

How the Development of Financial Inclusion Reshapes Micro-foundations: An Analysis of the Impact on Corporate Investment and Financing

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Abstract

Against the backdrop of digital technology driving financial inclusion towards a deep integration into the data ecosystem, this paper comprehensively reviews cutting-edge domestic and international literature and constructs an integrated analytical framework to systematically clarify how it reshapes the investment and financing decisions of micro-level enterprises. Research shows that on the “financing side,” digital financial inclusion, relying on multi-dimensional data accumulation, breaks down information barriers between banks and enterprises, promoting a shift in the credit paradigm towards “data credit,” and substantially alleviating the financing constraints of SMEs. On the “investment side,” by optimizing corporate liquidity management and leveraging the credit penetration effect of the supply chain, it significantly reduces the cost of precautionary cash holdings, prompting corporate investment to shift from “defensive contraction” to long-term “synergistic expansion.” Further integration of cutting-edge literature reveals that this micro-reshaping effect exhibits significant structural heterogeneity in the technological innovation attributes, digital foundation, and business niche of enterprises. Simultaneously, when the supply of funds exceeds an appropriate boundary, the empowering effect of financial inclusion exhibits an inverted U-shaped nonlinear characteristic, inducing excessive corporate debt and “decoupling from the real economy.” This article systematically reveals the inherent transmission mechanism of “financing relief - investment activation”, providing solid theoretical support for the precise formulation of differentiated regulatory policies and the effective prevention of micro-level risks.

Keywords

digital financial inclusion, investment and decisions, financing constraints, supply chain synergy, non-linear characteristics

1. Introduction

As an important component of the modern financial system, financial inclusion has undergone a profound transformation in its development process—that is, driven by technology, it has shifted from the traditional microcredit model that relies on physical branches to a digital financial ecosystem that is data-driven and reshapes the allocation of micro-enterprise resources [1]. Early financial inclusion mainly focused on basic poverty reduction for individuals, such as the micro-loan practice of Grameen Bank in Bangladesh in the

1970s, and the “inclusive financial system” advocated by the United Nations in 2005 [2]. However, with the explosion of new-generation digital technologies, countries have begun to incorporate them into their national strategies and innovate service models. For example, Kenya's “M-PESA” pioneered digital payments based on mobile communications [3]; India's “Prime Minister's People's Wealth Plan” (PMJDY) has used national power to build a large-scale underlying digital financial infrastructure [4]. These landmark global practices have not only expanded the boundaries of finance but also laid the micro-foundation for financial inclusion to deeply reshape the investment and financing logic of real enterprises.

In China, the development of financial inclusion has been given a more profound and important strategic significance. In the context of the new era, China has put forward the grand goals of common prosperity and high-quality development. The realization of these goals cannot be separated from the strong support of the financial system, and financial inclusion is an important tool for achieving these goals. Inclusion provides affordable and sustainable financial services to micro and small enterprises, farmers, and low-income urban residents who are underserved by traditional financial services. It can effectively promote the rational allocation of social resources, narrow the income gap, and promote social fairness and justice [5]. Therefore, financial inclusion in China is no longer just a financial policy or business model, but has risen to become an important part of the national strategy and become an indispensable financial infrastructure for achieving common prosperity and high-quality development goals [6].

The explosive application of digital technology has fundamentally reshaped the supply logic and implementation path of financial inclusion. The synergistic empowerment of financial technologies such as mobile payment, big data risk control and blockchain technology [7] enables financial services to transcend spatial and temporal constraints, significantly reduce the threshold and cost, achieve accurate risk identification and automated execution, and drive financial inclusion to leap from the “offline outlets + manual service” to the intensive model of “online platform + intelligent risk control”. The service efficiency and coverage have achieved a qualitative leap [8]. Existing research further shows that this efficiency improvement can significantly alleviate the financing constraints faced by micro-enterprises, thereby optimizing capital allocation and investment efficiency [9].

However, an examination of existing literature reveals that academic research on the effects of financial inclusion development has long focused on macro-level issues such as regional economic growth, income distribution convergence, and poverty reduction effects, and related review results are quite abundant [1]. In contrast, a systematic analytical framework has not yet been formed regarding how financial inclusion affects the behavior and decision-making of microeconomic entities (especially the corporate sector). Although some empirical articles exploring digital finance and corporate investment efficiency, financing constraints, and innovation behavior have emerged in recent years, these studies often focus on a single “financing end” perspective and lack a holistic review of the complete transmission chain of “investment and financing interaction.” Is there a consensus among existing literature on the explanation of theoretical mechanisms? In the context of digital transformation, does the impact of financial inclusion on enterprises at different life stages exhibit nonlinear characteristics? Currently, there is a lack of targeted systematic reviews in academia. To address this gap, this paper aims to systematically review cutting-edge domestic and international literature, deeply analyze how the development of financial inclusion reshapes the micro-foundation of corporate investment and financing decisions, and attempt to construct an integrated analytical framework. Specifically, this study will focus on the following three core objectives: First, clarify the conceptual evolution and logical starting point. This paper will trace the theoretical evolution of financial inclusion from traditional models to digital financial inclusion, defining its specific connotations and extensions at the micro-enterprise level. Secondly, it will deconstruct the transmission mechanism and its path of action. Unlike previous studies that viewed financing and investment in isolation, this paper will focus on how financial inclusion, by alleviating credit constraints, improving the information environment, and optimizing risk-sharing mechanisms, simultaneously affects the availability and cost of financing for enterprises, as well as the scale, efficiency, and risk appetite of investment, revealing the inherent linkage logic of “financing relief—investment activation.” Thirdly, it will explore the heterogeneity and complexity of the impact effects. Taking into full account the different characteristics of enterprises (such as ownership structure and digitalization level) and differences in the external environment, it will analyze the boundary conditions of financial inclusion in its micro-implementation process.

2. Concept Analysis and Dimension Definition

2.1 The Concept and Evolution of Financial Inclusion

Inclusion is centered on building a highly inclusive financial service ecosystem. It enables groups that are difficult to reach by traditional finance—especially residents of economically underdeveloped areas and low-income groups—to enjoy efficient and convenient financial support at reasonable prices, thereby solving the problem of “financing accessibility and affordability issues” to some extent [10]. According to the research framework of Arner, Buckley, Zetsche and Veidt (2020), the evolution logic of financial inclusion can be regarded as four iterations driven by technology. This evolution began with the traditional microfinance model that relied on physical branches and loan officers, namely the 1.0 stage. Subsequently, the emergence of Kenya's M-Pesa marked the industry's entry into the 2.0 era characterized by mobile communication connectivity. The popularization of smartphones and the 3.0 model, represented by platform economies such as Alipay have greatly reduced service costs through the ecosystem. At present, the industry is moving towards the 4.0 stage, which is driven by data and sustainability, emphasizing the supporting role of financial technology in achieving the SDGs [11]. From China's perspective, the development of financial inclusion in China has gone through a transformation from “reliance on traditional physical outlets” to “digital technology-driven”. Policy support after 2013 established its strategic position, while the application of mobile payment and big data truly realized low-cost, wide-coverage and regional convergence of financial services between 2011 and 2018 [10].

2.2 Analysis of the Impact Path of Financial Inclusion on Corporate Investment and Financing

The reshaping of micro-enterprise investment and financing behavior by financial inclusion is not achieved through a single channel, but is deeply embedded in a complex chain of mechanisms. Existing literature shows that financial inclusion empowered by digital technology has fundamentally changed the supply logic and reach of financial elements, thus exerting a profound synergistic impact on the funding constraints on the “financing side” and the allocation efficiency on the “investment side” of enterprises. To systematically reveal this transmission process of “financing relief - investment activation,” this section will conduct an in-depth analysis from three core dimensions: First, focusing on the alleviation and reconstruction of financing constraints, it will explore how financial inclusion can substantially break down the traditional credit barriers for SMEs through multi-dimensional data accumulation and the paradigm shift in credit evaluation; second, from a risk management perspective, it will analyze how financial inclusion can optimize the liquidity management boundaries of enterprises and further reshape their investment risk preferences; finally, it will extend to the perspective of supply chain synergy and network spillover, revealing how digital financial inclusion can enhance the investment and financing collaboration and resilience of the entire business network ecosystem through the credit penetration effect.

2.2.1 Easing and Restructuring of Financing Constraints

Traditional financial theory suggests that information asymmetry and high transaction costs between banks and enterprises are the root cause of severe credit rationing and financing constraints faced by enterprises, especially micro and small enterprises (MSEs). The development of financial inclusion, especially the deep integration of digital technology, has fundamentally alleviated and reconstructed this dilemma through two dimensions of the information screening mechanism and credit assessment paradigm [12]. First, financial inclusion uses multidimensional data to alleviate information asymmetry between banks and enterprises and effectively reduces adverse selection risk. In the past, traditional credit relied heavily on “hard information” such as financial statements and collateral for pricing, which led to small and medium-sized enterprises lacking standardized records being trapped in “information silos” for a long time. Inclusion uses big data, cloud computing and other technologies to capture unstructured data (such as transaction flow, logistics trajectory, tax records, etc.) of enterprises in the supply chain, e-commerce platform and payment settlement at low cost. The retention of this “digital footprint” transforms qualitative information that was originally ignored due to difficulty in quantification into standardized and traceable quantitative indicators, which greatly improves the granularity and transparency of information [13]. Financial institutions are able to reduce their reliance on on-site due diligence while accurately depicting the operating conditions and risk

profiles of enterprises, thereby substantially breaking through the financing barriers caused by information opacity.

Secondly, financial inclusion has restructured the credit assessment system of enterprises, promoting the transformation of credit logic from “asset collateral” to “data credit”. The core of traditional financial risk control is highly dependent on real estate collateral, which constitutes a “hard constraint” for the financing of asset-light SMEs. Inclusion introduces intelligent risk control models based on machine learning, which can more accurately capture the repayment willingness and dynamic debt-servicing capacity of enterprises through high-frequency data streams. This transformation makes the credit value of enterprises no longer simply anchored to static stock assets, but more based on their dynamic operating behavior and cash flow characteristics. By establishing a digital credit scoring system, financial inclusion has successfully transformed the “data assets” of enterprises into “credit capital” that can be used for financing, which not only expands the availability of credit resources, but also significantly reduces the rigid dependence on fixed asset collateral [14], enabling high-growth and highly innovative SMEs to obtain funding support with lower thresholds, thereby achieving Pareto improvement in the efficiency of credit resource allocation.

2.2.2 Risk Management Perspective

From the perspective of the micro-mechanism of risk management, existing literature points out that the widespread adoption of financial inclusion, especially digital payment tools, has significantly reshaped the boundaries of corporate liquidity management and cash flow characteristics. Under the traditional financial system, small and micro enterprises face high cash flow volatility and long-term fund settlement delays, and are often forced to hold a large amount of inefficient cash assets to cope with sudden liquidity shocks due to precautionary motives. The deep embedding of digital payment tools not only significantly shortens the working capital turnover period of enterprises through “second-level settlement” and disintermediation, reducing transaction friction costs, but also achieves efficient synchronization of capital flow and information flow. This digital transaction characteristic enables enterprises to more accurately manage cash flow dynamics based on high-frequency daily commercial settlements, thereby significantly reducing the level of precautionary cash holdings of enterprises [15]. The substantial mitigation of liquidity risk is essentially the release of the cost of precautionary cash holdings of enterprises, enabling enterprises to demonstrate stronger financial resilience when facing external macroeconomic uncertainties or local supply chain shocks.

Furthermore, the financial inclusion ecosystem based on digital technology has expanded external channels for risk sharing for enterprises, thereby profoundly affecting their risk preferences in investment and financing decisions. On the one hand, the accumulation of massive digital payment data has significantly reduced the information search costs for financial institutions, effectively alleviating information asymmetry in the credit market and the overall financing constraints of enterprises [16]. Financial institutions can rely on big data risk control models to provide more suitable risk hedging tools and supply chain financial services for small and micro enterprises. This risk transfer and sharing mechanism effectively alleviates the phenomenon of “managerial myopia” caused by enterprises bearing excessive idiosyncratic risks. When long-tail risks are effectively covered and financing constraints are broken, the investment decision model of enterprises will undergo structural shifts reducing reliance on low-yield, high-liquidity assets and significantly increasing capital allocation for long-cycle strategic projects (such as breakthrough innovations), such as innovation and R&D and equipment upgrades [17]. On the other hand, based on the signaling theory, the smooth and traceable cash flow of enterprises releases positive and stable operating signals to external capital providers. For example, when a company achieves efficient synchronization of cash flow and information flow through digital payment tools and demonstrates stable cash flow, creditors will consider the company to be less risky, thereby reducing the required liquidity risk premium. The company can obtain funds at a lower cost when financing, which in turn affects its investment decisions and makes it more willing to allocate funds to long-term strategic projects [16].

2.2.3 The Perspective of Supply Chain Synergy and Network Spillovers

Extending from the risk prevention of individual enterprises, the deepening development of financial inclusion, especially digital supply chain finance, has further reshaped the business network ecosystem in which enterprises are located. This is mainly reflected in the significant supply chain synergy and network spillover effects [16]. Under the traditional commercial credit model, there are serious financial friction and information barriers between the upstream and downstream of the supply chain. The capital appropriation of

weak small and micro enterprises by strong core enterprises (such as long-term accounts receivable) leads to serious liquidity depletion for the bottom enterprises, which in turn triggers systemic financing constraints and “underinvestment” problems. However, the intervention of digital financial inclusion has fundamentally changed this micro-foundation. Relying on blockchain and big data technology, the digital financial inclusion platform can transform the high-level commercial credit of core enterprises into divisible, transferable and traceable digital assets. This mechanism realizes the “cross-tier penetration” of trust among multi-level suppliers, breaking the “silo dilemma” of traditional financial institutions relying solely on the balance sheet of individual enterprises for credit granting [18].

In terms of the micro-manifestation of investment and financing, this digital credit penetration has generated a powerful positive network spillover effect. On the financing side, financial inclusion extends its reach along the real transaction chain to the long tail of the supply chain, systematically reducing the default risk and financial friction costs of the entire business network, enabling small and medium-sized enterprises deep in the network to obtain external funds at a lower cost [16]. On the investment side, with the overall easing of financing constraints within the network and the stabilization of cash flow expectations, the investment behavior of enterprises has undergone a qualitative change from “defensive contraction” to “supply chain synergy”. On the one hand, the motivation of enterprises to hoard inefficient cash to prevent upstream defaults has been greatly weakened, effectively suppressing inefficient investment (especially underinvestment) caused by liquidity shortages; on the other hand, the smooth flow of funds and information promotes strategic mutual trust between upstream and downstream enterprises, guiding node enterprises to allocate more capital to long-term joint R&D, equipment upgrades and industrial chain upgrade projects [17]. This not only improves the capital allocation efficiency of individual enterprises, but also enhances the network resilience and value creation capabilities of the entire industrial chain from a global perspective.

3. The Heterogeneity and Complexity of Its Impact

3.1 Firm Heterogeneity: Structural Differences Within Constrained Cohorts

Existing literature exploring the micro-level effects of financial inclusion has gradually abandoned the simplistic binary opposition between large enterprises and micro and small enterprises, instead delving into the structural differences within the financing-constrained group (i.e., SMEs). The reshaping of corporate investment and financing behavior by financial inclusion is not a one-size-fits-all approach, but rather profoundly constrained by the heterogeneous characteristics within enterprises. This is mainly reflected in the following three core dimensions:

First, the technological innovation attributes of enterprises determine the marginal driving effect of financial inclusion. Compared to traditional commercial or manufacturing SMEs, science and technology innovation-oriented (such as “Specialized, Refined, Differential, and Innovative” (SRDI)) SMEs typically possess characteristics of “light assets, high risk, and long cycles,” facing more extreme problems of collateral shortages and technological information asymmetry. However, digital financial inclusion, relying on multi-dimensional big data and intellectual property assessment, has the most significant pulling effect on the investment and financing behavior of these enterprises. Traditional enterprises often use financial inclusion funds to smooth short-term operating cash flow; however, once science and technology innovation enterprises break through the initial financing constraints, they can release strong long-term investment elasticity and accurately transform funds into high R&D investment and breakthrough innovation output [19].

Secondly, the enterprise's own digital infrastructure constitutes an implicit threshold for the implementation of financial inclusion dividends. The core of financial inclusion supply relies heavily on data traceability and algorithmic risk control, which means that its policy effectiveness exhibits significant heterogeneity among enterprises with different digital literacy levels. Small and micro enterprises that have completed initial digital transformation (such as deep application of electronic payment, deployment of SaaS or ERP systems) can continuously output high-quality operational “soft information” to external financial institutions, thereby effectively crossing the algorithmic risk control threshold and significantly improving capital allocation and investment efficiency [20]. Conversely, small and micro enterprises that rely heavily on traditional offline operations and lack digital footprints face a “new digital divide” in the context of financial inclusion, making it difficult to transform inclusive policies into substantial investment expansion advantages.

Finally, the enterprise's structural niche in the supply chain network profoundly affects its ability to absorb the spillover effects of financial inclusion. Although digital financial inclusion has the characteristic of penetrating along the industrial chain, this credit transfer is not a frictionless and equal distribution in complex networks. Micro and small enterprises located near the core enterprises in the supply chain (such as tier-1 and tier-2 direct suppliers) can quickly capture the spillover benefits of digital supply chain finance by relying on clear and strongly related real transaction backgrounds, thereby reducing financing costs and improving the overall resilience of the supply chain [16]. However, micro and small enterprises located at the extreme edge of the business network (long tail end) are still unable to obtain substantial credit penetration due to the hierarchical attenuation of commercial credit transfer and the ambiguity of transaction links. This niche difference objectively reveals the boundaries and limitations of financial inclusion in reshaping micro-networks.

3.2 The Complexity of Effects: Bidirectional Interactions, Macroeconomic Disequilibrium, and Non-linear Thresholds

The relationship between financial inclusion and micro-enterprise investment and financing behavior is not a simple one-way linear transmission, but is deeply embedded in a complex dynamic interaction mechanism and macro-institutional environment. This complexity is reflected not only in the evolution and constraints of the spatiotemporal dimension, but also in the nonlinear boundary of the intensity of the effect.

First, there is a significant bidirectional interaction and dynamic feedback mechanism between the two. Existing literature focuses on how financial inclusion can alleviate the financing constraints of enterprises in a one-way manner, but often ignores the reverse shaping of the supply of financial inclusion by enterprises' high-quality investment and financing behavior. In fact, when enterprises successfully carry out digital transformation or supply chain upgrades with the help of inclusive funds, these efficient investment activities will leave a higher quality "digital footprint" in the business system. This data feeds back and optimizes the big data risk control model of financial institutions, further reducing the risk premium and information search cost for the enterprise [18]. Thus, enterprises form a positive reinforcement loop of "acquiring inclusive resources - achieving efficient investment - underlying credit enhancement - attracting better financial empowerment", so that the impact of financial inclusion will show a snowball effect in the long term.

Second, the macro-regional endowment and institutional environment make the micro-impact of financial inclusion show a high degree of spatial non-equilibrium. The effectiveness of financial inclusion depends heavily on its local context. On the one hand, the level of digital infrastructure development constitutes a physical barrier. In the eastern coastal areas with well-developed digital infrastructure such as 5G base stations, the penetration rate and reach efficiency of financial inclusion tools are extremely high; while in the central and western regions with weak infrastructure, the difficulty in collecting underlying data greatly diminishes the reshaping effect of financial inclusion [21]. On the other hand, in areas where traditional finance is severely excluded and the rule of law environment is relatively weak, digital financial inclusion, by substituting for "hard collateral," often plays a stronger marginal role in providing timely assistance; however, to prevent funds from being "tunneling" by controlling shareholders and to ensure investment efficiency, it is highly dependent on the local high level of property rights protection and institutional constraints [22]. This intertwining of macro-endowments determines that the micro-impact of financial inclusion must be adapted to local conditions.

Finally, from a critical perspective, the micro-reshaping effect of financial inclusion has significant nonlinear characteristics and a moderate boundary, that is, it presents an "inverted U-shaped" relationship. Current research focuses more on the "positive empowerment" of financial inclusion, but pays less attention to the unintended consequences arising from its oversupply. In the early stages of financial inclusion intervention, it can indeed effectively smooth cash flow and improve the efficiency of main business investment; however, once the supply of inclusive funds exceeds the actual operating absorption capacity and technology transformation threshold of enterprises at this stage, it will induce serious moral hazard [23]. Excessive low-interest funds can easily lead small and micro enterprises into the trap of "excessive debt", and even stimulate management to have speculative motives, illegally transfer funds to the real estate or financial management market, and cause "financialization of real enterprises" and excessive investment. Therefore, the optimization of corporate investment and financing behavior by financial inclusion is not "the more the better". The "negative marginal effects emerge after breaching the non-linear inflection point" after

breaking through the nonlinear inflection point is a complex reality that must be faced in the future to prevent micro-systemic risks.

4. Conclusions

This paper systematically reviews the internal logic and transmission mechanism by which financial inclusion reshapes the investment and financing decisions of micro-enterprises. The literature review shows that, deeply empowered by digital technology, financial inclusion has achieved a leap towards a data-driven model. At the micro-level, digital financial inclusion not only effectively alleviates information asymmetry between banks and enterprises through multi-dimensional data accumulation, promoting the transformation of credit assessment towards “data credit” and substantially dismantling the financing constraints of SMEs; it also significantly improves corporate cash flow operations, reducing the cost of precautionary cash holdings and liquidity risks. Furthermore, relying on platform credit penetration, financial inclusion generates powerful supply chain synergy and network spillover effects, guiding corporate investment from “defensive contraction” to “synergistic expansion.” Integrative analysis further reveals that this reshaping effect is not absolutely equal, but is profoundly constrained by the heterogeneous characteristics of enterprises, such as their technological innovation attributes, digital infrastructure, and supply chain niche. When there is excessive supply of funds, it exhibits an inverted U-shaped nonlinear characteristic that may induce excessive corporate debt and the “financialization of real enterprises.”

Based on the above literature review, this paper proposes the following policy recommendations and future prospects. At the policy level, the government should formulate differentiated regulatory policies, leveraging digital financial inclusion to precisely channel resources to micro and small enterprises, while simultaneously taking strong precautions against new forms of financial exclusion and the “digital divide” caused by differences in digital literacy. Financial institutions, when optimizing product design, need to accurately grasp the “appropriateness” boundary of funding supply and be wary of systemic risks induced by exceeding the threshold of enterprise technology transformation. Looking towards future research prospects, the academic community needs to utilize large-sample micro-enterprise data to conduct more rigorous empirical measurements of the “inverted U-shaped” nonlinear inflection point between financial inclusion and corporate investment and financing efficiency; simultaneously, further exploration of the spatial disequilibrium and dynamic convergence mechanism of the micro-policy effects of financial inclusion under different regional digital infrastructure endowments is needed, in order to provide more precise theoretical support for China's solid promotion of common prosperity and high-quality development.

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Conflicts of Interest

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