

Assessing the Impact of Public Infrastructure on the Performance of Small and Medium Enterprises (SMEs) in Myanmar

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Abstract

This study examines the impact of public infrastructure on the performance and growth of SMEs in Myanmar, focusing on electricity supply, transportation networks, and telecommunications. It aims to identify infrastructure deficiencies that hinder SME growth and explore policy measures and investment strategies to improve infrastructure development. Using a quantitative approach, the research analyzes World Bank survey data from 2013 to 2017, supplemented by qualitative insights from SME owners, government officials, and industry experts. The study employs Structural Equation Modeling (SEM) and the Ordinary Least Squares (OLS) model to assess how infrastructure factors influence productivity, profitability, and revenue growth. The empirical model particularly emphasizes the relationship between electricity supply and SME performance, offering evidence-based insights for policymakers to prioritize infrastructure investments that foster economic growth.

The study highlights the critical role of public infrastructure, education, and financial access in shaping SME performance in Myanmar. Regional disparities exist, with Mandalay showing positive effects on productivity and revenue, while Taungyi and Bago experience negative impacts. Infrastructure quality, particularly in transportation, electricity, and telecommunications, significantly influences SME operations, reducing costs and expanding market access. However, rural SMEs face greater challenges due to infrastructure deficiencies. Education is also vital, as higher education levels among SME owners and managers enhance decision-making, competitiveness, and efficiency. Key challenges include inadequate infrastructure, limited access to finance and land, bureaucratic barriers, a shortage of skilled labor, and restricted market access. To support SME growth, strategic investments in infrastructure, financial accessibility, and digital transformation are essential.

Government support through policy reforms, tax incentives, and public-private partnerships can create a more favorable business environment. Strengthening education and skill development, promoting innovation, and leveraging technology can further enhance SME competitiveness. By addressing these challenges and implementing targeted strategies, Myanmar can foster SME-driven economic growth, job creation, and long-term stability.

Key words: Public Infrastructure, SMES performance, OLS model:

1. Main text

Public infrastructure, managed by the government, is essential for economic development, supporting social and business activities. It includes transportation, energy, telecommunications, water facilities, and educational institutions, which directly impact productivity, market access, and overall economic growth. Infrastructure investments, though costly, are crucial for long-term prosperity and can be financed through public funds, private investments, or public-private partnerships.

Reliable infrastructure enhances SME performance by reducing costs, improving efficiency, and expanding market reach. Electricity is particularly crucial, as a stable power supply boosts productivity and business operations. Telecommunications, including internet and mobile services, enable SMEs to communicate, market, and engage in e-commerce, fostering competitiveness. Poor infrastructure, on the other hand, increases costs and hinders SME sustainability, especially in developing economies.

Infrastructure investments drive growth by attracting private capital, creating jobs, and improving living standards. Public-private partnerships play a vital role in addressing infrastructure gaps, encouraging innovation, and ensuring sustainable development. Infrastructure development aligns with global goals, such as the Sustainable Development Goals (SDGs), by promoting inclusive and resilient economic progress. Therefore, strategic infrastructure development is essential for enhancing SME growth, economic stability, and long-term sustainability.

Nomenclature	
A	Introduction
B	Model
C	Conclusion

I. Introduction

Public infrastructure encompasses the physical systems and facilities managed by the government to support the social and economic activities of the public (Infocus, 2018). Infrastructure is a crucial driver of economic development as it directly impacts production processes, influencing output, income, profits, and employment (Palei, 2016). It encompasses essential physical systems such as transportation, communication, water facilities, and educational institutions that support businesses and economies. While infrastructure investments require significant funding, they are essential for long-term prosperity and can be financed through public funds, private investments, or public-private partnerships (Boyle, 2024).

Infrastructure is crucial for economic efficiency, enhancing the production of goods and services. Public infrastructure spending boosts short-term economic output and supports long-term productivity growth, although its impact varies with financing methods and economic conditions. Long-term, deficit-financed investments may crowd out private investment. Infrastructure types like roads, railways, and utilities influence economic outcomes. It is also key for quality of life and sustainable development, with rising demand in

emerging economies for energy, transportation, and water infrastructure, driven by population growth and urbanization (Casier, 2015). Infrastructure drives economic growth through supply and demand channels, with investments in energy, telecommunications, and transportation directly boosting production (McKibbin, 2010). Better infrastructure alleviates these burdens, enabling access to jobs, education, and markets, and helping individuals escape poverty. Upgraded infrastructure also fosters business investment by attracting both domestic and foreign capital, which drives economic growth, creates jobs, and raises income levels (Urbanisation, 2023). Well-maintained infrastructure supports businesses, improving productivity and competitiveness, with electricity being a crucial factor for economic development. An increase in electricity supply directly boosts SME performance. Successful privatization and transfer of electricity generation and distribution to private operators have further strengthened this impact (Obuebite, 2021). Public infrastructure, including transportation, energy, communication networks, and essential services, is crucial for the success of SMEs, especially in developing economies. Reliable electricity, transportation, and telecommunications improve productivity, reduce costs, and enhance competitiveness. However, inadequate infrastructure in underdeveloped regions hampers SME growth and sustainability. Adequate infrastructure supports SMEs by enhancing operational efficiency, market access, and competitiveness, making it essential for economic development and the success of small and medium-sized enterprises (Goh, 2019).

The relationship between public infrastructure and SME development emphasizes that the quality of infrastructure is crucial for SME performance, particularly in developing regions like sub-Saharan Africa. SMEs depend on infrastructure for efficient operations, market access, and cost management. The passage suggests that even with low institutional quality, well-maintained infrastructure can still positively impact economic growth (Oigiangbe, 2024).

Reliable infrastructure, including transportation, electricity, and digital connectivity, is crucial for SME efficiency, cost reduction, and market expansion. In developing countries, poor infrastructure creates challenges for SMEs, increasing costs and inefficiencies. Investing in public infrastructure supports entrepreneurship and business growth. Key elements like transportation, energy, and communication networks directly enhance SME performance by lowering costs, improving delivery times, and boosting productivity. Additionally, ICT infrastructure helps SMEs streamline operations, access global markets, and stay competitive (Lisa Nicholson, 2022). Reliable telecommunication systems are essential for SMEs to connect with customers, suppliers, and partners, enhancing relationships and collaboration. Advanced technologies like high-speed internet and cloud services enable cost-effective operations, remote work, data sharing, and improved customer service. These tools also provide market insights and digital marketing opportunities, helping SMEs compete with larger businesses. In countries with basic ICT adoption, even a fixed or mobile phone can improve communication, while advanced tools like email further enhance communication efficiency and reduce costs (Bahiti, 2013). Robust telecommunication infrastructure is vital for SMEs to improve efficiency, scale their business, and remain competitive globally. Public infrastructure, including postal networks, plays a key role in economic development by reducing transaction costs and fostering social capital. Postal systems facilitate communication, lower trade barriers, enhance market integration, and support state-building efforts, contributing to both short-term economic activity and long-term growth by strengthening trust and connectivity within communities (Cojocar, 2018). Similarly, transportation infrastructure enables SMEs to efficiently move goods, access raw materials, and reach customers, while also reducing logistics costs and improving delivery times (Mora-Vargas, 2022).

Telecommunication systems, including internet and mobile services, are essential for SMEs to communicate, market, provide customer service, and operate remotely, supporting global competitiveness. A stable electricity supply is crucial for productivity, while the integration of these infrastructures helps SMEs reduce costs and foster growth. Public infrastructure, such as transportation, energy, and telecommunications, plays a key role in economic growth and sustainability. Public-private partnerships (PPPs) are vital for addressing infrastructure gaps, with private investments and risk-sharing driving innovation in government projects (Pollack, 2023).

The importance of public infrastructure extends beyond economic benefits, as it underpins sustainable development goals (SDGs) by promoting inclusivity, environmental stewardship, and resilience against climate change. Therefore, the SDG set up its target to develop quality, reliable, sustainable and resilient infrastructure, including regional and trans border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all (Fay, 2019).

Electricity infrastructure is a fundamental driver of SME development, as reliable and affordable power is essential for day-to-day operations. For many SMEs, especially in sectors like manufacturing, retail, and technology, electricity is crucial for running machinery, lighting, refrigeration, and digital systems (Mitra, 2024).

Telecommunications infrastructure allows SMEs to connect with customers, suppliers, and markets through internet access, mobile services, and digital platforms, fostering innovation and market expansion (Maistre, 2022). Access to reliable telecommunication systems is crucial for e-commerce and remote business operations. Poor transportation infrastructure increases logistical costs and delivery times, limiting SMEs' competitiveness. Key public infrastructure components enable SMEs to operate efficiently, reach broader markets, and adapt to changing business environments, emphasizing the importance of strategic infrastructure development for SME success (Willie, 2023).

2. Objective of the Study

The objective of this study is to assess the impact of public infrastructure on the performance and growth of SMEs in Myanmar. It aims to examine how key infrastructure components, including electricity supply, transportation networks, and telecommunications, influence business operations, productivity, and market accessibility. The study seeks to identify specific infrastructural deficiencies that hinder SME growth and analyze their economic implications. Additionally, it intends to explore potential policy measures and investment strategies that could enhance infrastructure development to support SMEs. By providing empirical insights, this research aspires to contribute to informed decision-making for policymakers, investors, and business owners in fostering a more conducive environment for SME development.

2.1. Specific objectives of the study

- (i) To evaluate the public infrastructure impacts on the performance of small and medium Enterprises of Myanmar
- (ii) To examine the influence factors of public infrastructures in Myanmar on the establishment, operation, and sustainability of SMEs.
- (iii) To analyze the contribution of public infrastructure on SMEs performance including productivity, profitability and revenue growth.

3. Model

Using a research model enhances the quality of the study by offering a structured framework to analyze relationships between variables. In examining the impact of public infrastructure on SME performance, a model like regression analysis helps assess how infrastructure factors (e.g., transportation, telecommunications, electricity) affect performance indicators such as productivity, profitability, and revenue. It also controls for external factors like firm size and access to finance to ensure accurate results. The research model for Myanmar utilizes the World Bank dataset to explore the relationship between infrastructure quality and SME performance, providing insights for policymakers to prioritize investments that drive economic growth.

This research uses a quantitative approach, analyzing World Bank survey datasets from 2013, 2014, 2016, and 2017, along with secondary data from government reports and industry databases. A qualitative component includes interviews and surveys with SME owners, industry experts, government officials, and other stakeholders to gain insights into SME challenges and opportunities regarding public infrastructure. The empirical model focuses on the relationship between electricity supply and SME performance, using data from the World Bank surveys. This model helps quantify the impact of electricity on SME performance, providing evidence-based insights for policymakers to prioritize interventions effectively. (Avraam George, Christina Beneki, (2010).

This research uses Structural Equation Modeling (SEM) and the Ordinary Least Squares (OLS) model to analyze the impact of infrastructure on SME performance. SEM offers flexibility for modeling complex relationships and testing theoretical constructs, while OLS is used to estimate linear relationships between infrastructure factors (e.g., electricity, transportation, telecommunications) and SME performance indicators (e.g., profitability, productivity). The OLS model minimizes the sum of squared residuals to provide reliable estimates of how infrastructure factors influence business outcomes. This approach allows for the quantification of the relationships between variables, offering insights into the impact of infrastructure on SMEs. Thus, the equation of the research can be structured as:

Table 1: Summary Model

Aspect	Description
Research Model	Provides a structured framework to analyze the relationship between public infrastructure and SME performance.
Key Variables	Independent: Infrastructure factors (electricity, transportation, telecommunications). Dependent: SME performance indicators (productivity, profitability, revenue growth). Control: Firm size, access to finance.
Data Sources	World Bank survey datasets (2013, 2014, 2016, 2017), government reports, industry databases.
Methodology	Quantitative analysis using regression models, supported by qualitative interviews and surveys.
Empirical Focus	Examines the impact of electricity supply on SME performance using World Bank survey data.
Analytical Techniques	Structural Equation Modeling (SEM) for complex relationships and Ordinary Least Squares (OLS) for estimating linear relationships.
Significance	Provides insights for policymakers to prioritize infrastructure investments that support SME growth and economic development.

Sources: Author's Creation

This approach allows for the quantification of the relationships between variables, offering insights into the impact of infrastructure on SMEs. Thus, the equation of the research can be structured as:

$$\begin{aligned}
 MEP &= \beta_0 + \beta_1 Pubfra + \beta_2 Edu + \beta_3 loc + \beta_4 Esec + \beta_5 Esize + \beta_6 Fin + \beta_7 Regu + \beta_8 Land + \beta_9 Innov \\
 &\quad + \beta_{10} R\&D + \beta_{11} Email + \beta_{12} Web + \epsilon \\
 SMEP &= \beta_0 + \beta_1 Elect + \beta_2 Edu + \beta_3 loc + \beta_4 Esec + \beta_5 Esize + \beta_6 Fin + \beta_7 Regu + \beta_8 Land + \beta_9 Innov \\
 &\quad + \beta_{10} R\&D + \beta_{11} Email + \beta_{12} Web + \epsilon \\
 SMEP &= \beta_0 + \beta_1 Telecom + \beta_2 Edu + \beta_3 loc + \beta_4 Esec + \beta_5 Esize + \beta_6 Fin + \beta_7 Regu + \beta_8 Land + \beta_9 Innov \\
 &\quad + \beta_{10} R\&D + \beta_{11} Email + \beta_{12} Web + \epsilon \\
 SMEP &= \beta_0 + \beta_1 Transport + \beta_2 Edu + \beta_3 loc + \beta_4 Esec + \beta_5 Esize + \beta_6 Fin + \beta_7 Regu + \beta_8 Land \\
 &\quad + \beta_9 Innov + \beta_{10} R\&D + \beta_{11} Email + \beta_{12} Web + \epsilon
 \end{aligned}$$

Where, the equation is represents a multiple regression model used to evaluate the performance of small and

medium-sized enterprises (SMEs) based on various influencing factors.

SMEP: The dependent variable, representing SME performance.

β_0 : The intercept term, indicating the baseline level of SME performance when all independent variables are zero

Pubfra= Public Infrastructure.

β_{1Elect} : The coefficient for the variable representing access to electricity. This shows the impact of electricity availability on SME performance.

β_{2Tran} : The coefficient for transportation infrastructure, indicating how access to reliable transport affects SME performance: The coefficient for telecommunications infrastructure, reflecting its influence on SME performance.

β_{4Edu} : The coefficient for education, representing the effect of the availability of skilled labor and workforce training on SME performance.

β_{5loc} : The coefficient for location, showing how the geographical positioning of the SME impacts its performance.

β_{6Esec} : The coefficient for economic security, indicating how economic stability and security conditions influence SME performance.

β_{7Esize} : The coefficient for enterprise size, showing the relationship between the scale of the business and its performance.

β_{8Fin} : The coefficient for financial access, representing how the availability of financial resources and funding options affects SME performance.

β_9 : The coefficient for regulatory environment, indicating the effect of governmental regulations and policies on SME performance.

β_{10Land} : The coefficient for land access, which shows the influence of the availability and cost of land on SME performance.

β_{11Inno} : the coefficient of the improvement method, update production method for SMEs performance.

$\beta_{12 R\& D}$: the practices of research and development for the improvement of the business activities

$\beta_{13 Email}$: the coefficient of email use to be better communication their partner in enterprises performance.

β_{14Web} : the coefficient of the establishment of website for better and effective performances in business activities.

4. THE IMPACT OF PUBLIC INFRASTRUCTURE ON PERFORMANCE OF SMEs IN MYANMAR

This chapter examines the performance of small and medium-sized enterprises (SMEs) in Myanmar, which are vital for employment, income generation, and poverty reduction. SME performance is influenced by factors such as infrastructure access, financial resources, market conditions, and government policies. Despite challenges like inadequate infrastructure (e.g., electricity, transportation, telecommunications) and regulatory barriers, many SMEs demonstrate resilience through innovation and leveraging local networks. Key performance indicators include profitability, productivity, and revenue growth. Profitability measures financial gains, productivity assesses resource utilization, and revenue growth indicates market expansion. The success of SMEs in Myanmar largely depends on improvements in infrastructure, finance, and supportive policies.

Key performance indicators (KPIs) for SMEs in Myanmar encompass financial performance (revenue growth, profitability, cost management), operational efficiency, market expansion, customer satisfaction, innovation, adaptability, and human resource development. These KPIs reflect both the challenges and opportunities SMEs face in a competitive market. Revenue growth is closely linked to performance, as high-performing SMEs exhibit strong operational efficiency, market understanding, and adaptability, creating a positive feedback loop that drives further growth. Profitability is another crucial KPI, allowing SMEs to

reinvest in their growth, expand markets, and build resilience. Access to financial resources is also significant, as financial health enables SMEs to invest in technology and infrastructure. To improve SME performance in Myanmar, it's essential to enhance access to finance, improve infrastructure, simplify regulatory frameworks, and provide training programs for entrepreneurs and their workforce. This would foster growth, innovation, and long-term sustainability.

Table 2 Public Infrastructure Impacts on SMEs Performance

VARIABLES	Profitability	Productivity	Revenue growth
Public Infrastructure	0.0550 (0.0667)	0.323*** (0.118)	0.203*** (0.0709)
Inadequately educated workforce: No obstacle (Yes=1)	-0.246** (0.121)	-0.0273 (0.209)	-0.226* (0.129)
Access to land: No obstacle (Yes=1)	-0.388*** (0.124)	-0.359* (0.211)	-0.185 (0.133)
Access to finance: No obstacle (Yes=1)	0.120 (0.122)	-0.0239 (0.217)	0.0432 (0.130)
Innovation (Yes=1)	0.310* (0.168)	0.194 (0.283)	0.167 (0.178)
Constant	2.308*** (0.659)	2.196** (1.063)	3.490*** (0.741)
Observations	885	405	852
R-squared	0.289	0.290	0.253

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Sources: Author's Survey Result

The table shows that the examinations the relationship between various factors and three business performance indicators: profitability, productivity, and revenue growth. Public infrastructure positively affects productivity and revenue growth, but has little impact on profitability. An inadequately educated workforce negatively affects profitability and revenue growth. Limited access to land reduces profitability and productivity, with a lesser impact on revenue growth. Location also influences performance, with businesses in Mandalay showing better outcomes, while those in Taungyi and Bago struggle. Older firms face challenges in revenue growth, and male respondents and innovative practices are linked to higher profitability. Digital adoption, such as using email and websites, positively impacts all performance indicators. The R-squared values (0.25-0.29) suggest that these factors explain a moderate portion of the variation in business outcomes. Analysis on Public Infrastructure impacts on SMES Performance by Size

Table 3: Public Infrastructure Impacts on SMEs Performance

VARIABLES	Productivity		Profitability		Revenue Growth	
	Small	Medium	Small	Medium	Small	Medium

Telecommunications: No obstacle (Yes=1)	0.0519	-0.844**	0.499***	-0.323	-0.0183	-0.536**
	-0.303	-0.388	-0.123	-0.21	-0.14	-0.251
Constant	1.478	5.857***	1.483**	3.292**	3.145***	4.533***
	-1.088	-2.052	-0.582	-1.388	-0.713	-1.619
Observations	277	130	691	217	677	199
R-squared	0.196	0.328	0.193	0.325	0.148	0.301
Electricity: No obstacle (Yes=1)	-0.464*	-0.654	-0.375***	-0.0422	-0.289**	-0.0071
	-0.251	-0.45	-0.115	-0.235	-0.129	-0.293
Constant	1.701	5.869***	2.015***	3.137**	3.253***	4.256**
	-1.081	-2.079	-0.581	-1.395	-0.707	-1.639
Observations	277	130	691	217	677	199
R-squared	0.206	0.312	0.186	0.317	0.155	0.283
Transportation: No obstacle (Yes=1)	-0.475**	-0.344	0.0894	-0.442**	-0.166	-0.594**
	-0.233	-0.383	-0.118	-0.196	-0.134	-0.238
Constant	1.574	5.613***	1.675***	3.248**	3.205***	4.434***
	-1.073	-2.094	-0.582	-1.363	-0.713	-1.612
Observations	276	129	670	215	655	197
R-squared	0.212	0.302	0.184	0.345	0.151	0.305

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Sources: Author's Survey Result

The table (3) presents regression results examining the impact of the infrastructure including telecommunications, electricity, and transportation on productivity, profitability, and revenue growth for small and medium enterprises (SMEs). The coefficients indicate the effect of having no obstacle in each infrastructure category (Yes = 1) on the respective dependent variables, with standard errors reported in parentheses. Regarding telecommunications, the results show no significant impact on the productivity of small firms, but a negative and significant effect on medium firms (-0.844, p<0.05), suggesting that telecommunications infrastructure may not be as critical for productivity improvements at this scale. However, for small businesses, better telecommunications access significantly increases profitability (0.499, p<0.01), indicating that reliable telecommunications support sales, customer engagement, and operational efficiency, while the effect on medium firms is not significant. The impact on revenue growth is negligible for small firms but negative and significant for medium firms (-0.536, p<0.05), implying that telecommunications improvements may not directly contribute to growth for these firms. In terms of electricity, having no obstacles significantly reduces productivity for small firms (-0.464, p<0.1), indicating that resolving electricity issues alone does not necessarily lead to productivity gains. Similarly, for small businesses, the absence of electricity constraints negatively affects profitability (-0.375, p<0.01), suggesting that firms experiencing fewer electricity issues may face other operational inefficiencies. Revenue growth also sees a negative and significant impact for small firms (-0.289, p<0.05), while the effect on medium firms is minimal.

Transportation infrastructure similarly shows a negative and significant impact on productivity for small firms (-0.475, $p < 0.05$), indicating that resolving transportation issues does not necessarily improve productivity, with a non-significant effect on medium firms. While transportation does not significantly affect small firms' profitability, for medium firms, having no transportation obstacles reduces profitability significantly (-0.442, $p < 0.05$), potentially due to other logistical challenges. Furthermore, while transportation has no significant effect on revenue growth for small firms, for medium firms, the impact is negative and significant (-0.594, $p < 0.05$), suggesting that even when transportation constraints are removed, other factors might limit revenue expansion. These findings highlight several key takeaways: telecommunications access improves profitability for small firms but negatively affects medium firms' productivity and revenue growth; electricity improvements alone do not necessarily enhance firm performance; and transportation improvements do not guarantee higher productivity or profitability, particularly for medium firms. Policy implications suggest that infrastructure improvements must be context-specific, as resolving one constraint (such as electricity or transportation) does not guarantee higher SME performance. For small firms, telecommunications access appears essential for profitability, whereas electricity and transportation may not provide clear benefits. For medium firms, removing infrastructure obstacles does not always translate to better financial outcomes, pointing to other constraints like market access, regulatory burdens, or supply chain inefficiencies. Policymakers should consider integrated infrastructure and business support strategies rather than isolated improvements in specific sectors.

Table 4: Public Infrastructure Impacts on SMESs Performance by Sectors

	Productivity			Profitability			Revenue Growth		
VARIABLES	Manufacture	Services	Others	Manufacture	Services	Others	Manufacture	Services	Others
Electricity: No obstacle (Yes=1)	-0.569**	-0.713	-2.303	-0.121	0.0225	-0.957***	-0.317	-0.304	-0.464
	-0.246	0	0	-0.183	-0.219	-0.26	-0.207	-0.234	-0.296
Constant	2.221***	2.508*	2.116	2.221***	2.508*	2.116	3.218***	4.572**	1.358
	-0.842	-1.114	-1.607	-0.842	-1.114	-1.607	-0.926	-1.195	-1.379
Observations	459	253	196	459	253	196	437	249	190
R-squared	0.28	0.378	0.329	0.28	0.378	0.329	0.228	0.345	0.314
	Productivity			Profitability			Revenue Growth		
VARIABLES	Manufacture	Services	Others	Manufacture	Services	Others	Manufacture	Services	Others
Transportation: No obstacle (Yes=1)	-0.33	-0.892	-3.807	-0.0876	0.337	-0.259	-0.259	0.0771	-0.423
	-0.224	0	0	-0.165	-0.217	-0.277	-0.184	-0.236	-0.311
Constant	2.173***	2.170*	1.578	3.158***	4.454**	1.805	-0.144	-0.382	-0.441
	-0.839	-1.124	-1.693	-0.926	-1.201	-1.931	2.221***	2.508**	2.116
Observations	457	242	186	435	237	180			
R-squared	0.279	0.373	0.296	0.226	0.337	0.324	459	253	196
	Productivity			Profitability			Revenue Growth		

VARIABLES	Manufacturing	Services	Others	Manufacturing	Services	Others	Manufacturing	Services	Others
Telecommunications: No obstacle (Yes=1)	-0.795***	2.844	-6.908	-0.693***	0.485*	0.232	-0.720***	-0.501*	-0.0462
	-0.304	0	0	-0.21	-0.253	-0.278	-0.23	-0.272	-0.314
Constant	2.880**	-13.03	14.47	2.368**	2.384*	1.652	3.540***	5.477** *	2.685*
	-1.367	0	0	-1.049	-1.269	-1.756	-1.128	-1.339	-1.437
Observations	367	14	6	440	245	190	418	242	185
R-squared	0.13	1	1	0.183	0.237	0.24	0.153	0.209	0.234

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Sources: Author's Survey Result

The regression results in the table (4) analyze the impact of infrastructure obstacles electricity, transportation, and telecommunications on the productivity, profitability, and revenue growth of businesses across three sectors: manufacturing, services, and others. The findings indicate that electricity shortages significantly reduce productivity in manufacturing (-0.569, $p < 0.05$) and profitability in the "Others" sector (-0.957, $p < 0.01$), though their effect on revenue growth is not statistically significant. Transportation obstacles, on the other hand, do not show a significant impact on any of the performance indicators across sectors. However, telecommunications challenges have a pronounced negative effect on the manufacturing sector, significantly reducing productivity (-0.795, $p < 0.01$), profitability (-0.693, $p < 0.01$), and revenue growth (-0.720, $p < 0.01$). In contrast, the services sector benefits from improved telecommunications, with a positive impact on profitability (0.485, $p < 0.05$). Extreme values in the "Others" sector may be attributed to small sample sizes. Overall, electricity shortages pose a major challenge to productivity in manufacturing, while telecommunications infrastructure is crucial for both manufacturing performance and service sector profitability. Transportation obstacles appear to have minimal impact across all indicators. The R-squared values suggest that the models explain between 13% and 37% of the variation in business performance, indicating that other unobserved factors may also play a role.

Table 5: The Impact of Public Infrastructure on Business Performance: Examining Land Access Constraints"

VARIABLES	Productivity		Profitability		Revenue Growth	
	No land access obstacle	Land access obstacle	No land access obstacle	Land access obstacle	No land access obstacle	Land access obstacle
Public Infrastructure	0.477**	0.270*	0.273***	-0.135	0.331***	0.0936
	-0.192	-0.146	-0.103	-0.0888	-0.109	-0.0937
Constant	2.693	0.969	2.859***	1.663**	4.208***	2.971***
	-1.642	-1.319	-1.022	-0.844	-1.31	-0.871
Observations	206	199	488	397	471	381

R-squared	0.405	0.255	0.329	0.262	0.304	0.235
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Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Sources: Author's Survey Result

The regression results of table (5) analyze the effect of public infrastructure on business performance, considering whether businesses face land access obstacles. The findings indicate that public infrastructure has a significant positive impact on productivity for businesses without land access obstacles (0.477, $p < 0.05$) and a smaller yet still positive effect for those facing land access obstacles (0.270, $p < 0.1$). For profitability, public infrastructure strongly benefits businesses without land access constraints (0.273, $p < 0.01$), but its effect is negative and insignificant for those with land access obstacles (-0.135). Similarly, for revenue growth, businesses without land access issues experience a significant positive impact (0.331, $p < 0.01$), whereas those with land constraints see a weaker and statistically insignificant effect (0.0936). The R-squared values suggest that public infrastructure explains between 23.5% and 40.5% of the variation in business performance, with stronger explanatory power for businesses without land access obstacles. These results highlight that while public infrastructure positively influences business performance, its benefits are more pronounced for firms without land access challenges, suggesting that addressing land constraints may be necessary to maximize infrastructure investments.

Table 6: The Influence of Public Infrastructure on Business Performance: Assessing the Role of Financial Access Constraints"

	Productivity		Profitability		Revenue Growth	
VARIABLES	No finance access obstacle	Finance access obstacle	No finance access obstacle	Finance access obstacle	No finance access obstacle	Finance access obstacle
Public Infrastructure	0.162	-0.0188	0.162	-0.0188	0.221*	0.183**
	-0.113	-0.0836	-0.113	-0.0836	-0.12	-0.0881
Constant	3.367***	1.417	3.367***	1.417	4.277***	2.910***
	-0.922	-0.936	-0.922	-0.936	-1.084	-0.971
Observations	423	462	423	462	404	448
R-squared	0.373	0.278	0.373	0.278	0.346	0.272

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Sources: Author's Survey Result

The regression results of table (6) examine the impact of public infrastructure on business performance, considering whether firms face financial access obstacles. The findings show that public infrastructure has a small positive but insignificant effect on productivity (0.162) and profitability (0.162) for businesses without financial access obstacles, while the effect is slightly negative and insignificant for those facing financial constraints (-0.0188 for both indicators). However, for revenue growth, public infrastructure has a significant

positive impact for both financially unconstrained (0.221, $p < 0.1$) and financially constrained businesses (0.183, $p < 0.05$), suggesting that improved infrastructure contributes to revenue expansion regardless of financial barriers. The R-squared values indicate that the models explain between 27.2% and 37.3% of the variation in business performance, with a stronger explanatory power for firms without financial constraints. These results suggest that while public infrastructure alone may not significantly boost productivity and profitability, it plays a crucial role in enhancing revenue growth, particularly for financially constrained businesses. This underscores the importance of complementary financial access policies to maximize infrastructure benefits.

5. Conclusion

The study uses regression analysis to examine the impact of public infrastructure on SME performance in Myanmar, controlling for variables such as firm size, industry type, and regional economic conditions. Using data from World Bank Enterprise Surveys (2014, 2016, and 2017) and World Development Indicators, the research highlights that reliable electricity, efficient transportation, and telecommunications enhance SME efficiency, market reach, and profitability. High-performing SMEs attract more external financing, supporting further growth.

Regional disparities are evident, with Mandalay showing positive effects on productivity and revenue, while Taungyi and Bago face negative impacts. The study also emphasizes the role of education among SME owners, managers, and supervisors in improving decision-making, leadership, and business strategy. Higher education levels enhance competitiveness, adaptability, and operational efficiency, while lower education levels may limit SME growth. Overall, the research underscores the critical role of infrastructure quality and human capital in driving SME success in Myanmar.

5.1 Finding

The study highlights the crucial role of public infrastructure such as transportation, electricity, and telecommunications in shaping the performance of SMEs in Myanmar. Reliable infrastructure enhances operational efficiency, reduces costs, and expands market access, fostering SME growth and competitiveness. Efficient transportation lowers logistics costs and improves market reach, while a stable electricity supply ensures uninterrupted operations, particularly in manufacturing and services. Strong telecommunications enable SMEs to engage in e-commerce, market research, and financial transactions. However, infrastructure disparities between urban and rural areas create challenges, with rural SMEs facing higher costs and limited market access. Investment in infrastructure is essential for improving SME productivity, profitability, and sustainability. Additionally, factors such as education, regulatory frameworks, and access to finance also influence SME performance. Enhancing infrastructure quality can attract investment, support technology adoption, and create a stable business environment, ultimately driving economic growth and SME development in Myanmar.

5.2 Suggestion and Discussion

Small and Medium-sized Enterprises (SMEs) are the backbone of Myanmar's economy, contributing significantly to employment, GDP growth, and poverty reduction. Despite challenges such as limited access to finance, poor infrastructure, and regulatory constraints, SMEs remain resilient and vital to economic diversification and sustainability.

Key Challenges:

SMEs in Myanmar face several key challenges that hinder their growth and competitiveness. Inadequate infrastructure, including unreliable electricity, poor transportation networks, and limited telecommunications, significantly impacts operational efficiency and market reach. Access to finance and land remains a major

constraint, preventing SMEs from expanding or investing in new opportunities. Regulatory and bureaucratic barriers create additional difficulties, making it challenging for businesses to navigate legal requirements and administrative procedures. A shortage of skilled labor further exacerbates these issues, limiting productivity and innovation. Additionally, SMEs struggle with restricted market access and technological limitations, making it difficult to compete in both domestic and international markets. Addressing these challenges is crucial for fostering a more conducive business environment and supporting the long-term growth of SMEs in Myanmar.

Opportunities and Strategies for Growth:

Enhancing SME growth in Myanmar requires a multi-faceted approach that addresses key areas of development. Investments in transportation, electricity, and digital infrastructure can improve productivity and expand market access. Expanding financial options, including microloans, venture capital, and FinTech solutions, will enable SMEs to secure the necessary resources for growth. Digital transformation through e-commerce, digital payment systems, and cloud-based management tools can enhance operational efficiency and competitiveness. Workforce capabilities can be strengthened through targeted training programs in business management, financial literacy, and technology. Additionally, government support through policy reforms, tax incentives, regulatory streamlining, and public-private partnerships can create a more favorable business environment. Encouraging innovation and research and development will further enhance product quality, sustainability, and global competitiveness. By addressing these challenges and leveraging growth opportunities, Myanmar's SMEs can play a crucial role in driving economic development, job creation, and long-term stability.

5.3 Recommendations

To enhance SME growth and productivity in Myanmar, the government should prioritize strategic investments in public infrastructure, particularly in transportation, electricity, and digital connectivity. Improved transportation networks will lower logistics costs and expand market access, while a stable electricity supply will reduce operational disruptions and enhance productivity. Expanding digital infrastructure will enable SMEs to engage in e-commerce, access financial services, and reach wider markets. Public-private partnerships and targeted policies should address regional disparities to create an inclusive business environment. Additionally, financial reforms, investment-friendly policies, skill-building initiatives, and support for research and development will empower SMEs to innovate and compete. A regional infrastructure strategy focused on key business hubs can further boost SME performance by reducing costs, attracting investment, and fostering sustainable economic development. Streamlining regulatory frameworks and improving access to financing through loan guarantees and microfinance will further strengthen SME growth in Myanmar.

Investing in education and vocational training is crucial to equipping SME owners and employees with essential skills in financial management, technology adoption, and strategic planning. Promoting digital transformation through e-commerce and FinTech solutions will help SMEs expand their market reach and optimize operations. Public-private partnerships and regional initiatives should address disparities in access to resources and infrastructure. By implementing these measures, Myanmar can unlock the full potential of its SME sector, driving sustainable economic growth, job creation, and national development.

Table 7: References Summary

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