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## **Foreign Outsourcing Collaboration, and Firm-Level Characteristics**

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### **Abstract**

Foreign outsourcing of activities across economies has empowered the firms to derive the benefits from international fragmentation of production stages which is equally important for both development and developing economies. This fragmentation of production stages has enabled enterprises to relocate the production stages that have become inefficient due to the higher cost of production in home countries. This study consists of a multistage analysis to assess firms' characteristics that segregate the firms by engagement in various forms of outsourcing collaboration, firm sizes, and ownership status. The firms' characteristics have been assessed using trend analysis. The results reveal that firms that collaborate in foreign as well as domestic outsourcing possess superior characteristics compared to firms that solely participate in foreign outsourcing collaboration employing data from 217 textile and apparel firms collected from Faisalabad-Pakistan. Particularly large entities exhibit better characteristics. Large firms collaborating in foreign outsourcing demonstrate benefits such as higher capital stock, greater use of capital-intensive technology, greater rent and lease expenses, higher use of imported inputs, a higher proportion of educated workers, and a strong tendency for process innovation. Furthermore, small firms turn out to be more productive as well as more product innovative. Private limited liability companies (LLCs) outperformed compared to public LLCs in innovation while small sole proprietorship firms exhibit exceptional product innovation.

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**Keywords:** Foreign Outsourcing Collaboration, Domestic Outsourcing, Firm Level Characteristics, Pakistan

**Jel codes:** F02, F6, M11, O14, O19

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## 1. Introduction

Foreign outsourcing of activities across nations have been aided by the development of information & communication technology (ICT), enhanced trade facilitation system, efficient transportation services, and trade liberalization, which has enabled the firms to reap the advantages from international fragmentation of production stages equally important for both advanced and developing economies. Foreign outsourcing permits firms to participate in the global supply chain (GSC), allowing them to gain a competitive edge. Firms residing in developed countries participate in foreign outsourcing activities to reduce their production costs (Bilan et al., 2017; Nazir & Mahmood, 2018; Teng & Hsu, 2016) among other motives to take advantage of globalization.

Firms in developing countries also collaborate in foreign outsourcing with firms located in developed countries. Hansen *et al.* (2008) postulate that the growth of foreign outsourcing activities has created enormous opportunities for developing economy firms (DEFs) such as the entrance of new firms, creation of jobs, export earnings, and up-gradation of technology and skills. Foreign outsourcing collaboration with developing low-income economies is widespread in labor-intensive sectors such as apparel, etc. as multinational companies like Nike outsource a majority of their tasks to the firms located in these low-income economies (Tomiura, 2009). Foreign firms that engage themselves in foreign outsourcing are most likely large in size or low in productivity (Paul & Yasar, 2009) as large firms tend to adopt a decentralization strategy to become more competitive. In the case of Pakistan's surgical goods industry, Nazir & Mahmood (2018) find that local firms participate in foreign outsourcing collaboration primarily to overcome transaction costs. In this context, the prominent role is normally played by innovative and productive firms. More specifically, firm-level attributes such as firm size, human capital, the export orientation of firms, and technological capabilities also play a promising role in ultimate outsourcing decisions. Thus, domestic firms supply intermediate inputs to their collaborating foreign firms in outsourcing.

The current study focuses on the assessment of firm-level characteristics related to foreign outsourcing collaboration. More specifically, this study highlights the significance of firm-level characteristics involved in foreign outsourcing collaborations. The outsourcing or subcontracting system is more complicated in the textile industry of Pakistan. Different multinational firms have different approaches towards outsourcing e.g., textile companies in Pakistan are working for multiple internationally renowned firms and have a very complicated subcontracting chain as they deal with small units as well as home-based workers. Moreover, large domestic firms have their own offices in countries like the USA to avail outsourcing orders. Firms are also effectively using the power of division of labor and informalization of formal work such features are unique to Pakistan's textile industry. Another unique feature that provides novelty to this study concerns the outsourcing contracts received by the textile firms from foreign firms that are further subcontracted to local businesses called domestic outsourcing collaboration, especially to individual households or a group of households working from home in case of embroidery work that requires a special kind of human skill.

Firm-level characteristics are extremely important in engaging and collaborating with foreign outsourcing firms. Foreign firms, before they start doing business with firms that will collaborate with them in outsourcing activity, assess the potential production capabilities and delivery mechanisms. Therefore, in this study, we examine the firm-level characteristics that might influence the participation of DEFs in foreign outsourcing collaboration. That is, we examine what type of firms are chosen for outsourcing services, or which firm-specific characteristics are more attractive to foreign firms, for instance, productivity, human capital, technology orientation, and capital-labor ratio. Why focus on Pakistan for such an analysis? This is because Pakistan is the 8<sup>th</sup> largest exporter of textile products in Asia and the 4<sup>th</sup> largest producer, the 3<sup>rd</sup> largest consumer of textile products (BoI, 2021). Textile is the most crucial industry in Pakistan with innate potential for value addition and has the longest supply chain among all manufacturing industries (GoP, 2021). It contributes 60% to national exports on average, and provide employment to almost 40 percent of the manufacturing labor force (GoP, 2021). Many international brands are already working in collaboration with local firms such as Adidas, Levi's, Nike, Target, Puma, H&M, etc. (BoI, 2021). Moreover, Pakistan is the third-largest hosiery manufacturer economy in the world supplying goods to Adidas and Nike (BoI, 2021). Further, Pakistan has a comparative advantage in cotton which needs to be converted into sustainable comparative advantages and can produce goods at a lower cost as compared to developed economies and hence is a good location for further foreign outsourcing collaboration.

The remaining of the study is organized as follows. Section 2 discusses data and sampling design. This section also provides a detailed presentation of the methodology used in the study. Section 3 elaborates on firm characteristics. Finally, the conclusion and policy implications are presented in section 4.

## 2. Data, Sample Design, and Methodology

### 2.1. Sampling Design

We have studied the textiles and clothing cluster located in Faisalabad and the adjacent region. A total of 240 firms have been surveyed out of which 217 were found in all respects. The survey has been carried out from July 17 to August 31, 2023. The questionnaire includes firms that are involved in foreign outsourcing collaboration, domestic outsourcing collaboration, direct exporting firms, and domestic firms. After excluding outliers and incomplete questionnaires, the remaining 217 firms have been incorporated into the final study. Random sampling techniques have been employed to select the sample size.

The survey participants include owners, owner cum CEOs, directors, general managers, export managers, and compliance managers in textile firms. For unique data on foreign outsourcing collaboration, the survey specifically asked sample firms whether they “are involved in indirect exports through foreign outsourcing collaboration” and “obtain manufacturing or processing tasks from foreign firms” to know whether firms are involved in foreign outsourcing collaboration. Additionally, we have collected data on several independent and control variables which are firm size, human capital, language, fixed entry cost, foreign business experience, use of advanced technology, TFP, ICT, labor intensity, R&D, and export decision of the firm.

### 2.2. Measures of outsourcing

Theoretically, a clear link has been established with the help of the theory linking foreign outsourcing and productivity. A significant prediction has been made by Antras & Helpman (2004) regarding the decision to outsource in foreign countries and the organization of industry. They found that most productive firms are involved in foreign outsourcing to take advantage of cheap labor and least productive firms outsource to escape exist.

The input-output table is the most common source of foreign outsourcing since Feenstra & Hanson (1996) and Campa & Goldberg (1997). Using this measure outsourcing is defined as

$$\sum_k \left[ X_i^k \left( \frac{M_k}{C_k} \right) \right] \quad \dots (1)$$

where  $i$  represents an industry,  $k$  shows the good, thus  $X_i^k$  is input purchased of good  $k$  by industry  $i$ .  $M$  and  $C$  represent the import and consumption of goods  $k$  respectively.

Literature also gives alternative measures of outsourcing, Yeats (1998) used foreign trade statistics of OECD economies to calculate foreign outsourcing (referred to as production sharing) using the proportion of parts and components in aggregate exports. However, for the outsourcing data Egger & Egger (2001), Feenstra *et al.* (2000), and Gorg (2000) used preferential tariff-exempted import of final products after being processed in exported intermediate developed under schemes such as European Union (EU) inward/outward processing trade or US offshore assembly program.

Finally, microdata have been used by Swenson (2000) and Gorg and Hanley (2003). They explicitly distinguished foreign outsourcing from domestic outsourcing. Gorg and Hanley (2003) defined foreign outsourcing as intermediate inputs imports while Swenson (2000) studied firms situated only in Foreign Trade Zones in the US. These two studies are valuable contributions to literature under severe data constraints. Recently, several studies nationally and internationally used microdata in examining the impact/ determinants of outsourcing such as Nazir & Mahmood (2018). This study measures foreign outsourcing collaboration dummy variables. Specifically, the firms are asked to indicate whether they are involved in indirect exports through foreign outsourcing collaboration.

### Measures of productivity

Labor productivity is the most common measure of productivity which can be calculated as,

$$\theta = \ln \left( \frac{VA}{L} \right) = \ln(Sales - Cost) / L \quad \dots (2)$$

Where  $\theta$  indicates labor productivity per worker,  $VA$  is value-added,  $L$  indicates the total number of laborers,  $Sales$  shows total output sold and  $Cost$  indicates the cost of products sold. The total factor productivity (TFP) at the firm level is not possible to measure using cross-sectional data, thus we calculate Approximate TFP (ATFP) using

$$ATFP = \ln \left( \frac{Q}{L} \right) - 0.316 * \ln \frac{K}{L} \quad \dots (3)$$

Where  $Q$  shows sales and value-added, and  $K$  indicates capital. This productivity proxy (ATFP) has been used by Tomiura (2007) who adopted the measure from Head and Ries (2003). This measure of TFP modifies labor productivity by capital intensity, weighting capital as its importance. Tomiura (2007) and Head and Ries (2003) used 1/3 as the importance of capital in calculating AFTP based on the findings or recommendations of Hall and Jones(1999). The value for the importance of capital comes from the data, allowing it to vary over time and across countries. Thus, we have calculated the value using data for Pakistan on GDP (constant 2015, Million PKR), Capital stock (constant 2015, Million PKR), and Labor (total, in Million). The capital stock has been calculated using

$$K_t = K_{t-1} - 0.04 K_{t-1} + I \quad \dots (4)$$

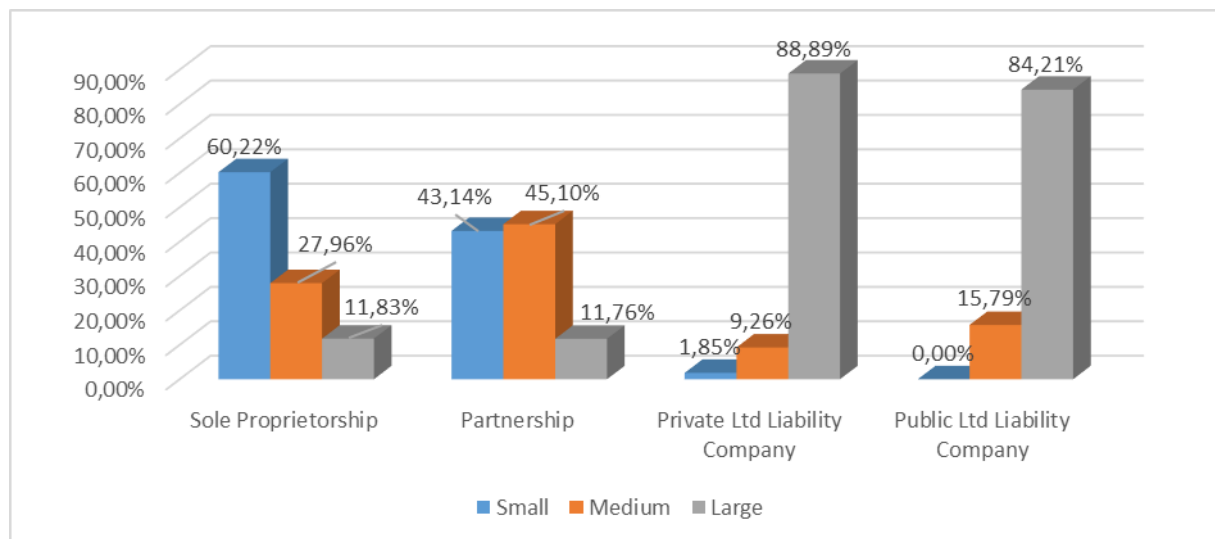
To find the importance of capital in the production function, OLS regression with logged variables utilizing data from 1990 to 2001 has been used. The value for parameter  $s$  turns out to be 0.3016 in the case of Pakistan which has been used in the calculation of AFTP in Eq. 3.

### 3. Firm Characteristics

Firm characteristics are distinguishing features that describe an establishment, such as size, structure, culture, financial condition, and export orientation of firms. These characteristics are critical in shaping a firm's and industry's competitive advantage, and performance. Understanding these characteristics is critical for making strategic decisions, policy implications, and managing the industry as a whole effectively.

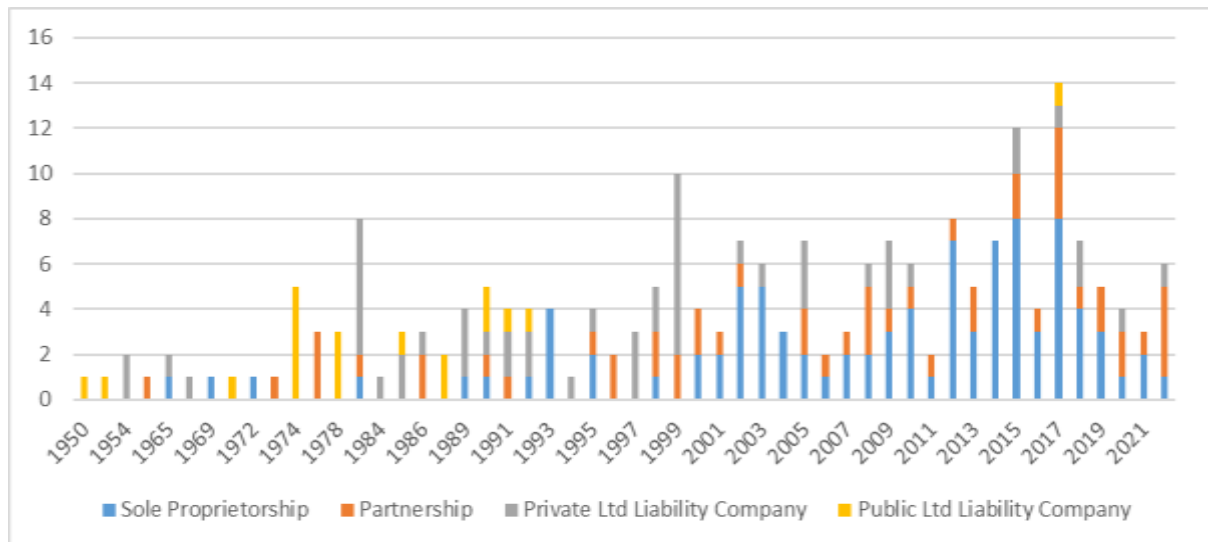
#### 3.1. Basic Characteristics

The understanding of firms' basic characteristics enables to comprehend the functioning and essential attributes of firms in general. Figure 1 indicates the division of firms according to their size and legal ownership status. The sole proprietorship firms are generally small, while partnership firms are marginally medium in size in comparison to small firms. The private and public liability firms are mostly large in size.



**Figure 1:** Legal Ownership Status and Firm Size

**Source:** Author's Own Calculations and Survey



**Figure 2:** Growth of Firms and their Legal Ownership Status

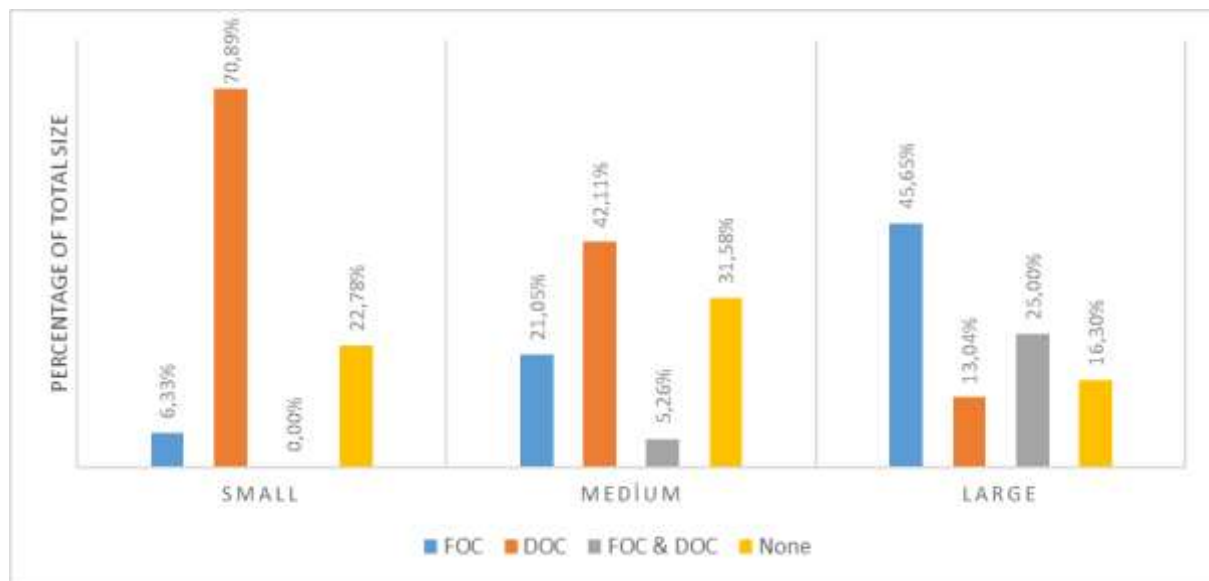
**Source:** Author's Own Calculations and Survey

The growth of firms as per their establishment and ownership status is shown in Figure 2. In the textile and apparel industry of Pakistan, the majority of firms, from the independence of the country up until 1970, were either public or private limited corporations with a small number of firms having ownership status of partnership. These businesses are still operational in the city of Faisalabad, Pakistan. The structure of firms changed slightly during the 1970s and till the 1990s with the inclusion of sole proprietorship and partnership as a result of the privatization policy adopted by the government. There has been phenomenal growth in sole proprietorship and partnership firms after the mid-1990s till date as a result of privatization policy. Figure 2 also depicts a steady decline in public liability firms after the 1990s, while a steady increase in private liability firms has since occurred.

### 3.2. Direct and Indirect Exports

Figure 3 shows different types of outsourcing collaboration concerning firm size. It indicates that firms are categorized as small, medium, and large according to their size. Outsourcing collaboration is categorized as foreign and domestic outsourcing collaboration. Firms may be engaged in foreign outsourcing collaboration, domestic outsourcing collaboration, both foreign and domestic outsourcing collaboration, and neither foreign outsourcing collaboration nor domestic outsourcing collaboration. Figure 3 indicates that most of the small-size firms are involved in domestic outsourcing collaboration with other firms either involved in direct exports or in indirect exports through foreign outsourcing collaborations. While only 6.33% of total small-size firms are involved in foreign outsourcing collaborations. The figure also reveals that none of the small-size firms are engaged in both foreign and domestic outsourcing collaborations at the same time. This leads us to an important conclusion that small firms having employees less than 50 are most engaged in domestic outsourcing collaboration while only 6.33% of small firms are involved in FOC activities and about one-fourth of them (i.e., 22.78%) are serving either the domestic market or international market through direct exports that is they are not taking part in FOC activities.

Similarly, the same situation can be seen in Figure 3 for medium-size firms in which the majority of the firms are engaged in DOC activities, followed by firms approximately one-third of firms (i.e., 31.58%) that are engaged in neither type of collaboration activities. Whereas 21.05% of firms are engaged in FOC activities and 5.26% of firms are engaged in both FOC and DOC activities. In contrast to small and medium firms, the majority of firms (that is 45.65%) engaged in FOC activities are large in size while 25% of the large firms are taking part in both FOC and DOC activities, followed by 16.3% of the large firms are engaged in neither FOC nor DOC activities. Lastly, 3.04% of the large firms are engaged in DOC activities. In sum, it can be said that it is the large size firms that are mostly collaborating with domestic and foreign firms at domestic and international levels.



**Figure 3:** Outsourcing Collaboration and Firm Size

**Source:** Author's Own Calculations and Survey

Table 1 represents the share of direct exports and indirect exports through FOC activities concerning firm size. A total of 33.64% of firms are involved in direct exports containing 11.98% of those either involved in FOC activities or DOC activities or both types of activities. Thus 21.66% of firms are engaged in direct exports only. Out of 33.64% of the firms that are engaged in direct exports, 9.68% are small, 11.52% are medium, and 12.44% are large which indicates that the majority of the firms that are involved in direct exports are large in size. Table 1 also indicates that 4.15% of the firms are engaged in both direct and indirect exports through FOC activities out of which 2.76% are large, and 1.38% are medium. While none of the small firms are involved in both types of activities. Similarly, 5.07% of firms are engaged in direct exports and DOC activities out of which 1.38% are large while the remaining are small and medium size firms in equal proportion. Table 1 also shows the proportion of firms that are involved in direct exports, FOC, and DOC activities at the same time which stood at 2.76% out of which 2.30% are large and 0.46% are medium, whereas none of the small-size firms are involved in these three types of activities at the same time.

**Table 1:** Share of Direct Exports, Indirect Exports through FOC Activities

Direct Exports	Firm Size	FOC	DOC	FOC & DOC	Neither FOC Nor DOC	Grand Total
Yes	Small	0.00	1.84	0.00	7.83	9.68
	Medium	1.38	1.84	0.46	7.83	11.52
	Large	2.76	1.38	2.30	5.99	12.44
	<b>Sub Total</b>	<b>4.15</b>	<b>5.07</b>	<b>2.76</b>	<b>21.66</b>	<b>33.64</b>
No	Small	2.30	23.96	0.00	0.46	26.73
	Medium	4.15	9.22	0.92	0.46	14.75
	Large	14.29	3.23	6.45	0.92	24.88
	<b>Sub Total</b>	<b>20.74</b>	<b>36.41</b>	<b>7.37</b>	<b>1.84</b>	<b>66.36</b>
<b>Grand Total</b>		<b>24.88</b>	<b>41.47</b>	<b>10.14</b>	<b>23.50</b>	<b>100.00</b>

**Note:** Author's own calculations using survey data. The values presented are in percentages. Where FOC and DOC stand for foreign outsourcing collaborations and domestic outsourcing collaborations respectively. **Source:** Author's Own Calculations and Survey

Whereas 66.36% are not involved in direct exports out of which 20.74% of the firms are involved purely in FOC activities, including 14.29% of large firms, 4.15% of medium-size firms, and 2.30% of small-size firms. Firms that are involved in only DOC activities are 36.41% out of which the majority are small size firms that is 23.96%, while 9.22% are medium size firms and 3.23% are large size firms. Table 1 also indicates firms that only engaged in FOC and DOC activities and are not involved in direct exports which is 7.37% out of which 6.45% are large. Last but not least, 1.84% of firms are neither involved in direct export nor in FOC & DOC activities.

### 3.3. Overall Firm Characteristic

Table 2 shows firm characteristics which include notable features of the textiles (spinning and weaving of cloth) and apparel (assembly of cloth into clothing) industry. These characteristics include information on the number of employees, capital, inputs, human capital, total sales, average productivity, and innovation. Table 2 provides the complete list of firms' characteristics.

**Table 2:** Firm Characteristic

Indicators	FOC	DOC	FOC & DOC	Neither FOC Nor DOC	All
Capital Stock (in PKR Million)	4306	340	5226	651	1895
Average Number of Employees including contractual (Annual, 2022)	1106	87	1277	257	501
Average Percentage of Female Employees (Annual, 2022)	12.49	4.05	14.53	6.88	11.74
Capital Intensity (K/L Ratio)	4.29	4.77	5.53	2.74	4.25
Rent and Lease Cost (in PKR Million) (Annual, 2022)	3.13	0.25	1.02	1.53	1.34
Wages of Skilled Labor (in PKR, Monthly)	45296	34649	45818	39069	39470
Average Fixed Entry Cost in 2022 (in PKR Million)	5532	393	7878	771	2519
Imported Inputs Content (average, %)	20.59	4.33	22.05	11.51	11.86
Average Years of Schooling of Workers	11.19	9.19	11.45	11.06	10.35
Percentage share of Employees having University Degrees	10.48	3.59	13.56	10.62	7.97
Average Total Sales in 2022 (in PKR Million)	5507	507	8076	1022	2640
Average Productivity	1.13	-0.09	1.01	1.14	0.61
Average Age of Firms (in Years)	27.30	15.73	33.05	21.31	21.68
Percentage share of newly innovated products in total sales from 2019 to 2021	21.38	1.74	23.52	6.91	10.05
Percentage share of newly innovated products in total sales in 2022 (Products new to the market) *	6.95	0.52	12.11	1.82	3.60
Percentage contribution of process innovation in total sales in 2022	7.05	0.21	4.16	1.46	2.60
Percentage reduction in average cost due to process innovation from 2019 to 2021	1.52	0.12	2.18	0.15	0.68
Percentage increase in turnover due to quality improvement in 2022	3.20	0.12	1.77	3.25	1.79

**Note:** \* means enterprise was the first one to market these products/services.

**Source:** Author's Own Calculations and Survey

Firm characteristics concerning the firms that are involved in FOC activities, DOC activities, both FOC and DOC activities, and those that are involved neither in FOC activities nor in DOC activities are described in Table 2. Each indicator is divided into these activities.

The capital stock of PKR. 5526 million is the highest for the firms indulged in both FOC and DOC firms, followed by firms engaged in FOC activities with a capital stock of PKR. 4306 million. While the DOC firms have the least capital stock. Whereas the least and rent cost is highest for firms involved in FOC activities compared to firms involved in other types of activities.

The number of employees varies with the size of the firm and with the activities the firm is engaged in. The average number of employees is highest for firms that are indulged in both DOC and FOC activities followed by firms that are engaged in FOC activities as presented in Table 2. The percentage of females shows that females are employed in a small proportion maximum of 14.53% is employed by firms involved in both DOC and FOC activities while 12.49% of the total labor force is female in FOC firms.

Capital intensity has been calculated using the capital-to-labor ratio. Firms that are involved in both FOC and DOC activities have the highest capital intensity of 5.53 as compared to firms that are involved in DOC which have capital intensity of 4.77 followed by firms engaged in FOC activities having capital intensity of 4.29. Whereas rent and lease cost is the highest for the firms involved in indirect exports through FOC activities.

When comparing the characteristics such as wages of skilled labor, average fixed entry cost in 2022, imported inputs content, human capital proxied by average years of schooling of workers, and percentage share of employees having university degrees, average total sales in 2022 firms involved in both FOC and DOC activities have highest numbers, followed by firms engaged in FOC activities.

The total factor productivity of firms has been calculated employing Eq. 3. The average productivity of firms that are involved in activities mentioned previously is reported in Table 2. The data indicates that firms that are neither involved in FOC activities nor DOC activities are the most productive as these are the firms that serve the domestic market only and are mainly small in size. These firms surpass the FOC firms that have a marginally low average TFP of 1.13. While firms involved in FOC and DOC activities at the same time exhibit an average productivity of 1.01. Finally, firms involved in DOC activities have a negative average productivity of -0.09. Thus, this provides a clear understanding that with firms that are engaged in exporting activity, FOC firms are most productive followed by firms that are involved in both DOC and FOC activities.

The average age of the firms has been calculated by subtracting the year of establishment from the current year which is 2023. Firms that are doing both FOC and DOC activities have the highest average age of 33.05 years, followed by the firms that are engaged in FOC activities with 27.30 years of average age. Whereas the DOC firms have almost half the average age as compared to either involved in FOC activities or in both FOC & DOC activities.

Firm characteristics related to the innovation of products and processes are also indicated in Table 2. In the product innovation category, firms involved in both FOC and DOC activities have the highest percentage share of newly innovated products in total sales from 2019 to 2021 followed by firms engaged in only FOC activities. Similarly, the percentage share of newly innovated products in total sales in 2022 is highest for firms keenly contributing to both DOC and FOC activities followed by firms involved in FOC activities. These enterprises are the first ones to market these products/services in fiscal year 2022. When comparing the percentage contribution of process innovation in total sales in 2022 and the percentage increase in turnover due to quality improvement in 2022, FOC firms have the highest contribution in total sales due to process innovation and quality improvement of goods due to process innovation. However, the firms that are doing both FOC and DOC activities have reduced a greater percentage of average cost due to process innovation in the last 3 years due to process innovation followed by firms only engaged in FOC activities. In sum, firms' characteristics provide a clear understanding that firms that are collaborating at both local and international levels have better performance, followed by firms that are engaged in foreign outsourcing collaboration.

### *3.4. Firms' Characteristics by Size*

Table 2 provides the overview of firm characteristics in general while

Table 3 to



**Table 6** extends Table 2 by dividing firm characteristics by the size of firms. This division is crucial as it provides us with an understanding of which size firms have better characteristics as compared to other firm sizes when comparing inter-activity firm characteristics.

Firms' characteristics by size of FOC firms are presented in

Table 3 which indicates that large firms dominate small and medium size firms in most of the characteristics. However, in some instances, characteristics of small firms dominate medium and large firms specifically in the area of total factor productivity and product innovation.

**Table 3:** Firm Characteristics by Size: FOC

Indicators	Small	Medium	Large
Capital Stock (in PKR Million)	54	167	6223
Average Number of Employees including contractual (Annual, 2022)	27	105	1576
Average Percentage of Female Employees (Annual, 2022)	0.00	14.29	12.50
Capital Intensity (K/L Ratio)	2.96	2.12	5.17
Rent and Lease Cost (in PKR Million) (Annual, 2022)	1.44	0.43	4.23
Wages of Skilled Labor (in PKR, Monthly)	65900	44333	42824
Average Fixed Entry Cost in 2022 (in PKR Million)	60	208	7998
Imported Inputs Content (average, %)	21.60	11.67	23.35
Average Years of Schooling of Workers	11.20	11.00	11.24
Percentage share of Employees having University Degrees	9.65	13.54	9.60
Average Total Sales in 2022 (in PKR Million)	240	265	7919
Average Productivity	1.74	0.75	1.17
Average Age of Firms (in Years)	17.60	23.92	29.70
Percentage share of newly innovated products in total sales from 2019 to 2021	33.40	9.33	23.66
Percentage share of newly innovated products in total sales in 2022 (Products new to the market) *	21.00	5.08	5.66
Percentage contribution of process innovation in total sales in 2022	5.00	0.83	9.34
Percent reduction in average cost due to process innovation from 2019 to 2021	0.00	1.67	1.68
Percentage increase in turnover due to quality improvement in 2022	2.80	1.25	3.89

**Note:** \* means enterprise was the first one to market these products/services.

**Source:** Author's Own Calculations and Survey

Capital stock, number of total and female employees, and capital intensity are highest for the large firms, followed by medium and small firms respectively. Surprisingly, small firms do not employ any females in the firm.

Capital intensity is highest for large firms as expected followed by small and medium firms respectively. This indicates that small firms are more capital-intensive compared to medium-sized firms. This may be because small firms use capital more intensively compared to medium-sized firms to become cost-effective and remain in business. Generally, small firms invest more in capital to compete with medium-sized firms. Similarly, rent and lease cost is highest for large firms, followed by small and medium firms respectively.

The average monthly wage paid to skilled employees is higher for small firms whereas the least amount is paid by large firms. This may be because small firms want to retain skilled workers to compete with medium and large firms. Whereas the average fixed entry cost for firms in 2022 is highest for large firms followed by medium and small firms as expected.

The imported inputs are critical factors of production that must be used to achieve the desired product quality. Large firms use about one-fourth of imported inputs in the production mix while it is almost half for the medium size firms while small firms use 21.6% of imported inputs in production as indicated in

### Table 3.

The average years of schooling of all the workers and the percentage share of employees having university degrees are the indicators that represent human capital in the firms. The average years of schooling are highest for the large firms, followed by small and medium firms respectively. While the proportion of university degree holders is highest for medium-sized firms followed by small firms. The large FOC firms have the lowest share of employees having a university degree which may be because of the large workforce involved in administrative and management activities.

The average sales in 2022 and the average age of firms involved in FOC activities are high for large firms followed by medium and small firms as expected. The average age of large firms is about 30 years while medium and small firms are approximately 24 and 18 years old. This shows that firms involved in FOC activities are well-experienced.

The average total factor productivity provides surprising results that small firms are more productive compared to medium and large firms. The large firms are next in the category while the least productive firms involved in FOC activities are medium-sized firms. Medium-sized firms are more than half as productive as small firms. This higher level of productivity may be justified by higher capital intensity compared to medium size firms, payment of higher wages to skilled employees, greater use of foreign inputs compared to medium size firms, and better human capital. All these characteristics enable small firms to perform better in the area of product innovation ultimately leading to quality improvement.

The percentage share of newly innovated products in total sales from 2019 to 2021 indicates that it is highest for small firms followed by large and medium-sized firms respectively. Similarly, the contribution of innovative products in total sales in 2022 is highest for small firms compared to medium and large firms. This may be due to the higher productivity of small firms as compared to medium and large firms. In the area of process innovation firms are leading the market as compared to small and medium size firms. The increase in turnover due to process innovation in 2022 is highest for large firms compared to small and medium-sized firms.

**Table 4** shows the characteristics of firms involved in DOC activities. All three types of firms small, medium, and large enterprises are taking part in DOC activities. The majority of characteristics large firms have better characteristics except for the number of female employees, capital-labor ratio, rent and lease cost, average productivity, and percentage contribution of newly innovated products in total sales in 2022. Medium-sized firms have a greater percentage of female employees on average while small-sized firms have greater capital intensity, pay more rent and lease, have higher average productivity, and have a higher percentage share of newly innovated products in total sales in 2022. As a whole large firms have greater capital stock, better human capital, and are more innovative compared to other firms.

**Table 4:** Firm Characteristics: DOC

<b>Indicators</b>	<b>Small</b>	<b>Medium</b>	<b>Large</b>
Capital Stock (in PKR Million)	53	561	1416
Average Number of Employees including contractual (Annual, 2022)	11	105	471
Average Percentage of Female Employees (Annual, 2022)	1.18	6.31	3.21
Capital Intensity (K/L Ratio)	5.12	4.81	2.72
Rent and Lease Cost (in PKR Million) (Annual, 2022)	0.29	0.16	0.24
Wages of Skilled Labor (in PKR, Monthly)	32895	36546	39925
Average Fixed Entry Cost in 2022 (in PKR Million)	66	685	1523
Imported Inputs Content (average, %)	0.00	7.50	21.00

Average Years of Schooling of Workers	8.45	10.21	10.90
Percentage share of Employees having University Degrees	3.48	2.85	5.99
Average Total Sales in 2022 (in PKR Million)	50	218	3761
Average Productivity	-0.01	-0.28	-0.09
Average Age of Firms (in Years)	13.54	15.04	29.70
Percentage share of newly innovated products in total sales from 2019 to 2021	1.38	2.29	2.50
Percentage share of newly innovated products in total sales in 2022 (Products new to the market) *	0.63	0.50	0.00
Percentage contribution of process innovation in total sales in 2022	0.00	0.27	1.20
Percent reduction in average cost due to process innovation from 2019 to 2021	0.00	0.25	0.46
Percentage increase in turnover due to quality improvement in 2022	0.00	0.05	1.00

**Note:** \* means enterprise was the first one to market these products/services.

**Source:** Author's Own Calculations and Survey

The characteristics of firms engaged in both FOC and DOC activities at the same time are represented in

Table 5. Only medium and large-sized firms participate in both FOC and DOC activities whereas none of the small-sized firms are involved in this type of activity. Small-sized firms are taking part in a single type of activity.

The large firms are dominating the medium-sized firms are all characteristics except capital intensity and percentage share of newly innovated products in total sales from 2019 to 2021. The capital-labor ratio is marginally greater for medium-sized firms compared to large firms. In comparison to large firms, medium-sized firms are contributing a higher percentage (5.57%) of newly created products to overall sales from 2019 to 2021.

The findings from Table 2 suggest that firms engaged in both FOC and DOC activities have better performance. This conclusion is further supported by results presented in

Table 5 by incorporating firm size. The results indicate that among firms that are participating in both FOC and DOC activities, large firms exhibit better characteristics and performance levels.

**Table 5:** Firm Characteristics: FOC and DOC

Indicators	Medium	Large
Capital Stock (in PKR Million)	1123	5874
Average Number of Employees including contractual (Annual, 2022)	145	1456
Average Percentage of Female Employees (Annual, 2022)	4.83	14.70
Capital Intensity (K/L Ratio)	5.71	5.50
Rent and Lease Cost (in PKR Million) (Annual, 2022)	0.00	1.18

Wages of Skilled Labor (in PKR, Monthly)	31000	48158
Average Fixed Entry Cost in 2022 (in PKR Million)	1211	8931
Imported Inputs Content (average, %)	18.33	22.63
Average Years of Schooling of Workers	11.00	11.53
Percentage share of Employees having University Degrees	9.00	14.28
Average Total Sales in 2022 (in PKR Million)	769	9230
Average Productivity	0.47	1.10
Average Age of Firms (in Years)	23.33	34.58
Percentage share of newly innovated products in total sales from 2019 to 2021	28.33	22.76
Percentage share of newly innovated products in total sales in 2022 (Products new to the market) *	1.67	13.76
Percentage contribution of process innovation in total sales in 2022	0.50	4.74
Percent reduction in average cost due to process innovation from 2019 to 2021	1.67	2.26
Percentage increase in turnover due to quality improvement in 2022	0.50	1.97

**Note:** Small firms do not engage in both FOC and DOC activities. \* means enterprise was the first one to market these products/services.

**Source:** Author's Own Calculations and Survey

**Table 6: Firm Characteristics: Neither FOC Nor DOC**

Indicators	Small	Medium	Large
Capital Stock (in PKR Million)	71	229	1854
Average Number of Employees including contractual (Annual, 2022)	21	115	710
Average Percentage of Female Employees (Annual, 2022)	9.52	11.30	6.06
Capital Intensity (K/L Ratio)	2.98	2.39	2.89
Rent and Lease Cost (in PKR Million) (Annual, 2022)	0.03	0.26	4.85

Wages of Skilled Labor (in PKR, Monthly)	36167	40972	40267
Average Fixed Entry Cost in 2022 (in PKR Million)	86	278	2183
Imported Inputs Content (average, %)	5.00	14.83	15.33
Average Years of Schooling of Workers	11.22	10.61	11.40
Percentage share of Employees having University Degrees	15.25	8.17	8.00
Average Total Sales in 2022 (in PKR Million)	154	424	2780
Average Productivity	1.41	1.09	0.88
Average Age of Firms (in Years)	18.17	16.72	30.60
Percentage share of newly innovated products in total sales from 2019 to 2021	3.33	6.53	11.67
Percentage share of newly innovated products in total sales in 2022 (Products new to the market)*	0.83	4.33	0.00
Percentage contribution of process innovation in total sales in 2022	0.00	0.00	4.97
Percent reduction in average cost due to process innovation from 2019 to 2021	0.00	0.00	0.49
Percentage increase in turnover due to quality improvement in 2022	0.00	0.00	11.07

**Note:** \* means enterprise was the first one to market these products/services.

**Source:** Author's Own Calculations and Survey

**Table 6** represents the attributes of firms neither participating in FOC activities nor DOC activities predominantly encompassing domestic and direct export firms. Among these large firms have better characteristics across various indicators compared to others. Nevertheless, there are a few exceptions such as medium-sized firms have the highest percentage of female employees, capital intensity is high for small firms, medium-sized firms marginally surpass large firms in terms of skilled employees' wages, small-sized firms demonstrate significantly greater average total factor productivity, whereas medium-sized firms notably with a higher percentage share of newly innovated products in total sales in 2022.

#### 4. Conclusion and Policy Implications

##### 4.1. Conclusion

This study highlights the characteristics of firms that are engaged in FOC. Firms also engage in domestic outsourcing collaboration. Textile and apparel firms operating in Pakistan are working for multiple internationally renowned firms and have a very complicated subcontracting chain as they deal with small units as well as home-based workers. By employing data from 217 textile and apparel firms collected from the city of Faisalabad, Pakistan, this study establishes the firm-level characteristics of firms engaged in various forms of outsourcing collaborations.

Firms' characteristics have been meticulously analyzed by segregating firms at various levels with a focus on various facets of involvement in economic activities. Initially, firms have been classified according to involvement in domestic and foreign outsourcing collaboration activities, and segregation based on domestic operations and direct exports. The analysis then delves into further bifurcating these firms based on their sizes classifying firms as small, medium, and large entities. This multistage categorization offers a range of useful insights.

At the outset, the results highlight firms that are engaged in both domestic and foreign outsourcing collaborations tend to possess superior characteristics as compared to firms exclusively involved in foreign outsourcing. When studying the impact of firm size, the study outlines that firms that are involved in both types of collaboration exhibit notably superior attributes. Specifically, large firms demonstrate striking characteristics compared to small counterparts that do not participate in both types of collaboration activities.

An intriguing picture emerges when firms are further segregated solely based on involvement in foreign outsourcing collaboration. Large FOC firms exhibit superior attributes such as higher capital stock, elevated capital intensity, greater rent and lease expenses, higher use of imported inputs, a higher proportion of educated workers, and a strong tendency for process innovation. Interestingly, small firms engaged in FOC activities turn out to be more productive compared to their counterparts and excel in product innovation.

#### 4.2. Policy Implications

The subsequent policy implications may be derived from abovementioned conclusion to foster FOC among developed and developing economies. These policy implications aim to foster a conducive & export-oriented environment through participating in different forms of outsourcing activities. It also aims to inculcate research environments in the textile and apparel sector of Pakistan.

- The productivity levels of firms should be sharply increased by focusing on human capital development, and research and development, especially incentivizing large private LLCs.
- Encourage the firms to indulge in the innovation of products and processes across all the firms, particularly increasing the process innovation among large firms participating in FOC activities.
- Prepare policies according to the needs of small sole proprietorship firms recognizing their potential for product innovation and providing targeted support to further enhance their R&D and product innovation capabilities.

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