FIRMS FINANCIAL INCLUSION AND EXPORT PERFORMANCE: EVIDENCE FROM MANUFACTURING SECTOR FIRMS IN PAKISTAN

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ABSTRACT

Financial inclusion of firms is crucial for creating jobs, boosting economic growth, and promoting sustainable development. The Sustainable Development Goals require a holistic approach to financial requirements and constraints at all levels. Financial services enable organisations to invest in new technologies, increasing productivity and competitiveness. Promoting equitable and accessible financial services is essential for attaining the SDGs and a sustainable future. The study examined how financial inclusion affects enterprise export performance based on access to finance ratios. The study analysed the effects of firms' financial inclusion determinants and macro environment factors on firms' export values. The study used data from Pakistan's manufacturing sector, comprising 8,400 annual balance sheets of 400 firms listed on the Pakistan Stock Exchange from 1999-2021. Driven by the nature of the data, the method of moment quantile regression was employed to assess the below and above mean regression estimations, and a two-step system GMM approach was used to address endogeneity concerns. The study came up with four key findings along with relevant policy implications. First, the study found that assets positively affected a firm's export performance from lower to higher quantiles across all sub-samples. The finding emphasizes the need for asset investment to help firms compete in foreign markets and export. Second, our sample firms' export performance was negatively impacted by asset tangibility, except for low-gearing corporations. Export performance suffers when fixed assets dominate. The study emphasises the necessity of a balanced asset mix because fixed assets might hurt export performance. To improve exports, firms must examine and proactively manage their asset composition. Third, our research showed that debt-to-equity ratios, except for high-gearing firms, boosted export performance. Thus, domestic firms with leverage ratios above a certain threshold are more likely to fail. Thus, firms must balance debt and equity to avoid the risks of excessive leverage. Diversifying the asset mix to include liquid and intellectual property can boost export success. By carefully controlling their asset composition, firms can enhance their global competitiveness and avoid vulnerabilities from overreliance on fixed assets or excessive debt. Fourth, gearing was negative and inconsequential in high-gearing enterprises but positive and significant in low-gearing firms. The finding implies that gearing affects export performance differently depending on the firm's debt levels. Low-geared enterprises might strategically leverage assets and debt to boost exports. However, high-geared enterprises may already be financially constrained, and excessive debt may hinder their global investment and expansion. Therefore, enterprises must carefully examine their gearing levels and make informed judgments on optimizing their asset composition for optimal export performance. In addition, the study opened an area for further research on the role of exchange rates and firms' investment in line with firms' export performance.

PREFACE

Small and medium-sized firms (SMEs) cannot expand and create jobs in economies with low financial inclusion, which results in high unemployment and slow economic growth. With better access to financial services, SMEs can better manage cash flow and invest in production and export capacities. Financial inclusion, therefore, increases international competitiveness and export volumes. Pakistan has a continual balance of payment deficit and needs foreign cash to finance its budgets and businesses. By helping small- and medium-sized firms obtain inexpensive loans and other financial services, financial inclusion can help solve this shortfall through enhanced export earnings. In this background, this study explores how financial inclusion affects Pakistani manufacturing sector exports. The study covers 400 firms listed on the Pakistan Stock Exchange from 1999 to 2021.

TABLE OF CONTENTS

INTRODUCTION

The post-1990s literature, both theoretical and empirical, shows a positive association of financial development with economic growth and firms' performance through innovative and productivity-enhancing investment and by minimising transaction costs, better allocation of resources, and risk management. (King & Levine, 1993). Better financial intermediation positively influences aggregate income and productivity (Ginie & Townsend, 2004; Jeong & Townsend, 2007, 2008; Amaral & Quintin, 2010; Buera et al., 2011). Financial indicators, such as credit to GDP ratio and financial access of firms, enhance economic growth, innovation, and job creation as well as help reduce poverty and income inequality (Beck et al., 2005; Ayyagari et al., 2008; Beck et al., 2007; Clarke et al., 2006). The empiricists claim that improved financial access by the firms enables them to address medium-plus long-term financial constraints and enhance their profitability and production in developing countries. (Allen et al., 2020; Triki & Gaj Igo, 2014).

The greater financial deepening removes frictions and barriers and influences profitability via two channels. First, it encourages fund allocation more efficiently among entrepreneurs. It increases output as funds are channelised to more capable entrepreneurs, increasing their output more compared to the output of less talented entrepreneurs. Secondly, efficient financial contracts curb losses from financial frictions, e.g., monitoring and credit participation costs, leading to better performance (Allen et al., 2020).

After the Great Recession of 2009 and the financial crises, the focus of the investigation has been on the non-linear relationship between financial development and economic activities, especially in developed economies where there is a greater likelihood of the financial sector experiencing high diminishing returns (Philippon & Reshef, 2013), diversion of financial resources from more productive sectors (Deidda, 2006), or large economic fluctuations which possibly induce financial crises (Easterly, Islam, and Stiglitz, 2001; Loayza & Ranciere, 2006).

As far as developing countries are concerned, it is imperative to investigate and determine the impact of "not enough finance" in the less developed financial sector where usually the banking sector plays little or an insignificant role in the development of the financial sector and economic growth (Henderson, Papageorgiou, & Parmeter, 2013; M'eon & Weill, 2010; Deidda & Fattouh, 2002), particularly in the economies with low financial development and credit-to-GDP ratio lower than 14 per cent, financial development plays little role in determining economic growth (Rioja & Valev, 2004). Several studies have highlighted specific issues that undermine economic growth both at the national and micro levels in developing economies. For instance, studies have looked at the performance of institutions, which is largely poor (Demetriades & Hook Law, 2006), limited financial competition due to political deadlock (Rajan & Zingales, 2003), high inflation due to supply shocks (Rousseau & Wachtel, 2002), etc., which undermine finance-growth correlation and causation. Some studies recommend country-specific policies as per their requirements and the level of financial development rather than relying on one-size-fits-all policies.

In developing countries, where financial depth or size (credit or liquidity/GDP) may not be large enough to yield its expected economic benefits, a question of interest may be whether accounting for the quality of financial development adds to the story beyond the large size of the informal sector (Gu'erineau & Jacolin, 2014).

The finance literature provides limited empirical evidence on developing economies' financial depth and growth nexus. For example, Chauvet and Jacoline (2015) investigated the effect of financial development and inclusion on firms' performances in economies with low financial development. Based on firm-level data from 26 countries, they concluded that the level of access to external credit explains the difference between firms' performance operating in developing economies where

financial inclusion is limited and developed countries where financial inclusion is almost universal. In addition, they further argued that financial inclusion, on average, is positively associated with a firm's growth if financial development does not impact a firm's growth. The study concluded that financial development plays a significant role in a firm's economic growth conditioned to high financial inclusion. Similarly, Chauvet and Jacoline (2017) analysed the effect of financial inclusion and bank concentration on a firm's growth in developing countries. Using firm-level data for a sample of 55,596 firms in 79 countries, they reported that a firm's access to formal finance is positively associated with its performance and growth.

A firm's financial inclusion also has a serious implication on the firm's export potential. Studies have investigated the role of different financial factors that affect a firm's export orientation, performance, and survival of exporter firms (Pinto et al., 2017; Vu et al., 2020; Federici & Parisi, 2012; Peluffo, 2016; Greenaway et al., 2007; Shivaswamy et al., 1993; Salchenberger et al., 1992). Aam and Khatoon (2021) analysed the nexus between financial inclusion and export market penetration for 31 developing countries They argued that financial inclusion has positive implications for export market penetration and that export market penetration alters economic growth in developing Asian and African countries.

There is limited available empirical literature on firms' export performance in Pakistan. The studies include Memon et al. (2012), Awan & Bashir (2016), Ullah et al. (2017), Safer et al. (2019), and Ahmad & Siddiqui (2019). These studies have investigated the association between a firm's capital structure and growth performance and have established a positive link. Higher exports show a country's global competitiveness, gear up resource allocation more efficiently, enhance foreign exchange reserves, improve competition, and increase employment and domestic innovation (Malik et al., 2017). However, Pakistan's export performance has remained low and unimpressive despite employing several remedial measures. Moreover, export statistics show that Pakistan's exports persistently lag behind other regional and developing countries. The imbalance in the trade deficit and the decline in export performance have been areas of concern over time. According to the World Bank report (2021), the limited and restricted availability of external financing, especially long-term financing for business enterprises that increase a firm's export capacity, is one of the key impediments to the country's export performance.

Motivation

In the existing literature, especially finance literature, researchers document the vital importance of the financial inclusion of individuals. However, there is limited but significant importance given to the financial inclusion of firms. According to The World Bank, financial inclusion "means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit, and insurance – delivered responsibly and sustainably."

In the context of a firm's financial inclusion, it implies that acquiring a loan from commercial banks can boost the firm's production and exports. Many studies show that financial inclusion is an important factor and plays a major role in firms' performance and exports. Similarly, some studies show that small and medium-sized firms perform below their potential due to a lack of access to formal financial resources. The financial inclusion of SMEs enables them to exploit formal financial resources to finance their economic activities, which eventually increases their performance in terms of production and export (Aam & Khatoon, 2021). Furthermore, it is believed that the financial inclusion of individuals and business enterprises plays a significant role in achieving Sustainable Development Goals.

In addition, the financial inclusion of firms in developed and developing economies is different. For instance, in the case of developed countries where the financial development level is high, firms use intangible assets, such as property rights, to secure external loans for better firm performance. On the other hand, in developing economies where the financial development level is low, firms rely more on tangible assets to access external finance, which eventually improves the firm's economic activities (Hur, Manoj, & Riyanto, 2006).

Given the context, it is plausible and well-established that the financial inclusion of a firm is an important determinant of its performance and exports. However, it may not be the only solution to firms' lacklustre export performance and it may be a myth that financial inclusion is a one-size-fits-all solution to every enterprise problem.

Both literature and recent debate on financial inclusion in the context of SDGs motivated the present study to treat the financial inclusion of firms as a significant determinant of a firm's performance, especially export. The study attempts to assess whether financial inclusion plays a significant role in determining the export performance of manufacturing firms in Pakistan in the context of developing economies.

Significance of the Study

The study attempts to evaluate and quantify the impact of a firm's financial inclusion on the export performance of Pakistan's manufacturing sector. To the best of our knowledge, there is scant literature concerning firm export performance and financial inclusion with a focus on Pakistan. Prior studies have used limited financial variables and observations to investigate firms' export performance. The present study is unique in the sense that its empirics are based on a rich panel data set of 8,400 balance sheets and around 6,000 observations from more than 400 firms in Pakistan's manufacturing sector for the period 1999-2020 to assess the export performance of Pakistan's manufacturing sector conditioned on access to finance.

The study employs different financial ratios to measure firms' financial inclusion indicators, specific variables, and macro determinants that affect firms' export performance. Importantly, the study employs robust econometrics techniques to quantify the impact of firms' financial health and export performance. In addition, under different and alternate specifications, the study further analyses the nexus sector-wise, size-wise, leveraged-based, and equity-based.

The study has important implications for policymaking. A firm's greater access to formal financial institution loans has important implications for a firm's better economic performance and higher exports. Larger financial resources lead to better export performance, which, eventually, improves the current account balance and export-led economic growth of a country.

Purpose and Scope of the Study

- To investigate the relationship between the financial inclusion of large-scale manufacturing sector firms and their export performance.

- To investigate the impact of firm financial determinants and macro environment on a firm's export values.

- To quantify the association between a firm's financial inclusion and export performances in terms of the firm's size, sector, and capital structure.

Firms' internal and external factors, including financial inclusion indicators, determine the firm's performance and growth sustainability level. These determinants are extensively investigated to theorise an enterprise's sustainability and economic growth. A firm's access to external finance is

noted as a key determinant of a firm's sustainable growth, which, eventually, contributes to economic growth at the macro level. However, empirical evidence regarding the interplay between a firm's financial inclusion and export performance at a larger scale in Pakistan is limited so far.

Pakistan's exports for years, and during the COVID-19 pandemic, have delivered far lower export earnings than its regional counterparts. An inefficient export performance not only deteriorates the current account balance of the country but also results in poor economic performance (Malik, Ghani, & Din, 2017). The existing literature on firm performance in Pakistan has highlighted the impact of firm capital structure on a firm's performance (see Memon et al., 2012; Awan, 2016; Ullah et al., 2017; Safer et al., 2019; Ahmad & Siddiqui, 2019). However, this literature has investigated only a small number of firms from the manufacturing sub-sector, with none exploring a firm's export performance as an outcome variable and financial ratios of firms as an indicator of a firm's financial inclusion

Research Questions

Motivated by the existing gap in the literature, this study is designed empirically aims to address the following questions:

Question 1: What is the impact of financial inclusion indicators on the export performance of the manufacturing sector of Pakistan?

Question 2: Whether the nexus remains the same or changes subject to the firms' size, sector, or capital structure (leveraged vs. equity).

Public Policy Relevance

The public policy relevance of the study is pertinent as it investigates the unimpressive export performance of Pakistan's manufacturing/industrial sector. The interest of the study is manufacturing sector firms, as these firms comprise the real sector of the economy and cause a sporadic impact on the industrialisation of economies (Efobi et al., 2018). Since Pakistan's financial system has passed through several developmental phases, the proposed study is relevant and contributes at the policy level. The study highlights the impediments to Pakistan's larger manufacturing sector's exports. The performance of Pakistan's manufacturing sector in terms of exports and the overall export performance of Pakistan have been below potential for years if not decades. Therefore, highlighting and thoroughly analysing the export performance of Pakistan's manufacturing sector under financial constraints is critical. The manufacturing sector has further linkages with other sectors and has greater implications for the overall macroeconomic indicators. Hence, due consideration and evidence-based policy is required to address the 'haves not' of firm operating in the manufacturing sector of Pakistan.

Secondly, another contribution of the study at the policy level is that the entire focus of the ongoing National Financial Inclusion Strategy initiated by the State Banks of Pakistan in 2014 mainly targets individual financial inclusion. The strategy does not consider firms' financial inclusion (SBP, 2015). Given the significance of financial inclusion, the study highlights the importance of firms' access to finance and export at the policy level.

LITERATURE REVIEW

Export and firm performance literature depicts several factors determining firms' export performance in general and particularly in developing economies. The determinants of firms exporting are categorised under different themes. The themes are such that they cover different aspects of firms' export experience, for instance, firms' supply-side factors and firms' demand-side

determinants. At the same time, some studies have accounted for both the supply and demand sides of firms' export experience. In addition, other studies have investigated internal and external factors affecting firms' exporting behaviour.

Notwithstanding a firm's financial health, access to finance and firm exporting orientation in developing economies have emerged as important debates in the literature on finance. The following is a brief review of the existing related literature which conceptualises the relationship between a firm's financial health and export. It also covers recent empirical debates on the topic in the context of Pakistan.

Factors determining the demand side of a firm's export include real effective exchange rate, nominal exchange rate, production capacity, and relative export price. The determinants that impact a firm's export supply side, as employed in different studies, are domestic investment, gross capital formation, domestic production, foreign direct investment, and relative price (Gul & Rehman, 2014).

In investigating Indonesia's export performance, Rahmaddi and Ichihashi (2012) found that a firm's demand and supply sides played a significant role in determining a firm's export. However, they found the elasticities of the supply side were higher than the demand side elasticities as the Indonesian exports are supply-driven. Similarly, Jongwanich (2010) concluded that supply-side determinants were vital to firms' export performance. Roy (2007) documented that both the demand and supply sides of the equation played a significant role in the determination of export performance in the case of India.

Considering both the demand and supply aspects of a firm's export performance, Funke and Holly (1992) highlighted the importance of both the demand and supply side of export performance. They employed variables related to export on the demand side of the equation and another variable that determines the supply side of the equation. The reported results indicated that both the demand and supply side elasticities significantly determined firms' exports.

Importantly, the internal and external factors affecting firms' export performance are broadly categorised as resource-based paradigms and contingency paradigms (see Carlos M.P. Sousa, Francisco J. Martínez-López & Filipe Coelho, 2008). The internal factors are based on resource-based theory, suggesting that a firm's export performance is based on a firm's internal factors, such as firm size, firm experience, international experience of the firm, competence, such as resource commitment, customer relationship, product uniqueness, product quality, resilience to respond to the market shocks and changes, and managerial characteristics, such as the level of education, international experience, and innovativeness (see Aaby & Slater 1989; Zou & Stan, 1998; Moen, 1999).

On the other hand, the external factors are based on the contingency theory. The theory suggests that foreign market instincts, such as cultural similarities, government regulations, market competitiveness, and local business impact firms' export performance. Many studies have cited and employed broad environmental instincts, political factors, and cultural factors as the determinants of export performance (see Erramilli & Rao, 1993; Styles & Ambler, 1994). Factors other than internal and external or demand and supply side impacting a firm's export performance including financial constraints, exporting tendency, competitiveness, foreign market penetration, and export incentives have been thoroughly investigated globally.

In international trade literature, sunk costs (financial constraint) and other vital factors are noted as factors affecting firms' export decisions. Firms bear sunk costs to obtain foreign market information, develop the foreign market channel, and innovate the cost of goods quality in line with international standards. Thus, financially constrained firms are less likely to bear the sunk cost. Qasim, Rizov, and

Zhang (2020) empirically analysed the response of financial constraints to the export decisions of Pakistani firms, employing the Whited-Wu index and assets tangibility as a measure of financial constraints using a sample of Pakistan's listed manufacturing firms. The study found that exporters were less financially constrained as compared to non-exporters. In addition, the study noted that financial constraint was a significant factor affecting the exporting decisions of Pakistan's firms. Along with the significant impact on export and exporting decisions, it has an impact on the exporting tendency of firms.

Kazmi, Imran, and Khan (2020) investigated the impact of financial constraints on a firm's exporting tendency of firms in Pakistan, using the World Enterprises Data. They employed the logistic regression to highlight a firm's exporting probability. The study reported that financial constraints lower the exporting tendency of firms. In addition, the study showed that the manufacturing sector was affected more by financial constraints than the service sector in terms of export performance. Along with financial constraints, other factors, such as international market competitiveness and comparative advantage, were used as a firm's export determinants.

Comparative advantage and competitiveness are significant in international trade and export literature. As per the global competitiveness ranking (2017-18), out of 13 7 countries Pakistan ranked 115, Bangladesh 99, and India 40. Safeer et al. (2019), using primary data and employing Porter's Diamond Theory to investigate the challenges of Pakistan's export competitiveness, found a lack of internal factors, i.e., innovation, energy, and own brand, of vital importance in terms of the firm's export performance. Export market penetration shows the share of export of a specific product/service in a particular market out of the total target market for that product/service. Ayesha and Khatoon (2021) studied the effect of financial inclusion on export market penetration using quantitative data from 31 developing countries and employing pooled OLS and GMM techniques. The study found that financial inclusion has a considerable impact on export market penetration.

To offset barriers that impede enterprise's international trade, governments in developing countries introduce several incentives that induce trade across countries, regions, and continents. Emerging economies seek policies that encourage and promote exports as they are considered a linchpin of sustainable economic growth. For this purpose, incumbent governments extend the range of export incentives to encourage the export performance of enterprises. The range of export incentives varies across countries, including lower income tax, export finance incentives, zero rating sale tax, exemption from customs duties, etc. Ahmad, et al., (2015) investigated the textile sector and compared the government's tax incentives in Bangladesh, India, and Pakistan. The study documented that Bangladesh's textile sector is the most export-oriented comparatively and has the highest export incentive among the three countries.

Investment, specifically foreign direct investment, is noted to be a vital player in the game. Aam and Khatoon (2021) argued that countries attracting significant foreign direct investment prosper faster than others with less significant foreign investment. The rationale, as noted, is that high investment induces high production, fulfilling domestic consumption and creating space for higher exports. In the case of developing economies, comparatively, exporter experiences insignificant export-led investment by both domestic and foreign investors and, thus, rely on financial services to finance export-oriented production.

Therefore, firms' access to formal financial institutions, i.e., financial inclusion, becomes a pivotal factor in a firm's export-led production. The impact of financial inclusion on firms' growth and export performance is thoroughly investigated. Studies have employed several different financial factors that affect firms' performance, export orientation, and survival of exporter firms.

Scores of studies have documented the impact – direct and indirect – of a firm's financial inclusion on a firm's growth and firm's export performance. Chauvet and Jaclin (2015) analysed the impact of access to external finance on a firm's economic growth, productivity, and export performance in countries with low financial development. The study used firm-level data from World Bank Enterprises for 26 countries. The findings of the study showed that financial inclusion had a positive association with a firm's economic growth in a country where financial development is less developed and has little or no impact on a firm's growth and export performance on average. In addition, the study noted that where financial inclusion was high financial deepening enhanced firms' growth. Likewise, Harrison, Lin, and Xu (2013) addressed key factors explaining Africa's economic performance, using World Bank Enterprise data for African countries. The study reported that along with other key factors, such as lack of infrastructure and political competition, firms' access to finance, define firms' growth and performance. Efobi, Orkoh, and Atata (2018), using World Bank Enterprise data for Nigerian manufacturing firms, found through a quasi-experimental approach that using formal financial services increase firms' export. In addition, the study argued that access to traditional loan grow firms' export capacity, though the result differed according to firms' location.

Most of the studies have documented the linkages between financial constraints and the international trade of enterprises. Some studies have specifically reported that financial constraints impede firms' international trade. Interestingly, Silva (2011) analysed the effect of international trade on firms' financial health. The study used a sample of Portuguese manufacturing firms and employed the difference-indifference methodology. The reported results indicated that international trade is a smooth path for exporting firms to enhance their financial health compared to non-exporter firms.

Kumarasamy and Singh (2018) assessed the impact of access to finance and financial development on firms' ability to export using World Bank Enterprises Survey data for the Asia-Pacific region. The study indicated that access to formal finance enables enterprises to enter the international market. It further indicated that financial development enables firms that operate in remote areas to enter international business easily.

Greenaway, Guariglia, & Kneller (2007) analysed the link between firms' financial factors and their exporting decision using a sample size of 9,292 UK manufacturing firms from 1993-2003. The study employed liquidity and financial leverage ratios as firms' financial health variables and the causal effect runs from export to financial health rather than the usual direction from financial health to export. The study reported that firms engaged in international trade had better financial health than non-exporter ones. In addition, the study reported that participation in the international market improved firms' financial health significantly. On a similar note, using micro-level French manufacturing firms' data, Stiebale (2011) assessed whether financial constraints matter for firms entering the export market. The study reported no evidence that financial constraint mattered for a firm's exporting decision. It indicated another unobservable factor that enabled firms to initiate exports and gain financial strength. In line with former studies, Bridges and Guariglia (2008) studied the impact of financial indicators on the survival probability of firms that were domestically and internationally engaged. The evidence was based on 61,496 UK companies over the period 1997-2003. The study employed collateral ratio and leverage ratio to account for financial variables. The results showed that increasing the leverage ratio of a firm increased the failure probability of a domestic firm by a greater extent. At the same time, financial indicators either did not have a significant or a minimal impact on internationally engaged firms.

The documented literature pertinent to the linkages between firms' financial health and export performance exhibits contrasting results and conclusions. Studies that have used firm-level data for developed countries report either a significant or insignificant impact on a firm's financial health variables, such as liquidity ratio, leverage ratio, and collateral ratio on their export performance (for

details, see Greenaway, Guariglia, Kneller, 2007; Bridges and Guariglia, 2008); Stiebale, 2011, etc.). On the other hand, the literature emerging from developing economies regarding access to finance and financial constraint has been documented as factors that have a significant impact on a firm's economic growth and performance, in general, and a firm's export performance specifically. For details, see Chauvet and Jaclin (2015), Harrison, Lin and Xu (2013), Silva (2011), Kumarasamy and Singh (2017), and Kazmi, Imran, and Khan (2020).

DATA

Data Description

The section presents the essential features of the data. We initially digitalised data of 427 firms from 1999 to 2020. Out of 427 firms, 319 firms had positive export sales. Therefore, we picked the firms exporting in any of the years for our analysis.

Figure 1: Export-wise Firm's Frequency
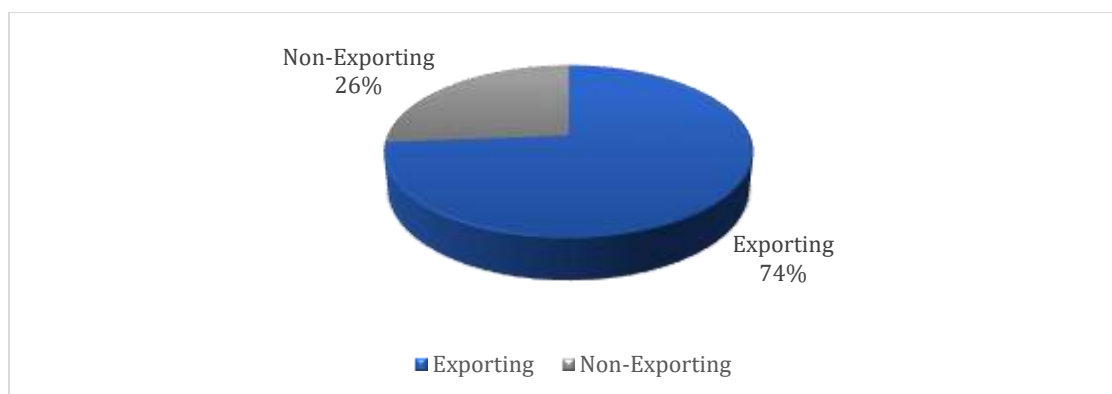
Source: Authors' calculations.

Table 1: Sector-Wise Distribution of Firms

Sector	Per Cent
Chemicals and Pharma	10.06
Coke and Refined Petroleum	2.36
Electrical Machinery	1.46
Food Sector - Sugar	10.46
Made-up Textile	2.01
Motor Vehicles - Trailers	4.48
No-Metalic- Cement	6.12
Non-Metalic -Mineral Products	2.09
Other Food Products	3.57
Other Manufacturing	8.96
Other Textiles	2.9
Paper- Paperboard	1.66
Textile Sector	43.87
Total	100

Figure 2: Sector-Wise Distribution of Firm

Legend:
- Chemicals$Pharma
- Coke&RefinedPetroleum
- ElectricalMachinery
- FoodSectorSugar
- MadeUpTextile
- MotorVehiclesTrailer
- NonMetalicCement
- NonMetalicMineralProduct
- OtherFoodProduct
- OtherManufacturing
- OtherTextile
- PaperPaperboard
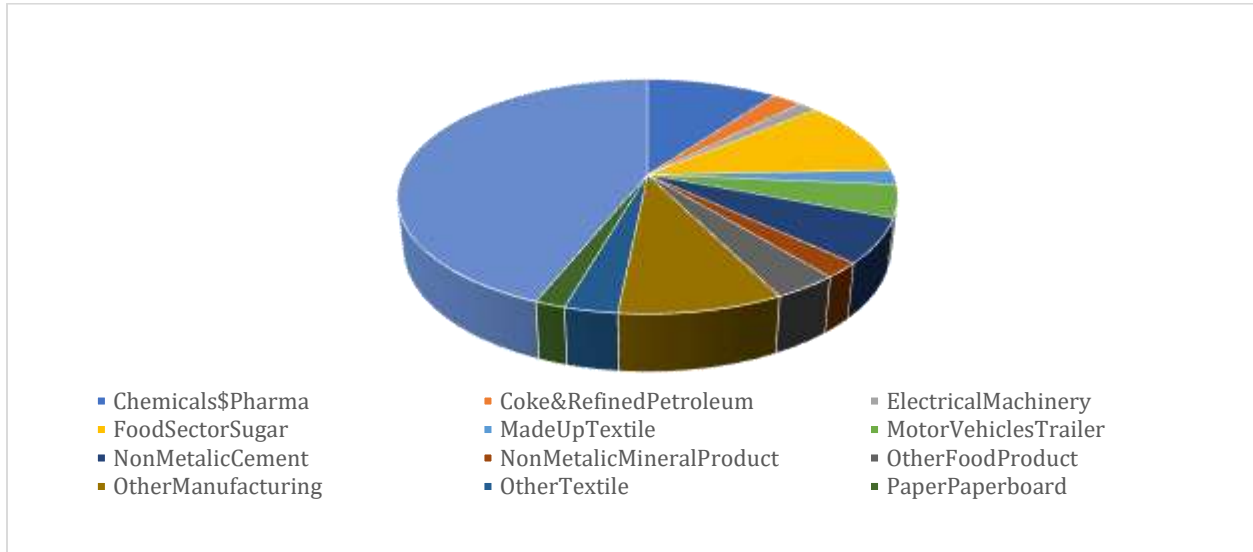
Table 1 and Figure 2 present the sector-wise distribution of our dataset. The 315 firms broadly belonged to 15 sectors. Textile was the largest sector with almost 44 per cent of the firms belonging to this sector. Chemical and pharma was the second largest sector with 10 per cent firms, and the food sector - sugar was the third largest. On the other hand, electrical machinery was the smallest sector with only 1.46 per cent of firms in this sector. We used the log of export sales of the firms measured in Pak Rupees as our dependent variable in the study. The export sales revenue of the firms depicted their export performance in the studied period.

The study's primary objective is to measure the impact of financial inclusion indicators on the export performance of the firms. The description of variables is given in Table 2. We used four proxies for financial inclusion, of which two are related to the firm's assets and two depict the debt burden, access, and availability of loans to the firms. The first indicator of financial inclusion is the firm's total assets taken from the firm's balance sheets measured in Pak Rupees. The second indicator of financial inclusion is asset tangibility, which is the ratio of tangible assets to the firm's total assets.

The third indicator of financial inclusion is the debt-to-equity ratio, the ratio of total debt to total equity. It is the debt-to-equity ratio for companies using debt financing. The fourth and final indicator of financial inclusion is gearing, a measurement of the entity's financial leverage, demonstrating the degree to which a firm's activities are funded by owner funds versus creditor funds. It is measured by dividing the sum of current and total fixed liabilities by total capital employed. This specified gearing pattern helps in determining the financial inclusion of a firm.

Two firm-level variables were used as control variables in the model. The first control is RETA, measured as a retained earnings to total assets ratio. Retained earnings are equal to a sum of reserve accounts and retained profit. For RETA, the firm's age is implicitly considered as this ratio gauges accumulative profit over some time. It is worth mentioning that this ratio exhibits biases as it is inclined towards classifying young firms as distressed as firms require time to attain cumulative profits. However, the literature shows extensive use of RETA.

The next variable is OINS, which is the operating income to net sales ratio. Operating income considers COGS (cost of goods sold) and fixed expenses. Interest and taxes are not deducted from net operating income. Net sales refer to the total amount of sales the business makes after allowing for deductions for damaged products, returns, and discounts.

Further, we used three macro-level controls in the study. Since we measure the export performance of the firms, the overall trade dynamics of the country may significantly affect the firm export performance. Therefore, the first control is trade openness, which is the ratio of the sum of exports and imports to GDP. Next, our model used the risk premium as a control variable. The risk premium is measured as the difference between low-grade government bond returns and long-term government bond returns.

The third macro-level control is the quantum index, which is the industrial production growth that may also affect the firm performance from a macro aspect. industrial production growth rate is measured by the following formula: $dip_t = ip_t - ip_{t-1}$, where DIP is the growth rate of industrial production, IP_t is the industrial production flow in year t, and its lagged value is Ip_{t-1}.

Table 2: Description of Variables

Variable	Role	Measurement	Source
Export Sales	Dependent	Log of export sales measured in Pak Rupees	Balance Sheets
Assets	Financial Inclusion Indicators	Log of total assets of the firm measured in Pak rupees	Balance Sheets
Asset Tangibility		Fixed Assets/Total Assets	Balance Sheets
Debt to Equity Ratio		Total Debt/Total Equity	Balance Sheets
Gearing		Gearing is the Total Debt to Total Capital Employed ratio	Balance Sheets
RETA	Micro Controls	Retained Earnings to Total Assets	Balance Sheets
OINS		Operating Income to Net Sales ratio	Balance Sheets
Trade Openness	Macro Controls	Exports-imports/ GDP	WDI, World Bank
Risk Premium		Low-grade Govt bond return – long-term Govt bond return	State Bank of Pakistan
Quantum Index		Industrial production growth rate	State Bank of Pakistan

Note: Financial leverage variable divides firms into leveraged and non-leveraged for in-depth analysis.

The construction of variables, their description, and the data source are given in Table 3.

Table 3: Variable Construction

DETERMINANTS OF FIRM'S FINANCIAL INCLUSION			
VARIABLES	**CONSTRUCTION**	**DESCRIPTION**	**SOURCE**
Firms' Export	Log of firms' export values		SBP: Financial Statement Analysis of PSE listed non-financial companies(1999-2020)
Total Assets Total Assets Growth	TA=B+A3 TAG=DLOG(TAM) **SIZE= TAG/GNP DF 1974**	Log of total assets of a firm divided by the GDP deflator	SBP: Financial Statement Analysis of PSE listed non-financial companies(1999-2020)

Total Assets Growth/ GNP price deflator			
ASSET TANGIBILITY Fixed Assets/Total Assets	FIX.A/TA=A3/B+A3 **ATNG = FIX.A/TA**	This indicator shows the volume of tangible assets that the firm possesses.	SBP: Financial Statement Analysis of PSE listed non-financial companies(1999-2020)
DEBT TO EQUITY RATIO Total Debt/Total Equity Current Lib+Total Fixed Lib/Shareholder's Equity	CL+TFL/SH.HLDR.EQ =C+D/E **DBERM= CL+TFL/SH.EQ**	It is *the debt-to-equity ratio* for companies using debt financing. It is a commonly used variable to calculate debt burden.	SBP: Financial Statement Analysis of PSE listed non-financial companies(1999-2020)
GEARING Current Liabilities+Total Fixed Liabilities/Total Capital Employed	CL+TFL/TCAP EMP=C1+C2+D1+D3 /E+D **GEAR = CL+TFL/TCAP EMP**	It measures the firm's financial leverage. And measure the level of finance provided by the owner and creditor	SBP: Financial Statement Analysis of PSE listed non-financial companies(1999-2020)
DUMMY VARIABLES			
GEAR% Dummy Variable	**One if GEARING > 20-40%** (High Gearing) **0 otherwise** (Low Gearing)	This specified gearing pattern helps in determining the Financial Inclusion of the firm.	
EQUITY% Dummy Variable	**One is EQ.FINAN > 40%** (High Equity Fin) **0 otherwise** (Low Equity Fin)		
SPECIFIC DETERMINANTS FOR FIRMS: CAMEL CATEGORY			
*RETA (Assets) Retained Earningotal Asset ratio	SURPLUS/TA= E3/B2+A3 **RETA= SURPLUS/TA**	*Retained earnings are equal to reserve accounts+retained profit* For RETA, the firm's age is implicitly considered as this ratio gauges accumulative profit over some time. It is worth mentioning that this ratio exhibits biases as it is inclined towards classifying young firms as distressed, as firms require time to attain cumulative profits. Yet the	SBP: Financial Statement Analysis of PSE listed non-financial companies(1999-2020)

		literature shows extensive use of RETA	
*OINS (Management & Earnings) Operating Income to Net Sales ratio	GR.PROF-EXP/SALES= F3-F8/F1 **OINS = GR.PROF-EXP/SALES**	Operating income considers COGS (cost of goods sold) and fixed expenses. *Interest and taxes are not deducted from net operating income.* Net sales refer to the total amount of sales the business makes after allowing for deductions for damaged products, returns, and discounts	SBP: Financial Statement Analysis of PSE listed non-financial companies(1999-2020)
CONSTRUCTION OF MACRO VARIABLES			
IP DIP = DLOG (IP)	Industrial Production Growth rate $DIP_t = \log IP_t - \log IP$ Industrial Production: *Industrial Production Growth rate*	We use an annual rate of industrial production, which is calculated, based on financial literature, by taking the first difference in natural logs: *DIP* is the annual growth rate of industrial production, IP_t is the flow of industrial production in year t and IP_{t-1} is its lagged value.	SBP: Handbook of Statistics
Trade Openness:	**Export-Import/Gdp** $INFT_t = \log CPI_t - \log$		WB indicators
Risk Premium **Low-Grade Govt Bond Return – Long-Term Govt Bond Return**	*Risk Premium*: $RP_t =$ LOW GB$_t$ – LGB$_t$	$LOWGB_t$ *is* the return on low-grade bonds, and LGB_t is the return on long-term government bonds. Low-grade bonds are long-term assets that are less liquid than government bonds. Redemption of these bonds before the maturity date is subject to a penalty. Thus they are more risky for investors than the government bonds for which a market exists. Since both types of bonds are long-term, the difference in return on the two gives an estimate of risk premium outside the stock market.	SBP: Handbook of Statistics

METHODOLOGY

To choose the best estimation technique, the study started by testing the data properties. Descriptive statistics of the variables used in the analysis were used in the first step. This study calculated each variable's mean, median, and range. Additionally, the standard deviation of values was computed to duplicate variable volatility and measure the variance of each observation concerning the mean. The study used skewness and Kurtosis to check for data normality as a logical first step. A thorough normality test was developed by Jarque & Bera in 1987. This test determines whether data are normally distributed by looking at skewness and excess Kurtosis. The equation that follows yields normality statistics.

$$JB = \frac{N}{6}\left(S^2 + \frac{(K-3)^2}{4}\right) \quad (5)$$

The null hypothesis of Jarque-Normality Bera's test is that the data are normally distributed, which may be challenged by statistically significant estimates.

Slop Heterogeneity and Cross-Sectional Dependence

The current study employed panel cross-section dependence and slope heterogeneity after examining variable regularity and irregularity. The general macroeconomic environment may have different effects on each firm. Firms may become dependent on one another due to various macroeconomic factors. For instance, any modification to laws or macroeconomic policies may impact all businesses and lead to cross-sectional dependence. As a result, businesses may share and differ from others. Panel data's slope homogeneity and cross-section dependence may cause problems in econometric analysis (Bao, 2020). This study employed the Pesaran and Yamagata (2008) slope coefficient homogeneity (SCH) test and the Pesaran (2021) cross-sectional dependence test to determine whether a phenomenon is homogeneous or heterogeneous. The SCH formula is:

$$\Delta_{SCH} = \sqrt{N(2k)^{-1}}\,(N^{-1}S - K) \quad (6)$$

Additionally, the above test provides estimated results for the adjusted SCH, which are as follows:

$$\Delta_{SCH} = \sqrt{N}.\sqrt{\frac{T+1}{2K.(T-K-1)}} \cdot (N^{-1}S - 2K) \quad (7)$$

When significant estimates are established, the alternative hypothesis, which contradicts the null hypothesis, indicates heterogeneous slope coefficients. The recent study conducted the Pesaran (2021) cross-section dependence test between firms after estimating slope coefficients. If this issue is ignored, estimation bias may result (Campello, Galvao, & Juhl, 2019). The following is the formula used to evaluate cross-sectional dependency:

$$CD_{Test} = \frac{\sqrt{2T}}{[N.(N-1)]^{\frac{1}{2}}}\sum_{i=1}^{N-1}\sum_{K=1+i}^{N} T_{ik} \quad (8)$$

The null hypothesis of the test implied the independence of firm cross-sections. An alternate cross-sectional dependence hypothesis can be accepted once significant estimates have been established. The variables in the dataset did not exhibit any cross-sectional dependence by the null hypothesis. Also supported by the alternative hypothesis is the cross-sectional dependence of the variables in the data set.

Unit Root Tests

This study used the Fisher test after confirming heterogeneous slope coefficients and cross-sectional dependency. The benefit of this test is that, unlike the IPS test, it does not call for a balanced panel. Different lag lengths can also be used in the individual ADF regression. The Fisher test has the additional benefit of applying to any unit root test that has been derived. The Levin-Lin and Im-Pesaran-Shin (IPS) panel data unit root tests and the Fisher test, proposed over 60 years ago by R. A. Fisher and has an illustrious history in the statistical literature, were contrasted by Maddala and Wu (1999). The Fisher test is simple and easy to use.

Method of Moment Quantile Regression

First, a panel quantile estimation approach that assesses the dependent variance and conditional mean statistics was put forth by Koenker and Bassett Jr. (1978). Even with irregularly distributed variables, quantile regression produces reliable results. The current study used Machado and Silva's (2019) moment's quantile regression, which followed the properties of quantile regression. This approach evaluates distributional and heterogeneous quantile effects (Sarkodie & Strezov, 2019). Location-scale estimates typically take the following form:

$$Y_{it} + \vartheta X_{it} + \left(\delta_i + \rho \acute{Z}_{it}\right) . \mu_{it} \quad (12)$$

The preceding equation shows $P. \left(\delta_i + \rho \acute{Z}_{it} > 0\right) = 1$, where p is the probability (.). Moreover, $\theta, \vartheta, \delta, and \ \rho$ are parameters to be estimated. The subscript I shows the fixed impact of $\theta_i \ and \ \delta_i$, i= 1, 2, 3...n and Z exhibits the k-vector of predictable X elements that are variation conversions $\sim$ as follows:

$$Z_\sim = Z_\sim(X), \sim = 1, 2, 3 \dots . k \quad (13)$$

According to Machado and Silva (2019), in Equation (13), X is distributed independently for each l and t. l is orthogonal to X and can be distributed over fixed cross-sections and time, stabilising the other components and preventing excessive exogenic behaviour. Equations (2-4) then become:

$$Q_y \left(\tau \ X_{it}\right) = \left(\theta_i + \delta_i \ q(\tau)\right) + \vartheta X_{it} + p \acute{Z}_{it} \ q(\tau) \quad (14)$$

X is the vector of the independent variables, financial inclusion indicators, and micro and macro controls, as determined by Equation (14). The quantile distribution is also shown in the equation above. The dependent variable is export sales and its estimate depends on where those variables are located. Moreover, $-Q_y \ (\tau) \equiv \theta_i + \delta_i \ q. (\tau)$ is a scalar coefficient of quantile τ for each cross-section (i). Individual effects do not control intercept shift, unlike least square fixed effects. Due to variables' time-invariance, heterogeneous influence can shift across quantiles. Q (τ) also shows the $\tau - th$ quantile sample: the 25th, 50th, 75th, and 90th. Each quantile's equation is as follows:

$$min_q \ \sum_i \sum_t \gamma_t (R_{it} - \left(\delta_i + \rho \acute{Z}_{it}\right) q) \quad (15)$$

Where

$$\gamma_t(A) = (\tau - 1). AI \ \{A \le 0\} + TAI\{A > 0\} \quad (16)$$

Specifies check function.

To determine the impact of financial inclusion variables on the export value of the firms, we specify the following model:

$$Export \ Value_{it} = \ \alpha + \ \beta \ Financial \ Inclusion \ Indicators_{it} + \gamma Firm \ Level \ Controls_{it} + \delta \ Macro \ Level \ Controls_t + \epsilon_{it} \qquad (1)$$

14

Here, Export Value$_{it}$ stands for a log of export sales. Financial Inclusion indicators include total assets, asset tangibility, debt-to-equity ratio, gearing, and Firm-Level Controls$_{it}$ includee RETA and OINS. Macro Level Controls$_{it}$ include industrial production growth rate, trade openness, and risk premium.

The estimations were done on the full sample and then by disaggregating the sample by leverage structure, gearing, equity, size, and sectors. The firms were divided according to their leverage capital structure. We grouped firms based on their financial leverage ratio. Category 1 is for firms with more than a 40 per cent leverage ratio and Category 2 includes firms with less than 40 per cent leverage. We grouped firms based on their gearing ratio with a 40 per cent cut-off and termed them high-gearing and low-gearing firms. Then, firms were grouped based on their equity ratio, with an equity ratio of more than 40 per cent in one group and less than 40 per cent in the second group.

Next, we have divided firms into four groups based on their size. The assets of the firms measured in million rupees were used for this breakdown. The State Bank of Pakistan specifies firms as medium-sized if they have assets worth PKR 300 million or less, while firms with more than PKR 300 million assets are termed large-sized firms. In our dataset, the majority of the firms were large-sized, with 86 per cent of them having assets of more than PKR 300 million. Therefore, we further categorised large-sized firms into three categories to dig deeper into the dynamics of firm size.

In sum, we had four categories of firms in terms of size. The first category consisted of firms having assets worth PKR 300 million or less. The next category was large firms with assets from PKR 300 million to PKR 1,625.6 million (the 50th percentile). The third category included firms from the 50th to 75th percentile having assets between PKR 1,625.7 to 5,318.8 million. Moreover, the fourth category included firms above the 75th percentile in terms of assets.

Next, we created subsamples of firms based on sectors. The first sub-sector is textile, which comprises almost 43 per cent of the firms and the second is the other manufacturing consisting of 10 per cent of firms in the dataset. The third subgroup is the food sector and sugar, with 10 per cent of firms, and the fourth is chemical and pharma, which comprises 8 per cent of firms in our data set. The fifth group consists of all other firms.

Endogeneity Concern and Proposed Methodology:

Endogeneity is a major methodological concern for many business and management research areas that rely on regression analysis to draw causal inferences. Roberts and Whited (2013, p. 493) define endogeneity as a correlation between the explanatory variables and the error term in a regression. Endogeneity may arise due to the omission of explanatory variables in the regression, resulting in the error term correlated with the explanatory variables, thereby violating a basic assumption of ordinary least squares (OLS) regression analysis. It may also be caused by the dependent variable being influenced by one or several explanatory variables. Such endogeneity may be of the simultaneous type in which contemporaneous realisations of both the dependent and explanatory variables in question affect each other. Or it may be of the dynamic type in which past realisations of the dependent variable influence current realisations of one or more of the explanatory variables (Abdallah et al., 2015).

We employed a two-step system GMM approach to address this issue to minimise endogeneity issues. This approach has at least two main advantages. First, it controls for industry-specific effects, which cannot be controlled with industry-specific dummies owing to the dynamic structure of the model and, second, it controls for simultaneity bias arising from the endogenous regressors (Khan et al., 2020). To determine the impact of financial inclusion variables on the export value of the firms, we specified the following GMM model:

$$Export\ Value_{it} = \alpha + \beta_0\ Export\ Value_{it-1} + \beta\ Financial\ Inclusion\ Indicators_{it} +$$
$$\gamma Firm\ Level\ Controls_{it} + \delta\ Macro\ Level\ Controls_t + \epsilon_{it} \qquad (2)$$

Here Export Value$_{it}$ stands for a log of export sales. Financial Inclusion indicators include total assets, asset tangibility, debt-to-equity ratio, gearing, and Firm-Level Controls$_{it}$ include RETA and OINS. Macro Level Controls$_{it}$ include industrial production growth rate, trade openness, and risk premium.

RESULTS AND DISCUSSION

Results

This section presents the study findings starting from descriptive statistics and data diagnostics to determine the correct type of estimation technique for our data. In descriptive statistics (Table 4), the mean values of all variables except OINS, risk premium, and trade openness are positive.

Skewness and Kurtosis tests were used further to confirm the normality of each variable in this study. The empirical findings of the normality test are shown in Table 5. The joint test of skewness and Kurtosis and Jarque and Bera (1987) provide significant estimates for all variables. This test takes into account excess Kurtosis and skewness. This test takes into account excess Kurtosis and skewness. The sample data came from a normally distributed population according to the null hypothesis. The alternative theory contends that the data are not drawn from a population with a normal distribution. Since all of the variables' prob> chi (2) values are less than 0.05, the null hypothesis indicates that the variables were not normally distributed, rejecting the null hypothesis since according to the null hypothesis, the variable might be normally distributed.

Table 4: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Log of Export Sales	6,025	8.358	6.291	0	17.686
Log of Assets	6,025	14.321	1.988	-0.415	19.92
Financial Leverage	6,025	8.455	181.407	0.001	5,689.05
Asset Tangibility	6,025	0.519	0.239	0	3.658
Debt to Equity Ratio	6,025	0.895	39.256	-1649.8	1043.09
Gearing	6,025	2.407	92.761	-428.32	6,593.23
RETA	6,025	0.163	0.857	-5.467	35.954
OINS	6,025	-1.167	13.613	-572.21	3.902
Quantum Index	6,025	123.865	17.628	100	173
Trade Openness	6,025	-0.093	0.025	-0.133	-0.048
Risk Premium	6,025	-0.952	1.143	-4.067	1.82

Source: Authors' calculations
Table 5: Normality Test

	Skewness	Kurtosis	Jarque-Bera Test	
Variable	Prob>chi2	Prob>chi2	chi2(2)	Prob>chi2
Log of Export Sales	0	0	7.83.7	0
Log of Assets	0	0	42,000	0
Asset Tangibility	0	0	8,529	0

Debt to Equity Ratio	0	0	190,000,000	0
Gearing	0	0	4,700,000,000	0
RETA	0	0	250,000,000	0
OINS	0	0	240,000,000	0
Quantum Index	0	0	903	0
Trade Openness	0.0025	0.002	406	0
Risk Premium	0	0	710	0

Source: Authors' calculations

As mentioned previously, a firm depends on other firms for economic and non-economic reasons, leading to specific similarities and differences. The results of the Pesaran and Yamagata (2008) SCH test are presented in Table 6. Neglecting slope heterogeneity or homogeneity may lead to inefficient estimation. An analysis of slope heterogeneity is required. Both SCH (delta) and adjusted SCH (delta adjusted) satisfy the homogeneous slope null hypothesis and are statistically significant. This demonstrates the possibility of rejecting the null hypothesis and the heterogeneity of slope coefficients.

Table 6: Testing for Slope Heterogeneity

Slope Heterogeneity Test	Statistics
Delta	2.639.487***
Delta Adjusted	5.060***

Note: *** p<0.01, ** p<0.05, * p<0.1
Source: Authors' calculations

Next, as Campello et al. (2019) claimed, estimation bias in panel data results from cross-sectional dependency. The Pesaran (2021) CD test was used (Table 7). The null hypothesis of cross-sectional independence was rejected because all variables had high statistical significance. These variables depend on one another cross-sectionally, demonstrating how one firm's variables impact another's variables.

Table 7: Cross-sectional Dependence

Variable	Statistics
Log of Export Sales	37.76***
Log of Assets	343.913***
Asset Tangibility	7.428***
Debt to Equity Ratio	19.314***
Gearing	34.865***
RETA	21.484***
OINS	364.86***
Quantum Index	866.449***
Trade Openness	869.256***
Risk Premium	873.565***

Note: "*** p<0.01, ** p<0.05, * p<0.1"
Source: Authors' calculations

Only the Fischer-type Dickey-Fuller and Phillip Perron unit root tests could be used to check for the presence of unit roots in the data because the data set was unbalanced. Table 8 presents the test results. Under mixed-order integration, all variables were found to be stationary.

Table 8: Unit Root Testing (Fischer-Type Phillips Perron Panel Unit Root Test)

Order of Integration	Level				First Difference			
Variables	Inverse chi-squared P	Inverse normal Z	Inverse logit t) L*	Modified inv. chi-squared-Pm	Inverse chi-squared P	Inverse normal Z	Inverse logit t) L*	Modified inv. chi-squared-Pm
Log of Export Sales	1,033.6	-1.14	-6.08	11.59	2,820.56***	-34.3***	-45.1***	62.49***
Log of Assets	858.397**	5.3899	2.1881	6.235***	2,571.2***	-31.9***	-39.6***	54.4***
Asset Tangibility	1,280.7***	-6.9	-11.1***	18.1	3,537.9***	-42.6***	-56.1***	81.6***
Debt to Equity Ratio	2,328.5***	-20.0	-31.0***	47.5***	4,494.4***	-49.2***	-71.4***	108.4***
Gearing	1,935.8***	-16.9***	-24.1***	36.4***	4,092.0***	-46.4***	-64.9***	97.1***
RETA	1,165.7***	-2.0	-7.5	14.9***	2,749.4***	-35.4***	-44.0***	59.4***
OINS	1,483.4***	-12.3***	-17.1***	23.7***	7,351.9***	-70.6***	-113.4***	188.3***
Quantum Index	1,571.5***	-18.5***	-17.6***	26.1***	6,226.4***	-63.3***	-94.6***	156.7***
Trade Openness	704.54***	-5.94***	-5.27***	1.86	3,575.2***	-46.5***	-54.9***	82.4***
Risk Premium	2,717.13***	-32.24***	-40.55***	58.20***	11,900.0***	-96.1***	-182.5***	314.4***

*Note: "*** $p<0.01$, ** $p<0.05$, * $p<0.1$"*
Source: Authors' calculations

The Jarque and Bera (1987) test found that the variables were not normally distributed. Therefore, we used the method of moment quantile regression (MMQREG), which handles non-normal variables. Table 8 shows the approach's estimated results.

Now, we present the results from the method of moment quantile regressions. Table 9 presents our full sample estimates. The results show that assets positively impacted export sales, with the impact getting stronger as we move from lower to higher quantiles. On the other hand, asset tangibility hurt export sales, but the impact weakens as we move from lower to higher quintiles. Equity debt was insignificant for lower quantiles but positive and significant for upper quantiles. Gearing has overall positive signs and the impact gets stronger moving from lower to higher quantiles.

Table 9: Quantile Regression Estimates (Full Sample)

VARIABLES	Qtile_25	Qtile_50	Qtile_75	Qtile_90
Log of Assets	0.826***	0.979***	1.017***	1.032***
	(0.061)	(0.028)	(0.023)	(0.022)
Asset Tangibility	-4.142***	-1.623***	-0.991***	-0.742***
	(0.559)	(0.253)	(0.210)	(0.203)
Debt to Equity Ratio	-0.000	0.001	0.002	0.002*

	(0.003)	(0.001)	(0.001)	(0.001)
Gearing	0.009	0.015*	0.016**	0.017***
	(0.018)	(0.008)	(0.007)	(0.006)
RETA	-0.167*	-0.306***	-0.340***	-0.354***
	(0.087)	(0.039)	(0.033)	(0.031)
OINS	0.018***	0.027***	0.029***	0.030***
	(0.006)	(0.003)	(0.002)	(0.002)
Quantum Index	-0.007	-0.012***	-0.014***	-0.014***
	(0.008)	(0.003)	(0.003)	(0.003)
Trade Openness	21.714***	12.869***	10.646***	9.773***
	(5.527)	(2.495)	(2.080)	(2.012)
Risk Premium	-0.037	-0.112**	-0.131***	-0.138***
	(0.120)	(0.054)	(0.045)	(0.044)
Constant	0.992	7.239***	8.808***	9.425***
	(1.345)	(0.608)	(0.506)	(0.490)
Observations	6024	6024	6024	6024

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.
Source: Authors' calculations

Table 10 presents results for leveraged versus non-leveraged firms. Assets positively impacted exports in all quantiles of the leveraged and non-leveraged firms and impact got stronger from low to top quantiles. Furthermore, the coefficients are larger in all the quantiles of the non-leveraged firms. The assets had a greater impact on the firms' exports if they were less leveraged. Asset tangibility harmed leveraged and non-leveraged firms, with the effect weakening from lower to higher quantiles. Furthermore, the negative impact was stronger for all the quantiles of leveraged firms.

The debt-to-equity ratio was significant and positive only for the upper quantiles of the leveraged firms. Gearing positively impacted export sales and the effect is more pronounced for non-leveraged firms.

Table 10: Quantile Regression Estimates

	Leveraged Firms				Non-Leveraged Firms			
VARIABLES	**Qtile_25**	**Qtile_50**	**Qtile_75**	**Qtile_90**	**Qtile_25**	**Qtile_50**	**Qtile_75**	**Qtile_90**
Log of Assets	0.821***	0.965***	1.000***	1.012***	0.890***	1.015***	1.047***	1.065***
	(0.071)	(0.031)	(0.026)	(0.025)	(0.125)	(0.063)	(0.054)	(0.052)
Asset Tangibility	-4.273***	-1.566***	-0.924***	-0.69***	-3.46***	-2.28***	-1.97***	-1.81***
	(0.665)	(0.292)	(0.244)	(0.237)	(1.063)	(0.535)	(0.461)	(0.444)
Debt to Equity Ratio	-0.001	0.001	0.002*	0.002*	0.089	0.108	0.112	0.115
	(0.003)	(0.001)	(0.001)	(0.001)	(0.275)	(0.138)	(0.119)	(0.115)
Gearing	0.007	0.012	0.014**	0.014**	2.317**	2.215***	2.189***	2.174***
	(0.018)	(0.008)	(0.007)	(0.006)	(1.048)	(0.527)	(0.454)	(0.437)
Constant	3.719**	8.214***	9.281***	9.662***	-8.62***	2.792**	5.719***	7.380***
	(1.548)	(0.678)	(0.569)	(0.553)	(2.637)	(1.349)	(1.148)	(1.101)
Observations	4698	4698	4698	4698	1326	1326	1326	1326

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.
Source: Authors' calculations

Table 11 presents the same finding for assets positively impacting sales, with the effect being strong in the firms' low gearing and upper quintiles. Asset tangibility harmed sales for all quantiles of the high and low-gearing firms, with the effect getting weaker from lower to higher quintiles. Gearing had a strong negative impact on the export sales of high-gearing firms. If firms already used more than 40 per cent gearing, further increases in gearing impacted their exports negatively.

Table 11: Quantile Regression Estimates

	High Gearing Firms				Low Gearing Firms			
VARIABLES	Qtile_25	Qtile_50	Qtile_75	Qtile_90	Qtile_25	Qtile_50	Qtile_75	Qtile_90
Log of Assets	0.702***	0.883***	0.922***	0.935***	0.729***	0.961***	1.083***	1.145***
	(0.086)	(0.033)	(0.026)	(0.025)	(0.068)	(0.061)	(0.059)	(0.062)
Asset Tangibility	-4.48***	-2.83***	-2.47***	-2.35***	-3.14***	-0.121	1.466**	2.275***
	(0.731)	(0.280)	(0.224)	(0.21)	(0.687)	(0.638)	(0.601)	(0.630)
Debt to Equity Ratio	-0.002	0.001	0.001	0.002*	0.022**	0.031***	0.036***	0.039***
	(0.003)	(0.001)	(0.001)	(0.001)	(0.009)	(0.008)	(0.008)	(0.009)
Gearing	-0.120**	-0.09***	-0.09***	-0.08***	-0.002	0.004	0.008	0.010
	(0.049)	(0.019)	(0.015)	(0.015)	(0.014)	(0.011)	(0.012)	(0.012)
Constant	4.390***	9.304***	10.352***	10.716***	-7.01***	0.044	3.750**	5.640***
	(1.695)	(0.650)	(0.522)	(0.501)	(1.819)	(1.625)	(1.591)	(1.668)
Observations	4,842	4,842	4,842	4,842	1,182	1,182	1,182	1,182

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.
Source: Authors' calculations

Table 12 presents the results for low-equity and high-equity firms. Assets had a very stable positive impact on export sales of the firms and the impact slightly increased from lower to higher quintiles of the equity-based firms while decreasing for low equity firms.

Assets tangibility was mostly negative in this specification. The debt-to-equity ratio had a positive and significant impact on the export sales of high-equity firms, but the impact was insignificant on low-equity firms. Gearing was positive and significant for high-equity firms. Gearing significantly increased export sales of equity-based firms. At the same time, the impact was negative on low-equity firms. The equity-based firms gained more from debt and gearing than non-equity-based firms.

Table 12: Quantile Regression Estimates

	High EquityFirms				LowEquity Firms			
VARIABLES	Qtile_25	Qtile_50	Qtile_75	Qtile_90	Qtile_25	Qtile_50	Qtile_75	Qtile_90
Log of Assets	0.788***	0.970***	1.011***	1.027***	0.885	0.819**	0.791***	0.780***
	(0.068)	(0.027)	(0.022)	(0.022)	(1.093)	(0.330)	(0.135)	(0.206)
Asset Tangibility	-2.92***	-0.72***	-0.213	-0.014	-5.558	-3.210	-2.224**	-1.829
	(0.658)	(0.265)	(0.215)	(0.208)	(8.412)	(2.550)	(1.039)	(1.590)
Debt to Equity Ratio	0.041*	0.041***	0.040***	0.040***	-0.002	0.000	0.001	0.001
	(0.023)	(0.009)	(0.008)	(0.007)	(0.013)	(0.004)	(0.002)	(0.002)
Gearing	0.029	0.026***	0.025***	0.024***	-0.003	-0.039	-0.054**	-0.060*
	(0.024)	(0.010)	(0.008)	(0.008)	(0.176)	(0.053)	(0.022)	(0.033)
Constant	0.305	7.017***	8.550***	9.156***	4.130	10.065*	12.557***	13.555***
	(1.526)	(0.614)	(0.501)	(0.483)	(18.613)	(5.634)	(2.295)	(3.515)
Observations	5,185	5,185	5,185	5,185	839	839	839	839

*Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.*

Tables 13 and 14 below, present the results for firms segregated according to their size. Assets significantly and positively impacted the export sales of firms of all sizes, with the effect being greater for the firms within the 25th to 75th quintiles of the size variable. Asset tangibility decreased export sales of medium-sized and large-sized firms up to the 75th quantile. Asset tangibility was positive and significant for large firms above the 75th quantile in all the firms included in the study. The debt-to-equity ratio was mostly insignificant in this specification. Gearing positively impacted the export sales of the bottom and top firms in terms of size and negatively impacted the firms in the 50-75th quantiles.

Table 13: Quantile Regression Estimates

Variables	Medium-sized firms with assets less than 300 million Rs				Large-sized Firms in 25- 50% quintiles			
	Qtile_25	Qtile_50	Qtile_75	Qtile_90	Qtile_25	Qtile_50	Qtile_75	Qtile_90
Log of Assets	0.177**	0.144*	-0.082	-0.151	2.404***	2.182***	2.093***	2.062***
	(0.069)	(0.075)	(0.127)	(0.147)	(0.365)	(0.229)	(0.201)	(0.197)
Asset Tangibility	-1.24***	-1.220**	-1.082	-1.040	-3.97***	-3.54***	-3.36***	-3.30***
	(0.474)	(0.506)	(0.873)	(1.011)	(0.744)	(0.467)	(0.410)	(0.403)
Debt to Equity Ratios	0.006	0.004	-0.004	-0.007	-0.001	0.001	0.002*	0.003**
	(0.008)	(0.009)	(0.015)	(0.017)	(0.002)	(0.001)	(0.001)	(0.001)
Gearing	0.026**	0.030**	0.058***	0.067***	0.017	0.010	0.007	0.006
	(0.011)	(0.012)	(0.020)	(0.024)	(0.028)	(0.018)	(0.015)	(0.015)
Constant	1.594	3.434*	16.068***	19.965***	-12.8***	-0.158	4.916***	6.672***
	(1.529)	(1.822)	(2.837)	(3.271)	(3.094)	(1.968)	(1.702)	(1.671)
Observations	867	867	867	867	2,145	2,145	2,145	2,145

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.
Table 14: Quantile Regression Estimates

Variables	Large-sized Firms in 50-75% quintiles				Large-sized Firms in Above 75% quintiles			
	Qtile_25	Qtile_50	Qtile_75	Qtile_90	Qtile_25	Qtile_50	Qtile_75	Qtile_90
Log of Assets	1.667**	1.288***	1.184***	1.141***	-0.554*	0.174	0.528***	0.670***
	(0.738)	(0.282)	(0.212)	(0.206)	(0.330)	(0.133)	(0.092)	(0.093)
Asset Tangibility	-8.06***	-4.05***	-2.951***	-2.492***	1.538	0.439	-0.095	-0.308
	(1.387)	(0.514)	(0.380)	(0.367)	(0.991)	(0.448)	(0.312)	(0.317)
Debt to Equity Ratio	0.003	-0.000	-0.001	-0.002	-0.003	-0.002	-0.001	-0.000
	(0.010)	(0.004)	(0.003)	(0.003)	(0.007)	(0.003)	(0.002)	(0.002)
Gearing	-0.066	-0.06***	-0.059***	-0.058***	0.136	0.126***	0.121***	0.119***
	(0.045)	(0.017)	(0.013)	(0.013)	(0.084)	(0.039)	(0.027)	(0.028)
Constant	7.858	9.968***	10.547***	10.788***	14.348***	12.311***	11.322***	10.926***
	(6.248)	(2.386)	(1.795)	(1.744)	(3.242)	(1.492)	(1.041)	(1.059)
Observations	1,506	1,506	1,506	1,506	1,506	1,506	1,506	1,506

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.

Tables 15 and 16 present results for sectoral analysis. Assets positively and significantly impacted the export sales of all the firms except for chemical and pharma firms. Asset tangibility affected

export sales of the other small sectors positively, while it negatively affected all other sectors. The debt-to-equity ratio had mostly an insignificant effect in the sectoral analysis. Gearing had a positive impact on the majority of sectors, but the coefficient was insignificant in most specifications.

Table 15: Quantile Regression Estimates

Variables	Textile Sector				Other small sectors			
	Qtile_25	Qtile_50	Qtile_75	Qtile_90	Qtile_25	Qtile_50	Qtile_75	Qtile_90
Log of Assets	1.975***	1.509***	1.376***	1.302***	0.956***	1.117***	1.153***	1.179***
	(0.107)	(0.043)	(0.034)	(0.034)	(0.112)	(0.074)	(0.076)	(0.079)
Asset Tangibility	-9.39***	-6.05***	-5.10***	-4.56***	3.084***	1.249**	0.835	0.543
	(0.850)	(0.347)	(0.275)	(0.271)	(0.926)	(0.616)	(0.627)	(0.657)
Debt to Equity Ratio	0.001	0.001	0.002	0.002*	0.015***	0.004	0.002	-0.000
	(0.003)	(0.001)	(0.001)	(0.001)	(0.004)	(0.003)	(0.003)	(0.003)
Gearing	-0.017	0.002	0.007	0.011*	0.020	0.031	0.033	0.035
	(0.017)	(0.007)	(0.006)	(0.006)	(0.035)	(0.024)	(0.024)	(0.025)
Constant	3.291*	7.982***	9.322***	10.073***	-4.228*	5.260***	7.404***	8.914***
	(1.718)	(0.715)	(0.571)	(0.566)	(2.260)	(1.506)	(1.527)	(1.601)
Observations	2,642	2,642	2,642	2,642	1,606	1,606	1,606	1,606

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.
Source: Authors' calculations

Table 17 presents the results of the system GMM. Lagged export sales were positive and significant in all the equations. The assets-related financial inclusion proxies positively and significantly impacted the firms' exports. A one per cent increase in assets brought 176 ($e^{1.013*log(1.01)} = 1.76$) per cent increase in the export sales of the firms. It implies that firms with larger resources/assets tend to export more. Asset tangibility had a negative and significant impact on export sales. One per cent increase in tangible assets brought a 99 per cent decrease in sales. From debt-related proxies of financial inclusion, gearing had a negative and significant impact on export sales.

The reported gearing results indicate that a per cent increase in the proportion of creditor funds compared with a firm's owner fund to finance firm activities was more likely to decrease a firm's export performance by 10 per cent. The high gearing ratio implies that the creditors largely financed the firm's activities more than the owner.

The debt-to-equity ratio is measured as total debt to total shareholder equity. The indicator is used as a variable indicating the financial inclusion of the firm. The debt-to-equity ratio had a positive and significant impact on the export sales of the firms. One unit increase in the debt-to-equity ratio brought a 1.40 (exponential 0.014=1.014)[1] per cent increase in the export sales of the firms. The variable debt-to-equity ratio in the full sample estimation reports unique results.

Table 16: Quantile Regression Estimates

Variables	Other Manufacturing				Food Sector and Sugar				Chemical and Pharma			
	Qtile_25	Qtile_50	Qtile_75	Qtile_90	Qtile_25	Qtile_50	Qtile_75	Qtile_90	Qtile_25	Qtile_50	Qtile_75	Qtile_90
Log of Assets	0.162	0.803***	0.962***	1.041***	1.546***	0.812***	0.548**	0.418*	-0.68***	-0.42***	-0.32***	-0.27***
	-0.209	-0.095	-0.077	-0.072	-0.336	-0.252	-0.23	-0.23	-0.135	-0.089	-0.08	-0.081

[1] Linear Regression Models with Logarithmic Transformations Kenneth Benoit∗ Methodology Institute London School of Economics kbenoit@lse.ac.uk March 17, 2011

Asset Tangibility	- 5.8***	- 5.96***	- 5.98***	- 5.99***	- 9.58***	- 8.23***	- 7.7***	-7.5***	- 8.25***	- 4.66***	- 3.29***	- 2.65***
	- 1.722	-0.791	-0.654	-0.622	-1.717	-1.241	-1.178	-1.18	-1.4	-0.955	-0.829	-0.836
Debt to Equity	0.023	-0.004	-0.011	-0.015	0.002	0.006	0.008	0.009	-0.005	-0.008	-0.009*	- 0.009**
	- 0.042	-0.019	-0.016	-0.015	-0.013	-0.009	-0.009	-0.009	-0.008	-0.005	-0.005	-0.005
Gearing	0.032	0.046***	0.050***	0.051***	-0.046	-0.033	-0.028	-0.026	0.002	0.031	0.042	0.047*
	- 0.046	-0.021	-0.018	-0.017	-0.071	-0.051	-0.049	-0.049	-0.044	-0.028	-0.026	-0.026
Constant	- 1.384	6.169***	8.056***	8.987***	- 16.8***	1.238	7.763***	10.957***	17.069***	18.978***	19.709***	20.047***
	- 3.937	-1.806	-1.488	-1.412	-3.56	-2.993	-2.421	-2.407	-3.142	-2.023	-1.874	-1.882
Observations	540	540	540	540	630	630	630	630	606	606	606	606

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.
Source: Authors' calculations

As far as the control variables are concerned, all positively impacted the export sales of the firms. RETA indicates retained earnings to total assets ratio and is termed a 'self-financing ratio.' The reported results in Table 8 depict that a one per cent increase in a firm's self-financing ratio tended to enhance a firm's export performance by 2 per cent. It signifies the previous results While the external financing indicators were less likely to improve export performance, a self-financing ratio inspired more export orientation in the case of Pakistan's manufacturing sector. A higher RETA ratio implies that the firm has the potential to self-finance its capital expenditure rather than relying on external sources of finance. Similarly, OINS (operating income to net sale ratio) measures a firm's operational efficiency. The OINS, as reported, indicates that a one per cent increase in a firm's operational efficiency was associated with a one per cent increase in a firm's export performance.

The quantum index shows national industrial production potentials and is used as a macro variable to quantify the impact of industrial production and its nexus on a firm's export performance. As expected, the reported results of the IP Quantum Index indicate that a unit change in industrial production Quantum Index brought about a 12-unit positive change in the firm's export performance. Bangladesh's manufacturing sector shows similar evidence. A 1.01% increase in exports was associated with a 1 per cent increase in industrial production in Bangladesh (Rehman, 2017).

Table 17: GMM Estimates

Explanatory Variables	Full Sample
Lagged Export Sales	0.388***
	(0.005)
Log of Assets	1.013***
	(0.032)
Asset Tangibility	-7.897***
	(0.094)
Debt to Equity Ratio	0.014***
	(0.001)

Gearing	-0.103***
	(0.005)
RETA	-0.071
	(0.047)
OINS	0.009***
	(0.002)
Quantum Index	0.146***
	(0.008)
Trade Openness	15.179***
	(4.086)
Risk Premium	1.110***
	(0.310)
Observations	5,370
Number of IDs	319
Year Dummies	Yes
F test	5036.6***
AR1/prob.	-0.10.06/0.00
AR2/prob.	1.39/0.165
Sargan/prob.	237.83/0.126
Hansen/prob.	238.40/0.12

Note: i) Robust standard errors are reported in parenthesis; ii) *** denotes p<0.01, ** p<0.05, and * p<0.1, respectively; iii) F is a Wald test of the joint significance of the reported coefficients; iv) AR(1) and AR(2) are serial correlation tests of order 1 and 2 using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation; v) Hansen is a test of the over-identifying restrictions, asymptotically distributed as under the null of no correlation between the instruments and the error term, the p-value is given after /; vi) all equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.

In Table 18, the firms are divided according to their leverage capital structure. In Columns 2 and 3, we have grouped firms based on their financial leverage ratio. In Column 2, results for the firms with more than 40 per cent leverage ratio are presented and In Column 3, the firms with less than 40 per cent leverage are presented. Similarly, we have grouped firms based on their gearing ratio with a 40% cut-off and findings are presented in Columns 4 and 5.

Assets positively impacted export sales for all types of firms, leveraged or non-leveraged, low gearing or high gearing, While Asset tangibility negatively impacted export sales of all types of firms. Gearing hurt the exports of highly leveraged and high-gearing firms, while it positively impacted low-leveraged and low-gearing firms. The debt-to-equity ratio had a positive impact on all types of firms.

Table 18: GMM Estimates for Leveraged versus Non-Leveraged Firms

Explanatory Variables	Leveraged Firms	Non-Leveraged Firms	Gearing 40% and Above	Gearing less than 40%
Lagged Export Sales	0.353***	0.169***	0.316***	0.260***
	(0.004)	(0.002)	(0.003)	(0.003)
Log of Assets	0.736***	0.919***	1.209***	0.814***
	(0.022)	(0.013)	(0.024)	(0.012)
Asset Tangibility	-6.295***	-8.096***	-3.924***	-0.835***
	(0.109)	(0.128)	(0.092)	(0.075)
Debt to Equity Ratio	0.016***	0.143***	0.014***	0.013***

	(0.001)	(0.016)	(0.001)	(0.001)
Gearing	-0.101***	0.503***	-0.131***	0.006***
	(0.003)	(0.018)	(0.005)	(0.002)
Observations	4136	1234	4264	1106
Number of IDs	311	197	311	187
Year Dummies	Yes	Yes	Yes	Yes
F test	7305***	310006***	4877***	577014***
AR1/prob.	-8.4/0.00	-5.20/0.00	-7.06/0.00	-5.01/0.00
AR2/prob.	1.23/.22	0.75/0.45	1.11/.26	1.49/0.13
Sargan/prob.	242.65/0.08	142.67/0.99	225.92/0.275	138.67/0.99
Hansen/prob.	243.49/0.08	160.78/0.99	255.5/0.029	155.7/0.99
Controls	Yes	Yes	Yes	Yes

*Note: i) Robust standard errors are reported in parentheses; ii) *** denotes p<0.01, ** p<0.05 and * p<0.1, respectively; iii) F is a Wald test of the joint significance of the reported coefficients; iv) AR(1) and AR(2) are serial correlation tests of order 1 and 2 using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation; v) Hansen is a test of the over-identifying restrictions, asymptotically distributed as under the null of no correlation between the instruments and the error term, the p-value is given after /; vi) all equations include RETA, OINS, risk premium, trade openness, and quantum index as control variables.*

Table 19 captures the capital structure of the firms in terms of equity. The firms are grouped based on their equity ratio, with an equity ratio of more than 40 per cent in one group and less than 40 per cent in the second group. The majority of the coefficients were significant with previous signs. Gearing was negative for high-equity firms.

Table 19: GMM Estimates Equity versus non-equity based

Explanatory Variables	Equity More than 40%	Equity Less Than 40%
Lagged Export Sales	0.414***	0.009
	(0.004)	(0.011)
Log of Assets	0.781***	2.621***
	(0.029)	(0.075)
Asset Tangibility	-5.440***	-3.690***
	(0.075)	(0.336)
Debt to Equity Ratio	0.018***	0.004***
	(0.002)	(0.000)
Gearing	-0.123***	-0.010
	(0.005)	(0.006)
Observations	4,667	703
Number of IDs	314	154
Year Dummies	Yes	Yes
F test	7657***	988067***
AR1/prob.	-9.26/0.00	-3.18/0.00
AR2/prob.	1.13/0.25	0.01/0.92
Sargan/prob.	230.28/0.21	77.68/0.99
Hansen/prob.	251.02/0.042	108.4/0.99
Controls	Yes	Yes

*Note: i) Robust standard errors are reported in parentheses; ii) *** denotes p<0.01, ** p<0.05 and * p<0.1, respectively; iii) F is a Wald test of the joint significance of the reported coefficients; iv) AR(1)*

In Table 20, we have divided firms into four groups based on their size. The firms' assets measured in million PKR were used for this breakdown. The State Bank of Pakistan specifies firms as medium-sized if they have assets worth PKR 300 million or less, while firms with more than PKR 300 million assets are termed large-sized firms. In our dataset, the majority of the firms were large-sized, with 86 per cent of them having assets of more than PKR 300 million. Therefore, we further categorised large-sized firms into three categories to dig deeper into the dynamics of firm size. The first category consisted of firms having assets worth PKR 300 million or less. The next category was large firms with assets from PKR 300 million to PKR 1,625.6 million (the 50th percentile). The third category included firms from the 50th to 75th percentile having assets between PKR 1,625.7 to 5,318.8 million. Moreover, the fourth category included firms above the 75th percentile in terms of assets.

Assets had a positive impact on export sales of all-sized firms. At the same time, asset tangibility was negative for the first three categories and positive for the top firms. The debt-to-equity ratio had a positive impact on sales of firms of all sizes. Gearing harmed the sales of firms medium-sized firms and had a positive impact on the bottom and top firms but it turned positive for the top quantile. This result coincides with the financial leverage result. Moreover, similar logic may be proposed for this finding as well.

Table 20: GMM Estimates (Size-Wise)

Explanatory Variables	Medium-sized Firms with assets less than 300 million Rs	Large-sized Firms in 25-50% quintiles	Large-sized Firms in 50-75% quintiles	Large-sized Firms in Above 75% quintiles
Lagged Export Sales	0.253***	0.087***	0.241***	0.262***
	(0.019)	(0.004)	(0.001)	(0.004)
Log of Assets	0.172***	1.809***	0.315***	0.396***
	(0.056)	(0.036)	(0.029)	(0.044)
Asset Tangibility	-0.658***	-3.210***	-10.417***	2.294***
	(0.184)	(0.185)	(0.099)	(0.208)
Debt to Equity Ratio	0.007***	0.004***	0.016***	0.002***
	(0.002)	(0.000)	(0.001)	(0.000)
Gearing	0.021**	-0.017***	-0.020***	0.047***
	(0.010)	(0.004)	(0.002)	(0.008)
Observations	701	1,799	1,412	1,458
Number of IDs	110	217	194	143
Year Dummies	Yes	Yes	Yes	Yes
F test	297423***	218777***	220006***	329109***
AR1/prob.	-3.35/0.00	-6.78/0.00	-5.19/0.00	-4.38/0.00
AR2/prob.	1.24/0.21	1.59/0.11	0.55/0.58	0.70/0.84
Sargan/prob.	100.73/0.99	139.5/0.99	211.19/0.54	167.7/0.99

Hansen/prob.	72.19/0.99	159.5/0.99	157.5/0.99	121.69/0.99
Controls	Yes	Yes	Yes	Yes

Next, we created sub-samples of firms based on sectors the results of which are given in Table 21. The first sub-sector is textile, which comprised almost 43 per cent of the firms, and the second is the other manufacturing consisting of 10 per cent of firms in the dataset. The third sub-group is the food sector and sugar, with 10 per cent of firms, and the fourth is chemical and pharma, which comprised 8 per cent of firms in our dataset. The fifth group consists of all other firms. The results remain consistent with the previous results for the first two sectors. However, the financial inclusion indicators became insignificant in the next three sectors.

Table 21: Sector-Wise GMM Estimates

Explanatory Variables	Textile	Other Manufacturing	Food Sector and Sugar	Chemical and Pharma	Others
Lagged Export Sales	0.404***	-0.207	-0.247	-0.806	0.186***
	(0.004)	(0.490)	(0.794)	(0.904)	(0.033)
Log of Assets	1.197***	8.938	1.244	-1.465	0.925***
	(0.018)	(10.598)	(1.241)	(1.270)	(0.176)
Asset Tangibility	-6.745***	-65.638	29.204	-0.752	-0.662
	(0.119)	(60.164)	(39.294)	(10.879)	(1.462)
Debt to Equity Ratio	0.001	13.123	-0.406	-0.249	0.000
	(0.001)	(8.574)	(0.374)	(1.009)	(0.002)
Gearing	-0.050***	-23.543*	-0.433	-0.191	0.004
	(0.002)	(13.570)	(1.448)	(0.267)	(0.035)
Observations	2,338	486	568	538	1,440
Number of IDs	147	27	31	33	81
Year Dummies	Yes	Yes	Yes	Yes	Yes
F test	49802***	94.18***	232.79***	149.8***	2475***
AR1/prob.	-7.02/0.00	-1.11/0.26	-1.05/0.29	-0.51/0.61	-5.01/0.00
AR2/prob.	0.84/0.39	0.06/0.95	-0.79/0.432	-0.61/0.54	1.44/0.15
Sargan/prob.	241.08/0.08	88.2/0.99	113.23/0.99	111.4/0.99	118.77/0.99
Hansen/prob.	125.18/0.99	0.00/1.0	3.58/0.99	7.78/0.99	64.26/0.99
Controls	Yes	Yes	Yes	Yes	Yes

Discussion

This positive impact of assets implies that firms with larger resources/assets tend to increase exports. Exporting firms bear certain fixed costs to acquire enabling factors, such as license and shipping. Firms having larger assets and resources increase their exports. On the other hand, small firms are less likely to export subject to financial resource constraints (Williams, 2011). These results align with other studies (Sousa, Martínez-López, & Coelho, 2008).

Acquiring external finance requires collateral that ensures debt backup and returns. Therefore, firms often need larger fixed assets to secure formal financial institution loans. It implies that firms with larger fixed assets are more likely to acquire external loans. Firms acquiring loans from commercial banks subject to collaterals in developed and developing economies differ.

Enterprises in developing economies, where financial development is less developed, have the comparative advantage of tangible assets in determining international trade. Tangible assets play a significant role in terms of availing external financial resources. It is used as collateral to secure external loans and protect financers against possible default on the debtors' end (Braun, 2003). In the case of advanced economies with higher levels of financial development, intangible assets play a significant role in determining firms' export performances instead of tangible assets Hur and Raj (2006). One plausible explanation can be that firms in advanced economies use intangible assets to secure a loan that leads to higher exports. An enterprise invests more in intangible assets to secure external loans in a country with higher financial development and an effective legal system (Giannetti, 2003).

However, in this study, the results related to asset tangibility indicate that the capital formation of fixed assets concerning a firm's total assets undermines export performances. The inverse impact of asset tangibility may be that the firm more probably diverts its financial resources from financing export activities toward larger fixed assets development. The study focuses on Pakistan's larger manufacturing sector firms listed on the Pakistan Stock Exchange operating in an almost developed economic environment. Therefore, to secure an external loan, relying on fixed assets to secure a loan may be costlier than depending on intangible assets that back up an external loan. (Bridges & Guariglia , 2008).

Gearing shows the firm's financial inclusion and access to external financial resources. The results imply that firms relying more on external debt to finance assets and activities are more likely to enhance exports. Qasim, Rizov, and Zhang (2020) empirically investigate the response of financial constraints to the export decisions of Pakistani firms. The study showed that financial constraint was a significant factor affecting the exporting decisions of Pakistan's firms. Along with the significant impact on export and exporting decisions, it had an impact on the exporting tendency of firms. Attempts to gain access to finance ensure export enhancement.

The debt-to-equity ratio is the relative ratio of the creditor's fund versus shareholder equity. The construct shows the firm's total debt concerning shareholder equity. The reported results indicate that the acquired debt can encourage export performances for firms acquiring higher debt than shareholder equity. Harrison, Lin, and Xu (2022) reported that other key factors, such as lack of infrastructure, political competition, and firms' access to finance, define firms' growth and export performance. Efobi, Orkoh, and Atata (2018) found through a quasi-experiment that formal financial services increased firms' exports. In addition, the study argued that access to formal debt enhanced firms' export capacity.

The present study also used macro controls, such as trade openness, industrial production, risk premium, and exchange rate. Several studies investigated the macro environment's role in

determining a country's economic growth and export performance. For instance, a macro variable, trade openness, is positively associated with economic growth. Several studies have reported that trade openness positively and significantly affects economic growth (Romer & Frankel, 1999). Fatima et al. (2020) argued that trade openness was negatively related to GDP growth and was subject to low-level human capital accumulation. Usman (2014) concluded that trade openness improved export performance in the primary, manufacturing, and service sectors of Pakistan. The study considered the importance of exchange rates in the context of export performance. As per the findings of the study and as per theory and literature, the study concluded that for better export performance sound macro environment was equally crucial. Specifically, exchange rate stability, trade liberalisation and openness, sound industrial production environment, human capital accumulation, political stability, and the firm's financial inclusion led to higher export performances.

EMPIRICAL MODEL-BASED POLICY RECOMMENDATIONS

⇒ Firms, especially manufacturing firms, need to enhance their assets/resources, which significantly impacts firms' export performance.

⇒ Asset tangibility depicts a negative relationship with export performance in the LSM sector of Pakistan. A greater proportion of fixed assets as part of total assets undermines the export performance. This result is consistent for all sample estimates. The result also suggests that the composition of assets for the LSM sector of Pakistan must factor in the development of intangible assets, as in the case of developed countries having high levels of financial development, intangible assets, such as property rights play a significant role in firms' export performances.

⇒ The highly significant and negative sign for high-gearing firms is in line with the literature that increasing a firm's leverage ratio beyond a certain threshold increases the failure probability of domestic firms (Bridges & Guariglia, 2018).

⇒ For export orientation, the capital structure needs to be leverage-based, as the ratios for leverage/debt significantly enhance export sales performance. The formal line of credit, ensuring leverage, is a workable phenomenon for facilitating the export performance of the LSM of Pakistan.

Recommendations for Stakeholders

For State Bank:

• Policies such as the Export Finance Scheme (EFS) and Long-Term Finance Facility (TFS), which were in place for two years by the SBP, under which loans were given to exporters at low policy rates, are needed.

• It is high time that TERF, which was extended to exporters and local manufacturers during COVID-19, is resumed for exporting manufacturers, if not for all.

• Diaspora bonds for industries in the Far East (3 years-5 years)

• Collateral issue

• Establish a more predictable exchange rate regime for exporting firms. East Asia has had a dual exchange rate for a long time as they want to facilitate exports).

- There is a need to focus upon:
  - Availability and ability to raise the debt
  - availability and ability to raise equity

- Planning Commission and BOI must sit together and bring regulatory reform that the OFDI must go to exporting firms, which currently going mostly to domestic consumption, i.e., iron, cement, leather, footwear, etc.)

- There must be a sound investment policy that creates room for:
  - FDI for exporting firms
  - Joint ventures with exporting firms

For Planning Commission

- The PSDP for economic ministries must be carefully reviewed, such as industry, food security, and commerce.

- The evaluation of the PSDP portfolio of how the PSDP outlay facilitates exporting firms (in general and particularly in economic ministries).

- There are barriers to scaling up, i.e., why exporters cannot increase exports or handle big orders. Big orders are going to Bangladesh and India. Pakistan focuses more on SME exports and not on large exports even in the textile sector. The Planning Commission needs a sector-wise diagnostic.

For the Finance Ministry and the SECP

- They need to look into why is the asset base of the enterprise sector locked and why it does not grow in terms of GFCF (gross fixed capital formation).

- A 'sandbox' by SECP is needed.

- Further, a burning issue is that the accumulation of debt is not allowed by 'crowdsourcing,' while raising equity from crowdsourcing is allowed even though debt is much cheaper than equity.

- Even though there is s a working committee on the FATF, there appears to be a decision paralysis.

For Finance Ministry

- Since the phenomenal increase in the policy rate, the private sector has been shedding credit. Also, 80% of domestic borrowing is by the government. So loanable funds are reduced from two angles:
  - Domestic borrowing
  - Less supply of loanable funds

- Since exports pick up at a floating rate, when the policy rate increases, loans become expensive and the exporter returns credit. This also hinders asset creation.

- The SBP may increase the rate but must manage exporters at a lower rate.

- The issue of EXIM Bank: The EXIM Bank (The Export-Import Bank) was established for this purpose by the World Bank to smooth the business cycle. However, no single entity can continue export financing.

- SBP was to put an exchange reserve in the EXIM Bank for exports but there is now an impasse due to the economic meltdown.

For the Ministry of Commerce

- National Tariff Policy (Component of tariff on imported inputs): This policy has an anti-export bias as tariff rates are too high for imports. If textile sector dyes are to come, then the tariffs must be at least at the level of Bangladesh.

- Further, the 3-year trade policy by the Ministry of Commerce (STPF) focuses on increased asset creation and size. However, considering the current crisis that Pakistan is facing, this policy needs to be reviewed/revised. It had very little focus on a few sectors. The number of focused sectors needs to be increased.

Ministries of Industries and Production

There are two organizations under MOIP

1. EDB (Engineering Development Board): The ratio of input/output is decided by the EDB, i.e., how much of an imported input is allowed to exporters. This input-output assessment, again, has an anti-export bias. Some can import, others cannot, which is discriminatory and needs to be deliberated upon for manufacturing exporters.

2. SMEDA:

- SMEDA should partner with PIDE on the issue of why only established exporters and not exporters are present in manufacturing after 2013 and why this list has not changed over time.

- SMEDA must look into barriers to entry, i.e., why SMEs do not become exporters, and what are the challenges to new entrants in the export segment.

CPEC LTP (Long-Term Plan)

- It is time to review why the goals outlined in LTP have not been fulfilled, such as China-bound goals.

- Rethinking CPEC LTP

- Overlapping is another issue. Provincial P&Ds, in their development budget, allocate budget for "Industrial Development," and there is considerable misalignment and duplication, e.g., in the Hattar Industrial Estate, KPK, is already established, and the Federal placed STZA.

- Why is the Cabinet Committee on Export Promotion dormant?

CONTRIBUTION

The present study thoroughly investigated and analysed the large-scale manufacturing sector's data comprising thousands of balance sheets and firms' export performance. Seminal study as per scale of data and diss-aggregated analysis of the LSM sector of Pakistan from multiple angles. The study has the following contributions:

- This study goes beyond and assesses the capital structure of the LSM concerning Export performance.

- The study employs holistic debt ratios. It captures the debt burden relative to firms' equity and total capital employed.

- Based on the firm's size and the firm's capital structure, the study estimated thresholds where leverage is useful and positively impacts export sales performance.

- The study contributes that over-access to external debt largely has critical implications for high-gearing firms, as after a certain threshold, any additional debt increases the probability of risk and firms' ability to meet debt repayments rather than to increase exports.

FUTURE RESEARCH

The exchange rate needs to be factored in to capture the over-appreciation paradigm, continuing for years in this framework of export performance.

The firm's investment and export nexus needs to be explored further. Since, as per our analysis, the risk premium is negative, investment in long-term and short-term government bonds/securities may not be the optimal option as the sample period of two decades has seen a bullish trend in investing in these instruments, therefore, this aspect needs to be investigated empirically.

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