P-ISSN: 2790-6795	Annals of Human and Social Sciences	July-September 2025,Vol. 6, No. 3
O-ISSN:2790-6809	http://doi.org/10.35484/ahss.2025(6-III)15	[184-197]

Annals of Human and Social Sciences
www.ahss.org.pk

RESEARCH PAPER

Exploring Infrastructure as a Catalyst for Firm-Level Sales Outcomes: A Study from Pakistan

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ABSTRACT

This study investigates how financial, physical, and institutional infrastructure collectively shape firm performance in Pakistan. Despite increasing global recognition of infrastructure's role in economic development, Pakistan industrial sector, continue to face challenges in leveraging infrastructure to optimize firm performance. Adopting firm-level microdata from the World Bank Enterprise Surveys (WBES) 2022 and employing rigorous econometric analysis, the study captures the potentially dynamic relationships of three infrastructure types and firm performance. Our findings strongly support the notion that firm age, foreign ownership, quality certification, and infrastructure are key determinants of higher sales, while managerial time spent on regulatory compliance can negatively impact growth. The results indicate that a holistic strategy encompassing several infrastructure attributes yields the highest firm-level effects. To promote greater firm-level performance and overall economic growth in Pakistan, authorities must prioritise integrated plans that take into consideration these crucial interdependencies, as well as solve specific infrastructural inadequacies.

KEYWORDS Infrastructure Quality, Enterprise Performance, Microdata-Based Empirical Analysis, Econometric Modeling, Institutional Framework, Physical and Financial Infrastructure

Introduction

In emerging economies, where resource restrictions and structural inefficiencies frequently impede corporate development, infrastructure is widely acknowledged as a vital stimulant for economic growth and firm productivity, particularly for developing economies. (Calderón & Servén, 2010). The operational environment for firms is shaped by the growing complexity and interdependence of many forms of infrastructure as economies progress. The purpose of this study is to particularly investigate the dynamic impact that three essential categories of infrastructure financial, physical, and institutional play in determining the performance of a company in Pakistan, which is experiencing economic growth in South Asia.

Comprehensive infrastructure development is emphasised in the Sustainable Development Goals (SDGs) of the UN, particularly SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation, and Infrastructure), and SDG 16. (Peace, Justice, and Strong Institutions). This study intends to provide policy-relevant insights that help motivate strategic investments and changes in line with these global development priorities by examining the complex relationship between infrastructure and corporate performance.

The markets, organisations, and legal frameworks that make it easier to obtain capital and conduct financial transactions are collectively referred to as financial infrastructure. Good financial systems lower transaction costs, offer crucial risk management resources, and guarantee that companies, especially small and medium-sized firms (SMEs), have access to the credit and funding they need to expand and innovate. (Beck,

Demirgüç-Kunt, & Levine, 2007). Businesses usually face high borrowing costs and liquidity constraints in countries with undeveloped financial systems, which have a direct effect on their competitiveness and output. (World Bank, 2020).

Physical infrastructure, notably energy and information and communication technology (ICT), is another fundamental driver of corporate success. A consistent energy supply is indispensable for uninterrupted production and operational efficiency. Frequent power failures and fluctuating energy prices can significantly curtail output and cause manufacturing delays, leading to lost revenues and diminished competitiveness (Alby, Dethier, & Straub, 2013). Similarly, robust ICT infrastructure—including internet penetration, digital platforms, and mobile coverage empowers companies to access new markets, enhance supply chain coordination, improve customer interactions, and adopt innovative technologies (Clarke, Qiang, & Xu, 2015). However, a persistent digital divide remains a significant obstacle in countries like Pakistan, especially for rural and smaller enterprises.

Institutional infrastructure comprises the rules of law, legal structures, regulatory frameworks, and governance mechanisms. Strong institutions foster trust, reduce uncertainty, safeguard property rights, and ensure contract enforcement—all vital prerequisites for firms to thrive in a market economy (North, 1990; Acemoglu & Robinson, 2012). Conversely, weak institutions manifest as administrative delays, corruption, and policy uncertainty, collectively deterring investment and constraining business growth. Pakistan, despite its progress, continues to face challenges in areas such as energy reliability, financial penetration, and institutional quality (Asian Development Bank, 2022; World Economic Forum, 2023). These contextual differences give this study a special situation, enabling a thorough analysis of the proportionate influence of integrated infrastructure on firm-level results nationwide. In literature studies like Dollar et al. (2005) and Hallward-Driemeier et al. (2006), using aggregated data or cross-country comparisons, have emphasized individual restrictions like as power outages, waits at customs, and financial availability as important factors influencing corporate performance.

A macroeconomic viewpoint has dominated traditional infrastructure development research, frequently ignoring the crucial microeconomic effects of high-quality infrastructure at the corporate level. By using a firm-based methodology to investigate how institutional, financial, and physical infrastructure collectively impact company performance in Pakistan, an emerging yet structurally diverse South Asian economy, this study closes a major gap.

The research is particularly significant for several key reasons. This study highlights how crucial it is to use firm-level microdata, like WBES 2022, to reveal the various difficulties that Pakistani businesses face—difficulties that are frequently obscured by aggregated national statistics. It provides more focused and successful policy actions meant to improve company productivity and competitiveness by utilizing granular evidence. It also emphasizes the intricate interactions between infrastructure-related elements that are frequently disregarded in current models, such as institutional quality, ICT uptake, electrical dependability, and financial inclusion. By combining institutional, financial, and physical infrastructure into a single analytical framework, the study provides a more thorough understanding of how firms function in emerging economies. Finally, it highlights enduring obstacles that impede economic performance in Pakistan, including unstable energy, financial exclusion, and inadequate institutions, and promotes comprehensive development methods.

Even with the generally recognized crucial contribution of infrastructure to economic efficiency and competitiveness worldwide in the case of emerging economies, Pakistan has severe and entrenched infrastructural weaknesses that greatly hinder business activities and industrial production in general. Inconsistent power supply, narrow ICT

coverage, availability constraints of formal financial institutions, and diffused institutional inefficiencies like regulatory ambiguity and poor enforcement mechanisms create frequent and serious challenges for companies (World Bank, 2020). These shortcomings not only diminish productivity and profitability but also choke investment, innovation, and employment generation in all sectors.

A careful review of the literature in Pakistan identifies several reinforcing knowledge gaps in understanding this problem. First, most empirical studies use a compartmentalized framework that examines narrowly the individual infrastructure components, most often energy availability or financial access, without integration. For example, although the macroeconomic consequences of the energy crisis in Pakistan have been extensively documented (Kessides, 2013), overarching firm-level analyses that look at its effect are limited.

The essential contribution of institutional infrastructure—including the quality of governance, regulatory capacity, corruption control, and rule of law—is widely underemphasized in research on Pakistan. In the face of worldwide evidence that identifies institutions as central drivers of the efficacy of physical and financial infrastructure (Dollar, Hallward-Driemeier, & Mengistae, 2005), this fundamental interaction is insufficiently debated within the Pakistani environment. This missing link is more troubling considering the nation's ongoing challenges of political instability, red tape, and uneven policy implementation, all of which undermine directly businesses' capacity to take advantage of infrastructure and to conduct business under a stable rule of law.

Finally, the unavailability of firm-level microdata, including that offered by the WBES 2022, only adds to this analytical lacuna. As such, most of the policy debate in Pakistan draws on country-level aggregated data, which do not identify the essential heterogeneity of experience by size, sector, and location. It results in overbroad policy measures that are not specific enough to effectively address the unique issues faced by businesses of different kinds in different circumstances.

Due to these deficiencies, current models present a partial and potentially inaccurate picture of the dynamic infrastructure-business relationship and the underlying drivers of firm performance in Pakistan. This thesis seeks to meet this critical necessity for a wide-ranging and empirically based examination of infrastructure's overall effect on firm performance.

Our research will try to find out how financial, physical, and institutional infrastructure collectively impact the performance of firms in Pakistan. This study will focus on the following main research objective: To develop an infrastructure index by evaluating the combined impacts of financial, physical, and institutional infrastructure and to empirically assess the impact of infrastructure on firm performance in Pakistan.

Literature Review

Although infrastructure is widely recognized as a key component of economic growth, only in recent decades has its microeconomic impact particularly on firm-level performance been given more attention. Theoretical foundations connecting infrastructure to firm performance are rooted in neoclassical growth models, where infrastructure is productivity-increasing public input. Romer (1990) and Barro (1990) conceptualize infrastructure, i.e., transport, energy, and ICT, as forms of capital that raise marginal returns on private investment and firm productivity. Infrastructure enhances market access, reduces transaction and coordination costs, raises factor mobility, and facilitates enterprises to expand. North (1990) stressed the role played by institutions, believing legal and regulatory systems reduce uncertainty and encourage investment. These theoretical concepts form the basis of most of the empirical work examining the global relationship

between infrastructure and firm outcomes. Calderón and Servén (2010) examined cross-country evidence between 1960 and 2000, using panel data for over 100 countries. The evidence indicates that the quantity and quality of infrastructure significantly influence productivity and growth, where ICT and power infrastructure impact most. It reveals that an additional 1% of infrastructure stock corresponds to an additional 0.07% increase in production per worker.

Escribano, Guasch, and Pena (2010), Allcott, Collard-Wexler, and O'Connell (2016), Forman, Goldfarb, and Greenstein (2012), Fernandes, Mattoo, Nguyen, and Schott (2019) unequivocally show that financial, physical, and institutional infrastructure are the bedrock of firm performance. Although the specific effect differs by industry and location, the general trend is apparent: firms that function within countries that have more developed and stable infrastructure perform better than those in inferior conditions. Yet infrastructure's effect is often tied to supporting governance and regulatory reforms. This study shows that a holistic strategy that includes several infrastructure attributes yields the highest firm-level effects.

The relationship between infrastructure and firm performance has gained more attention in South Asia, particularly in Pakistan, as the push for industrialization in the region, rapid population growth, and chronic infrastructural deficits persist. In Pakistan, the role of energy infrastructure has been a significant area of concern in studies evaluating company constraints. Haider, Din, and Ghani (2012) examined firm-level information from the Pakistan Institute of Development Economics and found that power disruptions highly impacted productivity in small and medium enterprises, which often have limited resources to invest in alternative energy sources. Their evidence indicated that constant power supply has a greater correlation with growth in production compared to labor or capital inputs. Likewise, Malik and Ahmed (2015) investigated the industrial sector and concluded that businesses with self-generation potential were more resilient, placing significance on energy autonomy in reducing unreliability in infrastructure. This is upheld by the World Bank (2017), which established that approximately 34% of Pakistani businesses considered energy as a major constraint, with annual losses of up to 9% of gross sales due to power shortages. ICT infrastructure is also a significant competitiveness driver in the two countries; however, its uptake is uneven.

In Pakistan, Aftab and Khan (2020) employed panel data to analyze telecom and IT sector reforms and their impact on business performance. They concluded that internet and cellular connections enhance operational efficiency and reduce transaction costs, especially for SMEs involved in digital business. Correspondingly, Mahmood and Zaheer (2017) concluded that the availability of broadband internet is positively linked to innovation activities and market development among export-oriented firms. Institutional level: regulatory inefficiencies, corruption, and legal uncertainty hinder the business climate in Pakistan.

Overall business performance is impacted by the inability to implement consistent property rights enforcement and drawn-out legal processes, particularly for businesses operating in weak governance contexts. (Hussain and Javid, 2019). Small businesses were found to be particularly negatively impacted by these institutional restrictions since they lack the political and financial means to overcome bureaucratic demands. Amjad, Din, and Ghani (2013) provided evidence for this conclusion by demonstrating gains in institutional quality, such as a decrease in corporate expenses and simpler taxes processes, which encourage investment and productivity. From the standpoint of institutional infrastructure, legal institutions, property rights, and regulatory quality all have a significant impact on how firms behave in the nation. In the meanwhile, Pakistan's corporate performance is nevertheless impacted by institutional inefficiencies such as corruption, bureaucratic inefficiency, and contract delay. (Kiani & Ahmed, 2018).

According to Khondoker et al. (2021), the digital divide has resulted in substantial disparities between Indian and Pakistani enterprises in terms of their ability to innovate and grow their consumer base. Additionally, studies by Khan and Khattak (2021) illustrate, Pakistani enterprises, particularly SMEs, face much higher infrastructural obstacles than Indian firms, limiting their possibility for expansion. Comparative research emphasises the interaction of various infrastructure aspects. Mahmood, Din, and Qayyum (2020) contrasted Pakistani manufacturing businesses to those in India and found that Indian companies profit more from ICT investment due to greater institutional backing and financial infrastructure, while Pakistani companies suffer from unpredictable energy and inadequate governance. The writers underlined that balanced business performance growth in the country requires integrated infrastructure development strategies.

Despite extensive global research on the link between infrastructure and company performance, major gaps exist in understanding this relationship inside Pakistan, particularly addressing the combined effects and interactions of financial, physical, and institutional infrastructure. Existing studies frequently focus on particular factors, such as energy or finance, typically utilising descriptive methodologies with inadequate micro-level or econometric data, failing to capture the complex, dynamic interplay impacting enterprises. Pakistan's research ecosystem lacks thorough, empirical investigations that use large-scale datasets like WBES 2022 to illustrate how institutional barriers, energy instability, and ICT restrictions all influence company performance. Addressing this gap is critical for establishing targeted infrastructure investments and institutional changes customised to Pakistan's particular business climate, resulting in more efficient resource allocation and long-term economic growth.

Methodology

Production Theory serves as the theoretical foundation for our investigation. (Varian, 1992). This research also draws from the New Institutional Economics framework, (North D.C., 1990). Both these theories explain how external and internal variables influence firm-level production and performance. Figure No 1 presents the theoretical framework of the study based on the theoretical foundation.

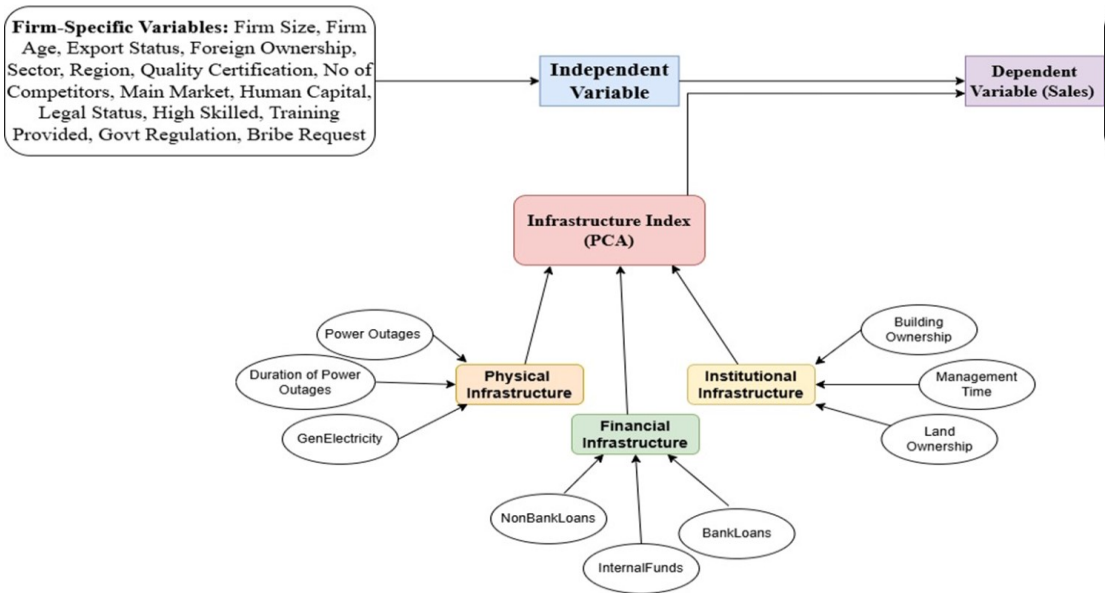

Figure No 1: Theoretical Framework

The WBES 2022 data, is utilized in this research, offers a precise picture of the business conditions and infrastructure constraints faced by Pakistan, which is the major focus country for this study. The choice of financial, physical, and institutional infrastructure

as the central variables in this research is motivated by a realistic appreciation of their complex and interlinked functions in influencing business performance, especially in an emerging economy such as Pakistan. Existing literature tends to isolate these types of infrastructure, but holism is more crucial. By concentrating on these three unique but highly interactive categories, this research strives to go beyond isolated analyses to provide a more in-depth and empirically founded understanding of how their dynamic interaction collectively drives firm-level performance, filling a critical gap in the current literature in the context of Pakistan. Table No 1 gives details of the variables of the study.

Table 1
Variables used for the construction of Infrastructure Index

Type of Infrastructure	Definition
Financial	% of Working Capital Financed From Internal Funds/Retained Earnings.
Financial	% of Working Capital Borrowed From Banks.
Financial	% of Working Capital Borrowed From Non-Bank Financial Institutions.
Physical	Number of Power Outages Experienced in A Typical Month
Physical	Average Duration of Power Outages (Hours)
Physical	% of Electricity From Generator Owned/Shared By The Establishment
Institutional	% of Buildings Occupied by the Establishment and Owned by the Establishment
Institutional	% of Land Occupied by the Establishment and Owned by the Establishment
Institutional	Percentage of Senior Management's Time Spent Dealing With Government Regulations

To evaluate the association between infrastructure and business performance this study uses an Ordinary Least Squares (OLS) regression model to investigate the impact of infrastructure Index and other independent variables on firm performance in Pakistan. The baseline regression equation is organized as follows:

$$log\_sales = \beta_0 + \beta_1(I) + \beta_2(A) + \beta_3(FO) + \beta_4(EM) + \beta_5(QC) + \beta_6(IE) + \beta_7(NC) + \beta_8(MMN) + \beta_9(MMI) + \beta_{10}(CD2) + \beta_{11}(CD3) + \beta_{12}(L + \beta_{13}(LD3) + \beta_{14}(BR) + \beta_{15}(SMT) + \beta_{16}(TP) + \varepsilon \ldots\ldots 1$$

Where:

I = Infrastructure Index, A = Firm Age , FO = Foreign Ownership , EM = Export Management, QC = Quality Certification, IE = International Export, NC = Number of Competitors, MMN = Main Market National, MMI = Main Market International, CD2 = City D2, CD3 = City d3, LD2 = Legal/Regulatory (lsd2), LD3 = Legal/Regulatory (lsd3), BR = Bribe Request , SMT = Senior Manager Time Spent, TP = Training Programs for Permanent Workers and ε = Error term

The dependent variable is in the logarithm, so the coefficients represent percentage changes in sales (approximately) for a one-unit change in the independent variable. For mitigating the multicollinearity problems related to infrastructure variables, Principal Component Analysis (PCA) was utilized. PCA is a statistical methodology utilized to reduce the dataset dimensionality while preserving as much variance (information) as possible. PCA compresses many correlated variables into a set of uncorrelated components, making analysis easier and model interpretability better.

Results and Discussion

For the construction of Infrastructure Index with PCA, Correlation analysis was used to investigate the links between the variables. A correlation coefficient (r) of 0.3 or higher

between at least some variables is often considered necessary for PCA. (Ďuriš et al., 2021). The variables included in our study showed high or moderate correlations, meaning that they shared common information, which PCA can capture efficiently in fewer components. Using Kaiser Criterion, Nine principal components were identified, with the first four explaining 61.83% of the variance, and having Eigen value greater than 1. The Figure No 2 displays the Infrastructure Index over a series of 1,288 firms, illustrating significant variability in infrastructure quality or availability across different firms. The index fluctuates mostly within a range of approximately 0.00 to 0.80, with occasional spikes nearing 1.00, indicating sporadic periods or areas with notably better infrastructure conditions. The overall pattern suggests that the infrastructure condition is inconsistent, with frequent short-term fluctuations, highlighting potential disparities or instability in infrastructure development. Such a pattern may reflect underlying issues like uneven investment, regional disparities, or sector-specific challenges that impact infrastructure performance over time.

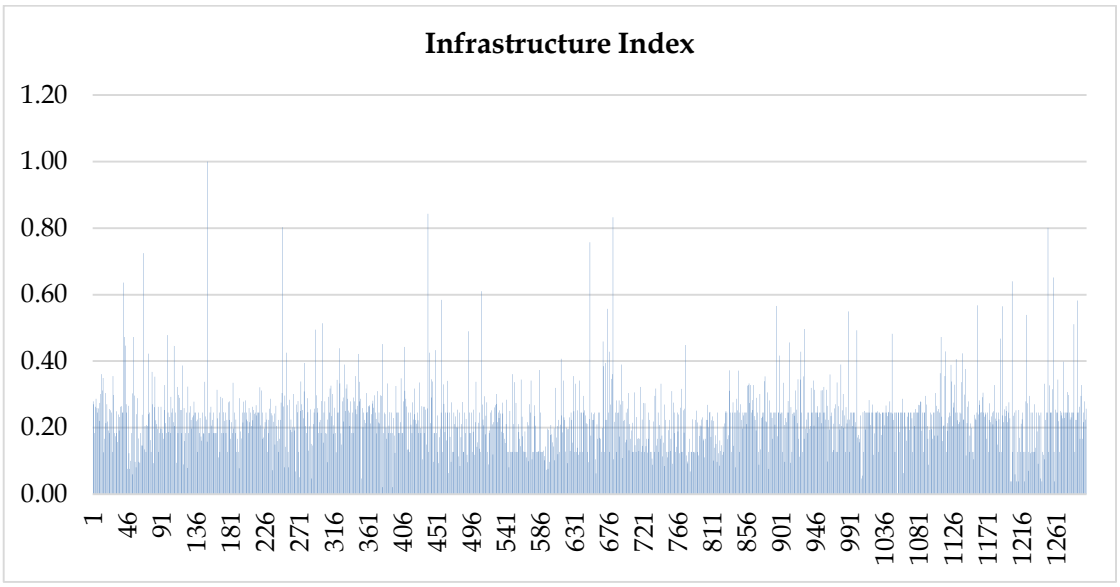

Figure No 2: Infrastructure Index of firms

The results of regression analysis presented in Table No 2, indicate that the Infrastructure Index has a statistically significant positive effect on firm sales, meaning that improvements in infrastructure are closely linked to enhanced firm performance. Specifically, a one-unit increase in the Infrastructure Index is associated with approximately an 11.3% rise in firm sales, holding other factors constant. This finding aligns with a substantial body of previous research that emphasizes the crucial role of infrastructure in supporting business success. For example, studies by Calderón and Servén (2010) and Escribano et al. (2010) highlight how better infrastructure such as reliable energy, advanced ICT, and efficient transport—directly increases productivity and market competitiveness. Similarly, research has shown that financial infrastructure facilitates access to finance, enabling firms to invest and grow (Demirgüç-Kunt & Maksimovic, 1998; Beck et al., 2005), while institutional quality, including legal and regulatory frameworks, reduces uncertainty and encourages investment (North, 1990; La Porta et al., 1998). Overall, these findings reiterate the importance of multifaceted infrastructure development for fostering firm growth, particularly in emerging economies where deficiencies in physical, financial, and institutional infrastructure can significantly hinder business performance.

Table 2
Regression Model

Variable	Coefficient	Variable	Coefficient
Infrastructure Index	3.146*** (0.4739)	Manager Time Spent	-0.021** (0.0069)

Firm Age	0.010*** (0.0028)	Training Program for Permanent Workers	0.528** (0.1284)
Foreign Ownership	1.148*** (0.3382)	High Skilled Labor	0.002*** (0.0004)
Extopmang	0.00099 (0.0043)	Bribe Request	0.0251 (0.0937)
Quality Certification	0.610*** (0.1016)	Constant (_cons)	16.983*** (0.1632)
Intexport	0.258** (0.1894)	No of Obs	1,300
No. of Competitors	0.00024 (0.0007)	F-statistic	49.21
Main Market National D2	1.025*** (0.0909)	Prob > F	0.0000
Main Market InterD3	0.881*** (0.2062)	R-squared	0.5949
City D2	-0.520** (0.1739)	Adjusted R-squared	0.4869
City D3	0.200* (0.1583)		
LSD2	-0.629* (0.0851)		
LSD3	0.6164 (1.4183)		

Note: Standard errors in parentheses; - '*,' '**,' '***' stands for 10%, 5%, and 1% level of significance, respectively. Brackets give robust standard errors.

Apart from infrastructure, other independent variables have a favorable impact on company sales. Sales are higher for older businesses, foreign-owned businesses, and businesses with more senior management experience. Firm age has a positive and significant effect, corroborating findings by Folta et al. (2014) who note that older firms typically benefit from accumulated experience, established market networks, and operational efficiencies, all of which contribute positively to performance. This shows that having a competitive edge comes from staying in the market, particularly when institutional and infrastructure support get better over time. Similarly foreign ownership exhibits a strong positive impact, aligning with research by Demirgüç-Kunt and Maksimovic (1998) and Beck et al. (2005), who show how access to better technology, management know-how, and corporate governance frameworks allows foreign-invested businesses to frequently outperform their native competitors. Additionally, foreign businesses might benefit from improved access to global markets, which would boost their competitiveness and sales.

Similarly, businesses with quality certifications and those engaged in exporting likewise have superior sales results. The positive impact of quality standards aligns with Verbeke and Kano (2016), In a similar vein, companies who export and have quality certificates see higher sales figures. As a quality indicator, certification builds consumer confidence and creates new business prospects.

Spending on training programs for permanent employees has a positive effect on firm sales. These independent variables' statistical significance is assessed by their own respective p-values from the regression test and are found to be highly unlikely to owe their effects to random chance. Investment in workforce training is significantly positive, supporting Lazear's (2004) findings that human capital development leads to higher productivity, innovation, and better firm outcomes. Well-trained employees are better equipped to adapt to infrastructural and technological changes, improving operational efficiency and sales.

The positive impact of quality standards aligns with Verbeke and Kano (2016), who show that certification enhances firm reputation, access to export markets, and operational efficiency. Certification acts as a signal of quality, fostering customer trust and opening new market opportunities. Access to international markets positively influences performance,

consistent with Redding (2010), who emphasizes that export orientation enhances firms' productivity by exposing them to competitive pressures and advanced practices.

On the other hand, higher numbers of competitors result in lower sales. The primary market orientation, whether international or national, also has a higher impact on sales levels. The insignificance suggests limited impact of the current competitive landscape within this model or indicates that other factors (like infrastructure and market access) are more decisive for firm performance. Firms operating primarily in national markets enjoy significantly higher performance, consistent with findings by Redding (2010) emphasizing that larger or more accessible markets enable firms to scale operations and increase sales.

Moreover, city and legal status of the firm are determinants in sales. Regional variables show mixed effects—City D2 and LSD2 adversely affect performance, possibly reflecting infrastructural deficits or regional disparities noted by Hanson and Neumayer (2010). Conversely, City D3's large positive coefficients suggest that location-specific infrastructure or institutional quality improvements can uplift firm performance, emphasizing the importance of localized development. The presence of bribes and higher senior management time devoted to government regulations is associated with decreased sales. For Manager Time Spent the negative coefficient suggests that excessive managerial time spent on operational issues might reduce overall firm performance, possibly reflecting managerial inefficiencies or overextension, as discussed in Fama and Jensen (1983). It implies that effective delegation and time management are crucial for maximizing productivity and performance.

These results show that the model is statistically significant, and that the explanatory variables account for a considerable percentage of the variation in sales in Pakistan. The adjusted R-squared value indicates that the model fits the data well. The dataset contains 1,300 companies in Pakistan. The model explains 59.4% of the variance in firm sales. Even after controlling the number of variables, the model explains a large percentage of the variation in sales. The model is statistically significant, with the total F-statistics demonstrating a substantial link between the explanatory factors and sales. The standard deviation of residuals, with smaller values suggesting a better fit.

In sum, the findings reinforce the extensive literature affirming that infrastructural development along with firm-specific factors such as age, ownership, workforce quality, and market orientation—collectively drive firm performance. These results are consistent with prior empirical research emphasizing the vital role of physical, financial, and institutional infrastructure in facilitating business growth, especially in emerging economies (Calderón & Servén, 2010; Escribano et al., 2010; Demirgüç-Kunt & Maksimovic, 1998). They also highlight the importance of regional and locational factors, suggesting targeted infrastructure investments and institutional reforms can significantly improve firm outcomes.

Conclusions

This study initiated an investigation into the multiple factors that influence business growth, with a particular emphasis on the annual total sales in dynamic economic environments. The main goal was to carefully study how internal firm characteristics and external environmental variables particularly infrastructure related variables, interact with each other so that we could get a full picture of how they affect a company's growth over time. The goal of this research was to provide a nuanced and solid explanation of these important factors that affect firm performance, and it did so by using rigorous analysis.

The results mostly back up popular theories in economics and management, making it clearer that firm growth is the result of many factors. It was clear and consistent that the

firms' Infrastructure Index had a positive effect on their sales in the sample we looked at. Similarly the firm maturity, as indicated by firm age, and foreign ownership are powerful catalysts for increased sales, underscoring the benefits of accumulated experience, enhanced stability, and access to broader financial and global market resources (López-Duarte et al., 2015; Simerly & Li, 2000). The significant positive impact of quality certification further underscores the critical role of commitment to standards as a competitive differentiator. Crucially, our research provides strong empirical support for the enduring value of human capital investment: both dedicated training programs for permanent staff and a higher proportion of skilled labor were significantly linked to improved firm performance, echoing established principles in organizational development and human resource management. Most importantly the profound influence of robust infrastructure on sales performance strongly aligns with economic literature, highlighting its foundational role in reducing costs and expanding market reach.

While the number of competitors did not yield a statistically significant effect within this model, the varying impacts of different urban settings (City D2 vs. City D3) indicate that localized conditions profoundly affect sales outcomes. Similarly, strategic engagement in distinct national and international markets (Main Market National D2 and Main Market Interd3) demonstrably contributes to business performance. A compelling, albeit subtle, finding was the negative correlation between managerial time spent navigating government regulations and firm performance, suggesting that excessive bureaucratic burdens can indeed impede operational efficiency. While the impact of bribe requests did not reach statistical significance, this may point to the complex and often unquantifiable nature of such variables. Collectively, our findings underscore that sustainable firm growth is not merely a product of isolated factors but emerges from a strategic synergy between beneficial ownership structures, targeted human capital investments, adherence to quality standards, and advantageous market positioning within a supportive infrastructural environment.

Recommendations

Given these findings, some policy recommendations can be made to promote better firm performance: Government should focus on improving critical infrastructure (roads, energy, digital networks) to enhance business performance and sales, especially in both urban and rural areas. Offer subsidies and tax relief to businesses seeking internationally recognized quality certifications (e.g., ISO, HACCP), enhancing competitiveness and sales. Provide tax relief and financial support for companies offering training programs for permanent employees, boosting skills and workforce productivity. Streamline foreign investment regulations, reduce bureaucratic hurdles, and offer incentives to attract foreign capital, technology, and expertise, positively impacting sales. Target assistance to firms in larger cities facing challenges like congestion and high competition, improving their ability to compete and grow. And simplify compliance procedures and reduce unnecessary regulatory burdens, freeing up management time and improving business efficiency.

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