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Fintech and SME Finance: Expanding Responsible Access

Fintech and the Future of Finance Flagship Technical Note



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Acronyms

ABL	Asset-Based Lending
AI	Artificial Intelligence
AML	Anti-Money Laundering
API	Application Program Interface
APIX	API Exchange
CCAF	Cambridge Centre for Alternative Finance
CFT	Counter Financing of Terrorism
CGAP	Consultative Group for the Advancement of the Poor
DLT	Distributed Ledger Technology
DFS	Digital Financial Services
FCA	Financial Conduct Authority
FSA	Japan Financial Services Agency
FSB	Financial Stability Board
GDPR	General Data Protection Regulation
GPFI	Global Partnership for Financial Inclusion
ICCR	International Committee on Credit Reporting
IOT	Internet of Things
KYC	Know-Your-Customer
LEI	Legal Entity Identifier
MCA	Merchant Cash Advance
MENA	Middle East and North Africa
MIS	Management Information System
ML	Machine Learning
MNO	Mobile Network Operator
OECD	Organization for Economic Cooperation and Development
P2P	Person-to-Person
PE	Private Equity
QR Code	Quick Response Code
SCF	Supply-Chain Finance
SDGs	United Nations Sustainable Development Goals

SEC	Securities and Exchange Commission
SME	Small and Medium Enterprises
UNDP	United Nations Development Program
VC	Venture Capital
WEF	World Economic Forum

Executive Summary

Small and medium enterprises (SMEs) represent the economic backbone of most developed and emerging countries. Globally, SMEs account for more than 90 percent of all businesses and more than 50 percent of employment. SMEs are also significant contributors of economic activity, representing on average 60 to 70 percent of the GDP of most countries worldwide.

SMEs play a major role in economies, however lack of access to finance in many cases is a critical barrier for them. Many reasons prevent SMEs from accessing adequate to finance. These include higher cost of reaching and serving SMEs, relative to the revenue potential for lenders, information asymmetries that lead to non-availability of financial and credit data needed by lenders to assess creditworthiness of SMEs and, from the SME side, lack of collateral, lack of financial literacy, and difficulties in registration and verification.

Digital financial services (DFS) can help close the financing gap for SMEs, by providing access to alternative sources of funding and improving access to traditional players by enabling new digital products and process automation. Digitization and automation make the financing process more efficient, thereby lowering costs. The use of alternative data sources and big-data analytics provide additional information sources to the credit risk-assessment process, allowing SMEs that were once unable to obtain finances to gain access. New business models such as the sharing economy and e-commerce, digitization of SME business processes, and open banking and APIs, provide rich data on SME activities and cash flows, enabling DFS, and helping SMEs obtain access to financial products.

Globally, millions of small businesses are at risk of closing permanently and/or have suffered massive losses due to the COVID-19 pandemic. In a crisis, SMEs are more vulnerable in terms of access to finance when compared to large corporations. Speed of execution is critical for the provision of government relief funds to SMEs; digital financial products are essential to support SMEs during the COVID-19 pandemic.

However, there are obstacles and challenges that make it difficult for SMEs to fully adopt digital financial products. The main areas where challenges have been identified are: digital financial literacy and awareness of DFS, digital infrastructure, financial supervision and regulation, identity, and data privacy and data protection. Some issues are more prevalent in emerging markets, which have less developed digital infrastructure, systems, and processes.

Policy and regulatory approaches can facilitate access to finance for SMEs through DFS. Foundational elements where policy can have a positive impact include:

- Digital financial education programs for SMEs highlighting DFS awareness,
- Affordable digital infrastructure that fosters widespread internet access and use, along with robust cybersecurity frameworks,
- Financial regulatory frameworks that encourage financial innovation while minimizing the risks created by digital financial products,
- Robust, secure, and universally accepted company identification/registration frameworks for SMEs, and
- Adequate data protection and data privacy regulations.

In addition, policy and regulatory recommendations that are specific to digital financial products for SME financing can be focused around the following themes:

- a. Promote digitization of SME operations, improve the availability of SME information, expand credit information sharing, and support efficient and widely accessible digital payment systems
- b. Develop modern credit infrastructure frameworks to support introduction of fintech asset-based lending products for SMEs
- c. Support growth and development of debt and equity capital platforms to improve SME access to finance through regulatory frameworks that balance innovation with investor/consumer protection.

1. Introduction

The objectives of this technical note are to provide an overview of how digital technologies are helping to address the main barriers/frictions to financing for SMEs through the adoption of fintech solutions; present the impact on the incumbents and the implications for market structure; discuss the challenges and risks these fintech solutions pose; and present policy recommendations to address the challenges and risks. While the note focuses on access to finance issues and analyzes how fintech solutions could potentially help overcome these challenges, it is important to acknowledge that efficient support for development of SMEs cannot be achieved solely by focusing on one policy area. Readers are therefore advised to view the information in the note and the presented recommendations as part of what should be a wider policy targeting SME development. Such policy would, in addition to access to finance issues, also involve other policy areas critical for SME development, including business environment, firm capabilities, access to markets and institutional framework.

Fintech solutions for SMEs include digital credit and equity products such as loans, supply chain finance, secured revolving lines of credit, merchant receivables finance, P2P/marketplace lending, as well as equity crowdfunding. In addition, the digitization of internal business processes and business-to-business (B2B) processes such as electronic invoicing (e-invoicing), and tokenized assets using blockchain/distributed ledger technology (DLT), can also help address the major barriers to SME access to finance. The introduction of innovative solutions by fintech and big tech firms and neo-banks or challenger banks is disrupting traditional financial institutions. This note will examine the impact and the main implications for financial market structure, especially in emerging markets. Finally, this technical note discusses the main challenges in the adoption of fintech solutions and the main policy and regulatory recommendations to address these challenges.

This technical note is structured in the following manner. Section 2 provides an overview of the main barriers/frictions that SMEs face to access finance. Section 3 explores how digitization is an enabler for SME finance and how different fintech solutions address these barriers. The fintech solutions analyzed include digital credit, asset-based lending, and equity products. Also examined are innovative products such as digital payments, credit risk assessment using alternative data, tokenized assets, and electronic invoicing. Market enablers such as e-commerce and open banking, and the digitization of business processes, which contribute to addressing the barriers/frictions to SME access to finance, are also highlighted. Section 4 analyzes how the providers of these fintech solutions for SMEs impact traditional banks, financial institutions, and implications on the financial market structure. This section also discusses the effects of the COVID-19 pandemic on the use of digital financial products for SMEs. Section 5 then addresses some of the key risks and challenges involved in the adoption of digital financial products and key market enablers. Finally, section 6 presents policy and regulatory recommendations to address the different challenges.

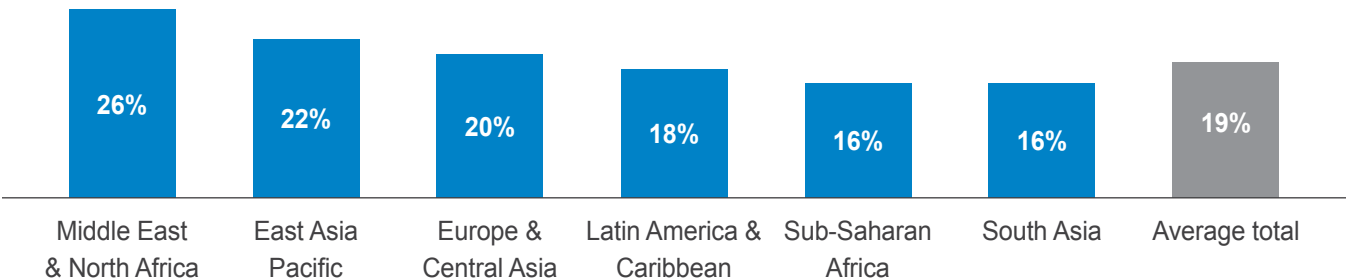
2. Barriers for SME Access to Finance

2.1 Access to Finance Remains a Key Challenge for SMEs

Access to finance is a critical barrier for SMEs to start, sustain and grow their businesses. About half of formal SMEs do not have access to formal credit and instead rely on internal funds, or cash from friends and family, to launch and initially run their business. An extensive survey of SMEs in 135 countries showed that access to finance was reported as the most serious obstacle to current operations of businesses.¹ In emerging markets, approximately 131 million or 41 percent of formal SMEs have unmet financing needs. Creating opportunities for SMEs in emerging markets is one of the main ways to advance economic development and reduce poverty.²

The finance gap for formal SMEs in developing economies is estimated at \$5 trillion or about 1.3 times the level of SME lending.³ Women-owned businesses comprise 23 percent of SMEs and account for 32 percent of the SME finance gap.⁴ When informal SMEs are taken into account, there is another \$2.7 trillion potential demand for finance.⁵ The finance gap volume varies by region, as shown in figure 1.

Figure 1. Formal SME Finance Gap as Percentage of GDP—by Region



Source: SME Finance Forum.

1. Ayyagari, M., Demircuc-Kunt, A., & Maksimovic, V. (2017). SME Finance (Policy Research No. 8241). Washington D.C. <http://documents.worldbank.org/curated/en/860711510585220714/pdf/WPS8241.pdf>.
2. SME Finance Forum MSME Finance Gap Database <https://www.smeffinanceforum.org/data-sites/msme-finance-gap>.
3. Ibid.
4. SME Finance Forum website. <https://www.smeffinanceforum.org/data-sites/msme-finance-gap>.
5. Ibid.

2.2 Supply-Side Barriers for SME Access to Finance

Supply-side barriers have a big impact on the supply of financing to SMEs. Structurally, there are various barriers that make it difficult for financial institutions to provide financing to SMEs in emerging markets. This technical note focuses on the supply-side barriers, which refer to frictions that constrain the supply of capital to small businesses. Supply-side barriers where fintech solutions have demonstrated the biggest impact in closing the financing gap are as follows:

- High cost to acquire and serve, relative to revenue
- Information asymmetry
- Lack of collateral (leading to higher capital charges from regulators)

2.2.1 High Cost to Acquire and Serve Relative to Revenue

Standard SME finance techniques relied on building strong relationships through personalized contacts, which required investing in a number of dedicated staff in SME-lending departments. This, combined, with information asymmetries of SMEs, results in higher cost per unit of finance, thereby raising costs and lowering options for SMEs to have access to finance. Also, relatively high regulatory costs of offering securities to the public traditionally made attracting funds via capital markets unrealistic for SMEs.

SME lending, by definition, also implies smaller loan amounts compared to corporate lending, but require just as much (if not more) work for the underwriting process, operations, legal, and credit-risk monitoring of the loan. As a result, SME lending tends to be riskier and less profitable for lenders, given the smaller loan amounts, higher risks, and equal amount of work for each loan.

Several fintech solutions have emerged that can address this issue. Process automation and products leveraging DFS help lower transaction costs and make borrowing and equity-capital raising a lot faster and easier by automating customer onboarding, underwriting, due diligence and collection, as well as lowering regulatory compliance costs. These products include: receivables financing such as factoring, reverse factoring, and merchant receivables financing; secured revolving lines of credit; and platform finance—P2P lending and equity crowdfunding.

2.2.2 Information Asymmetry

Information asymmetry due to the lack of available financial and credit data is also a major obstacle for SME to access financing. Many SMEs do not have reliable financial statements and/or are unregistered and have no official documentation when compared to large enterprises, making it difficult for financiers to appropriately evaluate and monitor credit risk. SMEs also tend to be young, with little or no history of receiving finance from formal financial markets, which creates a gap in publicly available credit history, further undermining the risk-assessment process. This lack of available information is traditionally substituted by higher requirements of collateral. However, the value of such collateral, and its impact on the availability of finance, is strongly related to the existence of frameworks and institutions that enable identification, valuation, registration, and ultimately, efficient monitoring and enforcement of collateral.

A few fintech solutions have been developed to address the information asymmetry barrier to SME finance. These solutions are based on using alternative data sources, Big Data analytics, AI, and ML do provide additional sources of information to financiers, enabling them to conduct more efficient credit-risk assessments of SMEs. Information from payment processors (that is, credit-card clearing companies and payment systems), ecommerce marketplaces, and digital banks, can also provide data to help measure cash flow and income, and calculate an SME's repayment capacity.

Using such new sources of data and advanced analytics techniques has made it possible to provide financing to SMEs that were previously unable to obtain financing from financial institutions.

2.2.3 Lack of Collateral

Despite progress in many countries, SMEs are hard-pressed to finance their business activities due to a systemic lack of credit—a frequently cited obstacle for entrepreneurs. Lack of collateral is often the cause of this credit unavailability, especially for women-owned businesses. The main reason for this market barrier is that lenders almost exclusively require real property as collateral, while the assets of SME borrowers are concentrated almost exclusively in movables: approximately 80 percent of collateralized loans require real property, while approximately 75 percent of SMEs' asset-base is concentrated in movables (equipment, inventory, and accounts receivable).⁶ Women are particularly disadvantaged here, as they own less real property than men. Thanks in part to WBG assistance, globally, several markets have developed modern secured transactions frameworks under which lenders can develop credit products based on movables, tapping into the significant but presently underused value of SMEs' movable property as collateral for new loans. Regulators' recognition of value of movable collateral in risk weighting of assets will help increase the use of these products.

Several fintech solutions have emerged to help introduce and use movables as collateral (equipment, inventory, accounts receivable, payment instruments, and cash on deposit), mainly by following fintech-enabled asset-based lending products: factoring, reverse factoring, secured revolving lines of credit, merchant receivables financing, and tokenized assets. Additionally, the digitization of platforms, which present and record transactions, connectivity with independent sources to help verify the existence and eligibility of collateral (that is, payment processors, tax authorities, bank accounts, etc.), the internet of things to help monitor maintenance, sale, and restocking/replacement of collateral, and smart contracts to automate settlement of agreements, make asset-based financial products more affordable to both SMEs and financiers. Section 3 will analyze in more detail how these fintech solutions address these barriers.

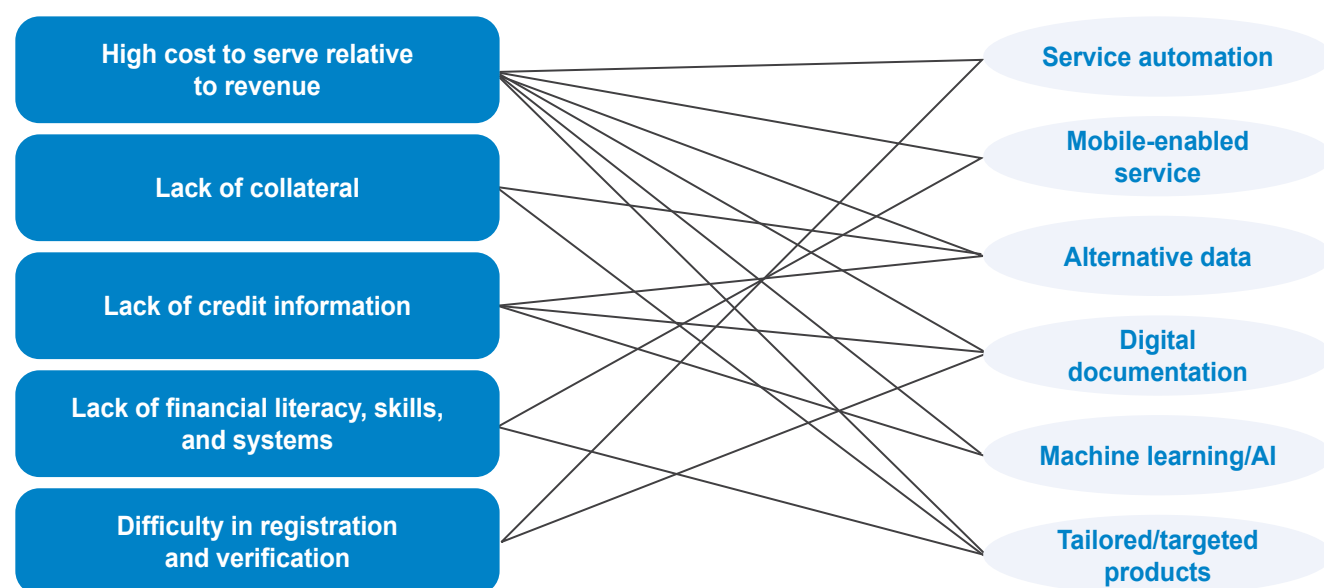
6. World Bank Group, Finance Competitiveness and Innovation, Knowledge Guide on Secured Transactions, Collateral Registries and Movable Asset-Based Financing, Washington D.C. 2019. <https://openknowledge.worldbank.org/bitstream/handle/10986/32551/142346.pdf>

3. The Impact of Digitization and Fintech Solutions on SME Access to Finance

3.1 Digitization as a Leading Enabler of SME Finance

With the application of different technology innovations, digital financial services (DFS), or the provision of financial products and services through digital channels, has become an essential enabler to closing the SME financing gap.⁷ Technology innovations serve as the foundation for development of new business models and digital financial products, which include digital loans and other credit products, as well as equity capital through crowdfunding platforms. DFS makes the lending and equity-capital raising process a lot faster, easier, and more cost effective by automating the onboarding, underwriting, due diligence tasks, and collection of payments. The use of DFS through mobile devices is also significantly lowering transaction costs, making it economically viable to serve SMEs and provide wide access to simple products that can target SMEs where owners/managers do not have high financial literacy. In addition, the use of alternative data sources, combined with big-data analytics, artificial intelligence (AI), and machine learning (ML), are decreasing information asymmetry by providing additional sources of information to assess credit risk of SMEs. These new sources of data and advanced analytics are making it possible to provide financing to SMEs that lack credit histories or do not have collateral and were previously unable to obtain financing from financial institutions. The use of digital documentation combined with the automation of many processes helps in registering the company and verifying the identity of the business, improving its chances to access finance. Finally, the design of tailored products helps to address barriers, such as financial literacy, the lack of collateral, and the relative high costs to serve SMEs. Figure 2 provides a summary of how DFS can address the key inclusion challenges for SMEs.

7. Rapid advances in technology are transforming the financial services sector, leading to the development of innovative digital financial products and new business models. Technology innovations such as mobile phones and cloud computing serve as foundations for the digitization of financial products and services. Artificial intelligence (AI), machine learning (ML), and Big Data analytics are useful to evaluate the credit risk of SMEs, as well as gain insights on SME customers. Other technology innovations that are relevant to SME financing include: blockchain/distributed ledger technology (DLT), Quick Response (QR) codes for digital payments, Application Programming Interfaces (APIs) and Internet of Things (IOT).

Figure 2. Digital Technologies Can Address the Key Inclusion Challenges for SMEs

Source: World Bank staff.

DFS are typically delivered by new players such as fintech and big tech companies, challenger or neo-banks, with traditional financial institutions starting to offer them as well. Fintech firms generally focus on a financial product or service and utilize new technologies and ways to do business and serve customers in a more efficient and transparent manner.⁸ Banks and other financial institutions are also starting to offer digital financial products and services, or increasingly partnering with fintech firms to deliver these products. Although fintech firms are mainly young companies founded by entrepreneurs mostly over the last decade, large technology companies such as Alibaba, Tencent, Facebook, Amazon, and Google are starting to and/or considering offering digital financial products and services—in some cases, these firms are referred to as big tech companies. When compared to fintech startups, the main advantages of big tech companies are the massive customer base and the large amount of resources and customer data available. Challenger or neo-banks are also emerging and offer a wide range of digital financial products to consumers and SMEs. E-commerce platforms, accounting systems, payment systems providers, and others that have a nexus or create a network of SME users, help provide relevant sources of data that could be leveraged to increase access to finance by SMEs.

DFS can also encourage informal enterprises to join the formal economy, thereby leading to higher economic activity. In general, informal businesses have lower productivity than formal businesses, which can be a drag on the economy. Informal firms are also restricted from accessing formal financing instruments, formal market opportunities, such as government procurement, large firm-based supply chains and distributor opportunities. Moreover, workers in the informal sector lack social protections, such as insurance and pension benefits. The widespread adoption of mobile phones is making it possible to deliver digital financial products to more people, including informal businesses. Digital payments can help informal businesses establish a credit history, potentially opening the door to formal financing.⁹ Digital payroll systems and digital forms of identification can also help informal firms to register and operate as formal firms, which in turn can lead to obtaining access to bank loans and other forms of formal financing.






8. Financial Stability Board. 2017. Financial Stability Implications from Fintech: Supervisory and Regulatory Issues that Merit Authorities' Attention. London, UK. <http://www.fsb.org/wp-content/uploads/R270617.pdf>.

9. Ibid.

3.2 Addressing the Barriers of SME Finance with Fintech Solutions

Fintech solutions and digital enablers help to address supply-side barriers, increasing SME access to finance. The following sections examine in detail how the fintech solutions highlighted in table 1 address the supply-side barriers described in section 2.

Table 1. Key Digital Finance Products¹⁰ or Enablers and SME Finance Barriers Addressed

Fintech solution	Overview	Key barriers/ Frictions addressed
 Factoring	Factoring is a financing product that allows a financial institution to provide financing to an SME supplier through the purchase of its accounts receivable or invoices (“receivables”). In factoring transactions, the SME supplier is the client of the financial institution.	<ul style="list-style-type: none"> • Lack of Collateral • Information asymmetry • High cost to serve relative to revenue
 Reverse factoring	Reverse factoring is a financing product by which a financial institution provides immediate liquidity to SMEs through the discounting of accounts payable of a large buyer. In reverse factoring transactions, the large buyer is the client of the financial institution.	<ul style="list-style-type: none"> • Lack of collateral • Information asymmetry
 Secured revolving lines of credit	Secured revolving lines of credit (known as asset-based lending or ABL) is a lending product used to provide working capital to mature or sophisticated SMEs, using their account receivables and inventory as collateral.	<ul style="list-style-type: none"> • Lack of collateral • High cost to serve relative to revenue
 Tokenized assets	Tokenization of assets refers to the process of issuing a blockchain token that digitally represents a tangible or intangible asset, for trading, discounting or financing as collateral in a distributed ledger.	<ul style="list-style-type: none"> • Lack of collateral • High cost to serve relative to revenue
 P2P/Marketplace lending	Peer-to-peer (P2P)/marketplace lending is a lending business model that uses online platforms to match potential lenders with borrowers. The term marketplace lending is sometimes used to distinguish between business models where lenders are institutional investors instead of individuals. However, the terms are also widely used as synonyms.	<ul style="list-style-type: none"> • Information asymmetry • High cost to serve relative to revenue

10. Several of these products have existed in non-digital form. Digitization has made them more accessible for SMEs.

Table 1 continued









Fintech solution	Overview	Key barriers/ Frictions addressed
 Equity crowdfunding	<p>Equity crowdfunding is the process of raising small amounts of equity capital from many retail investors (“crowd”) by issuing shares, typically through an online platform. The basic premise behind crowdfunding is to enable small businesses to reach out to many potential investors and offer investments in their companies. Crowdfunding is made possible by using technological advancements and regulatory exemptions that decrease the costs of issuing shares to the public and increases the promotional potential of offers.</p>	<ul style="list-style-type: none"> • High cost to serve relative to revenue
 Digitization of business processes	<p>Refers to the digital transformation of accounting, inventory, purchasing, billing, sales and delivery methods, practices and documentation, including the development of customer portals and e-commerce applications.</p>	<ul style="list-style-type: none"> • Information asymmetry • High cost to serve relative to revenue
 Digitization of bank processes	<p>Refers to automation of bank processes from onboarding to marketing, product applications, underwriting, risk management, disbursement, and servicing. Eliminating manual processes increases self-service rates, reduces processing costs, and generally lowers the cost to serve, while reducing errors and enabling cross-product leveraging of customer data.</p>	<ul style="list-style-type: none"> • High cost to serve relative to revenue • Lack of information
 Electronic invoicing	<p>Refers to the digital evolution of tax invoices, which have the same legal validity as their paper-based counterparts, but are originated, validated, remitted, received, rejected or accepted, and/or archived or registered electronically for tax, accounting, billing, and commercial or financing/discounting purposes.</p>	<ul style="list-style-type: none"> • Information asymmetry • High cost to serve relative to revenue • Lack of collateral
 Digital payments	<p>Refers to transfers of value that are made using digital or electronic devices and channels to transmit data. Digital payments include payments initiated by debit or credit card, mobile phone, computer, tablet, or wearable digital device.</p>	<ul style="list-style-type: none"> • Information asymmetry • High cost to serve relative to revenue
 Credit risk assessment using alternative data	<p>Refers to the use of alternative data such as mobile phone call records, utility and bill payments, digital payment transactions, social media, industry/sector data, and many others in the development of credit-risk models to assess willingness and ability to pay of SME borrowers.</p>	<ul style="list-style-type: none"> • Information asymmetry

Table 1 continued

Fintech solution	Overview	Key barriers/ Frictions addressed
 E-commerce	The buying and selling of goods or services using the Internet via computers, tablets, or other digital devices or mobile phones. E-commerce is leveling the playing field for SMEs to display their products online and on equal footing with larger companies. The platforms provide rich data on cash flows, inventories, and business performance of active SMEs.	<ul style="list-style-type: none"> • Information asymmetry • High cost to serve relative to revenue
 Open banking	Refers to practices or regulations that aim to make traditional financial institutions share their customers' data (after customer consent) with third parties—including fintech firms—in a secure, standardized manner so that it can level the playing field between smaller companies and large financial institutions.	<ul style="list-style-type: none"> • High cost to serve relative to revenue

Source: World Bank staff.

3.2.1 Factoring

Factoring is a financing product that allows a financial institution to provide financing to an SME supplier through the purchase of its accounts receivable or invoices (“receivables”). In factoring transactions, the SME supplier is the client of the financial institution.

Factoring in most developing economies takes place by cherry-picking models where lenders principally finance high-dollar accounts receivable from the most creditworthy buyers, creating a high-value, low-volume business model. However, fintech platforms provide for automated processing, verification, monitoring, and collection of receivables, permitting fintech providers to introduce low-value, high-volume business models for factoring. Lower value invoices can also be financed from less creditworthy buyers where, in cases of non-payment of a receivable, instead of relying on collection remedies and procedures, the platform automatically categorizes the receivable as ineligible for financing. This would require recourse payment, chargeback from a collateral cushion, or replacement by a new receivable of equal or greater value of the ineligible receivable. An added advantage of a low-value, high-volume factoring model is that it allows the SME to sell its products to a greater variety of buyers, since the SME can obtain financing even when selling to smaller buyers.

Factoring can help increase access to finance for SMEs by allowing them to tap into their accounts receivables as collateral for assignment and discounting, reducing long payment terms and injecting immediate liquidity for growth and operations. Additionally, fintech can increase an SME's invoices or receivables available as collateral or financing by making it efficient to factor low-value invoices, otherwise excluded as collateral in traditional cherry-picking models—where financing institutions finance, almost exclusively, high-value receivables, payable by blue-chip buyers. Traditional factoring as enabled by credit infrastructure and fintech (and as contrasted to reverse factoring below), also permits an SME to directly finance its receivables even without a buyer's confirmation of the payment obligation or the buyer's willingness to permit the assignment or to participate in a supply-chain financing scheme. Use of receivables as collateral or for finance in this manner is facilitated by legal systems that invalidate buyer prohibition on assignment, and

fintech systems that effectively measure credit risk based on historical performance of the relationship between the buyer and SME seller, based on alternative data.

The effectiveness of factoring (and reverse factoring) for SME financing is reliant on effective collateral and credit-risk measurement and monitoring. Fintech can automate determination of whether accounts receivables offered for assignment, discount, or collateral by an SME are valid and whether they are eligible for financing or subject to credit/debit notes or other rights of setoff by the payer. Likewise, fintech can automate the credit process for underwriting, collections, and credit-risk determination, allowing for an automated risk-management model, including fraud detection and prevention. Fintech platforms also monitor collections and deposits in real time, to verify that invoices or accounts receivable are paid at maturity and that deposits are made pursuant to payment notification and instructions given to the payer.

A factoring platform must also provide the legal and economic certainty that the accounts receivable financed by one financial institution have not been previously taken in pledge or discounted by another. This is accomplished by a secured transactions system, which requires that all encumbrances over accounts receivable are registered in a collateral registry. First-in-time registration then provides legal priority for the financial institution to register its interest ahead of others and provide notice to subsequent parties that the assets have been previously encumbered. Factoring platforms establish real-time interoperability with collateral registries to determine the eligibility for financing of invoices and accounts receivable. Likewise, fintech systems can register factoring transactions in a collateral registry automatically and in real time.

3.2.2 Reverse Factoring

Reverse factoring is a financing product by which a financial institution provides immediate liquidity to SMEs through the discounting of accounts payable by a large buyer. In reverse factoring transactions, the large buyer is the client of the financial institution.

Reverse factoring helps increase access to finance for SMEs by allowing them to turn their receivables into ready cash. Reverse factoring requires the SME's buyer's (payer) active and willing participation in a reverse factoring/supply-chain financing program. This is where the buyer (instead of the SME) becomes the actual client of the financial institution, hence the term reverse factoring. Buyers are frequently indisposed, however, to participate in such systems, they must carry the financing on their ledger, but it is their supplier who receives the financing. Digitization and fintech solutions provide significant incentives for buyer participation, making this type of SME financing possible. For example, fintech reverse factoring platforms frequently improve payment conditions and extend payment terms for buyers, without causing supply chain disruptions. In addition, many reverse factoring platforms, including the Nacional Financiera (NAFIN) development bank system in Mexico and the Trade Receivables Discounting System (TReDS) system in India, allow for strengthening relationships between SME suppliers and anchor buyers. They do this by linking the financing transaction to the supply relationship, also providing supply-chain management and payment management applications and other operational tools to the buyer. Finally, reverse factoring is also the central element of all supply-chain financing transactions, acting as the linchpin for other supply-chain financing components, such as purchase order and distributor financing, which allow the buyer to reach a larger market. These additional functionalities are staples of fintech reverse factoring platforms, such as those provided by Demica, eFactor Network, and a great number of others.

3.2.3 Secured Revolving Lines of Credit

A secured revolving line of credit (known as asset-based lending or ABL) is a lending product used to provide working capital to mature or sophisticated SMEs, using their account receivables and inventory as collateral.

SMEs require credit to finance their entire production or business cycle. However, they face far greater obstacles and count on less collateral to finance pre-sale activities than to finance post-sale activities. Pre-sale includes inventory acquisition, manufacturing, harvesting, and delivery of services; post-sale activities include the sale of inventory and the collection of cash or receivables for delivered goods or services. Traditional and reverse factoring (as described above) are important post-sale financing products for SMEs, crucial for injecting liquidity after sale and delivery of the goods or services has taken place. However, financing for pre-sale activities is rare in developing economies, leaving SMEs to fend for themselves during the most capital-intensive phase of their commercial activities. Without pre-sale financing, however, it is the SMEs that are financing their large buyers, not the other way around.

The reason behind the imbalance between pre and post-sale financing is related to the reduced value assigned to pre-sale collateral due to risks associated therewith. A lender who finances manufacturing business phases, for example, faces a conversion risk: that raw materials used as collateral are not converted into finished goods. Likewise, a lender who finances an agricultural enterprise faces conversion risk that crop inputs used as collateral are not converted into final agricultural products. The lender for both types of enterprises also faces a sale risk: that finished products used as collateral are not sold at market prices once manufactured or harvested. Finally, once goods are sold, the lender faces a payment risk: that even after the goods are sold, the accounts receivable used as collateral are not paid by the buyer. As a result, in addition to an overall default risk, a pre-sale lender faces these three additional risks (conversion, sale, and payment). By contrast, a lender in a post-sale financing transaction (or a factor in a factoring transaction) faces only the payment risk after buyer's confirmation of the invoice being financed.

Secured lines of credit as enabled by credit infrastructure and fintech solutions can greatly reduce pre-sale risks and make financing available for an SME's entire business cycle by allowing a lender to take a security interest in original collateral, which automatically extends to the proceeds of the transformation of that collateral in the SMEs ordinary course of business. That is to say, the lender's security interest in the original collateral automatically extends to the conversion from raw materials into finished products, from finished products into accounts receivable, and from accounts receivable into payment instruments, and finally into cash on deposit.

Fintech systems facilitate and simplify the process for revolving lines of credit by ensuring that borrowing requests made by an SME are supported by existing collateral at the time of disbursement. DLT or other finance technology can also be used to verify the existence of receivables and to monitor the prompt payment and deposit thereof into a secured deposit account. In economies with electronic invoicing, this process can also take place by direct interoperability with the tax authority via an API connected to the lender's core banking system. For sophisticated SMEs, the API can also be connected to the borrower's accounting software, providing a complete data profile of the SME and its collateral to facilitate lending.

3.2.4 Merchant-Receivables Financing

Merchant receivables financing (also referred to as merchant cash advances or MCAs) is a short-term financing product that leverages SME retailer's acceptance of payment card transactions, using payment card revenue as collateral. Payments of credit and debit card receivables are then deposited into a controlled (lockbox) account also provided as collateral. Payment of the amortized portion of the loan takes place directly from the controlled account via a daily percentage withdrawal of credit card deposits, allowing an SME to finance its operation and growth with a type of previously unavailable collateral. Fintech systems are used to measure the historical performance of the SME's payment receivables to establish the credit amount, as well as to monitor daily collections. The fintech system includes collateral monitoring and early alert mechanisms in case of discrepancies between expected and actual credit card sales, allowing the lender to adjust advances, fees and retention of funds collected based on the SME's actual cash flow.

Digital technologies play an essential role in the creation of reliable and effective data for merchant receivables financing. Fintech systems are used to measure the historical performance of the SME's credit card or electronic payment

receivables to establish the credit amount provided to an SME and to monitor daily collections. The fintech system includes collateral monitoring and early alert mechanisms in case of discrepancies between expected and actual credit card sales, allowing the lender to adjust advances, fees, and retention rates based on the SME's sales. For lenders who also provide point-of-sale devices to SMEs, information collection can be automated throughout the loan cycle: from measuring the historical performance of the POS device, to the daily monitoring of POS collections, to deposits in the lockbox account. Outside the major financial centers in the United States and Europe, payment card receivables financing has been relatively limited. However, several emerging economies with reformed secured transactions systems, including Colombia, Guatemala, and Mexico, have begun to introduce this credit product. Banco Davivienda, one of the largest SME lenders in Colombia, for example, has provided new loans to SMEs by taking security interests in credit card receivables generated by their own point-of-sale systems to finance small restaurants and retail enterprises. Banco Caja Social in Colombia is also leveraging secured transactions reforms to introduce technology-enabled secured merchant advances for their SME retail and service clients affected by the COVID-19 pandemic.

Merchant advances provide two distinct advantages, which reduce the risks and costs of lending to SMEs. First, the lender has access to continuous and real-time information on the business activities and income of the SME via the point-of-sale or other electronic payment systems, allowing it to adjust advances and collections, in real time, depending on sales performance. Second, the lender takes the receivables from credit and debit cards as collateral, as well as the cash proceeds thereof deposited in the controlled account. The lender also establishes a contractual direct right of collection of the outstanding amount or amortized portion of the loan from that account. The technological platform developed for the merchant advance product, moreover, allows for adjustments in advances and collections to be made automatically based on real-time credit-risk assessment, collection amounts, and performance of payment card receivables.

3.2.5 Tokenized Assets

Tokenization of assets refers to the process of issuing a blockchain token that digitally represents a tangible or intangible asset, for trading, discounting or financing as collateral in a distributed ledger. The digital representation of movable assets in this manner can leverage the decentralization and added security of DLT to capitalize value and increase asset liquidity of movables. For example, warehouse receipts representing agricultural commodities deposited in authorized warehouses can be tokenized and traded or financed in a blockchain without requiring any movement of the assets themselves. The tokenization of the warehouse receipt allows a buyer or financial institution to purchase or take a security interest in the token to finance the SME producer in manners not possible without DLT, with the final holder of the token having the right of possession of the physical warehoused goods. Tokenization of warehouse receipts can also allow a lender to finance pre-warehousing and pre-tokenization agricultural processes; by allowing the lender to take a security interest in the original crop inputs and their proceeds. This would include harvested crops, warehouse receipts, token, and the proceeds of the sale or financing of the token on a blockchain, ultimately providing innovative and secure ways to finance SME production and business activities. A growing number of fintech companies provide solutions in this space, including Komgo, Jibrel, Neurored, and others.

3.2.6 Peer-to-Peer (P2P)/Marketplace Lending

Peer-to-peer (P2P)/marketplace lending is a lending business model that uses online platforms to match potential lenders with borrowers. The term marketplace lending is sometimes used to distinguish between business models where lenders are institutional investors instead of individuals. However, the terms are also widely used as synonyms.

To assess the creditworthiness of SME borrowers, P2P platforms focus on using alternative data, including social media, payments data, and even applying psychometric testing. Recently, P2P platforms have been incorporating AI and ML to enhance the credit-risk assessment and underwriting process, speeding up the decision-making process to qualify SME applicants and offer financing in less time than banks. Depending on the platform business model, lenders can have access to large, complex datasets about borrowers or rely on the platform to assess borrowers by simply opting

to buy into different asset classes. As opposed to relying on only a credit score, underwriting decisions via P2P platforms utilize a large number of data points including education, academic transcripts, labor profiles, bill-payment histories, and employment history. The greater computational capacity, processing bandwidth, and storage scale afforded by Big Data is then used to facilitate detailed credit analysis. Platforms also offer applications that allow SMEs to directly link their accounting software or business bank account to the platform, increasing accessibility of data, efficiency of risk assessments, and the whole loan application process.

P2P platforms rely on automation of parts or even all of the lending process, from examining credit-history to reviewing applications, to ultimate approval. Speeding up the decision-making process makes for more efficient operations for the P2P lending platform, lowering operating costs per unit of provided finance. Automation of these processes also leads to better service for both the investor/lender and the borrower. Lenders can quickly find borrowers they are comfortable lending to, while likewise, borrowers can be rapidly matched to prospective lenders at the right credit price.

Flexibility coupled with speed, convenience of access and more accurate underwriting lowering adverse selection increases the overall appeal of this type of finance to SMEs. P2P lending for SMEs has been mainly concentrated around three countries, which generated 98 percent of the total volume: China (88 percent of total), the United Kingdom (3 percent) and the U.S. (7 percent).¹¹ Although P2P lending volumes in other countries are relatively small, emerging markets such as Eastern Europe and Southeast Asia are gaining traction. For example, Investree is one of the largest P2P lending platforms in Indonesia focused on SME borrowers. The company offers SMEs a broad suite of digital financial products including invoice financing, merchant cash advance and uncollateralized loans. Another example is Mintos, a peer-to-peer lending platform based in Latvia that acts as a loan aggregator partnering with loan originators worldwide to bring in their loans onto the platform. It has more than 200,000 active investors and has been expanding investment opportunities on the marketplace beyond Europe by offering loans in Africa, Latin America, and Southeast Asia.

3.2.7 Equity Crowdfunding

Equity crowdfunding is the process of raising small amounts of equity capital from many retail investors (“crowd”) by issuing shares, typically through an online platform. The basic premise behind crowdfunding is to enable small businesses to reach out to many potential investors and offer investments in their companies. This is made possible by using technological advancements and regulatory exemptions, which decrease the costs of issuing shares to the public and increase promotion potential of offers.

Equity crowdfunding has created new opportunities to access finance for SMEs and startups. By leveraging ease of access to many potential investors through online marketplaces, equity crowdfunding is helping SMEs and startups attract new investors and much-needed capital to sustain and grow their businesses. Reliance on social media and online platforms enables efficient dissemination of information about SME business plans and financial conditions, making this information accessible to numerous retail investors. In addition, many regulators request platforms to conduct certain level of due diligence on SME issuers hence reducing information asymmetry between retail investors and SME issuers and enabling investors to make better-informed investing decisions.

Regulatory flexibility is a key pre-condition to development of equity crowdfunding as an alternative to the usual sources of equity investments in SMEs and startups, such as family and friends and angel and VC/PE funds. An important aspect of equity crowdfunding is lower regulatory compliance costs, making this venue a viable option for SMEs. Traditionally, SMEs would be requested to follow regular capital markets regime to issue and offer securities to the public, which requires such elements as publishing a prospectus, acquiring necessary authorizations, regulatory reporting, and

11. Digital lending volume data from Cambridge Centre for Alternative Finance (<https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/>). Please note that this data does not include digital lending volume from big tech firms and other financial institutions such as banks.

meeting corporate governance requirements. The cost of regulatory compliance is high, and many SMEs don't have the ability to comply. In some jurisdictions there are "traditional" exemptions; for example, waiver of the prospectus requirement if an offer is made to accredited (sophisticated) investors only or if the offer is below a certain threshold. These are still often seen as overly restrictive to support the development of an SME equity market. Crowdfunding regulatory frameworks usually include specifically crafted exemptions, which in effect, lower compliance costs for SMEs. When coupled with the efficiency and low cost of using internet platforms to promote offers, this can make raising equity capital a realistic option for SMEs.

3.2.8 Digitization of Business Processes

Digitization of business processes refers to the digital transformation of business processes such as accounting, inventory, purchasing, billing, sales and delivery, tax compliance, payroll, client management, practices, and documentation, including development of customer portals and e-commerce applications.

Many micro-enterprises and SMEs don't maintain reliable financial statements, making it difficult for potential lenders to properly evaluate their creditworthiness. Digitization of business information can provide alternate and accurate information sources needed for lending. The relatively low value of loans to these smaller enterprises, together with the required amount of effort needed to verify an SME's financial records, make lending to SMEs largely unprofitable related to the amount of work it takes to sort through paper records and measure credit risk, even when such information is available. The digitization of business processes can provide a reliable alternative to audited financial records, allowing the use of digital records on sales, expenses, cash flow and inventory needed for lenders to make informed and timely decisions on extending loans to SMEs.

The digitization of business processes, along with payment and collections information from SMEs' clients, generate important data that can help SMEs obtain credit from financial institutions and fintech lenders. Data related to the sales volumes, performance, and patterns, as well as payment history of the SME's clients, can provide a full digital overview of an SME and transparency into its present and expected future cash flow. Digital information on inflows and outflows of inventory can also provide immediate information to a lender on the movables available as collateral. Finally, digitized accounting information, especially cloud-based accounting, is available to potential lenders. It can help provide a full overview of an SME's income and expenses, financial strengths and weaknesses, growth potential or credit, and business risks, making credit decisions immediate and more accurate. Like e-commerce platforms, providers of accounting systems and payments services to SMEs similarly have rich data on business operations and cash flows that are being leveraged to offer finance. For example, Square Capital uses Square's connectivity to small merchants and information from its payments processing to offer working capital loans—and collect the repayments.

3.2.9 Digitization of Bank Processes

The digitization of bank processes refers to the automation of internal processes, such as onboarding, marketing, product applications, underwriting, risk management, disbursement, and servicing. Eliminating manual processes increases self-service rates, reduces processing costs, and generally lowers the cost to serve, while reducing errors and enabling cross-product leveraging of customer data. Additionally, it frees staff for higher value-added activities, increasing overall productivity.

While there are numerous challenges for traditional banks to provide access to finance for SMEs in emerging markets, banks can follow a structured framework to effectively serve SMEs. The framework defines three key strategic objectives that banks need to achieve to efficiently serve SMEs while doing it profitably:¹²

12. IFC. 2010. The SME Banking Knowledge Guide. Washington, DC. <https://www.ifc.org/wps/wcm/connect/c6298e7b-9a16-4925-b6c0-81ea8d2ada28/SMEE.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-c6298e7b-9a16-4925-b6c0-81ea8d2ada28-jkCVrZU>

- Revenue Generation: Increase revenues per client
- Operational Efficiency: Lower operating costs per transaction
- Portfolio Quality: Reduce risks in the portfolio.

These three strategic objectives are not different from the objective for other financial service activities. However, optimizing the tradeoff between these objectives is particularly challenging in the SME segment. Thus, the need for significant business volume requires adopting industrial processes, while intrinsic SME specificities create a conflicting need for customized products.¹³

Fintech solutions and the digital transformation of banks can significantly accelerate the digitization of bank processes to better serve SMEs. By digitally transforming the bank's internal operations, the IT and Management Information System (MIS) structure can be enhanced to better deliver analytics on SME clients, and create a more detailed client segmentation. By having better information on the clients, banks can design more customized financial products for SMEs in a cost-efficient manner that meets their requirements. Moreover, the use of alternative data for credit-risk assessments by leveraging Big Data analytics, AI and ML, can result in automated credit risk-management tools to accurately evaluate potential SME clients. Finally, by partnering with DFS providers such as fintech and big tech companies, banks can digitize different processes and enhance their sales delivery channel, target new SME clients, and serve them in a more efficient and cost-effective manner. The Market Participants Survey, which is a part of this series, of financial institutions found that 90 percent expect fintech and digital transformation to increase operational and cost efficiencies, and 88 percent expect digitization to reduce the costs of MSME lending.¹⁴

3.2.10 Electronic Invoicing

Electronic invoicing refers to the digitization of all invoices between seller and customer. They have the same legal validity as their paper-based counterparts, but are originated, validated, remitted, received, rejected or accepted, and/or archived or registered electronically, for tax, accounting, billing, and commercial or financing/discounting purposes.

The tax authorities in numerous countries have developed, or are in the process of developing, electronic invoice systems, which can leverage technology to reduce tax evasion, increase revenues, and also increase access to finance for SMEs. Paper-based invoices contain three types of information: (i) tax elements, (ii) accounting elements, and (iii) commercial/financial elements. As economies move toward electronic invoicing, this data can be captured in electronic invoices generally developed in XML files—XML is the most frequently used language for securely encoding, organizing, and storing data in a self-contained document—which is ideal for incorporating tax and accounting information (by the seller) when the invoice is generated, and also to automatically generate commercial/financial information when the invoice is traded or used as collateral.

Electronic invoices can incorporate data on the traceability of a sale transaction (delivery of goods or services by a supplier, receipt of goods or services by a buyer, payment confirmation by a buyer) and can contain information on the eventual endorsement or assignment in factoring or as collateral by a supplier to a lender, factor, fintech, or institutional investor. In effect, all information typically found along the breadth of supply chain of any sale transaction can be contained in a single XML file generated by tax authorities. This would turn an ordinary tax invoice into a credit instrument that can be automatically used as collateral for discounting or lending. Although usage of electronic invoices is new, it represents great potential for financing, given that SMEs hold electronically tradable assets, which require no manual notifications, paper documents, or express and separate confirmations by buyers. Hence, use of electronic invoices with embedded delivery, payment, and endorsement or assignment data will directly facilitate introduction of fintech factoring and other platforms.

13. Ibid.

14. Global Market Survey: Digital Technology and the Future of Finance (Fintech Market Participants Survey) by Erik Feyen, Harish Natarajan, Guillermo Rabadan, Robert Paul Heffernan, Matthew Saal and Arpita Sarkar.

Electronic invoicing can create significant efficiencies in secured lending for SMEs, provided that the government requires commercial and financing information to be contained in the invoice and makes credit and cash invoice information available to lenders. In such cases, lenders can instantly and automatically verify that invoices an SME offers in assignment or collateral are valid and financeable—this is typically accomplished via an API connected to the lender’s core banking system or factoring platform. Lenders can also verify the existence of inventory and equipment offered as collateral by collecting invoice data from the tax authority related to the purchase of these goods. It can also enable integration with promotional programs from governments, such as sustainable production, energy efficiency, no child labor, etc.

3.2.11 Digital Payments

Digital payments are transfers of value that are made using digital or electronic devices and channels to transmit data. Digital payments include payments initiated by debit or credit card, mobile phone, computer, tablet, or wearable digital device.

Digital payments represent an essential pillar to drive financial inclusion for SMEs and consumers. Digital payments have been developed by banks and a variety of payment-service providers (PSPs) to address the limitations of cash as a payment instrument and to provide new opportunities for increased speed, safety, and convenience in a rapidly changing world.¹⁵ Digital payments can facilitate access to other financial services as well as be critical for the provision of these financial services. For instance, digital payments are essential in the process of collection of interest and principal for loans, as well as in the use of savings accounts.

Digital payments provide significant benefits to SMEs since it can lower transaction and delivery costs for merchants and lower fraud and potential chargebacks. Advances in technology such as mobile phone/internet, contactless solutions such as QR codes, Big Data analytics, APIs and biometric technologies are impacting the evolution of digital payments. These innovations have led to the development of new delivery channels and payment methods, which significantly simplify the payment process, help in customer onboarding, and improve the precision of real-time approvals.¹⁶

The transaction data generated from digital payments can be valuable to assess credit risk of SMEs, and thus help reduce the information asymmetry barrier. Fintech firms, banks, and big tech firms can use digital-transaction data as important points to evaluate the credit risk of merchants to offer loans and other financial products to small businesses that might not have had access to financing in the past. This is particularly useful in emerging and developing economies, where many small businesses lack formal financial information or may not have had access to formal financial products in the past. An example is Kopo Kopo, a fintech based in Kenya that offers digital-payment access to merchants through M-PESA. The company applies Big Data analytics to merchant payment transaction data to offer SMEs a range of value-added services, such as unsecured, short-term loans. Accelerating the development of digital payments for merchants to generate digital-transaction data can thus help countries advance overall financial access and inclusion by driving access and usage for individuals and SMEs.¹⁷

15. BIS and World Bank (2016). Payment aspects of financial inclusion. Washington, D.C. <http://pubdocs.worldbank.org/en/963011459859364335/payment-systems-PAFI-Report2016.pdf>

16. Ibid.

17. World Bank Group/World Economic Forum, Innovation in Electronic Payment Adoption: The case of small retailers (Washington, D.C.: 2016), <https://openknowledge.worldbank.org/handle/10986/24700>.

3.2.12 Credit Risk Assessment Using Alternative Data/Data Analytics

Alternative data are increasingly being used in the development of credit-risk models to assess the willingness and ability to pay off SME borrowers, contributing to expanding their access to finance. Traditional data sources for SMEs such as financial statements are being enhanced by non-traditional or alternative data sources such as mobile phone call records, utility and bill payments, digital-\ payment transactions, social media, psychometric and behavioral tests, and industry/sector information. These new data sources are extremely useful when evaluating the credit risk of SMEs, which are considered “thin file” because they may not have traditional data such as financial statements and cash-flow records. Credit-risk models are developed, based on the different alternative data sources using advanced data analytics that consist of AI and ML algorithms, making it possible to lend to SMEs that previously may not have had access to financing.

Most fintech and big tech firms that offer digital lending products to SMEs have developed their own proprietary credit-scoring models, using a combination of alternative and traditional data. For example, LenddoEFL, a Singapore-based fintech company, is one of the first companies to use psychometric tests as part of the credit-scoring model. Using more than 10,000 different data points, LenddoEFL focuses on providing credit-scoring solutions to banks and other financial institutions by evaluating the credit risk of customers, in emerging markets, who may not have had previous opportunities to borrow. Given the success of credit-risk models using alternative data, banks are building their own models and partnering with fintech firms that offer data analytics and credit risk-assessment solutions.

3.2.13 E-Commerce

The buying and selling of goods or services using the Internet via computers, tablets, or other digital devices or mobile phones has substantially increased market access for SMEs. E-commerce platforms have rich data on the cash flows and business performance of SMEs active on their platforms and may also manage their inventories.

E-commerce is helping to reduce information asymmetries, making it easier for SMEs to effectively compete with larger companies. It allows merchants, irrespective of size, gender or where they are located, to sell their products online and achieve success as long as they offer high-quality products that customers want. A 2018 World Bank study on e-commerce in rural villages of China shows that households that participate in e-commerce have per capita income 80 percent higher than households that do not participate; and e-shop workers have wage levels equal to or higher than workers in urban private industries.¹⁸ It also shows that setting up an online e-commerce firm in these rural villages only requires a high-school education, making it possible for anyone without specialized skills to be involved. In addition to democratizing access to markets, e-commerce offers other benefits to SMEs such as:

- Opportunities to access new markets and geographies, which can lead to increased sales.
- Lower operating costs and reduced purchasing and procurement costs since it does not require physical presence.

E-commerce transactions are recorded digitally, which can serve as an important data source for fintech companies, financial institutions, and e-commerce platforms interested in providing finance to SMEs. By utilizing Big Data analytics and AI and ML algorithms, these firms can track commercial transactions, inventories, and cash flows, and evaluate creditworthiness of the merchants using the platform. An e-commerce marketplace operator has visibility to customer demand, payment, and returns patterns, and may even manage inventory and fulfillment for the merchant, giving the platform unique insights into the merchant’s business viability and financing needs and control over inventory that could act as collateral for a loan. A recent trend is e-commerce platforms offering short-term digital loans to SMEs to fund their working capital needs. These loans may be based on expected future cash flows of the SME merchants by considering historical transactions, inventories managed by the marketplace, or electronic invoices from customers (factoring). For

18. World Bank (2019). *E-Commerce Development: Experience from China*. Washington, DC. Forthcoming.

instance, MercadoLibre, the largest e-commerce platform in Latin America, offers working capital loans to SME merchants on its platform in a fast and easy manner.

3.2.14 Open Banking/APIs

Open banking refers to practices or regulations that aim to make traditional financial institutions share their customers' data (after customer consent) with third parties, including fintech firms in a secure, standardized manner so that it can level the playing field between smaller companies and large financial institutions. Application Programming Interfaces (APIs)¹⁹ are used to enable third-party developers to build applications and services around the financial institution. The use of APIs for the sharing of information by banks can help boost transparency and make regulatory compliance more efficient. The main benefit of open banking/APIs is that it promotes competition and helps to break the barriers created by large financial institutions, so that fintech firms can provide access to all customers.

Open banking can enable SMEs to gain access to finance more easily and aid in their digitization through various types of open data and payment applications. Account aggregation is the first application that most people think of when open banking is mentioned, as it links financial accounts across banks and/or geographies to provide a consolidated financial position for a small business. For a financial institution, being able to access an SME owner's bank account details and transaction history provides extra information that can be used to assess the creditworthiness of the SME more effectively.²⁰ Another application is the integration of online invoice interfaces that are used to track and issue e-invoices with bank account information from SMEs, thereby enabling fintech firms and/or financial institutions to provide more customized invoice financing.

While some policymakers have taken a market-driven approach to open banking, encouraging financial institutions to promote data-sharing frameworks with fintech firms other jurisdictions have issued bespoke regulatory frameworks. In the U.S., there are no regulatory frameworks, but the major banks are aware of the strategic importance of open banking and are already developing API-based offerings in partnership with fintech companies. The Financial Services Authority (FSA) in Japan has not issued any specific regulations on open banking, but the regulator has established an authorization process for third-party providers (fintech firms) and introduced an obligation for banks to publish their open API policies. On the other hand, several jurisdictions such as the U.K., EU, and Mexico have introduced open banking regulatory frameworks.

19. APIs refers to a standard of data exchange between two parties, which provides a more secure and transparent way of communicating information between systems.

20. Asian Development Bank Institute (2019). Fintech for Asian SMEs. Tokyo, Japan. <https://www.adb.org/sites/default/files/publication/502781/adb-fintech-smes.pdf>

4. DFS Impact on Market Structure and Implications of the COVID-19 Pandemic

4.1 Digital Transformation of Incumbents

Adoption of technology by incumbent financial institutions has the potential to impact competition and market structure. Banks and NBFIs are adopting technology to better compete among each other and with new entrants such as fintech firms (see next section). They are using digital channels such as mobile apps, digitalizing internal processes, and leveraging data for credit and other analyses. These can lower the cost to reach and serve SMEs, and enable new products, as described above. Close to 90 percent of bank respondents to the Market Participants Survey expect digital transformation to help reduce costs of MSME lending.

In the absence of new entrants, technology-driven economies of scale and scope would tend to result in market concentration.²¹ Not all banks will have the ability to transform, nor move at the same pace. Those that leverage technology effectively can grow their SME customer base faster and more profitably and will benefit from economies of scale and scope from their technology investments. A bank that successfully deploys technology to serve its customers better and more profitably will have lower unit costs and lower cost of capital, as well as more data to fine tune its algorithms, further reducing its credit costs. 48 percent of bank respondents to the Market Participants Survey expected MSME lending to become more concentrated, while 31 percent anticipated less concentration.

External competition from fintech and big tech firms and challenger banks will play a role in determining market structure alongside internal transformation of the sector. In country after country, new players are entering the market and targeting SMEs. The Market Participants Survey found that 60 percent of commercial banks see a risk of losing MSME lending customers and 63 percent see a risk to the profitability of this business line due to digital transformation of the market. We turn now to the impact of new entrants.

4.2 Impact of New Competitors

DFS offered by fintech and big tech companies, and challenger or neo-banks to SMEs—normally underserved by traditional banks and other financial institutions (or not served at all)—can potentially pose a threat to traditional banks. The rapid advances in technology, combined with a customer-centric approach, are driving the development of new business models and financial products that can be offered in a faster, more efficient and convenient manner to SMEs. Digital financial products enable financial inclusion by offering financing to small businesses, which never had access to bank loans in the past. These technology innovations have opened up the financial sector to new propositions

21. “Fintech and the Digital Transformation of Financial Services: Implications for Market Structure and Public Policy (Market Structure note) by Erik Feyen, Jon Frost, Leonardo Gambacorta, Harish Natarajan, and Matthew Saal.”

and blurred the lines between pure financial services or products (as an end-product) and financial services seamlessly integrated into other services and products (as a means to an end).²² The financial sector is rapidly transforming as new players—fintech firms, big tech companies, and digital banks—offer digital financial products to SMEs to address gaps not covered by incumbents, as well as compete against them. Increased competition from the new entrants offering digital financial products could pose a significant risk that could negatively affect the profitability of incumbents, for whom SME financing represents a significant part of business. At the same time, it also offers great spaces for collaboration, where new players can introduce innovative risk-analysis methodologies with the use of technology and leverage on the higher financial capability of traditional incumbents. The impact on incumbents can be analyzed from the perspective of these new players in the market:

- Fintech firms
- Big tech companies
- Challenger or neo-banks

4.2.1 Fintech Firms

Initially viewed as a major threat to some areas of banks' business, fintech firms have focused on filling the SME financing gaps that banks did not cover due to a wide range of supply-side barriers. The use of Big Data analytics and AI/ML are making it possible to address the information asymmetry that prevented banks from providing loans to SMEs that did not have traditional financial statements or credit histories. Mobile phones/internet connectivity and cloud computing allow fintech firms to offer credit products to SMEs at anytime and anywhere, in a fast and convenient manner, without the need to travel to physical branches. By making it economically viable to offer loans to small businesses that never had access before, in theory fintech firms can create competitive pressures for incumbents. In fact, the advances in technology used by fintech firms have encouraged banks to digitally transform their operations by streamlining their loan underwriting processes and employ better and faster data-analytics systems; the benefits of digitization significantly outweigh investments in technology.

There has been a shift by banks and other financial institutions towards viewing fintech firms as partners and enablers rather than competitors. Fintech firms, which are typically small and relatively young (that is, less than 10 years of age), see significant benefits by building partnerships with banks; since fintech firms can provide access to cheap capital and market reach to more customers. Similarly, banks realize that by partnering with fintech firms that use innovative risk analysis approaches to serve SMEs, they can take advantage of the innovation expertise to grow their business, retain existing customers and attract new ones. In addition to partnerships and collaborations, incumbents are also developing their own internal fintech capabilities and investing in fintech firms. The larger banks that have significant resources are pursuing their own digitization initiatives to explore the potential benefits of using AI/ML to conduct SMEs risk analysis. At the same time, banks are also investing in fintech firms via corporate venture capital funds and direct acquisitions, to learn from firms that use their proprietary algorithms to offer financing to SMEs. The approach used by incumbents will depend on the size and available resources of the institution, their business model, and their capacity to adapt to a digital world through technology investments. For instance, smaller banks in emerging markets, which have limited technological capabilities, are developing partnerships and collaborations with fintech firms.





Other innovative ways that fintech firms are collaborating with banks is through industry sandboxes/marketplaces such as the ASEAN API Exchange (APIX), which was launched by the ASEAN Financial Innovation Network (AFIN) founded by the ASEAN Bankers Association, the Monetary Authority of Singapore, and IFC. APIX is a cross-border, open-architecture platform that enables financial institutions and fintech firms to connect through a cross-border marketplace. In this environment, fintech firms and banks can conduct collaborative experiments in a sandbox among

22. European Banking Authority. 2018. EBA Report on the Impact of Fintech on Incumbent Credit Institutions' Business Models. Brussels, Belgium. <https://eba.europa.eu/sites/default/documents/files/documents/10180/2270909/1f27bb57-387e-4978-82f6-ece725b51941/Report%20on%20the%20impact%20of%20Fintech%20on%20incumbent%20credit%20institutions%27%20business%20models.pdf?retry=1>

financial industry participants and can facilitate adoption of APIs to drive digital transformation and financial inclusion across the Asia-Pacific region. Ultimately, the partnerships created between fintech firms and financial institutions can provide SMEs better access to finance.

The impact on incumbents is expected to be moderate to low, as more fintech firms collaborate and partner with banks to deliver digital financial products to SMEs. Table 2 below summarizes the impact on incumbents for each of the digital financial products presented earlier in the section. Although there has been rapid growth of fintech firms offering digital financial products to SMEs, these products still represent a small proportion of overall credit to SMEs in most jurisdictions.

Table 2. Fintech Impact on Incumbents by SME Digital Financial Product

Digital financial product	Impact on incumbents	Comments
 P2P/Marketplace lending	Moderate	<ul style="list-style-type: none"> Investor base is evolving, with financial institutions (that is, banks, asset management firms) becoming more prominent; however, in emerging markets, consumers still represent the majority of investors The use of bank accounts is essential for the management, clearing, and settlement of customer funds
 Supply-chain financing	Moderate/Low	<ul style="list-style-type: none"> Partnerships and collaborations with banks are common, with financial institutions generally serving as the main investors/purchasers of invoices sold As it relates to trade finance, blockchain/DLT may be able to disintermediate the correspondent banks from the process, resulting in a more efficient process and allowing SMEs to gain more access to financing. Nevertheless, the technology adoption is still nascent and at early stages
 Payment card receivables financing	High/Moderate	<ul style="list-style-type: none"> Technology innovations introduced by fintech firms make it possible to easily track and automatically set up payments from a portion of the merchant's cash flows However, integration with the SME's bank accounts is essential for this product to work
 Equity crowdfunding	Low	<ul style="list-style-type: none"> Equity crowdfunding serves as an alternative source of equity capital for SMEs, when compared to VC firms Restrictive regulations have limited the growth and scale up of equity crowdfunding platforms Equity crowdfunding only provides capital to SMEs and startups, while VC firms may provide additional benefits such as mentorship, training, and networking.

Source: World Bank staff.


4.2.2 Big Tech Companies

Unlike fintech firms, big tech companies offering digital financial products are well capitalized, have well established networks, a very large customer base, and access to substantial amount of customer data, which can pose a significant threat to traditional banks. Companies such as Alibaba, Amazon, Tencent, Facebook, Mercado Libre, and others have ventured into providing financial products and services to small businesses through digital means. Due to their sizeable customer base, extensive amount of capital, access to the leading technologies to process Big Data, and the use of proprietary customer data from their non-financial service operations, big tech firms enjoy some competitive advantages over incumbents. In advanced economies and markets with advanced payments systems, big tech companies' financial activities are generally focused on electronic payments and tend to complement the activities of existing financial institutions.²³ For instance, in Kenya, M-PESA has over 20 million active users in payments and has partnered with banks to offer credit and deposit products through M-Shwari. On the other hand, in emerging markets, big tech firms provide a broader range of financial services such as digital lending, insurance, and asset management. For example, e-commerce platform Mercado Libre is offering working capital loans to merchants on its platform and is also experimenting with asset-management and insurance products. The variation could be due to a variety of reasons such as the high degree of brand recognition associated with their existing core technology businesses, the approaches to financial regulation, and the penetration of financial services across different geographies.²⁴

Big tech companies are interacting with incumbents by competing directly as well as building partnerships with them. Direct competition by big tech companies is generally more prevalent in emerging markets where financial systems are at an earlier stage of development, and there is a lower penetration of financial services. Therefore, big tech companies can provide financial services directly to consumers and SMEs. In advanced economies, big tech companies generally provide financial services in partnership with financial institutions. This may be in part due to regulatory considerations (that is, legal separation between banking and commercial activities) as well as the greater penetration of financial services in some jurisdictions making it more difficult for big tech firms to challenge traditional banks.

Big tech companies' impact on traditional banks can be high, particularly in value-chain and asset-financing products for SMEs. By harnessing their large existing customer bases and technological infrastructure, big tech companies can distribute loans to SMEs without the cost of having a physical branch. In addition, advanced analytics allows big tech firms to leverage large amounts of data from e-commerce and social networks to compensate for a lack of credit history, collateral, and other factors that typically limit the provision of small business loans.²⁵ Table 3 below summarizes the impact on incumbents for each of the digital financial products presented earlier in the section.

Table 3. Big Tech Companies' Impact on Incumbents by SME Digital Financial Product




Digital financial product	Impact on incumbents	Comments
 P2P/Marketplace lending	Not applicable	<ul style="list-style-type: none"> Big tech firms typically provide financing to SMEs using their own capital and thus do not get involved in serving as an intermediary between investors and borrowers

23. FSB (2019). Big Tech in Finance: Market Developments and Potential Financial Stability Implications. London, UK. <https://www.fsb.org/wp-content/uploads/P091219-1.pdf>

24. Ibid.

25. Ibid.

Table 3 continued

Digital financial product	Impact on incumbents	Comments
 Supply-chain financing	High	<ul style="list-style-type: none"> Using their e-commerce platforms, big tech firms can offer working capital loans to merchants by evaluating their transactions with customers and using this data to assess their credit risk. This approach allows merchants to gain access to financing, which they were unable to obtain in the past from traditional banks
 Payment card receivables financing	Medium/High	<ul style="list-style-type: none"> Like supply-chain financing, merchants and small business owners that are part of large e-commerce platforms can easily access financing without having to use traditional banks However, integration with the SME's bank accounts is essential for this product to work
 Equity crowdfunding	Not applicable	<ul style="list-style-type: none"> Big tech firms have not expanded in this area; at the moment, only fintech firms provide equity crowdfunding solutions.





4.2.3 Challenger Banks or Neo-Banks

Challenger banks and neo-banks are increasing in number in both advanced economies and emerging markets, directly competing against traditional financial institutions. Challenger banks, because they are recent greenfield institutions, and neo-banks, because they are fintech-first, use the latest digital technologies to offer a better banking experience at lower cost. Like fintech firms and big tech companies, challenger and neo-banks use new types of data to determine creditworthiness and target the segment of SMEs that are underserved by banks. Some challenger and neo-banks are offshoots of large e-commerce players, and leverage data from those platforms; MYbank in China is an example. Challenger and neo-banks are tuned to analyze this data and issue credit much faster—and at much lower underwriting and servicing costs—than traditional banks. This is especially true for those niche markets such as MSMEs, which fall outside of the risk appetites of many traditional banks. A number of prominent challenger banks are based in the U.S., Europe, and the United Kingdom, where regulators welcomed entry of licensed challengers to foster competition. A number of prominent neo-banks have emerged in Latin America and Southeast Asia. NuBank, based in Brazil, had more than 48 million customers and a market capitalization larger than any Brazilian bank at its listing in 2021, but operated as a payment services institution rather than under a full banking license. Given the demand for broader services to compete with traditional banks, and consistent with the rebundling trend described in the Market Structure note of this series, many neo-banks apply for banking licenses in their respective countries. Fairmoney in Nigeria, for example, started as a lending platform and then obtained a microfinance bank license.

Challenger banks' impact on incumbents is high for most of the digital financial products offered to SMEs. Table 4 provides a summary of the impact that challenger banks would have on traditional financial institutions. In general, digital banks compete directly with traditional banks, and thus present a significant threat to these institutions across the entire

product spectrum. However, one advantage that traditional banks have over challenger banks is well-established brands and a longer operating history. While challenger banks may provide significant advantages in terms of convenience, efficiency, and lower costs, these companies are still fairly young and just starting to build their brands. Also, many challenger banks are still to experience a financial crisis, so it is difficult to know how they will be able to cope during economic downturns.

Table 4. Challenger Banks' Impact on Incumbents by SME Digital Financial Product

Digital financial product	Impact on incumbents	Comments
 P2P/Marketplace lending	High	<ul style="list-style-type: none"> Challenger banks can offer marketplace lending by partnering with fintech firms. With banking licenses, digital banks can play the role of custodian of accounts, originally done by the traditional banks
 Supply-chain financing	High	<ul style="list-style-type: none"> Challenger banks can offer working capital financing to SMEs, similar to big tech companies and, in some cases, partner with e-commerce platforms to do so
 Payment card receivables financing	High	<ul style="list-style-type: none"> By partnering with e-commerce firms, challenger banks can offer merchants and small business owners access to financing without having to use traditional banks
 Equity crowdfunding	Not applicable	<ul style="list-style-type: none"> Challenger banks have not expanded in this area. Currently, only fintech firms provide equity crowdfunding solutions.

Source: World Bank staff.

4.3 The Impact of the COVID-19 Pandemic on SMEs and Alternative Lenders, and the Crucial Role of Digital Financial Services

Globally, the COVID-19 pandemic is disproportionately affecting SMEs, causing numerous businesses to close down and/or layoff staff. In an economic crisis, SMEs are generally more vulnerable than large corporations due to the usually very thin liquidity cushions available to them to bridge sharp falls in volumes of business and income. As a result of the COVID-19 pandemic, many small businesses have reported that they have only a few months of cash reserves to survive. Based on a recent survey, one-quarter of small businesses have already temporarily shut down in the U.S. and 54 percent of all small businesses indicated that they are closed or could close due to the economic impact of the pandemic.²⁶

Many firms have turned to digital platforms to adapt to the negative shocks. As captured in World Bank Business Pulse Surveys conducted in several markets,²⁷ since the beginning of the pandemic, firms have increased adoption of digital platforms, with a smaller proportion investing in digital solutions or repackaging their product mix. The uptake of digital platforms is generally higher among large firms, firms in services sectors, and those located in large cities.

To support SMEs during this crisis, governments around the world are implementing a variety of measures ranging from grants to concessional loans, employee subsidies, VAT reductions, and payroll-tax deferrals. Specifically, support measures include direct grants to businesses and different debt-financing instruments, such as concessional loans with delayed repayments, reduced/no-interest loans, and credit-guarantee schemes. In addition, different government programs are supporting firm employees through wage subsidies, labor training subsidies, and subsidies for employee sick leave. Other types of support include payroll, social security, and VAT reductions and deferrals. Speed of execution is critical to provide the assistance that SMEs need.

Leveraging the use of digital lending is important to help SMEs obtain the funding and support they need in a timely manner. Governments around the world have implemented relief schemes in the form of loans to small businesses, which are mainly distributed through traditional channels. However, digital lending platforms offer a few advantages over banks such as faster application, review, and approval processes conducted online and through mobile devices. Even though they can move faster than banks, only a few of the largest digital lending platforms have been admitted to the relief schemes due to restrictive financial regulations in many countries. On the other hand, Chinese digital lending platforms have built extensive partnerships with banks and other financial institutions to distribute relief schemes. One example is the partnership that MYBank and Alipay created with more than 100 local Chinese banks to offer small street vendors in Wuhan; loans that are fully digital and quick. MYBank has already disbursed loans to more than 350,000 merchants and is waiving interest rates for the first month.²⁸

Although the P2P-lending sector is diverse with different business models, some shared characteristics that make them so valuable for SME access to finance also make them vulnerable in times of crisis. Their clients are weaker, investors tend to fly quickly, and access to new funding becomes limited when a crisis hits. Fintech alternative lenders typically serve micro and small businesses which, as already mentioned, have limited cash buffers. Any drop in their clients' earnings quickly affects the repayment of loans, pressuring the quality of lenders' portfolios. Reports show that a growing number of small businesses have been requesting payment holidays or restructurings due to business difficulties caused by the COVID-19 pandemic. This is curbing new lending, increasing interest rates, and in some cases,

26. U.S. Chamber of Commerce. April 3, 2020. "New U.S. Chamber- MetLife Poll: One in Four Small Businesses on Brink of Permanent Closure, Half Eyeing Temporary Shutdown." <https://www.uschamber.com/press-release/new-us-chamber-metlife-poll-one-four-small-businesses-brink-of-permanent-closure-half>

27. World Bank. 2020., Business Pulse Survey. Impact of COVID-19 on firms in Vietnam. <https://openknowledge.worldbank.org/bitstream/handle/10986/34580/Results-from-the-First-Round-of-COVID-19-Business-Plus-Survey.pdf?sequence=1&isAllowed=y>

28. Mobile Payments Today. "Alipay launches recovery assistance for Wuhan merchants." April 9, 2020. <https://www.mobilepaymentstoday.com/news/alipay-launches-recovery-assistance-for-wuhan-merchants/>

leading to cost-cutting, including furloughing of employees of P2P lenders. Heightened risk aversion can reduce/has reduced investor appetite for lending to small businesses through alternative-lending platforms, leading to a reduction in lending volumes. Many investors are trying to sell their investments through bulletin boards offered by some platforms. However, sales are taking longer, and some platforms have even stopped such facilities in an effort to stabilize this run to the bottom. Unlike commercial banks, alternative lenders do not have access to retail deposits. As investors reduce their exposure to risk during the crisis, alternative lenders are facing constraints to obtain the necessary funds to continue lending to small businesses or offer restructuring of existing loans.

5. Challenges of Digital Financial Services for SME Financing

Fintech solutions are enabling increased financial inclusion and access for SMEs by addressing the main supply-side barriers. However, there are many challenges for the adoption and usage of these solutions. Some issues are more prevalent in those emerging markets, which have less-developed digital infrastructure and systems/processes in place. Many challenges and risks apply both to consumers and SMEs. Below are specific challenges related to the various fintech solutions described in section 3.

5.1 Digital Payments

Lack of interoperability between payment system providers can negatively impact adoption of digital payments by SMEs. Interoperability refers to the ability of different IT systems, software, and devices to access, exchange, and use information seamlessly in real time, so that all participants can operate across all systems. Without interoperability, it is difficult to scale up the use of digital payments since it is only limited to a particular payment service provider (PSP) network. The result is higher operating costs for merchants and small businesses, since it would require more point-of-sale terminals that may be expensive to maintain.

Potential fraud and theft are important risks for SMEs to consider when adopting digital payments. Since most digital payments are nearly instantaneous, fraudsters may be able to withdraw funds before the fraudulent activity is spotted. In addition, the proliferation of new devices such as mobile phones and IOT-connected devices represents potential areas of vulnerability that hackers can exploit.

5.2 Credit Risk Assessment Using Alternative Data/Data Analytics

There are challenges and risks associated with the use of alternative data to develop credit-risk models. Some of the risks and challenges include the following:²⁹

- Unintended side effects such as potential for discrimination and bias
- Opaqueness of the credit-scoring methodologies
- Minimum thresholds are set at levels to lower collection and submission costs, which tend to exclude SMEs and individuals in the informal sector
- Non-compliance with credit laws and regulations.

29. GPFI, 2018. "Use of Alternative Data to Enhance Credit Reporting to Enable Access to Digital Financial Services by Individuals and SMEs operating in the Informal Economy. Buenos Aires." Argentina. https://www.gpfi.org/sites/gpfi/files/documents/Use_of_Alternative_Data_to_Enhance_Credit_Reporting_to_Enable_Access_to_Digital_Financial_Services_ICCR.pdf

AI/ML algorithms could have bias in training data, such as gender, race, or ideological biases, as well incomplete or unrepresentative datasets, which will limit their ability to be objective and exclude groups of people and/or businesses from accessing digital lending products.³⁰ AI/ML algorithms sometimes operate in a “black box”, failing to provide details as to how they gather and use the data for identifying prospects, credit ratings, scoring, and credit approval.³¹ This feature makes it more difficult to explain solutions, compounding the impact of potential discrimination by making it harder to establish safeguards.

5.3 P2P/Marketplace Lending

Specific P2P/marketplace lending challenges are the lack of understanding of the risks involved by investors/borrowers and the potential for fraud committed by platform operators. Without an appropriate regulatory framework, legitimacy and quality of platforms is hard to establish, especially in the fast moving and evolving environment with many new players coming on to the market. The absence of effective supervisory frameworks increases appeal of moral hazard, which can lead to actions that defraud investors. Another significant challenge comes from the fact that platforms advertise investing to many retail investors with potentially low level of financial education. Investors tend to focus on expected returns rather than on the higher risk of default. They often ignore, or do not understand, that the investments are not protected by deposit insurance schemes. At the same time, the standard of disclosure of key facts including fees and terms and conditions of the loans to the borrowers is usually lower than what established financial consumer protection standards in a given jurisdiction might require. This creates a risk of increase of inappropriate borrowing with potential detrimental impact on individual borrowers.

To attract investors to this higher-risk investment business, P2P/marketplace-lending platforms depend on the positive business culture and existence of anchor investors, as opposed to traditional risk-mitigating methods, usually utilized through traditional wealth building or conventional investment mechanisms. Such positive business culture involves trust in institutions, leverages positive effects of peer pressure, good payment culture, efficient debt enforcement procedures, and generally well-developed credit infrastructure. It is therefore important for the markets that lag behind in some of those aspects to continue focusing on system-wide reforms in addition to creating specific P2P/marketplace lending regulatory envelopes.

In many jurisdictions, P2P/marketplace-lending platforms are not required to report their SME borrowers' loan performance to credit-reporting service providers.³² This issue is intensified by the inability of P2P/marketplace lenders to access credit-reporting services or their unwillingness to share proprietary client data due to potential concerns regarding competition. Therefore, some P2P/marketplace-lending platforms do not adequately report loan repayment information to major credit bureaus or consult credit bureau data when underwriting a loan.³³

30. Deloitte, “Banking on the bots: unintended bias in AI”. <https://www2.deloitte.com/uk/en/pages/financial-services/articles/banking-on-the-bots-unintended-bias-in-ai.html#>

31. GPFI, SME Finance Forum, Alternative Data Transforming SME Finance (Washington, DC: 2017). http://www.smeffinanceforum.org/sites/default/files/post/files/AlternativeFinanceReport%20low_res.pdf

32. GPFI, SME Finance Forum, Alternative Data Transforming SME Finance. (Washington, DC: 2017). http://www.smeffinanceforum.org/sites/default/files/post/files/AlternativeFinanceReport%20low_res.pdf

33. Accion, Responsible Digital Credit: What does Responsible Digital Credit look like? (Washington, DC: 2018). https://content.centerforfinancialinclusion.org/wp-content/uploads/sites/2/1970/01/Responsible_Digital_Credit_FINAL_2018.07.18.pdf

5.4 Supply Chain/Accounts-Receiveable Financing

There are a few challenges/obstacles that may hinder the growth of factoring to SMEs from fintech platforms, which can be addressed by regulatory reforms. Factoring relies on evidence that the sale transaction took place and on the historical performance of the sale and payment relationship between the seller and buyer. In developing countries, however, established practices and the lack of modern factoring frameworks and technology, permit factoring exclusively of confirmed receivables. In most economies this means that factoring can take place only in cases where the payer (typically a large buyer) is willing to: (i) confirm its payment obligation, (ii) authorize the factoring transaction, and (iii) commit to paying the factor at date of maturity. As a result, a factor must conduct invoice-by-invoice due diligence to ensure the payer's confirmation is attached to each invoice, which implies additional time, expense, and often notarization and paper-based techniques. This invoice-by-invoice confirmation limits bulk financing of receivables and the use of fintech, even in cases where the payer is willing to provide the authorizations mentioned. By contrast, regulatory best practices facilitate the use of factoring by eliminating buyer discretion on the three points mentioned above: (i) making it legally possible for SMEs to assign non-confirmed invoices, (ii) invalidating non-assignment clauses imposed by buyers, and (iii) making it obligatory for buyers to pay a factor that acquired an invoice, regardless of whether the invoice was confirmed, or its assignment authorized.

The biggest challenge in reverse factoring is obtaining the buyer's willingness to both participate in the factoring transaction and, in fact, initiate a client relationship with the financial institution on behalf of its SME supplier. In most jurisdictions, buyers are confronted with significant practical and legal disincentives to do so, given that bank regulation often treats reverse factoring as a line of credit to the anchor buyer—rather than as the purchase of commercial debt from the seller. In practical terms, this means that a buyer must apply for a loan to finance invoices it must pay to its SME suppliers—converting the commercial debt it owes to the SME into a financial debt it now owes to a bank. This forces the buyer to carry the loan (for which it is not the beneficiary) on its books, reducing its ability to obtain credit from other sources for its own operations.

The lack of a secured transactions framework and modern collateral registry are major challenges for the adoption of secured revolving lines of credit by SMEs. Secured revolving lines of credit require the taking of a security interest in present and future collateral and its proceeds; that is to say, in the physical and financial transformation of movables, for example the transformation of raw materials into finished products, the post-sale transformation of finish products into accounts receivable, or the post-payment transformation of accounts receivable into cash on deposit. In turn, the amount available to the SME under the line of credit is directly tied to the quality and quantity of fluctuating collateral. The end result is a continually fluctuating loan, secured by a floating lien, over a continually transforming pool of collateral. The advantage of this credit product is that it can provide financing for the entire (pre and post-sale) commercial cycle of the SME, as opposed to factoring and reverse factoring, which can be used only to provide liquidity to an SME after a credit sale has taken place. Considering these requirements, however, a government that wishes to provide secured revolving lines of credit for SME financing must invest in the development of a complete secured transactions framework, including the adoption of a secured transaction law, based on international standards and best practices, which unifies all types of security devices, facilitates creation, and establishes the rights and obligations of the lender and the borrower.

5.5 E-Invoicing

For e-invoicing systems to facilitate SME lending, the electronic invoice must contain not only tax and accounting information, but also commercial and financing information. Financing information includes date of remittance, date of receipt, acceptance by buyer, and assignment or endorsement by supplier, and was historically recorded on the invoice,

for example, by the buyer stamping “received” and the supplier physically signing or endorsing a transfer on the back of the invoice. As many economies move toward electronic invoicing, however, tax authorities in charge of implementation often only convert the tax and accounting elements from the paper invoice into the electronic version and are frequently hesitant to include commercial/financial elements—often considered to reside outside tax authorities’ mandate. Adding these credit infrastructure aspects and making this information available to financial institutions can be significant enablers for SME financing and allow the use of e-invoices as collateral and for factoring via fintech systems.

5.6 Equity Crowdfunding

Development of equity crowdfunding as a viable finance alternative depends on a combination of several factors, including favorable market circumstances, enabling regulatory framework, incentivizing the tax system, and positive business culture. Markets with an environment of low returns on traditional investments and where acceptance of online social networking for doing business is high, show higher promise for equity crowdfunding. Regulatory environments that legitimize the business, provide adequate investor protections, and efficiently protect minority-shareholders, create a facilitative environment and decrease legal uncertainty. Another observed precondition is the existence of a savings/investing culture among retail investors riding on investments of anchor investors as well as a steady stream of investment opportunities (startups supported by accelerators and incubators coming to market).

Strict regulatory requirements negatively impact the scale up of equity crowdfunding platforms as a source of capital for SMEs. Since equity crowdfunding involves the issuance of equity capital to investors, the platforms and SME issuers are required to follow general securities law in most jurisdictions. This imposes strict limits on who can intermediate the investment (the platforms), who can issue the securities and under what circumstances (the fundraisers; in this case, the SME), and who can invest in this form of equity (investors). This has proven to be burdensome, effectively preventing equity crowdfunding from developing.

On the other hand, relaxing typical capital-markets regulatory risk mitigants to decrease the costs of the activity tends to increase the chance of those risks hurting investors. The ultimate risk of investing is losing the investment in part or entirely. This is exacerbated for retail investors with crowdfunding because of specific crowdfunding features that can be grouped in the following four categories:

- Investor inexperience and higher risk nature of investee companies
- The nature of securities being issued—illiquid and hybrid
- Lack of reliable information and misleading marketing practices
- Platform business conduct issues.

Regulators introducing specific rules for crowdfunding activities recognize these risks and respond to them by trying to balance investor protection measures with the costs of regulation for providers and issuers.

5.7 E-Commerce

Potential monopolistic behavior of large e-commerce platforms may discourage SMEs from participating in these platforms, which could result in lower access to finance. Currently, Amazon and Alibaba are the two largest e-commerce platforms globally; Amazon captures more than half of all online retail sales in the U.S. and approximately

14 percent of worldwide online retail sales.³⁴ Alibaba currently captures 53 percent of all online retail sales in China, and more than 55 percent of all online retail sales globally.³⁵ Due to their dominant market position, there is a risk that these companies may use their market power to pressure small merchants to agree to their terms, even if they may not seem reasonable. For instance, in China there have been cases where merchants in Alibaba's Tmall platform were allegedly punished by steps to cut traffic to their storefront when the merchants refused to sign an exclusive contract with Alibaba.³⁶

34. Statista. "Global retail e-commerce market share of Amazon from 2016 to 2019." 2019. <https://www.statista.com/statistics/955796/global-amazon-e-commerce-market-share/>

35. eMarketer. "China to Surpass U.S. in Total Retail Sales." 2019. <https://www.emarketer.com/content/china-to-surpass-us-in-total-retail-sales>




36. CNBC. "At war with Alibaba: Top brands fight China e-commerce giant." CNBC website. April 23, 2018. <https://www.cnbc.com/2018/04/23/at-war-with-alibaba-top-brands-fight-china-e-commerce-giant.html>

6. Policy and Regulatory Recommendations³⁷

6.1 Policy and Regulatory Recommendations for Foundational Elements




Policy and regulatory advances can help increase use of fintech solutions for SME access to finance. Table 5 below summarizes the key foundational elements, corresponding policy, and regulatory recommendations and potential action items.

Table 5. Policy and Regulatory Considerations for Foundational Elements

Foundational elements	Policy and regulatory recommendations	Potential actions
 <p>Digital financial literacy and awareness of DFS</p>	Implement digital financial education programs for SMEs highlighting the benefits of DFS	<ul style="list-style-type: none"> • Build trust and promote benefits of using digital financial services • Protect consumers and SMEs from vulnerabilities around new types of exclusion • Ensure coordination between public authorities and private and not-for-profits, given the numerous private and public initiatives that might be in place in a country
 <p>Digital infrastructure</p>	Invest in digital infrastructure and make it affordable to achieve widespread internet access and usage	<ul style="list-style-type: none"> • Ensure “last mile connectivity” and complement offline solutions with online ones to cover absence of connectivity • Enhance competition in broadband internet to increase speed and reduce cost
 <p>Financial supervision and regulation</p>	Establish financial regulatory frameworks that encourage financial innovation while at the same time minimize risks created by digital financial products	<ul style="list-style-type: none"> • Balance enabling financial innovation and address policymakers and regulators’ mandate of preserving financial integrity, guaranteeing consumer protection, and maintaining financial stability

37. While most recommendations fall under the purview of financial regulators and supervisors, in some cases, coordination with other authorities would be essential.

Table 5 continued

Foundational elements	Policy and regulatory recommendations	Potential actions
 Identity	Develop and implement robust, secure, and universally accepted company Identification/ registration frameworks for SMEs	<ul style="list-style-type: none"> • Ensure universal coverage and accessibility • Promote open standards and vendor neutrality
 Data privacy and data protection	Establish data protection and data privacy regulations that adequately address cybersecurity risks	<ul style="list-style-type: none"> • Regulations should guarantee that SMEs own their data and that appropriate rules are in place for the use and security of their data
 Fraud and cybersecurity risks	Establish data protection and privacy regulations that adequately address cybersecurity risks	<ul style="list-style-type: none"> • Establish and maintain a cybersecurity framework to guide fintech firms, financial institutions, and digital solution providers as to what is expected of them and proportionate to risk.

Source: World Bank staff.

6.2 Specific Policy and Regulatory Recommendations for Fintech Solutions

Specific policy and regulatory recommendations should be considered to address the challenges and risks and the enablers of fintech solutions presented in section 4. These policy and regulatory recommendations can be summarized and grouped into the following thematic areas:

- Improve availability of SME information, expand credit information sharing, support efficient and widely accessible digital-payment systems
- Develop modern credit infrastructure frameworks to support the introduction of fintech asset-based lending products for SMEs
- Support growth and development of debt and equity capital platforms to improve SME access to finance through regulatory frameworks that balance innovation with investor/consumer protection.

Improve availability of SME information, expand credit information sharing, and support efficient and widely accessible digital-payment systems

Ensuring that alternative data is used responsibly, consistent with consumer protection laws, would be helpful to mitigate concerns related to potential biases and the explicability of the results of some AI models. The use of alternative data, combined with advanced data analytics and AI/ML, are reducing information asymmetry and making it possible to assess the credit risk of SMEs that did not have access to finance in the past. However, cases of biases have emerged that can result in financial exclusion. Therefore, it is important to establish policies or regulatory principles

that guide the responsible use of data, consistent with consumer protection laws, and encourage the use of AI models/ systems that are explainable, so the methodology is transparent and easy to understand. Potential actions that regulators can take are as follows:

- Encourage access to information in a non-discriminatory manner to market participants
- Consider establishing or adopting policy and regulatory principles that guide the responsible use of data and/or create a code of ethics for fintech platforms to follow³⁸
- Encourage international cooperation for a trustworthy AI
- Promote automation of SMEs data collection to help to increase availability and quality of data and ensure that the data remain updated and readily accessible.

Develop modern secured transactions frameworks to support the introduction of fintech asset-based lending products for SMEs

Secured transactions reforms, particularly a factoring law, which allows assignment of receivables without the buyer's confirmation and authorization and obligates the buyer to pay the factor after an assignment, can correct challenges to SME financing. In jurisdictions that do not count with modern collateral registries, factors may also be unable to determine the existence of previous liens over receivables, adding uncertainty and costs to factoring transactions. To eliminate the risk of double assignment, a country should consider the establishment of a modern collateral registry to notify third parties once an invoice has been previously factored or otherwise assigned. Electronic invoicing systems currently in place or under development in many economies can also facilitate fintech enabled factoring by allowing electronic invoices to be traded directly via platforms, eliminating the costs and complexities of paper-based systems. As a result, to facilitate factoring, governments should consider adopting a modern factoring law and collateral registry, move toward the development of electronic invoicing, and update bank regulation to recognize assignment of receivables.

The development of modern secured transactions frameworks helps the introduction of asset-based lending products for SME financing based on movable assets. The large-scale introduction of SME financing products based on invoices, accounts receivable, and electronic payments require secured transactions and factoring laws, based on international standards and best practices, to regulate the creation and operation of secured loans, to establish the rights and obligations of the parties, and to establish enforcement remedies in case of default. These products also require modern collateral registries to establish priority in favor of the first lender to register a loan or factoring transaction, and to provide notice of previously recorded liens to interested third parties, who may otherwise lend against or acquire encumbered movables.

The establishment of regulatory frameworks that enable use of electronic invoices for trading or collateral can facilitate the adoption and use of supply-chain financing solutions for SMEs. In a large number of economies, account receivables are represented exclusively in credit invoices. When said invoices are paper-based, they contain information on the date, sale amount, seller, buyer and payment terms. This information is used for accounting and tax purposes. Paper-based invoices in these economies, however, also allow the capturing of information related to use of the invoice as collateral or for factoring, including date of remittance, receipt, confirmation, and endorsement or assignment. This is usually done through a series of stamps, notations, or signatures on the paper invoice itself (stamps usually on the face of the invoice and notations or signatures on the back). As a rapidly growing number of tax authorities have developed or find themselves in the process of developing electronic invoicing systems, they logically focus on capturing the data needed for tax collection and ignore the data required for financing. Tax or other relevant authorities in these economies, however, can develop regulatory and technological frameworks that allows e-invoices to be traded or used

38. GPFI. 2018. "Use of Alternative Data to Enhance Credit Reporting to Enable Access to Digital Financial Services by Individuals and SMEs operating in the Informal Economy." Buenos Aires, Argentina. https://www.gpfi.org/sites/gpfi/files/documents/Use_of_Alternative_Data_to_Enhance_Credit_Reporting_to_Enable_Access_to_Digital_Financial_Services_ICCR.pdf

as collateral, including capturing data on the remittance, receipt, acceptance, assignment, and or endorsement of the invoice—as was the case with its paper precursor. To do so, a regulatory framework would need to encrypt information on the receipt and/or confirmation of the invoice by the buyer, as well as add a data field for assignment. The development and recognition of electronic signatures for these purposes would also be required. Alternatively, some economies have developed invoice registries (or created interoperability in cases where collateral registries have been developed), which provide notice of assignment of an invoice or its use as collateral. From a practical standpoint, adding these regulatory and technological features to the e-invoice has the effect of digitizing the account receivable represented therein and to allow for its effective use in factoring, reverse factoring, secured revolving lines of credit, and other ABL credit products.

To facilitate reverse factoring, governments should consider reforming bank regulation to treat reverse factoring as the true sale of commercial debt, and not as the issuance of financial debt. In jurisdictions that do not have modern collateral registries, factors may also be unable to discover liens over receivables adding uncertainty and costs to reverse factoring transactions. In these cases, governments should develop a collateral registry to publicize all liens over receivables.

Secured merchant advances require robust secured transactions frameworks, including a law based on international standards and best practices, a modern collateral registry, extrajudicial enforcement systems, and bank regulation that categorizes payment card receivables as eligible collateral. They also require advanced data collection on the historical performance of an SME's electronic payments, accurate algorithmic projections of future receivables, as well as robust collateral monitoring and collection systems.

There are a number of concrete actions government policy makers can take to support the introduction of asset-based lending products that leverage fintech solutions for SME lending. Some of these measures include:

- Conduct market assessments to determine the potential impact of SME lending using movables as collateral
- Update legal frameworks on secured transactions, leasing, and factoring, based on international standards and best practices, to permit the effective use of movables
- Develop online collateral registry systems that provide real-time transparency to financing transactions based on movables
- Leverage current secondary markets for trading movables-based securities and for the disposition of collateral after default
- Measure credit-risk mitigation provided by modern secured transactions and fintech frameworks to determine potential increased lending to SMEs using technological platforms and movable collateral
- Develop, facilitate, and launch public and private sector platforms for receivables trading and collateral monitoring
- Provide incentives to lenders to develop innovative credit products for SMEs based on updated legal and technological frameworks. For example, a more reasonable treatment in risk weighting of assets by supervisors, and other ways that eliminate excessive capital requirements.

Support growth and development of debt and equity capital platforms to improve SME access to finance through regulatory frameworks that balance innovation with investor/consumer protection

There are a growing number of jurisdictions around the world that have established specific regulatory frameworks for P2P lending, which balance the facilitation of further industry growth with investor/consumer protection measures. Some of these measures include:

- Licensing requirements
- Minimum paid-up capital requirements
- Corporate governance and conflict of interest standards
- Business continuation strategies and contingency measures

- Consumer protection standards—obligations to treat consumers fairly
- Rules ensuring transparency and enabling investors to make informed decisions
- Ringfencing client funds.

In times of crises, policymakers should additionally consider measures to provide immediate financial and policy support that reduces negative effects on P2P lenders and the small businesses they serve. These measures can include:

- Granting equal access to programs offered to conventional lenders
- Allowing P2P lenders to participate in relief programs and subsidized lending to help small businesses weather the crisis
- Including P2P lenders in regulatory relief initiatives.

Governments could consider extending liquidity facilities on an equal basis to some P2P lenders; this can enable them to continue serving small businesses and facilitate debt restructuring. Clear eligibility criteria—based on prudential, market conduct and business model parameters, such as the funding structure and the type and size of clients—would ensure that the support aligns with policy objectives. They should also consider offering P2P lenders access to programs such as loan guarantee schemes, with terms and conditions that foster sound lending. However, these measures need to be carefully assessed, given their monetary or fiscal impact. In times of crises, governments could also consider using regulated P2P lenders as partner institutions for distribution of relief funds to small businesses, leveraging their existing digital capacity and efficiency. Speed and efficiency of distribution, as well as increased competition with incumbent institutions that typically channel these funds, would bring direct benefits to small businesses while simultaneously increasing the transparency of government relief programs and supporting P2P lenders.

With growing realization of the potential role of equity crowdfunding for SMEs, regulators around the world are starting to seek ways to encourage the development of the service by reducing regulatory costs, without compromising investor protection. Existing securities laws are usually considered to be disproportionate for small activities like crowdfunding and not fit for the purpose. This is leading a growing number of regulators on a path toward creating a specific regulatory regime for equity crowdfunding activities (for example, Brazil, Dubai, EU, and Malaysia) or introducing exemptions into existing capital market regulations (Australia, U.S.). Relaxing existing regulatory requirements, traditionally serving as capital markets' risk mitigants, naturally increases the chances of negative impact of those risks to investors. To create a balance between facilitation of development of the industry and investor protection, policy makers should consider the following actions:

- Provide definitions of permissible activities for crowdfunding platforms
- Introduce licensing requirements for platforms
- Establish minimum paid-up capital requirements
- Establish corporate governance and conflict of interest standards
- Define permissible activities for investors, investee companies and platforms
- Ensure investor protection standards including disclosure and reporting rules for SME issuers.

The key is to strike a good balance, reflecting the realities of a particular market, protecting retail investors on one hand (for example, by limiting their exposure related to their net worth), while keeping costs down (for example, through less onerous issuer reporting requirements) and creating attractive investment opportunities. A tiered risk-based approach should be considered for this purpose.

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