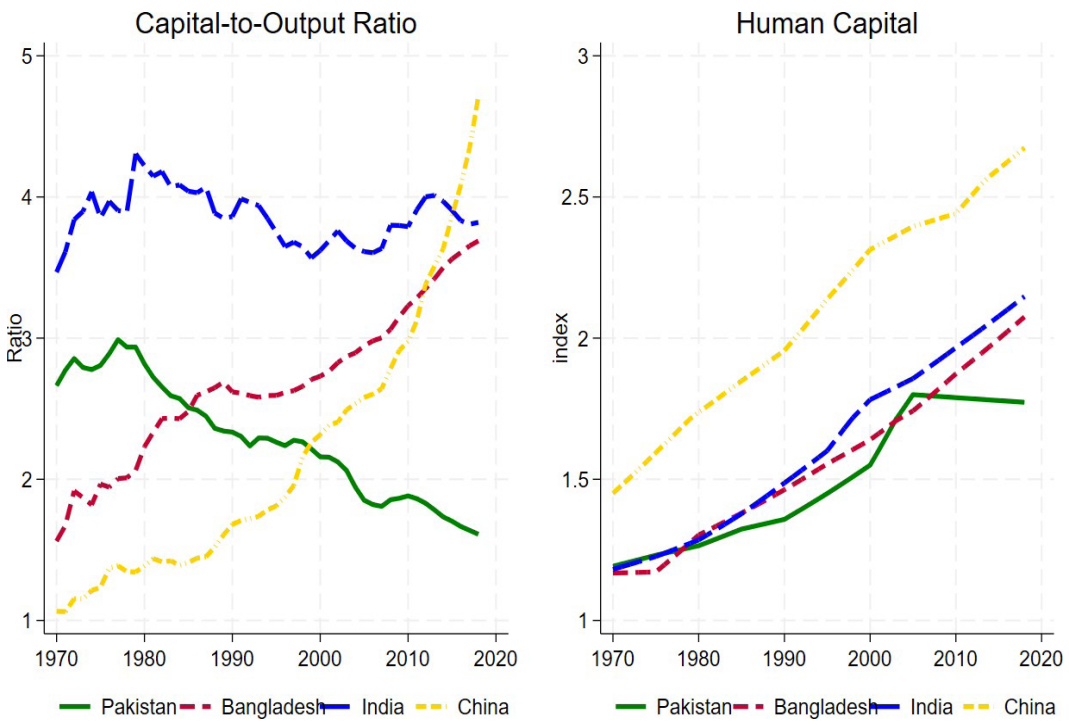


Figure 4.5

Capital-Output Ratio and Human Capital across Countries

The last column of Table 4.1. reports statistics on how much of the variation in labour productivity can be explained by the variation in the input index for the period between 1980 – 2019. The input index captures both capital-output ratio and human capital and takes the form,

$$\left(\frac{K_t}{Y_t}\right)^{\frac{\alpha}{1-\alpha}} \frac{H_t}{L_t}.$$

Unsurprisingly, capital accumulation explains only 6.22% of the fluctuation observed in labour productivity in Pakistan. This suggests that the remaining 93.78% is explained by variation in TFP growth. The only other country in the list which comes close to Pakistan is the United States. However, the statistic for the US is not surprising. Since the US already has one of the highest levels of labour productivity, any further improvements in labour productivity are most likely to come from improvements in TFP. In contrast, the statistic for Pakistan is concerning. Despite having labour productivity which is only 13% of that of the US, variation in factor inputs do not explain much of variation in labour productivity.

Table 4.1 also shows that all the regional economies saw both physical and human capital as an important driver of changes in labour productivity over the past four decades. On the other extreme, almost all the variation in labour productivity in Viet Nam is explained by the variation in the input index. Within South Asia, all the four countries included in the table saw capital accumulation explaining more than 30% of the variation in labour productivity. Inklaar and Timmer (2013) use PWT 8.0 dataset to show that the average for the world has been close 35% for the period between 1980 – 2011.

Understanding why capital-to-output ratio has been falling in the case of Pakistan even when TFP growth is comparable to the rest of the world is critical for understanding the trend in labour productivity and designing policies to address it. However, we leave it for another study.

5 The Challenge of Misallocation of Resources

Section 3 argued that one of the reasons for limited economic transformation in the case of Pakistan is the dismal performance in terms of improving its labour productivity both at the aggregate level and across sectors. Importantly, the discussion also highlights the role of non-agricultural sector as the key driver of the transformation process as opposed to the agriculture sector. But is this the only reason for the lack of economic transformation? In this section, we explore the possibility if the (mis)allocation of resources across sectors can itself explain the phenomenon of missing transformation in Pakistan. For example, government policies such as regulatory barriers, fiscal incentives, and trade protection may allow some sectors to consume resources by more than what is considered economically efficient. Alternately, frictions in the labour market may prevent labour from moving from less productive to more productive sectors. Market failures such as frictions in credit markets can also prevent some sectors from growing to the level which is efficient.

We focus on looking at data for the *level* of labour productivity and wages across sectors and ask to what extent frictions in the labour market or elsewhere in the economy may prevent economic transformation in Pakistan. The answer to this question can have significant implications for policymakers. If it is the frictions in labour market then the focus of policymakers must turn to reforming labour laws, providing affordable housing in urban area, improving public transport, expanding social security, and other such measures which will be important for addressing the misallocation of resources and facilitating the reallocation of labour from one sector (or region) to another. Pirzada (2023) uses data from the labour force survey to suggest that this may be an important factor preventing economic transformation in the case of Pakistan. However, if it turns out that labour mobility is not a critical issue then the focus must shift to other places. For example, protection from external competition through tariff and non-tariff measures can allow some sectors to grow beyond the efficient level. Likewise, agricultural support prices and

restrictions on land use for certain economic activities can also result in the same.

a. Some Economic Theory

We start with outlining the relevant theory before using data to undertake the analysis. Consider a Cobb-Douglas production function for sector i which takes the following form,

$$Y_i = K_i^{\alpha_i}(A_i L_i)^{1-\alpha_i} \qquad (1)$$

where Y_i is output, K_i is capital, L_i is labour, and A_i captures labour augmenting productivity for sector i. α_i is the sector-specific output elasticity of capital and, under the assumptions stated below, equals the share of income going to capital.

We assume that both goods and factor markets are perfectly competitive. As a result, prices equal marginal costs, and the wage rate and the rental rate of capital equals the marginal revenue product of labour and the marginal revenue product of capital, respectively. In absence of any frictions which may prevent labour from moving from one sector to another, wages *per unit of labour* must also be similar across all sectors. This is because, under the assumption of perfect labour mobility, whenever wages are higher in one of the sectors, labour will relocate to this sector until wages are once again equal across sectors. Later, we look at the data on wages to analyse the extent to which this assumption is true. This will inform us if it is the frictions in the labour market which explain the limited economic transformation in Pakistan.

One can use the expression for the production function in (1) to obtain an expression for sector-specific labour productivity $\left(\frac{VA_i}{L_i}\right)$ such that,

$$\frac{Y_i}{L_i} = \frac{1}{1-\alpha_i} MPL_i = \frac{1}{1-\alpha_i}\frac{w_i}{p_i}$$

$$\frac{p_i Y_i}{L_i} = \frac{1}{1-\alpha_i} w_i \qquad (2)$$

$$\frac{VA_i}{L_i} = \frac{1}{1-\alpha_i} w$$

where MPL_i is the marginal product of labour, p_i is the price of goods produced in sector i in terms of the aggregate consumption basket, and w is the real wage rate.

VA_i is the value-added produced in sector i and $\frac{1}{1-\alpha_i}$ is the inverse of the labour share in value-added for the sector. The last expression says that, under the assumptions stated above, labour productivity in any given sector must depend on the production technology and the wage rate *per unit of labour*.

We now outline some results which are important for the discussion below. Under the assumption of perfect competition, the wage rate in sector i always equals the value of marginal product of labour for the sector, $w_i=p_i\ MPL_i$. Moreover, since labour is perfectly mobile, the wage rate across sectors must equal as well, $w_i=w$. If we assume further that all the sectors face the same production technology, α_i, labour productivity must also be similar across sectors.[12]

This sets our benchmark. If labour productivity is indeed different across sectors, then it must be due to one of the following reasons,

i. Differences in production technology such that some sectors are relatively more or less capital intensive than others;
ii. Differences in wages *per unit of labour* across sectors due to imperfect labour mobility;
iii. Distortions from government policies and market failures which lead to some sectors producing more or less than what is economically efficient.

The emphasis on *per unit of labour* in (ii) is important. Even under the assumption of perfect labour mobility, wages can still differ across sectors due to differences in the composition of skilled and unskilled labour in production. However, wages *per unit of labour* (after adjusting for differences in human capital) must be similar under perfect labour mobility.

What do (i), (ii), and (iii) tell us about the (mis)allocation of resources across the economy? If labour productivity differs across sectors, this may be due to differences is production technology, α_i. In this case, there is no reason to suspect misallocation of resources. However, if differences in labour productivity are due to (ii) and (iii) then these do indeed point to the misallocation of resources across sectors. A sector with lower labour productivity is producing more than what is efficient whereas the opposite is true for the sector with higher labour productivity. Specifically, differences in wages *per unit of labour* point to imperfect labour mobility as the primary factor driving both the difference in wages and labour productivity across sectors. Policies

12 The intuition for this is straightforward. Imagine $p_j\ MPL_j$ in sector j increases such that it is now higher relative to the rest of the economy. Since labour market is perfectly competitive, an increase in $p_j\ MPL_j$ must also result in an increase in the wage rate in sector j. However, under perfect labour mobility, wage rate must be the same across all sectors. This is achieved through labour relocating from the rest of the economy to sector j to benefit from higher wages. The increase in L_j decreases $\left(\frac{K_j}{L_j}\right)$ in sector j and increases $\left(\frac{K_{-j}}{L_{-j}}\right)$ in all other sectors until the point when wages are once again equal across sectors. Note that $MPL_i = (1-\alpha_i)A_i^{1-\alpha_i}\left(\frac{K_i}{L_i}\right)^{\alpha_i} = \frac{w_i}{p_i}$.

which remove relevant frictions and increase labour mobility will then facilitate both economic transformation and improve overall productivity in the economy. Alternately, if (i) and (ii) cannot explain differences in labour productivity, then there may be other reasons such as trade restrictions, regulatory barriers, fiscal incentives and other such policies instituted for political economy reasons which may incentivise production in some sectors at the expense of others. Market failures, especially in the credit markets, can also be critically important. Hsieh and Klenow (2009) show how distortions in general can result in misallocation of resources across firms. They show how these affect the value of marginal products of labour and capital across firms even when they face the same wage and rental rate of capital, and have the same production technology, α.

b. Taking theory to data

We now turn to data to discuss which of these possibilities is more likely to be true in the case of Pakistan. We follow the literature and rewrite equation (2) in the form of *productivity gap* such that,

$$Gap\left(\frac{VA_i}{L_i}\right). = \frac{Gap(w_i)}{Gap(LS_i)} \qquad (3)$$

where Gap(.) represents the ratio between the sector-specific and the aggregate value for a given variable. For example, Gap $(\frac{VA_i}{L_i})$ is the ratio of labour productivity in sector i and the aggregate economy. This is also true for Gap(LS_i) and Gap(w_i). LS_i is the share of labour income in the value-added for sector i, 1-α_i.

The discussion in 4.a implies that, under perfect labour mobility and no difference in human capital across sectors, Gap(w_i) must equal 1 for all sectors. In other words, wages must be similar across sectors such that there is no gap between the wage rate in sector i and the average wage rate for the economy, Gap(w_i)=1 for all i. If this is indeed the case, then all the variation in $Gap\left(\frac{VA_i}{L_i}\right)$ should only result from variation in Gap(LS_i). However, if variation in both Gap(w_i) and Gap(LS_i) cannot explain the observed variation in $Gap\left(\frac{Y_i}{L_i}\right)$, we have reason to believe that differences in labour productivity across sectors are due to factors such as regulatory barriers, trade protection, and fiscal incentives due to political economy reasons. Additionally, the differences may also be due to market failures which affect some sectors more than others, and the measurement issues in data.

We now turn to data. We start with analysing the misallocation across all the sectors for which we have data before focusing on misallocation across the agriculture and the non-agriculture sectors.

i. Misallocation across the economy

For calculating productivity gaps across sectors, we use data on value-added and labour force for each sector from the ETD database. Figure 5.1 plots data on labour productivity gap across sectors for the year 2018. A ratio of less than one indicates that labour productivity for the sector is less than the average labour productivity for the economy. In contrast, a ratio greater than one means that labour productivity for the sector is greater than the average labour productivity. It is clear that there are significant differences in labour productivity across sectors. Labour productivity in construction, agriculture and manufacturing is less than the aggregate labour productivity for the country. However, labour productivity in finance, business, mining, and real estate is considerably higher. To quantify how much the productivity gap varies across sectors, we calculate the *coefficient of variation* which equals the standard deviation divided by the mean for the sample. However, before we do that, we combine the finance, business and real estate sectors to have a corresponding sector which maps to *financing, insurance, real estate and business services* sector for the wage gap. We also combine the government and other sectors to have a corresponding sector which maps to *community, social and personal services* sector. We find the coefficient of variation to equal 1.16.

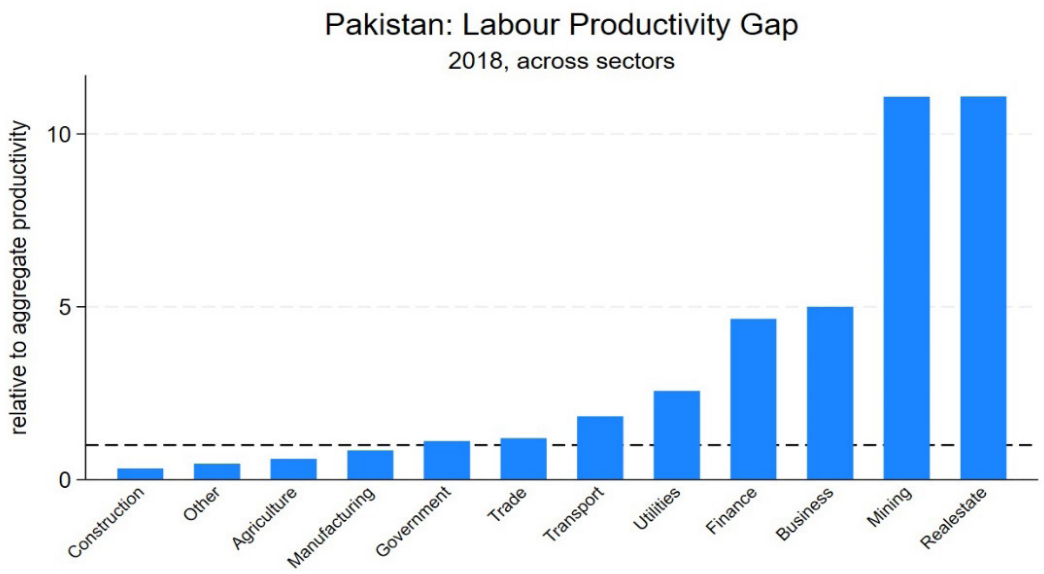


Figure 5.1

Pakistan: Labour productivity gap across sectors, 2018

We now analyse data for the wage gap. Specifically, we want to quantify the variation in wage gap observed across sectors. Later, we also comment on the extent to which some of the wage gap could potentially be explained by differences in human capital. However, without sector specific data on human capital per worker, the discussion on the role of human capital remains speculative. We use wage data from the 2020-21 Labour Force Survey for Pakistan to calculate wage gap across sectors. The survey only reports data on annual income for self-employed across sectors. The survey also reports data on hours worked per week for the self-employed across sectors. However, data on hours worked is reported for 20 sectors whereas that for annual income is reported for only 9 sectors. We map the 20 sectors to the 9 sectors as closely as possible and take averages to find hours worked for each of the 9 sectors. We then use data on annual income and hours worked to calculate income per hour (our measure for wage). Finally, we use data on income per hour across sectors and income per hour at the aggregate level to calculate wage gap across sectors.[13]

Figure 5.2 reports the results. As in the case of productivity gap, a ratio of less than one indicates that the hourly wage for the sector is less than the average hourly wage for the economy. In contrast, a ratio greater than one means that the wage for the sector is greater than the average wage. The figure shows that wages across 4 of the 9 sectors are comparable to the average wage in the economy. In the other five sectors, wage gap is close to 2.75 for *mining & quarrying,* 1.8 for *financing, insurance,*

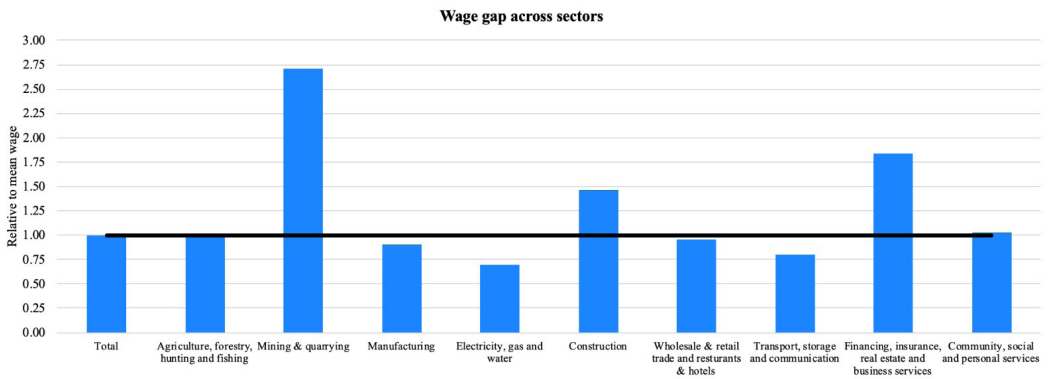


Figure 5.2

Wage gap across sectors in Pakistan

13 Our measure for wage is far from perfect. The annual income reported by the self-employed may also include income from capital if the self-employed individual is also the investor in their business. This would be less of a problem if fraction of income due to capital was the same across sectors. However, this is unlikely. The investment required to setup a business can vary considerably across sectors. Nonetheless, with available data and the limited scope of this study, this is the best we can do. Future work can improve on our measure for wage across sectors and see the extent to which the conclusions in this report change.

real estate, and business services, 1.5 for ***construction,*** and about 0.75 for both *electricity, gas and water and transport, storage, and communication.* To quantify how much the wage gap varies across sectors, we calculate the *coefficient of variation* as before. We find the coefficient of variation to equal 0.52.

The coefficient of variation for the wage gap is almost half that for the productivity gap. Moreover, some of the variation in wage gap can be further explained by differences in human capital per worker across sectors. For example, the human capital per worker in the *financing, insurance, real estate, and the business services* sector is most likely higher than the average level of human capital per worker across the economy. As a result, a significant fraction of the wage gap for the sector may be explained by differences in human capital. Differences in human capital could also explain the low levels of wage gap for both the utilities and the transport sectors. These sectors are likely to employ workers who possess less human capital than the average worker in the rest of the economy. While the discussion on human capital remains speculative, this will nonetheless lower the variability in the wage gap depending on the extent to which workers possess more human capital in the financial services sector and less so in utilities and transport. [14] [15]

The above discussion rules out frictions in the labour market as the predominant reason for differences in labour productivity across sectors. But what about differences in production technology across sectors? To understand the extent to which differences in production technology can explain differences in labour productivity, we use the values for the labour share across the sectors, $(1-\alpha_i)$, from Inklaar et al. (2023) except with one change. Inklaar et al. calculate the share of labour, $(1-\alpha_i)$, for the median economy for the agriculture sector to only equal 0.21. This is due to a significantly large share of land in total income – at 0.47. However, they also point to significant uncertainty around the share of land which ranges from 0.29 at the 25th percentile to 0.67 at the 75th percentile. Considering this uncertainty, we revise the labour share upwards from 0.2 to 0.4 to come closer to what is reported in the rest of the literature (see section 5.2 in Herrendorf and Schoellan, 2015). The coefficient of variation for $Gap(LS_i)$ equals 0.38.

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14 We do not take stand on mining & quarrying. A significantly higher wage gap for the mining & quarrying sector could potentially reflect both higher level of human capital and lower degree of labour mobility specific to this sector. The capital-intensive nature of the sector suggests that the sector is likely to employ relatively more skilled workers when compared to the rest of the economy. Moreover, since production activities linked to the sector may be concentrated in isolated and far off places, the sector may also face significant frictions preventing labour from relocating to where the production is based. Both these reasons may justify the higher wage gap observed for the sector. However, more data in required to fully understand the wage gap observed for this sector.

15 Data on productivity gap and wage gap for the construction sector are also difficult to interpret. One may resort to higher levels of human capital to explain the higher levels of wage gap for the sector. However, in anything, anecdotal evidence and data on productivity gap suggests that human capital per worker for the sector may be lower relative to the average worker in the economy. An alternate explanation may involve mismeasurement in our measure for wages. It is possible that a significant proportion of the annual income reported in the survey by self-employed in this sector is attributed to capital rather than labour. Correcting for this may reduce the wage gap to close to one.

The coefficient of variation for both the wage gap and the gap in production technology suggests that differences in wages and production technology across sectors cannot on their own explain the observed differences in labour productivity. However, what about the two together? To answer this question, we calculate the value for the expression to the right of equation (3) for each sector. We call this *adjusted* wage gap i.e., adjusted for differences in production technology. We then calculate the coefficient of variation as before and compare it the coefficient of variation for productivity gap.

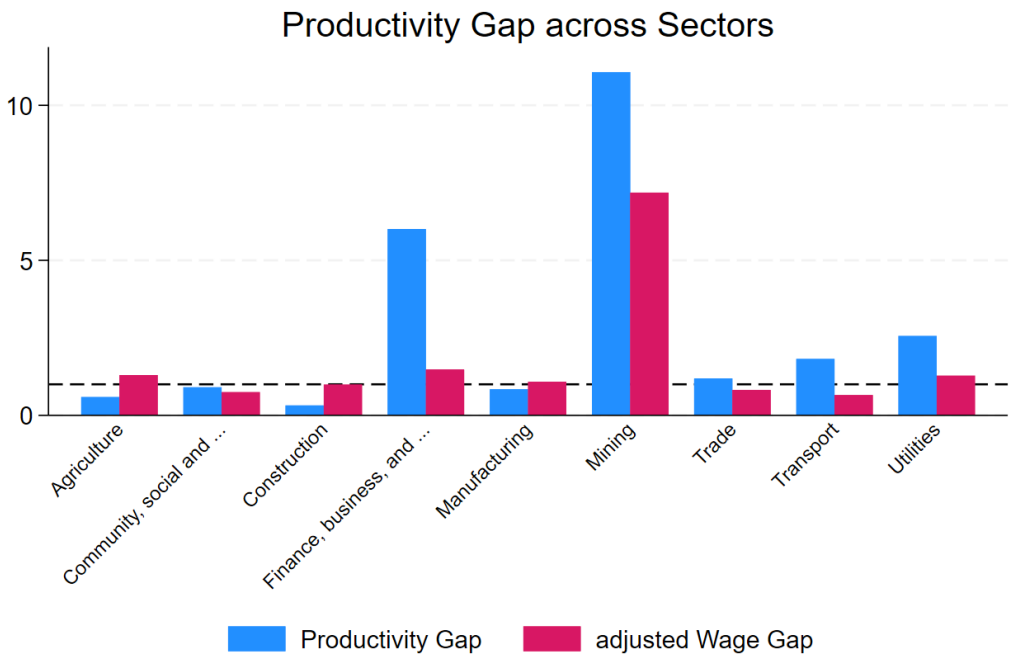

Figure 5.3

Productivity gap and the wage gap after adjusting for differences in production technology

Interestignaly, the coefficient of variation for the adjusted wage gap equals 1.19 which exactly equals the coefficient of variation for the productivity gap for our 9-sector economy. Figure 5.3 plots the productivity gap and the adjusted wage gap across sectors. While the two are not exactly similar, the differences are significantly smaller compared to when wages are not adjusted for differences in technology. A further adjustment for human capital can potentially reduce the differences between the productivity gap and the adjusted wage gap even further. This is most likely to be the case for *finance, business, and other services* and possibly *mining*. Nonetheless, there are significant differences between the two for some of the sectors.

ii. Misallocation across agriculture and non-agriculture sectors

The literature studying differences in labour productivity across sectors has particularly focused on productivity gap in the agriculture sector. Gollin et al. (2014) find labour productivity in the agriculture sector to be significantly lower in the case of developing countries than in the case of developed countries. They find this to be the case even after they adjust for differences in human capital across agriculture and non-agricultural sectors and measurement errors in data. The results in Inklaar et al. (2023) are also consistent with the *"development literature arguing that there is surplus labor in agriculture."* Figure 5.4 uses data from the database constructed in Inklaar et al. (2023) to plot agricultural productivity gap for the 84 countries, including developed and developing countries, for the year 2017. On average, labour productivity in the agriculture sector is significantly lower relative to the national average for developing countries than it is for developed countries.

Several authors have used this as evidence to suggest that countries can be better off by reallocating resources out of the agriculture sector. For example, McMillan and Rodrik (2013) argue that reallocating labour from less productive to more productive sectors can increase the overall labour productivity for many countries.

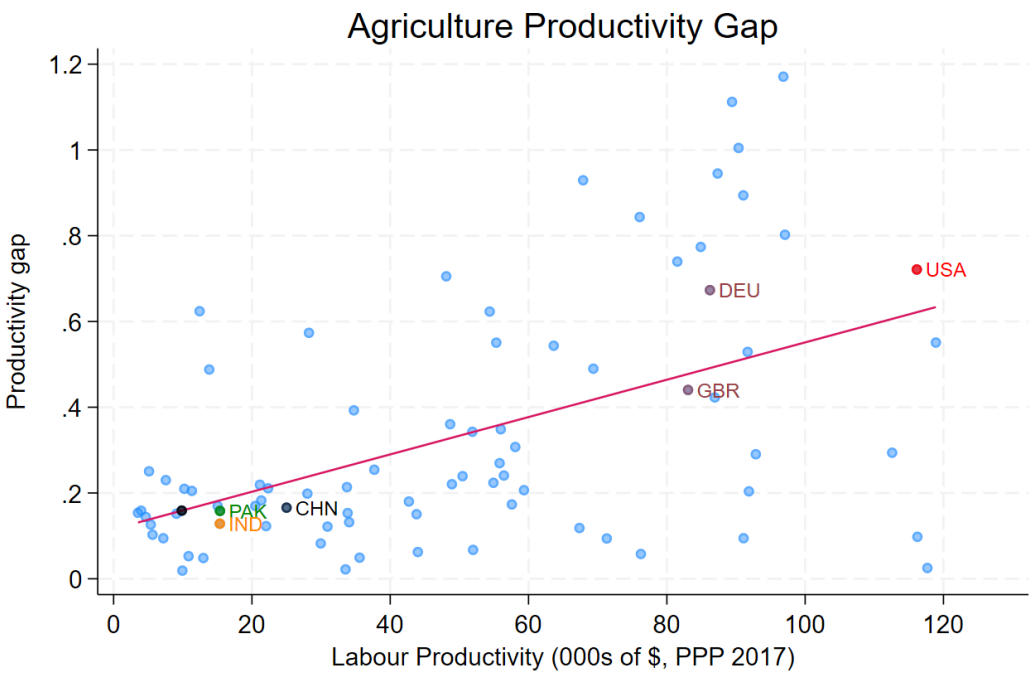

Figure 5.4

Agricultural Productivity Gap

We now replicate this exercise for Pakistan. To do so, we reduce the number of sectors in the previous section from nine to two. One of the nine sectors include agriculture. For the non-agriculture sector, we take taking a weighted average of productivity and wage gaps for the remaining eight sectors. The weights are based on employment share for each of the sector from the ETD database. We find that wages in agriculture sector equal 94% of that in the non-agricultural sector. In contrast, labour productivity in the agriculture sector is only 47% of that in the non-agriculture sector. In absence of distortions such as those due to government policies and market failures, explaining the difference in labour productivity between the agriculture and the non-agricultural sectors will require the labour share of income in the agriculture sector to be twice that of the share in non-agriculture sector. However, if anything, Herrendorf and Schoellan (2015) report the labour share for the agriculture sector to be less than that for the non-agriculture sector. Studies focusing on developing economies such as those cited in Herrendorf and Schoellan find the labour share to equal 0.4. Inklaar et al. (2023) estimate the labour share in total income to be even lower at only 0.21.

The evidence presented above points to distortions due to government policies and market failures as the key reason behind limited economic transformation. This is an important result. While frictions in the labour market may still play a significant role, these do not appear to be the dominant factor preventing economic transformation in the case of Pakistan.

iii. Recollections

The analysis in section 5 studies the extent to which resources are misallocated across sectors. To achieve this, we motivate our discussion using a simple neoclassical model which allows for multiple sectors across the economy. The model shows that under the assumption of perfect competition in goods and factor markets, labour productivity in any given sector must depend on the wage rate and differences in production technology across sectors. Moreover, if labour is perfectly mobile, the wage rate per unit of labour must also equal across sectors. Having set the stage, we turn to the data from the PBS labour force survey and international databases and ask what factors play an important role in explaining observed differences in labour productivity across sectors. Here is what we find.

Our results show that the observed variation in labour productivity across the nine sectors of the economy cannot be explained by either the differences in wages or production technology across sectors. The coefficient of variation for each of these is less than half of what we observe for labour productivity. However, together, the two factors can go a long way to explain differences in labour productivity across the economy. This suggests that there is limited evidence of resource misallocation across the sectors at the economy-wide level. Figure 5.5 plots our measure of dispersion in labour productivity across sectors for the 84 countries in the Inklaar et al. (2023) dataset with income levels on the horizontal axis. While differences in labour productivity are higher than what is observed for India and China, Pakistan does better

than the average within the same income group. Moreover, the coefficient of variation for Pakistan is not significantly higher than what is observed for some of the advanced economies.

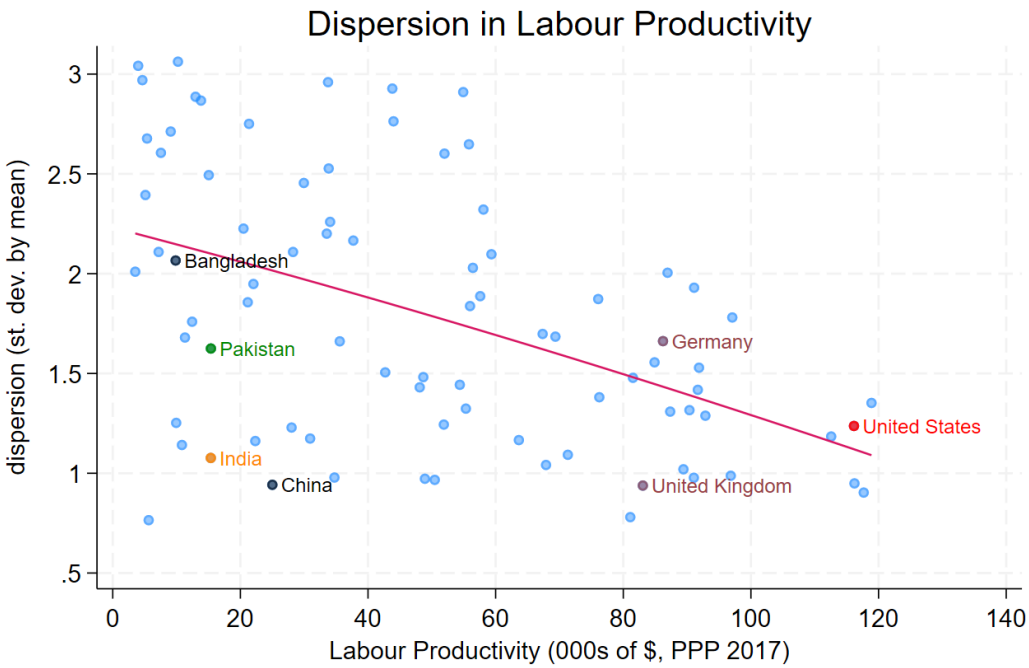

Figure 5.5

Coefficient of variation across countries

However, these results are reversed when we restrict our attention to the agriculture and the non-agricultural sectors. Our results point to significant overallocation of resources in the agricultural sector at the expense of the non-agricultural sector. The productivity gap between the two sectors cannot be explained by either imperfect labour mobility or differences in the production technology. Instead, trade restriction which prevent import of intermediate inputs and agricultural machinery, fiscal policies incentivising agriculture over non-agriculture sector, regulatory barriers and support prices, macroeconomic uncertainty, and factors such as market failures in the credit markets are likely to play a more important role.

This supports the findings in the literature including the policy proposal that countries can increase their overall productivity by implementing policies which allow or facilitate resources to move from less productive agriculture sector to the more productive non-agricultural sector. This not only facilitates the process of structural

transformation but further strengthens it by subsequently increasing the overall productivity of the economy which plays a key role in the transformation process.

In what follows, we turn to understanding how trade reforms in the form of integration in global value chains can help increase the TFP growth rate for Pakistan and facilitate the transformation process. However, before answering this question in section 7, section 6 starts with documenting key facts which help understand Pakistan's position relative to the rest of the world when it comes to integration in the GVCs.

6 GVCs: Forward and Backward Trade Linkages

The discussion around structural transformation in previous sections has abstracted from any serious discussion on the role of international trade in the transformation process. In the last three decades, starting mostly with Matsuyama (1992), a small body of literature has emerged which brings international trade at the core of the discussion on structural transformation. Some of the recent papers in this literature includes Matsuyama (2009), McMillan and Rodrik (2011), Uy et al. (2013), Betts et al. (2017), and Teignier (2018). In the presence of international trade, production is no longer tightly linked with domestic consumption. Instead, countries' comparative advantage becomes an important factor in determining the structure of economy. A country with comparative advantage in non-agricultural sector will see transformation happening at a much faster rate when it opens up its economy to international trade. Alternately, a country with comparative advantage in agriculture may find it difficult to reallocate resources from agriculture to non-agricultural sector even when the increase in incomes levels at home results in a disproportionately large increase in the demand for non-agricultural goods than for agriculture goods.

Teignier (2018) consider the case of South Korea and Britain and show that South Korea's economy would have transformed at a much faster rate if they had not continued to protect their agriculture sector from international competition. Likewise, Britain would have transformed at a much slower pace and would have had a significantly higher share of labour in agriculture if it had not liberalised international trade during the 19th century.

Sectors	Effective Rate of Protection (2019)
Dairy Products	165%
Sugar	123%
Food products n.e.c.	245%
Beverages and tobacco products	167%
Textiles	77%
Wearing apparel	185%
Leather products	77%
Wood products	76%
Petroleum, coal products	79%
Motor vehicles and parts	143%

Table 6.1

Effective Rate of Protection *(Source: Varela et al., 2020)*

The discussion on international trade as a mechanism for structural transformation is important for Pakistan as it continues to protect its dominant sectors from international competition. Varela et al. (2020) document the high levels of effective tariff protection which most of the dominating sectors currently enjoy in Pakistan. These range from agricultural products, processed food, textiles, automobiles, manufactures n.e.c. and others. Table 6.1 reproduces the table from the EAG Vision Document which gives the effective rate of protection for various production sectors from Varela et al. (2020). In what follows, we document Pakistan's openness to international trade through its participation in Global Value Chains (GVCs). The next section considers in detail if increasing participation in GVCs can increase overall productivity of the economy and facilitate the transformation process.

According to a report titled "Pakistan's Economy and Trade in the Age of Global Value Chains" published by the Asian Development Bank and the Islamic Development Bank Institute in January 2022, Pakistan's participation in global value chains (GVCs) is not only low but Pakistan also produces relatively less complex textile products relying mostly on processing in foreign countries. Fernandes, Kee and Winkler (2020) find several factors such as endowments, geographical distance, trade policies,

and FDI which influence GVC participation across countries. Antras (2020) also lists several determinants of GVC participation both at the country-level and at the firm-level. Factors such as trade costs can adversely influence GVC participation rates. Moreover, higher trade openness is likely to indicate favourable conditions for international trading activities. Hence, it may also be an important determinant for GVC participation across countries.

GVC participation can take the form of both forward and backward integration. The former involves exporting raw materials and intermediate goods for further processing in the importing country which is then re-exported either back to the home country or to a third country. In contrast, the later involves processing foreign inputs for exports by the home country. Aslam, Novta, Rodrigues-Bastos (2017) uses EORA database to show how these measures are calculated.

In this section, we use data from Asian Development Bank's Multiregional Input Output (MRIO) database to calculate the level of GVC participation and the GVC position for each country. This data is available for 35 sectors across 62 countries for the period 2007 – 2022. The ADB MRIO database covers more sectors compared to the 26 sectors covered in the simplified version of the EORA MRIO database. However, the ADB database includes less countries and is only available for 2007 – 2022. In contrast, the EORA database covers 190 countries and is available going all the way back to 1990. In the next section of this report where the emphasis is on presenting econometric analysis, we use the EORA database due to its advantage in terms of greater coverage both across countries and over time. Data on GDP per capita, trade openness and population is taken from Penn Worlds Tables database (version 10.0). Data on distance to measure remoteness for each country in our sample is taken from CEPII's Gravity dataset.

a. Regional comparison

Before proceeding with the analysis, we define few concepts which are useful to keep in mind. The GVC participation rate is calculated as the sum of foreign value-added in-home exports (backward linkage) and the domestic value added in the exports of the trading partners (forward linkage) divided by home country's gross exports. The GVC position is calculated as the difference in forward participation and backward participation, where countries reporting a positive value are likely to participate in GVCs more through the forward linkages than through the backward linkages. The export-oriented sectors are defined as sectors that account for more than 10 percent of the share in a country's exports. For example, the textile sector is considered export-oriented in the case of Pakistan as it accounts for more than 10 percent of the total exports (on average) originating from Pakistan between 2007 – 2022.

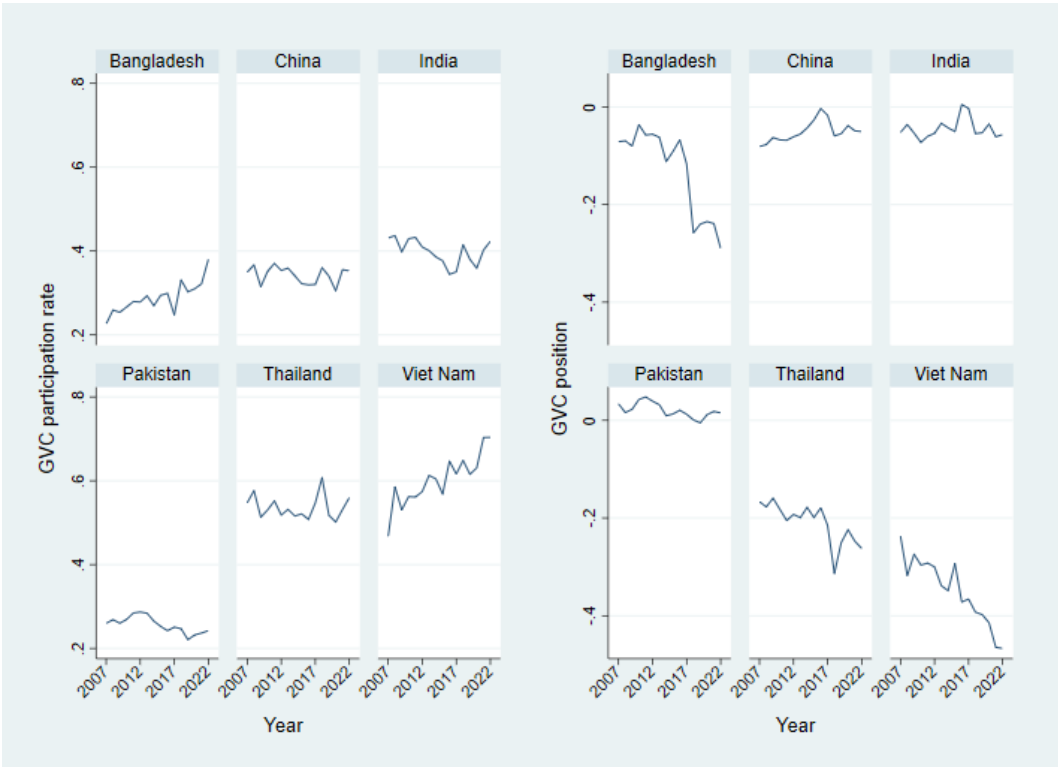

Figure 6.1

GVC participation and GVC position across countries

Figure 6.1 presents data on GVC participation and GVC position for Pakistan and several other developing countries, including the regional peers. Pakistan has the lowest level of GVC participation relative to the regional countries, at 0.24 in 2022. Moreover, GVC participation has been decreasing since 2011. In contrast, GVC participation for Bangladesh and Vietnam has increased considerably during this period. While the GVC participation rate for Bangladesh increased from close to 0.22 in 2007 to close to 0.4 in 2022, the number for Viet Nam has increased from less than 0.5 to close to 0.7 over the same period. The GVC participation for the other four countries has remained stable but is significantly higher than that for Pakistan. The number is close to 0.4 for both India and China whereas it is close to 0.55 for Thailand. Specifically, GVC participation rate for Bangladesh has increased from a similar value to that for Pakistan in 2007 to a level comparable to China and India. This clearly suggests that Pakistan is a laggard in comparison to its regional counterparts when considering its participation in GVCs.

The measure for GVC position also tells a different story for Pakistan when compared to regional countries. GVC position has been consistently positive for Pakistan, except in 2019 when it turned slightly negative. This implies that Pakistan's limited participation in the GVCs is led by participation through forward linkages. The only other instance a regional counterpart reported a positive value was India in 2016. This clearly suggests that while Pakistan participates in GVCs through forward linkages, the other major regional economies participate in the GVCs through backward linkages. Moreover, the GVC position for Bangladesh has changed from minus 0.03 to approximately minus 0.3. For Viet Nam, the number has changed from minus 0.23 to minus 0.46. This shows that the increase in GVC participation for the two countries was driven by an increase in participation through backward linkages i.e., processing imported inputs for exports. The GVC position for Thailand has also changed from minus 0.16 to minus 0.3, suggesting a change in the nature of GVC participation over this period. However, both China and India have maintained a steady GVC position of minus 0.08.

The increase in GVC participation driven by increase in backward linkages for most countries considered here also points to these countries opening their economies to international trade. In contrast, Pakistan has one of the lowest levels of trade openness across countries. The higher levels of effective protection enjoyed by dominant sectors is a key factor preventing increase in backward integration in the case of Pakistan.

b. Trade openness and participation in global value chains

Figure 6.2 plots a scatter plot between the two measures for GVCs and trade openness. There is a clear positive correlation between GVC participation rate and trade openness and a negative correlation between GVC position and trade openness. Countries that are more open to trade are not only more likely to participate in GVCs but their GVC participation is likely to be dominated by backward linkages.

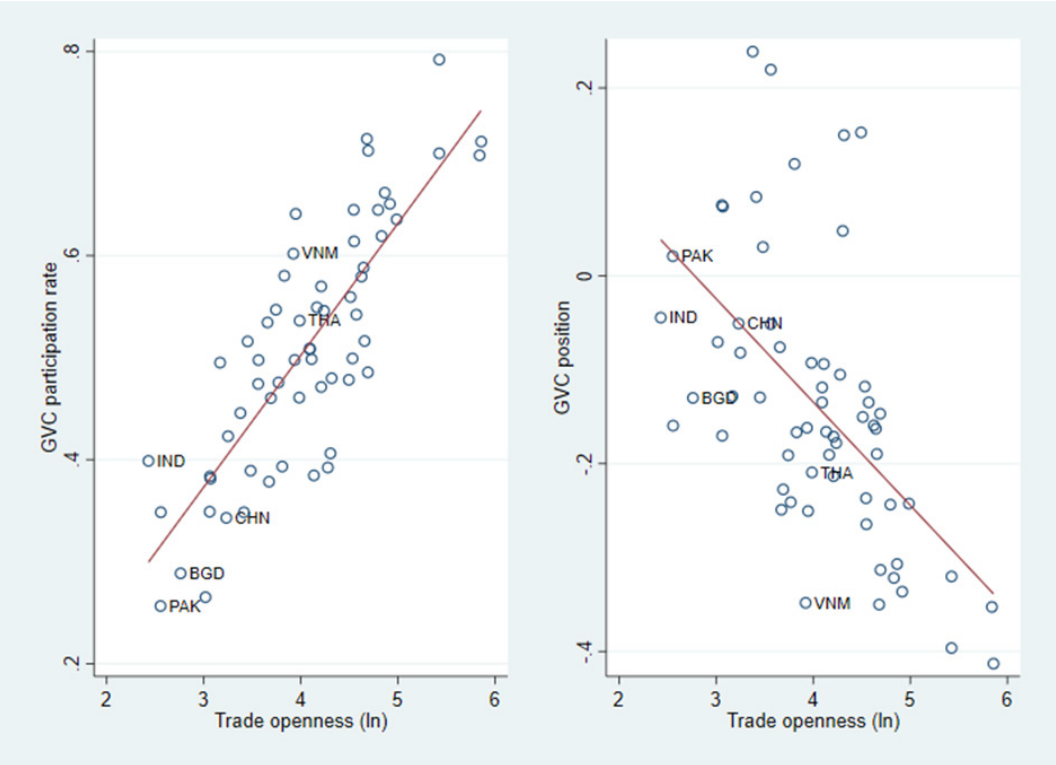

Figure 6.2

Correlation between GVC participation, GVC position and trade openness, across countries

Figure 6.3

GVC participation and GVC position for export-oriented industries, across countries

We now look at the nature of GVC participation for both export and non-export industries across the countries considered above. Figure 6.3 plots the GVC participation rate and the GVC position for the export-oriented industries and the other industries between 2007 and 2022. The results are revealing. Export-oriented industries in Pakistan report lower levels of GVC participation than export-oriented industries in the regional countries. Further, there is a significant difference in the level of GVC participation for Pakistan and India between the two types of industries. While export oriented industries report higher rates of participation than other industries in India, it is the opposite in Pakistan.

Unlike export-oriented industries in other countries, the export-oriented industries in Pakistan also report a positive GVC position. Further still, the GVC position of export-oriented in Pakistan is even higher than the GVC position of other industries in the country for much of this period. In contrast, the export-oriented industries in Bangladesh, Thailand and Viet Nam have seen a significant increase in backward linkages in recent years. This again suggests that export-oriented industries in

Pakistan are participating in GVCs through forward linkages, while export-oriented industries in the regional counterparts are participating through backward linkages.

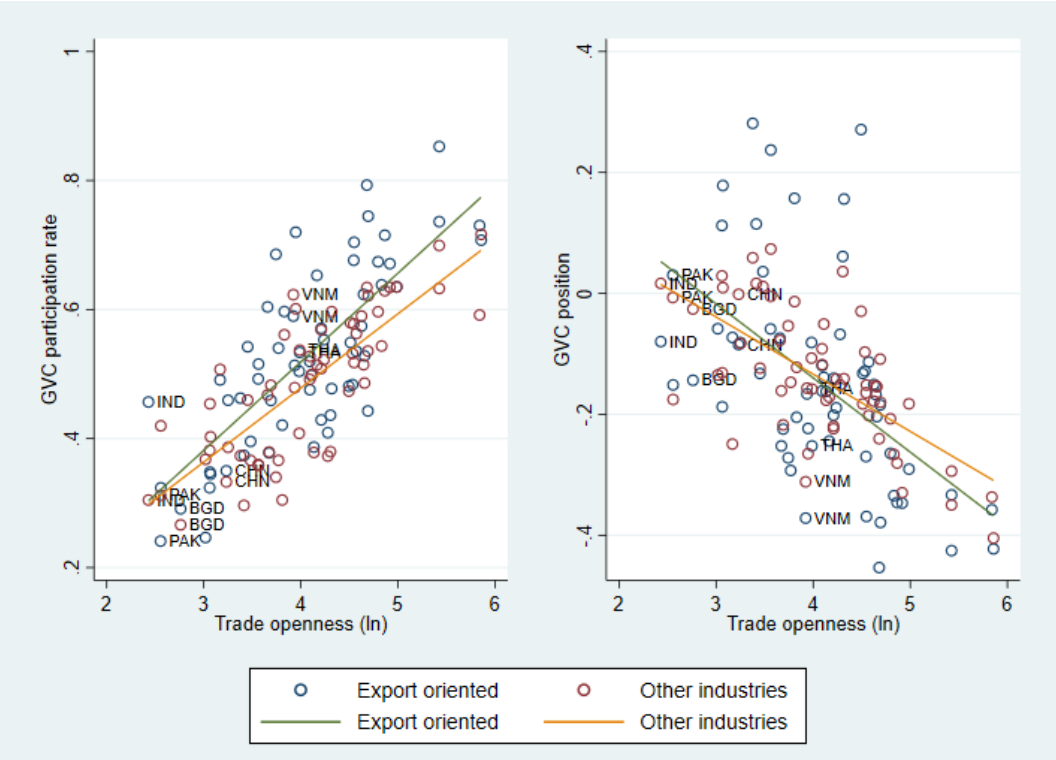

Figure 6.4

GVC participation and GVC position for export-oriented and non-export-oriented industries, across countries

Figure 6.4 repeats the exercise in figure 6.3 but this time looking at both export-oriented and non-export-oriented industries across countries. As before, the correlation between GVC participation and trade openness is positive and the correlation between GVC position and trade openness is negative across both export-oriented and other industries. However, the correlation between trade openness and the two measures of GVC is stronger for export-oriented industries relative to other industries.

To explore the relationship between trade openness and integration with the GVCs, we estimate an OLS model with measures for GVC as dependent variable and trade openness as the independent variable. We also control for other factors which may influence GVC integration such as the level of economic development (GDP per capita), size of the country (population), distance from trading partners (remoteness), and time fixed effects.

Table 6.2 reports the results. Trade openness continues to be correlated with both GVC participation and GVC position. The correlation between trade openness and GVC participation is positive and statistically significant at one percent significance level, whereas that between trade openness and GVC position is negative and statistically significant at one percent significant level. The estimates for the correlation between GVC measures and trade openness are similar across the Asian countries and the full sample. The results reenforce the analysis above that higher trade openness is associated with greater GVC participation driven by higher backward linkages.
The estimation results for the relationship between GVC measures and remoteness are also interesting. Higher remoteness is associated with lower GVC participation and higher participation through forward linkages. In other words, more centrally located countries are likely to report higher levels of GVC participation rate and participate through backward linkages rather than forward linkages. It is worth noting that Pakistan ranks reasonably well in the rankings for remoteness relative to other countries (see the appendix in Melitz (2007)). By one measure, Pakistan ranks 52, whereas by another measure Pakistan ranks 76 out of a list of 157 countries.

	Full Sample		Asian Region	
	GVC Participation	**GVC Position**	**GVC Participation**	**GVC Position**
Trade openness (ln)	0.15*** (0.00)	-0.19*** (0.01)	0.14*** (0.01)	-0.17*** (0.01)
Remoteness (ln)	-0.11*** (0.01)	0.07*** (0.02)	-0.05** (0.02)	0.14*** (0.04)
GDP per capita (ln)	-0.03*** (0.00)	0.10*** (0.01)	0.00 (0.01)	0.09*** (0.01)
Population (ln)	0.01*** (0.00)	0.00 (0.00)	0.01*** (0.00)	-0.00 (0.00)
Constant	1.06*** (0.10)	-0.95*** (0.19)	0.35* (0.21)	-1.55*** (0.32)
Observations	793	793	299	299
R-squared	0.72	0.51	0.74	0.48

Robust standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*
Includes year fixed effects

Table 6.2

OLS estimates for trade openness and integration with GVCs.

We now repeat the exercise for export-oriented and non-export-oriented industries. The results are reported in table 6.3. Again, the correlation between trade openness and GVC participation is stronger for export-oriented industries than it is for other industries. Likewise, the correlation between trade-openness and GVC position is also stronger for export-oriented industries. Nonetheless, trade openness is also correlated with GVC measures for non-export-oriented industries. The correlations are statistically significant at one percent significance level for both export and non-export-oriented industries. It is also interesting to note that remoteness affects export-oriented industries more than it affects other industries both when looking at GVC participation and GVC position.

	GVC Participation		GVC Position	
	Export Oriented	**Other Industries**	**Export Oriented**	**Other Industries**
Trade openness (ln)	0.17***	0.13***	-0.22***	-0.13***
	(0.01)	(0.01)	(0.01)	(0.01)
Remoteness (ln)	-0.14***	-0.08***	0.11***	-0.02*
	(0.01)	(0.01)	(0.02)	(0.01)
GDP per capita (ln)	-0.03***	-0.02***	0.12***	0.06***
	(0.00)	(0.00)	(0.01)	(0.00)
Population (ln)	0.01***	-0.00	-0.00	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)
Constant	1.33***	0.87***	-1.38***	-0.02
	(0.13)	(0.15)	(0.21)	(0.12)
Observations	793	793	793	793
R-squared	0.65	0.63	0.49	0.56

Robust standard errors in parentheses
**** p<0.01, ** p<0.05, * p<0.1*
Includes year fixed effects

Table 6.3

OLS estimates for export-oriented and other industries

In summary, trade openness is the most significant factor that not only positively drives GVC participation but also encourages backward linkages. It is imperative to note here that this is an introductory study aimed at understanding the trade patterns involving the GVC participation rate and the GVC position of Pakistan and its regional counterparts. A deeper understanding with a more robust empirical strategy is required to determine the right mix of policies needed to better integrate Pakistan into GVCs.

7 GVC Participation and Productivity Growth

We now turn to understanding the relationship between productivity growth and integration in global value chains. To put this into perspective, we follow the exercise in Jones (2013) and calculate the output multiplier for improvements in productivity for Pakistan. We find that a 1% increase in TFP will increase GDP by 2.52% over the long run. This is one of the highest amongst the group of countries for which Jones reports values for the multiplier. Additionally, the role of productivity improvements in driving transformation has already been discussed at length in previous sections and is at the core of the analysis in this report.

Theoretically, Meza et al. (2019) show how an increase in barriers which affect firms access to intermediate inputs used in production decrease aggregate productivity. This provides motivation for the exercise in this section. More precisely, we start with considering if increase in backward linkages will increase a country's productivity. If the low level of backward integration is due to factors other than trade barriers and instead driven by a country's comparative advantage, then backward integration may not affect aggregate productivity. However, if trade barriers indeed affect the level of backward integration, then we expect to find a positive relationship between backward integration and productivity. We also consider the role of forward integration which is defined as a fraction of country's exports which are reexported by the importing country to a third country.

To study this, we use the panel data on global value chains from the UNCTAD-Eora GVC database and the aggregate productivity data from the Penn World Table (PWT) version 10.01. The Eora database includes data on 190 countries for the period from 1990 to 2018. We prefer this to the ADB's MRIO database due to EORA's wider coverage both across countries and over time. Before proceeding with the analysis, we plot the statistics on forward and backward linkages from the EORA database for Pakistan and few regional countries to confirm that Pakistan's participation in GVCs is dominated by forward linkages as suggested in section 6 using ADB's MRIO database (Figure 7.1).

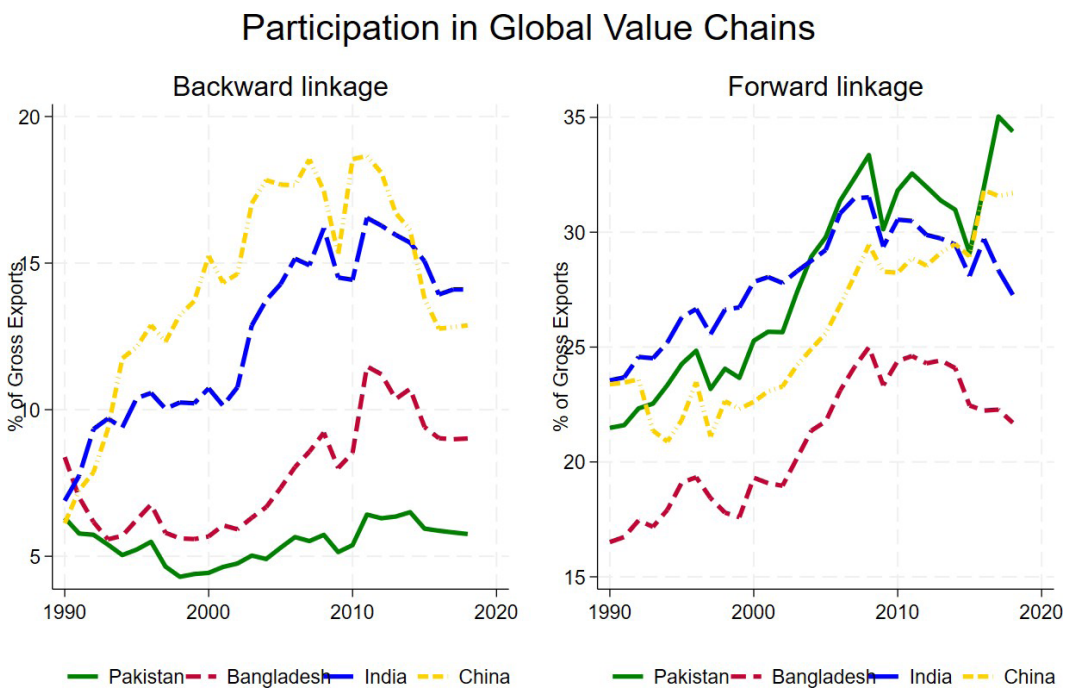

Figure 7.1

Participation in Global Value Chains

The PWT database includes data on 183 countries for the period from 1950 to 2019. However, the PWT database only provides data on aggregate productivity for 118 countries. This is due to the missing data on income share for employed and self-employed labour in GDP. The median real GDP per capita (in international dollars) for the 118 countries equals $17,222 for the year 2018. Unfortunately, the 118 countries do not include Pakistan. While this does not matter for the analysis in this section, we are still inclined to include it in the sample since the focus of this report is on Pakistan. To overcome this, we start with assuming that the share of labour income in value-added for Pakistan equals 50%. We then use the data in PWT database and the methodology in Inklaar and Timmer (2013) to calculate a series for aggregate productivity growth for Pakistan. For more details, see discussion in section 4.a above.

a. Two-way fixed effects model

We estimate the following two-way fixed effects model to study the relationship between GVC participation and the current and future productivity:

$$TFP_{i,t+h}^{gr} = \alpha + \mu_i + t + \beta_1 bgvc_{i,t} + \beta_2 bgvc_{i,t}^2 + \theta_1 fgvc_{i,t} + \theta_2 fgvc_{i,t}^2 + \delta bgvc_{i,t} fgvc_{i,t} + \boldsymbol{\gamma X_{i,t}} + \epsilon_{i,t}$$

where $TFP_{i,t+h}^{gr}$ is aggregate productivity in country i at time $t+h$ such that h ≥ 0. $bgvc_{i,t}$ and $bgvc_{i,t}$ are our measures for backward and forward linkages in the global value chains, respectively. $\boldsymbol{X_{i,t}}$ is a vector of control variables. μ_i and t are the country and time fixed effects. Finally, $\epsilon_{i,t}$ is the error term. The model allows for the interaction between forward and backward linkages and includes the quadratic terms to allow for the marginal effect to change conditional on the level of integration in the value chains. In baseline exercises we do not control for any other variables. However, in the robustness exercises, we include different measures of international capital flows from Alfaro et al. (2014) database and governance indicators from the World Bank's governance indicators database as control variables and show that the results from the baseline exercises do not change significantly.

Before proceeding, we do emphasise that the results in this section may be interpreted with caution. This is because it is also likely that an increase in current aggregate productivity or an expected increase in future aggregate productivity may increase a country's participation in global value chains. This will bias our estimates for the effect of GVC participation on productivity growth. However, in a robustness exercise not reported here for brevity, we use micro data on trade flows from the second version of the International Trade and Production database and estimate a two-way fixed effects model with our measure for TFP growth as the explanatory variable. We further control for domestic and global macroeconomic variables which may be a source of potential omitted variable bias. The dependent variable includes data on export growth for 170 product categories. We control for both product-level fixed effects and time fixed effects. The coefficient estimates for this model should not suffer from the bias due to reverse causality since export growth for individual product categories is less likely to affect aggregate TFP growth. The results from this exercise show that changes in TFP growth do not affect export growth in the case of Pakistan. This gives us some confidence in the exercise we do in this section. Given the results from the robustness exercise, the reverse causality between TFP growth and GVC participation may not be a significant problem. Moreover, the exercises in this section mostly consider the effect of GVC participation on future TFP growth. While expected changes in TFP growth can influence firms' decisions to participate in the GVCs today, we believe that future changes in TFP growth are less likely to be predictable for Pakistan. Nonetheless, caution is warranted.

b. Backward linkages

Figure 7.2 reports the effect of a 1 percent increase in backward linkages on TFP growth at different horizons, and when the current level of backward and forward integration equals that of Pakistan i.e., 5.4% and 27.9% of gross exports, respectively. The figure shows that the effect is statistically insignificant for the same year. However, the effect becomes statistically significant in the subsequent year and suggests that a 1 percent increase in backward linkages increases TFP growth by 0.36 percentage points. The effect persists for few years but becomes insignificant again from year 5 onwards.

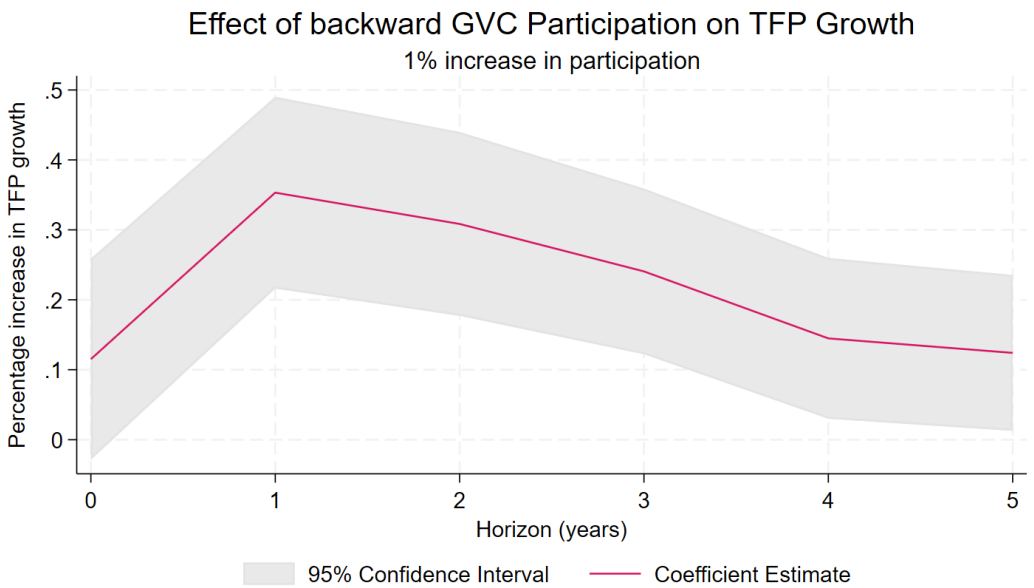

Figure 7.2

Effect of backward GVC Participation on TFP Growth

The finding lends support to the hypothesis that barriers to trade which limit firms access to imported inputs may be an important reason for low levels of backward linkages in Pakistan. However, there can also be other potential explanations such as firms not internalising the benefits of trade integration in the form of learning by doing. As a result, the level of backward integration remains low, and the productivity benefits are not realised. However, Pakistan does have a relatively higher level of forward integration. This calls into question the above argument and lends more credence to the former hypothesis.

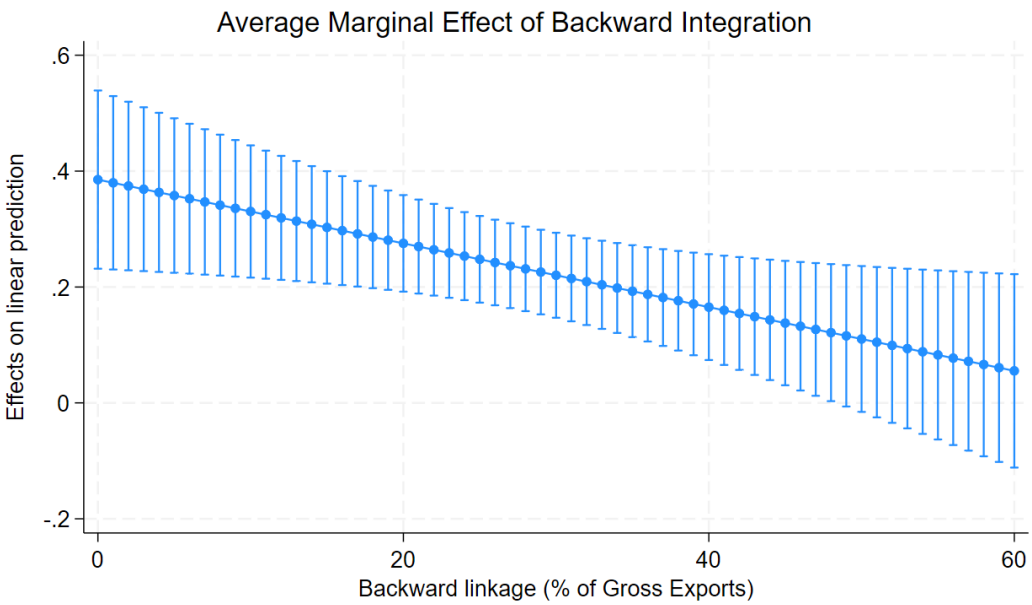

Figure 7.3

Average Marginal Effect of Backward Integration

Figure 7.3 turns to studying how the benefits of backward integration depend on the level of backward integration. The figure shows that the effect on TFP growth is the highest when level of backward integration is low to begin with. However, the effect becomes insignificant as the level of backward integration increases to 50% or higher.

Finally, figure 7.4 controls for variables which may be a potential source of omitted variable bias. The left panel includes results after controlling for different types of capital flows. These include equity flows, change in international foreign reserves, IMF related credit flows and population growth. The maximum effect in the subsequent year is slightly smaller than in the case when we do not control for these variables. However, at the same time, the effect becomes more persistent. The right panel repeats the same exercise except that we control for work governance indicators taken from the WGI database. The effect in the subsequent period is now bigger than before. However, the effect also becomes less persistent and becomes statistically insignificant from year 3 onwards.

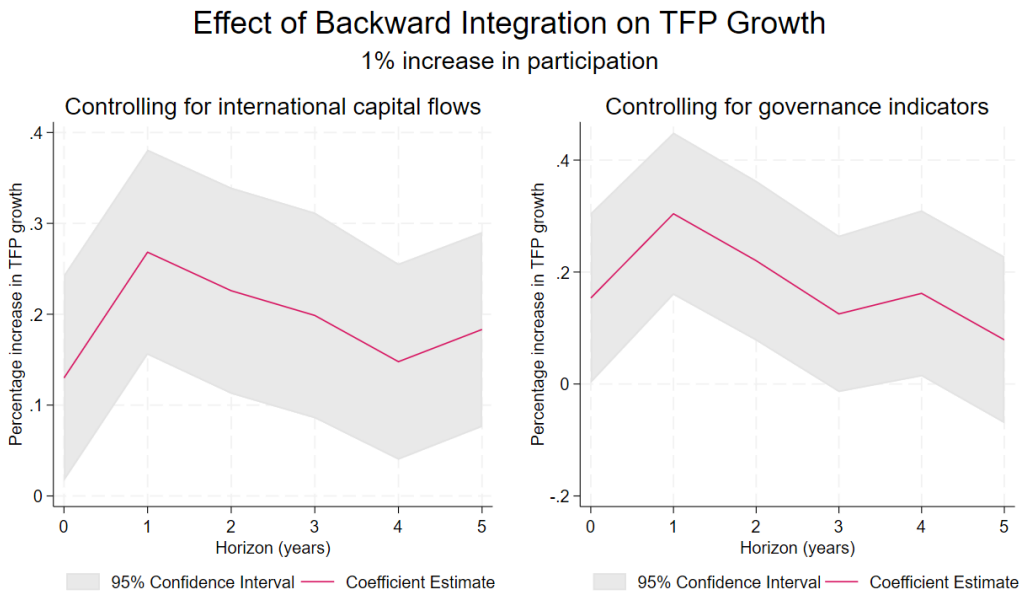

Figure 7.4

Effect of backward integration on TFP growth

Overall, an increase in backward linkages continue to have a positive effect on TFP growth in subsequent years even after we control for a variety of control variables. However, this effect is stronger when the current level of backward integration is low than when it is high. This is especially relevant to Pakistan which has one of the lowest level of backward integration at only 5.4% of gross exports.

c. Forward linkages

We now turn to exploring the relationship between forward linkages and productivity growth. Figure 7.5 is similar to figure 7.2 except that it reports results for when there is a 1 percent increase in forward linkages. As before, the figure assumes that the current level of backward and forward linkages is similar to that for Pakistan. The results show that an increase in forward linkages increase TFP growth both in the current and the subsequent years. However, as in the case of backward linkages, the maximum effect materialises with a gap of one year. The effect persists before becoming insignificant from year 4 onwards.

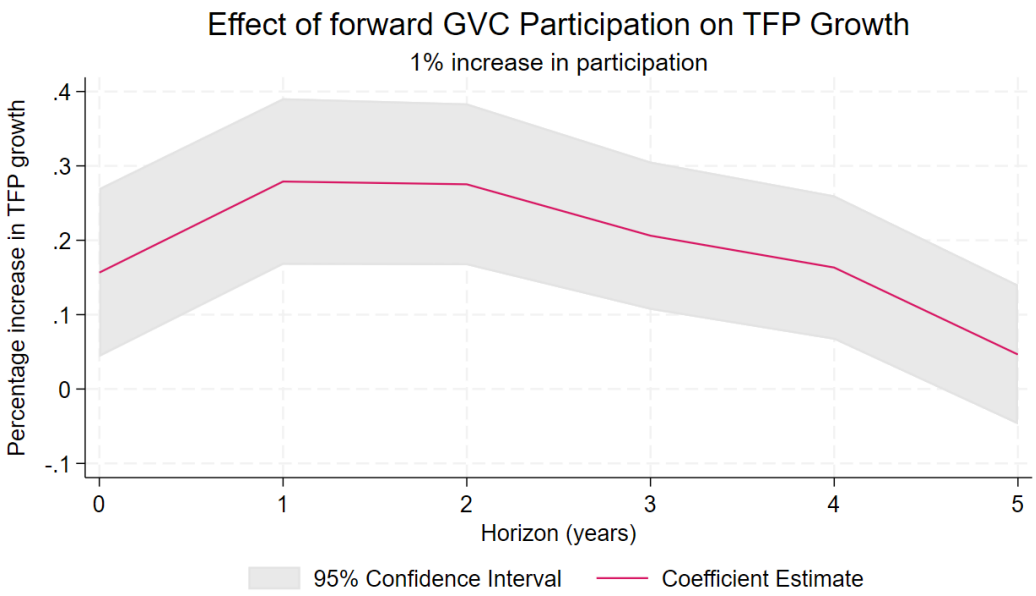

Figure 7.5

Effect of Forward GVC participation on TFP Growth

Figure 7.6 plots the marginal effect for different levels of forward linkages. It is interesting to note that the marginal effect is higher than in the case of backward linkages when the level of forward linkage is significantly low.[16] However, the effect becomes statistically insignificant much sooner than in the case of backward linkages. In the case of Pakistan where the forward linkage already equals 27.9% of gross exports, the marginal effect of an increase in backward integration is indeed greater than the marginal effect of an increase in forward integration.

16 Another reason for why the relationship between forward linkages and TFP growth comes out to be stronger than in the case of backward linkage is the bias in the estimates due to TFP also influencing the level of integration. We suspect that the effect of changes in TFP growth on forward linkages is stronger than it is on backward linkage. However, this remains speculative for now. A more rigorous study will account for the reverse causality from TFP growth to the level of integration when estimating the effect of GVC integration on TFP growth. We leave this for this future work.

Finally, figure 7.7 plots the responses after controlling for different types of international capital flows (left panel) and governance indicators (right panel). Unlike in the case of backward linkages, controlling for variables related to international capital flows increases the size of the effect of an increase forward integration on TFP growth. The effect also become significantly more persistent. In contrast, controlling for the governance indicators makes the results statistically insignificant.

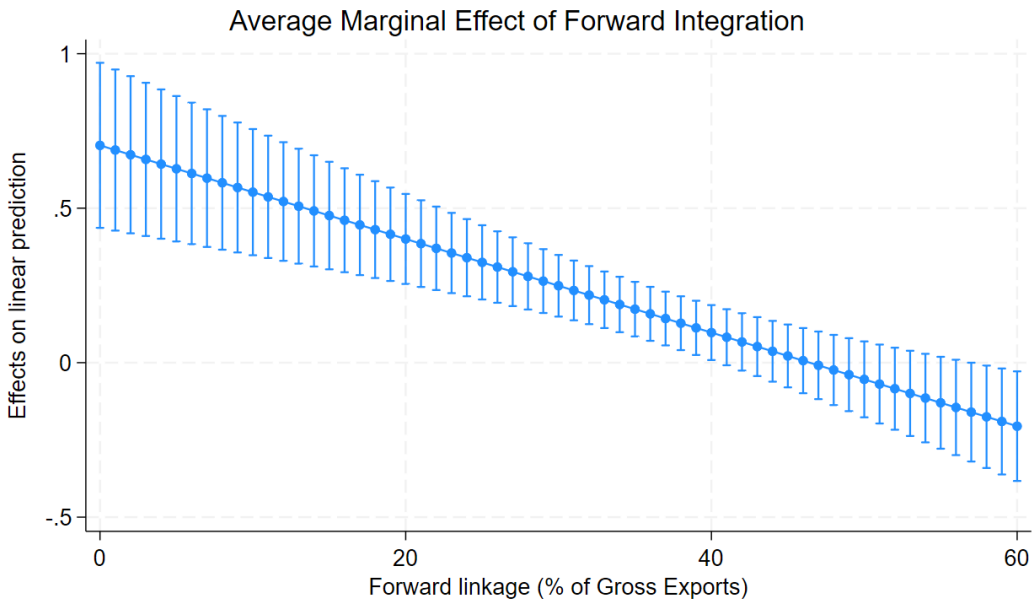

Figure 7.6

Average Marginal Effect of Forward Integration

To conclude, both backward and forward linkages have important implications for the TFP growth. However, these effects crucially depend on the prevailing levels of backward and forward linkages. In the context of Pakistan which ranks higher on forward linkages than on backward linkages, the productivity improvements from enhancing backward integration may be significantly higher.

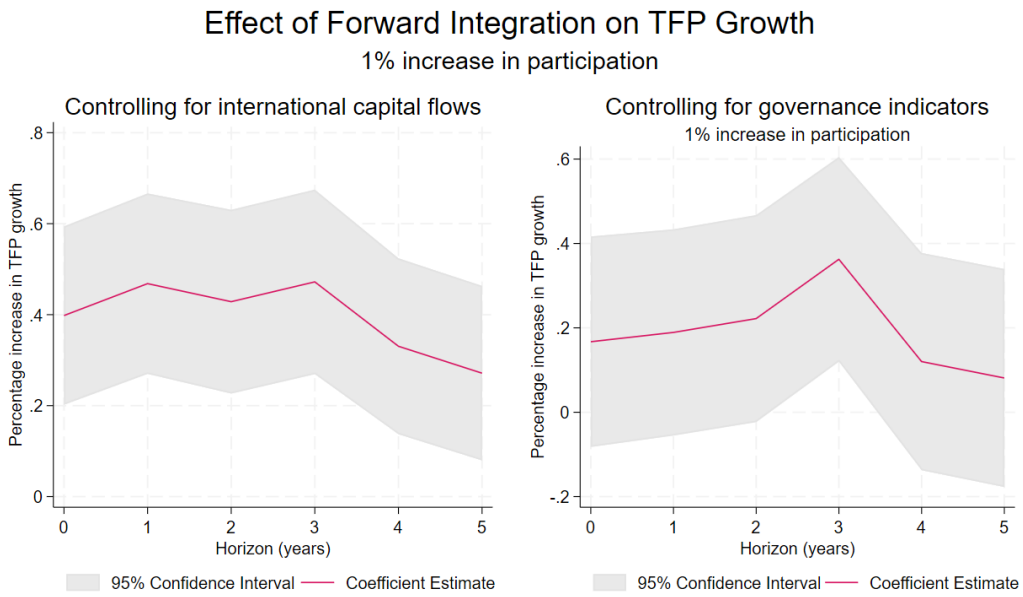

Figure 7.7

Effect of Forward Integration on TFP Growth

8 Recollections

The discussion in sections 5 – 7 bring to the forefront the role of government policies which prevent an efficient allocation of resources and, in the process, hinder economic transformation. Going further, the discussion in section 4 can also be linked back to macroeconomic policies pursued by subsequent governments. Section 4 noted that the predominant factor underlying low growth in labour productivity is the declining capital-to-output ratio over the last five decades. Pirzada (2023) points to high macroeconomic uncertainty as one of the key reasons behind this trend.

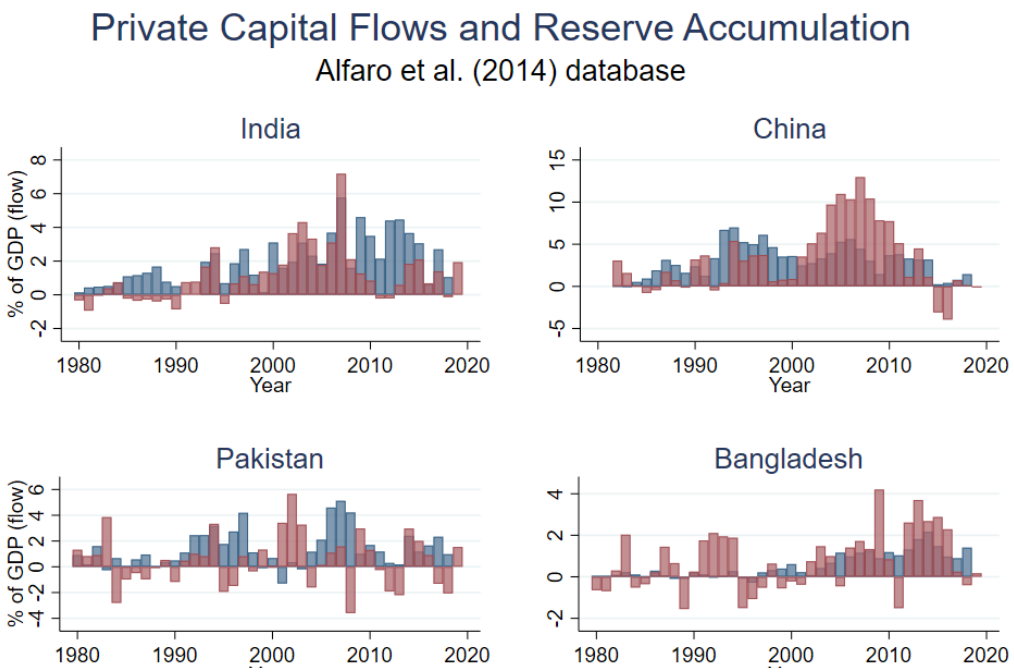

Figure 8.1

Net Private Capital Flows and Reserve Accumulation

We reproduce the figure in Pirzada (2023) which shows net private capital inflows and reserve accumulation for some of the South Asian economies, including Pakistan. Figure

8.1 shows that Pakistan received more private inflows over the thirty-year period relative to Bangladesh. In some of the years, the inflows are also comparable to that for India. However, while policymakers in other fast growing South Asian economies accumulated these inflows in the form of foreign reserves to insure their respective economies against the risk of external shocks, policymakers in Pakistan preferred to use the inflows to incentivise more and more consumption. It is easy to appreciate how an increase in risk will reduce risk adjusted returns on investments and, thus, hinder if not reverse capital deepening. In an interesting paper focusing on investment decisions by farmers in Ghana, Karlan et al. (2014) show how reducing risk through providing insurance against climatic shocks increased farm investment.

This begs the question on why do policymakers implement policies which undermine prosperity? Put another way, why do policymakers continue to pursue policies which not only prevent reallocation of resources in a way which improves productivity but, moreover, repeatedly inflict economic and social costs on the citizens in the form of frequent crises? The answer to this lies beyond the scope of this report. However, it is closely tied to the process which directly or indirectly gives individuals or groups access to corridors of decision making. To recall, Jones (2013) points to the economic interests of the ruling elite as an important factor behind why a country's resources are not used efficiently. He notes, *"misallocation is the equilibrium outcome of a political process interacting with institutions and the distribution of resources (including physical capital, human capital, ideas, and natural resources)."*

Malik and Duncan (2022) document this phenomenon in the context of Pakistan. They show how, at the onset of the 2013 crisis, organised sectors and businesses linked to powerful families successfully lobbied to increase trade protection in the form of non-tariff measures to protect themselves from international competition. Likewise, the 2018 crisis saw a sharp increase in import duties in sectors linked to powerful families. The 2022 crisis has proven to be no different. These examples are telling as these reveal how elite groups which dominate Pakistan's economic landscape continue to influence policies to prevent a reallocation of resources which could potentially undermine their economic interests. Importantly, this is true even when the market forces continue to signal that the prevailing economic structure is ill-suited for delivering prosperity for the broader society. And yet again the policies which repeatedly fail to deliver for the masses continue to persist.

In a paper on political transitions, Acemoglu and Robinson (1999) put forward a framework which sheds light on the interrelation between policies which continue to benefit the ruling elites and the prevalence of the non-democratic institutions. Specifically, in societies with large gaps between the elites and the masses, a transition from non-democratic institutions to democratic institutions is too costly for the elites. This is because any such transition will leave them worse-off by shifting significant proportion of economic resources away from them. However, it is possible for the *"disenfranchised poor"* to *"contest power by threatening social unrest or revolution, and this may force the elite to democratize."* Acemoglu and Robinson develop this argument in more detail in their book on *Economic Origins of Dictatorship and Democracy*.

Without going in detail, these recollections aim at emphasising to the reader that the challenge of resource misallocation as discussed in this report in the case of Pakistan is not just a challenge of technical knowledge and administrative expertise but also has power relations between the ruling elites and the effectively disenfranchised masses at the core of it. We are unlikely to achieve economic progress without bringing these to the forefront of any discourse on reforms.

9 Conclusion

This report documents the phenomenon of missing economic transformation observe for Pakistan and explore potential reasons for this. The first half of the report provides a detailed overview of the nature of economic transformation and how it compares with regional economies over several decades. To do so, we study both trends in labour productivity at different levels of aggregation and changes in the employment share of different sectors over time. The report also considers different factors that may have contributed to limited economic transformation in the case of Pakistan. It particularly focuses on the role of capital accumulation and the TFP growth. The second half of the report focuses on the challenge of misallocation of resources across sectors. We particularly ask if there is an overallocation of resources in the agriculture sector which cannot be explained by differences in human capital and production technology. We end the report with detailed discussion on the integration in Global Value Chains (GVCs) and how increased participation in GVCs may help increase overall productivity in the economy and facilitate the transformation process.

Results from the first half of the report make clear that Pakistan has seen one of the lowest declines in the share of agriculture in total employment when compared with the 51 developed and developing countries included in the ETD database. Part of the reason for this is also that labour productivity in both the overall economy and the agriculture sector has increased by the least in the case of Pakistan relative to the regional economies. As a result, unlike in most other countries, there is limited incentive for labour to move from agriculture to non-agricultural sector.

But what is behind the dismal increase in labour productivity in the case of Pakistan? The report finds that a critical reason for this is the lack of capital deepening. In fact, capital-to-output ratio (capital deepening) has been declining since late 1970s such that today Pakistan has one of the lowest levels of capital-to-output ratio across the list of 183 countries included in the PWT dataset. While Pirzada (2023) point to higher level of macroeconomic uncertainty as the primary reason for this trend, future work must explore this in more detail.

We further decompose growth in labour productivity into labour productivity due to improvements within the sectors and due to the process of structural transformation itself. We find that the average annual growth in labour productivity due only to improvements in labour productivity within sectors equals only 0.79%. On the flip side, the process of structural transformation itself explains 45% of the average annual growth in aggregate labour productivity for Pakistan. This suggests that the limited structural transformation that Pakistan has undergone during the relevant period has been growth enhancing. However, when we decompose the reallocation effect into static and dynamic effects, we find that the structural transformation in Pakistan has shifted resources to sectors with low growth in labour productivity thus undermining the country's future growth prospects.

The second half of the report starts with documenting productivity gaps across sectors. We find that the agriculture sector has one of the lowest levels of labour productivity across the economy. When we aggregate the sectors into agriculture and non-agriculture sectors, we find that labour productivity in the agriculture sector is 47% that of the non-agriculture sector. We consider if differences in wages and production technology across the agriculture and the non-agriculture sector can explain the difference in labour productivity across the two sectors. However, we find that these factors cannot explain the productivity for the agriculture sector. This points to an overallocation of resources in the agriculture sector which is economically inefficient. The results point to the combination of government policies motivated by pollical economy reasons and market failures which incentivise production in some sectors more than others as key reasons for the overallocation.

Since an increase in labour productivity is considered an important driver for economic transformation, the report goes on to explore how an increase in integration in the Global Value Chains can help increase overall productivity in the economy. We document that the level of participation in the GVCs is one of the lowest for Pakistan when compared with fast growing developing economies. Moreover, the limited participation in the GVC comes from exporting raw materials and intermediate inputs which are process in imported countries for exports. The report also notes that, unlike regional countries, the export-oriented sector in Pakistan scores even worse than the non-export-oriented sector in terms of both the level and the nature of GVC participation. We conclude with showing that an increase in GVC participation can go a long way towards increasing the productivity growth in Pakistan and, as a result, facilitate the transformation process.

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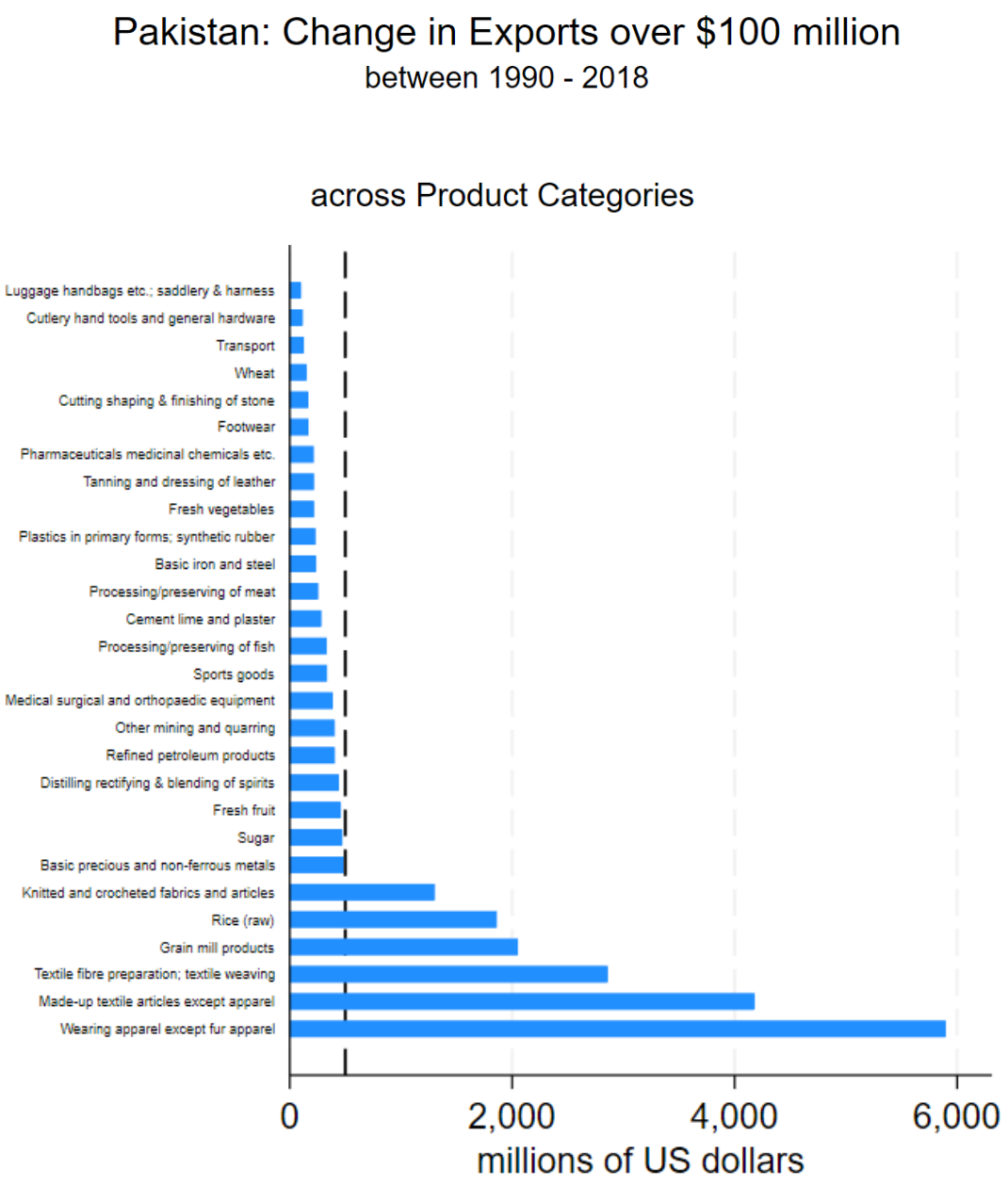
Appendix

1. Absolute change in exports

We start with considering the increase in Pakistan's exports to rest of the world across both product categories and export destinations. In aggregate, Pakistan's exports of goods and services increased from close to $6 billion in 1990 to $30 billion in 2019. Figure 1 plots the increase in exports across both product categories (left panel) and countries (right panel) for which exports have increased by more than $100 million over the last three decades. The vertical dash line represents the increase in exports of $500 million. To avoid shocks from influencing our results, we take a three-year moving average before calculating the change in exports over this period.

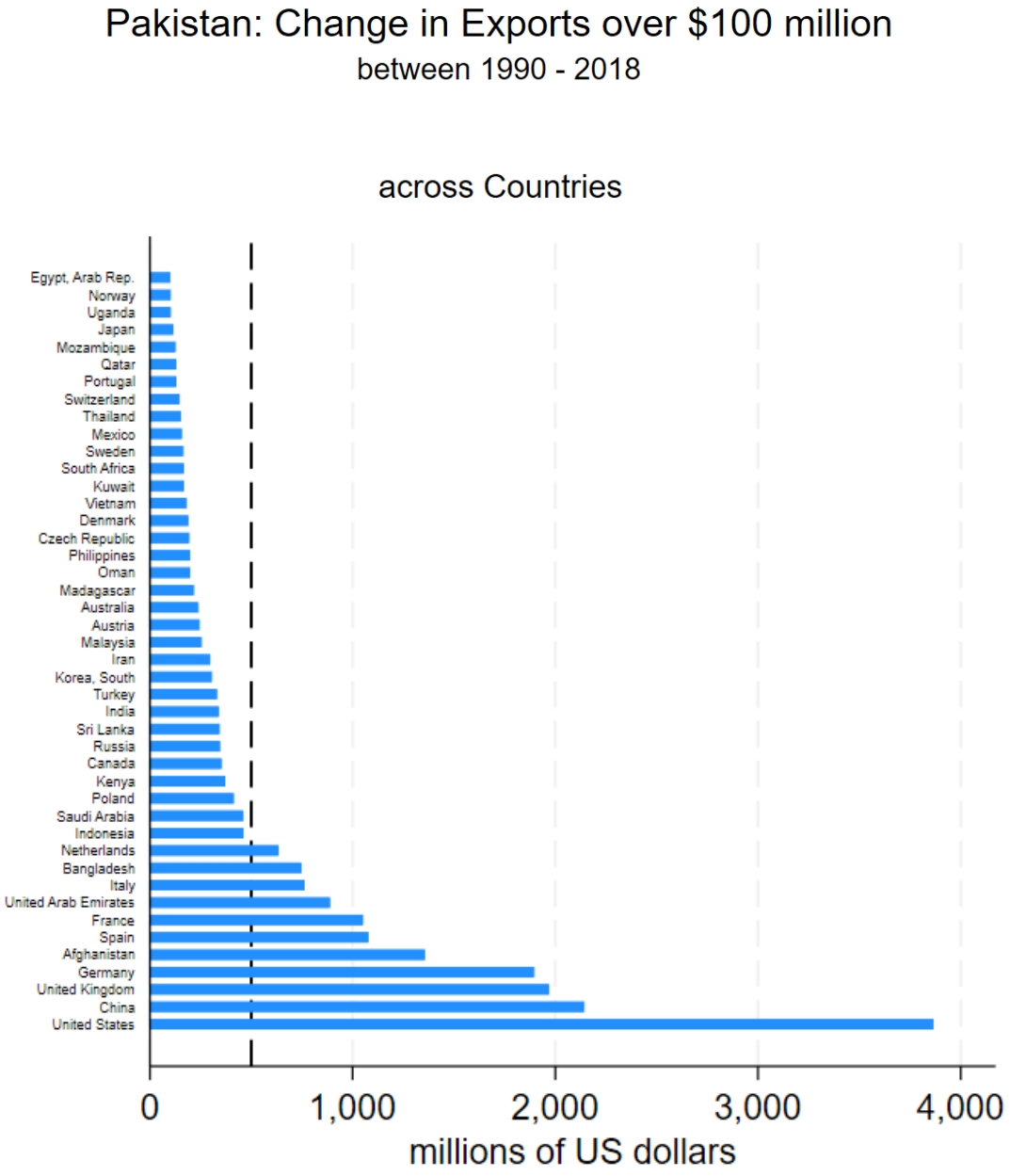
The figure is revealing. Out of 170 product categories and 265 countries in the database, Pakistan's annual exports have increased by more than $100 million for only 28 product categories and to 44 countries. However, even within this, only few product categories and export destinations dominate. Focusing on product categories, annual exports have increased by more than $500 million only for 6 product categories. These include *grain products, rice (raw),* and four of the *textile* categories. In terms of export destinations, it is the US, China, the UK, Germany, Spain and France which explain half of the increase in Pakistan's total exports over the sample period. The list of countries for which exports have increased by more than $500 million includes only 11 countries.

It is important to note that the 6 product categories for which exports increased substantially comprise of products which have a very low score on the *Product Complexity Index* calculated by the Harvard Growth Lab. In contrast, a similar analysis for India reveals a very different picture. Not only exports increased by



Note: The vertical line in both plots represent an increase in exports of $500 million

Figure 1 a



Note: The vertical line in both plots represent an increase in exports of $500 million

Figure 1 b

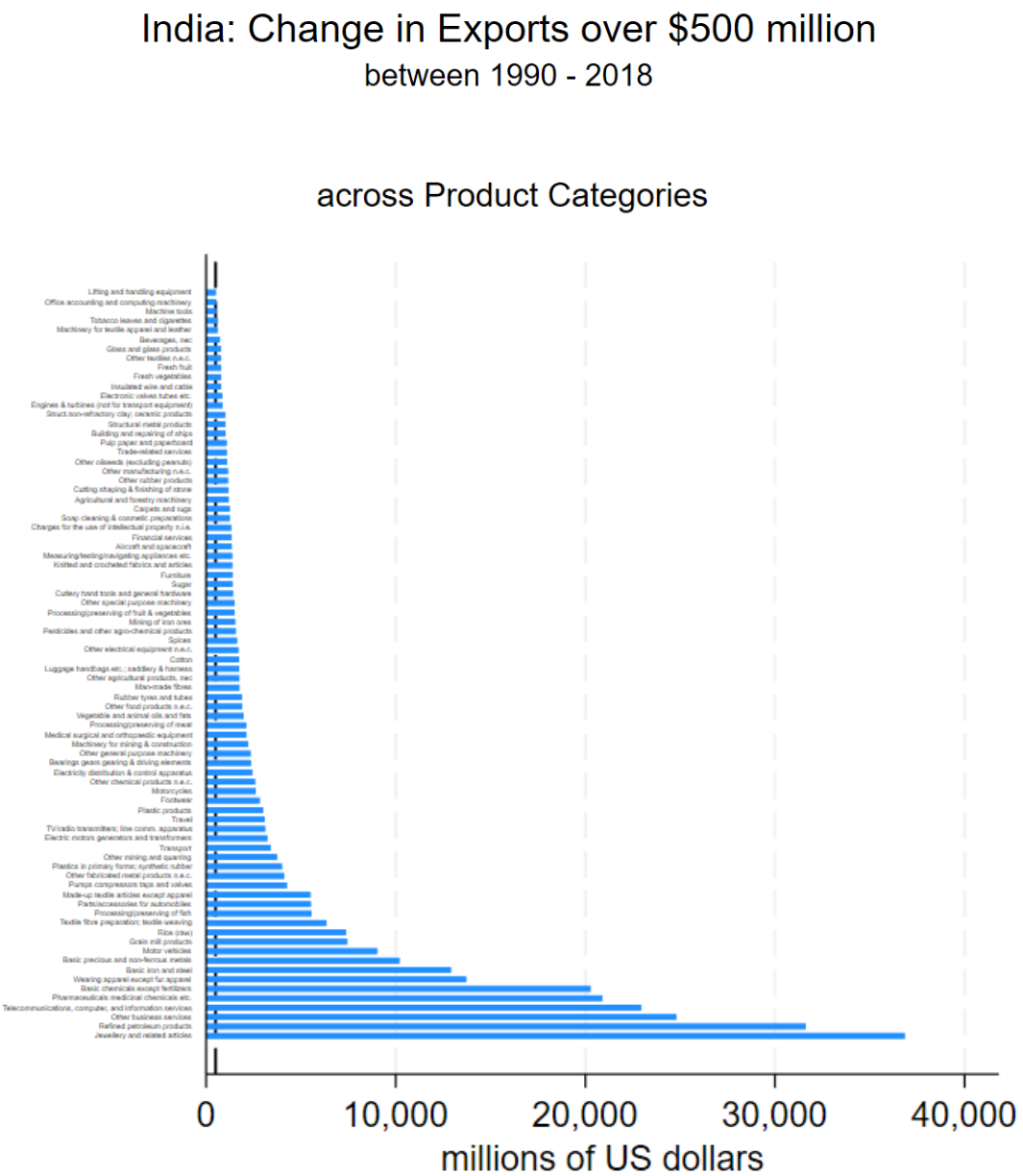


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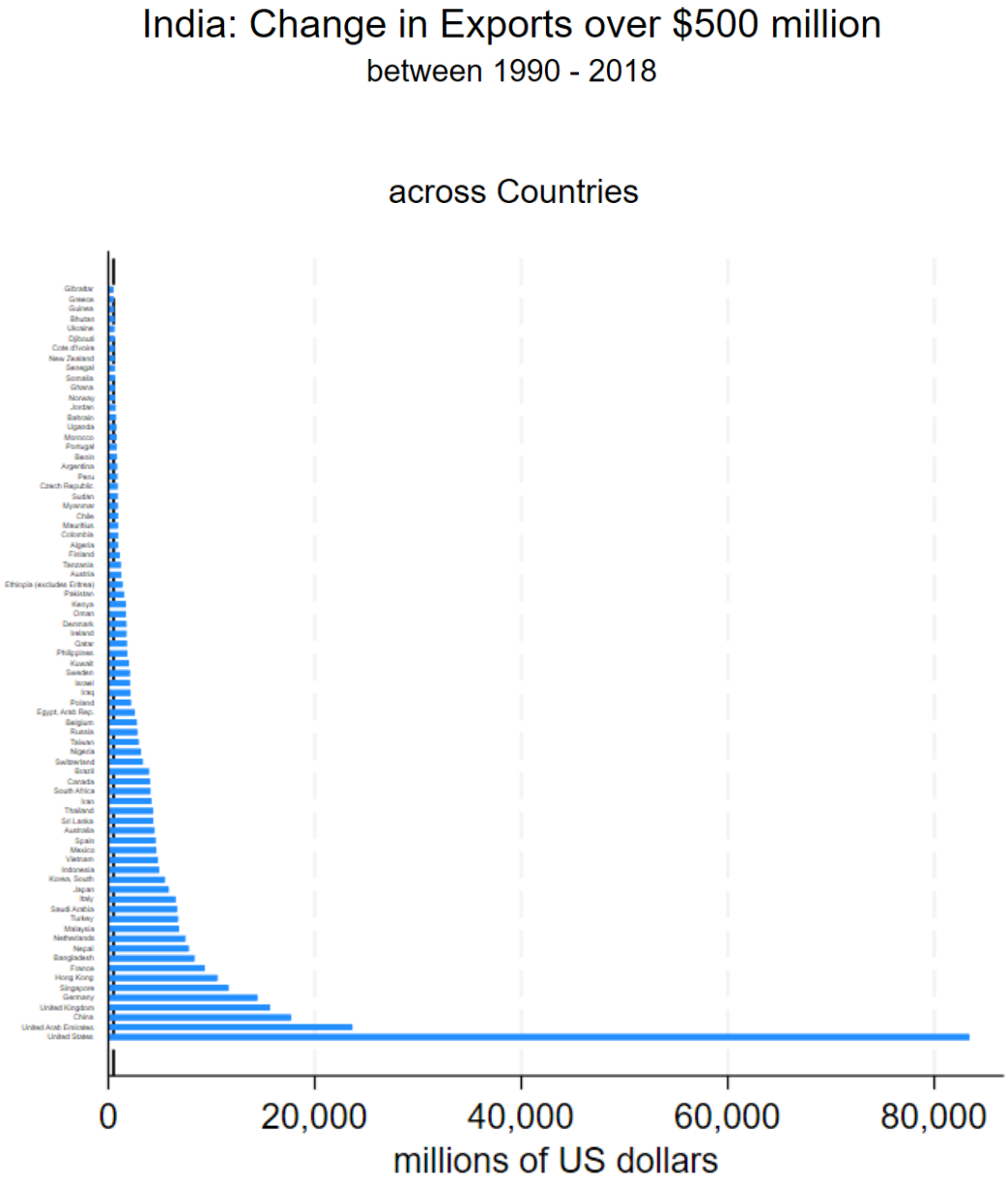
Figure 2 a



Note: The vertical line in both plots represent an increase in exports of $500 million

Figure 2 b

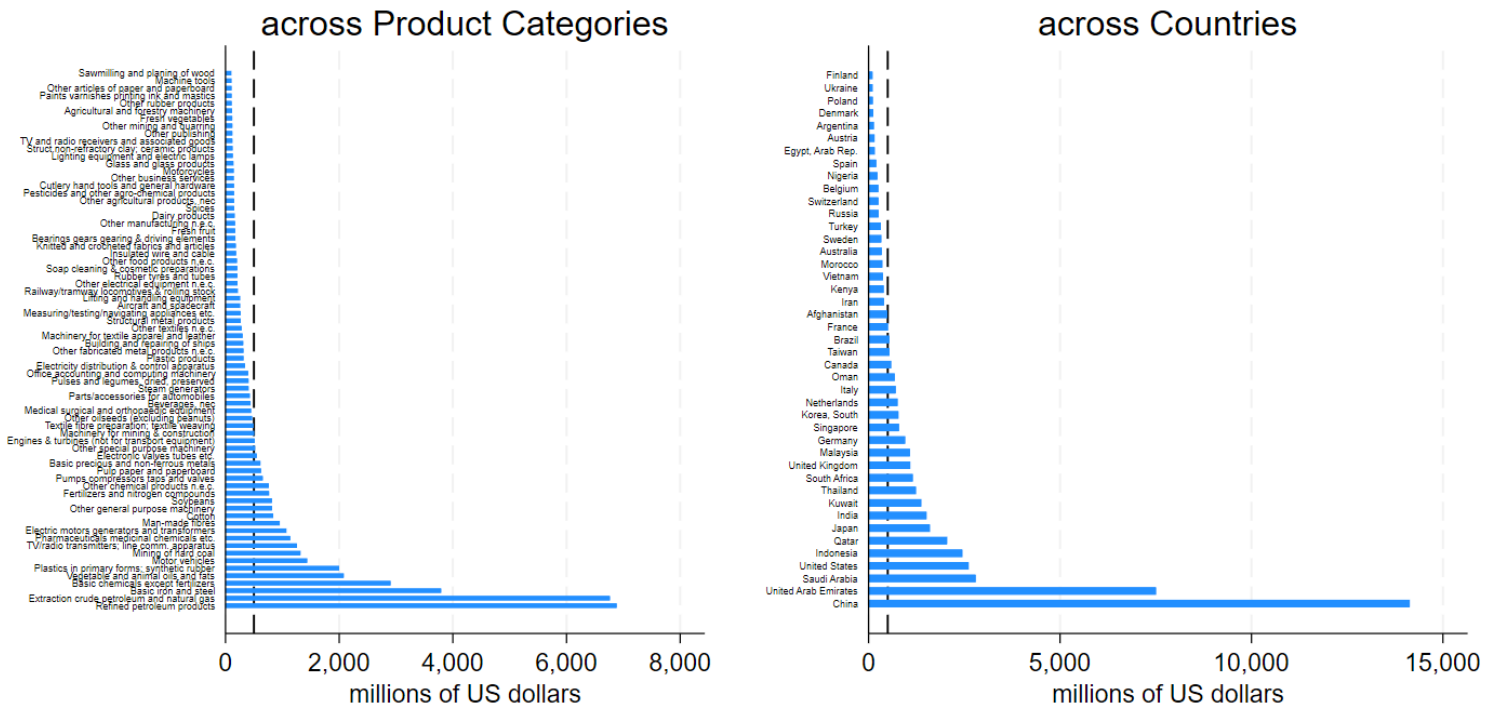
substantially more the increase came from sectors such as chemicals, engineering (electrical and mechanical), automotives, textiles, business services, information technology, iron and metals, processed food, jewellery, and *petroleum* (see Figure 2).

Figure 3 repeats the same exercise as in figure 1 but for imports. First, there are many more product categories for which imports increased by more than $100 million. This is not surprising. An increase in both overall exports and remittances meant that the country could finance more imports than it otherwise could. Having said that, it is still critical to note that imports increased by more than $500 million for only 23 product categories out of a total of 170. Within this, a large fraction of the increase came from the increase in imports of petroleum products and *natural gas*. We also see a significant increase in imports of basic industrial inputs such as *iron and steel, plastic, basic chemicals, and coal.* The data also shows some increase in imports of small engineering products which are clustered around the $500 million line. In the consumption category, *vegetable and animal oil and fats oil and motor vehicles* are the only prominent categories showing a collective increase of around $3.5 billion.

Overall, while the import data does point to some change in the underlying structure of the economy, these appear to be quantitatively small (except petroleum products) and restricted to few product categories. As discussed in the main test, there is very little change in the share of product categories in both the export and the import basket.

Pakistan: Change in Imports over $100 million

between 1990 - 2018



Note: The vertical line in both plots represent an increase in imports of $500 million.

Figure 3

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