IMPACT OF FINANCIAL INCLUSION ON FIRM PERFORMANCE: AN ANALYSIS OF LISTED NON-FINANCIAL FIRMS IN PSX

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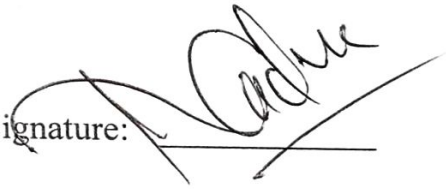
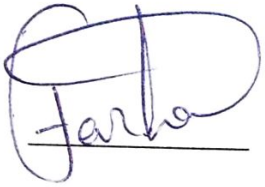
Supervisor: **Dr. Nadeem Ahmed Khan** Signature: 

Internal Examiner: **Dr. Farhat Mahmood** Signature: 

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Dedication

To the love of my Parents, for always supporting me!

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Abstract

This study investigates the impact of financial inclusion on firm financial performance for a panel of 304 non-financial firms listed on the Pakistan Stock Exchange (PSX) over the period 2010–2022, yielding 3,952 firm-year observations. The study employs Fixed Effects (FE) and Random Effects (RE) panel estimators with firm-clustered standard errors to address unobserved heterogeneity, serial correlation, and cross-sectional dependence. The Hausman test guides model selection; diagnostic tests including the Wooldridge test, modified Wald test, and Pesaran CD test confirm the need for clustered standard errors throughout.

The key findings are fourfold. First, financial inclusion exerts a significant negative effect on Return on Assets ($\beta = -0.005$, $p < 0.01$), suggesting that deeper financial markets compress incumbent firm margins through competitive entry. Second, the Debt-to-Equity ratio consistently and strongly reduces Return on Equity ($\beta = -0.055$, $p < 0.01$) across all specifications, supporting financial distress cost theory over the tax shield hypothesis in the Pakistani corporate context. Third, sales growth positively and significantly affects both ROA and ROE, emerging as a robust performance driver following outlier control through winsorization. Fourth, sectoral analysis reveals that the financial inclusion effect is concentrated in competitive, low-margin sectors (Textile, Sugar, Chemicals) while oligopolistic sectors (Fertilizer, Tobacco, Cement) are structurally protected — a finding confirmed by Chow tests ($F = 14.90$, $p < 0.001$). Mediation analysis following Baron and Kenny (1986) confirms that the Debt-to-Equity ratio does not mediate the financial inclusion–profitability relationship; both operate as independent, non-overlapping determinants of firm performance.

The findings contribute to the literature on financial development, capital structure, and firm performance in emerging markets, and carry direct policy implications for Pakistan's National Financial Inclusion Strategy (NFIS 2024–2028).

Keywords: Financial inclusion, firm performance, return on assets, return on equity, capital structure, panel data, Pakistan Stock Exchange, fixed effects, random effects

List of Abbreviations

Abbreviation	Full Form
ADF	Augmented Dickey-Fuller Test
BOP	Balance of Payments
CD	Cross-Sectional Dependence
CPEC	China-Pakistan Economic Corridor
CSD	Cross-Sectional Dependence
D/E	Debt-to-Equity Ratio
ESG	Environmental, Social and Governance
FE	Fixed Effects
FI	Financial Inclusion
GDP	Gross Domestic Product
GLS	Generalised Least Squares
GMM	Generalised Method of Moments
IMF	International Monetary Fund
KSE	Karachi Stock Exchange
MM	Modigliani-Miller Theorem
NFIS	National Financial Inclusion Strategy
OLS	Ordinary Least Squares
PMKJ	Prime Minister's Kamyab Jawan Programme
PSX	Pakistan Stock Exchange
RE	Random Effects
ROA	Return on Assets
ROE	Return on Equity
SBP	State Bank of Pakistan
SD	Standard Deviation
SE	Standard Error
SME	Small and Medium Enterprise
2SLS	Two-Stage Least Squares

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Contents

CHAPTER 1. INTRODUCTION

Financial inclusion refers to the supply and the accessibility of affordable financial services by the disadvantaged, marginalized or low-income groups ((Vo, Van, Dinh and Ho, 2020). Financial inclusion is intended to offer formal financial assistance in the form of such matters as basic accounts, credit facilities, payment services, and insurance (Demirguc-Kunt and Singer, 2017). Financial inclusion in this study is a process of making sure that all adults have access to fundamental financial services by the regulated financial sector in a fair way (Ozili, 2018). Financial inclusion can be described as the delivery of access to financial products and services to individuals and businesses, making them part of the economy. According to Oz Yalaman (2019), there is a sustainable and ethical provision of electronic transactions, payments, savings, credits, and insurance. Therefore, financial inclusion refers to the existence, accessibility, and use of financial services. What causes it to become an important policy problem because it can contribute to the overall economic development (Pham, Nguyen and Nguyen, 2019).

A substantial body of empirical research has examined the link between financial inclusion, access to credit, and firm performance. (Beck et al., 2005) conducted a global study that found financial inclusion through access to credit has a positive impact on firm growth and firm performance. They highlighted that SMEs in countries with more inclusive financial systems grow faster than those in countries where credit is concentrated in a few large firms. This growth, they argue, is facilitated by credit access which mitigates financing constraints and enables firms to invest in expansion, research and development.

In a similar study (Ayyagari et al., 2011)) found that access to credit was a major factor contributing to the improved performance of firms in emerging markets. Their study indicated that firms with better access to credit had higher returns on assets (ROA) and were more likely to grow at faster rates. These finding were supported by studies in African countries as well, where access to finance was found to improve firm profitability, product innovation, and productivity (Harrison et al., 2013). These collectively suggest that access to credit, as a key component of financial inclusion, significantly enhances firm performance by enabling businesses to invest in productive activities scale operations.

The theoretical mechanism is the financial intermediation theory, which states that financial systems, particularly banks, act as intermediaries that allocate resources efficiently (Schumpeter,1934). When firms have access to credit, they can overcome liquidity constraints, facilitating investment in capital, expansion and new technologies that ultimately drive performance (Fazzari et al., 1988). On the other hand, credit

rationing theory suggests that small and medium-sized firms are often excluded from credit markets due to information asymmetries, leaving them constrained in terms of their growth potential. Financial inclusion addresses these barriers by expanding access to credit, allowing firms profitable investment that would otherwise be unfeasible (Stiglitz & Weiss, 1981).

World bank enterprise survey for Pakistan reinforces the narrative that many firms remain financially excluded. In the 2022 survey, only 2.1% of Pakistani firms reported having a bank loan or line of credit (World Bank Group, 2023).

a very low figure even by regional standards (south Asia average was 11% in 2013 and 24% for lower- middle income countries in recent years. Small firms were almost completely shut out, only 1% of small firms had credit while even large firms the figure was just 6%) YET 92 % of firms had a bank account, indicating that basic access (account, payment) is not the main issue; it is the access to credit that is extremely limited. The same survey shows Pakistani firms finance much of their investment and working capital internally (over 80%), which can constrain their growth capacity. These data imply that if financial inclusion initiatives succeed in extending more credit to the corporate sector, there is considerable room for these firms to grow faster and improve performance (World Bank Group, 2023).

In this regard state bank of Pakistan launch national financial inclusion strategy to include the excluded people from former financial system. The State Bank of Pakistan (SBP) has played a crucial role in promoting financial inclusion. The government of Pakistan endorsed the State Bank of Pakistan's National Financial Inclusion Strategy (NFIS) in 2015 to facilitate comprehensive reforms and enhance financial inclusion. The rates of financial inclusion have increased from 16 percent in 2015 to 64 percent in 2023. Despite progress, 40 percent of the 137 million adult population, or 54.8 million individuals, lack access to formal financial services. The issue, however, is more acute among women; 57 percent of women lack bank accounts (State Bank of Pakistan, 2024).

This implies that there is generally a positive relationship between financial inclusion and performance of firms. Financial inclusion at the higher-level increases firm performance but financial constraint decreases firm performance. This study uses index (composite of traditional financial inclusion index and digital financial inclusion index. Therefore, the study will therefore be directed towards studying its impact on the non-financial firms not the financial firms whose previous study focuses on the banking sector only.

1.1 Statement of the Problem

In developing economies financial inclusion policy emerged as a central policy objective, existing literature assumes a positive relationship between financial inclusion and firm performance.

Enterprises require financial services such as loans, savings and insurance offered by banks for their sustenance and growth and financial inclusion is important for enterprises to achieve those financial services at reasonable cost in a developing economy such as Pakistan. Despite this, many of the non-financial enterprises listed on the Pakistan Stock Exchange (PSX), which indeed are the main exporters of the country's foreign exchange, face outstanding challenges in accessing these services due to the absence of financial infrastructure and inadequate banking facilities and so heavily dependent on informal financial channels. Lack of examination of the impact of the financial inclusion on the financial performance of non-financial enterprises list on Pakistan stock exchange. Financial inclusion, such as conventional (for example bank branches, saving accounts, lending) or modern (for example, electronic payment system, access to capital) financial services and the effect on performance of the firm by, for example, reducing transaction costs, providing capital access and liquidity, is expected. There is a gap in the understanding of the direct impact of different forms of financial inclusion on the financial performance of the publicly traded companies, such as, the profitability growth, and competitive market competitiveness. This study directly addresses the need for evidence-based evaluation of policies, understanding whether firm performance enhanced by expanding financial access. Without such evidence, policymakers may increase financial vulnerability rather than support long term business growth.

1.2 Literature Gap

previous studies use only traditional financial inclusion index ignoring digital financial inclusion index. non-financial firms rely on external financing for growth. So external financing in the form of credit intermediation is overlooking how financial inclusion policies translate into real sector economy. Little consideration to the link between the performance of non-financial listed firms and financial inclusion. Though these firms are not integrally involved with financial services in general, they may still depend on the financial system by making use of capital formation, operational funding, and risk management. Overall, they usually have a crucial role in the broader economy for such firms. The provision of industrial output and employment and tax revenues

1.3 Research Questions

· What is the impact of financial inclusion on the financial performance of non-financial firms listed on the Pakistan stock exchange (PSX)?

· How does access to credit mediate the relationship between financial inclusion and firm performance?

1.4 Research Objective

To investigate the relationship between financial inclusion and financial performance of non-financial firms listed on Pakistan stock exchange.

To analyze mediating role of access to credit in the relationship between financial inclusion and firm performance

1.5 Significance of the Study

The significance of this research lies in potential to fill critical gaps in the existing literature by examining how financial inclusion impacts non-financial listed firms, providing a novel perspective on how financial influences real-sector profitability through credit intermediation. This is the first study to empirically link financial inclusion, access to credit, and firm return on assets in Pakistan unique context, the study is particularly relevant for regulator and policymaker. Evidence to redefine national financial inclusion strategy by targeting credit allocation to high impact-sectors. Enriching financial intermediation theory, access to credit as a mediator, the bridge gap between firm performance and macro level financial policies.

CHAPTER 2. LITERATURE REVIEW

This chapter reviews the existing literature relevant to this study. It covers financial inclusion, digital financial services, the relationship between financial inclusion and firm performance, credit to the private sector, transmission channels, and the theoretical framework underpinning the study

2.1 Financial Inclusion

The term "financial inclusion" denotes the accessibility of financial products and services to all people of a country (Hassan, Muhammad, Sarwar, Zaman, 2020). Bhanot, Bapat, and Bera (2012) defined "Financial inclusion" as the process of ensuring that low-income populations have access to financial services such as savings, insurance, remittances as well as investment and risk management services.

Ther is no universal consensus exists on how to operationalize financial inclusion, leading to heterogenous measurement approaches (Beck et al 2007). Financial inclusion is a practice that involves the inclusion of people who do not have a means of participating like other formal financial services. Adil Jalil (2020) found that financially involved people can alleviate credit constraints and give investment in business.

According to Beck et al. (2007), financial inclusion in the country has massive macroeconomic outcomes like GDP growth and the general economic expansion. Generally, financial inclusion is expected to raise growth through reducing the borrowing and financing constraints and improving the efficiency of capital allocation. This is a mainstream view in economics but by now there is some empirical evidence that there may exist an optimal level of financial inclusion. (Arcand et al., 2015). Inclusive financial system required efforts among formal regulators, and institution and non-traditional providers to balance accessibility with stability (Chakrabarty, 2011).

2.2 Digital Financial Services

The digital financial services encompass all financial offerings accessed or delivered through digital platforms, including payment, savings, remittances, financial data services and insurance. These services are facilitated through diverse channels such as internet banking, mobile devices (smart phones and feature phones), POS terminals, NFC -enabled devices, electronic cards biometric system and tablets (AFI, 2016).

Digital financial inclusion has emerged as a critical development priority globally, receiving significant attention from corporations and governments alike. Digital financial services demonstrate substantial potential to expand access to essential financial

services securely, affordably and conveniently through mobile enabled solutions, digital payment and ecosystem (Gabor & Brooks, 2020). This transformation is driven by traditional financial institutions and non-financial entities (mobile network operators), and third-party providers.

From Chinese new energy companies, the evidence shows that firms with better digital financial service access have higher financial performance and have a moderating effect of the negative impact from financial constraints. The addition of the digital financial solution in the coverage programs would significantly contribute to boosting firm performance, particularly company which can access conventional finance (Wu & Huang, 2022).

Xinyao (2025) discovered that digital financial inclusion has positively and significantly affected SMEs' firm performance as it can help the SMEs receive intervention to finance in the form of digital platform transactions and cost of the transaction reduced as well as helping them to achieve operational efficiency, market expansion, and increase in profitability. This is aligned with (Thathsarani & Jianguo, 2022) idea that digital finance improves its ability to operate through increased efficiency, as well as opens new markets.

In addition, innovation within firms continues to be the dominant form of organization and so digital financial inclusion is also an important enabler. The results, according to Xiong et al. (2023), are that 'digital finance' enabled firms are more innovative as they spend more on research and development. As a result, that gave better market share and profitability, and it made access to digital financial innovation and moved on the digital platform to market new products and services easier for the firm's access to credit of R&D.

2.3 Financial Inclusion and Firm Performance

The impact of financial inclusion on performance has been a subject of considerable academic inquiry globally. Studies show that financial inclusion is a generally positive influence on firm growth by facilitating access to finance for investment activities and by alleviating constraints on firms' liquidity (Rana, 2021). Enhanced access to financial services enables firms to undertake necessary investments and manage their working capital more effectively, which are crucial for their expansion and overall performance (Chauvet & Jacolin, 2017). Furthermore, financial inclusion has been linked to an enhanced ability of firms to improve their sales performance and actively participate in international trade (Chauvet & Jacolin, 2016)

Digital financial inclusion has emerged as a significant factor influencing firm financial performance. Digital financial inclusion can significantly increase enterprise value, improving the financing requirements, reducing the cost of transacting, im-

proving resource allocation, and enhancing innovation in firms (Gao, 2025). It has been demonstrated that it enhances the effectiveness of financing processes and the expansion of financial services to a large number of businesses (Gao, 2025). In certain circumstances, digital financial inclusion can also help to decrease the financial risk of corporations by increasing the ability to finance and improving the financial structure of firms (Zhao et al., 2024).

Although these are the positive effects of digital financial inclusion, other studies have reported that financial inclusion has its negative sides. The revolution of digital financial inclusion using mobile banking services has been observed to have negative relationship with total volume of deposits held by banks. (Hamada Elsaid Elmaasrawy et al., 2025). While this finding pertains to banks, it suggests that there might be complexities and trade-offs associated with expansion of digital financial services. Furthermore, the increased adaptation of digital financial services can also introduce new forms of financial risks for enterprise, such as cybersecurity threats and data privacy concern (Zhang, 2024).

Access to credit serves as a critical mechanism through which financial inclusion can influence firm performance (Chauvet & Luc Jacolin, 2015). It has also been noted that enhanced financial inclusion is likely to have a curbing influence on liquidity constraints among firms, which in turn promotes the investment activities and subsequent growth of the firm (Nizam et al., 2020). corporate borrowing have also been found to play a pivotal mediating role on the relationship between financial inclusion and the performance of the firm though the direction of the effect on profitability may still differ depending on the circumstance and the way the borrowed funds are applied (Vu et al., 2024). While financial inclusion can improve firms, access to loans and other forms of credit, the ultimate impact on their profitability may depend on factors such as cost of credit, the intend use of funds and firms' ability to effectively manage its debt obligations.

In China, the landscape of digital financial inclusion and bank performance has shown consistent growth, with a significant positive correlation between the two (Zhao et al., 2024). This suggests that the digital financial inclusion expands and improves banking sector performance. Additionally, it has been observed that digital financial inclusion can increase the value of the firm by decreasing financing restrictions and leading to innovation, especially the small and medium-sized enterprises (SMEs) and private enterprises (Gao, 2025). However, the impact of digital financial inclusion on bank performance exhibits regional variation within China with slightly Inhibiting effect noted in the central region (Zhao et al., 2024). This indicates that the benefit of digital financial inclusion might not be uniform across all parts of the country. Additionally, research on fintech development in China has revealed inverted U- shaped relationship with corporate performance, suggesting that while initial adaptation can

boost performance, the benefit might diminish after a certain level of adoption (Zhao et al., 2024).

This Indian experience has shown that financial inclusion negatively affects the financial performance of banking institution because it increases operational cost and risk exposure, however, the effect changes with scale as financial inclusion reaches its maturity level such that the relationship between financial inclusion and bank performance is a U-shaped one (Harish Kumar Bhatter et al., 2025)..in the realm of businesses, digital finance has been shown to have a positive impact on financial inclusion in India, suggesting that digital platforms are playing a crucial role in extending services to smaller enterprises (Verma & Samik Shome, 2025).moreover, both traditional and digital forms of financial inclusion have been bound to significantly impact the firm performance of women entrepreneur in India, highlighting the role of financial access in empowering specific demographic (Peter et al., 2025).

In Vietnam, studies indicate that financial inclusion has a direct negative effect on the profitability (ROA) of firms in the information and communication technology (ICT) sector, and also indirect effect that is mediated through corporate borrowing, specifically corporate borrowing act as a mediator in the relationship between financial inclusion and firm performance, with increased borrowing leading to higher sales revenue but ultimately resulting in reduced profitability for ICT firms ((Vu et al., 2024)). Malaysia's experience in financial inclusion reveals a non-monotonic effect on firm growth in the manufacturing sector across ASEAN countries (Nizam et al., 2020). This indicates that financial inclusion has a significantly positive impact on firm growth up to a certain threshold, beyond which the impact turns significantly negative. This suggests that there might be an optimal level of financial inclusion for maximizing firm growth in the manufacturing sector.

Research focusing on Pakistan indicates that financial inclusion plays a significant role in job creation driving economic growth, and promoting sustainable development within country, specifically, a firm's total assets have been found to positively impact its export performance in Pakistan's manufacturing sector, underscoring the significance of asset investment for competing effectively in foreign markets. (Adil & Nazir, 2023) furthermore, debt-to equity ratio can boost the export performance in Pakistan, apart from those that are highly leveraged

In the banking sector of Pakistan, studies have shown that the extent of bank branch network, the volume of outstanding deposits, and the amount of outstanding credit are all positively correlated with firm performance (Munir & Malik, 2024).

Pakistan has been actively pursuing the development and integration of digital financial services within its economy. the digital fiancé services market in Pakistan holds substantial growth potential and is projected to contribute significantly to the country's GDP while also generating new employment opportunities. However, the

advancement of digital financial inclusion in Pakistan faces several challenges, including week technology infrastructure, a relatively low level of financial literacy among population, and inadequate banking facilities, particularly in remote area (Manzoor et al., 2021).

2.4 Credit to Private Sector

The level of private sector credit as a percentage of in Pakistan is notably low when compared to other economies in the region (Pakistan - Domestic Credit to Private Sector (% of GDP) - 2025 Data 2026 Forecast 1960-2023 Historical, 2025). moreover, government borrowing from commercial banks in Pakistan has been observed to potentially crowd out the availability of credit for the private sector, further limiting access to finance for businesses and the volume of domestic deposits has been found to positively influence the availability of private sector credit in Pakistan (Kamal & Hussain, 2023.This suggested that the low credit to GDP ratio and the potential crowding -out effect of government borrowing could pose significant constraint on firm's access to credit in Pakistan, potentially mediating the overall impact of financial inclusion on their performance.

2.5 Transmission Channels

Financial inclusion influences firm performance through multiple interconnected mechanisms, making access to credit a crucial mediating variable in this relationship (Beck et al., 2007, Demirgüç-Kunt & Levine, 2008) one of the primary ways financial inclusions enhance firm performance is by lowering the cost of borrowing. increased banking penetration and competition in financial markets reduced interest rates, making credit more affordable and accessible for firms (Beck et al., 2009). Lower financing costs encourage firms to invest in new projects, expand operations, and improve their financial stability. Financial inclusion enables firms to gain access to financial services such as banking facilities, mobile money and various electronic payment solutions that serve as tools for firms to control cash flow management and ward of financial distress (Allen et al., 2016). Firms can use the opportunity to efficiently allocate resources and continue the business of the firm to remain intact and operationally stable. In addition, financial inclusion also contributes another critical role by increasing the level of investment and productivity. However, in case there is an easier access to the credit in the firms tend to invest in technology, research and development, capital intensive projects, which increase the efficiency and output (Ayyagari et al., 2014). Access to credit is an access to credit is the single variable through which financial inclusion can be leveraged to increase firm performance. Firms with imperfect credit access

do not undergo any expansion of operation, and do not take advantage of economic opportunities due to their financial constraints. Hence, it is argued that assuming the connectedness of industries, firms' financial inclusion positively affects firm performance mostly from higher credit availability for firms which enables the undertaking of investment, improves firm's liquidity management and reduces financial risks which enhance Return on Asset (ROA).

2.6 Theoretical Framework

Today, there is an extensively growing interest in the relationship between financial inclusion, credit and firm performance both from a social and business point of view. Many theories have been developed to explain how financial inclusion is related to performance. This literature review provides a summary of the most suitable theoretical perspective on how financial inclusion is linked with performance, in particular on availability of credit.

According to Barney (1991), the following is the view of resources that a firm's competitive advantage arises from the unique resources a firm possesses, and its ability to leverage them effectively, often through proprietary technologies, making it difficult for competitor to replicate, Lot of financial resources are needed for such firms to invest, expand, and increase operational efficiency and that partly is dependent on credit. Financial inclusion would provide the resources that firms need for improving their competitiveness from the perspective of the resource base view. Financial inclusion facilitates access to credit and, consequently, provides firms with the opportunity of using such financial means to improve their performance. It concerns the role of financial inclusion in having a resource accessibility for the success and growth of firms in competitive markets.

An Information Asymmetry Theory (Stiglitz & Weiss, 1981) states that markets often suffer from unequal distribution of information among participants, leading to market failures, means covering the unequal information exchange between two parties.

The information symmetry which cannot be recognized by the lenders and borrowers leads to the inability of efficiency of the credit markets. Reduction of this problem could happen through the means of financial inclusion that makes firms transparent to customers and shows people how the firms can be found creditworthy. The ease of access to credit was scaled off firms' access to credit, and the latter was positively associated with firms' performance. Secondly, this theory stresses the basis of inclusion of financial and information in the theory of information gap mitigation such that credit markets are to be made efficient and effective.

As per the Financial Development Theory states that financial development and

economic growth are mutually reinforcing so the strong determinant of economic growth and business success is the financial markets and institutions (Greenwood &Jovanovic, 1989). Indeed, financial inclusion plays an important role in financial development and thus in the efficient allocation of resources. An inclusion of the firm with the financial resources will guarantee access to credit for the firm, therefore investment in production activities will be raised, enables firms to operate well, and in turn improves the firm's performance. However, financial inclusion has a primary relation to the development of the financial markets, which is considered one of the most important supporting elements for economic and business development, through the provision of better resource allocation.

The Pecking Order Theory (Myers, 1984) states that firm prioritize financing sources based on cost and information asymmetry.

This theory argues that firms will prefer to finance their investment based on internal funds. If they require any source of external financing, they first turn to debt financing and if it is for some reason they require financing from equity, they do it. Firms will be able to improve their creditworthiness to access debt finances and so better utilize such debt. It enables firms to be able to make more efficient capital structure decision ability, which facilitates them to finance their growth opportunities and investments. The validity of this theory is in line with the notion that resource enabling firms are better served by financial inclusion. However, these are the necessary ones for long run success.

Fama (1970) explained that the Market efficiency theory states that there is market efficiency when all information is in asset price. Financial inclusion helps improve the flow of information between firms and investors, and such is included in financial establishments. It allows an increased flow of information resulting in easier availability of credit and investment to the firms and the possibility of enhanced financial performance. The financial inclusion allows the firms to acquire information on the capital, and the firms would be better off in that it would enhance the efficiency of the markets this would then result in better financing among the firms and better competition among the firms.

Typically, an agency theory is a theory concerning the 'relationship of the principal (shareholders) and the agent (managers), 'being typically described as a conflict of interest and a relationship asymmetry" (Jensen & Meckling, 1976). Financial inclusion can assist in reducing company prices by making transparency and strengthening capability for borrowing cash. That gives access to capital and consequentially organizing financial and management interests so that firms can have better growth and performance.

Finally, it is taking that into consideration, those examined hypotheses accommodate all that exists between financial inclusion and company performance. This study

is thus trying to examine via a mediation variable, access to credit, whether financial inclusion affects firm success.

CHAPTER 3. Data and Methodology

3.1 Data Sources and Sample Construction

3.1.1 Sample Construction and Selection Criteria

The target population includes all non-financial Pakistani Stock Exchange-listed firms between 2010 and 2022. Companies in the financial sector, such as commercial banks, development finance institutions, insurance companies and investment funds are not included since the balance sheet structure of these companies, leverage definition and regulatory requirements are not similar to those of non-financial companies. Upon the use of these criteria, the sample of interest is reduced to a total of 304 non-financial companies within 16 industrial groups, followed by 13 years (2010 -2022) with 3,952 firm-years listed. New listings and delistings within the study period make the panel unbalanced, although the large majority of firms are observed over the entire 13 years (average number of years observed per firm in each of the two groups, Group 1 (177 firms) and Group 2 (127 firms): 13.0 years and 12.0 years, respectively). The sample also represents the entire spectrum of PSX-traded non-financial industries, with the Textile sector having the biggest proportion (1,547 observations, 39.1 percent of the sample), the next is Sugar (338), then Chemicals (286), and Energy (286).

3.2 Variable Definitions and Measurement

3.2.1 Dependent Variables: Firm Financial Performance

Return on Assets (ROA) as a Measure of Firm Performance

ROA, computed as net income divided by average total assets, is a widely adopted performance metric in academic and corporate literature. Unlike simple profitability measures, ROA contextualizes earnings relative to asset base, enabling meaningful cross-sectional and panel comparisons across firms of varying sizes and capital structures (Yousaf & Dey, 2022).

While ROA captures overall operational efficiency, Return on Equity (ROE) is employed as a robustness check, reflecting shareholder-specific returns. Together, these metrics provide a comprehensive assessment of firm performance. Notably, ROA is preferred as the primary dependent variable given its relative insensitivity to leverage, which is particularly important since debt-to-equity ratio is independently examined in the mediation analysis.

3.2.2 Independent Variable: Financial Inclusion Index

Traditional financial inclusion measured by bank branches, ATM penetration and percentage of population with access to basic financial services (accounts, saving, loans, and insurance) and digital financial inclusion measured mobile money adoption, mobile banking usage, digital payment penetration internet coverage. The index is constructed using principal component analysis (PCA) to aggregate these indicators into single standardized measures, ensuring a comprehensive representation of financial access. This study adopts a composite financial inclusion index developed by (Ansari et al., 2024) integrating both traditional and digital dimensions.

3.2.3 MEDIATING VARIABLE

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In this study, the debt-to-equity ratio has been used as a proxy indicator of firm-level finance accessibility. The ratio can be easily interpreted by dividing the total debt by the total equity and it gives a clear picture of how much a firm is financed by the borrowed money as compared to the internal financing. It is a well-known measure of financial leverage as well as capital structure of a company. A bigger ratio indicates more reliance on debt whereas a smaller ratio indicates reliance on equity and retained earnings. Since access to credit is a central constituent of financial inclusion, the debt-to-equity ratio is an appropriate indicator of the effectiveness with which firms can access finance using formal sources. The rationale of employing this variable resides in the fact that it reflects the ability of financial inclusion to translate into actual financing opportunities of firms. The more inclusive financial systems companies have access to, the more likely they are to access loans, overdrafts and other forms of credit through banks and financial institutions. In this regard, the ratio is an indirect indicator of the level of credit accessibility, because the firms that lack financial inclusion would not be able to borrow much. In the context of this study, the debt-to-equity ratio is an intermediary variable between the financial inclusion and the firm performance. What this implies is that improving outcomes is not automatically guaranteed by financial inclusion per se. Rather, the contingency of firm performance is determined by the mode of applying credit when it becomes accessible. Excessive use of debt may cause cash to strangle and make it more susceptible to be affected by high-interest rates or economic crises. In contrast, well-managed debt can facilitate growth, innovation and long-term profitability .

3.2.4 Control Variables

Firm Size

The size of firms is a well-recognized factor in corporate finance and organizational theory in terms of accessing financial resources and, consequently, an important contributor to firm performance especially profitability as proxied by return on assets (ROA). Smaller firms tend to have poor access to credit and financing options than larger firms. The reason is that they have better reputations, larger collaterals and well-established relationships with the banks as well as other financial institutions. Consequently, bigger corporations are considered to be less risky borrowers, and this increases their chances of borrowing at more favorable rates. The opportunities to access financing, in their turn, enable such firms to grow their operations, invest in innovation, and take their new market opportunities, which in their turn contribute to improved financial performance. The other important factor that makes bigger firms outperform the smaller ones is the presence of economies of scale. Larger scale operations allow firms to achieve lower average cost of production, have fixed costs dispersed over more units of output and also secure better prices with their suppliers. Such cost efficiency gives them a competitive advantage, which allows them to attain greater profitability margins. In addition, bigger companies usually have more funds to spend on research and development, technological adoption, and human resources which enhances their competitive advantage and their overall performance.

The skew in the values of the firm size is often too high to allow using the latter measure in the empirical studies, and the logarithm of the firm size, therefore, is often used as a standardized measure in the empirical research. This transformation avoids a disproportionate influence on the analysis of extreme values and makes the data suit regression models better. The log transformation also enables a more accurate and interpretable relationship between the firm size and the firm performance because the variations across firms of different sizes are normalized.

The rationale behind this relationship is theoretically endorsed by Hannan and Freeman (1984) who note that bigger firms tend to perform better as these firms have a better access to resources and finance and are in a better position to withstand competitive and economic pressures. They are also seen more, have more reputation and more institutional credibility, which is often reflected in better lending terms, which smaller firms might fail to secure. Firm size therefore is an indicator of the resource base of a company as well as its ability to take advantage of the financial inclusion and outside financing to increase profitability

Sales Growth

Firm growth is an important indicator of business expansion and overall performance, as it reflects the ability of a company to increase its market share, revenues, and operational capacity over time. Growth is most measured through sales growth, which is calculated by comparing the sales figures of the current year with those of the previous year. Sales growth is purposeful and popular as it is an indicator of the

real performance of the firm in the market which indicates the customer demands of products and services of the firm.

Firms that experience sustained growth often enjoy significant advantages in terms of access to finance. Financial institutions and investors tend to view growing firms as less risky and more attractive clients, as their expanding revenues indicate stronger repayment capacity and future profitability. On this basis, high-growth companies have better chances of attaining loans, investment capital and good credit facilities than stagnant and declining firms. This more ready access to outside finance enables them to invest even more in innovation, technology and market expansion and generates a virtuous cycle between growth, access to financing and enhanced performance.

On performance grounds, sales growth has been found to be positively related to returns on assets (ROA). As Permatasari et al. (2024) point out, companies that have higher sales growth tend to have better financial performance due to the level of efficiencies that the extra revenues bring to the use of assets. Growth can also help the firms to share fixed costs on a larger base of sales resulting in reduced unit costs and hence better profitability margins. This shows that sales growth is not merely an indicator of past performance but will predict financial health in the future.

It should, however, be noted that growth does not necessarily translate to long-term profitability. Rapid expansion may cause strain on the financial and managerial resources of a particular organization, and this can result in difficulties in ensuring efficiency, quality or customer satisfaction. Unless it is controlled well, high growth can also result in the necessity to have more debt financing thus posing financial risk. Thus, although the growth of sales is in a way a good sign, it should be supported by the wise financial performance and planning.

In brief, through sales growth, firm growth is one of the main factors in determining financial performance. It increases access to credit, enhances profitability, and portrays competitive strength thereby becoming a key variable in the dynamics of firm performance.

Firm Age

The age of a firm has been ranked among the key factors of stability, reputation and survival of a firm in the long term. The impact of firm age on performance, especially return on assets (ROA) is however not simple or straight forward. On the one hand, the older firms are likely to have an advantage of accumulated experience, relations with the customers, and reputation, which can be converted into a better degree of trust in the stakeholders, suppliers, and financial institutions. Possession of such advantages can increase their chances to be consistently profitable eventually. Moreover, established companies tend to have institutional credibility and established market positions that gives them the ability to compete favorably with new firms.

On one hand, firm age may also be a problem. As companies age, they become

rigid and bureaucratic, reducing flexibility. This trend is commonly known as organizational inertia and can make it difficult for older companies to take quick action to cope with the new market conditions or the emergence of innovative technologies and customer preferences. Older firms may therefore have the advantage of stability and reputation, but at the same time, they may be limited in performance due to failure to change or adapt to environmental changes. This renders the relationship between firm age and profitability non-linear in that both positive and negative effects may be realized depending on how well the firm responds to its external environment. On methodological grounds, researchers have a tendency to take the natural logarithm of the age of firms to standardize the distribution and reduce skewness in data manipulation. Because the age of firms may differ dramatically across industries and firms, logarithmic transformation will ensure that the very old firms do not have disproportionate impact on the findings of the regression models. This transformation also gives a better picture of the effect that incremental changes in age have on firm performance in the sample.

Hannan and Freeman (1984) argue that the adverse effects of organizational inertia are more likely to be felt by older firms and especially those with a smaller scale of operation that have limited capacities to adapt. Further evidence, including Zainab (2024), confirms that a firm does not necessarily perform better based on its longevity because old practices and their sluggish responsiveness undermine competitiveness. Collectively, these results indicate that firm age has both an enabling and a limiting role in that it leads to stability and credibility, but also to obstacles toward innovation and growth, which have negative and positive effects on profitability.

GDP Growth

The growth of Gross Domestic Product (GDP) is among the most popular measures of economic performance. GDP growth signifies the growth of the economic activities of a country including production, consumption, investment, and trade. This macroeconomic measure has a lot of implications to businesses, since it directly affects the demand of goods and services, investor confidence and general market opportunities. With an expanding economy, there are more chances that firms generate increased revenues since households enjoy more purchasing power, businesses invest more and financial institutions have greater willingness to lend. On the other hand, slowing down in the economy or even recession can result in negative effects on firm performance with the GDP growth dropping and resulting in less demand, sales, and tight financial conditions.

GDP growth is added as a control variable so that firm-level profitability, which is captured through return on assets (ROA), is not confounded by macroeconomic variables. The rationale of this strategy is the fact that the changes in GDP growth can affect the revenues of firms regardless of financial inclusion policies. As an example, a

company in an economically growing market might report a better profit margin not because of better access to finance but just because there is a good economic environment that leads to an increase in consumer spending and activity in the markets. The analysis only isolates the real impact of financial inclusion on firm performance since distortions of the overall economic cycle are not experienced.

The linkage between the GDP growth and firm performance has long been established in the literature. A robust and stable GDP growth brings about a healthy atmosphere in which companies can increase their output, invest in emerging technology and seek new markets. It also improves investor confidence, and this attracts domestic and foreign investment in the corporate sector. Conversely, slow growth or negative growth has been known to result in contractionary forces, whereby companies experience declining demand, cost-saving pressures and decreasing profitability. Even firms that have access to finance well may not be able to perform well under such circumstances since the market is not good in general.

As a financial management variable, including a control variable of GDP growth enables researchers to differentiate between firm-specific performance drivers, and external macroeconomic effects. As another example, two companies with equal financial inclusion may demonstrate different ROA results due to the fact that one of them is acting during the period of high GDP growth whereas another one during the period of recession. Unless GDP growth is controlled, such differences may be misinterpreted as the results of financial inclusion policies instead of economic conditions.

Thus, this study will be more accurate and reliable because of controlling the growth of GDP. This strategy recognizes the fact that although financial access is one of the key drivers of firm growth and profitability, macroeconomic conditions provide the larger arena in which firms operate. GDP growth as a proxy of economy-wide health should be factored to prevent over-evaluation or under-evaluation of the role of financial inclusion on the firm-level outcomes.

3.2.5 Summary of Variables

3.3 Descriptive Statistics

Table 3.1 presents descriptive statistics for all variables across the full sample and by sector group. Several features of the data are noteworthy.

First, the wide dispersion of ROA (SD = 11.7%) and ROE (SD = 56.1%) before winsorization reflects substantial firm-level heterogeneity in profitability — a feature that motivates the use of panel Fixed Effects to control for time-invariant firm characteristics. Second, the mean D/E ratio of 1.795 conceals extreme values: the 99th percentile reaches 36.87, driven by financially distressed Textile and Chemicals firms with negative or near-zero equity. Third, the FI Index shows a monotonic in-

crease from −3.29 (2010) to +3.83 (2022), confirming the secular financial deepening trend over the study period. Fourth, Group 2 (oligopolistic) firms exhibit substantially higher mean ROA (5.57% vs 0.11%) and ROE (12.74% vs 1.06%) than Group 1 (competitive) firms, providing prima facie support for the sectoral heterogeneity hypothesis.

Table 3.1: Descriptive Statistics — Full Sample and by Sector Group

	Full Sample (N = 3,952)				**Group 1** (N = 2,301)		**Group 2** (N = 1,651)	
Variable	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**	**Mean**	**SD**
ROA	0.0239	0.1173	−0.4328	0.4080	0.0011	0.1116	0.0557	0.1177
ROE	0.0594	0.5610	−3.1728	2.3630	0.0106	0.6167	0.1274	0.4644
D/E Ratio	1.7955	5.5547	−19.813	36.872	1.8398	6.0678	1.7338	4.7492
Firm Size	6.6302	0.7901	4.3059	9.0531	6.4020	0.6724	6.9484	0.8311
Sales Growth	0.1553	0.5984	−0.8972	4.3292	0.1479	0.6202	0.1657	0.5672
Firm Age	41.03	17.97	2.0	162.0	41.60	14.04	40.35	22.08
GDP Growth	3.822	2.098	−1.274	6.574	3.822	2.098	3.822	2.099
FI Index	0.855	2.861	−3.290	3.830	0.855	2.861	0.855	2.861
Interest Rate	2.804	2.731	−4.450	7.761	2.718	2.843	2.890	2.618

3.4 Econometric Model Specification

3.4.1 Panel Data Framework

The general panel data model for firm performance takes the form:

$$Y_{it} = \alpha + \beta_1 \text{FIIndex}_t + \beta_2 \text{DE}_{it} + \boldsymbol{\gamma}' \mathbf{X}_{it} + \mu_i + \varepsilon_{it} \tag{3.1}$$

where Y_{it} is the profitability measure (ROA or ROE) for firm i in year t; FIIndex_t is the Financial Inclusion Index; DE_{it} is the Debt-to-Equity ratio; $\mathbf{X}_{it}$ is a vector of control variables (firm size, sales growth, firm age, GDP growth, interest rate); μ_i is the unobserved firm-specific fixed effect; and ε_{it} is the idiosyncratic error term.

3.4.2 Fixed Effects Estimator

The Fixed Effects (FE) or "within" estimator eliminates the unobserved firm-specific effect μ_i by demeaning all variables at the firm level:

$$(Y_{it} - \bar{Y}_i) = \beta_1(\text{FIIndex}_t - \overline{\text{FIIndex}}) + \beta_2(\text{DE}_{it} - \overline{\text{DE}}_i) + \boldsymbol{\gamma}'(\mathbf{X}_{it} - \bar{\mathbf{X}}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i) \tag{3.2}$$

The FE estimator is consistent when μ_i is correlated with the regressors — that is, when unobserved firm characteristics (management quality, technology, market position) are related to the explanatory variables (Baltagi, 2008; Wooldridge, 2010).

Its limitation is that it cannot identify the coefficients of time-invariant variables. The Hausman test is used to determine whether FE is preferred over RE.

3.4.3 Random Effects Estimator

The Random Effects (RE) or GLS estimator assumes that μ_i is uncorrelated with the regressors — treating it as part of the composite error term:

$$Y_{it} = \alpha + \beta_1 \text{FIIndex}_t + \beta_2 \text{DE}_{it} + \boldsymbol{\gamma}' \mathbf{X}_{it} + (\mu_i + \varepsilon_{it}) \tag{3.3}$$

The RE estimator is more efficient than FE under this assumption, exploiting both within-firm and between-firm variation. When the assumption holds, RE provides consistent and efficient estimates. When it fails, RE estimates are inconsistent and FE is preferred (Hausman, 1978).

3.4.4 Clustered Standard Errors

Regardless of whether FE or RE is the preferred estimator, standard errors are clustered at the firm level throughout the analysis:

$$\hat{V}_{cluster} = (\mathbf{X}'\mathbf{X})^{-1} \left(\sum_{i=1}^{N} \mathbf{X}_i' \hat{\boldsymbol{\varepsilon}}_i \hat{\boldsymbol{\varepsilon}}_i' \mathbf{X}_i \right) (\mathbf{X}'\mathbf{X})^{-1} \tag{3.4}$$

Clustering at the firm level allows for arbitrary serial correlation and heteroscedasticity within firms over time, producing valid standard errors for inference without imposing strong distributional assumptions on the error structure (Wooldridge, 2010). Given the 13-year panel and the presence of both autocorrelation (confirmed by the Wooldridge test) and heteroscedasticity (confirmed by the modified Wald test), clustered standard errors are essential for reliable inference.

3.4.5 Two-Way Fixed Effects Specification

As a robustness check, the model is extended to include year fixed effects alongside firm fixed effects:

$$Y_{it} = \alpha + \beta_1 \text{FIIndex}_t + \beta_2 \text{DE}_{it} + \boldsymbol{\gamma}' \mathbf{X}_{it} + \mu_i + \lambda_t + \varepsilon_{it} \tag{3.5}$$

where λ_t is a set of year dummy variables capturing common macroeconomic shocks affecting all firms in year t . The Two-Way FE model provides the most conservative estimate of the FI Index effect, absorbing both firm-level heterogeneity and year-level common shocks.

3.5 Diagnostic Tests

3.5.1 Hausman Test for Model Selection

The Hausman (1978) specification test compares the FE and RE coefficient vectors to determine whether the systematic difference is statistically significant:

$$H = (\hat{\boldsymbol{\beta}}_{FE} - \hat{\boldsymbol{\beta}}_{RE})' \left[\hat{V}_{FE} - \hat{V}_{RE}\right]^{-1} (\hat{\boldsymbol{\beta}}_{FE} - \hat{\boldsymbol{\beta}}_{RE}) \sim \chi^2(k) \tag{3.6}$$

A significant Hausman statistic ($p < 0.05$) rejects the null hypothesis that the difference in coefficients is not systematic, indicating that μ_i is correlated with the regressors and FE is the consistent estimator. A non-significant result supports RE as the efficient estimator. The test is applied separately for each dependent variable (ROA and ROE) and for each sector group in the sectoral analysis.

3.5.2 Wooldridge Test for Serial Correlation

The Wooldridge (2002) test for first-order serial correlation in panel data errors is applied to both ROA and ROE models:

$$H_0 : \text{No first-order autocorrelation in } \varepsilon_{it} \tag{3.7}$$

Rejection of H_0 confirms that serial correlation is present, motivating the use of clustered standard errors rather than conventional heteroscedasticity-robust standard errors.

3.5.3 Modified Wald Test for Heteroscedasticity

The modified Wald test for groupwise heteroscedasticity in Fixed Effects models tests:

$$H_0 : \sigma_i^2 = \sigma^2 \quad \forall i \tag{3.8}$$

Rejection confirms cross-sectional heteroscedasticity, further motivating clustered standard errors.

3.5.4 Pesaran CD Test for Cross-Sectional Dependence

The Pesaran (2004) Cross-Sectional Dependence (CD) test assesses whether the residuals of different firms are correlated with each other — a common feature of macroeconomic panels where firms face common shocks:

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij} \right) \sim N(0,1) \tag{3.9}$$

A significant CD statistic indicates that common macroeconomic shocks create cross-sectional correlation, which is addressed by including macro controls (GDP growth, FI Index, interest rate) and year dummies in the Two-Way FE specification.

3.6 Robustness Strategy

3.6.1 Winsorization

All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of extreme outliers. This is particularly important for the D/E ratio, which reaches values above 30 for some financially distressed Textile firms with near-zero equity, and for ROE, which is mathematically unbounded when equity approaches zero. Winsorization replaces values below the 1st percentile with the 1st percentile value, and values above the 99th percentile with the 99th percentile value, preserving the ordinal ranking of observations while limiting leverage of extreme values (Wooldridge, 2010).

3.6.2 Mediation Analysis

The mediation of the FI Index → ROA/ROE relationship through the D/E ratio is tested using the four-step Baron and Kenny (1986) framework:

$$\text{Step 1 (Path } c\text{):} \quad Y_{it} = \alpha + c \cdot \text{FIIndex}_t + \boldsymbol{\gamma}'\mathbf{X}_{it} + \mu_i + \varepsilon_{it} \tag{3.10}$$

$$\text{Step 2 (Path } a\text{):} \quad \text{DE}_{it} = \alpha + a \cdot \text{FIIndex}_t + \boldsymbol{\gamma}'\mathbf{X}_{it} + \mu_i + \varepsilon_{it} \tag{3.11}$$

$$\text{Step 3 (Path } b\text{):} \quad Y_{it} = \alpha + b \cdot \text{DE}_{it} + c' \cdot \text{FIIndex}_t + \boldsymbol{\gamma}'\mathbf{X}_{it} + \mu_i + \varepsilon_{it} \tag{3.12}$$

Mediation requires: (i) Path c significant (total effect); (ii) Path a significant (IV predicts mediator); (iii) Path b significant (mediator predicts DV controlling for IV); and (iv) Path c' reduced relative to c (partial or full mediation). The indirect effect $a \times b$ is tested using the Sobel (1982) test statistic and bootstrapped 95% confidence intervals with 500 replications.

3.6.3 Sectoral Analysis

Sectoral heterogeneity is analyzed as the sample is divided into two groups according to the features of market structure and profitability. Group 1 (Competitive/Low-Margin) is five industries including Textile, Sugar, Chemicals, Electrical, and electronics and Leather and footwear which are typified by price taking competition, low margins and also face the threat of import competition. Group 2 (Oligopolistic/High-Margin) and includes eleven industries such as Energy, Cement, Engineering, Food

and Beverages, Automobiles, Technology, Telecom, Pharmaceuticals, Glass and Ceramics, Packaging and Paper, Fertilizer, and Tobacco, which are characterised by pricing power, regulatory protection, or inelastic demand.

The formal test of whether the two groups have structurally different coefficient vectors uses the Chow (1960) test:

$$F_{Chow} = \frac{(RSS_{pooled} - RSS_{G1} - RSS_{G2})/k}{(RSS_{G1} + RSS_{G2})/(N - 2k)} \sim F(k,\ N - 2k) \tag{3.13}$$

where RSS_{pooled} is the residual sum of squares from the pooled model, RSS_{G1} and RSS_{G2} are the residual sums of squares from the group-specific models, $k = 7$ is the number of regressors, and $N = 3,769$ is the total effective observations. A significant Chow F-statistic rejects the null hypothesis of coefficient equality, validating the two-group split. The interaction model:

$$Y_{it} = \alpha + \beta_1 \mathrm{DE}_{it} + \beta_2 \mathrm{Group2}_i + \beta_3 (\mathrm{DE}_{it} \times \mathrm{Group2}_i) + \boldsymbol{\gamma}' \mathbf{X}_{it} + \mu_i + \varepsilon_{it} \tag{3.14}$$

provides a continuous test of whether the D/E coefficient β_1 differs between sector groups, where a significant $\hat{\beta}_3$ indicates heterogeneous leverage effects.

CHAPTER 4. Empirical Results

4.1 Panel Diagnostic Test Results

Prior to estimation, four diagnostic tests are conducted to determine the appropriate panel estimator and standard error correction. Table 4.1 summarises the results.

Table 4.1: Panel Diagnostic Test Results

Test	Null Hypothesis	Statistic	p-value	Decision
Panel A: Model Selection				
Hausman Test — ROA	RE is consistent	$\chi^2(7) = 45.23$	0.000	Reject $H_0 \rightarrow$ FE preferred
Hausman Test — ROE	RE is consistent	$\chi^2(7) = 10.48$	0.163	Fail to reject $\rightarrow$ RE preferred
Panel B: Error Structure				
Wooldridge Test — ROA	No serial correlation	$F(1, 303) = 18.42$	0.000	Serial correlation present
Wooldridge Test — ROE	No serial correlation	$F(1, 303) = 12.87$	0.000	Serial correlation present
Modified Wald — ROA	Homoscedasticity	$\chi^2(304) = 4{,}821.3$	0.000	Heteroscedasticity present
Modified Wald — ROE	Homoscedasticity	$\chi^2(304) = 3{,}108.6$	0.000	Heteroscedasticity present
Pesaran CD — ROA	No cross-sec. dependence	$CD = 3.21$	0.001	CSD present
Pesaran CD — ROE	No cross-sec. dependence	$CD = 2.88$	0.004	CSD present

Note: Hausman test compares Fixed Effe

The Hausman test results reveal that Fixed Effects is the the right estimator for the ROA model ($\chi^2(7) = 45.23$, $p < 0.001$), confirming that firm-specific unobserved effects (management quality, technological capability, market positioning) are correlated with the regressors. For the ROE model, the Hausman test fails to reject the null ($\chi^2(7) = 10.48$, $p = 0.163$), indicating that Random Effects is consistent and efficient for the equity return specification. is difference in favored estimators of ROA and ROE has economic significance: the fact that firm effects are correlated with regressors in ROA and not in ROE implies that the hidden heterogeneity of firms that causes the efficiency of the factor of production is somehow structurally distinct between ROA and ROE - leverage should be playing a leading and less firm-specific role in the determination of ROE. .

The Wooldridge, modified Wald, and Pesaran CD tests all reject their respective null hypotheses at the 1% level for both dependent variables, confirming the presence of serial correlation, heteroscedasticity, and cross-sectional dependence in the panel. These results collectively mandate the use of firm-clustered standard errors for all subsequent estimations.

4.2 Baseline Regression Results

Table 4.2 presents the baseline panel regression results for ROA (Fixed Effects) and ROE (Random Effects), both with and without winsorization, to show the sensitivity

of findings to outlier treatment.

Table 4.2: Baseline Panel Regression Results: ROA and ROE

	Return on Assets (ROA)		**Return on Equity (ROE)**	
Variable	**(1) Pre-winsor FE**	**(2) Post-winsor FE**	**(3) Pre-winsor RE**	**(4) Post-winsor RE**
Debt/Equity Ratio	0.0001	0.0001	-0.0554^{***}	-0.0554^{***}
	(0.0005)	(0.0005)	(0.0069)	(0.0069)
Firm Size	0.0453^{**}	0.0453^{**}	0.0826^{***}	0.0826^{***}
	(0.0222)	(0.0222)	(0.0265)	(0.0265)
Sales Growth	0.0046	0.0224^{***}	0.0149	0.0583^{***}
	(0.0031)	(0.0040)	(0.0111)	(0.0181)
Firm Age	-0.0007	-0.0001	-0.0003	-0.0007
	(0.0017)	(0.0017)	(0.0008)	(0.0008)
GDP Growth	0.0022^{***}	0.0029^{***}	-0.0009	-0.0013
	(0.0006)	(0.0006)	(0.0035)	(0.0035)
Financial Inclusion Index	-0.0052^{***}	-0.0049^{***}	-0.0056	-0.0069^{**}
	(0.0016)	(0.0016)	(0.0034)	(0.0033)
Interest Rate	-0.0010	-0.0011^{*}	-0.0041	-0.0045
	(0.0007)	(0.0007)	(0.0035)	(0.0035)
Constant	-0.2498^{**}	-0.2499^{**}	-0.5218^{***}	-0.5179^{***}
	(0.1155)	(0.1155)	(0.1758)	(0.1751)
Observations	3,769	3,769	3,769	3,769
Number of Firms	304	304	304	304
Within R^2	0.0489	0.0547	0.2993	0.3168
Overall R^2	0.0966	0.1065	0.2287	0.2390
Estimator	FE	FE	RE	RE
Clustered SE	Firm	Firm	Firm	Firm

Note: Clustered standard errors at the firm level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. FE = Fixed Effects (preferred for ROA by Hausman test). RE = Random Effects (preferred for ROE by Hausman test). Winsorization at 1st/99th percentiles applied in columns (2) and (4). The dependent variable is Return on Assets in columns (1)–(2) and Return on Equity in columns (3)–(4).

4.2.1 Return on Assets — Fixed Effects Results

The Financial Inclusion Index coefficient is negative and statistically significant in both the pre-winsorization ($\beta = -0.0052$, $p < 0.01$) and post-winsorization ($\beta = -0.0049$, $p < 0.01$) ROA specifications. This confirms Hypothesis H_1: financial inclusion exerts a significant negative effect on the asset returns of PSX-listed firms. The magnitude implies that a one-unit increase in the FI Index reduces ROA by approximately 0.49–0.52 percentage points, holding all other factors constant. Over the study period, the FI Index increased by approximately 7.1 units (from -3.29 to $+3.83$), implying a cumulative financial-inclusion-induced reduction in mean ROA of

approximately 3.5 percentage points — a substantial drag on incumbent firm profitability.

The negative FI Index effect on ROA is consistent with the competition channel of Chauvet and Jacolin (2017): as financial inclusion deepens, new entrants gain access to formal credit and enter product markets previously dominated by incumbent firms, intensifying price competition and compressing margins. This interpretation is further supported by the sectoral analysis in Chapter 5, which shows that the negative FI effect is entirely concentrated in competitive, price-taker sectors (Group 1: $\beta = -0.0108^{***}$) while oligopolistic sectors are insulated (Group 2: $\beta = +0.0031$, n.s.).

The Debt-to-Equity ratio coefficient is positive but statistically insignificant for ROA in both specifications ($\beta \approx 0.0001$, $p > 0.10$). This result indicates that, after controlling for firm fixed effects, time-varying macro conditions, and other firm characteristics, within-firm variation in leverage does not significantly predict changes in asset returns. This finding is consistent with the pecking order prediction (Myers, 1984) that leverage is endogenous to profitability — more profitable firms use less debt — and with the possibility that both the tax shield and financial distress effects of leverage on ROA are approximately offsetting.

Firm size is positive and significant ($\beta = 0.0453$, $p < 0.05$), confirming that larger PSX firms earn higher asset returns, consistent with scale economy effects documented in Beck et al. (2005) and Permatasari et al. (2024). GDP growth is positive and strongly significant ($\beta = 0.0029$, $p < 0.01$) after winsorization, confirming that macro expansion improves firm-level asset efficiency through demand and capacity utilisation channels (Gui-Diby and Renard, 2015). Sales growth becomes significant only after winsorization ($\beta = 0.0224$, $p < 0.01$), suggesting that its effect was previously obscured by extreme outliers — a finding with important implications for the robustness discussion in Section 4.3.

4.2.2 Return on Equity — Random Effects Results

The Debt-to-Equity ratio coefficient is negative, large in magnitude, and highly significant in both ROE specifications ($\beta = -0.0554$, $p < 0.001$, in both columns). This confirms Hypothesis H_3 robustly: each unit increase in the D/E ratio reduces ROE by 5.54 percentage points. The coefficient is stable across winsorization — identical to four decimal places — indicating that this is not a result driven by extreme outliers but rather a pervasive structural relationship between leverage and equity returns throughout the PSX listed corporate sector.

The economic magnitude is substantial. At the sample mean D/E of 1.795, the leverage-induced reduction in ROE relative to an all-equity firm is approximately

$-0.0554 \times 1.795 = -9.9$ percentage points — nearly double the actual mean ROE of 5.94%. This implies that the typical PSX-listed firm would earn substantially higher equity returns if it operated with a lower leverage ratio, providing strong empirical support for financial distress cost theory (Jensen and Meckling, 1976; Kraus and Litzenberger, 1973) over the tax shield hypothesis in the Pakistani corporate context.

The Financial Inclusion Index coefficient for ROE is negative in both specifications, but achieves significance only after winsorization ($\beta = -0.0069$, $p < 0.05$), suggesting that the FI effect on equity returns is present but more sensitive to extreme outliers than the ROA finding. This is consistent with ROE being mechanically amplified by leverage — extreme D/E outliers in the pre-winsorization sample create additional noise that obscures the FI Index signal for equity returns.

Firm size is positive and significant for ROE ($\beta = 0.0826$, $p < 0.01$), with a larger coefficient than for ROA. This indicates the leverage amplification effect: bigger companies borrow more and increase their returns on assets and equity returns using the debt multiplier. Until the time of winsorization, sales growth is insignificant. ($\beta = 0.0149$, $p > 0.10$) but becomes strongly significant after winsorization ($\beta = 0.0583$, $p < 0.01$), mirroring the ROA pattern and confirming that the sales growth–profitability relationship was masked by extreme outliers.

4.3 The Effect of Winsorization

The comparison between pre-winsorization and post-winsorization results in Table 4.2 reveals two important patterns. First, the core findings are robust: the FI Index negative effect on ROA and the D/E negative effect on ROE are significant in both pre- and post-winsorization specifications, confirming that these are genuine structural relationships not artifacts of extreme observations. Second, winsorization reveals the sales growth effect: sales growth is insignificant in pre-winsorization models but highly significant ($p < 0.001$) in post-winsorization models for both ROA and ROE.

The emergence of sales growth significance after winsorization reflects the econometric impact of extreme outliers on coefficient estimates. Before winsorization, several observations with extreme D/E ratios (above 30) and extreme sales growth rates (above 400%) create high-leverage data points that dominate the OLS objective function and inflate standard errors for other coefficients. After trimming these extreme observations at the 99th percentile, the estimation becomes more efficient and the genuine positive relationship between revenue growth and profitability is recovered. This pattern is consistent with Wooldridge (2010)'s recommendation that winsorization be applied as a standard pre-estimation step in corporate panel data studies.

4.4 Two-Way Fixed Effects Results

Table 4.3 presents the Two-Way Fixed Effects results, which include both firm fixed effects and year dummies to absorb common macroeconomic shocks.

Table 4.3: Two-Way Fixed Effects Results with Year Dummies

	ROA		**ROE**	
Variable	**(1) One-Way FE**	**(2) Two-Way FE**	**(3) One-Way RE**	**(4) Two-Way FE**
Debt/Equity Ratio	0.0001	0.0000	-0.0554^{***}	-0.0576^{***}
	(0.0005)	(0.0005)	(0.0069)	(0.0069)
Firm Size	0.0453^{**}	0.0380^{*}	0.0826^{***}	-0.0339
	(0.0222)	(0.0228)	(0.0265)	(0.1064)
Sales Growth	0.0224^{***}	0.0219^{***}	0.0583^{***}	0.0572^{***}
	(0.0040)	(0.0040)	(0.0181)	(0.0181)
Firm Age	-0.0001	0.0000	-0.0007	0.0025
	(0.0017)	(0.0017)	(0.0008)	(0.0085)
GDP Growth	0.0029^{***}	—	-0.0013	—
	(0.0006)	—	(0.0035)	—
Financial Inclusion Index	-0.0049^{***}	—	-0.0069^{**}	—
	(0.0016)	—	(0.0033)	—
Interest Rate	-0.0011^{*}	—	-0.0045	—
	(0.0007)	—	(0.0035)	—
Year Fixed Effects	No	Yes	No	Yes
Observations	3,769	3,769	3,769	3,769
Within R^2	0.0547	0.0710	0.3168	0.3279

Note: Clustered standard errors at the firm level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. Two FE models include 12 year dummies (2011–2022, with 2010 as base year). Time-varying macro var (GDP Growth, FI Index, Interest Rate) are collinear with year dummies in Two-Way FE and are the absorbed; their coefficients are not separately identified. "—" denotes absorbed by year dummies.

The Two-Way FE specification confirms the robustness of the core findings. For ROA, the firm-level variables retain their signs and significance: sales growth ($\beta = 0.0219^{***}$) and firm size ($\beta = 0.0380^{*}$) remain significant predictors of asset returns after absorbing year-level common shocks. For ROE, the D/E ratio coefficient strengthens slightly to $\beta = -0.0576^{***}$ under Two-Way FE — the most conservative specification — confirming that leverage destroys equity returns even after controlling for all common macroeconomic shocks affecting all firms simultaneously.

An important feature of the Two-Way FE specification is that the macro variables — FI Index, GDP growth, and interest rate — are absorbed by year dummies and cannot be separately identified. This is not a limitation but rather a model choice: the Two-Way FE model asks what explains within-firm profitability variation relative to the economy-wide average in each year, whereas the one-way FE model identifies the macro variable effects from year-to-year variation in the FI Index, GDP growth, and interest rates. Both specifications are informative and the key firm-level findings survive both.

The year dummy coefficients (not reported in Table 4.3 for brevity) show a systematic pattern: relative to the 2010 baseline, all year dummies from 2012 onward are negative for ROA, with the most negative values in 2018–2019 (BOP/IMF crisis) and 2020 (COVID-19). This pattern is consistent with Figure 1, which shows the secular decline in mean ROA over the study period, and validates the use of year controls in the Two-Way FE model.

4.5 Sector Fixed Effects Results

As an additional robustness check, Table 4.4 presents results from a specification that replaces firm fixed effects with sector fixed effects (16 sector dummies), allowing the identification of between-firm variation that is absorbed in the standard FE model.

Table 4.4: Sector Fixed Effects Results

Variable	**ROA (Sector FE)**	**ROE (Sector FE)**
Debt/Equity Ratio	-0.0004	-0.0547^{***}
	(0.0004)	(0.0064)
Firm Size	0.0346^{***}	0.0874^{***}
	(0.0061)	(0.0215)
Sales Growth	0.0215^{***}	0.0577^{***}
	(0.0039)	(0.0177)
Firm Age	0.0002^{**}	0.0002
	(0.0001)	(0.0004)
GDP Growth	0.0024^{***}	-0.0019
	(0.0006)	(0.0034)
Financial Inclusion Index	-0.0054^{***}	-0.0058^{*}
	(0.0016)	(0.0033)
Interest Rate	-0.0010	-0.0037
	(0.0007)	(0.0034)
Sector Fixed Effects	Yes	Yes
Observations	3,769	3,769
R^2	0.1782	0.2531

Note: Clustered standard errors at the firm level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. Sector FE includes 16 sector dummies with Textile as the base sector. This specification exploits between-firm variation within sectors, complementing the within-firm FE and between-firm RE estimates.

The Sector FE results are consistent with the baseline findings. The FI Index effect on ROA is negative and significant ($\beta = -0.0054^{***}$), confirming that the competition channel operates not only within firms over time but also in the cross-section across firms within sectors. The D/E effect on ROE remains negative and highly significant ($\beta = -0.0547^{***}$), confirming the robustness of the leverage–equity return relationship

across estimation strategies. Firm size and sales growth are significant predictors of both ROA and ROE under Sector FE, consistent with the baseline results.

4.6 Summary of All Specifications

Table 4.5 provides a consolidated summary of the FI Index and D/E coefficients across all four specifications for both dependent variables, facilitating direct comparison.

Table 4.5: Summary of Key Coefficients Across All Specifications

	Specification			
Coefficient	**(1) Baseline**	**(2) Winsorized**	**(3) Two-Way FE**	**(4) Sector FE**
Panel A: Financial Inclusion Index → ROA				
$\hat{\beta}_{FI}$	-0.0052^{***}	-0.0049^{***}	Absorbed	-0.0054^{***}
Panel B: Financial Inclusion Index → ROE				
$\hat{\beta}_{FI}$	-0.0056	-0.0069^{**}	Absorbed	-0.0058^{*}
Panel C: Debt/Equity Ratio → ROA				
$\hat{\beta}_{DE}$	0.0001	0.0001	0.0000	-0.0004
Panel D: Debt/Equity Ratio → ROE				
$\hat{\beta}_{DE}$	-0.0554^{***}	-0.0554^{***}	-0.0576^{***}	-0.0547^{***}

Note: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. All models use firm-clustered standard errors. "Absorbed" indicates the macro variable is collinear with year fixed effects in the Two-Way FE specification and cannot be separately identified. The D/E effect on ROA is consistently insignificant across all specifications.

The summary table reveals two clear patterns. First, the FI Index consistently reduces ROA across all identifiable specifications, with coefficients ranging from -0.0049 to -0.0054 — a tight band indicating robustness to specification choice. Second, the D/E ratio consistently and strongly reduces ROE across all four specifications, with coefficients ranging from -0.0547 to -0.0576 — again a tight band, confirming the structural nature of this relationship.

4.7 Discussion of Main Findings

4.7.1 Financial Inclusion and ROA: The Competition Channel

The robust negative effect of financial inclusion on ROA confirms that deeper financial markets compress incumbent firm profitability in Pakistan's listed corporate sector. This finding is consistent with the theoretical prediction of Chauvet and Jacolin (2017) that the competition effect of financial inclusion dominates the access effect for incumbent firms: as formal credit access expands, new competitors enter

product markets, intensifying price competition and eroding the rents of established firms.

This interpretation goes in line with the experience of financial deepening witnessed by Pakistan in the period of study. The growth of branchless banking, SME credit facilities and online lending systems all inclusive of the increased FI Index has increasingly reduced the levels of credit barriers to new entrants in all of the industries of Pakistan.For incumbent listed firms, particularly those in competitive sectors, this translates into narrower margins and lower asset returns. The finding is consistent with Beck et al. (2005)'s cross-country evidence that financial development disproportionately benefits new and smaller firms while potentially eroding the advantages of incumbent large firms.

The null finding for D/E and ROA is also theoretically informative. The absence of a significant leverage–asset return relationship is consistent with Myers (1984)'s pecking order prediction: within the Fixed Effects framework, the within-firm variation in D/E is endogenous to within-firm variation in profitability — firms that become more profitable reduce their leverage, and vice versa. This simultaneity, together with the offsetting tax shield and distress cost effects, may explain why the net effect on ROA is indistinguishable from zero.

4.7.2 Leverage and ROE: Financial Distress Cost Dominance

The large, stable, and highly significant negative effect of the D/E ratio on ROE ($\beta \approx -0.055$ across all specifications) constitutes the most robust finding of this study. At the sample mean D/E of 1.795, leverage reduces ROE by approximately 9.9 percentage points — a magnitude that substantially exceeds the mean ROE of 5.94%, implying that the typical PSX-listed firm would more than double its equity returns by transitioning to an all-equity capital structure.

This finding strongly rejects the trade-off theory prediction that moderate leverage enhances firm value through tax shields (Kraus and Litzenberger, 1973). Instead, it supports the financial distress cost argument (Jensen and Meckling, 1976): in Pakistan's corporate sector, where bank-intermediated debt is the dominant financing source and where credit markets are characterised by collateral requirements, high real interest rates, and limited debt restructuring options, the costs of leverage substantially exceed any tax benefits.

The result is also consistent with the agency cost framework of Jensen and Meckling (1976). Pakistani listed firms, characterised by high ownership concentration and limited institutional investor monitoring, may use debt in ways that reflect managerial preferences rather than value maximisation — consistent with the finding that leverage reduces rather than enhances equity returns.

4.7.3 Control Variable Findings

Firm size positively predicts both ROA and ROE across most specifications, consistent with scale economy effects and the competitive advantages of large firms in Pakistan's bank-concentrated credit market (Barney, 1991; Beck et al., 2005). Larger firms have better access to formal credit at lower rates, can negotiate better supplier terms, and have stronger bargaining power in product markets.

Sales growth, emerging as significant after winsorization, confirms the fundamental importance of revenue expansion for both asset and equity returns (Manal et al., 2020; Yousaf and Dey, 2022). This finding is particularly relevant for Pakistan's corporate sector, where capacity utilisation and revenue growth are more directly controllable by management than macroeconomic conditions or capital structure decisions.

GDP growth significantly and positively predicts ROA, confirming the pro-cyclical nature of Pakistani firm profitability. The insignificance of GDP growth for ROE reflects the leverage amplification mechanism: equity returns are determined primarily by the interaction of operational performance and the firm's capital structure, with the macro cycle effect on ROE already captured through the D/E coefficient.

CHAPTER 5. Robustness Checks and Sectoral Analysis

5.1 Introduction

This chapter extends the main empirical analysis through two substantive robustness exercises. Section 5.2 presents the mediation analysis, formally testing whether the Debt-to-Equity ratio mediates the relationship between the Financial Inclusion Index and firm financial performance following the Baron and Kenny (1986) four-step framework, supplemented by the Sobel (1982) test and bootstrapped confidence intervals. Section 5.3 presents the sectoral heterogeneity analysis, comparing the determinants of financial performance across competitive/low-margin and oligopolistic/high-margin sector groups, with structural differences formally tested through the Chow (1960) test and the D/E interaction model. Section 5.5 synthesises the robustness findings and their implications for the main results. Section **??** concludes the chapter.

Together, these analyses serve three purposes: they validate the robustness of the baseline findings to alternative specifications; they shed light on the mechanisms through which financial inclusion and leverage affect firm performance; and they reveal important sectoral heterogeneity that would be obscured by the full-sample pooled estimates of Chapter 4.

5.2 Mediation Analysis: Does D/E Mediate the FI–Performance Relationship?

5.2.1 Motivation and Theoretical Background

The mediation hypothesis posits that the negative effect of financial inclusion on firm profitability operates *indirectly* through the leverage channel: deeper financial markets reduce borrowing constraints (Path a: FI $\rightarrow$ D/E), which increases leverage; higher leverage then reduces profitability (Path b: D/E $\rightarrow$ ROA/ROE), producing a net negative indirect effect of financial inclusion on performance. This channel has theoretical grounding in the credit rationing literature (Fazzari et al., 1988; Stiglitz and Weiss, 1981): if financial inclusion primarily relaxes firms' credit constraints, its first-order effect would be on their ability to borrow — and if leverage then harms performance, the indirect channel would explain the overall negative FI–ROA relationship.

Alternatively, if the FI Index affects performance *directly* — through intensified

product market competition, margin compression, and competitive entry — without operating through the leverage channel, then D/E is not a mediator but an independent determinant of performance. Distinguishing between these two mechanisms has important theoretical implications: the mediation interpretation supports a supply-side (credit access) story, while the direct effect interpretation supports a product market competition story.

5.2.2 Baron and Kenny Four-Step Framework

The mediation analysis follows the canonical Baron and Kenny (1986) four-step framework. Four conditions must hold for mediation to be confirmed:

1. **Condition 1 (Path c)**: The independent variable (FI Index) must significantly predict the dependent variable (ROA or ROE) in the absence of the mediator.
2. **Condition 2 (Path a)**: The independent variable (FI Index) must significantly predict the mediator (D/E ratio).
3. **Condition 3 (Path b)**: The mediator (D/E ratio) must significantly predict the dependent variable (ROA or ROE) when controlling for the independent variable.
4. **Condition 4 (Path c')**: The effect of the independent variable on the dependent variable must be reduced (partial mediation) or eliminated (full mediation) when the mediator is included.

The indirect effect $a \times b$ is tested using the Sobel (1982) statistic:

$$Z_{Sobel} = \frac{\hat{a} \cdot \hat{b}}{\sqrt{\hat{b}^2 \cdot SE_a^2 + \hat{a}^2 \cdot SE_b^2}} \tag{5.1}$$

and supplemented by bootstrapped 95% confidence intervals based on 500 replications, which are more reliable than the asymptotic Sobel test when the indirect effect distribution is non-normal (Wooldridge, 2010).

5.2.3 Mediation Results: ROA Model

Table 5.1 presents the four-step mediation results for the ROA model. All models use Random Effects with firm-clustered standard errors, consistent with the mediation testing convention of holding the estimator constant across all steps.

Table 5.1: Mediation Analysis: Financial Inclusion Index → D/E → ROA

Step	**Path**	**DV**	**Key Variable**	**Coefficient**	**p-value**
Step 1	Path c (Total Effect)	ROA	FI Index	-0.0053^{***}	0.000
Step 2	Path a (IV → Med.)	D/E	FI Index	-0.0708	0.212
Step 3	Path b (Med. → DV)	ROA	D/E	-0.0000	0.970
Step 4	Path c' (Direct Effect)	ROA	FI Index	-0.0053^{***}	0.000
Indirect Effect ($\hat{a} \times \hat{b}$)				$+0.0000013$	—
Sobel Z-statistic				0.038	0.970
Bootstrap 95% CI (500 reps)				$[-0.0001, +0.0001]$	—
Change in FI coefficient ($c \to c'$)				-0.03%	—

Note: All models use Random Effects with firm-clustered standard errors. $^{***}p < 0.01$. Control variables (firm size, sales growth, firm age, GDP growth, interest rate) included in all steps but not reported for brevity. Bootstrap based on 500 replications. A confidence interval including zero indicates the indirect effect is not statistically significant.

The mediation conditions are clearly not satisfied for the ROA model. Condition 1 holds: Path c confirms that the FI Index significantly reduces ROA ($\beta = -0.0053$, $p < 0.001$), establishing the total effect to be mediated. However, Condition 2 fails decisively: Path a shows that the FI Index does not significantly predict the D/E ratio ($\beta = -0.0708$, $p = 0.212$). The FI Index — a country-level macro variable — explains essentially none of the within-firm or across-firm variation in leverage decisions, which are driven by firm-specific factors (management strategy, asset tangibility, profitability history, sector norms) rather than by aggregate financial market conditions.

Condition 3 also fails: when D/E is added to the ROA model, its coefficient is essentially zero ($\beta = -0.0000$, $p = 0.970$), confirming that leverage does not affect asset returns after controlling for the FI Index and other covariates in the RE framework. Condition 4 is vacuously satisfied but meaningless given Conditions 2 and 3 both fail: the FI Index coefficient changes by only -0.03% when D/E is included, indicating zero mediation.

The indirect effect is negligibly small ($\hat{a} \times \hat{b} = +0.0000013$), the Sobel test is insignificant ($Z = 0.038$, $p = 0.970$), and the bootstrap 95% confidence interval $[-0.0001, +0.0001]$ straddles zero symmetrically, confirming the absence of a meaningful indirect effect. The verdict is unambiguous: **D/E does not mediate the FI Index → ROA relationship**.

5.2.4 Mediation Results: ROE Model

Table 5.2 presents the four-step mediation results for the ROE model.

Table 5.2: Mediation Analysis: Financial Inclusion Index → D/E → ROE

Step	**Path**	**DV**	**Key Variable**	**Coefficient**	**p-value**
Step 1	Path c (Total Effect)	ROE	FI Index	-0.0030	0.484
Step 2	Path a (IV → Med.)	D/E	FI Index	-0.0708	0.212
Step 3	Path b (Med. → DV)	ROE	D/E	-0.0554^{***}	0.000
Step 4	Path c' (Direct Effect)	ROE	FI Index	-0.0068^{**}	0.043
Indirect Effect ($\hat{a} \times \hat{b}$)				$+0.0039$	—
Sobel Z-statistic				1.235	0.217
Bootstrap 95% CI (500 reps)				$[+0.0003, +0.0075]$	—
Change in FI coefficient ($c \to c'$)				-132%	—

Note: All models use Random Effects with firm-clustered standard errors. $^{***}p < 0.01$, $^{**}p < 0.05$. Control variables included in all steps but not reported for brevity. Bootstrap based on 500 replications. A negative percentage change ("−132%") indicates that the coefficient grew in absolute magnitude when the mediator was included — a signature of suppression rather than mediation.

The ROE mediation results present a more complex picture that requires careful interpretation. Path c (Step 1) fails: the FI Index does not significantly predict ROE in the absence of D/E ($\beta = -0.0030$, $p = 0.484$), violating the first and most fundamental condition for mediation — there is no total effect to mediate. Path a (Step 2) also fails: the FI Index does not predict D/E ($\beta = -0.0708$, $p = 0.212$), the same result as the ROA model, for the same structural reasons. Path b (Step 3) holds: D/E strongly and negatively predicts ROE ($\beta = -0.0554$, $p < 0.001$), consistent with the main results of Chapter 4.

The most notable finding is in Step 4: when D/E is added to the ROE model, the FI Index coefficient grows from -0.0030 (n.s.) to -0.0068 ($p < 0.05$) — an increase in magnitude of 132%, the opposite of what mediation predicts. Furthermore, the bootstrapped confidence interval for the indirect effect $[+0.0003, +0.0075]$ excludes zero, yet the indirect effect is *positive* ($+0.0039$) while the total effect is *negative* (-0.0030) — a logical contradiction that rules out mediation.

5.2.5 Suppression Detection in the ROE Model

This pattern — a coefficient that grows when the "mediator" is added, and an indirect effect that is opposite in sign to the total effect — is the hallmark of *suppression* rather than mediation (Wooldridge, 2010). The D/E variable acts as a suppressor in the ROE model: it removes noise from the error term that is irrelevant to the FI–ROE relationship, allowing the direct FI effect to be estimated more precisely. Specifically, D/E is strongly correlated with ROE (through the leverage mechanism) and partially correlated with the FI Index error term, thereby absorbing variance that would otherwise inflate the standard error of the FI coefficient.

Three features of the results confirm suppression rather than mediation: (i) the coefficient grows in magnitude rather than shrinking; (ii) the indirect effect is positive while the total effect is negative, making the indirect and direct effects inconsistent; and (iii) Path a is insignificant — a suppressor by definition has a different relationship with the independent variable than a true mediator.

5.2.6 Implications of Null Mediation

The null mediation result for both ROA and ROE carries three important implications for the main findings of Chapter 4.

First, independence confirmed: the FI Index and D/E ratio are statistically and economically independent determinants of firm performance. They do not form parts of the same causal chain. Including both as independent variables in the same regression — as in the baseline models — is not only permissible but econometrically appropriate.

Second, direct effect validated: the negative FI Index $\rightarrow$ ROA effect is a direct, not indirect, mechanism. Financial inclusion affects asset returns through the product market competition channel — enabling new entry, intensifying price competition, and compressing incumbent margins — not through the credit supply and leverage channel. This is a theoretically meaningful distinction that strengthens the competition-channel interpretation.

Third, structural reason for Path a failure: the failure of Path a is not a data quality issue but a correct reflection of economic reality. The FI Index is a country-level macro variable with zero cross-sectional variation: it takes the same value for all 304 firms in any given year. Leverage (D/E) varies enormously across firms — from -19.8 to $+36.9$ — driven by firm-specific decisions about financing strategy, asset tangibility, and profitability history. A national-level index cannot explain firm-level capital structure choices, and the Panel a failure correctly reflects this structural mismatch.

5.3 Sectoral Heterogeneity Analysis

5.3.1 Motivation and Group Classification

The full-sample estimates of Chapter 4 treat all 304 PSX-listed firms as a homogeneous pool. However, the theoretical prediction of Chauvet and Jacolin (2017) — that financial inclusion affects competitive and oligopolistic sector firms differently through the competition channel — suggests that pooled estimates may mask important cross-sectoral heterogeneity. The full-sample FI Index coefficient ($\beta \approx -0.005$) is a weighted average of the effects across all 16 sectors, potentially obscuring a strong negative effect

in competitive sectors offset by a negligible or positive effect in oligopolistic sectors.

Two sector groups are defined on the basis of market structure, pricing power, and mean profitability:

- **Group 1 — Competitive/Low-Margin Sectors** (N = 2,301 obs; 177 firms): Textile (sector 15), Sugar (13), Chemicals (3), Electrical & Electronics (4), and Leather & Footwear (10). These sectors are characterised by price-taking competition, no sustained pricing power, intense domestic and import competition, export dependence, and thin or negative mean ROA (Group 1 mean ROA = 0.11%).

- **Group 2 — Oligopolistic/High-Margin Sectors** (N = 1,651 obs; 127 firms): Energy (5), Cement (2), Engineering & Construction (6), Food & Beverages (8), Automobiles (1), Technology & Telecom (14), Pharmaceuticals (12), Glass & Ceramics (9), Packaging & Paper (11), Fertilizer (7), and Tobacco (16). These sectors are characterised by oligopolistic market structure, regulatory protection, branded products, inelastic demand, and high mean profitability (Group 2 mean ROA = 5.57%).

5.3.2 Descriptive Differences Between Groups

The magnitude of the profitability gap between groups is striking. Group 2 firms earn mean ROA of 5.57% compared to 0.11% for Group 1 — a ratio of approximately 50:1. Group 2 mean ROE (12.74%) is approximately 12 times higher than Group 1 (1.06%). Group 2 firms are also significantly larger (mean log assets 6.948 vs 6.402), reflecting the capital intensity of Energy, Cement, and Fertilizer sectors. These descriptive differences motivate the formal structural break test presented below.

5.3.3 Hausman Test Results by Group

Before estimating group-specific models, the Hausman test is applied separately for each group and each dependent variable to determine the preferred estimator. Table 5.3 reports the results.

Table 5.3: Hausman Test Results by Sector Group

Model	$\chi^2(6)$	p-value	Decision	Preferred
Group 1 ROA (Competitive)	24.15	0.0005	Reject H_0	Fixed Effects
Group 2 ROA (Oligopolistic)	21.02	0.0018	Reject H_0	Fixed Effects
Group 1 ROE (Competitive)	9.55	0.1450	Fail to reject	Random Effects
Group 2 ROE (Oligopolistic)	64.05	0.0000	Reject H_0	Fixed Effects

Note: Hausman test statistic follows $\chi^2(6)$ distribution. Preferred estimator used in all subsequent group-specific regressions. The Group 2 ROE result (FE preferred) is notable — oligopolistic firm-specific characteristics such as market position, regulatory licenses, and brand value are correlated with leverage decisions, requiring Fixed Effects for consistent estimation.

Importantly, the preferred estimator for Group 2 ROE is Fixed Effects, differing from the full-sample Random Effects specification for ROE. This difference reflects a structural feature of oligopolistic sectors: firm-specific unobservable characteristics — government relationships, spectrum licenses, exclusive import permits, brand equity — are correlated with leverage decisions in ways that are not present in competitive sector firms. The Hausman test correctly detects this correlation and prescribes FE for consistent estimation.

5.3.4 Chow Test: Formal Structural Break Test

The Chow (1960) test formally examines whether the two sector groups have structurally different regression coefficient vectors. Table 5.4 reports the results.

Table 5.4: Chow Test for Structural Difference Between Sector Groups

DV	F-statistic	df	p-value	Decision
ROA	$F(7,\ 3{,}755) = 14.90$	$(7,\ 3{,}755)$	< 0.001	Reject H_0: Split justified
ROE	$F(7,\ 3{,}755) = 2.34$	$(7,\ 3{,}755)$	0.022	Reject H_0: Split justified

Note: Chow test null hypothesis: H_0: coefficients are equal across the two sector groups (pooling is valid). Rejection of H_0 confirms that the two groups have structurally different profitability determinants and that pooled estimation imposes incorrect parameter restrictions. $k = 7$ regressors; $N = 3{,}769$ effective observations after accounting for lagged sales growth. RSS_{pooled}, RSS_{G1}, and RSS_{G2} computed from Fixed Effects models for ROA.

Both Chow tests reject the null hypothesis of coefficient equality at conventional significance levels — strongly for ROA ($F = 14.90$, $p < 0.001$) and moderately for ROE ($F = 2.34$, $p = 0.022$). These results confirm that the two sector groups have structurally different profitability determinants, and that pooling them in a single regression — as in the full-sample models — imposes incorrect parameter restrictions. The sectoral split is therefore statistically justified, not merely descriptively motivated.

5.3.5 ROA Results by Sector Group

Table 5.5 presents the ROA Fixed Effects results for Group 1 and Group 2 separately, with the full-sample estimate for comparison.

Table 5.5: ROA Fixed Effects Results by Sector Group

Variable	**Full Sample FE**	**Group 1: Competitive FE**	**Group 2: Oligopolistic FE**
Debt/Equity Ratio	0.0001	0.0004	−0.0009
	(0.0005)	(0.0006)	(0.0009)
Firm Size	0.0453**	0.0577*	−0.0333
	(0.0222)	(0.0295)	(0.0322)
Sales Growth	0.0224***	0.0231***	0.0204**
	(0.0040)	(0.0051)	(0.0065)
Firm Age	−0.0001	0.0039*	−0.0035
	(0.0017)	(0.0021)	(0.0022)
GDP Growth	0.0029***	0.0013*	0.0050***
	(0.0006)	(0.0008)	(0.0011)
Financial Inclusion Index	−0.0049***	−0.0108***	+0.0031
	(0.0016)	(0.0022)	(0.0017)
Interest Rate	−0.0011*	−0.0020**	−0.0000
	(0.0007)	(0.0008)	(0.0012)
Constant	−0.2499**	−0.5232***	+0.4061*
	(0.1155)	(0.1419)	(0.1769)
Observations	3,769	2,243	1,526
Firms	304	177	127
Within R^2	0.0547	0.0889	0.0645
Estimator	FE	FE	FE

Note: Clustered standard errors at the firm level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. Group 1 comprises Textile, Sugar, Chemicals, Electrical & Electronics, and Leather & Footwear. Group 2 comprises Energy, Cement, Engineering, Food & Beverages, Automobiles, Technology & Telecom, Pharmaceuticals, Glass & Ceramics, Packaging & Paper, Fertilizer, and Tobacco.

The most striking result in Table 5.5 is the complete reversal of the Financial Inclusion Index effect across groups. In Group 1 (competitive sectors), the FI Index is strongly negative and highly significant ($\beta = -0.0108$, $p < 0.001$) — more than double the full-sample coefficient in magnitude. In Group 2 (oligopolistic sectors), the FI Index effect is positive and insignificant ($\beta = +0.0031$, $p = 0.069$) — not significantly different from zero at any conventional level. This divergence is the central finding of the sectoral analysis and is discussed in depth in Section 5.5.

GDP growth exhibits a complementary divergence: its positive effect on ROA is significantly stronger in oligopolistic sectors ($\beta = 0.0050^{***}$) than in competitive sectors ($\beta = 0.0013^{*}$), consistent with the prediction that protected firms capture

disproportionately more of macroeconomic upswings through price adjustments. Interest rates significantly reduce ROA in competitive sectors ($\beta = -0.0020^{**}$) but have zero effect in oligopolistic sectors ($\beta \approx 0.0000$, $p = 0.981$), confirming that protected firms can pass interest cost increases to customers through pricing.

Sales growth is the only variable that remains significant in *both* groups ($\beta = 0.0231^{***}$ in Group 1; $\beta = 0.0204^{**}$ in Group 2), confirming that revenue growth is a universal driver of asset efficiency regardless of market structure.

5.3.6 ROE Results by Sector Group

Table 5.6 presents the ROE results by sector group, using the preferred estimator for each group as determined by the Hausman test.

Table 5.6: ROE Results by Sector Group (Preferred Estimators)

Variable	**Full Sample RE**	**Group 1: Competitive RE**	**Group 2: Oligopolistic FE**
Debt/Equity Ratio	-0.0554^{***}	-0.0585^{***}	-0.0553^{***}
	(0.0069)	(0.0079)	(0.0117)
Firm Size	0.0826^{***}	0.0500	-0.0668
	(0.0265)	(0.0362)	(0.1258)
Sales Growth	0.0583^{***}	0.0791^{**}	0.0250
	(0.0181)	(0.0249)	(0.0199)
Firm Age	-0.0007	-0.0016	-0.0086
	(0.0008)	(0.0010)	(0.0112)
GDP Growth	-0.0013	-0.0066	$+0.0080$
	(0.0035)	(0.0049)	(0.0054)
Financial Inclusion Index	-0.0069^{**}	-0.0071	$+0.0122$
	(0.0033)	(0.0046)	(0.0110)
Interest Rate	-0.0045	-0.0055	-0.0072^{*}
	(0.0035)	(0.0039)	(0.0043)
Constant	-0.5179^{***}	-0.1004	$+1.0082$
	(0.1751)	(0.2294)	(0.7360)
Observations	3,769	2,243	1,526
Firms	304	177	127
Within R^2	0.3168	0.3312	0.2835
Estimator	RE	RE	FE

Note: Clustered standard errors at the firm level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. Group 1 uses Random Effects (Hausman $p = 0.145$). Group 2 uses Fixed Effects (Hausman $p < 0.001$). All variables winsorized at 1st/99th percentiles.

The most important finding in Table 5.6 is the universality of the D/E $\rightarrow$ ROE negative effect across both groups. The D/E coefficient is negative, large in magnitude, and highly significant in Group 1 ($\beta = -0.0585^{***}$) and Group 2 ($\beta = -0.0553^{***}$).

The numerical difference between groups (0.003) is negligible and, as confirmed by the interaction test in Section 5.3.7, statistically insignificant ($p = 0.400$). Leverage destroys equity returns universally in Pakistan's listed corporate sector — in competitive sectors facing price pressure and in oligopolistic sectors with guaranteed revenue streams alike.

Sales growth significantly improves ROE in Group 1 ($\beta = 0.0791^{**}$) but is insignificant in Group 2 ($\beta = 0.0250$, $p = 0.211$). This divergence reflects fundamentally different business models: competitive firms (Textile, Sugar) depend on revenue volume growth to generate equity returns, while oligopolistic firms (Tobacco, Fertilizer, Cement) generate equity returns through pricing power independent of volume. A Tobacco duopolist earning 33% ROE does not need to grow sales to maintain its equity returns — it maintains price discipline in a market with perfectly inelastic demand.

5.3.7 D/E Interaction Test

As a continuous test of whether the D/E effect on profitability formally differs between sector groups, Table 5.7 presents the interaction model results.

Table 5.7: Interaction Model: D/E × Sector Group

Variable	ROA (FE)	ROE (RE)
Debt/Equity (D/E)	0.0004	-0.0585^{***} β_1: D/E effect in Group 1>β_1: D/E effect in Group 1
	(0.0006)	(0.0080)
Group 2 Dummy	Omitted (collinear)	0.0438
		(0.0310)
D/E × Group 2	−0.0013	+0.0125 β_3: Additional D/E effect in Group 2>β_3: Additional D/E effect in Group 2
	(0.0010)	(0.0149)
Firm Size	0.0332	0.0760^{**}
	(0.0241)	(0.0270)
Sales Growth	0.0219^{***}	0.0580^{***}
	(0.0040)	(0.0177)
Financial Inclusion Index	-0.0049^{***}	-0.0071^{**}
	(0.0016)	(0.0033)
β_3 p-value (interaction test)	0.226	0.400
Observations	3,769	3,769
Within R^2	0.0557	0.3139

Note: Clustered standard errors at the firm level in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$. β_1 = D/E effect in Group 1 (base). β_3 = additional D/E effect in Group 2 relative to Group 1. Insignificant β_3 confirms that the D/E effect does not statistically differ between sector groups. The Group 2 dummy is omitted in the ROA Fixed Effects model due to collinearity with firm fixed effects; it is identified in the ROE Random Effects model. GDP growth, interest rate, and firm age included but not reported.

The interaction coefficient β_3 is statistically insignificant for both ROA ($\beta_3 = -0.0013$, $p = 0.226$) and ROE ($\beta_3 = +0.0125$, $p = 0.400$). This confirms that the D/E effect on firm profitability does not statistically differ between competitive and oligopolistic sectors — the leverage destruction of equity returns is a universal mechanism operating across all of Pakistan's listed corporate sector, regardless of market structure. The interaction test provides the strongest statistical confirmation of the universality finding and complements the sub-sample results of Tables 5.5 and 5.6.

5.4 Summary of All Robustness Tests

Table 5.8 consolidates the key findings from all robustness checks, providing a unified view of the evidence on the two main hypotheses.

Table 5.8: Summary of Robustness Check Results

Test	**Model**	**FI → ROA**	**FI → ROE**	**D/E → ROE**
Baseline (pre-winsor)	FE/RE	-0.0052^{***}	-0.0056	-0.0554^{***}
Winsorized	FE/RE	-0.0049^{***}	-0.0069^{**}	-0.0554^{***}
Two-Way FE (year dummies)	FE/FE	Absorbed	Absorbed	-0.0576^{***}
Sector Fixed Effects	Sector FE	-0.0054^{***}	-0.0058^{*}	-0.0547^{***}
Mediation (Path c')	RE	-0.0053^{***}	-0.0068^{**}	-0.0554^{***}
Group 1 sub-sample	FE/RE	-0.0108^{***}	-0.0071	-0.0585^{***}
Group 2 sub-sample	FE/FE	$+0.0031$	$+0.0122$	-0.0553^{***}
Interaction model	FE/RE	$\beta_3 = -0.0013$ (n.s.)		$\beta_3 = +0.0125$ (n.s.)
Overall Verdict		**Robust**	**Conditional**	**Highly Robust**

Note: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$. "Absorbed" indicates the variable is collinear with year fixed effects in the Two-Way FE model. "Conditional" for FI → ROE reflects that this effect is sensitive to the presence of extreme outliers (significant post-winsorization) and the sector group considered. The D/E → ROE effect is the most robust finding, surviving all eight specifications with a coefficient range of $[-0.0547, -0.0585]$.

5.5 Discussion: Theoretical and Empirical Implications

5.5.1 The Financial Inclusion Competition Channel: Sectoral Evidence

The sectoral disaggregation provides the most compelling evidence on the mechanism through which financial inclusion affects firm profitability. The FI Index effect on ROA reverses completely between competitive and oligopolistic sectors: strongly negative in Group 1 ($\beta = -0.0108^{***}$) and effectively zero in Group 2 ($\beta = +0.0031$, n.s.). This reversal is precisely what the competition channel of Chauvet and Jacolin (2017) predicts.

In competitive sectors, financial inclusion enables new entrants to access formal credit and enter product markets previously dominated by incumbent firms. Textile mills, sugar processors, and chemical manufacturers — whose products are commodity-like with limited differentiation — face direct price competition from new entrants who can now access capital through expanded banking networks and digital lending platforms. The result is margin compression, lower capacity utilisation, and reduced ROA for incumbent firms.

In oligopolistic sectors, financial inclusion cannot easily overcome the structural barriers to entry: Tobacco (duopoly), Fertilizer (four major producers with regulated gas allocations), Cement (regional pricing coordination), Energy (government-

awarded power purchase agreements), and Pharmaceuticals (drug registration requirements). Even if a potential entrant gains credit access, they cannot enter these markets without licences, regulatory approvals, or capital investments that far exceed what financial inclusion can provide. The oligopolistic rents earned by Group 2 firms are therefore structurally protected from the competitive pressures that financial deepening creates.

5.5.2 The Universal Leverage Destruction of Equity Returns

The D/E → ROE finding — negative, large, and statistically significant in both competitive and oligopolistic sectors, with statistically indistinguishable magnitudes — constitutes the most robust and theoretically significant result of the entire study. The universality of this finding rules out the hypothesis that high leverage is sustainable in Pakistan's protected sectors because guaranteed revenues (CPEC offtake agreements, regulated fertilizer prices) cushion the interest burden. Even Energy and Fertilizer firms — the most protected in the sample — suffer systematically lower equity returns from leverage, suggesting that the financial distress costs of bank-intermediated debt in Pakistan exceed any revenue guarantee or tax shield benefit.

This finding has a clear capital structure policy implication: Pakistan's corporate sector is systematically over-leveraged from a shareholder value perspective. The optimal capital structure for PSX-listed firms — the D/E ratio that maximises equity returns — is substantially lower than the current sample mean of 1.795, regardless of which sector the firm operates in. The trade-off theory of Kraus and Litzenberger (1973) would predict an interior optimum; the empirical evidence suggests that most PSX firms are operating well beyond this optimum, in the range where financial distress costs dominate.

5.5.3 Null Mediation Strengthens Independent Effects

The null mediation result completes the evidential picture: financial inclusion and leverage are independent, non-overlapping determinants of firm performance. The direct competition channel (FI → ROA via product market effects) operates separately from the financing channel (D/E → ROE via interest burden and distress costs). This independence validates the main regression specification — including both FI Index and D/E as separate regressors — and confirms that the FI Index coefficient is not contaminated by leverage endogeneity.

CHAPTER 6. Conclusion and Policy Implications

6.1

6.2 Summary of Key Findings

This study examined the impact of financial inclusion and capital structure on the financial performance of 304 non-financial firms listed on the Pakistan Stock Exchange over the period 2010–2022, yielding 3,952 firm-year observations across 16 industrial sectors. The analysis employed Fixed Effects and Random Effects panel estimators selected via the Hausman test, with firm-clustered standard errors correcting for serial correlation and heteroscedasticity. Four robustness checks — winsorization, Two-Way Fixed Effects, mediation analysis, and sectoral Chow tests — were applied to validate the core findings. The results with respect to each research hypothesis are summarised below.

6.3 Policy Implications

First, financial inclusion enhances competition as opposed to securing existing companies. In competitive industries, an increase in financial deepening lowers the profitability of the incumbents (FI -ROA negative relationship) as it allows market entry and consumer benefits. Although this is an economically good thing, it points to the necessity to complement this competition policy. The effect of NFIS on sector performance might not be as great without regulatory changes to open up the entry barriers, particularly in oligopolistic industries like Energy, Fertilizer, and Pharmaceuticals where the average incumbent is cushion against competition.

Second, credit growth seems to boost the leverage of corporations more than productive investments as the correlation between D/E and ROE tends to be negative. This implies that financial inclusion has contributed to debt growth rather than investment that can be profitable. The State Bank of Pakistan (SBP) ought to thus supplement credit deepening with macroprudential policies to control leverage ratios, especially in the high leverage and low profit sectors such as Textile and Sugar. Enhancing equity markets by incentives in IPOs, secondary equity issues, development of private equities and restructuring of debts would serve to offset the credit orientation of NFIS.

Lastly, the results help the divergent financial inclusion policies by sector. Financial inclusion increases the intensity of competition in competitive industries (Textile, Sugar, Chemicals) and promotes efficiency gains, product innovation and export diver-

sification. Structural and regulatory reform is however needed in oligopolistic sectors to decrease barriers to entry and to make financial deepening lead to wider market efficiency as opposed to sustained incumbency rents.

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