Original Research Article

Research on the alleviation paths of financing constraints for SMEs through digital transformation

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Abstract: SMEs are critical for an economy, innovation, jobs, and growth. And these kind of companies - especially in developing countries - they're looking for finance. Traditional finance institutions usually regard SMEs as big risk borrowers because of no guarantee, lack of transparency, and no credit history which makes the issue of investment and economic resilience worse. Digital transformation drastically and swiftly changes a business model, efficiency, and info flow; this paper investigates its complicated and tricky tie to making it simpler on an SME company's cash flow, as taking up digital tech improves their financial transparency and how things work, running supply chains efficiently, and makes businesses seem more worth trusting financially. It analyzes how digital transformation benefits SME financing through big data and digital sales platforms, as well as fintech. This paper tries to find appropriate financing policy tools for SMEs' digitalization by reviewing literature and researching it.
Keywords: digital transformation; small and medium-sized enterprises (SMEs); SME financing constraints; fintech; supply chain finance; credit assessment; financial inclusion

1. Introduction

SMEs boost economic advancement via employment, innovation and GDP in developed and developing economies: Although it's important, full growth also has obstacles, and having operating funds is one of the major obstacles. This is because lenders don't know borrowers, lack physical security ownership and worse financial reporting than large companies Non — Tech savvy financial institutuions have diffuculties on assessing the small businesses, so they tend to be very cautious on lending or asking for hign interest rates because of the risk aversion as well as the regulations on this issue. Finance gap restricts company growth and triggers numerous problems. It hinders economic progress. Small companies are limited by their funds for R&D, technical improvements, and market growth, as well as talent, resulting in a lack of world-class competitiveness.

2. Theoretical framework; Literature review

FinanceConstraintsofSMEsdependoninformationasymmetryandagencytheories;thelenderlacksborrowers'creditworthinessandpotentialdata. The info gap can be seen better in smaller and mid-size companies due to lack of records, short history, less strict reports to make comparisons with large public companies. and this secrecy stops lenders from figuring out what's succeeding, this could make it where lenders don't know they're picking riskier plans and borrowers don't know they're doing riskier stuff after they get money. Therefore, financial institutions need more guarantee, need higher rate, need credit rationing, or need all of them, result in financial constraint. Agencies emphasize borrower-SME owner/manager conflicts because lenders have trouble monitoring. And these glasses have exposed the market's flaw behind young adult's money trouble[3].

3. Make getting money easier

Digital transform gives diverse means to help SMEs in their financing problems. Each uses digital tech to address info mismatches and risk perception in traditional SME lending. BigData increases money visibility and credit evaluation. SMEs produce large amounts of both structured and unstructured data via digital tools like accounting softwares,ERP system,e-commerce platforms etc. they generate huge volumes of sales data,inventory data,customer interaction data etc. Big data analytics tools give us a better, more objective understanding of how well SMEs are doing and the capacity they have to work. Learning cash flow through social media and transaction history, a big data way to check how well SMEs pay back loans, allows lenders to make better decisions about giving money and give good terms because they see more info. SMEs showing financial prudence and operational efficiency digitally verifiable facts can attract more financial providers, increase funding options.

Second, Digital platform integrated with supply chain finance can be effective. Many small businesses (SMEs) act as suppliers or distributors within large businesses. Blockchain,cloud computing gives power to digital platforms which link supply chain and give open and checkable transaction For instance, **Table 1** Digital payments effect SME working capital by making incoming payment tracking less troublesome.

Table 1. Impact of digital payments on SME working capital management.

Aspect of Working Capital	Traditional Methods	Digital Payment Impact
Cash Conversion Cycle	Longer, unpredictable	Shorter, predictable
Receivables Management	Manual, delayed	Automated, real-time
Payables Management	Manual, inefficient	Automated, efficient
Liquidity Management	Reactive, limited visibility	Proactive, enhanced visibility

Thirdly, Digital transformation helps SME's access different types of finances through fintech, alternative financing, and bypasses banks. Fintech companies use algorithms, machine learning, and big data for quicker, less regulated loans and credit. On P2P and crowdfunding sites, SMEs deal with investors directly, instead of banks, and stress ideas and social impact[6].

4. Empirical evidence and case studies

Global SMEs have financial stress due to digital transformation studies. Digital transformation positively correlates with access to finance for SMEs empirically in different regions and levels of development. In Asia, Africa, Europe and North America studies show that the link between digital transformation and the financing of SMEs (China's Alibaba and JD). COM allowed tons of tiny businesses to make digital records of their little loans and working money by using special financial services called affiliate finance, like Ant Financial. A digital footprint can be just as good in measuring business risk as a traditional credit score, kind of like how India's UPI enables quick payments and helps fintech companies assess small businesses for online loans. These payment tracks represent SMEs' cash flow and their spending which forms a solid base for credit rating check.

A digital ecosystem will provide the bank with verifiable data on production, sales and repayment so as to facilitate custom micro-loans and agrifinance despite all the uncertainty. **Table 2** Digital transformation gives SMEs some repayment records to improve their chance for funding. These show that digital transformation helps SMEs get out of long term financing problems.

Table 2. Key performance indicators for SMEs post-digital transformation.

Indicator	Pre-Digital Transformation	Post-Digital Transformation
Loan Approval Rate	Low	Significantly Higher
Interest Rates on Loans	High	Lower
Access to New Funding	Limited	Expanded
Revenue Growth	Moderate	Accelerated
Operating Costs	High	Reduced

5. Challenges and policy implications

5.1. Enduring challenges in digital adoption

Most SMEs have high start-up costs and do not have digital skills and facilities. Many have very thin margins, so new hardware, software, cybersecurity, and digital systems also need new capital. Finance: SME owners and workers themselves do not have digital skills, so they have underused or misused new technologies, which makes them unable to use data properly for credit evaluations. There is no right, cheap, internet infrastructure for poor/rural areas, causing low digital adoption. Due to digital gap,hinders the progress and blocks making of a digital footprint for new finance. SMEs want money but aren't ready for digital, so it's like having a circle of small size and not much forward movement.

And then, apart from costs, skills, other things like privacy, security, regulation stuff too. SMEs digitization expose sensitive data to third parties. More danger comes in via network attacks, data outflows, and unscrupulous intrusions. A lot of SMEs don't have internal expertise or money for strong cybersecurity, so they're easy targets. Big data leaks do hurt a little company's name, use money and stop people from buying things, which may create issues for getting more money later. Old rules in lots of places didn't consider digital lending, different data, or crossing borders. regulation lag produces an element of uncertainty so that SME finance grows at an uncertain pace, alternative data are either mistrusted or rejected for their use. This is a big problem for SMEs in overcoming financing barriers.

Traditional financial institutions slow move to the digital world is a big problem. Incumbent banks struggle to match fintech's pace with aged systems, risk-averse cultures, traditional credit checks, and ignoring SMEs' digital data. Fintech companies need cash reserves and client connections, reliant on digital data, showing collaboration and innovation difficulties. Banks won't make borrowers' chanceseven if SMEs do digital things without new ideas.

5.2. Strategic policy implications

Policy makers have to work their way around barriers by way of digital move and fintech inclusion to strengthen SMEs through use of govt perks to defeat financial and skill blocks Give subsidies, grants, and tax breaks to small companies to get digital devices, software, and security tools. These financial stimuli could knock this one down. It has to have lots more digital skills. Governments, schools, industry associations, and tech suppliers can offer training that is not expensive and is easy to get for small business owners and workers. Digital, cybersafety, and using devices are basics for business and finance. Giving SMEs finance and expertise allows the government to speed up digitalisation and make sure it covers lots of industries rather than just big ones.

Governments need to create flexible but specific standards on data privacy,safety and ethics for trustworthy df. Data standards are nationwide, secure digital IDs are for SMEs, and publicly-invested e-infrastructure. Policy makers can help smaller businesses obtain cheap, simple to use cybersecurity choices. They could also supply free expert consultations, or create safe online workplaces. A secure digital environment makes SMEs want to digitize their finances, share data and makes banks feel more confident about using this data for inclusive credit assessment.

In order for a SME to solve the funding gap, it will have to cultivate an ecosystem of innovation and collaboration. Regulators create "regulatory sandbox" Fintech can test new ideas without major problems. Policy should work with existing banks i.e., Agile Fins. Banks could use fintech's tech, data, platform, as fintech could use banks' customers, regulation, capital. Maybe SMEs' hybrid financing products would come about, best of both worlds, and policymakers could do projects on industry-specific digital platforms or ecosystem finance which could allow secure transfer of data across industries such as farming to have customized financers. Governments can facilitate working together if the financial systems get involved with digital opportunities and benefit from it. Openness and improved SME financing.

6. Conclusion

SMEs are constrained by funding for development and global improvement. Traditional lending models are limited because of asymmetric information, lack of collateral and lack of transparency, which leaves out a lot of SMEs from the traditional finance game. The paper points out continuing digital transform as an important and complicated chance to remake SME financings and solve long-time problems. Digital tech lets SMEs make things clear, swift, and get new ways to find money. It will improve creditworthiness and expand financing.

Digital transformation helps smes to generate and use big data analytics seamlessly. It provides a detailed, up-to-date, and objective perspective on finances and operations; lenders can cut down on information asymmetry. SMEs can use digital supply chain finance platforms to get better working capital terms from larger partner's creditworthiness. Fintech and alternative lending models can offer fast and easy access to finance compared to traditional banks. Indirect benefits resulting from improved operations, efficiencies and cost-cuts will result in a healthier SME financially and hence become more attractive and durable as a borrower.

The potential is there, but getting good results isn't cheap, computers aren't easy, and the internet can be dangerous. Policymakers,financial institutions, and small enterprises all need governmental aid for becoming digital along with reading and writing. The regulations should be in line with the digital age, spur innovation, and guarantee data safety and consumer health. Banks + Fintechs are working together to craft a financial setting for SMEs that is inclusive and digital transformation is a strategic growth element. Smart digital tech investment can help small biz to solve money problems, compete against others, improve, and benefit economy.

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