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En route to the world: understanding firms that solely export

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Abstract

We present novel empirical evidence to characterize the export and import patterns of firms that only export. Using a rich customs database encompassing the universe of foreign trade transactions in Pakistan over 2011-2014, we establish five stylized facts concerning various attributes of pure exporters in the context of a developing country. First, pure exporters have significantly smaller sales, export earnings, and import spending, compared to exporting firms that also sell in the domestic market. Second, pure exporters enter a greater number of foreign destinations, on average, and sell a wider range of products, irrespective of the degree of product differentiation. Third, pure exporters import fewer numbers of inputs, and within narrowly defined product categories, use less expensive varieties of imported inputs. Fourth, within a given product-destination pair, the average export price set by pure exporters is significantly lower compared to that charged by other exporters. Lastly, market size, income, and distance from the destination country are positively associated with the likelihood of an exporting firm to be a pure exporter.

1. Introduction

A large number of theoretical and empirical studies of international trade have documented that firms engaged in international trade differ substantially from those serving only the domestic market. Since only the most productive firms are able to bear the costs of entering foreign markets (Bernard and Jensen 1995; Melitz and Redding 2014), the self-selection of domestically well-established firms into exporting has led to a common perception that most exporters also sell domestically. On the contrary, some recent studies indicate that this pattern does not accurately describe the exporting behaviour of a vast number of firms in many developing countries. In particular, there exists a sizable proportion of exporters that serves solely the foreign market.[1] These firms are typically referred to as 'pure exporters', although the terms born-to-export as well as born-global firms have also been used in the literature (Eaton et al. 2011; Astarloa et al. 2015). Despite the significance of pure exporters in explaining the growth of exports in many countries, the existing literature has made limited progress in highlighting the distinctive characteristics of these firms. For instance, we know very little about the nature of goods exported, numbers of products supplied and destinations served, and importing attributes of pure exporters.

This study attempts to fill this critical gap in the literature by comparing firms that both export and sell domestically to those that only export.[2] We present novel empirical evidence to characterize the exporting and importing behaviours of pure exporters in the context of a developing country. Using a rich customs database encompassing the universe of import and export transactions in Pakistan from 2011 to 2014, we establish key stylized facts about various firm attributes, emphasizing on the scope of their global engagement as well as offering a description of the range of products traded by pure exporters. We perform numerous empirical exercises to fully exploit the richness of our data, and conclude that there exists a significant degree of heterogeneity across exporters in terms of their scale of operation as well as the nature of commodities traded.

The use of large administrative datasets is common in the international trade literature for developed countries. However, such highly detailed data have mostly been unavailable for research on developing countries. In addition to the advantage of the comprehensive coverage of data used, what is truly intriguing about the case of Pakistan is that about three-quarters of exporting firms are pure exporters.[3] Table I depicts that surprisingly high fractions of pure exporters exist within a majority of manufacturing sectors defined at the two-digit standard

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[1] For example, 27.4 percent of all exporters in China do not sell in the local market (Gao and Tvede 2013). The sizeable fraction of pure exporters in China is comparable to that in several other countries, such as, Indonesia, Thailand, Vietnam, and Ireland (McWilliams and Verma 2012).

[2] This distinction is important. Our primary focus is on the comparison of pure exporters to ordinary exporters, i.e., exporters that also sell in the domestic market, and not a comparison of pure exporters to *all* firms in the country.

[3] The extraordinarily large proportion of pure exporters in Pakistan has also been recognized by Defever and Riano (2017). Our analysis, on the other hand, covers a longer time horizon, and the unique identification codes available in our data allow us to track firms overtime.

international trade classification (SITC).[4] In the textile and apparel industry, the largest in the country, comprising of approximately 10,779 firms, 73.75 percent of exporting firms do not sell domestically. Table I also displays the fraction of total exports in each sector attributable to pure exporters. Interestingly, irrespective of their comparatively smaller numbers, exporting firms that do sell in the domestic market, account for a majority of Pakistan's exports, a key feature of nearly all existing trade models and an empirically robust finding.

Table I: Descriptive statistics by sector

SITC Industry	No. of Exporters	Pure exporters (percentage)	Exports (millions)	Exports by Pure exporters (percentage)
Chemicals, etc.	1992	57.73	38380	14.02
Electronic and Electrical Equipment	839	56.14	8164	6.05
Fabricated Metal Products	2346	85.81	8670	64.59
Food and Tobacco Products	4806	71.62	740000	65.95
Footwear	1325	77.89	12110	18.83
Fuel (Oil, Coal)	137	38.69	100085	0.08
Instruments, etc.	2968	90.73	29050	70.57
Leather and Leather Products	4983	88.44	125400	39.39
Lumber and Furniture	992	71.27	4815	13.81
Machinery and Computer Equipment	2502	57.91	15000	22.67
Miscellaneous Manufacturing	3599	78.38	36100	28.25
Paper and Allied Products	1774	61.89	7055	6.02
Primary Metal Industries	2832	66.35	93800	58.42
Printing and Publishing	711	65.26	346	34.39
Rubber and Plastics	3067	66.29	44740	17.97
Stone, Clay, Glass, and Concrete	2549	70.11	75000	20.27
Textiles and Apparel	10779	73.75	1421000	10.63
Transportation Equipment	697	58.39	6460	38.70

Notes: Based on authors' calculations using transaction-level export data obtained from FBRP. The table reports total number of exporting firms and export earnings by sector, along with the corresponding percentages of exporters and export value accounted for by pure exporters. Export values are measured in Pakistani rupees for 2014.

A number of studies examine the rationale for the existence of pure exporters.[5] As pointed out by Astarloa et al. (2015), pure exporters have emerged in industries for which there is little or no domestic demand. As entrepreneurs become aware of potential exporting prospects, they create

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[4] Fu (2011) and Fernandes and Tang (2013) have shown that pure exporters are only concentrated in labor intensive sectors. This does not appear to be the case in Pakistan.

[5] One way of rationalizing firms serving only the domestic market is to abandon the fixed cost of production, and to assume instead that there is a fixed cost of serving both, the domestic and foreign markets. If these fixed costs are allowed to be stochastic, the productivity cut-off for some firms for serving the domestic market could be above that for the export market. Elhanan et al. (2017) use such a specification to study the effects of trade on wage dispersion.

new establishments to exploit them.[6] Mostafa and Klepper (2009) indicate that numerous Bangladeshi textiles firms were born to export in order to exploit the advantage of non-binding MFA quotas. Another strand of literature explains the existence of pure exporters to be associated with low-productivity firms belonging to sectors in which a country's comparative advantage lies (Defever and Riano 2017; Lu 2010). Despite their low productivity and relatively small scale of operation, these firms are competitive in a sufficiently large foreign market (Lu et al. 2014; Manova and Yu 2013). Nevertheless, none of these studies perform a rigorous investigation of the trade patterns and attributes of pure exporters. While our findings confirm the comparatively smaller size of pure exporters, the distinctive characteristics of these firms highlighted by the remaining stylized facts are novel, and serve as the primary contribution of this paper.

The rest of the paper is organized as follows. The next section describes the data used in the empirical analyses. Section 3 documents and discusses the stylized facts pertaining to trade patterns of pure exporters. The final section concludes.

2. Data

We use administrative data collected by the Federal Board of Revenue Pakistan (FBRP) over July 2011 to June 2014. Our dataset reports the universe of Pakistan's foreign trade transactions for manufactured goods, and contains detailed information about the date of the transaction, product exported, destination country, and the value and quantity exported. The FBRP uses eight-digit SITC product classification system, which is broadly consistent with the internationally used standard industrial classification. We also observe the type and number of products imported by each firm. Along with the information about import and export transactions, the data also lists domestic sales by each firm. The customs data was recorded electronically by an independent IT firm working for the FBRP, and serves as the country's official source of information on taxes, imports, and exports. Owing to the nature of the data collection process, it is prone to having much less measurement error compared to what is typically the case for a developing country.

Thus, we are able to track each firm's exports and imports by product in a given year, and also whether the firm sold its output domestically or internationally. We define 'pure exporter' as a firm that sells only internationally over the period investigated; firms having positive domestic sales during any of the three years under consideration were classified as not being a pure exporter.[7] Table AI in the Appendix presents summary statistics by exporting status. Out of a total of nearly 83,928 firms in our data, there are 22,118 exporters, and a staggering 72.6 percent of exporting firms sold solely in the international market.

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[6] Astarloa et al. (2015) list numerous examples, including, Malaysia, Taiwan, and Korea for electronics production, and Colombia and Ethiopia for fresh cut-flower industry.

[7] The transaction data covers the period July 1st, 2011, to June 30th, 2014. For the purpose of computing annual sums and averages, as discussed later, we define a year as July 1st of the last year to June 30th of the current year. This categorization does not affect our fundamental objective, and continues to appropriately address measurement issues and seasonal effects.

3. A Portrait of Pure Exporters

In this section, we present stylized facts about the scale of operation and types of products exported and imported by pure exporters based on customs data from Pakistan. We first explore the correlation between pure exporting status of a firm and various firm-level characteristics. Next, we examine the relationship between average prices and exporting status. Finally, we explore whether the pure exporting status of a given exporter is related to destination country attributes.

3.1. Scale of pure exporters

We first consider the relationship between exporting status and the aggregate scale of operation of firms by estimating the following specification:

$$X_{it} = \beta_0 + \beta_1 \text{Pure Exporter}_{it} + \gamma_t + \varepsilon_{it}, \tag{1}$$

where X_{it} comprises of a set of firm i's characteristics, such as, total export and import values, quantity of exports, and sales revenue of the firm in year t. All variables in X_{it} are measured in logs. γ_t denotes year fixed effects. We are interested in the sign of β_1, i.e., the conditional correlation between the magnitude of total sales, exports, and imports, and whether or not the firm is a pure exporter. Because exporting status and these firm attributes are both expected to be affected by unobserved firm-level characteristics, it is not possible to give β_1 a causal interpretation.[8] Instead, we are interested in estimating the extent to which the scale of operation differs for pure exporters relative to exporting firms that also sell in the domestic market. We cluster errors, ε_{it}, at the firm level. At this level of aggregation, the sample consists of 46,852 observations for 22,118 firms.

The estimation results are depicted in Table II. Columns (1) and (3) in Table II indicate that, across exporting firms, pure exporters have smaller worldwide as well as overall revenues. In particular, being a pure exporter is associated with having 73.5 percent lower export earnings, and 94.9 percent smaller overall sales. Furthermore, the volume of exports, measured by quantity instead of value of exports, is also statistically smaller for exporters selling exclusively in the international market. The point estimates obtained in column (4) indicate that, on average, pure exporters incur relatively smaller import bills. All the patterns shown in Table II are significant at 1 percent.[9] The comparatively smaller size of pure exporters has been documented in some of the recent studies (Zhu 2016). However, these results are contrary to those obtained by Astarloa et al. (2015) describing the Bangladeshi experience, whereby born-to-export firms entered big. Therefore, our first finding pertains to the much smaller scale of pure exporters.

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[8] Consequently, the primary methodology used for our econometric analysis, and the structure of the paper are closely related to Manova and Zhang (2012).

[9] Alternatively, in order to identify the sign of the conditional correlation between firm-product level characteristics and pure exporting status within a given eight-digit SITC product group, we aggregate the data to firm-product-year level, and define the dependent variable as X_{ipt} accordingly. By controlling for product fixed effects in this alternate specification, we obtain comparable estimates for β_1. These results are presented in Table AIII in the Appendix.

Table II: Exporting status and firm characteristics

	Log (Exports) (1)	Log (Export quantity) (2)	Log (Sales) (3)	Log (Imports) (4)
Pure exporter	-1.392***	-1.437***	-2.976***	-2.471***
	(0.042)	(0.051)	(0.036)	(0.060)
Year effects	Yes	Yes	Yes	Yes
Observations	46,852	46,852	46,852	16,791
R-squared	0.066	0.044	0.268	0.168
No. of firm clusters	22118	22118	22118	7623

Notes: The table reports the conditional correlation between firm characteristics and pure exporting status of firms, based on authors' calculations using customs data obtained from FBRP. The estimates are obtained at the firm level. The outcome variable is the log of firm's exports value, exports volume, total sales, and imports value in columns (1), (2), (3), and (4), respectively, by firm. All regressions include year dummies and a constant term. Robust standard errors clustered by firm are given in parentheses. Asterisks denote significance levels: * significant at 10%; ** significant at 5%; *** significant at 1%.

Table III: Firm exporting status and export characteristics

	No. of Destinations (1)	No. of Products (2)	No. of Homogeneous goods (3)	No. of Differentiated goods (4)	No. of Intermediate goods (5)	No. of Capital goods (6)	No. of Consumer goods (7)
Pure exporter	0.733***	2.112***	0.274***	1.958***	0.504***	0.362***	1.521***
	(0.079)	(0.157)	(0.053)	(0.156)	(0.107)	(0.071)	(0.146)
Log (Sales)	0.915***	1.181***	0.269***	1.174***	0.543***	0.152***	0.975***
	(0.022)	(0.033)	(0.019)	(0.033)	(0.028)	(0.012)	(0.028)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	46,852	46,758	6,277	43,899	21,768	8,578	34,069
R-squared	0.216	0.109	0.154	0.113	0.090	0.040	0.118
No. of firm clusters	22118	22118	3618	20910	11801	4849	16579

Notes: The table reports the conditional correlation between pure exporting status of a firm and various exporting characteristics, based on authors' calculations using customs data obtained from FBRP. The estimates are obtained at the firm level. The outcome variable is the number of products exported (columns (2)-(7)) by the firm, while the dependent variable in column (1) is the number of foreign destinations. Columns (1) and (2) examine the full sample; columns (3) and (4) restrict the sample to homogeneous and differentiated goods, respectively, according to Rauch (1999) classification; and columns (5)-(7) classify exported commodities into intermediate, capital, and consumer goods, respectively. All regressions include year dummies and a constant term. Robust standard errors clustered by firm are given in parentheses. Asterisks denote significance levels: * significant at 10%; ** significant at 5%; *** significant at 1%.

3.2. Pure exporters and exports

Next, we examine whether pure exporters differ substantively from other exporters with respect to the numbers of products exported and export destinations served. For each firm, we compute the total number of products exported, classified at the eight-digit level, as well as the numbers

of homogenous and differentiated varieties exported in a given year. Owing to the dominance of pure exporting firms across manufacturing sectors in Pakistan and their significantly smaller scale, one would expect the range of products sold by pure exporters to be methodically different from that of exporters that also sell domestically. We use Rauch's (1999) classification scheme to categorize four-digit SITC product categories as either differentiated or homogeneous products, and also group commodities as intermediate, capital or consumer goods. Thus, we estimate the following equation separately for each dependent variable, N_{it}, specified above:

$$N_{it} = \beta_0 + \beta_1 \text{Pure Exporter}_{it} + \beta_2 \text{Log (Sales)}_{it} + \gamma_t + \varepsilon_{it}. \qquad (2)$$

By controlling for firm's sales, Eq. (2) also accounts for the much smaller scale of pure exporters illustrated above.[10] The estimates obtained are presented in Table III. Columns (1) and (2) reveal that, across all exporting firms, pure exporters sell a wider range of products, on average, and serve a larger number of foreign destinations. This finding holds for all types of exported commodities.

Table IV: Firm exporting status and import characteristics

	No. of Products	No. of Homogeneous goods	No. of Differentiated goods	No. of Intermediate goods	No. of Capital goods	No. of Consumer goods
	(1)	(2)	(3)	(4)	(5)	(6)
Pure exporter	-5.838***	-0.262***	-5.313***	-2.972***	-1.911***	-1.859***
	(0.482)	(0.072)	(0.474)	(0.399)	(0.276)	(0.219)
Log (Sales)	5.821***	0.258***	5.632***	4.639***	1.540***	0.385***
	(0.364)	(0.029)	(0.353)	(0.273)	(0.125)	(0.104)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,038	3,465	15,626	13,780	7,379	7,358
R-squared	0.138	0.061	0.140	0.163	0.123	0.016
No. of firm clusters	7424	1864	7220	6320	3757	3938

Notes: The table reports the conditional correlation between pure exporting status of a firm and various importing characteristics, based on authors' calculations using customs data obtained from FBRP. The estimates are obtained at the firm level. The outcome variable is the number of products imported by the firm. Column (1) examines the full sample; columns (2) and (3) restrict the sample to homogeneous and differentiated goods, respectively, according to Rauch (1999) classification; and columns (4)-(6) classify imported commodities into intermediate, capital, and consumer goods, respectively. All regressions include year dummies and a constant term. Robust standard errors clustered by firm are given in parentheses. Asterisks denote significance levels: * significant at 10%; ** significant at 5%; *** significant at 1%.

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[10] In a slightly different specification, we replace current year sales by their one-year lagged values to address potential endogeneity concerns. These estimates are illustrated in a supplementary Online Appendix.

3.3. Pure exporters and pattern of imports

Gao and Tvede (2013) explain that a large proportion of pure exporters are processing trade firms. The previous section indicates that their exported commodities are not necessarily limited to finished consumer goods. Moreover, many pure exporters are two-way traders; they also import a large number of raw materials. In order to shed light on the types of imported inputs as well as to compare the number of imported input varieties across exporters, we re-estimate Eq. (2), replacing N_{it} by the number of narrowly defined imported product categories described above. All panels in Table IV indicate that pure exporters import a significantly smaller number of products compared to perhaps much larger regular exporters.

3.4. Export and import prices

Is there a noticeable difference in the quality of goods traded by pure exporters compared to the rest of the exporting firms? Although the pattern of average export prices observed may not conclusively distinguish between efficiency and quality heterogeneity across exporters, it would be interesting to study the dissimilarity, if any, in average unit values of commodities exported across the two categories of exporting firms. To explore the variation in export prices across firms selling a given SITC-8 product to a specific foreign destination, we first construct an average export price (Manova and Zhang 2012). The computation of unit values involves the following steps. We aggregate the data to the firm-product-destination level by summing up sales and quantities for each firm-product-destination group for a given year. Next, we take their ratio to construct firm i's average export price of product p in destination d, denoted by u_{ipdt}. The correlation between f.o.b. export prices and pure exporting status, within a given product-destination pair, can be estimated by using the following specification:

$$u_{ipdt} = \beta_0 + \beta_1 \, \text{Pure Exporter}_{it} + \theta_{pd} + \gamma_t + \varepsilon_{ipdt}, \tag{3}$$

which includes product-destination pair fixed effects θ_{pd}. Product fixed effects control for the variation in units across products, as well as for systematic differences in product characteristics across goods that affect all firms equally, such as, transportation costs, consumer preferences, and comparative advantage. In addition to controlling for the role of product characteristics common to all firms, the product-destination pair fixed effects also account for product attributes that affect the firm's export performance equally across export markets. Thus, θ_{pd} subsumes product-destination specific characteristics that are invariant across exporters, and β_1 is identified purely from the variation in prices across exporters within a given product-destination pair. At this level of aggregation, the complete sample consists of 388,560 observations and 32,422 product-destination groups. Table V (column 1) reveals that compared to other exporters, within a given product line and foreign market, pure exporters charge a 15.29 percent lower average export price. The statistical and economic significance of this result consistently holds for all product types, irrespective of the degree of product differentiation.[11]

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[11] We also report the estimates obtained after controlling for product fixed effects instead. As indicated in Table AIV in the Appendix, the average export price charged by pure exporters within a specific product line is comparatively lower across foreign markets.

Table V: Variation in prices across exporters

	All products (1)	Homogenous goods (2)	Differentiated goods (3)	Intermediate goods (4)	Capital goods (5)	Consumer goods (6)
A. Dependent variable: ln ux_{ipdt}						
Pure exporter	-0.17***	-0.082**	-0.171***	-0.142***	-0.54***	-0.152***
	(0.018)	(0.039)	(0.019)	(0.033)	(0.127)	(0.019)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Product-destination effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	388,560	22,471	358,128	99,172	23,206	264,515
R-squared	0.567	0.673	0.546	0.592	0.668	0.501
No. of firm clusters	21509	3299	20269	10832	4214	16277
Product-destination pairs	32422	1740	29591	12751	1955	17411
B. Dependent variable: ln um_{ipt}						
Pure exporter	-0.24***	-0.199**	-0.243***	-0.211**	-0.50***	-0.164**
	(0.086)	(0.088)	(0.087)	(0.086)	(0.174)	(0.080)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Product effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	262,287	7,433	248,909	177,853	51,086	31,315
R-squared	0.560	0.738	0.553	0.457	0.415	0.379
No. of firm clusters	7617	1905	7405	6460	3848	4037
No. of products	5534	295	5002	3494	817	1109

Notes: The table reports the relationship between pure exporting status of a firm and the unit prices of exported and imported commodities, based on authors' calculations using customs data obtained from FBRP. The estimates are obtained at the firm-product-destination level in Panel A, and at the firm-product level in Panel B. It exploits the variation across firms within product-destination pairs (products), by including product-destination (SITC-8 product) fixed effects in Panel A (B). The dependent variable is log of average unit export price ln ux_{ipdt} (log of average unit import price ln um_{ipt}) in Panel A (B). Column (1) examines the full sample; columns (2) and (3) restrict the sample to homogeneous and differentiated goods, respectively, according to Rauch (1999) classification; and columns (4)-(6) classify commodities into intermediate, capital, and consumer goods, respectively. All regressions include year dummies and a constant term. Robust standard errors clustered by firm are given in parentheses. Asterisks denote significance levels: * significant at 10%; ** significant at 5%; *** significant at 1%.

It is widely believed that firm productivity and input quality are complements in producing output quality, and in equilibrium, more-productive firms use higher-quality inputs to produce higher-quality products (Verhoogen 2008; Kugler and Verhoogen 2012). Although, the direct measures of firm's productivity or product quality are not available in our data, it is worthwhile to link the relatively lower-valued exports of pure exporters to the average price of imported inputs used by these firms. Therefore, we compute average unit values of imported inputs in a similar fashion as described above by collapsing the data to firm-product-year level, and estimate Eq. (3) by replacing export price by imported input price. The estimates reported in Panel B of

Table V confirm that, across exporters and within a given product category, the average price of imported products used by pure exporters is indeed considerably lower.

3.5. Pure exporting status and gravity model of trade

Naturally, one would be interested in investigating whether a majority of exports by pure exporters are directed towards specific foreign destinations, such as, the neighbouring countries or countries with which Pakistan has signed a preferential trade agreement. Since pure exporters have been shown to cater to a larger number of foreign markets compared to other exporters, it is probable that there exists a systematic relationship between exporting intensity and destination country's attributes, such as, market size or income per capita.[12] We estimate the following probit model for our data aggregated to firm-destination-year level:

$$\text{Pure Exporter}_{idt} = \beta_1 \left(\frac{Y}{P}\right)_{dt} + \beta_2 Y_{dt} + \beta_3 D_d + \beta_4 \text{FTA}_d + \beta_5 \text{Colony}_d + \gamma_t + \varepsilon_{idt}, \qquad (4)$$

where the dependent variable is a dummy variable which assumes the value of one to indicate that the exporting firm is a pure exporter, and zero otherwise. Y_{dt} is the real GDP (measured at PPP) of country d in year t, and P_{dt} is the size of its population. D_d is the geographic distance measured in kilometers between Karachi (Pakistan's most populated city), and the most populated city of the destination market. FTA_d and Colony_d are dummy variables that equal one if there exists a trade agreement between Pakistan and country d, and if Pakistan shares a common colonial history with country d, respectively.[13] All variables except FTA_d and Colony_d are log-transformed. Data on distance and colonial relationship come from CEPII, while the remaining variables were taken from the World Bank's World Development Indicators (WDI).

The estimates obtained are presented in Table VI. There exists a significant and positive association between income per capita and market size of the destination country, and the pure exporting status of exporters in Pakistan. This finding somewhat confirms the theoretical framework developed by Lu et al. (2014) to substantiate the existence of pure exporters in China, whereby pure exporters exist only when the size of the foreign market is large relative to domestic market. Furthermore, the effect of distance is also positive and statistically significant. Finally, it appears that there is a negative association of being a pure exporter with FTA_d. As indicated earlier, pure exporters have been shown to have a comparatively smaller scale of production, which is expected to render most of these firms unable to compete with much larger regular exporters in relatively competitive FTA markets. Columns (3) and (4) provide the linear probability model estimates of Eq. (4) as an alternative specification, and demonstrate the robustness of these results. For example, raising market size by one percent is associated with a

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[12] Table AII in the Appendix lists the top ten export destinations by exporting status, along with the corresponding values of export earnings, measured in Pakistani rupees in 2014. Both types of exporters sell substantial volumes of goods to two of Pakistan's neighbouring nations: Afghanistan and China. Interestingly, both types of firms also direct sizeable values of exports to developed countries.

[13] Pakistan has free trade agreements with Sri Lanka, China, and Malaysia, and preferential trade agreements with Iran and Mauritius. Pakistan is also a part of the South Asian Association for Regional Cooperation (SAARC).

0.016 percentage point increase in the likelihood of being a pure exporter. The corresponding numbers for income and distance are 0.061 and 0.029, respectively.

Table VI: Pure exporters and destination market characteristics

	Probit regression		Linear probability model	
	(1)	(2)	(3)	(4)
Log (GDP p.c.)	0.156***	0.156***	0.061***	0.061***
	(0.008)	(0.008)	(0.003)	(0.003)
Log (GDP)	0.041***	0.042***	0.016***	0.016***
	(0.005)	(0.005)	(0.002)	(0.002)
Log (Distance)	0.078***	0.077***	0.029***	0.029***
	(0.010)	(0.010)	(0.004)	(0.004)
FTA	-0.031**	-0.032**	-0.013**	-0.014**
	(0.014)	(0.014)	(0.005)	(0.005)
Colonial relationship	0.189***	0.188***	0.068***	0.067***
	(0.018)	(0.018)	(0.007)	(0.007)
Year effects	No	Yes	No	Yes
Observations	149,877	149,877	149,877	149,877
R-squared	0.0228	0.0232	0.031	0.031
No. of firm clusters	21876	21876	21876	21876

Notes: This table examines the differential effect of market income, size, distance, FTA, and colonial relationship on firms' exporting status, based on authors' calculations using customs data obtained from FBRP. The estimates are obtained at the firm-destination level. The dependent variable is a dummy variable which equals one to indicate that the exporting firm is a pure exporter, and zero otherwise. Columns (1) and (2) report estimates obtained by running a probit model, whereas columns (3) and (4) estimate a linear probability model. The probit regression coefficients give the change in the z-score or probit index for a unit change in the control variable, and can be used to compute the predicted probabilities. All regressions include a constant term. Robust standard errors clustered by firm are given in parentheses. Asterisks denote significance levels: * significant at 10%; ** significant at 5%; *** significant at 1%.

We carry out several robustness checks to test whether our results are sensitive to the exclusion of outliers, our choice of gravity model variables, or driven by measurement error. By including product fixed effects, we are able to rule out the possibility that our results are driven by some goods being relatively easily monitored by customs officers, or that customs officials are more conscientious about particular goods. We re-estimate Eq. (1)-(4) after removing outliers from the sample.[14] Finally, we estimate an alternative specification of the gravity model by including additional variables: a dummy variable for the existence of a common language, a dummy variable for the destination country being landlocked, and replacing real income of the destination country by the size of its population. All results are consistent with our baseline findings.[15]

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[14] We follow a common practice in the literature to identify outliers as firms having total exports, imports, and/or sales revenues below the 1st percentile or above the 99th percentile of the respective distribution.

[15] The results generated as robustness tests are available in the Online Appendix.

4. Concluding remarks

This study documents five stylized facts about the characteristics and trade patterns of pure exporters using data on the universe of exporting firms in Pakistan. The systematic patterns established in this note can be summarized as follows. First, pure exporters are significantly smaller in terms of the overall levels of sales, export earnings, and import spending, compared to exporting firms that also sell in the local market. Second, pure exporters enter more foreign markets, and sell a wider range of products, irrespective of the degree of product differentiation. Third, pure exporters import fewer numbers of inputs, and within narrowly defined product categories, use cheaper varieties of imported inputs. Fourth, within a given product-destination pair, the average export price set by pure exporters is significantly lower compared to that charged by other exporters. Lastly, a larger size and income per capita of the foreign market, and greater distance from the destination country, are associated with a higher likelihood of an exporting firm to be a pure exporter. Although some of these findings confirm patterns recognized in the earlier literature, a majority of these stylized facts are novel.

Our findings suggest that it is important for future theoretical and empirical work to control for factors which could potentially be strongly correlated with exporting intensity of firms. Given the existence of a large fraction of pure exporters in developing countries, and thereby, its implications for aggregate trade patterns, it would be worthwhile to relate various firm-level characteristics, such as, productivity, to the observed exporting behaviour of these firms. As we have noted, pure exporters might often be stuck in low value-added stages of supply chain, and consequently, integrating the domestic market might be crucial to move into the production of higher value-added goods (Zhu 2016). By investigating the underlying mechanism driving these differences, we may be able to identify the idiosyncratic forces within the domestic market which compel many firms to solely export. These are potential topics for future research.

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Appendices

Table AI. Summary statistics

	Exporters				Pure exporters			
	Mean	Std. dev.	Min	Max	Mean	Std. dev.	Min	Max
Sales (Rs.)	1.46×10^9	19.2×10^9	0	1430×10^9	59.5×10^6	911×10^6	496.80	132×10^9
Exports (Rs.)	304×10^6	1.39×10^9	0	42.1×10^9	59.5×10^6	911×10^6	496.80	132×10^9
Export quantity	3.129×10^6	36.6×10^6	0	2.190×10^9	0.6312×10^6	6.092×10^6	0	500×10^6
No. of destinations	3.82	6.53	0	126	2.89	3.42	1	61
No. of products exported	4.74	8.31	0	129	4.70	7.83	1	457
Homogenous	0.26	1.05	0	25	0.19	0.64	0	16
Differentiated	4.36	7.93	0	118	4.40	7.45	0	429
Intermediate goods	1.80	3.87	0	86	0.98	2.82	0	171
Capital goods	0.18	0.75	0	22	0.35	1.02	0	45
Consumer goods	2.73	5.77	0	99	3.34	5.63	0	234
Imports (Rs.)	619×10^6	14.3×10^9	611	885×10^9	33.1×10^6	221×10^6	99	7.96×10^9
No. of products imported	20.10	46.69	1	1653	5.52	12.62	1	289
Homogenous	0.59	1.80	0	82	0.12	0.43	0	6
Differentiated	19.04	44.06	0	1512	5.30	12.29	0	281
Intermediate goods	13.62	30.83	0	903	3.78	8.90	0	154
Capital goods	4.05	10.24	0	250	0.73	2.86	0	66
Consumer goods	2.27	9.26	0	492	0.98	2.92	0	100

Notes: Based on authors' calculations using transaction-level export and import data obtained from the Federal Board of Revenue Pakistan (FBRP) for the years 2011-2014.

Table AII: Top trade partners by exporting status

	Pure Exporters		Other Exporters	
	Country	Export value (billions)	Country	Export value (billions)
1	Thailand	93.0	United States of America	282.0
2	United Arab Emirates	57.2	China	187.0
3	United States of America	56.2	United Kingdom	113.0
4	Afghanistan	52.4	Afghanistan	110.0
5	China	35.5	United Arab Emirates	97.1
6	United Kingdom	28.4	Germany	74.4
7	Germany	26.2	Bangladesh	62.4
8	Saudi Arabia	23.3	Italy	54.8
9	Kenya	15.1	Spain	54.0
10	Italy	12.6	Belgium and Luxembourg	49.4

Notes: Based on authors' calculations using transaction-level export data obtained from FBRP. The table reports Pakistan's top ten export destinations by exporting status, along with corresponding values of export earnings, measured in Pakistani rupees, for the year 2014.

Table AIII: Exporting status and firm characteristics – variation across firms within product

	Log (Exports)		Log (Export quantity)		Log (Imports)	
	(1)	(2)	(3)	(4)	(5)	(6)
Pure exporter	-1.135***	-1.020***	-1.149***	-0.894***	-0.175*	-0.434***
	(0.048)	(0.037)	(0.051)	(0.037)	(0.100)	(0.091)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Product effects	No	Yes	No	Yes	No	Yes
Observations	238,713	237,189	238,713	237,189	263,410	262,858
R-squared	0.043	0.322	0.033	0.389	0.003	0.336
No. of firm clusters	22118	22090	22118	22090	7623	7617
No. of products	-	4148	-	4148	-	5539

Notes: The table reports the conditional correlation between firm characteristics and pure exporting status of firms, based on authors' calculations using customs data obtained from FBRP. The estimates are obtained at the firm-product level. It exploits the variation across firms within products, by including SITC-8 product fixed effects. The outcome variable is the log of firm's exports value, exports volume, and imports value in columns (1)-(2), (3)-(4), and (5)-(6), respectively, by firm and product. All regressions include year dummies and a constant term. Robust standard errors clustered by firm are given in parentheses. Asterisks denote significance levels: * significant at 10%; ** significant at 5%; *** significant at 1%.

Table AIV: Variation in prices across exporters within SITC-8 product

	All products (1)	Homogenous goods (2)	Differentiated goods (3)	Intermediate goods (4)	Capital goods (5)	Consumer goods (6)
Pure exporter	-0.184***	-0.094	-0.188***	-0.179***	-0.508***	-0.164***
	(0.022)	(0.059)	(0.022)	(0.035)	(0.109)	(0.023)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Product effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	414,885	23,813	381,963	111,447	25,954	275,364
R-squared	0.448	0.445	0.434	0.421	0.596	0.376
No. of firm clusters	22089	3598	20885	11759	4828	16570
No. of products	4176	262	3672	2329	564	1180

Notes: The table reports the relationship between pure exporting status of a firm and the unit price of exported commodities, based on authors' calculations using customs data obtained from FBRP. The estimates are obtained at the firm-product-destination level. It exploits the variation across firms within SITC-8 product by including product fixed effects. The dependent variable is log of average unit export price. Column (1) examines the full sample; columns (2) and (3) restrict the sample to homogeneous and differentiated goods, respectively, according to Rauch (1999) classification; and columns (4)-(6) classify commodities into intermediate, capital, and consumer goods, respectively. All regressions include year dummies and a constant term. Robust standard errors clustered by firm are given in parentheses. Asterisks denote significance levels: * significant at 10%; ** significant at 5%; *** significant at 1%.