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Structural Transformation and Export Diversification: A Case Study of Pakistan

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ABSTRACT

Aim of the study: Structural transformation plays a significant role in a country's economic growth and development. There are many economies around the world which have experienced structural transformation, however, this phenomenon had not been rigorously analyzed for Pakistan. This study examined the process of structural transformation in Pakistan's economy through two dimensions.

Methodology: The first dimension is the study of structural transformation with reference to export diversification using traditionality index. For this, industry-specific data at 2-digit SITC from 1972 till 2021 was collected, using which the aggregate and average cumulative export experience functions were calculated. The traditionality index was further utilized to construct the structural change index by calculating medium-term structural change. The second dimension is the investigation of sectoral shifts, for which sectoral composition of GDP and sectoral % growth data were taken for 6 countries, including Pakistan. This data was then scrutinized in a comparative analysis approach.

Findings and conclusion: The findings of the study show that in context of export diversification, the top 10 export industries of Pakistan are traditional, and no significant structural change has been observed. According to the comparative analysis, the industrial sector's contribution to Pakistan's GDP is one of the lowest while growth of all three sectors lags behind other countries. Services sector is the highest contributor to Pakistan's GDP but is dominated by only 2 categories.

Study implications: This study can be helpful for law makers, the state, and industrialists to understand that the way forward is to diversify and shift to value adding exports to increase share of the industrial sector in GDP via appropriate reforms.

Keywords: Structural Change/Transformation, Export Diversification, Sectoral shift, Traditionality index, Medium-term Structural Change.

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Introduction

The most common principle studied in the field of economics is the 3 sector macroeconomic model developed by Allan Fisher, Colin Clark and Jean Fourastie in the early 20th Century (*Three-Sector Model*, 2022). This model enabled the researchers to divide the economy into 3 distinct sectors: primary sector (extraction of raw materials), secondary sector (manufacturing/industrial) and tertiary sector (services). The transitioning phase of the resource reallocation amongst these 3 sectors is defined as Structural Transformation, which is seen as one of the major drivers of economic growth and contributors to a stronger economy. The rate at which the sectoral transformation occurs, determines the reason why countries like Indonesia, China, Vietnam, Bangladesh and India are becoming successful faster than a country like Pakistan (McMillan et al., 2011). The differing patterns of structural transformation during the process of a country's national economic growth has been going on for many decades (Clark, 1957; Kuznets, 1966; Syrquin, 1988; Syrquin et al., 1989; Timmer et al., 2015).

Structural change (interchangeably structural transformation) has different meanings therefore different interpretations. In development economics, structural transformation is known as "the different arrangements of productive activity in the economy and different distributions of productive factors amongst various sectors of the economy, various occupations, geographic regions, types of products, etc." (Silva et al., 2008, p. 275). Moreover, structural transformation is a process in which capital and labor are interchangeably transferred between enterprises, sectors, and nations. This process is a result of changes in local demand and international trade patterns documented over the years. (Kuznets, 1966; Chenery et al., 1986). The pattern of the shift of resources; labor and capital from the production of primary goods onto more value-added (manufactured) goods and services, is the most commonly sought out interpretation of structural transformation. (Timmer et al., 2009).

Recently, studying the role of structural transformation in influencing the international position of a country has gained a renewed interest, as sectoral shifts bring about significant changes in the overall import and export composition of the country.

The study of structural transformation can be looked upon from 3 key dimensions:

1. Level of value-added goods and services over time
2. Export Diversification
3. Rate of Labor Productivity in each sector over time

Among these, export diversification is the most extensive dimension of structural transformation. This describes the chain of reaction as to how a change in a country's structural transformation of exports can lead to changes in the overall export composition or export basket, as countries typically export goods in which they have a comparative advantage. Examining the trade structure can aid in understanding the underlying knowledge or institutional advantages that make a country competitive. Therefore, it plays a significant role in determining the overall pattern of exports and the level of economic growth in a country.

There is enough literature (Marcolino, 2022; Saxonhouse, 1998; Tyler et al., 2017) regarding the cause and effect relationship of structural transformation and components of economic growth, especially in the case of developed nations. These are the nations that have become examples for developing and underdeveloped countries for improving growth and economic performance. South Asian countries like India, Bangladesh, China, Vietnam, and Indonesia translate the changes in sectoral shifts and labor productivity into accelerated economic growth and development for the nation. However, due to the differences amongst the level of resource endowment (labor and capital) within each of these 3 sectors of the economy, the pace of such sectoral changes varies greatly across countries. India's example of structural change is different from the pathway traditionally followed by the developed nations because

there exists a disparity between the share of labor employed in the manufacturing sector with that of its sectoral share in total GDP.

Like many East Asian countries, Indonesia has also experienced structural transformation over the years. Before the 1997–98 financial crisis, Indonesia experienced growth enhancing structural transformation that put the nation at the right path of development. Indonesia's structural transformation pattern has shifted from 'upgrading industrialization' (industry enhancing) before the crisis to a stagnant industrial growth afterwards. A limited change in the manufacturing value-added and employment shares has slowed down the nation's level of economic growth. (Kyunghoon et al., 2020)

Statement of the Problem

As the process of structural transformation has been studied and thoroughly examined in the case of different countries, this process should also be analyzed in the context of Pakistan which has undergone structural change overtime. The studies (Nasir, 2017; Gilal et al., 2019; Hausmann, 2010; Felipe, 2007) show that, in comparison to other Asian countries, Pakistan has lagged behind in terms of new and improved export activities. The studies show that this is in fact due to Pakistan's current products being highly capable with very few possible alternatives. Pakistan is concentrated in a relatively peripheral part of the product space and has not actively explored the productive opportunities unlike its competitors. However, there has been very little work that talks about structural transformation in the context of the Pakistani economy through the lens of export diversification and sectoral shifts.

Diversification, for example, has been shown in studies to help minimize the negative impact of economic shocks. In the short run, reliance on a few commodities implies that export earnings are extremely volatile as demand and supply conditions change. Diversification is particularly important for economic development. Thailand and Malaysia began their accelerated export-led growth stages in the 1980s and 1990s, whereas Bangladesh and India's economies started to emerge in the 1990s that are still growing. However, over time Pakistani exports have immensely decreased compared to its regional competitors.

This study examined the process of structural transformation in the context of Pakistan, to see the pattern of structural transformation, and whether Pakistan has experienced structural transformation or not. The study was undertaken to explore and address these issues.

Research Objectives

1. Examine the process of Structural Change through the lens of Export Diversification:
    a. Measurement of the extent of traditionality index
    b. Inter-industry Structural Change Patterns
2. Comparative analysis of Structural Transformation of Pakistan vs regional competitors

Literature Review

India may have had an atypical structural transformation but its manufacturing sector has remained very competitive. Like some of its neighboring countries, India shifted from agriculture towards services without proper prior growth in the manufacturing sector. However, its manufacturing sector has held up better than most developing nations as it still grew (albeit in small proportions) along with its services sector up until the late 2000s (Goel et al., 2015). Many multinational companies (MNCs) and major players in the global economy also invested in the manufacturing industry of India due to cheap labor, lax laws and cheaper intermediate goods. This in turn gives the sector a significant boost and edge over other regional ones. A very recent example is Apple hinting that they might shift the manufacturing of their iPhones to India and Vietnam amid the souring of relations and an ongoing trade war between the US and China.

A similar case is Bangladesh. Its industrial sector has fared even better than that of India's, showing continual growth up till now whereas India's has been relatively stagnant over the past few years. The major reason for this is the production of ready-made garments (RMGs). Over the past few years, the concentration of RMG production has increased by tenfold in the industrial sector as compared to non-RMG production. A plethora of MNCs and popular brands have their RMG industries set up in Bangladesh, due to cheap labor and very favorable laws, providing significant aid to this sector's growth. This allows the country to have a better balanced economy and a services sector backed by a strong and growing manufacturing sector. Although, it still faces issues regarding export diversification and (Raihan et al., 2020, p. 3) calls for a change in the structural transformation method the country is currently following.

The aforementioned sectoral shifts and economic diversification are more commonly known as structural transformation. As we can see from the country-wise examples, it works in the form of dimensions. The dimensions being prevailing industrial and services sectors, shift of factors of production towards the prevailing sector, change in product composition and product sophistication (low value to high value goods), leading to the last aspect: export diversification (Hausmann, 2008, p. 6). During recent times, the discussion in the context of structural transformation has aspects of export diversification and thus, export diversification can also be regarded as structural transformation of a particular economy.

Compared to the aforementioned countries, Pakistan has not been able to achieve growth inducing structural transformation. Instead, Pakistan's structural transformation has mainly focused on the sector which, even though constitutes a big share of exports, does not contribute efficiently to growth or output. (Hausmann, 2010). On the other hand, the industrial and manufacturing sector is being neglected. By not having a strong base in the form of a healthy manufacturing sector, Pakistan imports a lot of finished products which causes persistent trade deficits, negatively affecting the economy. The current trade deficit of Pakistan for fiscal year 2020-21 is 31.076 billion US $, a significant amount considering Pakistan's GDP was 263.7 billion USD (46 trillion PKR) in 2020. (Pakistan Bureau of Statistics, 2021)

On top of the prevailing trade imbalances, Pakistan's export basket consists mainly of primary and semi-manufactured goods, with the foreign exchange earnings from manufactured goods export being close to none over the past few years. Our focus in the early years was mainly on labor intensive products which were inherently low value-adding products (Hausmann, 2008, p. 13). The product sophistication and export diversification that comes as a fringe benefit with sectoral shifts and structural transformation was therefore not privy to Pakistan.

Various studies over the decades have touched upon the relationship of structural transformation and export diversification in the context of Pakistan. (Ahmed et al., 2019) looked at the export structure via the lens of traditionality, to analyze the degree of inter-industry SC that has taken place from 1972 to 2012. Ahmed and Hamid's findings indicated that the existing export base is still rather traditional, as indicated by the fact that the least traditional industries amounted for less than a tenth of overall exports in 2012 (Ahmed et al., 2019, p. 16). Although export diversification is expected to boost export growth and GDP growth rates, Pakistan's diversification has not resulted in increased exports. Aside from diversification, the literature suggests that the country's exports must undergo structural changes in order to upgrade to a more sophisticated export basket. (Khan et al., 2016). Pakistan specializes in industries such as textiles and leather. The set of skills gained from manufacturing these commodities are hardly applicable to the manufacturing of highly capital-intensive consumer goods. Furthermore, government policies such as industrial strategy and innovation policy, among others, have not been effectively used to facilitate the transfer of the product space's outskirts to its core (Nasir, 2017). According to (Gilal et al., 2019) there does exist an empirical relationship between the degree of observed structural transformation in Pakistan with that of the level of economic growth. The paper also says that there is an enormous need for the government to regulate the macroeconomic variables that impede the country's economic growth.

Structural transformation is considered to be an important economic process that helps uplift the economies. As such, there is extensive work done in this area for different countries across the globe. However, this process and transition for the Pakistani economy has not been investigated over the course of time. The intention of this study was to examine the process of structural transformation as the recently published work has been sparse on this topic, especially in context to Pakistan.

Methodology

Empirical Model

To gauge the degree of traditionality for each industry *(k)*, we calculated a cumulative export experience work or traditionality index *(trad)* for year *t* utilizing the following formula:

$$trad_t^k = \frac{\sum_{1972}^{t} e_t^k}{\sum_{1972}^{2021} e_t^k}$$

The numerator is the total cumulative sum of a country's exports *(e)*, starting from the origin time period t_0 (which was 1972 for this data) up until period *t*; the denominator is the total sum of exports for industry *k* from 1972 to 2021. After calculating the traditionality index for each industry we used it to calculate the average traditionality index (ATI) for each industry by applying the following formula:

$$avg\_trad^k = \frac{\sum_{t_0}^{T} trad_t^k}{T - t_0 + 1}$$

The cumulative export experience function for each industry ranged between 0 and 1. A traditional industry is one in which the export experience function is close to or equal to 1, and vice versa. These indices forecast that a traditional industry is one in which the export experience was concentrated earlier in the time period of analysis, whereas a nontraditional industry is one in which the export experience is concentrated later in the time period.

After the ATI was calculated for each industry, we ranked all the industries in a descending order based on the value of their respective ATI's (the industry with the lowest ATI was ranked at 1 and the industry with highest ATI was ranked at the 31st position).

To accomplish the second sub-objective (Inter-Industry Structural Change Patterns) of our general objective we looked at the intensity of medium-term structural change in the nation's export sector since 1972. We borrowed this method from (Ahmed et al., 2019, p. 312-313). To attain this, we first calculated the cumulative export experience functions for each of the 31 industries but instead of using the complete time period we used 5-year intervals for a more thorough analysis. This was the formula used to perform this task:

$$trad5_t^k = \frac{\sum_{t-2}^{t} e_t^k}{\sum_{t-2}^{t+2} e_t^k}$$

The 5-year interval cumulative export experience function was then used to calculate the inter-industry variance for each year, which enabled us to get a deeper understanding of the degree of medium-term structural change in the country's export sector over time. The following formula was used to calculate the variance for each year:

$$sc_t = Var(trad5_{k0}^k)_t$$

A high inter-industry variance is interpreted as periods of structural change with differing patterns across industries—some leading while others lagging behind in terms of export performance.

Finally, to carry out our second objective; Comparative analysis of Structural Transformation of Pakistan vs other regional competitors, we conducted a descriptive analysis where we analyzed and compared Pakistan's sectoral share of GDP and sectoral % growth with that of 5 other countries.

Type of Data Used and Sources

For the empirical analysis this study utilized industry-level data at 2 digit SITC taken from the UN Commodity Trade database. SITC revision 1 was chosen as it gives data from 1972 till 2021 which was deemed adequate by the researchers to examine the phenomenon of structural transformation and export diversification. 31 industries were chosen at the 2-digit level, the complete list of which is given in Appendix A. These 31 industries combined make up more than 90% of Pakistan's exports.

For the comparative analysis, data was extracted from the WDI database for all the countries ranging from years 1972 to 2020. For the 6 countries, six data series each were extracted, namely: 'Sectoral share in GDP' for agriculture, industry and services, and 'The annual sectoral % growth' for agriculture, industry and services. Industry also included data for the manufacturing sector. All the data was taken at the constant 2015 US Dollars prices. The data for the primary categories of the three sectors of Pakistan was taken from the Pakistan Economic Survey.

Data Analysis and Results

An assessment of structural transformation through the lens of export diversification

Evaluation of traditionality levels across Pakistan's export industries

For the first objective which was related to the assessment and evaluation of the extent of traditionality levels across Pakistan's export industries, we used the formulas discussed in the empirical methodology. For each of these industries, a year-wise cumulative export experience function was calculated, the means of which is ATI. The traditionality index or ATI calculated for 31 industries on a 2-digit level from 1972-2021 is reported in Table 4 of the index. The table showed that on average, the export industries which were more traditional were of a concentrated nature, consisting of raw materials, semi-manufactured, and non-manufactured goods. Most of the export industries with a very low traditionality index were found to be from the industrial and manufacturing sector.

For a more specific analysis of the nature of exporting industries constituting the largest share in our export bundle, ten major exporting industries for the year 2021 with the highest shares in total exports were listed, along with their ATI. Table 1 presents the traditionality levels of major exporting industries of

2021, and Table 2 presents the 10 least traditional industries ranked according to our ATI calculations. Industries with a smaller ATI are classified less traditional and industries with a higher ATI as traditional. The traditionality rank ranges from 1-31, 1 being the least traditional and 31 being the most traditional.

Table 1 : *Traditionality ranks of top ten export industries (SITC 2-digit level)*

(1)	(2)	(3)	(4)	(5)
65	Textile yarn, fabrics, made up articles, etc.	0.32	26	31.9
84	Clothing	0.233	14	29.6
04	Cereals and cereal preparations	0.283	22	8.17
68	Nonferrous metals	0.08	1	3.07
05	Vegetables and fruits	0.218	11	2.83
03	Fish and fish preparations	0.313	24	1.38
26	Textile fibers, not manufactured, and waste	0.504	31	1.38
01	Meat and meat preparations	0.134	2	1.26
66	Non-metallic mineral manufactures (nes)	0.21	9	1.22
89	Misc. Manufactured articles, NES	0.316	25	1.18

Source: Authors' calculations based on data from the UN Commodity Trade database.

According to Table 1, the most traditional industries were the ones constituting a large cumulative share of the total exports in 2021. Textile, yarn, fabrics, and made up articles along with the clothing industry had a cumulative share of more than 60 percent of our total exports, which come under the conventional textile sector. It is important to note that both of these industries had a high ATI and traditionality rank of 14 and above (traditionality increases with ranks), meaning that Pakistan has consistently exported traditional or conventional goods in a more significant quantity than other commodities.

Cereal and cereal preparations followed soon after the top 2 exporting industries of 2021, making up 8.17 percent of our total exports, non-ferrous metals (aluminum, copper, lead, nickel, etc.) following with a share of 3.07 percent. While cereal preparations had a high ATI and traditionality rank, non-ferrous metals were the opposite, with a low ATI and traditionality rank of 1, being the least traditional among the top ten export industries. Livestock commodities such as fish and meat preparations had a cumulative share of 2.64 percent, a contrasting fact considering Pakistan has the capacity and potential to expand their production, and as such, their composition in the total exports should rise.

From these top ten exports, the non-traditional industries with a traditionality rank of 13 and below had a cumulative share of 8.38 percent in Pakistan's current export bundle, making their share significantly less than traditional industries. This depicts a bias in exports, favored more towards the traditional and conventional commodities, and less towards the non-conventional and diversified products. The structure of our export bundle in the context of major export industries proved to be more conventional, depicting low levels of export diversification.

Table 2: *Traditionality ranks of least traditional export industries (SITC 2-digit level)*

(1) UN code	(2) Description	(3) ATI	(4) Traditionality	(5) Share of total
68	Nonferrous metals	0.08	1	3.07
01	Meat and meat preparations	0.134	2	1.26
09	Miscellaneous food preparations	0.155	3	0.51

64	Paper, paperboard and manufactures thereof	0.16	4	0.29
82	Furniture	0.183	5	0.68
27	Crude fertilizers and crude minerals (nes)	0.187	6	0.74
02	Dairy products and eggs	0.188	7	0.07
28	Metalliferous ores and metal scrap	0.190	8	0.73
66	Non-metallic mineral manufactures (nes)	0.21	9	1.22
08	Feed. Stuff for animals excl. Unmilled cereals	0.216	10	0.52

Source: Authors' calculations based on data from the UN Commodity Trade database

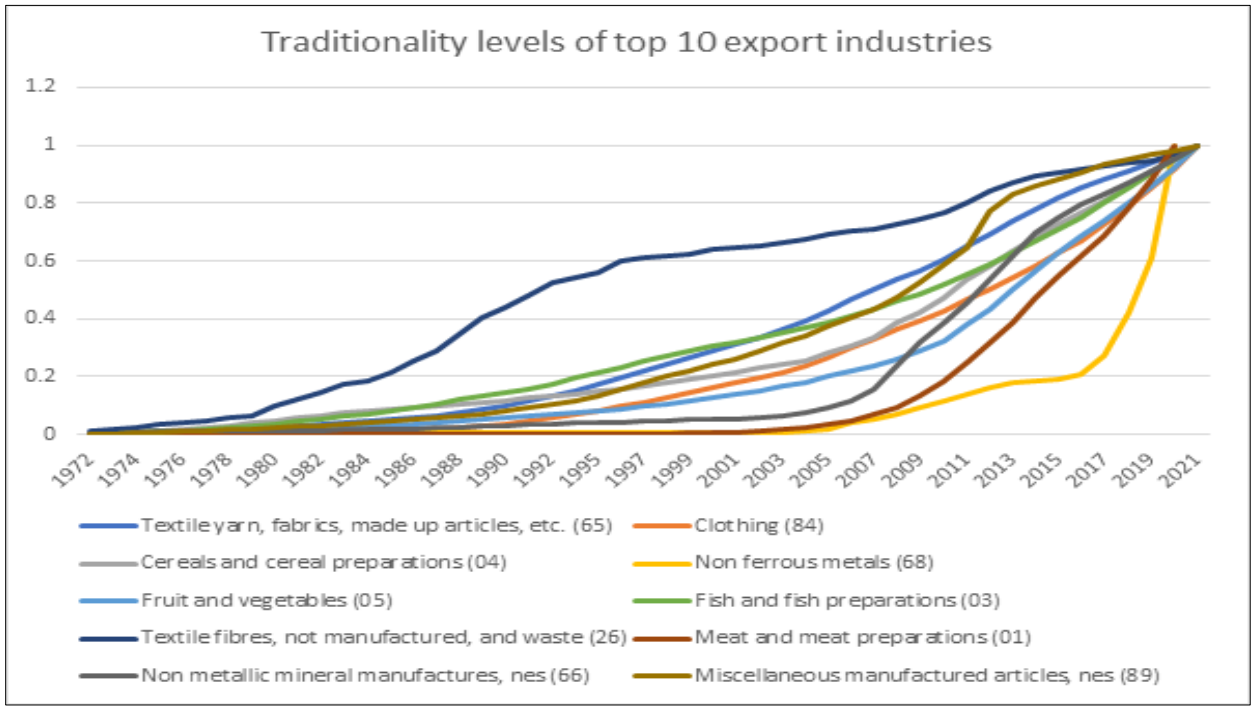
Table 2 lists the total export shares and traditionality of the ten least traditional industries, more commonly known as non-traditional or non-conventional. The striking observation coming from this analysis is that the 2 least traditional industries (Non-ferrous metals, meat and meat preparations) were also a part of the top ten exports, with a cumulative share of 4.33 percent. This means that only these two commodities moved towards non-traditionality. The total share of ten least traditional industries was less than 10 percent of total exports, compared to the larger share of traditional exports. From this we can infer that the non-traditional industries don't compose a higher percentage of our export basket, overshadowed by the more conventional commodities.

The structure of Pakistan's exports plays a large part in our overall export diversification. Our export composition not only has remained the same on an average over the years, but there has been no significant export diversification reported according to our ATI calculations. The export basket remained predominantly traditional (or conventional) and our exports did not experience very high levels of structural change. Following this generalization, in terms of export diversification, there was no significant structural transformation observed in the case of Pakistan.

Overall, 3 general insights were drawn from the results given in Tables 1 and 2:

1. The variation in ATI showed that the cumulative export experience function of industries has differed over time from 1972 to 2021, with the least traditional industry enjoying an ATI of 0.08 (Non-ferrous metals) and most traditional with an ATI of 0.5 (Textile fibers, not manufactured, and waste). Thus, our ATI ranges from 0.08-0.5 throughout 31 industries.
2. The cumulative share of top ten least traditional industries (those with a rank of 1-10) accounted for only a tenth of the total exports in 2021. This is evident from the data shown in Table 2, as the least traditional industries with a rank of 10 or less had a cumulative share of 9.14 percent of total exports in 2021 (column 5).
3. Based on this classification, Pakistan's top export industries are classified as the most traditional. This is evident from the data presented in Table 1, which gives the top ten exports on the basis of their export share (column 5). These exports accounted for a total of 81.99 percent of the total exports in 2021. On a traditionality rank of 1-31, 5 of the top ten export industries have a traditionality rank of 20 or higher. Moreover, this pool also contains some of the most traditional industries, namely, textile fibers and textile yarn, ranked 31 and 26, accounting for a total of 33.28 percent of total export share in 2021.

Figure 1: *Traditionality levels across the top ten export industries (SITC 2-digit level)*



Source: Authors' calculations based on data from the UN Commodity Trade database

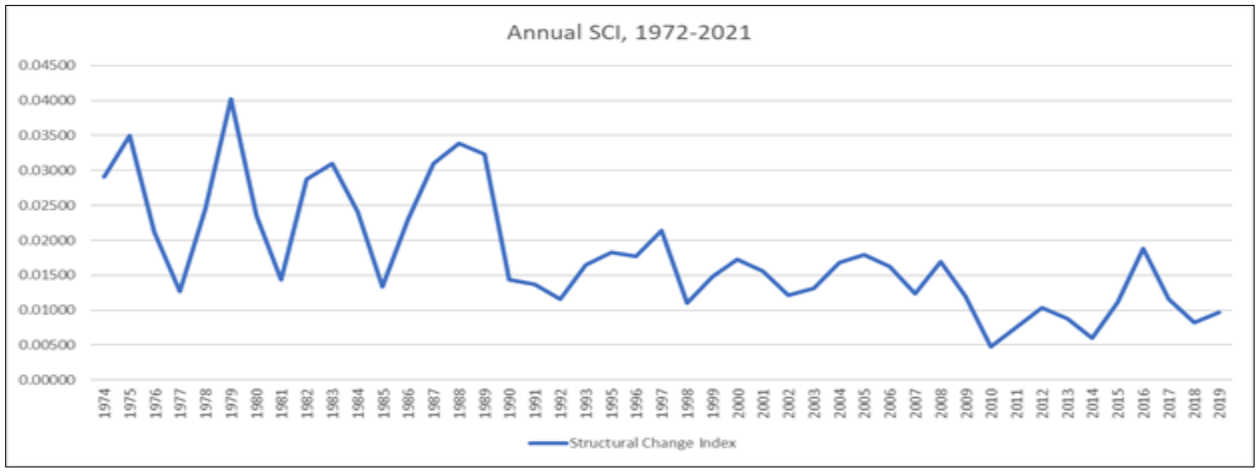
Plotting the traditionality index for the top ten export industries, industries for which the index lies to the left were considered more traditional than those for which the index lies to the right. Figure 1 shows that some of the most important export industries (textile fibers, clothing, and cereals) had their export experience functions lying to the left side of the graph, depicting that they're the most traditional. On the other hand, non-ferrous metal and non-metallic mineral manufactures lie to the right side of the graph, being the least traditional export industries.

From 1972-2021, the traditional or conventional industries have dominated our export structure, with their shares in total exports being the highest. The ATI plotted against time gives us a visual representation of our main takeaway; Pakistan has experienced low levels of structural transformation in the context of export share and composition.

An assessment of structural change in the context of Pakistan's export composition

For the second part of this study's main objective, we looked at the overall direction of structural change in the export sector over time (1972-2021) by plotting the structural change index or SCI against subsequent years. The yearly SCI or inter-industry variances helped us understand the medium-term structural change in the country's export sector over the years.

Figure 2: *Annual SCI, 1972-2021*



Source: Authors' calculations based on data from the UN Commodity Trade database

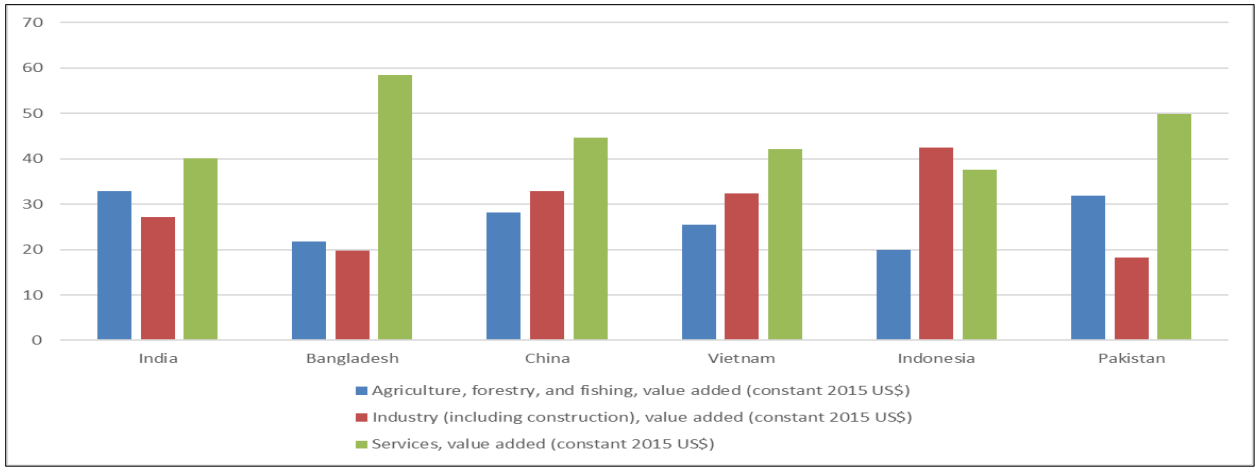
Periods in which the inter-industry variance is low reflects stable trends in the export sector while periods in which the inter-industry variance is high were interpreted as periods of structural change with differing patterns across industries; some leading while others lag behind in terms of export performance. The highest inter-industry variance recorded was 0.04 in 1979 and the lowest was 0.004 in 2010. Thus, we can say that the inter-industry variance of 31 industries from 1972-2021 ranged from 0.004 to 0.04, being a relatively smaller range.

The SCI trend showed rapid fluctuations in the range of 0.012 to 0.04 during 1972-1990. This depicts that during the first few years, there had been a marginal level of structural transformation reported in context to Pakistan's exports. However, the trend stabilized after 1990, with little variations in the structural change. Summarizing this, it can be said that Pakistan experienced low levels of sectoral shifts and diversification in the earlier decades and transitioned to a more rigid and conventional export composition in the last 3 decades.

Comparative Analysis of the Structural Transformation in Pakistan vs other Countries

Data was taken for the three sectors; Agriculture, Industry (includes manufacturing), and services. Value-added data was taken from 1972 to 2020 at the constant 2015 USD prices, and annual % growth data from 1972 to 2020.

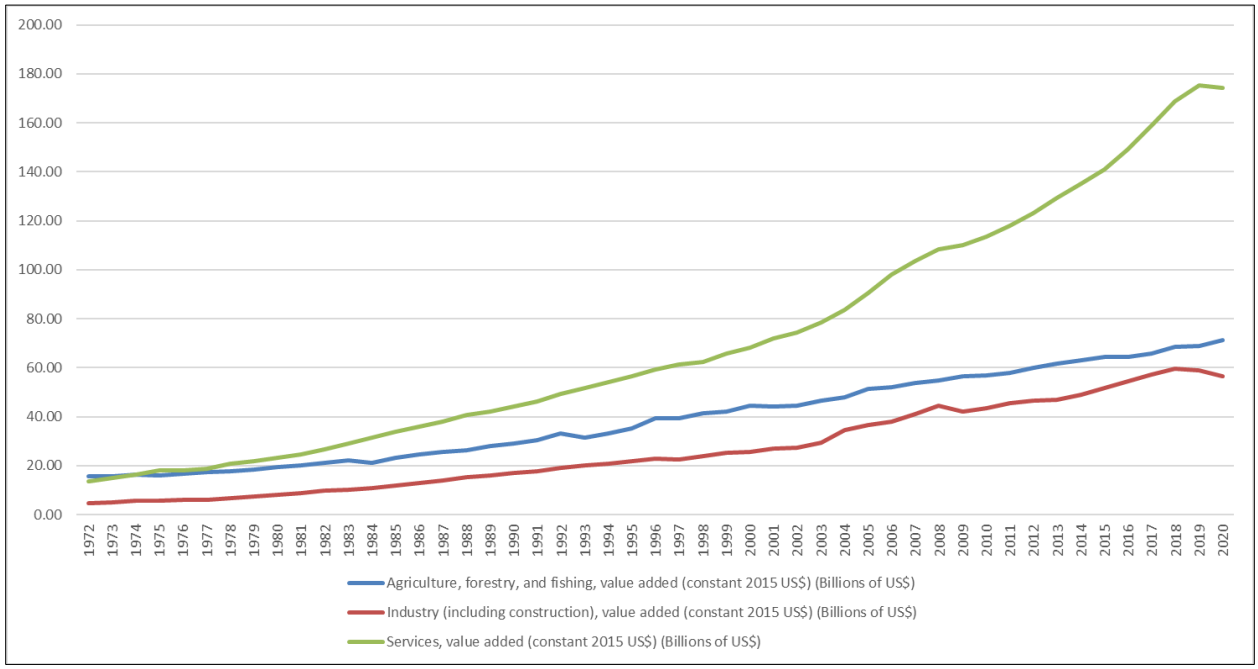
Figure 3: *Sectoral composition of GDP, value added (constant 2015 US$), 1972-2020*



Note: Data for Vietnam only covers the period 1985–2020, China does not have recorded services data for 1972-1977.
Source: Author's calculations based on data from World Development Indicators online database (World Bank, downloaded 25 April 2022).

Figure 3 presents the sectoral composition of the GDP of Pakistan vis-a-vis other countries. In the case of Pakistan, the services sector on average dominated the agricultural and industrial sectors from 1972 till 2020. When compared with other countries, Pakistan had the weakest industrial sector on average and one of the strongest agricultural sectors, on par with India's, implying that the country has depended more on its agricultural sector for contribution to GDP when compared with industrial. When it comes to the services sector, Pakistan had the second highest share of the services sector among the countries, only behind Bangladesh. This supports the argument that Pakistan has failed to develop its industrial sector over the years and has jumped to services development, experiencing an unorthodox sectoral shift. The primary outlier in figure 3 is Indonesia. Its industrial sector contributed the most even though it is in a similar region and proximity to the rest of the countries in the figure. Bangladesh and Pakistan had the most dominant services sectors while having the most deplorable contribution by the industrial sector. Although, Bangladesh fared slightly better than Pakistan in industrial sector contribution.

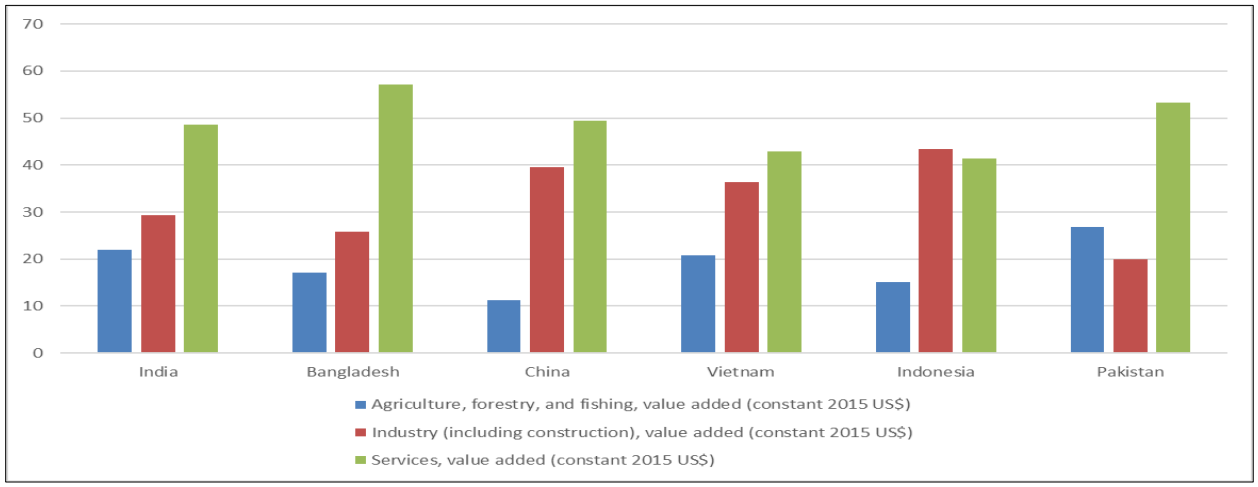
Figure 4: *Annual sectoral composition of GDP of Pakistan, value-added (constant 2015 US$), 1972-2020*



Source: Author's calculations based on data from World Development Indicators online database (World Bank, downloaded 25 April 2022).

Looking at the three sectors individually over the years for Pakistan, we saw that the industrial sector has always lagged behind agriculture and services, never having been able to surpass either of the two. Growth of agriculture has, for most of the years, remained well below the services growth, save for the first few years, and has always remained above industry.

Figure 5: *Sectoral composition of GDP, value added (constant 2015 US$), 2000-2020*

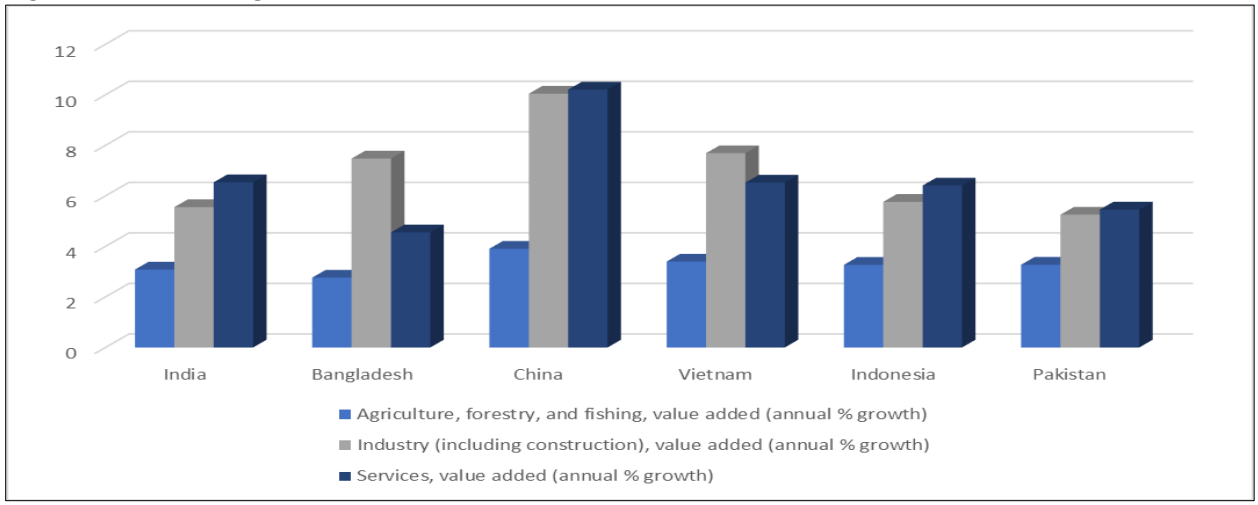


Source: Author's calculations based on data from World Development Indicators online database (World Bank, downloaded 25 April 2022).

Furthermore, we narrowed down the sectoral composition of GDP in the 21st century to get an insight of the recent trends of the three sectors in the particular countries. Looking at Pakistan first, we saw that the share of industrial and services increased and the share of agriculture decreased over the last two decades when compared with the whole timeline, but these shifts have been rather miniscule and don't signify any major changes to the economy or structural transformation. When compared with the other countries, Pakistan was the only country whose industry has yet to surpass its agricultural sector's contribution, indicating that it is critically lagging behind others in the region. Pakistan also had the highest agricultural sector contribution, relative to its GDP, among the countries meaning that it has yet to move on from its dependency on agricultural output and export. Among the outliers, Indonesia was the only country whose industry overtook its services, hinting that Indonesia's industry has had a more recent boom. India and Bangladesh's industries have overtaken their agricultural sector in the last 20 years showing growth in the industrial sector which was mentioned above in the paper.

Moving on, we compared the annual % growth of each countries' sector from 1972 to 2020.

Figure 6: *Sectoral % growth, Value-added, 1972-2020*

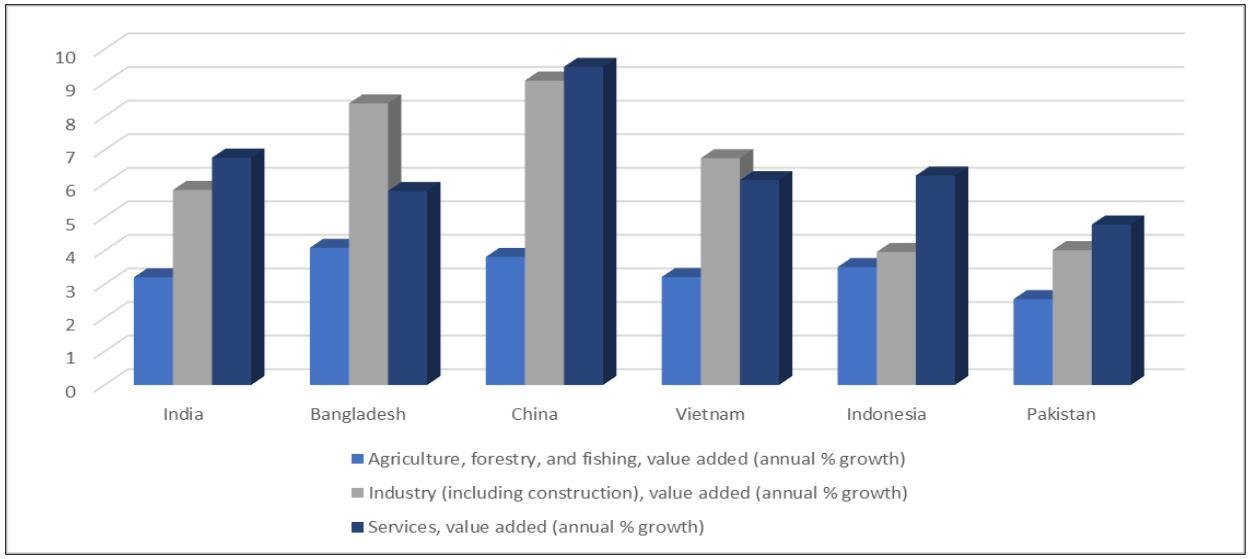


Note: Data for Vietnam only covers the period 1986–2020.
Source: Author's calculations based on data from World Development Indicators online database (World Bank, downloaded 20 April 2022).

Pakistan has overall staggered in all three sectors, only slightly outperforming Bangladesh in agricultural and services sector growth. Quite obviously China has had the highest growth in its industrial and services sector as it has emerged as a power house in recent years and is the second largest economy in the world. Vietnam and Bangladesh were the outliers here as both of their industrial sectors grew more than the other two sectors, Vietnam even more so as it had higher growth in all three sectors when compared to Bangladesh. This is one of the reasons why Vietnam earned the title of 'new Asian tiger'.

The slight difference between Pakistan and Bangladesh is eliminated if we look at (figure 7) the last 2 decades where all three of Bangladesh's sectors had healthy growth leading to Pakistan having the worst growth in all three sectors among the countries, only having its industrial sector growth on par with Indonesia's.

Figure 7: *Sectoral % growth, Value added, 2000-2020*



Source: Author's calculations based on data from World Development Indicators online database (World Bank, downloaded 20 April 2022).

This again supports the statement that Pakistan has critically lagged behind in economic growth in all three of its sectors, the most important of them being industry which already had the lowest sectoral contribution to the GDP. This low contribution over the years coupled with the lamentable growth rate means that Pakistan has had an economy with a very weak industrial base for most of its years.

To summarize the comparative analysis, Pakistan has heavily depended on its services sector, especially in recent years. Even though most other countries also have their services sector contributing the most to the GDP, the problem with Pakistan's service sector is that it is heavily concentrated only in two categories, which are: Wholesale & Retail Trade (30.24%) and Transport, Storage & Communication (20.05%) (Pakistan Economic Survey, 2021). These sectors consistently constituted the major share of the services sector over the years. Meaning that Pakistan's services sector is not very diverse. Also, most other countries had seen remarkable growth in their industrial sectors but Pakistan has had the weakest industrial growth in the region, even in recent years. So, Pakistan's services sector, unlike other countries, is not supported by a formidable, localized industrial sector.

Discussion and Findings

The findings of this study suggest that the current export base continues to be more traditional. The least traditional industries amount to less than a tenth of the total exports in 2021, while the more traditional industries constitute a larger share. There is less evidence of structural change in recent years, due to the fact that the ATI of traditional or conventional industries (textile, clothing) and their shares in our total

exports remained consistently high. Although there were marginal levels of structural change reported during 1972-1990, our export mix remained rigid throughout the years. Our composition consists predominantly of conventional goods which add little cumulative value to our total earnings. Another important takeaway was that even though we have the potential of producing and exporting livestock related commodities (fish and meat preparation), we don't export enough of them. As such, the livestock industry's share in total exports is nominal and significantly less than agricultural produce.

The analysis of sectoral composition of Pakistan's GDP solidifies our findings from the structural change index. These results suggest that even though there were marginal levels of sectoral shifts in the earlier decades, that transformation reduced as Pakistan approached the 21st century. Assessment of the process of structural transformation through sectoral shifts shows that Pakistan relies heavily on its services sector. There is heavy concentration in 2 categories with more than 50 percent cumulative share in services, so our services sector is limitedly diverse.

The comparative analysis of Pakistan vs regional competitors regarding the process of structural transformation points to an important insight. The countries under investigation (Indonesia, Vietnam, India, Bangladesh and China) have observed a gradual shift from agriculture towards manufacturing and then services. However, contrary to this, in the case of Pakistan, the share of industry has been the least among all other sectors. While a significant sectoral shift was reported from agricultural to services sector, there was no significant variation in the industrial sector's output share from 1972. Pakistan still lags behind in developing its industrial sector to encourage economic growth, whereas our regional competitors are thriving.

Conclusion

In a nutshell, the findings of this study conclude that although Pakistan has undergone structural transformation in terms of sectoral shifts and export diversification, that change cannot be recorded as growth augmenting. This is because the countries that observed a meaningful structural transformation in their economies moved up on the ladder of product sophistication, economic growth and development. Not only that, their industrial sector share increased significantly and they witnessed a phenomenal change in their export diversification, which is supported by sophisticated products. Contrary to this, in the case of Pakistan we observe that even though there was a sectoral shift from agriculture to services, the services sector was less diverse with no support from the localized industrial sector.

Policy Suggestions

The findings of this study suggest that in order to witness an impressive economic growth rate and development, the role of the industrial sector should not be overlooked and its contribution should be enhanced. For the purpose of economic growth, the policies and reforms that can bring a change in the industrial structure of the economy and upgrade our industry are essential. There is a need to introduce industrial reforms which strengthen the industrial and manufacturing sector through resolving structural bottlenecks (which includes barriers to trade). In order to improve our export composition, trade reforms to encourage the sectors which produce value-added commodities should be introduced. This will encourage our industrial growth, export structure, and economic development. Moreover, if Pakistan's factors of production were to focus on innovation and improve the skills of their labor force, it would encourage structural transformation in the direction of the industrial sector. In terms of Pakistan's services production, we should focus on sophisticated and value-added services, to increase their contribution in GDP and uplift our economy's structure. If growth were to increase in non-conventional or emerging sectors by means of government facilitation, it would bring about positive changes to our economic structure and development.

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Conflict of Interest

Authors declared no conflict of interest.

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References

Ahmed, H., & Hamid, N. (2014). Patterns of Export Diversification: Evidence from Pakistan. *The Lahore Journal of Economics*, *19*(SE), 307-326.

Briones, R., & Felipe, J. (2013). Agriculture and Structural Transformation in Developing Asia: Review and Outlook. *ADB Economics Working Paper Series,* 363.

Choga, I., & Tsegaye, A. (2015). Export Diversification and Structural Changes in South Africa. *Journal of Governance and Regulation*, *4*(3-1), 128-137.

De Piñeres, S. A. G., & Ferrantino, M. (1997). Export diversification and structural dynamics in the growth process: The case of Chile. *Journal of Development Economics*, *52*(2), 375-391.

Felipe, J. (2007). A Note on Competitiveness and Structural Transformation in Pakistan. *ADB Economics Working Paper Series*, 110.

Gilal, M. A., Ajmair, M., & Farooq, S. (2019). Structural Changes and Economic Growth In Pakistan, *Pakistan Journal of Applied Economics, 29*(1), 33-51.

Goel, M., & Restrepo-Echavarria, P. (2015). India's Atypical Structural Transformation. *Economic Research Federal Reserve Bank of St. Louis,* 23.

Hausmann, R. (2010). Pakistan: Competitiveness and Structural Transformation in Pakistan. *Asian Development Bank*.

Hausmann, R., & Klinger, B. (2008). Structural Transformation in Pakistan. *Growth Lab at Harvard's Center for International Development.*

Jayasooriya, S. (2017). Growth Empirics: Structural Transformation and Sectoral Interdependencies of Sri Lanka. *ADBI Working Paper Series*, 728.

Khan, M., & Afzal, U. (2016). The Diversification and Sophistication of Pakistan's Exports: The Need for Structural Transformation. *The Lahore Journal of Economics*, *21*(SE), 99-127.

Kibret, H. (2018). Structural Transformation in Africa: Shifting Gears. *United Nations Development Program.*

Kim, K., Mungsunti, A., Sumner, A., & Yusuf, A. (2020). Structural transformation and inclusive growth: Kuznets' 'developer's dilemma' in Indonesia. *UNU-WIDER Working Paper,* 31.

Marcolino, M. (2022). Accounting for structural transformation in the U.S. *Journal of Macroeconomics*, 71.

Nasir, J. (2017). Economic Development and Structural Transformation: Analyzing Pakistan's Case. *Criterion Quarterly*, *11*(3).

Pakistan Bureau of Statistics. (2022). Pakistan Balance of Trade - April 2022 Data - 1957-2021 Historical - May Forecast. *Trading Economics.*

Raihan, S., & Khan, S. S. (2020). Structural transformation, inequality dynamics, and inclusive growth in Bangladesh. *UNU-WIDER Working Paper*, 44.

Saxonhouse, G. R. (1998). Structural Change and Japanese Economic History: Will the 21st Century Be Different? *The American Economic Review, 88*(2), 408–411.

Sen, K. (2016). The Determinants of Structural Transformation in Asia: A Review of the Literature. *ADB Economics Working Paper Series*, 478.

Timmer, C. P. (2007). The Structural Transformation and the Changing Role of Agriculture in Economic Development: Empirics and Implications. *American Enterprise Institute*.

Timmer, P., McMillan, M., Badiane, O., Rodrik, D., Binswanger-Mkhize, H., Wouterse, F. (2012). Patterns of Growth and Structural Transformation in Africa. *International Food Policy Research Institute.*

Tyler, P., Evenhuis, E., Martin, R., Sunley, P., & Gardiner, B. (2017). Growing apart? Structural transformation and the uneven development of British cities. *Cambridge Journal of Regions, Economy and Society*, *10*(3), 425–454.

Appendix

Table 3: *List of product names*

SITC code (rev. 1)	Description
00	Live animals
01	Meat and meat preparations
02	Dairy products and eggs
03	Fish and fish preparations
04	Cereals and cereal preparations
05	Fruit and vegetables
06	Sugar, sugar preparations and honey
07	Coffee, tea, cocoa, spices & manufactures. Thereof
08	Feed. Stuff for animals excl. Unmilled cereals
09	Miscellaneous food preparations
22	Oil seeds, oil nuts and oil kernels
26	Textile fibers, not manufactured, and waste
27	Crude fertilizers and crude minerals, nes
28	Metalliferous ores and metal scrap
29	Crude animal and vegetable materials, nes
61	Leather, lthr. Manufs., nes & dressed fur skins
62	Rubber manufactures, nes
63	Wood and cork manufactures excluding furniture
64	Paper, paperboard and manufactures thereof
65	Textile yarn, fabrics, made up articles, etc.
66	Nonmetallic mineral manufactures, nes
67	Iron and steel
68	Nonferrous metals
69	Manufactures of metal, nes.
81	Sanitary, plumbing, heating and lighting fixt.
82	Furniture
83	Travel goods, handbags and similar articles
84	Clothing
85	Footwear
86	Scientif & control instrum, photogr gds, clocks
89	Miscellaneous manufactured articles, nes

Source: Data retrieved from UN Commodity Trade database

Table 4: *Export industries ranked by traditionality*

(1) UN code	(2) Description	(3) ATI	(4) Traditionality rank	(5) % share of total exports
68	Nonferrous metals	0.08	1	3.07
01	Meat and meat preparations	0.13	2	1.26
09	Miscellaneous food preparations	0.15	3	0.51
64	Paper, paperboard and manufactures thereof	0.16	4	0.29
82	Furniture	0.18	5	0.68
27	Crude fertilizers and crude minerals, nes	0.18	6	0.74
02	Dairy products and eggs	0.18	7	0.07
28	Metalliferous ores and metal scrap	0.19	8	0.73
66	Nonmetallic mineral manufactures, nes	0.21	9	1.22
08	Feed. Stuff for animals excl. Unmilled cereals	0.21	10	0.52
05	Fruit and vegetables	0.21	11	2.83
62	Rubber manufacturers, nes	0.23	12	0.15
67	Iron and steel	0.23	13	0.51
84	Clothing	0.23	14	29.63
83	Travel goods, handbags and similar articles	0.23	15	0.08
69	Manufactures of metal, nes	0.24	16	0.89
22	Oil seeds, oil nuts and oil kernels	0.24	17	0.84
07	Coffee, tea, cocoa, spices & manufacs. Thereof	0.25	18	0.58
06	Sugar, sugar preparations and honey	0.26	19	0.61
63	Wood and cork manufactures excluding furniture	0.27	20	0.02
86	Scientific & control instrum, photogr gds, clocks	0.27	21	0
04	Cereals and cereal preparations	0.28	22	8.17
85	Footwear	0.29	23	0.48
03	Fish and fish preparations	0.31	24	1.38
89	Miscellaneous manufactured articles, nes	0.31	25	1.18
65	Textile yarn, fabrics, made up articles, etc.	0.32	26	31.9
81	Sanitary, plumbing, heating and lighting fixt.	0.32	27	0.01
00	Live animals	0.36	28	0.02
61	Leather, lthr. Manufs., nes & dressed fur skins	0.39	29	0.69
29	Crude animal and vegetable materials, nes	0.43	30	0.26
26	Textile fibers, not manufactured, and waste	0.50	31	1.38

Note: Column 5 shows the ranking of the top 31 export industries taken on a 2-digit level by their export share.

Source: Authors' calculation based on data from the UN Commodity Trade database.

Table 5: *Annual SCI*

Year	SCI
1974	0.029067
1975	0.034943
1976	0.021146
1977	0.012674
1978	0.02453
1979	0.040251
1980	0.023484
1981	0.014401
1982	0.0288
1983	0.030938
1984	0.024023
1985	0.013391
1986	0.022953
1987	0.030932
1988	0.033886
1989	0.032293
1990	0.014408
1991	0.013649
1992	0.011548
1993	0.016533
1995	0.018237
1996	0.017683
1997	0.021433
1998	0.01104
1999	0.014817
2000	0.017317
2001	0.015589
2002	0.012118
2003	0.013182
2004	0.016827
2005	0.01794
2006	0.016285
2007	0.012311
2008	0.016981
2009	0.012018
2010	0.004796
2011	0.007521
2012	0.010309
2013	0.008761
2014	0.006037
2015	0.01118
2016	0.018862
2017	0.011541
2018	0.008204
2019	0.00964

Note: SCI for the years 1972, 1973, 2020, 2021 missing because of 5-year lags

Source: Authors' calculation based on data from the UN Commodity Trade database.