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Firms Financial Inclusion and Export Performance: Evidence from Manufacturing Sector Firms in Pakistan

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Financial inclusion of firms is crucial to create jobs, boost economic growth, and promote sustainable development. The study examines how financial inclusion affects enterprise export performance based on access to finance ratios. The study analyses the effects of firms' financial inclusion determinants and macro environment factors on firms' export values. The data comes from Pakistan's manufacturing sector covering 400 firms listed on Pakistan Stock Exchange from 1999-2021. Driven by the nature of the data, the Method of Moment Quantile Regression is employed to assess the below and above mean regression estimations, and a two-step system GMM approach is used to address endogeneity concerns. The results of the study are robust against different specifications. The study reveals that assets positively impact a firm's export performance, emphasising the importance of asset investment for foreign market competition. Asset tangibility negatively impacts export performance, except for low-gearing corporations, and fixed assets dominate. A balanced asset mix is crucial for improving exports. Debt-to-equity ratios, except for high-gearing firms, boost export performance, but domestic firms with high leverage ratios are more likely to fail. To avoid excessive leverage risks, firms must balance debt and equity. Diversifying the asset mix to include liquid and intellectual property can boost export success. Gearing affects export performance differently depending on a firm's debt levels. Low-geared enterprises can leverage assets and debt to boost exports, while high-geared enterprises may be financially constrained and face challenges from excessive debt. Therefore, enterprises must carefully examine their gearing levels and make informed decisions on optimising their asset composition for optimal export performance. The study also opens up the possibility of further research on the role of exchange rates and firms' investment in line with export performance.

JEL Classification: M10, M14, M19

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1. INTRODUCTION

The post-1990s literature, both theoretical and empirical, shows a positive association of financial development with economic growth and firms' performance

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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 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 firms' improved financial access to formal financial institutions address medium-plus long-term financial constraints and increase firms' profitability and production in developing countries. (Allen, et al. 2020; Triki & Gaj Igo, 2014).

It is imperative in emerging economies to investigate 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 percent, financial development plays little role in determining economic growth (Rioja & Valev, 2007). Chauvet & Jacoline (2015) argue that financial development plays a significant role in a firm's economic growth conditioned to high financial inclusion. And that firms' access to finance is positively associated with firms performance and growth (Chauvet & Jacoline, 2017).

A firm's financial inclusion 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). Ayesha & Khatoon (2021) argue 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); Safeer, et al. (2019); 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 despite remedial measures. Moreover, export statistics show that Pakistan' 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.

For business enterprises, financial inclusion implies acquiring loan from commercial banks which can boost firm's production and exports. Similarly, 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 (Ayesha & Khatoon, 2021). In addition, the financial inclusion of firms in developed and developing economies is different. In developed economies where financial development level is high, firms use intangible assets, such as property rights, to secure external loans for better firm performance. while, in developing countries where 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 that the financial inclusion of a firm is an important determinant of its export performance. However, it may not be the one-size-fit-all- solution for firms export.

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 robust econometrics techniques to quantify the impact of firms' financial health and export performance.

The study has important implications for policymaers. Firms greater access to formal financial institution services can potentially boost up firms export performances, and that could envetually improves the current account balance and export-led economic growth of a country. The objectives of the study are to investigate the impact of financial inclusion of large-scale manufacturing sector firms on their export performance, to quantify the impact of firm financial determinants and macro environment on a firm's export values, and 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. 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. The study exploit large panel dataset comprised 6,000 observations from 400 firms listed on Pakistan Stock Exchange, covering time period 1999-2020.

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. Pakistan's manufacturing sector's export and overall performance have been in-impressive and below its potentials for years. The manufacturing sector has further linkages with other sectors and has greater implications for the overall macroeconomic indicators. Hence, evidence-based policy is required to address the 'haves not' of firm operating in the manufacturing sector of Pakistan. Secondly, 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. Therefore, the study highlights the significance of firms' financial inslucion and firms' export performance at policy level.

The rest of the paper includes sections on literature review, data and methods, results and conlusion.

2. 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 firm's export supply side are domestic investment, gross capital formation, domestic production, foreign direct investment, and relative price (Gul & Rehman, 2014). Both suplly and demand side determinents paly significant role in firm's export performance (Rahmaddi & Ichihashi, 2012; Jongwanich, 2010; Roy, 2007; Funke & Holly, 1992).

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, 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, and managerial characteristics (see Aaby & Slater, 1989; Zou & Stan, 1998; Moen, 1999). On the other hand, the external factors are, based on the contingency theory, suggests that foreign market instincts, such as cultural similarities, government regulations, market competitiveness, and local business impact firms' export performance (see Erramilli & Rao, 1993; Styles & Ambler, 1994). Other factors affecting 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. Financial constraint was a significant factor affecting the exporting decisions and export tendency in Pakistan (Qasim, Rizov, & Zhang, 2020; Kazmi, Imran, & Khan, 2020)

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, Salman, & Shamsi (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.

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 & 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.. Likewise, Harrison, Lin, & Xu (2013) addressed key factors explaining Africa's economic performance. Efobi, Orkoh, & 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. Silva (2011) analysed the effect of international trade on firms' financial health. Arguing that international trade is a smooth path for exporting firms to enhance their financial health compared to non-exporter firms.

Kumarasamy and Singh (2018) study indicated that access to formal finance enables enterprises to enter the international market.. Ayesha and Khatoon (2021) study found that financial inclusion has a considerable impact on export market penetration. Greenaway, Guariglia, & Kneller (2007) 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. Stiebale (2011) reported no evidence that financial constraint mattered for a firm's exporting decision. In line with former studies, Bridges & Guariglia (2008) repored results show financial indicators either did not have a significant or a minimal impact on internationally engaged firms.

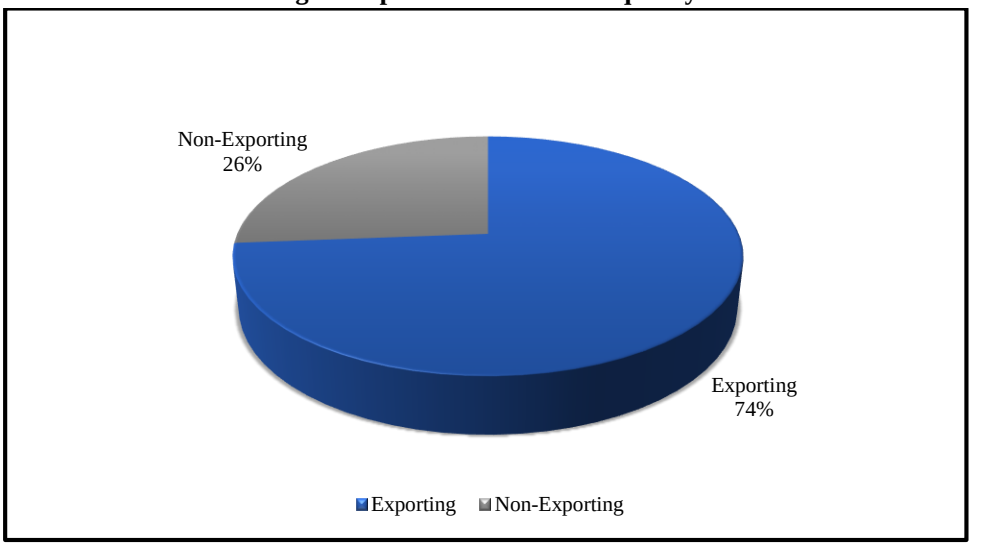
The documented literature pertinent to the linkages between firms' financial health and export performance exhibits contrasting results and conclusions. Studies that have used firm-level data for developed countries report either a significant or insignificant impact on a firm's financial health variables, such as liquidity ratio, leverage ratio, and collateral ratio on their export performance (for details, see Greenaway, Guariglia, & Kneller, 2007; Bridges & Guariglia, 2008); Stiebale, 2011, etc.). On the other hand, literature emerging from developing economies noted financial constraint as a key factor affecting firm's economic growth, performance, and export performance of fimrs, details, see Chauvet & Jaclin (2015); Harrison, Lin & Xu (2013); Silva (2011); Kumarasamy & Singh (2017); Kazmi, Imran, & Khan (2020).

3. DATA

3.1. Data Description

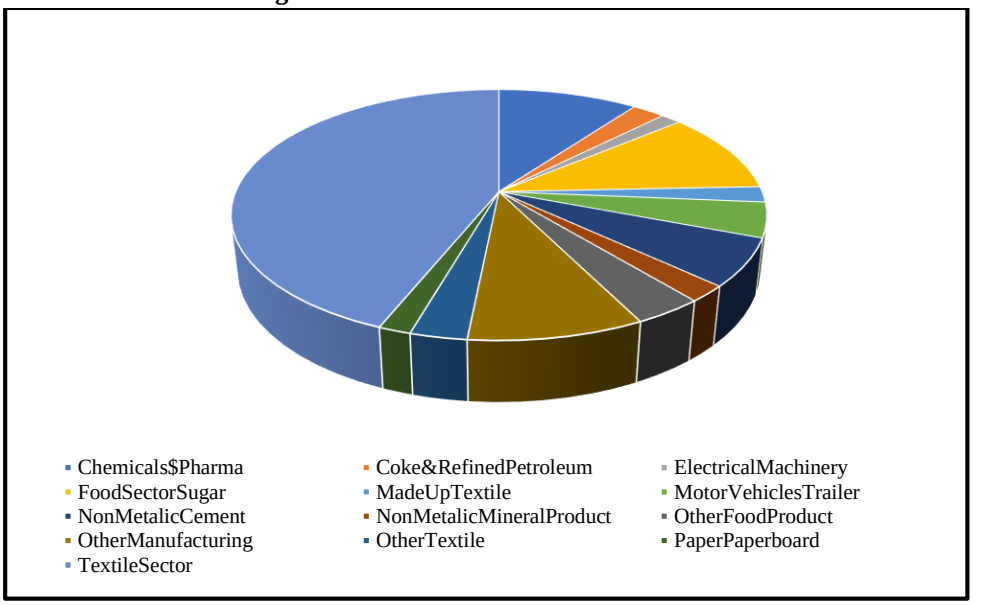
The section presents the essential features of the data. We initially digitalised data of 427 firms from 1999 to 2020. Out of 427 firms, 319 firms had positive export sales, see Figure 1. Therefore, we picked the firms exporting in any of the years for our analysis.

Fig. 1. Export-wise Firm's Frequency



Source: Authors' calculation.

Fig. 2. Sector-Wise Distribution of Firm.



Note: Author Calculations.

Figure 2 presents the sector-wise distribution of our dataset. The 315 firms broadly belonged to 15 sectors. Textile was the largest sector with almost 44 percent of the firms belonging to this sector. Chemical and pharma was the second largest sector with 10 percent 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 aims to measure the impact of financial inclusion indicators on the export performance of firms in Pakistan. Four proxies are used, including total assets, asset tangibility, debt-to-equity ratio, and gearing. The first indicator is the firm's total assets taken from its balance sheets in Pak Rupees. The second indicator is asset tangibility, which is the ratio of tangible assets to the firm's total assets. The third indicator is the debt-to-equity ratio, which is the ratio of total debt to total equity for companies using debt financing. The fourth indicator is gearing, which measures the degree to which a firm's activities are funded by owner funds versus creditor funds.

Two firm-level variables were used as control variables in the model: RETA (retained earnings to total assets ratio) and OINS (operating income to net sales ratio). RETA gauges accumulative profit over time, while OINS considers operating income and fixed expenses. The study also considered three macro-level controls: trade openness (the ratio of exports and imports to GDP) and the risk premium (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}. Detail of variables' description is given in Table 1. And detail of variables construction is given in Table 2 (See Appendix).

Table 1

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	
Asset Tangibility		Fixed Assets/Total Assets	
Debt to Equity Ratio		Total Debt/Total Equity	
Gearing		Gearing is the Total Debt to Total Capital Employed ratio	
RETA	Micro Controls	Retained Earnings to Total Assets	
OINS		Operating Income to Net Sales ratio	
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	

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

3.2. Methodology

The study aimed to select the best estimation technique by testing data properties. Descriptive statistics are used to calculate the mean, median, and range of variables, as well as the standard deviation of values. The study also used skewness and Kurtosis to check for data normality, a method developed by Jarque & Bera in 1987. This test determines if data are normally distributed by examining skewness and excess Kurtosis, resulting in normality statistics.

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

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

The study examines the impact of macroeconomic factors on firms, focusing on panel cross-section dependence and slope heterogeneity. Firms may become dependent on each other due to changes in laws or policies, leading to cross-sectional dependence. These factors can cause problems in econometric analysis. The study uses the Pesaran and Yamagata (2008) slope coefficient homogeneity (SCH) test and the Pesaran (2021) cross-sectional dependence test to determine if a phenomenon is homogeneous or heterogeneous.The SCH formula is:

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

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

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

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:

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

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. The study utilised the Fisher test to confirm heterogeneous slope coefficients and cross-sectional dependency, which is simpler and easier to use than the IPS test. It does not require a balanced panel and can be applied to any derived unit root test. The Fisher test, proposed over 60 years ago by R. A. Fisher, is a simple and easy-to-use method, unlike the Levin-Lin and Im-Pesaran-Shin (IPS) panel data unit root tests.

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 & Bassett Jr. (1978). Even with irregularly distributed variables, quantile regression produces reliable results. The current study used Machado & 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:

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

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 S exhibits the k-vector of predictable X elements that are variation conversions $\sim$ as follows:

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

According to Machado & 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:

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

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:

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

Where

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

Specifies check function.

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

$$Export\ Value_{it} = \alpha + \beta\ Financial\ Inclusion\ Indicators_{it} + \gamma Firm\ Level\ Controls_{it} + \delta\ Macro\ Level\ Controls_t + \epsilon_{it} \quad \ldots \quad (17)$$

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 are done on the full sample and then by disaggregating the sample by leverage structure, gearing, equity, sise, and sectors. The firms are 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 percent leverage ratio and Category 2 includes firms with less than 40 percent leverage. We grouped firms based on their gearing ratio with a 40 percent 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 percent in the second group.

Next, we have divided firms into four groups based on their sise. We have four categories of firms in terms of sise. 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 percent of the firms and the second is the other manufacturing consisting of 10 percent of firms in the dataset. The third subgroup is the food sector and sugar, with 10 percent of firms, and the fourth is chemical and pharma, which comprises 8 percent of firms in our data set. The fifth group consists of all other firms.

Endogeneity is a significant issue in business and management research that relies on regression analysis for causal inferences. It can occur due to the omission of explanatory variables, causing the error term to be correlated with the explanatory variables, or due to the dependent variable being influenced by one or several explanatory variables (Abdallah, et al. 2015).We employed a two-step system GMM approach to address this issue to minimise endogeneity issues

4. RESULTS AND DISCUSSION

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 3), the mean values of all variables except OINS, risk premium, and trade openness are positive.

Table 3

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Log of Export Sales	6,025	8.358	6.291	0.000	17.686
Log of Assets		14.321	1.988	-0.415	19.920
Financial Leverage		8.455	181.407	0.001	5,689.051
Asset Tangibility		0.519	0.239	0.000	3.658
Debt to Equity Ratio		0.895	39.256	-1,649.833	1,043.087
Gearing		2.407	92.761	-428.319	6,593.232
RETA		0.163	0.857	-5.467	35.954
OINS		-1.167	13.613	-572.213	3.902
Quantum Index		123.865	17.628	100.000	173.000
Trade Openness		-0.093	0.025	-0.133	-0.048
Risk Premium		-0.952	1.143	-4.067	1.820

Source: Author calculations.

The study used skewness and Kurtosis tests to confirm the normality of each variable. The normality test results are presented in Table 4. The joint test of skewness and Kurtosis, Jarque & Bera (1987) provide significant estimates for all variables, considering excess Kurtosis and skewness. The null hypothesis of normality is rejected, as the variables' prob>chi (2) values were less than 0.05.

Table 4

Normality Test

	Skewness	Kurtosis	Jarque-Bera Test	
Variable	Prob>chi2	Prob>chi2	chi2(2)	Prob>chi2
Log of Export Sales	0.00	0.00	7.83.7	0.00
Log of Assets	0.00	0.00	4.20E+04	0.00
Asset Tangibility	0.00	0.00	8529	0.00
Debt to Equity Ratio	0.00	0.00	1.90E+08	0.00
Gearing	0.00	0.00	4.70E+09	0.00
RETA	0.00	0.00	2.50E+08	0.00
OINS	0.00	0.00	2.40E+08	0.00
Quantum Index	0.00	0.00	903.3	0.00
Trade Openness	0.0025	0.002	405.7	0.00
Risk Premium	0.00	0.00	710.4	0.00

Source: Authors' calculations.

A firm's dependence on other firms for economic and non-economic reasons leads to similarities and differences. The Pesaran and Yamagata (2008) SCH test results, given in Table 5 that slope heterogeneity or homogeneity may lead to inefficient estimation. Both SCH (delta) and adjusted SCH (delta adjusted) are indicating the possibility of rejecting the null hypothesis and slope coefficient homogeneity.

Table 5

Testing for Slope Heterogeneity

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

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

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 6). The null hypothesis of cross-sectional independence was rejected because all variables had high statistical significance.

Table 6

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***

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

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 7 presents the test results. Under mixed-order integration, all variables were found to be stationary.

Table 7

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

Order of Integration	Level				First Difference			
Variables	Inverse chi-squared P	Inverse normal S	Inverse logit t) L*	Modified inv. chi-squared-Pm	Inverse chi-squared P	Inverse normal S	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***

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

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. Results show that assets positively impact export sales, with the impact increasing as the quantiles increase. Asset tangibility negatively affects export sales, but weakens as the quantiles increase. Equity debt is insignificant for lower quantiles but positive and significant for upper quantiles. Gearing has overall positive signs and strengthens its impact as the quantiles increase.

Table 8

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

Source: Authors' calculations.

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 9 shows that assets positively impact exports in all quantiles of leveraged and non-leveraged firms, with stronger effects from low to top quantiles. Non-leveraged firms have larger coefficients, and assets have a greater impact if less leveraged. Asset tangibility harms both firms, with weaker effects from lower to higher quantiles. The debt-to-equity ratio is significant and positive only for leveraged firms, while gearing positively impacts export sales, with a more pronounced effect for non-leveraged firms.

Table 9

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

Source: Authors' calculations.

Note: See note of Table 8.

Table 10 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 percent gearing, further increases in gearing impacted their exports negatively.

Table 10

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

Source: Authors' calculations.
Note: See note of Table 8.

Table 11 shows that assets have a stable positive impact on export sales of low-equity and high-equity firms. Equity-based firms have a slightly increased impact, while low equity firms experience a decrease. Assets tangibility is mostly negative. High-equity firms have a positive debt-to-equity ratio, while low-equity firms have an insignificant impact. Gearing is positive and significant for high-equity firms, increasing export sales of equity-based firms but negatively impacting low-equity firms. Equity-based firms gain more from debt and gearing.

Table 11

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

Source: Authors' calculations.
Note: See note of Table 8.

Tables 12 and 13 below, present the results for firms segregated according to their sise. The study found that assets significantly impacted export sales of firms of all sises, with the effect being greater for firms within the 25th to 75th quintiles. Asset tangibility decreased export sales of medium-sised and large-sised firms up to the 75th quantile. Asset tangibility was positive for large firms above the 75th quantile. The debt-to-equity ratio was mostly insignificant. Gearing positively impacted export sales of bottom and top firms, while negatively impacted firms in the 50-75th quantiles.

Table 12

Quantile Regression Estimates

	Medium-sised firms with assets less than 300 million Rs				Large-sised Firms in 25- 50% quintiles			
Variables	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

Source: Authors' calculations.
Note: See note of Table 8.

Table 13

Quantile Regression Estimates

	Large-sised Firms in 50-75% quintiles				Large-sized Firms in Above 75% quintiles			
Variables	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

Source: Authors' calculations.
Note: See note of Table 8.

Tables 14 and 15 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 14

Quantile Regression Estimates

	Textile Sector				Other Small Sectors			
Variables	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

Source:Authors'calculations.

Note: See note of Table 8.

We have conducted robustness analysis of the estimates by using GMM approach and attached thei findibgs as a supplementary file due to word limit to this paper. All the estimations using alternative approach are reobust and endorse the MMQR findings.

Discussion

The positive impact of assets suggests that firms with larger resources tend to increase exports, despite bearing fixed costs for enabling factors like licenses and shipping. Small firms, however, are less likely to export due to financial constraints. (Williams, 2011). The study by Souza, Martínez-López, and Coelho (2008) suggests that firms with larger fixed assets are more likely to acquire external loans from commercial banks. This is due to the need for collateral to ensure debt backup and returns. The study also highlights the comparative advantage of tangible assets in developing economies, where financial development is less developed, in determining international trade.

Tangible assets are crucial in availing external financial resources and protecting financiers against potential default on the debtor's 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 & Raj, 2006). One plausible explanation can be that firms in advanced economies use intangible assets to secure loans, which 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).

The study reveals that a firm's capital formation of fixed assets can negatively impact export performance. This can lead to a firm diverting its financial resources from financing export activities to larger fixed asset development. The research focuses on Pakistan's larger manufacturing sector firms, listed on the Pakistan Stock Exchange, operating in a developed economic environment. Firms relying on fixed assets may be more costly to secure external loans than intangible assets. The study suggests that firms relying more on external debt to finance assets and activities are more likely to enhance exports (Qasim, Rizov, & Zhang, 2020). The study reveals that financial constraints significantly impact Pakistani firms' export decisions, influencing their exporting tendencies and the decision-making process. It suggests that gaining access to finance can enhance exports, highlighting the importance of understanding and addressing financial constraints in business operations.

Table 15

Table 15

Quantile Regression Estimates

	Other Manufacturing				Food Sector and Sugar				Chemical and Pharma			
Variables	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)	(0.230)	(0.230)	(0.135)	(0.089)	(0.080)	(0.081)
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)	(1.180)	(1.400)	(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)	(3.560)	(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

Source: Authors' calculations.
Note: See note of Table 8.

The debt-to-equity ratio, a measure of a firm's total debt relative to shareholder equity, suggests that firms with higher debt than shareholder equity can enhance export performance. Harrison, Lin, & 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, & 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.

5. CONCLUSION AND POLICY RECOMMENDATIONS

For businesses to provide employment, accelerate economic growth, and advance sustainable development, they must be financially included. Businesses can invest in growth, hire more staff, and spur innovation when they have access to inexpensive finance and financial services. Financial inclusion helps create a more inclusive and fair society by ensuring that small and medium-sized enterprises have equal access to resources and opportunities. Addressing problems including insufficient infrastructure for digital finance, a lack of financial awareness, and restricted access to formal banking services are part of this. By doing so, we can create an environment that fosters entrepreneurship, creates jobs, and drives economic growth, ultimately leading to a more sustainable and prosperous future for all.

The study examines how financial inclusion affects enterprise export performance based on access to finance ratios. The study examines the impact of financial inclusion determinants and macroenvironmental factors on export values in Pakistan's manufacturing sector. Data from 400 firms listed on the Pakistan Stock Exchange from 1999 to 2021 is used to analyse the data. The results show that assets positively influence export performance, emphasising the importance of asset investment for foreign market competition. Asset tangibility negatively impacts export performance, except for low-gearing corporations where fixed assets dominate. A balanced asset mix is crucial for improving exports. Debt-to-equity ratios boost export performance, but domestic firms with high leverage ratios are more likely to fail. To avoid excessive leverage risks, firms must balance debt and equity. Diversifying the asset mix to include liquid and intellectual property can boost export success. Gearing affects export performance differently depending on a firm's debt levels. Therefore, enterprises must carefully examine their gearing levels and make informed decisions on optimising their asset composition for optimal export performance.

Firms, especially manufacturing firms, need to enhance their assets and resources, which significantly impacts firms' export performance. The findings suggest that the composition of assets in the LSM sector should consider the development of intangible assets, as they play a significant role in firms' export performance in developed countries with high financial development. The capital structure of Pakistan's LSM should be leverage-based for export orientation, as ratios for leverage and debt significantly improve export sales performance, and a formal line of credit can facilitate this.The National Tariff Policy, which imposes high tariffs on imported inputs, has an anti-export bias. To introduce textile-sector dyes, tariffs must be at Bangladesh's level. The study contributes by analysing the large-scale manufacturing sector in Pakistan, focusing on thousands of balance sheets and firms' export performance. It goes beyond assessing the capital structure of the LSM sector and uses holistic debt ratios to capture the debt burden relative to firms' equity and total capital employed.

APPENDIX

Table 2

Variable Construction

DETERMINANTS OF FIRM'S FINANCIAL INCLUSION	
VARIABLES	**CONSTRUCTION**
Firms' Export	Log of firms' export values
Total Assets, Total Assets Growth	TA=B+A3, TAG=DLOG(TAM)
Total Assets Growth/ GNP price deflator	**SIZE= TAG/GNP DF 1974**
ASSET TANGIBILITY	FIX.A/TA=A3/B+A3
Fixed Assets/Total Assets	**ATNG = FIX.A/TA**
DEBT TO EQUITY RATIO	CL+TFL/SH.HLDR.EQ=C+D/E
Total Debt/Total Equity	**DBERM= CL+TFL/SH.EQ**
Current Lib+Total Fixed Lib/Shareholder's Equity	
GEARING	CL+TFL/TCAP EMP=C1+C2+D1+D3/E+D
Current Liabilities+Total Fixed Liabilities/Total Capital Employed	**GEAR = CL+TFL/TCAP EMP**
DUMMY VARIABLES	
GEAR%	**One if GEARING > 20-40%** (High Gearing)
Dummy Variable	**0 otherwise** (Low Gearing)
EQUITY%	**One is EQ.FINAN > 40%** (High Equity Fin)
Dummy Variable	**0 otherwise** (Low Equity Fin)
SPECIFIC DETERMINANTS FOR FIRMS: CAMEL CATEGORY	
***RETA (Assets)**	SURPLUS/TA= E3/B2+A3
Retained Earningotal Asset ratio	**RETA= SURPLUS/TA**
***OINS (Management & Earnings)**	GR.PROF-EXP/SALES= F3-F8/F1
Operating Income to Net Sales ratio	**OINS = GR.PROF-EXP/SALES**
CONSTRUCTION OF MACRO VARIABLES	
IP	Industrial Production Growth rate
DIP = DLOG (IP)	$DIP_t = \log IP_t - \log IP_{t-1}$
	Industrial Production: *Industrial Production Growth rate*
Trade Openness:	**Export-Import/Gdp**
	$INFT_t = \log CPI_t - \log CPI_{t-1}$
Risk Premium	***Risk Premium*: RP_t = LOW GB_t – LGB_t**
Low-Grade Govt Bond Return – Long-Term Govt Bond Return	

Robustness Check: GMM Estimates

Table 16

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.

Table 16 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 percent increase in assets brought 176 ($e^{1.013*\log(1.01)}$ = 1.76) percent 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 percent decrease in sales. From debt-related proxies of financial inclusion, gearing had a negative and significant impact on export sales.

The study reveals that a 10 percent increase in the proportion of creditor funds compared to a firm's owner fund to finance activities can decrease a firm's export performance by 10 percent. The debt-to-equity ratio, measured as total debt to total shareholder equity, has a positive and significant impact on export sales, with a one-unit increase bringing a 1.40 percent increase in export sales. Control variables all positively impacted export sales. A one-

percent increase in a firm's self-financing ratio tended to enhance export performance by 2 percent. A higher RETA ratio suggests that a firm has the potential to self-finance its capital expenditure rather than relying on external sources of finance.

Similarly, a one-percent increase in a firm's operational efficiency was associated with a one-percent increase in export performance. The quantum index, which shows national industrial production potentials, shows that a unit change in the industrial production Quantum Index brings about a 12-unit positive change in the firm's export performance. In Bangladesh's manufacturing sector, a 1.01 percent increase in exports was associated with a 1 percent increase in industrial production. Overall, these findings suggest that a firm's financial inclusion, self-financing, operational efficiency, and quantum index can significantly impact export performance. (Rehman, 2017).

In Table 17, 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 percent leverage ratio are presented and In Column 3, the firms with less than 40 percent leverage are presented. Similarly, we have grouped firms based on their gearing ratio with a 40 percent cut-off and findings are presented in Columns 4 and 5.

Table 17

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: See note of Table 16.

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 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 percent in one group and less than 40 percent in the second group. The majority of the coefficients were significant with previous signs. Gearing was negative for high-equity firms.

Table 18

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: See note of Table 16.

In Table 19, 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 19

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

Note: See note of Table 16.

Next, we created sub-samples of firms based on sectors the results of which are given in Table 20. The first sub-sector is textile, which comprised almost 43 percent of the firms, and the second is the other manufacturing consisting of 10 percent of firms in the dataset. The third sub-group is the food sector and sugar, with 10 percent of firms, and the fourth is chemical and pharma, which comprised 8 percent 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 20

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

Note: See note of Table 16.

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