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FinTech Competition in Lending

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1. Introduction

Information technology (IT) is transforming the financial sector, disrupting both markets and intermediation. Artificial Intelligence (AI) is accelerating the process. This disruption spans new payment systems, decentralized finance, and the application of Machine Learning (ML) to large datasets for credit assessment. It is reshaping the provision of banking services, asset management, and trading. At the core of this revolution lies the accumulation and processing of data—particularly the ability to convert soft, qualitative information into hard, codifiable data.

While IT offers clear efficiency gains—such as faster and cheaper payments, improved loan screening and processing, and new services—it also raises concerns about financial stability, privacy, and broader welfare implications. Digital technologies have expanded market reach by promoting financial inclusion, especially in underserved populations and less developed financial systems. At the same time, they enable more precise customer segmentation, which facilitates not only personalized services but also fine-grained price discrimination.[1] The empirical evidence on IT's impact is mixed, particularly regarding loan pricing, the substitutability or complementarity of fintech and bank credit, loan defaults, and the consequences of data sharing.

Digitalization introduces new tensions in the classic trade-off between competition, efficiency, and financial stability. These now include a trade-off between competition and privacy: increased data disclosure can boost competition but may compromise privacy and enable price discrimination. A similar tension exists between financial stability and privacy, as greater disclosure to regulators may enhance stability at the expense of confidentiality, a trade-off that we do not address here.

A key policy question is whether—and to what extent—the competitive playing field should be tilted in favor of new entrants to enhance contestability. Open banking initiatives are a case in point, which support entry by mandating data sharing between incumbents and third-party providers at the customer's request. For instance, the California Consumer Privacy Act (CCPA), implemented in 2020, grants consumers control over their data, protecting their privacy while allowing for the collection of information. In the EU, the General Data Protection Regulation (GDPR) stipulates that data must only be used for the original purpose for which it was collected.

[1] IT raises concerns about monopolization due to network effects and the exploitation of dynamic economies of scale resulting from data accumulation and efficient processing by Big Tech platforms; however, we will not address this issue.

Moreover, regulatory asymmetries exist: incumbent financial institutions must comply with the Payment Services Directive (PSD2), which requires them to facilitate data sharing upon customer request, while new entrants are subject to the GDPR and must support data portability only when technically feasible. The Digital Markets Act (DMA), however, seeks to address these imbalances by requiring dominant digital platforms—or "gatekeepers"—to share data under interoperability rules.

This paper presents a framework that highlights key distinctions between fintech firms and incumbent banks, explains the varied empirical findings, and assesses the associated welfare trade-offs, with a focus on lending. It introduces a taxonomy of how IT affects lending frictions and emphasizes that the welfare impact of IT hinges on its effect on intermediary differentiation and the efficiency gap between them. This impact, in turn, depends on the degree of participation frictions and moral hazard among borrowers, the level of bank concentration and the intensity of inter-fintech competition, the ability to price discriminate, the size of the unbanked population, and the convenience benefits offered by fintechs. The framework enables a structured evaluation of the trade-offs inherent in digital banking, helping to define optimal competition levels and guide policy on price discrimination and data sharing.

The remainder of the paper is structured as follows: Section 2 provides background, empirical evidence, and an overview of key differences between banks and fintechs as well as of policy issues. Section 3 introduces the conceptual framework and presents a taxonomy of how IT affects lending frictions. Section 4 utilizes the framework to examine how fintech entry impacts market performance and welfare. Section 5 extends the framework, and Section 6 concludes with policy implications.

2. Background, evidence, and policy issues

An increasing number of financial technology (FinTech) firms and BigTech platforms are entering traditional banking domains by leveraging advanced information and automation technologies. In response, traditional banks are transitioning away from their reliance on physical branches, adopting IT and big data to meet evolving technological capabilities and rising consumer expectations (FSB, 2019; Vives, 2019). This digital transformation has prompted growing

investment in IT across the banking sector, enabling financial intermediaries to provide more personalized services and engage in price discrimination (Carletti et al., 2020). In recent years, FinTech companies have gained significant traction in lending, particularly to small and medium-sized enterprises (SMEs) in developed economies.[2] In emerging and developing markets, bigtechs have achieved notable penetration. Bigtechs have entered the lending business (in 2020, Google with Google Plex and Amazon with SME lending, in 2022, Apple bought Credit Kudos; in China Ant Group has a 30% stake in MyBank and Tencent a 30% stake in WeBank). MyBank and WeBank extend credit to millions of SMEs (Frost et al., 2019). In the US, Amazon provides lending and factoring services for SMEs and profits from the vast information it has on its sellers and this allows cherry-picking the best borrowers.

FinTech has delivered measurable efficiency gains in lending, also raising some concerns:

i) Screening and monitoring

- Fintechs use digital footprints and machine learning to effectively screen borrowers (e.g., Mercado Libre in Argentina; Frost et al., 2019).
- Algorithmic underwriting outperforms traditional human underwriting, leading to 10% higher loan profits and 7% lower default rates in auto lending (Jansen et al., 2025).
- Real-time data enhances monitoring, allowing platforms to deter delinquency by threatening to exclude misbehaving borrowers (Liu et al., 2024; Frost et al., 2019).

ii) Speed, convenience, and flexibility

- Fintechs offer immediate loan approvals. For example, MyBank enables applications to be completed in three minutes, with one-second approvals and zero human intervention.
- FinTech lenders have a notable advantage in convenience (Buchak et al., 2018; Fuster et al., 2019; Liu et al., 2024).

[2] In the US, the Federal Reserve's Small Business Credit Survey (2024) reports that 23% of SMEs that sought financing applied with a FinTech firm or online lender, up from 19% in 2016 (albeit declining from close to one-third in 2019). The annual growth rate of FinTech business lending volume in the US was over 40% from 2016 to 2020 (Berg et al., 2022). The COVID-19 pandemic likely accelerated the penetration of FinTech/BigTech firms because of government support (e.g., cooperation with SBA to distribute PPP loans) and the increasing demand for digital services (Demirgüç-Kunt et al., 2021).

- They process mortgage applications 20% faster than traditional lenders without increasing default rates and adjust supply more flexibly in response to shifts in mortgage demand (Fuster et al., 2019).

iii) Price discrimination

- Fintechs can use more targeted price discrimination due to their higher ability to process data and less rigid internal procedures (Buchak et al., 2019; Jagtiani and Lemieux 2019; Fuster et al., 2022; Johnson et al., 2023).[3]
- Banks are more cautious about price discrimination than fintechs because they are more scrutinized and have more to lose (e.g., deposit franchise, Begenau and Stafford 2023).[4]

iv) Financial inclusion

- Fintechs expand financial access for underserved and unbanked populations (Hau et al., 2024; Cornelli et al., 2024).[5]
- Open banking initiatives increase the likelihood that SMEs will form new lending relationships with non-bank lenders and reduce their interest expenses, but they do not necessarily improve financial inclusion (Babina et al., 2024). Nevertheless, more positive evidence exists. In India (Alok et al., 2024) and Germany (Nam 2023), open banking has improved credit access on both extensive and intensive margins, without increasing risk.[6]

[3] For example, Buchak et al. (2018) show that fintech lenders are able to price discriminate between different groups of borrowers when competing even with brick and mortar shadow banks (the fintech interest rate premium is higher for most creditworthy borrowers and lower for least creditworthy borrowers). They also find that standard variables for predicting interest rates explain less variation in mortgage interest rates of fintech lenders relative to non-fintech lenders, indicating that technology-based pricing uses non-standard methods and is more dispersed.

[4] Lenders face regulations about discrimination (statistical discrimination that goes beyond credit risk assessment is not legal) but different types of lenders have different levels of compliance. Compared to fintechs, banks are cautious about price discrimination because they are more scrutinized and have more to lose (e.g., deposit franchise) after customer or regulatory complaints. In addition, banks must curb the flexibility of local branches' (or officers') behavior to avoid operational and legal risks

[5] Fintech credit may act as a complement to bank credit (Tang, 2019; Hau et al., 2024; Cornelli et al., 2024) or serve as a substitute (Gopal and Schnabl, 2022; Eça et al., 2022).

[6] California's Consumer Privacy Act (CCPA) provides another example. By alleviating consumer reluctance to share data with fintechs, the CCPA has strengthened fintechs' screening abilities relative to banks and led to more individualized mortgage pricing, ultimately reducing loan rates (Doerr et al., 2023). This regulatory shift has also supported greater financial inclusion.

- Fintechs tend to extend more loans in markets where banking sectors are less competitive or more concentrated (Claessens et al., 2018; Jagtiani and Lemieux, 2018; Frost et al., 2019; Hau et al., 2024).
- Bigtech credit access can lead to increased usage of bank credit (Beck et al., 2022).
- Unanticipated bank branch closures have been associated with gains in fintech market share (Gisbert, 2023).

v) Financial stability

- Studies differ on whether default or delinquency rates are higher for fintech-originated loans compared to those issued by banks: some report higher rates (Di Maggio and Yao 2021; Beaumont et al., 2024), others lower (Fuster et al., 2019; Liu et al., 2024), and some find no significant difference (Buchak et al., 2018).[7]

vi) Growth

- Banks that adopt advanced IT experience higher loan growth (Dadoukis et al., 2021; Branzoli et al., 2024).
- Business lending by technologically advanced banks is less sensitive to geographical distance, which supports stronger local entrepreneurship (Ahnert et al., 2025).

The key differences between fintechs and (traditional) banks are the following:

- *Regulation*. Typically, fintechs do not obtain a banking license and concentrate on one function, like lending (e.g., BlueVine, OnDeck, CAN Capital, and Lending Club for SMEs, Quicken for mortgages, among bigtechs Amazon or Google) or payments (Stripe, Square, Wise, Klarna-with Buy Now Pay Later activity).[8] Consequently, they are subject to significantly lighter regulation (e.g., in terms of capital and liquidity requirements), as well

[7] Furthermore, Pierri and Timmer (2022) found that one standard deviation higher pre-crisis IT adoption led to 10% fewer non-performing loans during the GFC in the US.

[8] Square provides revenue-based loans with a percentage of the borrower firm's sales deducted automatically until the loan is repaid. Several fintechs in the US such as Square have sought to become Industrial Loan Companies (ILCs). Square Financial Services was approved in March 2020. This would allow them to take deposits and obtain Federal Deposit Insurance Corporation insurance. ILCs must hold higher capital levels than banks, and their non-bank parent companies must be able to back up them (see Restoy, 2021).

as lower supervision and compliance costs since they do not perform risk transformation activities.[9]

- *Liability structure and funding costs*. Fintechs tend to have more equity and higher costs of funds. Banks enjoy cheap deposits due to the protection of the safety net and their large balance sheet. Fintechs offload more loans than banks.[10]
- *Data and IT*. Banks tend to have more financial data than fintechs, but the latter have more advanced IT to process it. In particular, bigtechs are better at using the digital footprint of clients.
- *Relationship lending and soft information*. Banks rely partially on soft information, on collateral and long-term relationships with borrowers. Fintechs rely exclusively on hard information.
- *Monitoring and screening*. Fintechs typically use more advanced IT to screen and monitor loans, reducing the perceived distance between lenders and borrowers, whether in geographic or expertise terms, compared to traditional banks. For example, they can use the same (or similar) algorithm for different markets.
- *Price flexibility*. Fintechs can price more flexibly and fine-tune pricing to borrowers' characteristics because of their use of more advanced IT, less rigid internal procedures, and lower regulatory oversight.
- *Convenience benefits*. Fintechs offer better customer experience due to their more intuitive interfaces, but large banks may offer a broader array of products and services.
- *Portfolio effects*. Bigtechs have a large product portfolio, and for every financial product client, they can get an extra benefit by cross-selling other products and services.

These differences are not universal and vary in degree. As IT is applied more to banking, there is a convergence of banks and fintechs.[11]

[9] Some fintechs do obtain a banking license like Revolut or N26. Bigtechs typically perform financial activities through regulated entities (e.g., with a money transmitter license for payment services in the US).
[10] Buchak et al. (2018) provide evidence from the mortgage market, where shadow banks use the originate-to-distribute model to finance loans, while traditional banks have recourse to their deposit base and associated government guarantees.
[11] IT is transforming banks. For example, Kundu et al. (2024) examines IT's impact on the 25 largest US banks and show a bifurcation between traditional banks paying very low deposit rates and take interest rate risk and "digital" banks that drop branches, pay rates close to market and take credit risk.

The development of FinTech raises a range of important policy questions:

- What are the implications of IT-driven innovation for competition and welfare?
- Can we distinguish between different types of IT developments in terms of their economic effects?
- Should regulation maintain a level playing field or tilt in favor of new entrants to enhance competition? Should the goal be to maximize competition, or is there an optimal intensity?
- How does fintech entry affect financial stability?
- What is the appropriate policy stance toward price discrimination?
- What trade-offs are associated with data sharing and open banking?

Answering these questions requires a deeper understanding of what drives fintech entry, how such entry affects competition in the lending market, how incumbent banks respond, and how all this influences credit availability, entrepreneurial investment, and overall welfare.

3. Framework of analysis

This section provides a framework for studying competition between banks and fintechs in loan provision, considering the key differences between them in terms of price flexibility, monitoring and screening technology, funding costs, and convenience benefits. To this, we can add the costs of regulation and compliance. The framework is best attuned to the SME lending market.[12]

Consider a lending market in which banks and fintechs compete to finance entrepreneurs who lack initial capital and require external funding to undertake risky investment projects. Lenders—whether banks or fintechs—do not have direct access to the projects themselves; their revenues depend on issuing loans. To ensure finance, entrepreneurs need screening and monitoring (hereafter referred to as monitoring). Two primary *frictions* characterize this market:

1. *Participation friction and need to monitor*: Entrepreneurs face opportunity costs when deciding to invest. In the next section, we consider the case where they may also encounter

[12] The framework and its results are based on Vives and Ye (2025a, 2025b).

moral hazard—deriving private benefits from shirking effort. In both cases, effective lender monitoring can raise the success probability of projects or mitigate the moral hazard.

2. *Distance friction*: The cost of monitoring increases with the "distance" between lender and borrower. This distance may be physical[13] or in characteristics space, for instance, stemming from the bank's expertise in certain industries or sectors.[14] Lenders find it easier and more cost-effective to support borrowers who are closer (either geographically or in terms of specialization), as they must exert more effort to monitor those farther afield.

We distinguish between two categories of IT improvements based on whether they reduce this distance friction:

(a) IT-basic: General improvements in information collection and processing—such as enhanced data storage, computing power, or desktop software—do not reduce distance friction.

(b) IT-distance: Technologies that lower the effective distance between lenders and borrowers. These include improved internet connectivity, video conferencing, remote learning tools, AI, and advanced search engines, which enable lenders to expand their domain expertise and serve borrowers more effectively remotely.[15] A higher distance friction may arise for a bank that relies more on *relationship lending*. As a result, the bank's monitoring efficiency decreases faster with distance (where proximity between lender and borrower means a closer relationship, which brings more soft information to banks.

Big data and machine learning (ML) can improve both IT-basic and IT-distance capabilities. (See Table 1 for a schematic overview.) Improvements in the two types of IT have different competitive implications. While a general IT-basic improvement does not alter the relative competitive advantage of lenders, a general IT-distance improvement decreases bank differentiation, increasing competitive pressure (given that intermediaries are specialized). It is important, therefore, to distinguish between the direct efficiency-enhancing effect of improvements in IT and the strategic effect they may have through competitive spillovers, which can change the degree of differentiation and the intensity of competition.

[13] See, e.g., Petersen and Rajan (2002).
[14] See Blickle et al. (2025) and Paravisini et al. (2023).
[15] Jiang et al. (2023) finds that 3G mobile networks significantly reduce distance friction for banks, geographically expanding their lending. See also Agarwal and Hauswald (2010).

Table 1: Technology improvements and frictions (Vives and Ye, 2025a)

Improvement of efficiency	Related technology
Decreasing cost of acquiring information (improvement in collecting or/and processing information)	ML with big/unconventional data advances in cloud storage and computing, information management software
Decreasing physical distance friction (improvement in communication)	Diffusion of internet, video conferencing, smartphone, mobile apps, social media
Decreasing expertise friction (extending competence of human capital/ hardening soft information)	Credit scoring, ML with big/unconventional data, remote learning and AI

The cost of monitoring entrepreneurs depends positively on the effort exerted by the lender and the degree of distance friction between the lender and the borrower. It depends negatively on the lender's access to data and its analytical capabilities. In other words, greater distance friction increases monitoring costs and heightens the importance of lender specialization, making the relative cost advantage more sensitive to the proximity between lenders and borrowers.[16]

Banks and fintechs differ significantly in their capabilities for collecting and processing information. Fintechs typically possess superior IT-distance capabilities, enabling them to connect more effectively with entrepreneurs through digital channels. Conversely, banks may exhibit greater basic monitoring efficiency, primarily due to their access to richer financial information about firms. In terms of IT-basic capabilities, banks will outperform fintechs in monitoring and screening efficiency if their strength in data acquisition outweighs any disadvantage in processing and analytics.

To formalize these distinctions, consider a stylized baseline framework. Banks are positioned equidistantly around a circular city, à la Salop, while two fintechs are located virtually at the center of the circle. All lenders compete to serve entrepreneurs distributed across the city. Banks are assumed to be specialized, meaning they face distance friction and, in the baseline framework, cannot price discriminate. Fintechs, by contrast, do not experience distance friction and can offer location-specific pricing. Additionally, banks and fintechs may differ in their marginal funding costs and the level of convenience they offer to borrowers. Entrepreneurs will choose to invest and seek loans if their expected returns exceed their opportunity costs. (See Technical Box for details.)

[16] In Blicke et al. (2024) specialized banks receive a soft information signal.

An improvement in IT-basic reduces monitoring costs uniformly across all borrower locations, without altering the relative cost advantage of lenders in different areas. In contrast, enhancements in IT-distance mitigate the negative effects of lender–borrower separation, thereby reducing the monitoring costs associated with distance.

In the model, to emphasize in a stark way the potential differences in price flexibility between banks and fintechs, incumbent banks post uniform loan rates first, and fintechs respond by setting discriminatory loan schedules tailored to specific locations. Once loan rates are determined, entrepreneurs decide whether to undertake their investment projects and, if so, which lender to approach. Based on these choices, each lender evaluates whether to fund the loan applications it receives. Following disbursement, lenders choose their optimal level of monitoring depending on the borrowers' locations.

In addition to the presence of market power, a potential market failure in the baseline framework is that to maximize welfare (surplus generated), we must internalize an externality, balancing lender monitoring and entrepreneur participation.

We will derive the implications of this framework for market performance, incentives for IT investment, financial stability, and social welfare. The analysis will also extend to scenarios where banks are allowed to price discriminate.

Technical Box (Vives and Ye, 2025b)

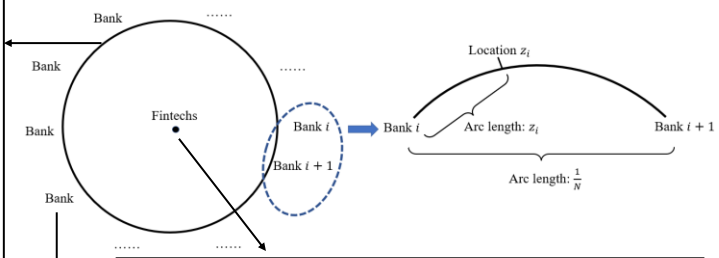
Market Structure

At each location: Mass M of entrepreneurs.
An entrepreneur at location z_i:
- incurs an opportunity cost u if investing; u is uniformly distributed on $[0, M]$;
- needs a unit of funding to invest;
- can borrow from a lender (a bank or fintech);
- invests in a risky project that returns

$$\tilde{R}(z) = \begin{cases} R \text{ with prob. } m(z_i) \\ 0 \text{ with prob. } 1-m(z_i) \end{cases}.$$

- is monitored by the lender with intensity $m(z_i)$.

Returns of different projects are independent.



There are $N \geq 2$ banks (incumbents) on the circumference.
A bank's monitoring intensity: $m(z_i)$ at cost

$$C_B(m(z_i), d) = \frac{c_B}{2(1-qd)}(m(z_i))^2$$

- c_B: inverse measure of bank monitoring efficiency (at zero distance)
- q: (physical or characteristics) distance friction
- d: distance from bank i to the monitored entrepreneur

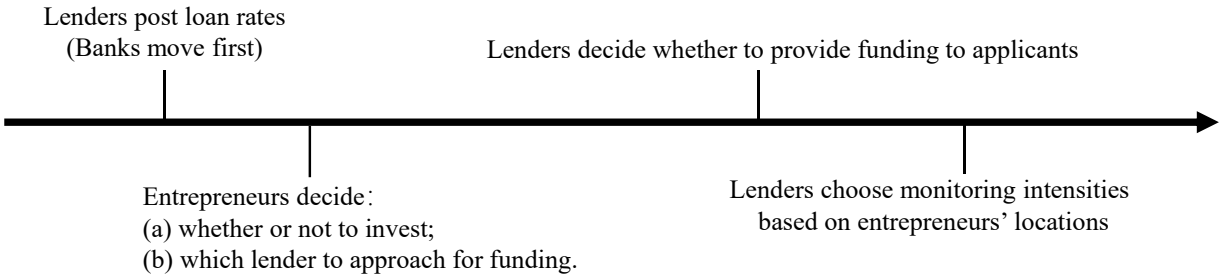
There are 2 fintechs (entrants) at the virtual center (fintech 1 and 2).
Fintech j's monitoring intensity: $m(z_i)$ at cost

$$C_{Fj}(m(z_i)) = \frac{c_{Fj}}{2}(m(z_i))^2$$

- c_{Fj}: inverse measure of fintech j's monitoring efficiency. $c_{F1} \leq c_{F2}$

Banks' marginal funding cost: ι_B.
Fintechs' marginal funding cost: ι_F (with $\iota_F \geq \iota_B$).

Timeline



- A bank posts a uniform loan rate r_B for all locations.
  - Bank monitoring intensity: $m_B(z_i) = \frac{r_B}{c_B/(1-qd)}$, where d represents the bank's lending distance.
- Fintech j posts a discriminatory loan rate at z_i, denoted by $r_{Fj}(z_i)$.
  - Fintech monitoring intensity: $m_{Fj}(z_i) = \frac{r_{Fj}(z_i)}{c_{Fj}}$.

4. Market performance and welfare

Within the baseline framework, we can analyze how the entry of fintech lenders affects competition in the lending market, yielding results consistent with empirical evidence. Three types of equilibria may emerge depending on the monitoring efficiency of fintechs relative to banks: blockaded entry, potential entry, and actual entry.

- In the *blockaded entry* regime, fintech monitoring efficiency is low, and fintechs are effectively excluded from the market. Banks and entrepreneurs behave as though fintechs do not exist, as these entrants pose no competitive threat.
- In the *potential entry* regime, fintechs are not actively lending, but their presence disciplines incumbents. If fintech monitoring efficiency reaches an intermediate level, banks respond by lowering loan rates to deter fintech market penetration. Although fintechs do not serve any entrepreneurs in this regime, they exert effective competitive pressure.
- In the *actual entry* regime, fintech monitoring efficiency is high enough that banks can no longer protect their entire market. As a result, fintechs begin lending, especially to entrepreneurs located far from bank branches.

When actual entry occurs, fintechs serve entrepreneurs who are geographically or functionally distant from banks. Fintechs will serve larger market areas and have higher lending volumes when the bank concentration is higher because then there are more locations distant from all banks. This finding is consistent with empirical research by Claessens et al. (2018), Jagtiani and Lemieux (2018), and Frost et al. (2019). Furthermore, fintech borrowers located near banks tend to receive more favorable loan rates—a pattern supported by Butler et al. (2017). Fintech's cost advantage and actual entry could come from an inferior regulatory burden (e.g., in terms of capital requirements, enforcement, and legal action).[17] Furthermore, the regulations reduce banks' ability to lend primarily through the extensive margin, indicating that the enhanced regulations increase the distance friction.

[17] This is documented for the US residential mortgage market by Buchak et al. (2018) with the tightening of the prudential regulation for banks after the global financial crisis of 2008. The authors find that increasing regulatory burden can account for about 55% of shadow bank growth during the 2008-2015 period, with technology accounting for another 35%.

The competitive advantage of fintechs strengthens as their monitoring efficiency improves relative to that of banks. In such cases, fintechs expand their reach and compel banks to lower their loan rates. This aligns with findings by Babina et al. (2024), who show that open banking—which improves fintechs' access to borrower data—encourages SMEs to form new lending relationships with non-bank lenders.[18] However, when fintech monitoring efficiency becomes sufficiently high, banks are unable to profitably serve distant borrowers due to their uniform pricing constraints. Consequently, fintechs can dominate those segments of the market, potentially gaining substantial pricing power, particularly in the absence of robust inter-fintech competition. This outcome echoes findings by He et al. (2023), who show that lending competition intensifies (or weakens) depending on whether open banking narrows (or widens) the screening ability gap between banks and fintechs. That gap is shaped by both data availability and technological capacity, as reflected in this framework. While open banking can enhance fintech competitiveness, it can also soften competition and harm borrowers if a single fintech becomes too dominant due to excessive data advantages.[19]

Fintech penetration through price discrimination. Fintechs' ability to engage in price discrimination significantly enhances their competitive edge over banks. When a bank competes with a fintech in a specific location, it faces a strategic constraint: lowering its loan rate in that area risks reducing its profits across all other locations, due to its uniform pricing policy. Fintechs, by contrast, are not bound by this limitation—they can tailor loan rates to individual locations without affecting their pricing elsewhere. As a result, fintechs can strategically undercut banks in targeted areas by offering very low loan rates, allowing them to penetrate the credit market even in the absence of an advantage in monitoring efficiency or funding costs.

NPLs at banks and fintechs. When a bank and a fintech have similar funding costs and serve borrowers in close locations, the fintech's advantage in discrimination allows it to offer lower loan rates and exert less monitoring effort than the bank. As a result, fintech borrowers have lower

[18] See also Doerr et al. (2023).

[19] In He et al. (2023), the improvement in fintech's screening efficiency – which potentially brings adverse welfare effects – is driven by the presence of an open banking policy, whereas in the present framework, socially undesirable IT improvements can arise from lenders' endogenous technology investment. Goldstein et al. (2023) find that in the presence of adverse selection due to the winner's curse; open banking may decrease competition since banks with good signals may refrain from lending. Huang (2023) finds that an improvement in IT by fintech lenders may weaken competition.

success probabilities (i.e., higher default rates) than bank borrowers with similar characteristics. However, if the fintech has significantly higher funding costs than the bank, the result will be reversed: the fintech will increase its loan rate above the bank rate, focus on smaller market areas, and conduct more thorough monitoring than the bank, which extends its market area. Then, fintech loans have a lower default risk than bank loans, controlling for borrower characteristics. If fintechs can provide borrowers with convenience benefits through loans, their competitiveness will increase, forcing banks to reduce loan rates and concentrate more on serving local market areas, where banks have high monitoring efficiency.[20] Then, fintechs serving entrepreneurs of similar characteristics will default more. (See Table 2.) The empirical evidence is indeed consistent with the mixed predictions (Buchak et al., 2018; Fuster et al., 2019; Di Maggio and Yao, 2021; Liu et al., 2024).

BigTech lending: In the case of a BigTech platform, each financial client may generate additional value through cross-selling of non-financial products. This portfolio effect can influence the platform's price discrimination strategy in lending. As shown by Bouvard et al. (2022), a BigTech firm may be willing to lend even when it is less efficient at monitoring than banks, due to the broader profitability of the client relationship. Furthermore, BigTech platforms may have incentives to expand credit to bolster their other platform businesses, i.e. to sell additional products or services on their e-commerce platforms or to acquire complementary data to monetize through their advertising platforms. The outcome may be aggravated platform moral hazard as loan volume is maximized. Big Tech platforms may also engage in cream-skimming, leveraging their superior overall customer data and technology to screen out low-quality loans more effectively than traditional banks (and small fintechs). As a result, traditional banks might end up bearing increased credit risk and adverse selection problems.[21]

Economies of scope in payments and lending: When there are synergies between payments, deposits, and loans—for instance, when payment data serves as a signal of a borrower's creditworthiness—the entry of a specialized payment fintech may disrupt these economies of scope. This introduces a trade-off between enhanced competition in the payment sector and the

[20] There is evidence that fintechs' advantage in providing convenience can induce them to price higher than banks (Buchak et al., 2018; Liu et al., 2024).
[21] But see Huang (2013) for a contrasting effect when the fintech specializes more as the cost of information acquisition is lowered and this ends up benefitting the bank that relies on collateral for its loans.

potential loss of informational advantages that support more efficient lending. Banks and fintech may have incentives to collaborate or merge.[22] Parlour et al. (2022) find that while fintech entry can promote financial inclusion, it may also harm consumers with a strong preference for traditional banking relationships. Their results also suggest that fintech entry can exacerbate price discrimination in the loan market, with ambiguous welfare effects.

Fintech entry and investment. Potential fintech entrants force banks to protect their market areas by offering lower loan rates, which benefits all entrepreneurs and thereby increases their total investment. However, actual fintech entry need not spur entrepreneurs' investment. The competitiveness of fintechs forces banks to provide higher utility to entrepreneurs, which incentivizes more entrepreneurs to undertake investment projects. However, actual entry decreases banks' uniform loan rate, potentially making it unprofitable for banks to serve distant locations. At such locations, banks' competitive threat disappears, and fintechs can gain significant market power, harming entrepreneurs and reducing their investment. The net effect of actual entry on investment is ambiguous. However, if competition among fintechs is sufficiently intense, actual entry will increase entrepreneurs' investment because fintechs will then provide high utility to entrepreneurs, regardless of whether the threat from banks' competition disappears. (See Table 3.)

Fintech entry and social welfare. In our framework, social welfare is the expected net value of implemented investment projects. It depends on three key components: the total level of entrepreneurial investment, the probability of project success (which is influenced by lender monitoring), and the social costs incurred, including those related to monitoring, funding, and opportunity costs. Fintech entry affects both entrepreneurs' utility and lenders' loan rates, which in turn influences the volume of investment and the intensity of monitoring efforts. When a fintech has higher monitoring efficiency than incumbent banks, its actual entry enhances the overall market monitoring capacity, resulting in a cost-saving benefit. Overall, the welfare effect of fintech entry is ambiguous. While entry can increase welfare by reducing costs through improved

[22] Banks may also fund fintechs (e.g., British Business Bank and Funding Circle, or Celtic Bank and OnDeck), thereby lowering fintechs' cost of capital and allowing them to operate with a small balance sheet. However, such arrangements can reduce banks' incentives to compete aggressively in the lending market (Hu and Zryumov, 2024). Partnerships may be formed, as has been the case with Amazon and JP Morgan on credit cards and financial services, or the recent ones of Apple and Citigroup, or JP Morgan and Klarna to foster deferred payment loans, or Stripe with different banks. Apple is currently unwinding its credit card partnership with Goldman Sachs and moving to JP Morgan Chase.

monitoring, it can also reduce welfare if it leads to significantly lower levels of investment or weaker monitoring by lenders.[23] However, when inter-fintech competition is moderately intense, the entry of fintechs with sufficiently high monitoring efficiency tends to enhance social welfare. In this case, the cost-saving benefits are realized without undermining the balance of incentives for entrepreneurs to invest and for lenders to monitor effectively. (See Table 3.)

Pre-entry local bank monopolies and fintech entry. In some locations, the absence of fintech competition means that banks operate without rivalry, effectively holding local monopolies. In these areas, entrepreneurs have no access to bank finance unless fintechs enter the market. When fintechs do enter, they both substitute for and complement traditional bank lending. They substitute by eroding the incumbents' market share, and they complement by expanding access to underserved regions—thereby promoting financial inclusion. This pattern aligns with empirical findings from Gopal and Schnabl (2022), Eça et al. (2022), Hau et al. (2024), Cornelli et al. (2024), and Alok et al. (2024). As fintechs enter the market, banks respond by lowering their loan rates from previously monopolistic levels. This competitive pressure, combined with expanded access to credit, results in higher social welfare. The efficiency gains from cost savings and increased investment outweigh the potential downside of reduced monitoring incentives, making fintech entry welfare-enhancing in these cases. [24] (See Table 3.)

Long-run effects: bank exit. Over the long term, fintech entry may lead some banks to exit the market and recover their salvage values. This reduces the competitive pressure banks exert on fintechs, making actual fintech entry more likely. However, if the reduction in bank competition significantly increases fintech market power, the result may be lower entrepreneurial utility and investment. Banks' exit will make areas where fintechs do not face a bank threat easier to arise. If competition among fintechs is sufficiently intense, fintech entry can still boost investment despite the decline in bank presence. Bank exits also give rise to an *option value effect*: banks retain the ability to exit the market and reclaim salvage value when fintech competition erodes their profitability. This exit option can enhance social welfare by reallocating resources more efficiently.

[23] An additional effect is that moral hazard problems may arise if fintechs have low stakes in the loans they help originate (but do not retain). This effect can be exacerbated by fintechs not relying on soft information, in which traditional banks have the advantage.

[24] There will not be a negative investment effect because with initial bank local monopolies there is no lending competition.

There are four circumstances where allowing bank exit is socially beneficial: First, if the salvage values are substantial, the option value effect is significant. Second, if the monitoring efficiency advantage of the leading fintech is very large, banks serve a very small market area and can gain some salvage value by exiting. Third, if there is an optimal intermediate level of inter-fintech competition. Fourth, if competition in the market is excessive and the level of inter-fintech competition is not too high, banks' exit improves welfare by reducing the intensity of competition. In this case, welfare will increase even if salvage values are small. Banks' exit will be bad for welfare when salvage value is small, the leading fintech is not very efficient, and either i) The leading fintech has monopoly power since then banks' exit will significantly hurt entrepreneurs (by enlarging the monopoly area of the leading fintech) without bringing a large salvage value; or ii) there is high inter-fintech competition which will lead to low prices inducing too low monitoring. In these scenarios, banks' exit will expand the areas served by the leading but not very efficient fintech.

Price discriminating banks. Whenever banks can price discriminate, their equilibrium loan rates decrease with distance to meet the competition despite having higher monitoring costs.[25] Several important changes occur in the competitive dynamics between banks and fintechs: i) Actual fintech entry will not take place unless fintechs have a clear advantage in monitoring efficiency or funding costs. When banks can tailor prices to specific locations, fintechs cannot undercut them solely through price discrimination. ii) the ability of banks to price discriminate reduces fintechs' market reach, as competition from banks becomes more location-specific and effective; iii) potential or actual fintech entry always makes entrepreneurs better off and hence increases their investment (the reason is that banks' competitive threat to fintechs will never disappear at any location if banks can break the uniform-pricing constraint and hence, fintech entry always increases the intensity of competition among lenders); iv) while fintech entry increases investment and borrower utility, the overall impact on social welfare is ambiguous because of the effect on lender profitability.

The following tables compare the results when banks can and cannot price discriminate in their competition with fintechs. Table 2 compares loan pricing and default rates (NPLs) between banks

[25] A similar result obtains in adverse selection models where the cost of screening increases with the distance to the borrower. As banks obtain less precise information for more distant borrowers, these loan applicants will be less informationally captured and, therefore, elicit greater competition from other lenders as shown by Hauswald and Marquez (2006).

and fintechs under different conditions, while Table 3 explores the effects of actual fintech entry, distinguishing between pre-entry market structures, local monopolies vs. competitive bank environments.

From Table 2, we observe the following. When banks cannot price discriminate and have funding costs similar to fintechs, they tend to exhibit lower loan default rates. This is because banks set higher loan rates, which increases their incentive to monitor borrowers. When banks have substantially lower funding costs, they tend to have higher defaults as they expand their market area, thereby decreasing monitoring efficiency. When fintechs offer convenience benefits over banks, then banks tend to have lower defaults as banks tend to specialize on local areas where they are more efficient. When banks have no funding cost advantage and cannot discriminate, fintechs tend to price lower than banks (after controlling for borrower characteristics) since fintechs can offer low loan rates at specific locations to compete with banks' uniform loan rates. This pattern aligns with the findings in Doerr et al. (2023). However, if fintechs provide notable convenience advantages, they may charge higher loan rates than banks for similar borrower profiles—a result consistent with Buchak et al. (2018) and Liu et al. (2024).

Table 2. Loan pricing and NPLs: banks v.s. fintechs (controlling for borrower location)

	Banks cannot discriminate			**Banks can discriminate**		
	With similar funding costs	With bank funding advantage	With similar funding costs and fintech convenience	With similar funding costs	With bank funding advantage	With similar funding costs and fintech convenience
Which lenders have higher loan rates?	Banks	Fintechs if bank funding advantage is high	Fintechs if convenience is high enough	Similar	Fintechs	Fintechs
Which lenders have higher loan default rates?	Fintechs	Banks if funding advantage is high (banks extend market area)	Fintechs (banks specializing)	Similar	Banks (banks extend market area)	Fintech (banks specializing)

From Table 3, we observe the following. When banks hold local monopolies prior to fintech entry, the introduction of fintechs generally leads to improved outcomes—regardless of whether banks can price discriminate. Specifically, fintech entry increases entrepreneurs' utility, boosts investment, and enhances overall social welfare. It also reduces bank profitability but can increase total industry profitability (i.e., combined profits of banks and fintechs), provided the leading fintech is sufficiently efficient and there is a moderate degree of inter-fintech competition.

In scenarios where banks cannot price discriminate, marginal increases in fintech efficiency will need enough inter-fintech competition to constrain potential fintech market power to improve entrepreneurial utility and investment. In contrast, when banks can price discriminate, this competitive condition is no longer necessary, as banks can respond flexibly to fintech pricing and retain influence across locations.

If banks are competitive pre-entry and cannot price discriminate, fintech entry increases entrepreneurs' utility and investment across all locations—again, assuming sufficient fintech competition. However, when the efficiency gap between the leading fintech and banks is large, and inter-fintech competition is weak, fintechs may gain excessive market power in the segments where banks no longer compete. This can reduce aggregate investment. Importantly, this negative outcome does not occur when banks are allowed to price discriminate, as they can strategically contest fintech dominance across locations. Social welfare tends to rise with fintech entry when the leading fintech is efficient and inter-fintech competition is at an intermediate level. Under these conditions, the incentives for lenders to monitor and for entrepreneurs to invest are well-balanced—whether or not banks can price discriminate. Bank profitability declines in all scenarios, while the impact on overall industry profitability remains ambiguous.

Table 3. The effects of actual fintech entry

	Banks cannot discriminate		**Banks can discriminate**	
	With pre-entry local monopolies	With pre-entry competition	With pre-entry local monopolies	With pre-entry competition
Investment/ Entrepreneur utility	↑	↑ at any location (with enough inter-fintech competition) ↓ in the aggregate (if leading fintech efficient enough and low intensity of inter-fintech competition because of dominance of effect in monopoly fintech area)	↑	↑
Social welfare	↑	↑ if leading fintech efficient enough and inter-fintech competition intermediate	↑	↑ if leading fintech efficient enough and moderate intensity of inter-fintech competition
Bank profitability and stability	↓	↓	↓	↓
Industry (bank and fintech) profitability	↑ if leading fintech efficient enough and moderate intensity of inter-fintech competition	↑ if leading fintech efficient enough and moderate intensity of inter-fintech competition	↑ if leading fintech efficient enough and moderate intensity of inter-fintech competition	Ambiguous

Price discrimination and social welfare. At any given location, a lender's socially optimal loan rate is the one that maximizes the combined value of entrepreneurial utility and lender profit. This balance hinges on a trade-off: higher loan rates incentivize lenders to monitor more effectively, while lower rates encourage greater investment by increasing the number of entrepreneurs willing

to undertake projects.[26] Banks and fintechs differ in their socially optimal pricing patterns. For fintechs, the optimal loan rate is uniform across locations. In contrast, for banks, the socially optimal rate increases with lending distance, since monitoring costs rise with distance. However, under competitive conditions where banks can price discriminate, their equilibrium loan rates decrease with distance in order to capture market share from rivals—despite the higher monitoring costs. This misalignment highlights a key insight: neither banks' nor fintechs' discriminatory pricing structures are generally consistent with socially optimal outcomes.

An important policy question is whether allowing banks to price discriminate enhances welfare when fintechs are also able to do so. The answer is ambiguous and context-dependent. When banks can discriminate, an efficient fintech will face more competitive pressure from banks, and the fintech's monopoly areas will disappear. This will improve welfare if the fintech serves large market areas and charges high loan rates to entrepreneurs, which is more likely to occur with low inter-fintech competition. However, it will hurt welfare if the fintech serves large market areas and charges low loan rates, which tends to happen when there is intense inter-fintech competition. In this case, there is excessive competition and too little monitoring.

In markets where banks hold local monopolies and fintechs are absent, price discrimination allows banks to expand their coverage, increasing financial inclusion and improving welfare. However, when fintechs enter the market and offer coverage, especially as their efficiency grows, fintechs naturally establish monopoly zones in underserved regions. In these settings, bank price discrimination no longer contributes to financial inclusion but may still intensify competition. If banks have local monopolies and there is no fintech entry, price discrimination will extend banks' coverage and increase financial inclusion, thereby enhancing welfare. However, if there is fintech entry, the market will be covered, and there will always be fintech monopoly areas, which tend to be significant as fintech's efficiency increases. In this case, allowing banks to discriminate has no financial inclusion effect but will increase competition. Ultimately, the welfare effect of bank price discrimination largely depends on the level of inter-fintech competition. If it is low, then

[26] As distance increases and monitoring becomes more costly, the surplus generated by one individual project (i.e., the utility of the entrepreneur plus the bank's profit by serving this entrepreneur) is smaller. Therefore, the marginal social benefit of increasing the number of projects will be smaller. The social planner will have a lower incentive to spur entrepreneurs' participation, thereby increasing the socially optimal rate.

bank's price discrimination will be good for welfare, but with high inter-fintech competition, there may be excessive competition and too little monitoring.[27]

5. Generalized price discrimination and bank and fintech heterogeneity

We examine what happens when both banks and fintechs are heterogeneous and engage in price discrimination. We also explore the strategic incentives lenders face when investing in different types of information technology (IT), assess the implications for bank stability, and examine the consequences of entrepreneurial moral hazard.

Competition among discriminating heterogenous lenders. Consider a market regime in which all lenders—whether banks or fintechs—are established and specialized (for example, in a circular city setting), are capable of price discrimination, and possess heterogeneous IT technologies that affect distance friction. As discussed earlier, under effective competition, a lender's loan rate tends to decrease with the distance to the borrower in order to attract market share from rivals—an observation supported by Herpfer et al. (2022). Lenders that adopt more advanced IT, regardless of its type, gain a competitive edge that allows them to charge higher loan rates and extend more credit—consistent with findings by Dadoukis et al. (2021) and Branzoli et al. (2024). However, as all lenders make technological progress, the type of IT advancement plays a crucial role in shaping market dynamics. When all lenders improve their IT-basic (which reduces monitoring costs without altering relative cost advantages), the intensity of competition remains unchanged. In this case, monitoring becomes more efficient across the board, allowing lenders to increase profitability and loan volume. This leads to greater investment by entrepreneurs and an improvement in social welfare. In contrast, improvements in IT-distance (which reduce the importance of distance in monitoring costs) diminish lender differentiation, thereby intensifying competition. As a result, loan rates decline across the market, encouraging more investment but also generating a hump-shaped effect on both lender profits and overall social welfare. Initially, these outcomes improve, but beyond a certain point, intensified competition erodes profitability and weakens the balance of

[27] Note that this statement does not contradict Table 3, which states that when banks can discriminate fintech entry increases welfare. This is because we are comparing what happens when banks cannot initially discriminate with what happens when they can. In this case, allowing banks to discriminate will increase welfare if inter-fintech competition is low.

incentives. As previously noted, price discrimination by lenders remains socially suboptimal, as it results in declining loan rates with distance—while the socially optimal rates should increase with distance to reflect rising monitoring costs.

Strategic incentives to invest in IT. When lenders can choose how much to invest in IT-basic and IT-distance, their strategic incentives differ depending on the type of technology. Competition in IT-basic tends to be a case of strategic substitutes—as one lender invests more, others are incentivized to invest less. By contrast, competition in IT-distance often behaves as strategic complements at advanced technology levels—each lender's investment increases the value of investment by others. This distinction has important implications. When IT is inexpensive and profits can cover the cost of investment, lenders may fall into a prisoner's dilemma: all invest heavily in IT-distance, reducing differentiation and triggering excessive competition from both a private and a social welfare perspective.[28] Although each lender would be better off if all invested less in IT-distance, none have the incentive to unilaterally deviate. The reason is that when lender differentiation is low, a lender's IT investment has a strong business-stealing effect, leading to high IT investment incentives among lenders.[29] When IT is not particularly cheap, investment decisions become more balanced. The two types of IT tend to co-move in response to shifts in cost: for instance, a decrease in the cost of acquiring one type of IT encourages investment in both types.

Investment dynamics between bank and fintech are shaped by IT capabilities. Consider a competitive scenario where a traditional bank, characterized by low IT-distance (i.e., high distance friction) and high IT-basic, competes with a fintech that has high IT-distance (low distance friction) and low IT-basic, due to limited access to firm-specific financial data. In this setup, the fintech's investment in IT-distance becomes a strategic complement to the bank's investment in either type of IT. As the fintech improves its ability to serve borrowers in distant or underserved areas, the bank is incentivized to upgrade both its IT-basic and IT-distance capabilities to defend its market share more effectively. Similarly, if the fintech begins to invest in IT-basic, the bank may respond by increasing its own IT-basic investment, again due to strategic complementarity. However, this relationship evolves as the fintech's IT-basic approaches parity with the bank's one. At that point,

[28] For a lender, own investment in IT-basic and IT-distance tends to be complementary.
[29] A similar effect obtains in adverse selection models, where overinvestment in information acquisition for screening occurs in a self-defeating attempt to capture market share (Hauswald and Marquez, 2006). Lenders then may have incentives to merge to avoid excessive investment.

the fintech's technological improvements reduce the marginal return on the bank's own IT investments, particularly as the bank's effective market area shrinks. In essence, when the fintech narrows the gap in IT-basic capabilities, the bank faces diminishing incentives to continue investing heavily in IT. This dynamic illustrates how strategic interdependence between competing lenders shapes their technological investment paths and how the composition of IT capabilities affects competitive positioning.

Lender stability and IT investment. Assume that both common and idiosyncratic risk factors drive project returns. Under this structure, a lender will go bankrupt if the common risk factor falls below a critical threshold. In this context, the impact of IT advancements on lender stability—that is, the probability of remaining solvent—varies depending on the type of IT. Progress in IT-basic generally increases lender stability. It enhances monitoring efficiency without reducing lender differentiation or weakening the incentive to monitor. As a result, lenders can limit risk while maintaining competitive margins, reducing the likelihood of insolvency. In contrast, progress in IT-distance can reduce lender stability, particularly when the differentiation-reducing effect is strong—producing a hump-shaped relationship between IT-distance and stability. This instability arises for three main reasons. First, the differentiation-reducing effect decreases lenders' loan rates, so an entrepreneur repays less to its lender in the event of project success. Second, lenders' lower monitoring effort (induced by the decrease in their skin in the game) makes entrepreneurs more likely to fail. Finally, the funding providers of lenders, knowing that entrepreneurs' expected repayment becomes lower, will require lenders to promise a higher nominal return, which further increases the difficulty for lenders to stay solvent. In summary, while IT-basic supports financial stability by improving monitoring without disrupting market structure, IT-distance can undermine stability if it erodes lender differentiation and monitoring discipline beyond a certain point.

What is the impact of entrepreneurial moral hazard?

When entrepreneurs derive private benefits from shirking, lender monitoring helps mitigate this risk. Indeed, it plays a critical role in enabling entrepreneurs to access credit and move forward with their investments. To accommodate this possibility, we revise the framework and let each location host a fixed number of borrowers, and lenders adjust their credit supply after borrowers have made their loan decisions. The effects of IT progress on competition, investment, and welfare remain broadly similar to the base case, but the moral hazard dimension introduces some nuances.

Improving any type of IT in a lender increases the lender's loan rates, market area, loan volume, and profit, while decreasing those of the rivals.[30] An improvement in IT-distance across all lenders intensifies bank competition, decreases banks' competitive loan rates and profits[31], induces lenders to move closer to each other, and generates a hump-shaped effect on entrepreneurs' investment and social welfare. A general improvement in IT-basic does not affect competition intensity, loan rates, and location choices, improving bank profit, entrepreneurs' investment, and social welfare. Let us see how the effect of IT-distance progress on lenders' credit supply is hump-shaped.[32] IT-distance progress generates three effects on loan supply: First, it improves lenders' monitoring efficiency, tending to increase their credit supply. Second, lenders' differentiation and loan rates decrease, increasing entrepreneurs' skin in the game and alleviating moral hazard; this effect also tends to increase credit supply. Finally, lenders' skin in the game decreases, reducing their monitoring incentives and willingness to supply credit. The first two effects dominate and increase lenders' credit supply and entrepreneurs' investment when IT-distance is not yet highly advanced (i.e., when lender differentiation is high), while the last effect – the decrease in lenders' monitoring incentives – dominates and reduces lenders' credit supply and entrepreneurs' investment when IT-distance is sufficiently developed. Moreover, as the moral hazard problem of entrepreneurs becomes more severe, the last effect will be more likely to dominate the first two. The reason is that a more severe moral hazard problem increases the need for monitoring, hence making the provision of monitoring incentives (determined by lenders' skin in the game) more important to credit supply. In contrast, IT-basic progress unambiguously increases lenders' credit supply since it has no differentiation effect.[33]

This framework can shed light on the competition between a traditional bank – which has better access to firm data and hence an advantage in IT-basic – and a fintech lender with better IT-distance

[30] Consistent with the evidence in Dadoukis et al. (2021); Branzoli et al. (2024); Ahnert et al. (2025).
[31] Consistent with the evidence in D'Andrea et al. (2021); Paravisini et al. (2023); and Duquerroy et al. (2022).
[32] Di Patti and Dell'Ariccia (2004) find that the relation between bank competition and banks' credit supply is hump shaped.
[33] If entrepreneurs can exert effort to improve the success probability of projects, there is an additional positive effect of IT-distance progress. In this extended setting, improvements in IT-distance lead to lower loan rates due to intensified competition and reduced lender differentiation. These lower rates, in turn, increase entrepreneurs' skin in the game, that is, the share of project returns they retain, thereby motivating them to exert more effort. The result is a higher probability of project success and, consequently, better loan performance for lenders. Although the overall welfare impact of IT-distance improvements continues to exhibit a hump-shaped pattern, the welfare-maximizing level of IT-distance is now higher compared to the case where entrepreneurs cannot influence project outcomes through effort. This is because the added benefit of enhanced borrower effort amplifies the positive effects of IT-distance on investment quality and social welfare, particularly at moderate levels of technological advancement.

and lack of firm data. With its better IT-basic, the bank can ensure a positive market share because it has higher monitoring efficiency than the fintech when serving firms sufficiently close to the bank. The implication is that although fintechs, with their advantage in IT-distance, can bring competitive pressure to banks, the latter will not be completely replaced.

In the presence of moral hazard and an equal number of entrepreneurs at any location, price discrimination is not socially optimal. The welfare-maximizing loan rate does not depend on lenders' IT or entrepreneurs' locations (which determine their lending efficiency). This rate represents the socially optimal way to share the project value between an entrepreneur and her lender. A higher rate increases the lender's monitoring incentive, but it decreases the entrepreneur's skin in the game and worsens the moral hazard problem. Although a lender's IT and an entrepreneur's location determine the value of a project it finances, the welfare-maximizing way to share this value must balance the severity of the entrepreneur's moral hazard and the lender's monitoring incentive, which is a trade-off independent of the lender's IT. The implication is that lenders' price discrimination will generate inefficient equilibrium outcomes: A lender will price aggressively at far-away locations – where the lender's IT advantage is low – to gain as much business as possible while at locations close to the lender's area of specialization it will price very high to exploit its high IT advantage. Such a strategy does not balance the severity of moral hazard well with the lender's monitoring incentive at each location. Regulators can enhance welfare by establishing a suitable reference loan rate for lenders and restricting their ability to engage in price discrimination.

6. Conclusions and policy implications

FinTech holds significant promise for lowering intermediation costs, stimulating innovation, improving risk assessment, enhancing financial inclusion, and increasing market contestability in financial services. However, its rise also introduces important trade-offs—particularly in relation to privacy, efficiency, security, and financial stability. While early evidence and theoretical models suggest that FinTech promotes entry and competition, its impact on stability and overall welfare remains uncertain. The proposed conceptual framework has highlighted that the welfare implications of FinTech on the lending market depend on several *key factors*:

- Whether IT reduces distance frictions—physical or informational—between intermediaries and borrowers, thereby affecting market differentiation and competition.
- The severity of incentive frictions of the borrowers such as moral hazard.
- Whether lenders can price discriminate and the degree of bank concentration.
- The efficiency gap between fintechs and banks (in terms of monitoring, screening, or convenience).
- The intensity of inter-fintech competition.
- The size of the unbanked population.
- The presence of economies of scope between lending and payment services.

These factors, whose relevance extends beyond the lending market, should be considered by authorities when designing regulations. Of particular interest are the welfare effects of price discrimination, now enhanced by digital technology and data sharing, as well as the appropriate policies to address them. A crucial determinant of the competitiveness of entrants and market performance is the regulatory burden of the different market actors and the associated guarantee schemes. A question arises as to *the extent to which regulation should help entrants or aim at a level playing field*.

Price discrimination has ambiguous welfare effects. Private incentives to discriminate do not typically align with social objectives—except normally when discrimination helps expand the market. Socially optimal loan rates balance the incentives of entrepreneurs and intermediaries to exert effort, thereby mitigating moral hazard and encouraging participation by entrepreneurs, while also enhancing monitoring or screening by lenders. This balance does not typically require location-based discrimination. With fixed and uniform entrepreneur participation at any location, the socially optimal rates do not depend on location. When entrepreneur participation is endogenous and monitoring costs increase with distance, socially optimal rates should rise with distance. However, under competition, price-discriminating intermediaries tend to do the opposite: lowering rates at distant locations to capture market share, which misaligns prices with costs and distorts incentives. Competitive discrimination will induce specialized intermediaries to misalign their pricing with costs to gain or protect market share without regard for the optimal balance of incentives. Fintech entry improves investment, entrepreneurial utility, and welfare, while decreasing bank profitability, particularly when pre-entry markets include underserved customers.

However, in markets where banks compete pre-entry and the entire market is covered, the results are ambiguous.

With sufficient inter-fintech competition, fintech entry boosts investment and entrepreneur utility at all locations—even if banks cannot price discriminate. However, in this latter case, a highly efficient fintech, coupled with low inter-fintech competition, can lead to reduced investment and entrepreneurial utility, as the fintech may gain excessive market power. This outcome does not occur when banks can price discriminate. When banks cannot price discriminate, fintech entry increases social welfare if the leading fintech is efficient enough and inter-fintech competition is intermediate, allowing for a balance between lenders' monitoring incentives and entrepreneurs' participation incentives. However, allowing banks to price discriminate when fintechs can discriminate improves welfare when there is limited fintech competition. In highly competitive fintech markets, such discrimination may lead to excessive competition and underinvestment in monitoring. If banks can price as flexibly as fintechs, fintech entry increases social welfare if the leading fintech is efficient enough and inter-fintech competition is *moderate*. Bank profitability and stability decrease with fintech entry, but industry (banks plus fintechs) profitability increases when banks cannot price discriminate if the leading fintech is efficient enough and there is moderate inter-fintech competition.

Data sharing under open banking provisions improves fintechs' competitiveness. If inter-fintech competition is weak, this can lead to monopoly pockets where fintechs exploit market power as banks exit some segments. This harms investment and welfare. Therefore, data-sharing policies must be accompanied by sufficient inter-fintech competition to avoid unintended concentration. When payment fintechs compete with banks, they may also not internalize the fact that reducing banks' access to payment data undermines their ability to assess creditworthiness and lend effectively. While fintechs may improve payment services, the trade-off is a potential loss of credit efficiency. [34] A public digital payment provider (such as a central bank digital currency or CBDC) may help by internalizing this trade-off—limiting its market share to account for the value of

[34] US banks oppose open banking. Jamie Dimon stated in his letter to shareholders in April that "Third parties want full access to banks' customer data so they can exploit it for their own purposes and profits". The banking industry sued to block an October 2024 open banking measure (applying to institutions with more than $850 million in assets) by the US Consumer Financial Protection Bureau (CFPB), and the now diminished CFPB under the new administration has asked a federal judge to vacate the measure. JP Morgan has told fintechs that it will start charging fees for access to their customers' bank account information (Bloomberg, July 11, 2025).

economies of scope between payments and lending. Furthermore, asymmetries in the obligations to share customer data between banks and fintechs may create an uneven playing field (e.g., in open banking in the EU, where PSD2 applies to incumbents and GDPR applies to non-bank entrants). In the EU, the DMA also imposes obligations on designated "gatekeepers" (bigtechs) and rebalances the obligations.

Regulatory design will be crucial, especially in deciding which activities to include within the banking regulatory perimeter. The trade-off is that regulating based on activity ("same activity, same regulation") may promote innovation and ensure a level playing field between established institutions and new entrants, but it may compromise financial stability. Prudential requirements must apply to entities, not activities, as it is the entities that fail and cause systemic problems. The policy dilemma involves, on one side, expanding the scope of bank regulation to all financial service providers, thereby limiting financial innovation and implicitly extending safety nets to new entrants, and on the other side, excluding new entrants from the perimeter to favor their competitive position. A balance must be struck between including activities with systemic risk potential within the regulatory perimeter and encouraging innovation and competition.

We have seen how the entry of FinTech firms can reduce the profitability of incumbents, their skin in the game, which may decrease their monitoring incentives or lead to excessive risk-taking to mitigate downward pressure on profits. A potential problem is that regulators might respond to increased risk-taking by raising banks' prudential requirements, but this could, in turn, incentivize the bypassing of regulation and the promotion of shadow banking activity. This creates a self-reinforcing cycle of rising shadow banking and risk-taking by incumbents alongside increasing prudential requirements. The US mortgage market after the global financial crisis illustrates this regulatory boundary issue. Indeed, the tighter regulatory scrutiny on banks following the subprime crisis led to a rapid expansion of shadow banking in mortgages, which nearly tripled its market share from 2007 to 2015, with fintechs more than doubling their residential loan origination. Shadow bank lenders expanded into borrower segments and areas where regulation made the activities of traditional, deposit-taking banks more costly. Furthermore, shadow banks depend on guarantees from government-sponsored enterprises (GSEs) by largely unloading the loans they originate onto them. We can say that the US has shifted from providing a housing subsidy via cheap deposits and private-label securitization to a shadow bank subsidy by allowing them to

offload originated loans onto GSEs, thus relying on public guarantees.[35] A parallel evolution happened in the US corporate loan market in the implementation of Basel III where less capitalized banks reduced loan retention and nonbanks stepped in.[36] The consequences of the US tightening of prudential requirements following the global financial crisis underscore the importance of considering regulatory arbitrage in the design of regulation and the safety net.

Consumer protection concerns rise with digitalization. Regulators must determine who controls the data and ensure transaction security on platforms. They also need to consider that digital technology enables greater price discrimination and the exploitation of behavioral biases of consumers and investors.

Regulating financial services is challenging due to the presence of all classic market failures: externalities, asymmetric information, and market power. The difficulty arises from the second best principle in the presence of several market failures. Fixing one of them, or moving in the direction of fixing one, may backfire because of the interaction with the others.[37] Increasing competitive pressure to limit market power provides a case, as we have seen. The optimal degree of competition in the lending market balances the incentives of entrepreneurs and lenders, ensuring that both parties have a sufficient stake in the outcome. Competitive pressure must be sufficient, but it can overshoot and destroy the monitoring (and screening) incentives of lenders. We have seen how this tension can be exacerbated by the severity of the moral hazard problem faced by entrepreneurs. Data sharing and price discrimination provide more examples. The regulator, when considering whether to tilt the playing field in favor of entrants with data sharing obligations to foster entry, should assess the potential benefits, if competition is insufficient before entry, against the costs of impairing economies of scope of incumbents and credit provision. The rule of thumb is that regulators should be wary of price discrimination when the market is not extended, as this can lead to a potential misalignment between social and private incentives. However, when some lenders (e.g., banks) face constraints on pricing discrimination, while fintechs do not, welfare may be reduced. In all cases, empirical evidence is needed to assess the trade-offs.

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[35] Buchak et al. (2018) show that the increased regulatory burden on traditional banks can explain about 55% of shadow banking growth in the 2007-2015 period, while 35% of the expansion in shadow banking activities can be attributed to the use of financial technology. Shadow bank funding relied on an 85% of mortgages sold to GSEs after origination in 2015.

[36] See Irani et al. (2021).

[37] See Vives (2016).

Despite the difficulties arising from the interaction of market failures, authorities should strive to improve regulation to alleviate the trade-offs. To the traditional tension between competition and stability in the lending market, we must add the trade-off between preserving privacy and competition (as exemplified by open banking) and between privacy and stability (with information disclosure to authorities that may be intrusive for consumers and investors).

Final takeaway: balance and regulatory coordination. Overall, a level playing field—in terms of pricing flexibility and access to information—is desirable to support a degree of competition that encourages efficient rent-sharing and sound incentives for all market participants. However, there are limits to how level the field can be, mainly due to prudential concerns. Financial stability depends on the soundness of institutions, and not all intermediaries can or should operate under identical regulatory conditions. In this regard, regulation by activity may aim to level the playing field between incumbents and entrants. However, financial stability depends on the soundness of entities, and therefore, there are limits to leveling the field.s

Regulatory coordination is essential, as FinTech introduces tensions between regulatory objectives: Banking regulators prioritize financial stability, competition authorities focus on customer welfare (together with consumer protection authorities) and market efficiency, and data regulators emphasize privacy protection. Balancing these objectives will be crucial to realizing FinTech's potential while ensuring the protection of economic and social outcomes.[38]

[38] See Carletti et al. (2020) for a broad perspective on those tensions in digital banking.

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