From Cash to Clicks: How Going Cashless Fuels the Growth of Micro, Small, and Medium Enterprises in Indonesia

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List of Abbreviations

MSME	Micro, Small and Medium Enterprises
QRIS	QR Code Indonesia Standard
WBES	World Bank Enterprise Survey
ERIA	Economic Research Institute for ASEAN and East Asia
FII	Financial Inclusion Index
VRIN	Valuable, Rare, Inimitable, and Non-substitutable
OJK	Otoritas Jasa Keuangan
OECD	Organisation for Economic Co-operation and Development

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إِنَّ مَعِيَ رَبِّي سَيَهْدِين

Indeed, my Lord is with me, He will guide me.

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Dedicated to the MSMEs of Indonesia — for your grit, heart, and hustle. You are the backbone of progress, and the future is yours to shape.

Abstract

This study explores the role of electronic payment systems influence the performance of Indonesia's Micro, Small, and Medium Enterprises (MSMEs) as well as the relationship to the Financial Inclusion Index. It combines qualitative interviews with MSME owners with quantitative data from the 2022–2023 World Bank Enterprise Survey, using multiple Ordinary Least Squares (OLS) regression models in STATA to demonstrate the impact of digital financing on the outcomes of the businesses. All five regression models indicate that e-payment usage positively impacts Micro, Small, and Medium Enterprises (MSMEs) at multiple levels across all industries, regardless of the firm's size, sector, gender ownership, and geographic factors. However, some results of the Financial Inclusion Index (FII) and other financial inclusion metrics are outliers. This is because they are vague at best and even negative at worst. Thus, performance cannot be gained without a deep, practical, strategic, and thorough breakdown of all the operational aspects of a business e.g. digital competencies, digital skills, and digital literacy. This is verified in the interviews as MSME owners explained how electronic payment systems in their businesses streamline the fast and simple transaction processes of their businesses. But some still can't participate in the economy due to factors which include lack of appropriate skills, reliable internet connection, or having payment systems that are too slow. The digitization of payment systems has made Indonesia's MSME sector more profitable and stable, but the differences in economic gains are still quite clear, both by region and by gender. For the digital economy to expand notably, it is essential to provide infrastructure in places experiencing widespread poverty and give women entrepreneurs the tools they need to be successful.

Relevance to Development Studies

The importance of this research to Development Studies lies in investigating how digital transformation such as cashless systems and electronic payments, can promote inclusive and sustainable growth. It addresses Indonesia's micro, small and medium enterprises (MSMEs) and workforce because it is chiefly concerned with how technology can empower communities, with attention to those marginalized, particularly women and rural entrepreneurs, and reducing inequality. It is not only the growth figures that come with this research. It seeks to capture how human beings, small business owners, adjust, persist, and prosper in the face of a rapidly digitizing economy. It addresses critical development issues of access, equity, and opportunity, underscoring that the extent of digitization – and progress – is of little consequence if no one is included in the advance.

Keywords:

Digital payments, financial inclusion, MSME performance, Indonesia, Gender inequality, Digital economy, Economic development, entrepreneurship

Chapter 1. Introduction

1.1 Background of The Study

Until recent years, cash was viewed as the dominant form of payment worldwide, including in Indonesia. People would transact using cash, attend brick-and-mortar banks, and perform day to day activities that involved cash usage. Nonetheless, a revolution of sorts is currently underway across the globe. People in both bustling cities and remote villages can now send and receive payments, save money, and conduct business in entirely new ways. This is, of course, the product of modern-day technological advancements. Currently, the world is in the cashless era. This is facilitated by the rise of digital payment systems, phone banking and the internet's many monetary services. However, in most developing nations, the motivation is much greater than simply traversing the conveniences of cash. This is primarily motivation driven by economic inclusion.

Demirgüç-Kunt et al. (2022) noted that unlike the ownership of accounts of which the percentage growth was nearly the same, the percentage of adults carrying out or receiving digital payments in developing economies in 2014 and 2021 rose from 35 to 57. That figure increased to 95% in high-income economies where coverage is virtually 100%. More importantly, these payments are more than the value of the transaction—they are the means to further financial engagement. In developing countries, for the 2021 survey, 83% of adults pulled digital payments, 66% of account holders used the account to store funds, 40% used it for formal savings, and 40% used formal credit (Demirgüç-Kunt et al. 2022) more than usual. MSME (micro, small, and medium) entrepreneurs are able to access the digital economy through these accounts.

These results suggest that the growth of digital payments has made financial inclusion more accessible, making it easier for MSMEs and business owners to participate in the digital economy. They are becoming more integrated to global and domestic supply chains that are more complicated and changeable than the old traditional systems they replaced. This change is helping women in low and middle-income nations in particular. They are becoming more self-sufficient, which gives them both personal and economic power.

Despite advancement in technology, some areas remained untouched. There are gaps within the socio-economic structure of societies that partially explain differences in technology adoption, such as the fair distribution of technology, physical connectivity, technology infrastructure, and infrastructure connectivity. Negative socio-economic conditions of areas where technology infrastructure is available are responsible for the limited benefits derived from the infrastructure. As Novikova et al. (2022) explain, countries where the benefits of digitalization the most are precisely the countries that are economically growing and adding as much as $1,482 to per capita GDP. This is only possible if the subsequent policy frameworks and design principles are inclusively integrated. In the absence of such frameworks, the

outcome of digitization will be the exacerbation of inequity rather than its mitigation.

At a micro level, electronic payment systems provide automated tracking of finances, secure transactions, and efficient management of credit and savings accounts. Tran et al. (2024) explores system innovations relating to a firm's performance in times of uncertainty and the role of digital and innovation leadership of MSME's and the need for strategic flexibility in the innovation's enduring frameworks. As explained, digital leadership is associated with dynamically driven capabilities (Schoemaker et al, 2018, as cited in Tran et al., 2024) and strategic collaboration, innovation (Benitez et al, 2022, as cited in Tran et al., 2024) and the enduring performance over a time (Sarfraz et al, 2022, as cited in Tran et al., 2024). Such insights are particularly useful in the context of emerging economies, which are usually MSME-centric and operate in a harsh climate.

Indonesia is a compelling country in which to track the ramifications of a digital shift. In the rest of Southeast Asia, its fast changes in accessibility to and use of financial services stand out. For example, in 2024 alone, Bank Indonesia reported 149.46% increase on a year-over-year basis in the volume of QRIS transactions, which totaled 31.65 trillion rupiah (Tempo, 2024). This rise is currently driven by smartphones and e-wallets like GoPay, OVO, ShopeePay, and DANA which provide services like e grocery shopping and ride hailing.

The Indonesian government added the 'Go Modern,' 'Go Digital,' and 'Go Online' programs to the Level Up 2024 Program to support the MSME sector go digital. These seminars teach people various digital instruments, online stores, and how to mark their businesses more significantly on the map. Many of these businesses, apart from the weak ties to the economy, face inequities based on their geography, social standing, and means.

Thus, there are two perspectives to look at for the reasons for adoption. Are small firms really growing, or are they simply shifting their existing operations into the digital space? Is digital transformation also helping businesses who aren't doing well to take part in the economy more completely, or is participation still limited to businesses that are already doing well?

These kinds of questions are important, especially in Indonesia, where micro, small, and medium enterprises (MSMEs) make up around 97% of all businesses and the informal economy remains a dominant part of the national economy. There are approximately 64.2 million MSMEs in Indonesia, providing employment for 97% of the total workforce (World Economic Forum, 2022).

This research aims to fill the gap that exists in the empirical literature. There is in fact limited research on the impact of electronic payments on the operational performance of micro, small and medium enterprises (MSMEs) in Indonesia. This is made possible by the electronic nationally-representative firm-level data collected in the 2023 World Bank Enterprise Survey (WBES). Together with the growing literature on financial inclusion, digitalization and development, the work provides much-needed empirical

evidence to policymakers who wish to construct more digitized economies that are accessible, fair, as well as sustainable.

1.2 Problem Statement

The extent to which electronic payments influence micro, small, and medium enterprises (MSMEs) within many developing economies remains largely unexplored, especially in light of the region's emerging electronic payment infrastructure. In Indonesia, over 99% of the business sector is made up of MSMEs (International Labour Organization, 2019) these businesses cover almost 97% of domestic employment and 56% of the country's total business investment (OECD, 2018), which play an important role in the country's employment as well as GDP. Their use of digital payment systems, in particular QRIS and e-wallets, has been increasing fairly rapidly recently. It remains, however, ambiguous whether the ongoing digital shift is improving business performance indicators such as revenue and customer base expansion and access to formal credit.

While official statistics and policy documents acclaim the advantages of transitioning to a cashless economy, financial inclusion, lower transaction costs, and enhanced market access, not much is known about the link between digital technologies and actual performance within the firm. In addition, the disparities in access to digital technologies and supporting infrastructure and firm-level preparedness raise the concern whether the fruits of digital transformation would be equitably shared, exacerbating the current socio-economic disparities.

This study will analyze how electronic payments affect the performance of MSMEs in Indonesia, filling in the gap using WBES 2023 firm-level data by the World Bank. The central issue is to determine whether the adoption of digital payment systems in Indonesia is the outcome of, or a driver to, business success, in order to guide the formulation of financial and digital strategies for the country's advancement towards a cashless economy.

1.3 Research Question and Hypotheses

Main research question:

What is the impact of electronic payment adoption on MSME performance in Indonesia?

Sub-questions:

- Does increased use of e-payments relate to higher revenue among MSMEs?
- How do these effects vary across different firm characteristics (e.g., size, sector, gender, or location)?

Hypotheses:

- H1: MSMEs that utilize electronic payments more often tend to do better in business, as assessed by revenue and sales.
- H2: The effect of adopting e-payments on performance depends on the type of business; service-sector and medium-sized businesses show stronger favorable links.
- H3: The link between e-payment use and MSME performance is stronger for businesses in Java than for businesses in other parts of the country. This is because there are gaps in infrastructure and digital readiness.

1.4 Research Objectives

This research aims to evaluate the impact of electronic payment adoption on MSME performance in Indonesia. It specifically seeks:

- To analyze the relationship between e-payment usage intensity and MSME performance.
- To explore heterogeneity in outcomes by firm characteristics (e.g., female-owned, rural, small-sized)
- To inform inclusive digital finance strategies and policies based on empirical patterns

Chapter 2. Literature Review

2.1 Theoretical Foundations

Understanding the reasons and effects of the adoption of digital payment systems on micro, small and medium enterprises (MSMEs) in Indonesia requires integrated and comprehensive theories. This research primarily derives from four integrated and interrelated theories, namely Endogenous Growth Theory, Schumpeter's Theory of Innovation, the Technology Acceptance Model (TAM) and Feminist Economics. These represent the economic, behavioral and social aspects of the adoption of digital payments. Furthermore, the inclusion of the Financial Inclusion Framework and Digital Transformation Theory/resource Based View (RBV) helps in the analysis of the intersection of digital payment MSMEs. These different viewpoints evaluate how the integration of financial MSME digital technologies, digital infrastructure and resources at the firm level drives MSME growth and resilience in developing economies.

2.1.1 Endogenous Growth Theory: Building from Within

Romer's 1990 work on Endogenous Growth Theory posits that investing in education, creativity, and digital infrastructures like the internet and mobile technology expands long-term growth potential. Thus, the use of e-wallets is understood as a step towards greater household participation in the formal financial system. Unlike the neoclassical frameworks, which treat technological advances as outside influences, Romer asserts that growth is the result of deliberate expenditure on education, R&D, and the technological frameworks of the economy

For the purposes of this study, mobile digital financial infrastructure and internet connectivity as well as e-wallets, QRIS systems, and other fintech services are to be considered as potential internal growth drivers. By replacing paper-based systems with digital payment technology, applied to MSMEs in their daily transactions, it is known to simplify the financial system and facilitate formal participation in the economy. Furthermore, with the adoption of this system, MSMEs are known to be able to collect transaction histories, which is known to increase transparency within institutions and improve the creditworthiness of individuals.

From this theoretical perspective, this provides support for the literature on finance, which has evolved to identify two main channels of growth within its primary scope;

1. **Direct productivity gains**

   When it comes to digital payments, there are no admin costs to lose, cash flow issues to lose, and all expenses to lose, as operational efficiency simply is much higher with digital payments.

2. **Indirect Institutional Effects**

   Fintech or finance technology helps advances in business formalization, rise in tax compliance, and the growth of financial inclusion resulting from easier access to financial services.

In Indonesia, MSMEs assists with 60% of GDP and opens access to employment. Digital payment platforms such as GoPay, OVO, Dana, and QRIS can present the possibility of these businesses operating in a digital market with barriers related to lower-level transaction reactions (Irianto & Chanvarasuth, 2025). Therefore, within the framework of endogenous growth, the adoption of financial innovation can create a perception or perspective as a strategic engine that can support the realization of development and sustainable economic resilience, especially in developing countries.

This theory elaborates the research by explaining how investments in digital financial infrastructure, including e-wallets and QRIS, catalyze MSME growth and enhance formal financial participation in Indonesia. In turn, this growing participation supports broader goals of financial inclusion and sustainable economic development.

2.1.2 Schumpeter's Theory of Innovation: Creative Destruction in Action

Joseph Schumpeter (1942) explained the idea of creative destruction, understood as a form of process. With the presence of an innovation disrupting the structure of the existing economy and realizing a new opportunity for growth. Based on the explanation, entrepreneurs are understood as agents of change who strive to introduce new production results, by adopting new technologies, and realizing networks in the New Market area, so as to bring about changes in the attitude of the economy. The adoption of digital payment systems carried out by MSMEs in Indonesia is a form of realistic or tangible manifestation of these innovation efforts. Technologies such as QR Codes, related to mobile banking, and related to digital wallet platforms that not only present practical things, but these technologies also attempt to reconfigure the mechanisms of small businesses that operate by utilizing:

- By reducing the existing obstacles, it is possible for micro businesses to compete in the digital market without needing large amounts of capital at the start
- Striving to increase operational efficiency, minimize financial burdens and handling, and increase financial security.
- Expanding their market reach enables MSMEs to innovate their business models, for example by integrating point-of-sale systems with online marketing platforms.

An empirical study conducted in Bangladesh presents how the phenomenon of mobile banking

platforms and agents has catalysed the growth of small businesses and increased participation in women's entrepreneurship, especially in rural and semi-urban areas (Alom et al., 2025). This shows that related to technological and insightful innovation efforts, it is known to bring changes to the mechanisms of MSMEs in interacting in the market area, with customers, and the existing financial system in Indonesia. This dynamic is evident in the presence or massive number of MSMEs applying or utilizing online or digital payment systems during and after COVID-19, which is known to accelerate integration into the formal economic area.

From this point of view, Schumpeter's idea shows how innovation and ambition come together as digital payments spread through Indonesia. Small and medium businesses are changing the way they work, becoming more efficient, and helping the economy grow while raising healthy competition. These changes do more than make things faster, they reshape how industries operate by encouraging creativity, bold decision-making, and quick adaptation to new technology.

With digital payments, small businesses can reach new customers, explore wider markets, and manage their sales with less hassle. Over time, these improvements build stronger trade connections and help businesses stay resilient in an economy that is always shifting. Seen this way, Schumpeter's theory fits Indonesia's economic journey well, showing how technology and new ways of doing business are driving growth and giving the country a sharper competitive edge.

2.1.3 Technology Acceptance Model: Adopting the Digital

Developed in 1989 by Davis, the Technology Acceptance Model (TAM) sought to explain why and how individuals come to accept and use new technologies. The model is centered on the psychological and behavioral factors that influence taxpayers' decisions to adopt technology, focusing on perceived usefulness and perceived ease of use. According to Davis, a technology will most likely be embraced when individuals consider it a contribution to the improvement of a task, and it is simple to operate. Over the years, the model has become one of the most examined and foundational pieces of technology adoption literature in a myriad of disciplines, digital finance included. In this study, the model serves to explain how MSME owners in Indonesia develop attitudes and intentions to adopt digital payment systems in their businesses.

The model explains that the two main constructs which are perceived usefulness (Perceived Usefulness/PU) and perceived ease of application (Perceived Ease of Use/PEOU) are user attitude determinants of new technology which are subsequently known to affect user intentions and the actual use of technology in question.

For MSMEs, perceived usefulness of electronic payment systems often relates to tangible business benefits such as:

a. Faster and more efficient transaction processes,
b. Improved customer experience and satisfaction,
c. Reduced risk of cash handling and theft,
d. Better financial record-keeping that facilitates access to formal credit.

Conversely, perceived ease of use pertains to MSME owners' information on the effort necessary to adopt a digital payment system on a digital platform as required on a seamless integration of interfaces, minimal transactional costs, already in place business frameworks, and lower technological know-how.

In Indonesia, thanks to the integration of the QRIS, now standard QR-based payment system, Indonesia's Central Bank saw the rapid growth of fintech. Affandi et al. (2024) explains MSME's motives toward the adoption of digital payments not only to boost sales but also to the ease of use of the system. Irianto & Chanvarasuth (2025) digital readiness indicators including but not limited to, internet access, mobile phone ownership, and digital literacy positively impacted both the perception of usefulness and perceived ease of use, thus increasing the adoption of payment systems.

The adoption of the Technology Acceptance Model (TAM) for micro and small firms is more suitable because their environments are simpler and less dependent on complex infrastructure. In such contexts, using financial technology depends more on how people see its value than on technical details or advanced systems. Building on TAM, this research looks at how small business owners in Indonesia view digital payments, focusing on perceived benefits and simplicity when deciding to jump in. Understanding these views will help to reveal what pushes, or holds back, small firms from going digital, pointing toward steps that could boost involvement across the nation's evolving money ecosystem.

2.1.4 Feminist Economics: Empowering Through Inclusion

Although the majority of the market adoption literature presents the uptake of new technologies as the outcome of rational decision-making, Feminist Economics identifies their socially embedded and gendered power relations. Folbre (1994; 2021) states that classically trained economists often overlook unpaid work, imbalanced distributions of power and access, as well as institutional obstacles that women face in the economy.

The inequitable design of digital financial services technologies illustrates exclusionary practices. Women entrepreneurs, with unique constraints, are unable fully to exploit the benefits offered by digital financial services:

a. Unequal access to devices, internet connectivity, and financial literacy programs.
b. Time constraints arising from unpaid household and care responsibilities.

c. Lack of collateral or credit history for formal financing.
d. Social norms and gender biases restrict their economic autonomy.

Alom et al. (2025) describes how women owned MSMEs in Bangladesh do not perform as well as the men owned ones despite the existence of digital payment platforms. This shows how feminist economics can substantiate the contextualization of the lack of digital financial inclusion as not only technologic or economic, but also sociocultural and institutional, needing concomitant, women-centered, and sociocultural relevant interventions.

In Indonesia, where many women manage MSMEs, most of which are in the informal sectors, this becomes relevant as the structural impediments that women face in the MSME sector are crucial in determining the design of accessible fintech, and empowerment.

Drawing on Feminist Economics theory, this study views inclusive digital finance as influenced not only by technology and market structures, but also by broader social forces, such as gendered power relations and institutional barriers that limit women's involvement in the MSME sector in Indonesia. This perspective explains why, relative to men, women continue to struggle to find and maintain access to many financial resources, training, and opportunities. It emphasizes that meaningful inclusion goes beyond access to digital technology; it involves dismantling the social and structural barriers that limit individuals. For women in Indonesia to succeed in the emerging digital economy, digital equity, robust access to and support resources, and the removal of barriers that undermine women's digital confidence are vital.

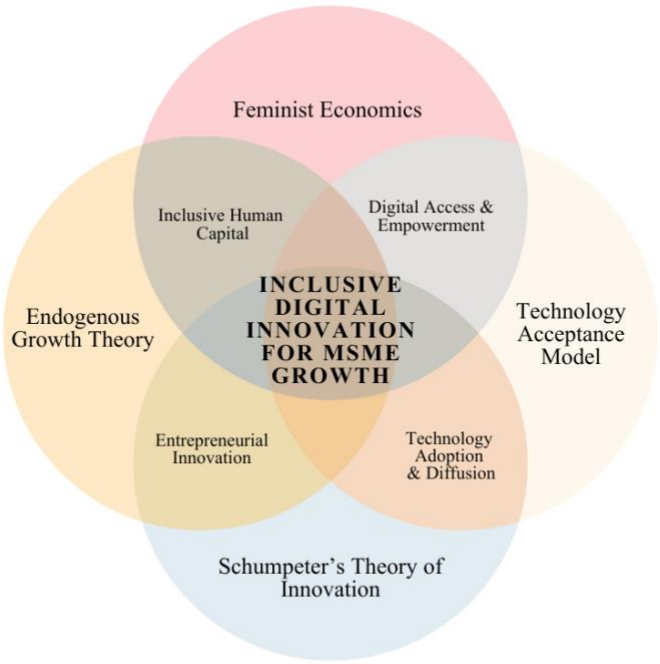

Figure 2.1 Theoretical Framework of Cashless MSME Growth

Inclusive digital growth can be understood from four interrelated theoretical perspectives. Schumpeterian Theory of Innovation along with Endogenous Growth Theory focuses on entrepreneurship, technological innovation, and knowledge as core drivers of productivity and economic growth over time, and growth. The Technology Acceptance Model (TAM) aids in understanding how MSMEs adopt innovations such as e-wallets and QRIS based on perceived usefulness and ease of use. Conversely, Feminist Economics highlights the other side of the coin focusing on the inequalities brought by social and gender discrimination and the exclusion from digital finance and its benefits. The views here show that shifting the economy into the digital world is also shifting society in the same direction. This change incorporates the connections between innovation, human capital, behavioral intent, equity, the degree of participation, and the benefits drawn from the growth of digitalization.

2.1.5 Financial Inclusion Framework

Financial inclusion starts with having accessible financial services and includes the full completion of services to hands the needs of a person or a business. According to Ozili (2025), the inclusion of finances depends on the different types of infrastructure, rules and regulations, digital literacy, and many other macroeconomic fundamentals.

Related Framework to Financial Inclusion tries to describe and define Financial Inclusion by focusing on three different dimensions:

1. Access, financial services are provided, such as bank accounts, credit-related facilities, insurance, and systems used for payment purposes.
2. Usage, how often and in what ways do people and businesses use financial services in the economic activities they perform? And do they do it well?
2. Quality, the degree to which financial services are reliable, affordable, secure, and suitable for users' needs.

Digital payments are integral for financial inclusion for MSMEs. Considering e-wallets and QRIS platforms, even businesses without bank accounts can establish transaction history and later evaluate it for credit. This is important for microenterprises located in rural areas where conventional banking is unavailable (Prawitasari et al., 2024).

Financial inclusion also contains the institutional framework which includes the role of the government, regulation, central bank policies, and the partnership of fintech in the access and use of services. In the case of Indonesia, Bank Indonesia's QRIS, the National Strategy for Financial Inclusion (SNKI), and the exponential growth of e-wallet services are paving the way for MSMEs to participate in the digital economy.

2.1.6 Digital Transformation Theory and Resource-Based View (RBV)

Barney (1991) argues in the resource-Based View (RBV) that the primary source of a firm's sustainable competitive advantage lies in the unique resources that a firm possesses that are valuable, rare, inimitable, and non-substitutable (VRIN). Imitable and known to be irreplaceable (VRIN). It is known that in a digital economy, technology is considered a strategic resource that can support efforts to improve capabilities, operational performance, and differentiation in the market.

By being known to present contributions to resource-based, the theory of digital transformation presents a picture of a fundamental reconfiguration and is related to the re-engineering of an organizational process, related to the structure, and related to the system of values that are present with the embrace of new technology regarding digital transformation, especially in the efforts to adopt electronic-based payment systems, presenting an MSME with many opportunities and strategic nature;

a. Real-time transaction data can significantly enhance decision-making processes and improve the accuracy of forecasts and estimates.

b. Improvements to financial management, which present the possibility of controlling cash flow and relating to greater transparency.
c. Integration with the presence of a marketing channel, increased engagement and related to retention of customers.
d. Better resilience, providing a possibility for businesses to be able to adapt quickly to constraints in market areas or markets experiencing crisis.

In Indonesia, the flexibility and efficiency of MSMEs have made it easier to handle offline and online market transactions thanks to the use of QR codes and digital wallets. According to Affandi et al. (2024), more flexible MSMEs show greater disciplined financial behavior because of the volume of digital payment transactions being processed.

In the context of this research, integration of the Resource-Based View with the Digital Transformation Theory enables us to examine how MSMEs are competing in the Indonesian economy in the context of digital integration. Therefore, in this case, electronic payment systems are not merely operational systems, but are to be regarded as strategic resources for better efficiency, more adaptability, and sustainable competitive advantage.

2.2 Empirical Literature Review

Several research works have looked on how MSMEs globally are able to incorporate electronic payment systems into their business operations. These studies are not limited to the economic consequences of adopting digital payments. They review contextual, structural, sociocultural, and, most importantly, qualitative factors.

Payment systems nowadays are quick, convenient, inexpensive, and easier to manage because of FinTech. Mobile finance systems, QR Code payment platforms, and digital wallets allow MSMEs to gain access to the market and increase profits, access firm data, enhance record keeping, and gain financial stability in more ways. Most research in this field has been conducted in a range of geographical and socio-economic contexts, from global to regional studies that focus on countries such as Bangladesh, those in Sub-Saharan Africa, Central Asia, and Indonesia.

Over the past few years, research on this subject has grown quickly, showing its global relevance. Studies now explore how digital payments affect business growth, inclusion, and resilience across different regions and social settings. From global analyses to country-specific case studies, evidence has emerged from Bangladesh, across sub-Saharan Africa, throughout Central Asia, and within Indonesia, each showing how financial technology is changing the way small businesses connect, trade, and grow.

2.2.1 Global Evidence

Global scientific research reveals the macro-level relationship between digital finance, financial inclusion, and economic growth. Sultana et al. (2025) found a pre-determined association between automated payment instruments (credit, debit cards, and mobile cash) and national performance measures like GDP in many countries. Digital payment solutions increase firm liquidity, speed up commercial transaction settlement, and reduce cash transactions.

These enterprises expand their market and enter the official financial system. Audretsch et al. (2025) offers a finer 'slice' of data from a RCT done in Kenya on the adoption of mobile payment systems by small businesses. Firms that were incentivized to utilize Safaricom's Lipa Na M-Pesa platform were found to increase their loan approvals by 50%. The firms equally reported improved mobile credit access and lower volatility in revenues, even though total sales did not change significantly. These findings suggest that the adoption of financial technology can help businesses achieve greater financial resilience. By improving access to credit and stabilizing revenue flows, firms become better equipped to manage cash flow volatility, external liquidity constraints, and related financial shocks. A report by VISA (2024) also found that MSMEs using mobile-based payment solutions were able to operate more smoothly during economic recessions. The monitoring systems that were put into place demonstrated decreases in interruptions and considerable increases in clarity of transactions.

According to these studies, financial technology enhances the growth of a business and the business's financial stability. They also point out the ways digital finance expands financial inclusion, especially in developing countries that have little access to banks. MSMEs can streamline their operations, establish credit histories, and obtain legal loans, thus significantly reducing their reliance on informal financial systems. This is made possible by inexpensive electronic payment systems.

2.2.2 Evidence from Bangladesh

The introduction of digital finance has expanded the entrepreneurial horizons of developing economies. Bangladesh, with its rapid advancement in mobile banking and agent platforms through bKash and Nagad, provides one of the most illustrative examples of this opportunity.

According to a longitudinal study by Alom et al. (2025), digital financial services were directly associated with enhanced entrepreneurial engagement among women and increased stability of businesses. With the use of mobile and agent banking, women`s ability to grow businesses, stabilize income, and access credit was proven to be positively correlated (1% level). These services decreased the reliance on informal lending, which has high interest, provides inadequate borrower protection, and short run lending.

The study captures the persistent gulf concerning the extent of the realization of available benefits. Providing evidence, women-owned businesses, although disadvantaged, still experience lower access to digital finance, lower entrepreneurial influence, lack of time resulting from unpaid care activities, and restricted access to enhanced financial services. These are classical examples that resonate with the Feminist Economics paradigm, which argues that access to technology and finance does not ensure economic benefits.

The Bangladesh case proves how mobile financial services can address the rural-urban divide almost simultaneously supporting the urban entrepreneurs and the micro enterprises in the rural areas that were previously denied access to the formal financial system. This also applies to Indonesia, which has the same rural-urban structure and a substantial population of female informal sector entrepreneurs.

2.2.3 Evidence from Other Developing Countries

As is the case in other developing nations, the evidence coming from Bangladesh also improves the promising features of digital financial inclusion. Women entrepreneurs' access to capital was relatively low, until lately, in Sub–Saharan Africa, where the integration of mobile money platforms with informal savings Jurassic' studied by Simba et al. (2025) more entrepreneurs have access to markets and improve their money lending systems. These systems of financing in which the loan is supported by the financial trust of other community members provides entrepreneurs with formalized trust-based systems which improves the basic digital financing structures. As a result, financial autonomy improves formation ratio and formal economy employment rises.

VISA's research on the republic of Uzbekistan (2023) also examined digital financial inclusion programs, mobile wallets, and how digital financial inclusion programs improved access to credit for many SMEs. These programs, which financed mobile services, provided especially better access to credit than traditional financing. SMEs were only able to borrow the crudest performance from bureaucratic banking, which advanced business in many indicators.

Also, Irianto & Chanvarasuth (2025) in their comparative study has proven that the adoption of digital payments increases the ability of small and medium enterprises (SMEs) to scale, lowers their transaction cost, and increases their market access. These results add to the body of evidence that the impacts of financial technology are not confined to specific regions, but can be extended to several other developing areas that possess the right infrastructure and regulatory frameworks needed.

2.2.4 Evidence from Indonesia

According to research by Prawitasari et al. (2024), Indonesia is one of the most dynamic fintech markets in Southeast Asia. In the past five years, the country has made significant strides towards cashless transactions, primarily due to the adoption of the QRIS system (Quick response Code Indonesian Standard) and the rapid proliferation of e-wallets, including OVO, GoPay, ShopeePay, and DANA.

It is explained that the application of digital-based payments to MSMEs can provide a form of growth in sales efforts, retention, and operational efficiency. Efforts to apply electronic payments are known to provide simplification in transaction efforts, in addition to providing facilities regarding MSME transitions and providing opportunities for related parties to expand trade areas or customer bases, by seeking to integrate supply chains, as well as accessing microfinance efforts through transaction records.

Irianto and Chanvarasuth (2025) It is known to have a broader or more nuanced perspective by focusing on the distribution of financial services, which are experiencing rapid development and are known to be uneven. MSMEs in rural areas are known to face infrastructure gaps, low levels of digital literacy, and inadequate access to high-speed internet networks, which present limitations to digital financial services provided to related parties. This is known to attempt to emphasize the need for an environment with appropriate policies that include targeted digital literacy efforts, low-cost internet access, and gender-responsive financial inclusion.

The Indonesian government, facilitated by Bank Indonesia and the Financial Services Authority (OJK), is implementing MSME integration into a national payment system through an inclusive strategy related to individual finances. QR codes help small-scale businesses without regular bank accounts accept digital payments. It lowers costs and makes transactions much safer. This method is noted as relevant policy and impacts adoption and learning challenges in other developing countries

2.2.5 Key Insights from the Literature

Earlier studies laid out results necessary for building the groundwork for this research. The expanded literature promotes the idea of digital finances for inclusion offering formal financial services to micro, small, and medium enterprises (MSMEs), facilitating the establishment of transaction histories, enhancement of credit profiles, and attainment of financial stability. The inclusion of formal finances to business operations also indirectly contributes to the overall business performance as access to digital payments eases credit access, enhances the management of cash flows, and stabilizes the business income (Affandi et al., 2024).

However, the findings are still shaped by the aspects of geography and gender. Digital finance may tackle some financial barriers, but the rewards are unequal, particularly for women and rural entrepreneurs

who face digital infrastructure gaps, education, and resource challenges (Alom et al., 2025; Simba et al., 2025).

Access to digital finances also improves business resilience by providing means to manage income volatility, access credit, and ease of coping with business shocks. In the case of Indonesia, although the rate of adoption is fast, the most basic infrastructure and digital literacy gaps still exist, especially in rural areas and this hinders inclusive growth.

Observation of the above allows for the importance of current research. This research aims to analyze the moderation effect of e-payments and financial inclusion on the performance of MSMEs with respect to gender and the context of Indonesia. Basically, the goal is to tackle the gap between global and local views in research and policy promotion related to digital finance and the empowerment of SMEs.

Chapter 3. Data & Methodology

3.1 Research Approach and Data Sources

This research includes both data and information that is quantitative and qualitative about the impact of electronic payment systems on the performance of MSMEs in Indonesia and is also based on cross sectional data that was obtained from the World Bank Enterprise Survey (WBES). The survey responses were taken during December 2022 to September 2023. This research specifically used the Ordinary Least Squares (OLS) regression method, run in STATA for the analysis involving electronic payments, the value of the Financial Inclusion Index (FII) and other variables that are firm-specific such as industry, region and demographics, and gender ownership. To make the findings valid and reliable, this research also looked for evidence of robustness in the use of multicollinearity, heteroskedasticity and robustness in the use of standard errors which are customarily used in regression analysis.

In the qualitative part of the research, to enrich the quantitative data, interviews were conducted with sampled and purposive MSME owner to explain the firm level procedures and the justifications to the level of adoption of e-payments. These interviews highlight the motivators, anticipated gains and challenges associated with electronic payment systems. They help explain the complicated and abstract relations in the data especially with regards to financial inclusion, sales performance, and the movement towards digitization.

To obtain rich qualitative data, purposive sampling was used to gather balanced viewpoints from MSME owners who are primarily electronic payment system MSME proprietors, this counts as non-probability sampling. This is because the researcher identifies sampling units based on specific characteristics, in this case, electronic payment system proprietors. This sampling method, however, serves more to illustrate qualitative data clarifying a particular trend in the quantitative data rather than for statistical generalization.

The participants are thus guaranteed to knowledgeable witnesses on the uptake of digital payments. This allows for an in-depth analysis of the rationale, difficulties the researcher, and situation constraints that the data do not explain. As Cresswell and Plano Clark (2018) explain, purposive sampling is a major strategy for mixed method studies where qualitative data is intended to add depth to the quantitative results.

This is consistent with mixed-method studies on digital finance and financial inclusion (Ayyagari, Beck & Demirgüç-Kunt, 2007; Creswell & Plano Clark, 2018), where integrated quantitative and qualitative data was used in the analysis to reflect the measurable and significant effects on Indonesian MSMEs.

3.2 Model Specification

This research used Ordinary Least Squares (OLS) regression to model continuous outcomes and in this research; sales. The analysis centers on the following model specification:

Model Specification:

$$log(Y_i) = \alpha + \beta_1 EPayment_i + \beta_2 FII_i + \beta_3 Size_i + \delta Xi + \epsilon_i$$

Where,

- Y_i: Firm performance variable (natural log of annual sales)
- $EPayment_i$: Binary or proportion variable indicating use of electronic payments (e.g., share of sales through e-payments)
- FII_i: Financial Inclusion Index made out of chosen WBES indicators (e.g. using credit, internet access, and e-payments) that show how involved the business is in both digital and financial activities.
- $Size_i$: Firm size, indicated by the number of employees.
- X_i: Control variables (sector, province, female ownership, internet disruption)
- $\epsilon_{i.}$ Error term

3.3 Construction of Variables

Dependent Variables (Y)

This study uses sales as a main indicators of MSME performance as outcome variables:

- Log of Annual Firm Sales($log(Y_i)$): Measures the firm's revenue, used to assess financial performance.

The variable is continuous and reflect the economies of scale and operational results of the business.

Independent Variables

- Electronic Payment Use: The main explanatory variable, which captures whether and to what extent the business uses digital payments, such as:
    - *Share of monthly sales made through electronic payments (k33_BR)*
    - *Main type of e-payment accepted (k34_BR)*
    - *Associated costs or delays in receiving e-payments (k35_BR, k36_BR)*

- **Financial Inclusion Index (FII)** – based on key indicators of access and use of financial services.
    - *Use of bank credit (k8)*
    - *E-payment usage (k33_BR)*
    - *Internet reliability (c39)*

  All components are standardized and averaged to form a single composite index score.

- **Control Variables** – used to isolate and clarify the main effects.
    - *Firm size (number of employees) [l6]*
    - *Sector (manufacturing, retail, services) [a4a]*
    - *Location (Java vs. non-Javal) [a3a]*
    - *Female ownership (b4a)*

The variables in this study were chosen to clearly show how digital payment habits relate business success. Instead of using annual revenue directly, its logarithmic value was applied, as it more smoothly reflects financial performance, operational efficiency, customer reach, and growth potential. The main factor driving the results, the use of electronic payments, indicates how deeply a business is

engaged in digital transactions, which can help raise income, lower costs, and improve cash flow management.

Table 3.1 Variable Definitions and Descriptive Statistics

Variable	Definitions	Obs	Mean	Std. Dev.	Min	Max
k33_BR	Percentage of sales through e-payments in a typical month	1443	23.529	40.461	-9	100
FII	Financial Inclusion Index	2955	0.001	0.4708	-2.958	0.6423
l6	Number of full-time temporary employees at end of last FY	2955	2.46	38.079	-9	1800
a4a	Industry sampling sector	2955	10.538	5.261	1	19
a3a	Region of the establishment	2955	10.845	6.535	1	22
b4a	% of the firm owned by females	1397	69.137	46.06.00	-9	100
c39	Internet disruptions in the last FY	2955	0.6132	2.875	-9	2

Note: The final regression sample comprises 514 firms after listwise deletion of missing or invalid values.

Table 3.1 shows descriptive statistics for the variables used in this research; *k33_BR* refers to the share of monthly sales made via electronic payment. FII is the Financial Inclusion Index, which includes information about the usage of bank credit, e-payments, and internet activity. *l6* is the size of the firm, which is measured in number of employees. *a4a* is the industry sector which is classified into Manufacturing, retail, and Services. *a3a* refers to the province in which the firm is located. *b4a* is the ownership gender variable which shows if the firm is female owned. Finally, *c39* is the internet reliability variable which is based on whether the firm had connection interruptions in the last fiscal year.

Chapter 4. Main Results and Discussion

4.1 Data and Descriptive Statistics

Data from the 2023 World Bank Enterprise Survey (WBES) for Indonesia, focusing on formal businesses in urban areas and peri-urban areas, is used for this research. This survey describes the features, performance, and the challenges in the business environment, which are confronted by micro, small and medium-sized businesses (MSMEs) respectively. This also includes information on the businesses' financial management and the use of digital technology.

The main variable for this research, $log(Y_i)$, measures a firm's annual sales and is used to compare firms of various sizes. This value, the share of sales made through electronic payments, and the Financial Inclusion Index (FII) which measures a firm's use of bank loans, electronic payments, and online financial activities, and measures the degree of the financial services used by the business. The other factors included business size (number of employees), industry sector (manufacturing, retail, or services), geographic area, business owners' gender, and the internet reliability (measured by service outages in the previous year). The final sample has 514 businesses after the removal of incomplete data.

The average sales value ($log(Y_i)$) for firms was 20.6, and about 15% to 25% of them accepted electronic payments. Women's ownership of at least a percentage of over 40% of businesses is a remarkable achievement. In this technology-advanced world, there are still many businesses that have internet connectivity issues, even with a large segment of the population being capable of going online. Having slower internet connection issues illustrates the problems with infrastructure that continues to impede the adoption of certain technologies, thereby reducing productivity growth.

In this research, analysis of each firm's Financial Inclusion Index (FII), is composed of average, composite variables, built around how financially "included" that firm is, relative to its competitors or counterparts. The FII is defined as the Financial Inclusion Index. It measures certain factors of financial inclusion. It looks at how often firms use digital payments, evaluates credit accessibility, and checks how reliable the internet connections are. The FII components show how each firm worked in the financial system during the review cycle, allowing intergroup comparisons on business performance.

4.1.1 Empirical Strategy

This study looks into how using digital finance affects how well a business does by using stepwise multiple linear regression (OLS). For this analysis, business performance is measured using the natural log of the business's yearly revenue. The main independent variables are the proportion of sales that are made through e-payments, along with a computed Financial Inclusion Index (FII).

The estimation strategy follows this particular model:

$$log(Y_i) = \alpha + \beta_1 EPayment_i + \beta_2 FII_i + \beta_3 Size_i + \delta Xi + \epsilon_i$$

Where,

- Y_i: Firm performance variable (log of annual sales or number)
- $EPayment_i$: Binary or proportion variable indicating use of electronic payments (e.g., share of sales through e-payments)
- FII_i: Digital and financial activity engagement will directly compute the FII using selected WBES indicators (i.e., using credit and e-payments, and internet access).
- $Size_i$: Firm size, indicated by the number of full-time employees.
- X_i: Control variables (sector, province, female ownership, internet disruption)
- $\epsilon_{i:}$ Error term

Five models were estimated in sequence, with control variables added progressively.

4.2 Results and Discussion

4.2.1 Model 1: E-Payment and Firm Performance

The first model is used as a baseline to provide an understanding of the impact of digital payments on micro, small, and medium enterprises. The coefficients show how useful digital finance instruments are for examining firm performance. This idea is consistent with earlier results, that digitization was the beginning of inclusive finance. The model uses the natural logarithm of annual sales as a dependent variable to quantify the performance of a firm in a quantifiable way.

Table 4.1 Regression Results for the Effect of E-Payment Use on Firm Performance

Variable	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval
E-payment use (*k33_BR*)	0.0222***	0.0016	0,6778	0.000	[0.0190, 0.0253]
Constant	19.9928***	0.082	245.02.00	0.000	[19.8327, 20.1529]
Observations (N)	1,087				
R-squared	0.1508				
Adjusted R-squared	0.1500				
F-statistic	192.67 ($p < 0.001$)				

*Notes: *p < 0.01, p < 0.05, *p < 0.1*

The results indicated that e-payments impact businesses to enhance their performance. Findings show that every 1 percent increase in e-payment usage leads to an increase in total sales by 0.022% with a coefficient of 0.022 ($p < 0.001$). Training is important not only from a statistical point of view, but also for its real-world consequences, particularly for small businesses with limited cash. These businesses do not just get online and use it to perform simple tasks; they go beyond what is basic. As a result, businesses are more efficient and they reach a broader base of customers.

Furthermore, transactions account for approximately 15% of the variation in firms' practices (R-squared value of 0.1508). While this may seem small, it is important to note that this model relied on a single key variable, focusing exclusively on the use of e-payments. Although the results are modest, they capture the positive influence of financial technology tools on the success of small businesses. Going digital leads to higher sales, even when other factors remain constant. In Model 1, the use of e-payment systems reflects that firms are not merely adapting to new technology but are actively improving their performance and resilience.

4.2.2 Model 2: Adding Financial Inclusion

Model 2 includes a more detailed analysis of the FII. Specifically, it analyses the relationship between the level of access to financial services and the use of electronic payments. Model 2 seeks to understand whether greater financial inclusion increases the positive impact of digital cash transactions on a business's profitability. While the first model focuses on the impact of adopting e-payments on the outcomes of a firm, the second model looks at whether businesses in financially inclusive areas receive more 'all round benefits' than those in less inclusive regions. Model 2 integrates digital inclusion and institutional inclusion and advances understanding of the relationship between technology and finance in a highly digital and cashless economy.

Table 4.2 OLS Regression Results for E-Payment Use and Financial Inclusion

Variable	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval
E-payment use (k33_BR)	0.02196***	0.00225	0,4297	0.000	[0.01755, 0.0268]
Financial Inclusion Index (*FII*)	0.01986	0.16160	0.12	0,62649	[−0.2972, 0.3369]
Constant	19.9964***	0.08669	230.66	0.000	[19.8263, 20.1665]
Number of observations (N)	*1,087*				
F-statistic	*2, 1084*				
Prob > F	*0.0000*				
R-squared	*0.1508*				
Adjusted R-squared	*0.1492*				
Root Mean Squared Error (Root MSE)	*2.1933*				

*Notes: *p < 0.01, p < 0.05, *p < 0.1*

For the Financial Inclusion Index (FII), the building blocks entail a business's financial ecosystem considering the technological, infrastructural, and financial integration all working together. It assesses the value of electronic payment systems, the availability of the internet, and the extent of credit from banks. These indicators propose a view of the corporation's globalization and digital business capabilities. The assumption is that, among MSMEs, those with all four financial points of access (the internet, formal credit along with other channels) should outperform those with only one informal financial access point. The FII

determines the level of financial investment and business ecosystem. On the other hand, the expectation from the regression on that variable ecosystem was a surprise. Performance was explained with a positive and statistically significant electronic payment system. In stark contrast, while positive, the FII measurement was statistically nonsignificant ($p = 0.902$). The model operates on the assumption that financial inclusion is a significant variable on sales value. The disparate effects of the various index components on performance are likely the reason. Poorly controlled working capital *vis a vis* credit throughout the manufacturing cycle may render it virtually worthless. Inadequate digital strategy and limitations may pose the most significant risks as expanded Internet access undermines the intended performance.

The index does not account for heterogeneity among firms. For instance, some small and medium-sized enterprises (SMEs) may particularly access financial services, including digital payments, while others may access credit but poorly use it due to weak managerial control. Thus, weak statistical significance should not exclude financial inclusion from the domain of potential significance. Such influence could be explained by managerial ability, industry particularities, or the market's characteristics.

An R-squared value which hasn't changed of 0.1508 illustrates that electronic payments remain a critical aspect of running a successful enterprise. Model 2 emphasizes a key consideration: financial inclusion, in and of itself, will not positively impact the performance of MSMEs. Improvements won't happen without optimizing resources, making structural changes, and having a supportive macroeconomic environment.

4.2.3 Model 3: Controlling for Firm Size

Table 4.3 OLS Regression Results with E-Payment Use, Financial Inclusion, and Firm Size

Variable	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval
E-payment use (k33_BR)	**0.0217 ***	0.0022	9.6700	0.0000	[0.0173, 0.0261]
Financial Inclusion Index (FII)	0.0154	0.1613	0.1000	0.9240	[−0.3011, 0.3319]
Number of Employees (l6)	**0.0027 **	0.0012	2.2900	0.0220	[0.0004, 0.0050]
Constant	**19.9945 ***	0.0865	231.080	0.0000	[19.8248, 20.1643]
Number of observations (N)	*1,087*				
F-statistic (3,1083)	*66.1600*				
Prob > F	*0.0000*				
R-squared	*0.1594*				
Adjusted R-squared	*0.1525*				
Root Mean Squared Error (Root MSE)	*2.1891*				

*Notes: *p < 0.01, p < 0.05, *p < 0.1*

In Model 3, full-time employees (*l6*) are included as a control variable to determine if the size of the firm matters. It is important to determine firm size because larger businesses usually have economies of scale, better managed systems, and more negotiation power. This model also analyzes the differences firm size may have in the effect of the use of electronic payment and the access to payment services on the performance of the firm.

Numerous findings arise from this analysis. Even within the parameters set in this study, electronic payment systems continue to positively influence all performance indicators (0.0217, $p < 0.001$). This shows the advantage of digital payment systems to businesses, regardless of their scale, and the incorporation of the Financial Inclusion Index does not enhance the model and shows $p = 0.924$, which signals that performance of the firm is likely not to improve through financial inclusion alone, without other factors.

In connection to the above, the scale of the business is also very crucial. The coefficient of 0.0027 ($p = 0.022$) indicates that the provision of more full-time employment positions positively correlates with revenue growth on an annual basis. This suggests a firm's, and indeed a country's, revenue growing potential is associated with the human factor, the organizational structure and the number of employees. The results in this analysis are consistent with the literature which suggests resilience, competitiveness, and growth of a firm are linked to the size of the firm.

Considering the size of the firm, the model improved, with the R-squared increasing to 0.1549. This increase is not a big increase, but it does indicate firm size helps explain some of the variation in performance. Overall, Model 3 indicates that digital payments increase sales for MSMEs. Larger firms may benefit more because of their resource availability and structural advantages, but the digital shift is still advantageous for smaller firms.

4.2.4 Model 4: Controlling for Sectoral Differences

Model 4 deepens the analysis by categorizing firms into sectors as a control variable. Hence, it can explain better causes behind the performance of businesses, whether they are caused by competition, market demand, or production processes. These factors are used to show the extent to which the use of technology drives growth in different business sectors, the model accounts for different sectors and the impact of digital finance and financial inclusion on firm performance.

The findings indicate a strong positive correlation between the usage of electronic payments and the performance of the organization as evidenced by the highly significant coefficient (coefficient = 0.0192, $p < 0.001$). This describes how meaningful and strong the relationship is. The positive and statistically significant (coefficient = 0.0034, $p = 0.003$) relationship that explains the effect of size of the firm still holds. This implies that the size-related benefits identified in Model 3 still hold after accounting for cross-sector differences. The Financial Inclusion Index however, is not statistically significant ($p = 0.844$) which means that the overall level of financial inclusion, even after accounting for cross-sector differences, is not beneficial to the operational performance of the firm.

Table 4.4 OLS Regression Results with Controls for E-Payment Use, Financial Inclusion, Firm Size, and Sector

Variable	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval
E-payment use (k33_BR)	**0.0192 ***	0.0022	8.6300	0.0000	[0.0149, 0.0236]
Financial Inclusion Index (FII)	0.0310	0.1578	0.2000	0.5861	[−0.2786, 0.3407]
Number of Employees (l6)	**0.0034 ***	0.0012	2.9400	0.0030	[0.0011, 0.0057]
Textiles	−0.5186	0.3961	−1.3100	0.1326	[−1.2959, 0.2587]
Garments	**−1.1719 ***	0.4151	−2.8200	0.0050	[−1.9864, −0.3575]
Leather Products	*−0.7674 *	0.3949	−1.9400	0.0520	[−1.5421, 0.0073]
Chemicals & Chemical Products	0.1912	0.4097	0.4700	0.4451	[−0.6127, 0.9951]
Rubber & Plastics Products	0.4439	0.4537	0.9800	0.2278	[−0.4464, 1.3342]
Non-Metallic Mineral Products	**−1.5674 ***	0.4208	−3.7300	0.0000	[−2.3924, −0.7428]
Fabricated Metal Products	**−1.4469 ***	0.3958	−3.6600	0.0000	[−2.2236, −0.6703]
Machinery & Equipment	0.3574	0.4070	0.8800	0.2689	[−0.4411, 1.1559]
Motor Vehicles	0.6966	0.4064	1.7200	0.0870	[−0.1002, 1.4933]
Other Manufacturing	**−0.7296 **	0.3649	−2.0000	0.0460	[−1.4456, −0.0136]
retail	−0.5849	0.3284	−1.7800	0.0750	[−1.2285, 0.0583]
Construction	−0.2892	0.4316	−0.6700	0.3500	[−1.1383, 0.5598]
Transport	−0.0194	0.4316	−0.0400	0.6694	[−0.8663, 0.8276]
Hotels	−0.4804	0.4068	−1.1800	0.1660	[−1.2816, 0.3205]
restaurants	*−0.7287 *	0.3774	−1.9300	0.0540	[−1.4692, 0.0117]
ICT	*−0.8628 *	0.4364	−1.9800	0.0860	[−1.7175, −0.0089]
Professional Services	−0.3262	0.4127	−0.7900	0.2979	[−1.1361, 0.4836]
Other Services	0.2880	0.3774	0.7600	0.3097	[−0.4525, 1.0285]
Constant	**20.4843 ***	0.2728	73.6300	0.0000	[19.9384, 21.0302]
Number of observations (N)	*1087*				
F-statistic (21,1065)	*13.7900*				
Prob > F	*0.0000*				
R-squared	*0.2138*				
Adjusted R-squared	*0.1983*				
Root MSE	*2.1292*				

*Notes: *p < 0.01, p < 0.05, *p < 0.1*

Outcome at the sectoral level is still insightful. For the sectors of Apparel, Non-Metallic Mineral Products, Fabricated Metal Products, Other Manufacturing, and ICT, the coefficients in these sectors are negative and statistically significant.

This means that firms in these fields have some problems that make it hard for them to properly use digital technology or turn financial inclusion into better performance. These outcomes may indicate systemic problems in these industries, which may include capital constraints, fierce competition, or low value-added production. On the other hand, Motor Vehicles, Professional Services, and Transport show no significant differences.

Incorporating these sectoral variables increases the R-squared value significantly to 0.2138, while the adjusted R-squared increases to 0.1983. This means that almost 21% of the variation in firm performance can now be modelled. The increase in significance demonstrates the primary relevance of the industry context in determining MSME performance, but also suggests that sectoral context interacts, in some significant ways, with the level of digital adoption and the size of the firm.

4.2.5 Model 5: Full Specification

The fifth model is the most comprehensive regression model, incorporating all main variables and control variables, namely:

- E-payment usage (*k33_BR*)
- Financial inclusion (*FII*)
- Firm size (*l6*)
- Business sector (*a4a*)
- Geographical region (*a3a*)
- Female ownership (*b4a*)
- Internet disruption (*c39*)

The final model includes all relevant explanatory and control factors, achieving the best possible specification. Apart from e-payment adoption, financial inclusion, and firm size, the model also accounts for industry sector, geographical region, female ownership, and internet disruption. The final model includes an extensive number of structural, demographic, and technological aspects that can affect how well MSMEs perform.

In terms of organizational growth, the ongoing use of electronic payments continues to be positively impactful and statistically significant (coefficient = 0.0154, $p < 0.001$). Unsurprisingly, the continued use of electronic payments is a solid means for MSME growth. This shows how digital technology can come to the aid of small businesses. The financial inclusion indicator, however, shows a puzzling statistically significant negative effect (-0.8651, $p = 0.004$). This means the greater the access to various financial services, the less likely a business will do well. One possible reason is MSMEs poorly use financial

resources due to inadequate soft skills, financial literacy, operational inefficiency, or unutilized financial instruments stuck in the organizational cash flow.

The firm size factor maintains a consistently positive and statistically considerable influence on the record (coef. 0.0041, $p < 0.001$), affirming that scale benefits have a considerable impact on the growth of MSMEs. Given that the coefficient for the reliability of the internet connection is positive, it seems that, for businesses that periodically have internet connection issues, the reliance on the internet for other incorporates functions like online selling. Even performance is enhanced with digital marketing, and the performance is negatively impacted by the poor reliability of the internet connection. Within the context of a firm, the coefficient of female ownership is negative and suggests that women-owning enterprises experience more complex issues like growth constraints.

The other control variables also provide important information. Certain industries, such as apparel, leather goods, construction, and ICT, underperformed than the overall industry. Several provinces, including Lampung, Maluku, East Nusa Tenggara (NTT), and West Kalimantan, also did poorer than other provinces. These results show that regional and sectoral determinants are very relevant for MSME performance in Indonesia.

Among all configurations, the entire model demonstrated the highest explanatory power, with an R-squared of 0.4484 and an adjusted R-squared of 0.3966. Thus, the factors explaining this model depict almost all the differences in competitive firm performances up to fifty percent, and this is considerably better than the previous model. Hence, Model 5 illustrates the extent to which the use of e-payments impacts the performance of MSMEs in various ways, while also demonstrating that it remains an essential component of business profitability.

Table 4.5 OLS Regression Results with E-Payment Use, Financial Inclusion, Firm Size, Gender Ownership, Sectoral, and Regional Controls (Clustered by Province)

Variable	Coefficient	Std. Error	t-value	p-value	95% Confidence Interval
E-payment use (k33_BR)	0.0159	0.0036	4.3000	0.0000	[0.0079, 0.0228]
Financial Inclusion Index (FII)	-0.8651	0.3943	-2.1900	0.0400	[-1.6815, -0.0450]
Number of Employees (l6)	0.0041	0.0004	10.0900	0.0000	[0.0033, 0.0049]
Female Ownership (b4a)	-0.0240	0.0019	-10.5500	0.0000	[-0.0242, -0.0166]
Internet Reliability (c39)	0.1387	0.0461	2.9800	0.0030	[0.0473, 0.2308]
Sector Controls					
Textiles	-0.6249	0.5729	-1.0900	0.2880	[-1.8163, 0.5665]
Garments	-1.1788	0.4303	-2.7400	0.0120	[-2.0738, -0.2839]
Chemicals & Chemical Products	-1.1586	0.5120	-2.2600	0.0390	[-2.2256, -0.0927]
Construction	-1.5229	0.8089	-1.8600	0.0760	[-3.1624, 0.1185]
ICT	-0.9417	0.5796	-1.6400	0.1170	[-2.1517, 0.5748]
Professional Services	-0.9314	0.5571	-1.6700	0.1040	[-2.0915, 0.2282]
Regional Controls					
West Java	1.2129	0.1029	11.8500	0.0000	[1.0052, 1.4333]
Bali	0.8857	0.1889	2.2700	0.0440	[0.5096, 1.2681]
East Nusa Tenggara	-1.5878	0.5294	-3.0000	0.0030	[-2.6282, -0.5475]
Lampung	-1.5916	0.6751	-2.3600	0.0190	[-2.9182, -0.2651]
South Sumatra, Bengkulu, Jambi	-1.1037	0.4476	-2.4700	0.0140	[-1.9832, -0.2245]
Bangka Belitung & Riau Islands	-1.2972	0.4534	-2.8600	0.0040	[-2.1874, -0.4061]
West Kalimantan	-2.3312	0.6182	-3.7700	0.0000	[-3.5460, -1.1163]
East & North Kalimantan	-1.6671	0.6474	-2.5700	0.0100	[-2.9392, -0.3949]
Maluku Islands	-1.5277	0.5139	-2.9700	0.0030	[-2.5372, -0.5177]
Constant	22.2621	0.4677	47.6000	0.0000	[21.3429, 23.1811]
Observations	514				
R-squared	0.4484				
Adjusted R-squared	0.3966				
Root MSE	1.6142				
Clustered by	Province (a3a)				

*Notes: *p < 0.01, p < 0.05, *p < 0.1*

4.2.6 Goodness of Fit

Model 5's findings are noteworthy, revealing deeper insights into the factors that shape MSME performance. Electronic payments, financial inclusion, business size, industry type, region, gender ownership, internet reliability, and other factors may account for 45% of MSMEs' performance variances, according to an R-squared value of 0.4484. This is a big improvement over earlier models that explained 20% of variance.

This model is more robust with an adjusted R-squared of 0.3966. Because it penalizes the addition of irrelevant variables, its value lowers as the model has more variables. This relatively strong value shows that geography, sector, and demographics help the model describe MSMEs' success, instead of limiting.

Indonesian MSMEs need more than digital tools to prosper, according to indicators. More structural, regional, and demographic factors are needed. All models show that electronic payments improve corporate success. Digital financing continues to help MSMEs grow profitably. In Model 5, digital transformation benefits small firms when done right.

In successful firm pivots, electronic payments become one of the most crucial criteria, albeit in a less-than-optimal scenario, and it is not a deterrent in regional and sectoral contexts. This shows that digital payments in MSMEs systems are valuable and have great potential.

Other methods have a more complex impact on financial inclusion. Model 5's results suggest a more cautious interpretation, where business performance prediction and formal financial services may worsen the situation for small enterprises.

For Model 3, business size is still important because more profitable firms employ more workers. This implies that profit, expansion, and stability require greater workforces.

Growth and expansion constraints in certain underdeveloped service and manufacturing industries and sectors are explained in inter-industry variation analysis in Model 5. In Model 5, inter-sectoral analysis show that there are structures which constrain growth in particular sectors, particularly where services and manufacturing are still underdeveloped. Model 5 analyzes the effect of location on inequality which gives clearer picture. Findings reveal that the firms in West Java are performing better compared to the performances of those in Lampung, Maluku, or East Nusa Tenggara. This shows significant differences in the performance of businesses in various parts of Indonesia.

Furthermore, female-owned businesses are less likely than male-owned ones to manage well; they have smaller budgets, fewer sources of contacts, and less access to markets. In addition, businesses with good online access benefit by reaching more people, operating more efficiently, and gaining more exposure.

Model 5 showed an increase in explained variation from 15 percent in Model 4 to 45 percent, highlighting the importance of these key factors. The results suggest that MSME performance is influenced more by location, industry, and systemic characteristics than by firm size or financial resources.

4.3 Robustness Checks

Conducting several robustness tests ensured that the results from the regression analysis were valid. Such tests primarily focused on the consistency of the results, the impact of random shocks on the results, and some assumptions of the models.

Table 4.6 Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

Test Statistic	Value
Chi-squared (1)	25.1000
Prob > Chi-squared	0.0000
Null Hypothesis (H_0)	Constant variance (no heteroskedasticity)
Alternative Hypothesis (H_1)	Heteroskedasticity present

To confirm the accuracy of the estimates, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity was performed. Here, the test showed a chi-squared value of 25.1 and a p-value of 0.0000 which illustrates the presence of heteroskedasticity.

More specifically, this suggests that the model's error variance differs for every observation, thereby indicating heteroskedasticity, and rejecting the null hypothesis of an equal error variance.

As a result, all subsequent regression analyses utilized heteroskedasticity-consistent standard errors. This change makes the research more credible because it makes the model stronger by making sure that the predicted coefficients stay unbiased and consistent even when there is heteroskedasticity. This unification makes the statistical conclusions from the investigation even more defensible.

Table 4.7 Variance Inflation Factor (VIF) for Model 5

Variable	VIF	1/VIF
k33_BR (Use of e-payment)	3.47	0.2880
FII (Financial Inclusion Index)	5.12	0.1954
c39 (Internet reliability)	2.87	0.3483
a3a (Provincial dummies)	1.16–2.58	–
a4a (Sector dummies)	1.33–3.00	–
b41 (Female ownership)	1.55	0.6435

The Variance Inflation Factors (VIFs) were also applied in this study to look at multicollinearity. The average VIF value is around 1.95, which is well below the threshold value of 10 and therefore

multicollinearity is not a problem. The variable with the highest VIF was FII (5.12); followed by the e-payment (k33_BR) (3.47). As a result, regression estimates are consistent and reliable.

To check whether the OLS regression assumptions are met, the heteroskedasticity was also tested by checking whether there are interactions between explanatory and response variables. These assumptions, such as linearity, independence of errors, homoscedasticity, and the absence of multicollinearity, ensure that the regression results are unbiased and reliable. Further diagnostics supported the results that heteroskedasticity did not invalidate them. In line with the previous result, the results in this research using digital payment have a positive and significant effect on growth and success of MSMEs with robust standard errors.

4.4 Regression Analysis Summary: The Gains and Gaps of Going Cashless

Several models and control variables were used to examine how electronic payments affect MSME performance in Indonesia, considering business type, region, financial access, and other factors.

Table 4.8 Summary of Regression Results Outputs with OLS Model

Variable	**Model 1** *Baseline*	**Model 2** *+FnclInclusion*	**Model 3** *+ FirmSize*	**Model 4** *+ FmlOwnr, Sector*	**Model 5** *Full Model*
k33_BR (E-payment use)	0.0222***	0.0220***	0.0217***	0.0192***	0.0154***
	(0.0016)	(0.0022)	(0.0022)	(0.0022)	(0.0033)
FII (Financial Inclusion Index)	–	0.1382	0,1069	0.2153	-0.865***
		(0.162)	(0.161)	(0.158)	(0.296)
l6 (Number of employees)	–	–	0.0027**	0.0034***	0.0041***
			(0.0012)	(0.0012)	(0.0009)
a4a (Sector dummy)	–	–	–	✓	✓
a3a (Province dummy)	–	–	–	–	✓t
b4a (Female ownership)	–	–	–	–	-0.0204***
					(0.0019)
c39 (Internet disruption)	–	–	–	–	0.139***
					(0.047)
_cons (Constant)	19.993***	19.996***	19.995***	20.484***	22.262***
Observations (N)	1,087	1,087	1,087	1,087	514
R-squared	0.1048	0.1048	0.1076	0.1486	0.311

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Table 4.8 displays five types of regression models in which the impact of digital payments, access to finance, and firm characteristics on MSMEs' performance in Indonesia are investigated. This is broken

down according to firm size, sector of operation, location, gender of business owner and internet reliability.

In Model 1, the impact of e-payment alone on the businesses was evaluated and the results indicated e-payments have a positive impact on business performance ($B = 0.022$, $P < 0.001$). Even a small increase in digital payments improves business performance. When the variables under Model 2 were expanded to include the Financial Inclusion Index (FII), its effect remained positive but failed to pass statistical tests ($p= 0.902$). This indicates that it is insufficient to provide financial services if the quality of financial services is improbable or unreliable.

Model 3 indicated that bigger firms are more profitable ($p = 0.022$) but use of digital payments remained significant as well ($p < 0.001$). Model 4 revealed that firms in the industries of Garment and ICT performed poorer when compared to businesses in Food and Beverage, however, firm size and e-payment adoption continued to have a positive effect. Arguably, it is structural and contextual factors like high capital requirements, inconsistent demand, and lack of digital infrastructure which have reduced the potential for digital payments to drive efficiency in Garment and ICT firms, vis-a-vis the more transactional Food and Beverage sector.

The results obtained from Model 5 which included location, gender and internet reliability variables reinforced the model's explanatory power (R-squared = 0.4484). Electronic payments continued to be a significant positive predictor of business performance ($p < 0.001$); however, the FII was negative and significant ($p = 0.004$), which shows that it is no good having access to finance without the skills to use it. Women-owned firms continued to suffer additional disadvantages ($p < 0.001$) and lack of reliable internet connection continued to restrict business performance ($p =0.003$).

To summarize, the regression findings show that digital payments are critical to the growth and efficiency of MSMEs in Indonesia. Still, the level of growth being experienced depends on the size, gender, and location of the firm. Larger firms are able to capture the most of the gains. The “missing middle”, women-led enterprises and medium-sized firms, which are too big for micro-finance and too small for conventional credit, still face structural disadvantages.

As the findings show, financial inclusion initiatives have been able to widen access, but that access is not an automatic recipe for success. The lack of digital skills, inadequate infrastructure, and weak institutional support will result in access initiatives failing to the opposite and distance gaps. This shows that the digital divide is not just a matter of connectivity. For the **fairest** and balanced digital transformation, there must also be empowerment, and that connectivity gap must include women and disadvantaged regions.

In the journey towards an inclusive digital economy, the real challenge is not adoption, but ensuring that digital finance works for everyone, narrowing, rather than widening, the gaps in opportunity and growth.

4.5 Synthesis of Findings: From Data to Meaning

Stepwise regression studies suggest that in Indonesia the continuous, positive adoption of digital payments does statistically validate all models in the impact studies. Regarding the size and main industry of the business, the results of the impact are also relevant. In contrast, the Financial Inclusion Index demonstrates a negative impact. This indicates that the provision of financial services, albeit paradoxically, without the fully usable provision demonstrates the absence of cross-validation models. Uneven structural inequities worsen the situation. The performance of women-led firms particularly suffers in stark regional outliers, suggesting that the benefits of financial inclusion are not fairly distributed.

These results suggest to policymakers that the promotion of electronic payments will grow MSMEs, but that will only happen with the support of women, the fair distribution of resources across industries, and inter-regional policies, and equitable inter-regional legislation. Digital financial inclusion can only promise to deliver the anticipated growth to Indonesia when distributed in an all-inclusive manner.

Qualitative data, through interviews, add meaning behind the numbers and statistics. Though MSME owners noted quicker sales and increased customer satisfaction from going cashless, challenges such as delayed deposits, weak network signals, or poor financial literacy still remained. Such issues help explain why the Financial Inclusion Index showed weaker, and even negative, impacts, and why women-led businesses faced greater challenges. Simply having something in place is not the end. For systems to function, there needs to be adequacy of access, digital readiness, and equitable opportunity.

Gendered and regional differences relate directly to the theoretical underpinnings of this research. The uneven spread of digital banking is consistent with Schumpeter's theory of innovation as benefiting the already affluent in money and skills. Weak digital literacy and the 'perceived ease of use' of technology explains lower adoption, especially among women and poor regions, as illustrated by the Technology Acceptance Model. From Feminist Economics as articulated by Folbre, chronic gaps in the availability of credit and access to technology underpin economic exclusion. Lastly, these variations demonstrate that, when uneven, access to new ideas and knowledge constraints Indonesia's potential to grow digitally.

4.6 Qualitative Data Findings: Voices from the Ground – The Move from Cash to Clicks

This section shares some of the insights gained from qualitative interviews of five MSME owners, which included two males and three females. They were picked through purposive sampling. Some interviewees were drawn from the same sector so that some level of comparison on the adoption of digital payments could be made within similar business environments, while some were from different sectors to gain wider insights. Their experiences, in total, indicate how the transition from cash to e-payments in Indonesia is a game changer for their daily business operations.

4.6.1 Scaling Up a Home-Based Catering Business

First, an interview with the owner of a home-based catering firm. The business started using digital payment systems in 2020 and introduced alternatives for cashless payments. The owner also said, “That’s when we switched to being a cashless business." The owner talked about the convenience of the cashless hybrid system, "customers can pay cash or use other methods of payment." This hybrid system is particularly important in the customer purchasing experience when a customer has no cash in hand.

Electronic payment systems make it efficient and simple for businesses and their customers. The owner said, "The reason is to make it easier for buyers that don't have cash to pay." She repeated her reasons that "cashless is easier and faster," and described how digital systems have made everyday business interactions easier and more convenient. In the words of the owner, "The only problem is having to withdraw money from the ATM," which would suggest that the problem is not with cashless payment systems but rather the handling of cash.

This owner response indicates that payment systems are important to small businesses and is in line with the regression results. It states that the adoption of electronic payment systems has a positive relation with business transactions and therefore, electronic payment systems improve business operation and customer satisfaction. It indicates that the adoption of electronic payment systems positively correlates with the business sales, and thus electronic payment systems enhance business operations and customer satisfaction. With the second interview, another home-based catering which has been operating for the past six years was looked at. From the beginning, the owner has used both electronic forms of payment and cash, including bank transfers. This was meant to simplify the payment systems for customers and the business.

Most comments regarding the use of mobile banking systems were complimentary. This was due to the efficient and customer-friendly nature of automated transfers. Customers also appreciated the time saved with processed payments and the time value offered with cashless banking. This, like the previous interview, describes the importance of responsive payment systems and, most importantly, automated systems, to the operational productivity of small businesses.

4.6.2 Surviving and Thriving as a Street Vendor

Two interviews give insight as to how utilizing e-payment methods is beneficial for street sellers in Indonesia in order to compete in the ever-evolving digital business world.

The first interview centers on a street food vendor who has been operating for about a year. He started to use QRIS, Indonesia's unified QR-based payment system, roughly eight months after he launched his business. “Selling has only been a year for me,” he said, “and QRIS has only a span of eight months. Customers have been a great deal for cashless payment systems. One store owner described the trend this way: “a lot of people these days prefer QRIS.” ‘To facilitate the payment and broaden the customer range’ becomes a reason for digitized payment systems. QRIS offers countless features, he noted, payment systems streamline, and faster payments are a win-win for customers and merchants.

The second interview was with a porridge seller whose family has been in the business for over two decades. "My father began this business over twenty years ago, " said the seller. They now accept digital payments via QR codes and bank transfers as well as cash. About five years ago with the rise of food delivery service apps such as Gojek, Shopee, and GrabFood, people began to really use cashless payment systems. "That's when we started adopting cashless systems," he said, "when we signed up for those apps."

There have been a number of helpful things that have happened to this long-running business since it switched to a cashless system. Digital transactions "make things easier, especially when giving change," help "avoid counterfeit money," and are in line with the trend toward modernity, since "everything is now digital and young people prefer to use their smartphones to pay." But there are still issues that need to be fixed. When people buy things online, the money often "stays in an intermediary account before being transferred," which can take "a day or two." Small vendors that rely on their daily sales to refill their shelves may have cash flow challenges in the short term because of these delays. The seller has some money on hand to resolve this, but he maintained that "there are no major problems with security."

Based on the two interviews, it's clear that digital payments are impacting how street vendors conduct their business in Indonesia. Using QRIS and similar systems, vendors can engage in commerce with clients more quickly and easily. Small businesses must incorporate cashless payments to remain competitive and to keep their business from going stagnant. In today’s rapidly expanding digital economy, going cashless isn’t optional; staying visible in Indonesia’s rising digital market means adapting, or risk being left behind.

4.6.3 Adopting Cashless Payments in a Clothing Boutique

The last person interviewed runs a boutique that has been open for 4 years. She takes payments in cash and by cashless payments. In 2021, she started taking cashless payments because customers began requesting it. She digital payments really streamline the transactions and saves communication efforts between

cashless customers and sellers. This helps customers who don't want carry cash. She also mentioned that ever since COVID19, the availability of cashless payments is particularly useful because it "reduces physical contact".

She explained some frustrations with cashless systems too, such as the risk of losing cash, the chance of a payment not going through, and downtimes of the internet. This can frustrate customers. The connection issue didn't bother her because she preferred systems that let her customers make larger payments as it really smoothened the process.

She illustrated the value of cashless payment systems for small businesses. This is also supported by the regression results which show that businesses within the fast pace sectors in Indonesia are more likely to grow and adapt if they utilize digital payment systems.

4.6.4 Beyond the Numbers: Barriers That Still Remain

The contribution of digital payment solutions to business performance in Indonesia is quite impactful and clearly positive for growth. The adoption and integration of electronic payments in the business model of all types of MSMEs in the country and all over the archipelago generates significant business growth in terms of speed, efficiency, and in terms of reaching customers. However, it becomes more complicated at a larger scale. Econometrics shows financial inclusion (FI) does not always relate positively with sales growth; in some cases, it actually relates negatively with sales. Essentially, a major problem may be that the small businesses are not only inexperienced, but also have no administrative and organizational framework to maximize the benefits of increased access to financial services. When the business is in turmoil or leadership is vague, being brought into the picture financially doesn't make much difference.

A clearer view of the situation is found in the qualitative literature. For instance, owners of small businesses and self-employed individuals stated that customers were pleased because cashless transactions made it easier to pay for goods. Yet, they feel exasperated with cashless systems that delay payments, breakdowns in transactions, and sluggish internet that traps funds. As one street vendor put it, "because of unstable network, it is possible for my operation to completely come to a standstill." More established microbusinesses agreed, especially the ones that had cashless systems which controlled client payments and blocked instant disbursement from intermediary accounts.

In this situation, the combination of the socio-economic environment, gender, and for women-led MSMEs, especially those located in rural poor regions, brings additional challenges. These may include insufficient digital skills, poor financial networks, and lower technological self-efficacy.

Even in a cash-oriented economy, MSMEs in Indonesia illustrate the advantages of digital payments. The potential of completely digitalized MSMEs is still only partially realized; although there have been advancements in digital infrastructure, trust, and access gaps still exist. Many small business

owners see the digital economy and the new ideas that come with it as a way to make money, but the research reveals that many new ideas are still digital deserts for people who aren't already connected to the internet.

In essence, while digital finance opens doors, not everyone can walk through them yet. Building trust, expanding connectivity, and closing digital literacy gaps are key to turning early progress into lasting inclusion.

Chapter 5. Conclusion & Recommendations

5.1 Conclusion

In Indonesia, the move from cash to clicks is changing how people do business. More shops and sellers now use smartphones instead of wallets, making it easier to trade, get paid, and connect with customers. Accessing money is no longer the struggle it once was. With faster transfers, clear transactions, and easy-to-use systems, more people are joining the online marketplace and feeling confident about it. Both customers and business owners are starting to trust digital payments, helping Indonesia grow stronger and stay more connected in a flexible, modern economy.

Looking ahead, Indonesia's growth will depend on how well everyone can take part and adapt, especially small businesses that drive much of this change. As e-wallets and QRIS payments spread, running a business becomes smoother and more organized. Owners can manage money better, reach more buyers, and handle challenges more easily. When small businesses recover quickly and keep moving forward, they help the whole economy grow. Moving toward a cashless future makes it easier for more people to join in, bringing steady progress and better opportunities for communities across the country.

This study employed five distinct regression models to demonstrate the beneficial and considerable impact of electronic payment systems on enterprises, irrespective of their size and industry. 'Financial Inclusion' does not encapsulate the complete essence. It is not only about the means and the ends. Unequal access may exist even with access to digitally inclusive tools. Along with access to digital manager resources, managerial resources need to be plentiful to achieve complete financially inclusive accessibility.

Unbalanced distribution of resources is not the only factor leading to financially inclusive access. Rather, the evidence is largely structural by virtue of the areas in which those inequities lie. For women, owning or operating an MSME in rural areas poses particular difficulties, including systems that are cashless, overly reliant on the internet, and digital skills that are underdeveloped. This study shows that more than the provision of adequate basic digital infrastructure, the broader contours of digital priming entail multifaceted empowerment and education, as well as suitable regulatory and institutional frameworks.

To achieve equity in development along with targeted digitalization, Indonesia works toward optimizing the access and benefits of digital finance to all actors, such as the government, fintech companies, and development partners. Stakeholders looking to enjoy the advantages of digital finance will need improvements on digital infrastructure, skills training, and gender responsive approaches in the policies surrounding digital finance.

The conclusion drawn here is consistent with existing research. Literature talks about the Technology Acceptance Model (TAM) in explaining the reason MSME owners adopt and use digital

payment technology, such as QRIS and e-wallets. The reason is payment systems are user-friendly and simple, thus easing and smoothening the customer service process. Nevertheless, lacks of digital systems and infrastructures points to the fact that the skills and demand to use technology are there, especially for the trained persons. The data in Endogenous Growth Theory illustrates the use of digital payment systems correlates positively with the growth of the systems. The overall economic development of Indonesia improves as digital technology allows MSMEs to streamline their operations, adopt new and innovative business models, and foster economic growth on a larger scale.

The conclusions include elements from the theory of Feminist Economics which point to the opportunities of women in economic activity being limited by more fundamental structural and social discrepancies. For gender gaps, within the performance of MSMEs the study finds there are more barriers to women-owned businesses accessing and using digital finance. Schumpeter's Theory of Innovation helps to explain the digital payment and how it changes the way organizations operate, the way people come into the markets and how the competition changes. Taken together, the findings show that Indonesia's switching to cashless transactions is about much more than adopting new technology. It also requires social transformation and more general development.

The country needs both social and legal systems in which everyone has a chance to participate and to pursue common economic and social objectives. Efficiency: While Indonesia has a cashless economy, it should be based on empowering citizens, creating jobs, improving resilience, and developing a healthy digital ecosystem.

Digital payments are moving Indonesia’s MSMEs from survival to growth. Yet without equal access to skills, infrastructure, and opportunity, the promise of financial inclusion will remain out of reach.

5.2 Policy Recommendations

Shifting to electronic payments is more than a technological change. More importantly, it opens the gate to inclusive economic growth by giving more businesses, and people, a chance to be involved, to participate, compete, and thrive in the digital economy. In Indonesia, the economically beneficial and operationally cashless system strengthens the adaptive capabilities of Micro, Small, and Medium Enterprises (MSMEs). However, merely focusing on the economically active population, or in this case the participants in formal financial activities, might be misleading; without supporting structures, capability, and equity, the economically weakest citizens will remain with only financial servicing without active participation. They will be the most economically vulnerable, and will most certainly continue to be exploited. For Indonesia to reap the digital dividends of the digital revolution, there must be inclusive growth.

The following are suggested policy responses to promote accessible and interconnected digitalization:

1. **Build The Specifications for Access**: For MSMEs to join the online economy, upgraded trusted digital inputs to remote and rural regions must be upgraded. The above regression study indicates that reliability of internet influences the performance of the MSMEs ($p = 0.003$). Hence weak connectivity is still a hurdle for the progress of businesses. Poor Internet access leading to transaction interruptions was reported by MSME owners in the interviews.

2. **Empower Through Knowledge**: Educating MSMEs on digital tools and financial literacy will prepare them for technological change and will go a long way towards the funding and financial success of their businesses. Within the Financial Incorporation Index, there are negative and, in some cases, positive though not significant dimensions of the FII in some of the regression models. This is because achieving better business outcomes is dependent on having the right skills and capabilities. That critical gap is filled in with the knowledge and expertise of the owner of the MSME.

3. **Champion Women's Economic Power**: Women's MSMEs need to have equitable access to financing, technology or training as a part of Digital finance. Research shows significant underperformance of women-owned businesses ($p < 0.001$) and the need of special gender focused measures to help bridge digital and financial inequalities.

4. **Forge Inclusive Partnerships**: Promote the partnership between the government, tech, and financial institutions that offer affordable, accessible, and safe digital finance platforms. The results of the regression shows that inequities both regional and sectoral continue to persist which demonstrates the need for partnerships and outreach to access and integrate the system in a fair manner. According to the interviews, MSME owners are dependent on middlemen but those can be difficult when they are inefficient or illiquid app-based payment systems delaying the completion of transactions. Collaborations that are more dependable and efficient would help to lessen illiquidity.

5. **Data-Driven Inclusion**: Use data from the MSMEs to improve data-driven policies and frameworks of digital inclusion. The regression analysis suggested significant differences by region and by firm (R-squared = 0.4484) and more nuanced data can help to sharpen the precision of the improvement-oriented efforts. Interviews stress the lack of national datasets that will

address local conditions, especially the informal financing and incentives for adopting technologies and suggest a need for data on the diversity and lived experiences of MSMEs.

It must be emphasized that Indonesia's transition to a cashless economy is not about achieving efficiencies, but empowering citizens. Equitable digital finance opens and reinforces the economy's participation gates, providing opportunities that are necessary to transform and strengthen the economy to a more inclusive and resilient state.

5.3 Research Limitations

Every research has certain boundaries and limitations which could affect how its results are interpreted and applied in the future. As a starting point, the data utilized consists of self-reported data of firms captured through the World Bank Enterprise Survey (WBES). As noted by De Mel, McKenzie and Woodruff (2009), in developing nations, microenterprises tend to lack formal record-keeping, which results in the profits reported by the microenterprises being disconnected from profit actual business performance. For the purposes of measuring various outcome variables, microenterprises are likely to inflate expenses or omit income due to effects of tax evasion, lack of economic comprehension, and biased recall of the results which fall under 'significant measurement error'.

Second, while the regression models attempt to control for some of the heterogeneity, the lack of some factors including entrepreneurial skill, risk capacity, or access to informal capital may result in biased estimates of the impact of adopting digital payments on firm performance. As Angrist and Pischke (2009) noted, observational studies suffer from omitted variable bias, which is the failure to include a part of the contribution a treatment makes (in this case, use of QRIS) which is non-random.

Third, the lack of longitudinal panel design does weaken the case for strong causal assertions, even though the WBES does contain rich cross-sectional data. Without the baseline data and the follow-up data, the analysis is limited in the assessment of the changes to a firm's earnings over a certain period, or the ability to conclusively assert that such changes were a result of the use of digital payment systems. As indicated by Wooldridge (2010), the issues of endogeneity and treatment effect identification, which are still up for further scrutiny, would have been better served by panel data approaches.

Finally, the results of this analysis have a limited scope for generalization due to the World Bank Enterprise Survey's focus on the formal sector. As a result, this study does not capture the viewpoints of informal or home-based MSMEs, a considerable portion of which face even greater challenges when it comes to the use of digital technologies. This is a considerable shortcoming since the informal sector in Indonesia is considerable, constituting nearly 59-60% of total employment (Statistics Indonesia, 2022. The

Jakarta Post, 2023). Including more informal enterprises would give a better understanding of how digital payment systems influence the entire MSME ecosystem.

In addition, the qualitative data in this study was limited to five interviews with MSME owners. While these interviews provided valuable insights into the motivations, benefits, and challenges of adopting digital payments, the small sample size restricts the breadth of perspectives captured. The findings from these interviews should therefore be viewed as illustrative rather than representative, offering depth and context to the quantitative results but not a comprehensive picture of all MSME experiences across Indonesia.

5.4 Future Research Directions

These findings can be elaborated upon in future research in three key strategies. First, having panel or longitudinal data allows researchers to examine the effect of digital payments on growth of MSMEs for different time periods, and how firms alter their MSME growth strategy before and after they begin using digital payments. Second, the impact on rural areas that have lost investment, the building of digital infrastructure, and the influence of broadband availability and reliability on MSMEs and their use of digital financing are still crucial areas that isolated MSMEs have not looked into. Finally, it is important to research female entrepreneurs who use digital payment systems and the social, economic, financial, and structural barriers that make their businesses less effective. If these areas of research were undertaken, an important dimension would be added to the understanding of behavioral and structural issues associated with digital financial inclusion in Indonesia.

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Appendix

Appendix 1 - Interview Questions

Section 1: Background

- **Bisnis Ibu/Bapak sudah berjalan berapa lama?**
  (How long has your business been operating?)

Section 2: Payment Methods

- **Pembayaran yang digunakan apa saja? Tunai aja atau ada cashless juga?**
  (What types of payments do you use? Only cash or also cashless?)
- **(Kalau ada cashless) Sejak kapan mulai menggunakan metode pembayaran cashless (non-tunai)?**
  (If using cashless: Since when did you start using cashless payment methods?)
- ***(*Kalau tidak cashless) Kenapa tidak pakai cashless? Kenapa tunai saja?**
  (If not using cashless: Why do you not use cashless? Why only cash?)

Section 3: Drivers & Ease of Use

- **Apa alasan utama Ibu/Bapak memilih menggunakan pembayaran cashless?**
  (What is your main reason for choosing to use cashless payments?)
- **Apakah menurut Ibu/Bapak pembayaran cashless lebih memudahkan dibandingkan pembayaran tunai?**
  (Do you think cashless payments are more convenient compared to cash?)

Section 4: Challenges

- **Ada tantangan atau kesulitan dalam menggunakan pembayaran cashless?**
  (Have you experienced any challenges or difficulties in using cashless payments?)