

# THE ROLE OF FINTECH IN SMALL BUSINESS LENDING: EVIDENCE FROM FRANCE\*

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## Abstract

This paper investigates the role of FinTech lending in credit markets for small-to-medium-size firms (SMEs). Using administrative data from France, we document three main findings. First, we find that SMEs borrowing from FinTech platforms are of similar age and size to SMEs borrowing only from banks; they have less cash and tangible assets, but innovate and invest more. Second, FinTech credit and bank credit serve as complements for firms. Following a FinTech loan grant, firms experience an increase in long-term loans extended by both relationship and new banks. This pattern holds after we control for credit demand. We present evidence on a novel channel: FinTech platforms help relax small firms' collateral constraints by offering unsecured medium-term loans, which are commonly used for investments in tangible assets. Last, we find that the credit expansion brought about by Fintech platforms have an adverse impact on the probability of bankruptcies at the extensive margin, but spurs growth in firm size, sales and employment at the intensive margin. These results suggest that FinTech lending may allow SMEs to pursue risky but innovative projects.

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# 1 INTRODUCTION

Financing is crucial for small business growth, yet small and medium-sized enterprises (SMEs) routinely report difficulty in accessing credit. Since the 2008 financial crisis, increased regulatory burden and stricter scrutiny on bank lending have further exacerbated credit constraints of small businesses (Buchak et al., 2018; Cortés et al., 2020; Gopal and Schnabl, 2020) and hindered firm growth (Bord et al., 2015; Chen et al., 2017). In contrast, online lending has been rapidly growing in various regions including the UK and US, which partially fills in the gap left by banks.<sup>1</sup> While FinTech lending is relatively small in the EU, various regulatory measures have been taken to scale up this market for its potential positive impact on SMEs and job creations.<sup>2</sup> In light of the recent Pandemic of COVID-19, the French government unprecedentedly provides guarantees for new loans granted by crowd-funding intermediaries.<sup>3</sup>

Despite the expansion of FinTech small business lending and EU regulator’s attempts to facilitate its development, we know very little about this market. Are FinTech and banks loans complements or substitutes for firms? Does FinTech lending expand credit access for SMEs in the long run or just substitute bank loans? The answer is theoretically not clear. On the one hand, FinTech platforms may serve as a substitute for bank credit, for firms value the convenience and speediness of online applications. Banks may also react to FinTech loans by reducing credit supply if FinTech loans are associated with more defaults. On the other hand, firms may also use FinTech credit as a complement for bank credit as the former because a successful FinTech loan application may signal good firm quality or enables firms to grow in their early stage, which subsequently improves bank credit access. Existing work offers little insights on these issues, probably due to data limitations. Unlike banks that are required to disclose lending to SMEs under the Community Reinvestment Act, online lenders are typically not subject to such mandate. Therefore, detailed information on FinTech SME borrowers and loans is rare.

This paper exploits a unique dataset on FinTech SME loans collected by the Banque de France (the French Central Bank). The loans in our sample represent over 60% of the FinTech SME market in 2016, the beginning of our sample period. As the creator of the firm credit scoring system, Banque de France shares the credit score with FinTech platforms, and in exchange, require platforms to disclose information on all loans facilitated through the platforms. In addition, with the borrower’s unique identifier, we are able to link the FinTech loan dataset to the credit registry, so as to obtain the complete credit history of firms who borrow from FinTech platforms. The data therefore covers all FinTech loans intermediated by the largest 10 French platforms from 2016, two years after online platforms were first allowed to operate in France, to April 2020. In total, these FinTech platforms facilitated 2,109 projects by 1,586 unique firms for a total amount of 319 million euro. While the French

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<sup>1</sup>According to the US Federal Reserve’s 2019 Small Business Credit Survey Report on Employer Firms, 32% of small businesses that sought financing applied with a fintech or online lender, up from 19% in 2016. In comparison, 44% applied with small banks and 49% with large banks.

<sup>2</sup>This mission was raised in the EU commission’s action plan on FinTech: [https://ec.europa.eu/info/business-economy-euro/banking-and-finance/digital-finance\\_en](https://ec.europa.eu/info/business-economy-euro/banking-and-finance/digital-finance_en)

<sup>3</sup><https://www.economie.gouv.fr/covid19-soutien-entreprises/pret-garanti-par-letat?gclid=CKHs45yctukCFdEhGwod0sgAoQ>

FinTech SME market is still small compared to the US market, it is the second largest in Europe, after the UK. In addition, EU and French regulators are taking various measures to encourage the growth of the market. Exploiting the richness of French administrative data could therefore help understand the challenges and the opportunities associated with the development of FinTech financing.

Using the linked data, we first provide a comprehensive description of the FinTech SME loans and borrowers, then investigate the role of FinTech lending in the credit market and the underlying economic channels. We document three main findings. First, we find that firms that borrow from FinTech platforms, compared to firms that borrow only from traditional banks, are similar in terms of size and age, are more leveraged, have less cash flows and tangible assets, and invest and innovate more. This implies that firms borrowing from FinTech platforms likely face large financial constraints. In terms of loan characteristics, FinTech loans on average are 151 thousand euro, have a 9.1% annual cost of borrowing inclusive of fees, and a maturity of 38 months. Over 40% of FinTech loans are used to finance investments and 23% are used for commercial growth.

Our second set of results relate to the role of FinTech lending in the SME credit market. In particular, we examine the credit access of FinTech borrowers following the FinTech loan grant. We find that FinTech SME borrowers experience an expansion in bank credit access. Furthermore, the credit expansion comes from long-term bank loans, as opposed to credit lines. The first glance of the data suggests that FinTech and bank credit are complements for SMEs, but both credit demand and supply could explain this finding. For example, firms that borrow from FinTech platforms may face investment opportunities and demand credit from FinTech platforms and banks simultaneously. While banks, upon observing a successful FinTech loan grant, may also be more willing to extend loans.

To further understand what drives FinTech SME borrowers' credit dynamics, we construct a control group consisting of firms that only borrow from banks, which share similar characteristics and credit history as FinTech borrowers. Crucially, we require the control firms to obtain loans from a new bank around the same time, which allows us to control for the nature and size of the credit demand. The results based on the matched sample are similar. After obtaining a FinTech loan, relatively to comparable bank borrowers, firms gain access to 10% larger long-term loans from both existing and new bank lenders. We do not observe this pattern for credit lines.

We then explore potential explanations for the observed differences in credit access between FinTech and bank borrowers. The first explanation for the complementarity between the two sources of credit is that a successful FinTech loan grant serves as a positive signal for firm quality, as the platform and hundreds of investors collectively exert efforts in screening firms (*the information channel*). A second possibility is that FinTech loans relax borrowers' collateral constraints. While having a three-to-five-year maturity, FinTech loans are uncollateralized. This allows SMEs to take on profitable projects without pledging collateral or personal guarantees. French banks, in contrast, impose stringent collateral requirements (Davydenko and Franks, 2008). As a result, FinTech loans help increase firms' pledgeable assets and expand borrowing capacity (*the collateral channel*).

We present several pieces of evidence that are consistent with the collateral channel. First, we find that the increase in credit access only applies to long-term loans but not credit lines, the latter being more sensitive to information and requiring larger monitoring

efforts. Second, the effects are not stronger for firms with a thin credit history, for which a successful loan application is a more valuable signal for firm quality. On the contrary, both rated and unrated firms benefit from the credit expansion. This is in line with the collateral channel because the collateral requirement typically does not vary with the length of lending relationships and information. Last, we find a stronger effect on loans used to finance tangible asset investments than those used for other purposes, which is a direct prediction of the collateral channel.

Taking stock of our results, we conclude that FinTech platforms enable collateral and liquidity constrained SMEs to take on profitable investment opportunities. Moreover, FinTech loans further benefit firms by expanding their access to long-term bank loans. Of course, FinTech loans' lack of collateral requirement is reflected in the higher borrowing cost. In contrast, banks are not able to offer similar loan products, possibly because of stringent capital requirements and conservative risk management.

To assess the overall benefits of FinTech lending and the resulting credit expansion, we also investigate the real effects of FinTech credit access on firm outcomes including growth, employment, investments and bankruptcies. We document that FinTech borrowers, relative to the bank borrowers, are 7% and 5% more likely to enter a bankruptcy procedure and being liquidated two years after the loan grant. However, focusing on firms that did survive, FinTech borrowers experience a larger growth in total assets, sales, employment and the average wage. This suggests that the regulatory measures aiming at spurring FinTech lending may benefit SMEs who pursue riskier and potentially more innovative projects.

**Literature** This paper contributes to a nascent literature on the role of FinTech lending. Most of these papers have focused on consumer credit and find that FinTech is a substitute for traditional banking (Buchak et al., 2018; Chava et al., 2019; Di Maggio and Yao, 2018; Tang, 2019; Vallee and Zeng, 2019). Balyuk (2019) argue that there is some complementarity due to information spillover. Only a few paper examines the expansion of FinTech lending to small businesses. Gopal and Schnabl (2020) find that finance companies and FinTech lenders substitute banks in small business lending market after the Global Financial Crisis, while Balyuk et al. (2020) document the differential effects of banking lending on FinTech growth by banks' information technology.

To the best of our knowledge, our paper is among the first that provides a comprehensive description of the FinTech SME lending market using detailed loan-level data. By linking the FinTech loan dataset to the French credit registry, we are able to observe all types bank loans obtained by FinTech borrowers. Unlike the contemporaneous work, we document a *complementarity* between FinTech and bank credit, which indicates that the regulatory measures aiming at spurring FinTech lending are likely to be beneficial. Moreover, different from Gopal and Schnabl (2020) that examine the *secured* business loan market, we observe all types of bank loans of FinTech borrowers, which allows us to document a novel channel for the complementarity between FinTech and bank lending.

A more developed literature looks at credit availability for small businesses. Much of this literature focuses on the importance of relationships and soft information in providing adequate financing for small firms (Agarwal and Hauswald, 2010; Berger and Udell, 2002; Chakraborty and Hu, 2006; Petersen and Rajan, 2002; Strahan and Weston, 1998, etc.),

with some emphasizing the role of collateral in multiple-bank relationships (Degryse et al., 2016; Donaldson et al., 2019)

This paper adds to this literature by showing that FinTech lenders expand credit access of SMEs by mitigating collateral constraints. To our knowledge, we are the first to identify this channel for FinTech SME loans. As most FinTech SME loans are unsecured, we believe our results have general implications and could inform policy makers of the value of FinTech lending.

The rest of the paper is organized as follows. Section 2 provides institutional details on the FinTech SME loan market in France. Section 3 describes our novel data sources. Section 4 provides a detailed description of FinTech loan and borrower characteristics and Section 5 presents the empirical results based on the matched sample, and Section 6 concludes.

## 2 FINTECH SME LOAN MARKET IN FRANCE

### 2.1 Historical background

Since 1945, lending activities in France have been regulated under “a banking monopoly” regime, which prohibits non-bank entities to carry out lending activities.<sup>4</sup> This principal is also laid down at the European level by Article 9-1 of the European Capital Requirements (CRDIV3). However, this regulation has been relaxed after the introduction of new categories of lenders in France in 2014.<sup>5</sup> Intermediaries in participatory financing (or “IFPs”, the French abbreviation) are given accreditation to intermediate corporate loans up to one million euro per loan.<sup>6</sup>

This study focuses on FinTech platforms offering lending solutions to firms. These platforms have been in operation in France in 2014 under the status of IFP. As a banking license is not required for IFPs, they are subject to neither capital nor liquidity requirements.

### 2.2 The French FinTech lending market

The French FinTech lending market has been growing since 2014, when the first IFP platform (Unilend) appeared. However, FinTech platforms still account for a small share of the small business loan market. Besides the one-million limit on loan size, the maximum investment amount per project per lender is also capped at 2,000 euro. Figure 1 depicts the aggregate volume of loans under 1 million made by banks and the FinTech platforms in our sample. As of April 2020, the total amount outstanding for FinTech loans is around 200 million, which accounts for less than 1% of total amount of bank loans under 1 million.

The application process is exclusively online and borrowers have to meet some minimum

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<sup>4</sup>Article L511-5 du Code Monétaire et Financier, the French banking monopoly is justified as it seeks to protect depositors from the risk of insolvency or illiquidity.

<sup>5</sup>Regulation EU. No575/2013 on prudential requirements for credit institutions and investment firms.

<sup>6</sup>As of 2019-08-17, according to ORIAS register (a French association that delivers accreditation to new players), 158 IFP were active in France and 87 had been in activity and were deregistered. One of the oldest active IFP was Credit.fr (registered on 2014-10-07). For the IFPs deregistered by ORIAS, the average lifetime had been 510 days and for the still active the average life had been 670 days as of end August 2019. The IFP status covers activities like donation, reward, royalties and lending.

requirements for firms. For example, firms have to be in operations for more than three years and at least three years of accounting data has to be provided, or firms have to have a minimum turnover of 250 thousand euro. Borrowers submit the loan request, along with a unique French firm identifier. Upon the completion of an application, platforms collect information on borrowers using the firm identifier and determine the interest rate, typically within 48 hours. Platforms in our sample have access the accounting data and the credit score from the Banque de France. On average, 2% of the submitted projects are accepted. Once accepted by the platform, the project is displayed online to lenders.

Both individual and institutional investors can invest on FinTech platforms. Lenders have access to a short description of the project provided by the borrowers, loan characteristics, including loan amount, interest rate and maturity, the credit score assigned by the platform, and some accounting information, such as turnover and leverage for the last three years of activity. If the project is fully funded, borrowers receive funds in one or two weeks.

The borrowing cost includes three parts. The first part is a fixed fee that covers costs associated with platform's operations. The fixed fees are required even if the application is rejected. The second part is an upfront fee proportional to the loan amount, and it ranges from 3% to 5% across platforms. This fee is paid only if the project is fully funded by the investors. Finally, similar to a traditional loan, borrowers pay interests to investors. Additional fees can be charged to borrowers in case of late or early repayments. No collateral or personal guarantees are required.

### 3 DATA SOURCES

We combine four databases provided by Banque de France (the central bank of France), and a public dataset using a unique firm identifier SIREN. These databases provide information on FinTech loans, newly originated bank loans, firm credit history, accounting and financial variables, as well as firm bankruptcy status.

**FinTech loan database** The Banque of France collects monthly data on corporate loans intermediated by FinTech lending platforms on a voluntary basis. In return, platforms have access to the credit score created by the Banque de France. Our FinTech loan database covers 10 platforms that requested to access firm's credit score and accounting information in the FIBEN dataset at Banque de France, which we further describe below. In 2016, these platforms originated 58% of the FinTech corporate loans in France. This share decreases to 21% in 2019. The FinTech loan database covers the period from 2016 to 2020. In total, there are 1,586 unique firms, 2,109 loans for a total amount of 319 million euro. For each firm, we observe loan amount, interest rate, and loan purpose.

**New bank loans (M-contran)** The second database provides information on a sample of new loans originated by banks in the first month of each quarter. They are selected within a rotating panel so as to form a representative sample of bank lending activities. On average, there are about 100,000 new loans each quarter by 345 different banks, which originate over 75% of loans to French firms. For each loan, we observe loan types, interest

rate and maturity. We use this database to construct the control group consisting of firms that borrowed from banks at the same time and in similar amounts as Fintech borrowers.

**The French credit registry** The French national credit registry contains monthly information on the credit granted by banks to firms whose total credit from a bank exceeds 25,000 euro. This total amount includes not only funds effectively granted to the firm (or drawn credit), but also the bank’s commitments on credit line (or undrawn credit), as well as specific credit categories (such as medium and long term lease with purchase options, factoring, securitized loans, etc.). We observe, for each firm, its industry, geographic location, size, and loan amount by category.

**FIBEN and DIANE: Accounting data and credit score** The third dataset report the credit score, and accounting and financial data for all companies with a turnover over 750 thousand euro for the period 2015-20. The credit score, created by the Banque de France, incorporates information on firms’ balance sheets, trade bill payment incidents, micro and macro economic environment, and the quality of business partners and managers, so as to reflect a firm’s ability to meet their financial commitments at a three-year horizon. Appendix B.3 presents detailed information on each category of the credit score and the expected default probability. We collect yearly reported accounting data for the period 2015-19. Because individual entrepreneurs are not obliged to report their accounting information, the FIBEN dataset covers a smaller set of firms than the credit register. We therefore complement FIBEN with another dataset DIANE, which reports balance sheets and financial statements for a wide range of French firms. We are able to append missing accounting information for 56% of firms that are not included in FIBEN.

**Bankruptcy information** The last dataset provides information on firm bankruptcy. Commercial and civil court legal announcements have to be disclosed in a French official registry called BODACC (Bulletin officiel des annonces civiles et commerciales). This dataset includes information firm identity, the date of the announcement, and the type of legal proceedings. Out of 869 FinTech borrowers (our matched sample as introduced in Section 5), we identify that 70 firms entered a collective procedure, and among those, 53 were liquidated. This represents 8% and 6% of FinTech borrowers in the sample, receptively. In contrast, 2% of the 2,411 firms in the matched sample that take a new bank loan in the same period have entered collective procedure and 2.3% have been liquidated.

## 4 FINTECH LOANS AND BORROWERS

Using the linked data, we first provide summary statistics on FinTech loans and borrowers, then we investigate the credit dynamics of FinTech borrowers.

### 4.1 FinTech loan characteristics

Table 1 Panel A presents descriptive statistics on the 2,109 FinTech loans by 1,586 firms in our sample. The average loan size is 151,240 euro, and medium amount is 50,000 euro. The



average annual percentage rate (APR), including fees, is 9.1% with a large variation: the maximum interest rate is 37.22% <sup>7</sup>. Loan maturity is between 3 months to 84 months with an average of 3 years. On the investor side, a project is on average financed by 506 individual investors, which represent 87% of total financing. This is because banks also invest on the platforms. Figure 2 shows the number and amount of loans in each loan purpose category. The top three purposes for FinTech loans, in terms of number of loans in each category, are to finance intangible investment (27%), commercial development (26.5%) and intangible investment (19.9%). The purpose distribution looks similar when we look at loan volume.

Using the unique firm identifier, we identify firms that have a banking relationship in our sample period. 21% of the firms do not have a banking relationship before obtaining the FinTech loan. We refer to these firms as the “unbanked FinTech borrowers”. Among them, 181 did not establish a banking relationship as of 2019. Table 2 provides summary statistics on loans separately for firms without and with a banking relationship before obtaining the FinTech loan.

We find that unbanked FinTech borrowers with pre-existing banking relationships receive a 42% smaller loan than their banked peers. The average maturity is 12 months longer, while the interest rates are 2.4% higher. In terms of investors, unbanked and banked firms receive a similar share of funding from banks, non-bank legal entities, and individual investors.

## 4.2 Comparing FinTech and bank loans

To understand how FinTech loans and borrowers differ from their bank counterparts, we present descriptive statistics on loan and borrower characteristics in this section.

**Loan characteristics** We start by comparing FinTech and bank loans. As FinTech loans are uncollateralized fixed-term loans, we also restrict our analysis to the same type of bank loans originated in the sample period. Table 3 presents the summary statistics. FinTech and bank loans mainly differ in loan size and price. First, the average size of unsecured FinTech loans are €60,000 larger. Second, while bank loans on average have a 1.7% interest rate, the average rate of FinTech loans is 7.43% higher. The difference becomes smaller (6.31%) when we compare FinTech loans to short-term bank loans, which is consistent with short-term credit instruments (such as credit lines) being more expensive than long-term loans. Although the FinTech rate includes fees while the bank rate does not, it is very likely that even after fees, bank rates are significantly lower. The higher price of FinTech loan may first reflect firm risk as we expect FinTech borrowers to differ from bank borrowers in many dimensions. Second, from loan application to a firm receives funds, it typically takes less than a couple of weeks for Fintech loans, while the processing time is more than one month for bank loans. Firms may value the fast speed and convenience of FinTech services, hence the higher price of Fintech loans.

**Firm characteristics** The difference in loan terms may be driven by firms’ characteristics. In order to understand which types of firms borrow from FinTech platforms and banks, we

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<sup>7</sup>We use interest rate and APR interchangeably in the following.



construct various corporate finance ratios and indicators using the balance sheet data from FIBEN.

Furthermore, we define two categories of borrowers in our sample. The first category includes firms that borrow from both FinTech platforms and banks (“FinTech-bank borrowers”), and the second one consists of firms borrowing only from banks (“bank-only borrowers”).<sup>8</sup>

We present descriptive statistics of firm characteristics and perform t-tests on these ratios for the two groups of firms in Table 4. The corporate finance ratios reveal that FinTech-bank borrowers have less working capital, sales, and net income than bank-only borrowers. In addition, FinTech-bank borrowers have a higher leverage and more investments. This indicates that FinTech borrowers have stronger liquidity needs, which may be a key driver of borrowing from FinTech platforms that typically provide faster services.

We also construct two measures for firms’ innovation activities following the conventional approach in the literature. The first measure is the total R&D output, and the second is total R&D expenditures. We observe that FinTech-bank borrowers have more innovation activities than bank-only borrowers. This may explain why those firms seek financing from FinTech platforms, as information asymmetry is more severe for innovative firms, which limits their bank credit access.

Our last indicator represents firm’s ability to pledge collateral. We define the collateral ratio as the share of tangible assets over total assets, and find that FinTech-bank borrowers have less collateral than bank-only borrowers.

In sum, these statistics suggest that firms borrowing from FinTech platforms have less cash flows, less tangible assets, invest and innovate more. This finding, together with the FinTech loan purposes described above, suggests that FinTech borrowers face more growth and investment opportunities, but are likely to be financially constrained (Fazzari et al., 1987; Hadlock and Pierce, 2010; Chaney et al., 2012).

We next turn to the bank lending activities of the two groups of borrowers. Figure 3 presents the average bank lending volume of FinTech-bank and bank-only borrowers between 2015 and 2020. It is clear that FinTech-bank borrowers experience a faster growth in bank lending than bank-only borrowers, especially before 2018. Towards the end of the sample period, i.e., during the Pandemic period of 2020, this difference becomes even sharper.

Does the fast growth of FinTech loan help relax financial constraints of SMEs? In the following sections, we describe the credit dynamics of FinTech borrowers in detail and further investigate the credit dynamics of FinTech and bank borrowers.

### 4.3 Credit dynamics of FinTech borrowers

Theoretically, it is not clear whether FinTech loans and bank loans are complements or substitutes. On the one hand, firms may value the streamlined process and speediness of FinTech services and switch from traditional lenders to FinTech lenders. In this case, FinTech and bank loans are substitutes. On the other hand, the low collateral requirement associated with FinTech loans may relax firm’s collateral constraints, allowing them to borrow more from banks. Similarly, a successful FinTech application could inform banks, especially those

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<sup>8</sup>We do not have accounting information for all the firms in the sample, in particular, the smallest firms.

with limited exposure to the firms, of the firm quality. While the first channel involves firm’s preferences over credit sources (credit demand), the second two channels bring credit supply by banks into play.

In this section, we empirically investigate how access to FinTech credit affects bank lending. We focus on the group of FinTech borrowers which have at least one banking relationship at any given point in the sample period. Fintech borrowers may therefore be banked or unbanked at the time of the first Fintech loan. We only keep the first FinTech loan when a firm borrows multiple times from FinTech platforms. This ensures that we observe the reaction of bank credit to the initial FinTech loan.

We use the specification in equation 1 to study firm’s credit dynamics around the FinTech loan grant. The dependent variable  $y_{i,t}$  is the logarithm of total loan amount granted to firm  $i$  in month  $t$  relative to the FinTech loan grant. For each firm, we restrict the observations between  $[-12, 24]$ . The coefficients of interests are  $\delta_t$ , which capture the amount of bank loan a firm obtains relative to the reference level at  $t = 0$ , when the FinTech loan is granted. The standard errors are clustered at firm level. Naturally, as we move further away from  $t = 0$ , the number of observations drops as fewer firms have a four-year continuous relationship with their banks.

$$y_{i,t} = \sum_{t=-12}^{24} \delta_t \mathbb{1}_t + \varepsilon_{i,t} \quad (1)$$

We start by showing the patterns of total amount of bank loans around the FinTech loan grant. Figure 4 plots the evolution of the total amount of bank loans (top panel), drawn credit and undrawn credit, for all FinTech-bank borrowers. In the 12-month period prior to  $t = 0$ , there is no change in total loan amount. Following the FinTech grant, firms experience a significant increase in the total bank loan amount throughout the 24-month observation period.

We break the total amount by credit usage in panels b and c. We find that the amount of drawn credit increases sharply after  $t = 0$ , while the amount of undrawn credit mildly increases around  $t = 0$  and stays constant afterwards. These two patterns combined suggest that the increase in credit observed in panel a is not explained by firms drawing on their existing credit lines, and that firms were granted more immediately available bank credit after obtaining the Fintech loan.

The aggregate pattern, however, does not inform us of the potential impact on the composition of bank loans. We therefore perform the same analysis for loans made by different lender types and in various categories, which are featured with specific monitoring and lending practices (see Berger and Udell, 1995; Chakraborty and Hu, 2006, for example).

Panels a and b of Figure 5 present the amount of loans made by new lenders, defined as lenders that did not have a relationship with the firm prior to  $t = 0$ , and pre-existing lenders. We find that the amount of loans granted by new (existing) lenders increases (decreases). This suggests that FinTech firms shift from existing lenders to new lenders.

We next turn to different loan categories, in particular, credit lines and long-term loans in panels c and d. The two loan categories also exhibit distinct dynamics. FinTech borrowers slowly accumulate credit line balance in the 12-month period prior to the FinTech loan, then reimburse the credit line at  $t = 0$ . This reduction is however temporary, with the

credit balance gradually accumulates again. In contrast, FinTech borrowers experience a 10% increase in long-term loans following the FinTech loan grant, and this increase persists for 14 months.

Therefore, FinTech borrowers are substituting existing lenders with FinTech platforms, as well as new bank lenders. In addition, the expansion in bank credit access is mainly driven by their access to long-term loans. These patterns are consistent with FinTech and bank credit being complements for SMEs. However, it does not inform us of whether the credit expansion is a causal result of a successful FinTech loan application. It may be that SMEs that face investment opportunities borrow from both FinTech platforms and banks simultaneously and obtain the FinTech loan shortly before the bank loans. In this case, the increase in bank lending reflects firm’s unobservable credit demand, rather than a relaxed credit supply.

To distinguish between the credit demand and supply channels, we construct a matched sample that consists of similar firms that obtain a bank loan in the same month as the FinTech loan. The underlying assumption is that firms with similar observable characteristics and credit history, which operate in the same industry and have the same borrowing need in the same month, face similar growth opportunities. Therefore, by constructing a control group, we control for credit demand. We detail our matching procedure in the next section.

## 5 CREDIT DYNAMICS BASED ON THE MATCHED SAMPLE

### 5.1 The matching procedure

Our goal is to analyze how a FinTech loan grant affects firms’ subsequent access to bank loans. To construct a control group, we select firms that have similar credit dynamics to FinTech borrowers but obtain loans from a *new* bank lender at the same time. This matched sample serves two goals. First, it controls for credit demand by firms. Control firms, by construction, also apply for a new loan around the same time as FinTech borrowers. Therefore, the subsequent credit dynamics of the two groups of firms are plausibly driven by credit supply. Second, matching firms on the condition that they obtain a loan from a new lender allows to neutralize the effects of the introduction of a new lending relationship on bank borrowing (Degryse et al., 2016). By comparing the two groups, we can therefore isolate the effects on credit dynamics that are driven by the FinTech loan grant.

For each FinTech borrowing firm, we select firms, from the universe in the credit registry, that are comparable in observable characteristics and obtain similar loans from new lenders in the same month. Specifically, the following filters are applied in the matching procedure: (1) the firm receives one or multiple loans from new lenders in the same month  $t = 0$  (2) the new loans are either short-term loans (credit lines) or long-term loans. (3) the firm has active banking relationships during the 13-month period  $[-6, +6]$  around the new loan grant. After applying these filters, we further select firms that are similar to the treated firms in total loan amount in the three month preceding the new loan grant. Last, for each treated firm, we select up to 5 firms that are the closest in the total bank credit amount  $L$  based on a distance measure  $\sum_{t=-2}^0 \left( 2 \times \frac{L_{FinTech,t} - L_{Control,t}}{L_{FinTech,t} + L_{Control,t}} \right)^2$ . The final matched sample include 29,309 firm-month observations for 869 FinTech borrowing firms and 2,411 control firms.

## 5.2 Credit dynamics in the matched sample

In this section, we compare the credit dynamics of the two groups of firms in a 36-month window around a FinTech or bank loan grant. We first analyze the aggregate patterns of their credit dynamics, then we quantify the impact of FinTech loan grant on firm credit dynamics using a difference-in-difference (DID) approach.

Figure 6 displays the aggregate credit patterns. The top, middle and bottom panels display the average loan amount by three groups of lenders: all lenders excluding the new lender/FinTech platform (thereafter “all lenders”), banks with which the firm has a lending relationship before the event (thereafter “existing lenders”), and new lenders without a lending relationship with the firm before  $t = 0$  (thereafter “new lenders”).

Several observations are worth noting. First, by construction, the two groups of firms have similar credit dynamics between  $[-2,0]$ . However, this is true even before  $t = -2$ , which reassures that the two groups are comparable. Second, following the new loan grant at  $t = 0$ , the total amount of loans increases for both groups at  $t = 0$ , but the increase is larger for FinTech borrowers. This suggests that FinTech loan access positively impact bank credit supply. Third, the amount of loans made by both existing and new bank lenders seems larger for FinTech borrowers than for bank borrowers.

To further quantify the effects, we perform a standard DID analysis, using the following specification:

$$y_{i,t} = \beta \text{treated}_i \times \text{post}_t + \gamma_{i,t} + \varepsilon_{i,t}. \quad (2)$$

The dependent variables  $y_{i,t}$  are the logarithm of loan amount or number of banks of different lender types. The coefficient of interest  $\beta$  is expected to be positive. We include both firm  $\times$  time fixed effect to control for firm-varying characteristics. The inclusion of firm  $\times$  year fixed effects, moreover, controls for unobservable investment opportunities that vary at firm-year level, which implies that our results are unlikely to be driven by credit demand. Standard errors are clustered at firm level.

Table 5 reports the regression results. Columns 1-3, respectively, present the changes in the amount of loans by all lenders, new lenders, and existing lenders. Consistent with the aggregate pattern, relative to control firms, new and existing bank lenders increase lending to FinTech borrowers by 29% and 5%. At the same time, the number of new bank also goes up by 7%, while the number of existing banks stays unchanged. Therefore, FinTech borrowers are able to establish new banking relationships.

We also investigate the effects separately on various loan categories and present the results in Table 6. Following a FinTech loan grant, firms experience a 5% and 14% increase in credit line and long-term loans by new bank lenders, while existing lenders only increase lending in long-term loans.

To capture the dynamics in the treatment effect, we implement a version of this equation where we replace the *post* dummy with month dummies. This specification not only allows us to zoom into the effects at a monthly frequency, but we can also visualize the pre-trends and examine the parallel trend assumption. Regression coefficients are plotted in Figure ???. According to Panel a, before obtaining the new FinTech or bank loan, there is no significant difference in credit dynamics between FinTech firms and control firms. While after the

new loan grant, only FinTech borrowers experience an increase, which persists during the 24-month period after the grant. Breaking loans into credit lines and long-term loans, we observe that this increase is driven by long-term loans, which sharply rises in the first 3 months and stays relatively stable afterwards.

$$y_{i,t} = \sum_{t \in [-12, 24]} \beta_t \text{treated}_i \times D_t + \gamma_{i,t} + \varepsilon_{i,t}, \quad (3)$$

Taken together, our evidence suggests that both FinTech and control borrowers experience a credit expansion from non-relationship banks following the FinTech grant. However, the increase is stronger for Fintech borrowers, suggesting that getting a Fintech loan eases subsequent access to bank credit.

### 5.3 Economic channels

The fact that FinTech borrowers expand subsequent access to bank credit, relative to similar control firms, can be explained by different mechanisms. First, as FinTech platform and investors collectively exert efforts in screening firms, a successful application may signal good firm quality. Subsequent lenders, upon observing this signal, may be willing to extend credit that is otherwise unavailable. We refer to this as the *information channel*. A second channel relates to the fact that FinTech loans are unsecured. While having a mid-to-long term maturity, FinTech loans allow firms to take on profitable projects without posting collateral or personal guarantees. Control firms, in contrast, are required to pledge assets for mid-to-long term bank loans. In the latter case, subsequent lenders may be reluctant to further extend credit if the firm has limited pledgeability. We refer to this channel as the *collateral channel*.

To distinguish between the two channels, we exploit the heterogeneity in firm and loan features in three dimensions: loan category, credit history, and loan purpose. We present two pieces of evidence, respectively, that are consistent with the collateral channel. First, as described in the previous section, FinTech borrowers experience an increase in only long-term loans but not in credit line balance. This is less consistent with the information channel, because credit lines are considered more sensitive to information while long-term loans are less so (Berger and Udell, 1995).

Second, the treatment effect is concentrated among firms that have a credit score. A fraction of firms is not assigned a credit score because of “lack of accounting documentation analyzed”. The information channel would predict a *stronger* positive impact on credit access for firms without a credit score, as the signal from the new loan is more informative for firms with a thin history. In contrast, the collateral story should apply to both types of firms. Indeed, credit quality may affect the price of long-term loans, but the collateral requirement typically does not vary with the length of lending relationships and information (Chakraborty and Hu, 2006).

Table 7 reports the results for the two subsamples. 65% of the firms in the sample do not have a credit score, which is not surprising as our sample mostly contains mostly SMEs. It is clear from the table that compared to control firms with a credit score, FinTech borrowing firms with a credit score experience a 12% growth in long-term credit following the new loan grant, while firms without a score also see a 10% increase in long-term credit. In addition,

there is no significant impact on credit lines from both existing and new lenders, which is again inconsistent with the information channel.

In panels d and e of Figure 7, we split the sample by whether the new FinTech/bank loan is used to finance investment in tangible assets or not. The collateral channel would predict a stronger impact for this types of loans. This is because by investing in new tangible assets, a firm expands the set of assets it can post as collateral. In addition, as opposed to bank loans, Fintech loans are uncollateralized, therefore FinTech loans result in a larger increase in borrowing capacity. Consistent with the prediction, we find that the effects are stronger in both the magnitude and the significance level for investment-purpose loans.

**Discussions** One alternative explanation for our results relates to the speed of online applications versus bank loan applications. More specifically, FinTech borrowers may apply for FinTech and bank loans simultaneously, while the control firms only submit applications to banks. But because bank loan applications take longer to approve, the increase in the long-term bank loans only appears after the FinTech loans. The following observations help mitigate the concern. First of all, we select the matched sample based on past credit dynamics, control firms are therefore expected to have similar credit demand as FinTech borrowers. Second, the increase in loan-term bank loans persist for at least two years, which suggests that the increase in bank loans is not just due to a temporary delay in when bank borrowers receive additional credit.

**Firm-level outcomes** So far the findings suggest that FinTech lending indeed helps expand firms' credit access. However, it is not clear whether the increase in credit availability leads to positive real outcomes. In this section, we assess the impact of FinTech loans on firm outcomes, including bankruptcy, growth and employment, using the same specification in Equations 2 and 3.

The information on firm activities is from FIBEN, while the information on default can be obtained from BODACC as mentioned in Section 3. Table 8 reports the results on firm growth and employment. The expanded credit access leads to a 7% increase in total assets and sales. Number of employees and average wages also goes up by 3% and 6% respectively. This result, however, only applies to surviving firms. It may be that Fintech and bank borrowers differ in terms of survival rate after obtaining the new loan. In line with this explanation, we find an adverse impact on the probabilities of entering a bankruptcy procedure and eventually being liquidated. Figure 8 shows that FinTech borrowers are 7% more likely to file for bankruptcies and 3.5% more likely to be liquidated. Taken together, this suggests that the regulatory measures aiming at spurring FinTech lending may allow SMEs to pursue riskier, potentially more innovative projects.

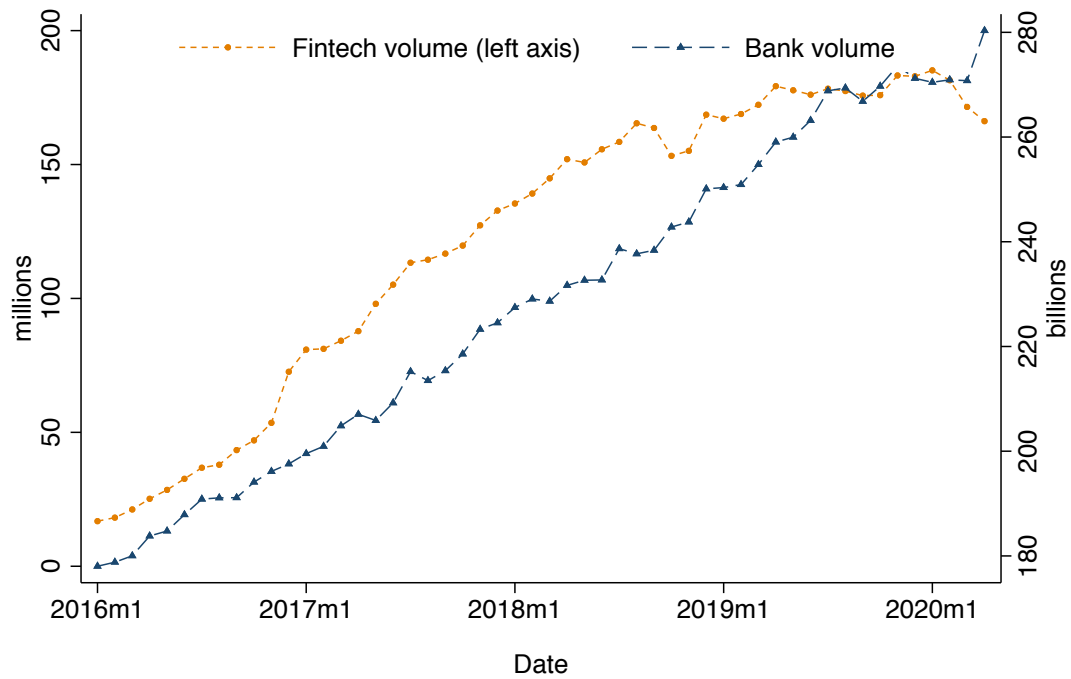
## 6 CONCLUSION

The decline in bank lending to SME and the emergence of FinTech lending poses several questions about the SME credit market. This paper provides a comprehensive description of the FinTech SME loan market, using administrative data from France. Despite being small, the French market is growing steadily and has received unprecedented support from



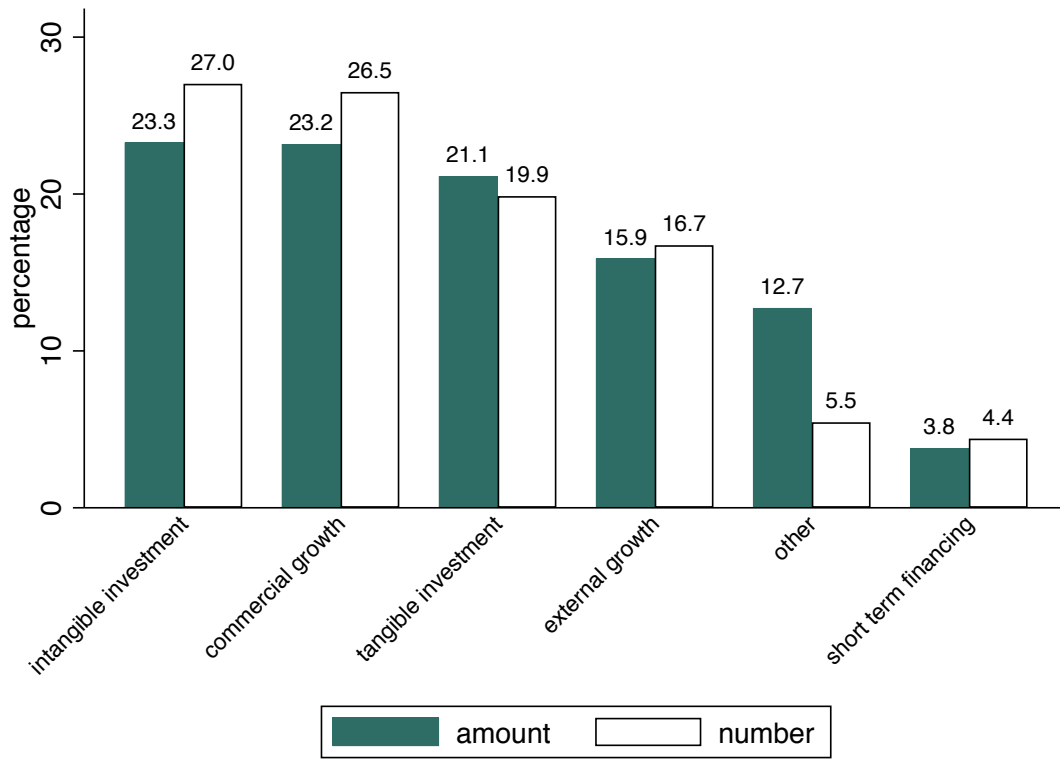
regulators. To understand the role of FinTech credit for firms, we investigate the credit dynamics of FinTech borrowers. We find that FinTech loans serve as complements for bank loans and expand credit access for SMEs. We also present evidence consistent with FinTech platforms alleviate financial constraint of innovative firms with limited collateral.

FIGURE 1  
 Aggregate lending volume by banks and FinTech platforms



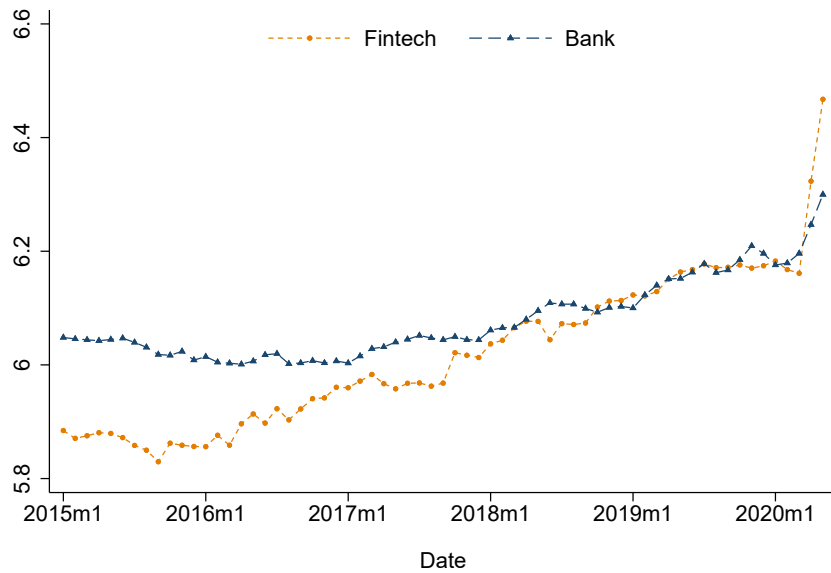
Notes: This figure presents the aggregate lending volume by banks and FinTech platforms to non-financial companies. We focus on loans under one million euro, which is the regulatory limit for the maximum amount of a FinTech loan.

FIGURE 2  
Loan purpose



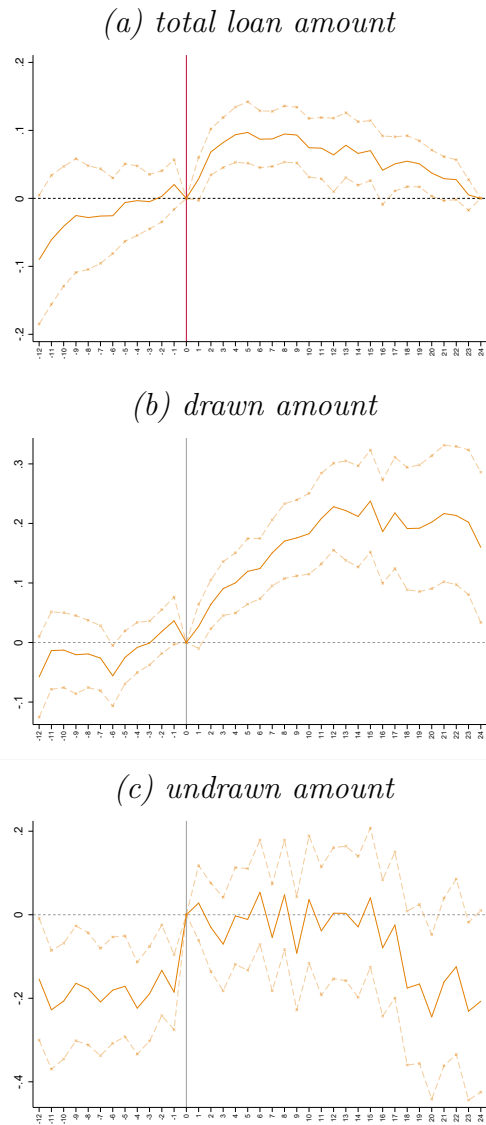
Notes: This figure presents the percentage of loans in each purpose category by the number loans and loan amount.

FIGURE 3  
Average bank lending for firms in the unmatched sample



Notes: This figure presents the average bank lending at firm level for FinTech and bank borrowers. The orange dots represent FinTech borrowers, while the blue triangles represent bank borrowers. The loan amount are in logarithms.

FIGURE 4  
Credit dynamics of FinTech borrowers



Notes: This figure presents the total amount of bank loans for FinTech borrowers in the 36-month window around the FinTech loan grant. The top, middle and bottom panels display the evolution of total loan amount, total amount of drawn credit, and total amount of undrawn credit, respectively. The loan amount are measured in logarithms in all panels.

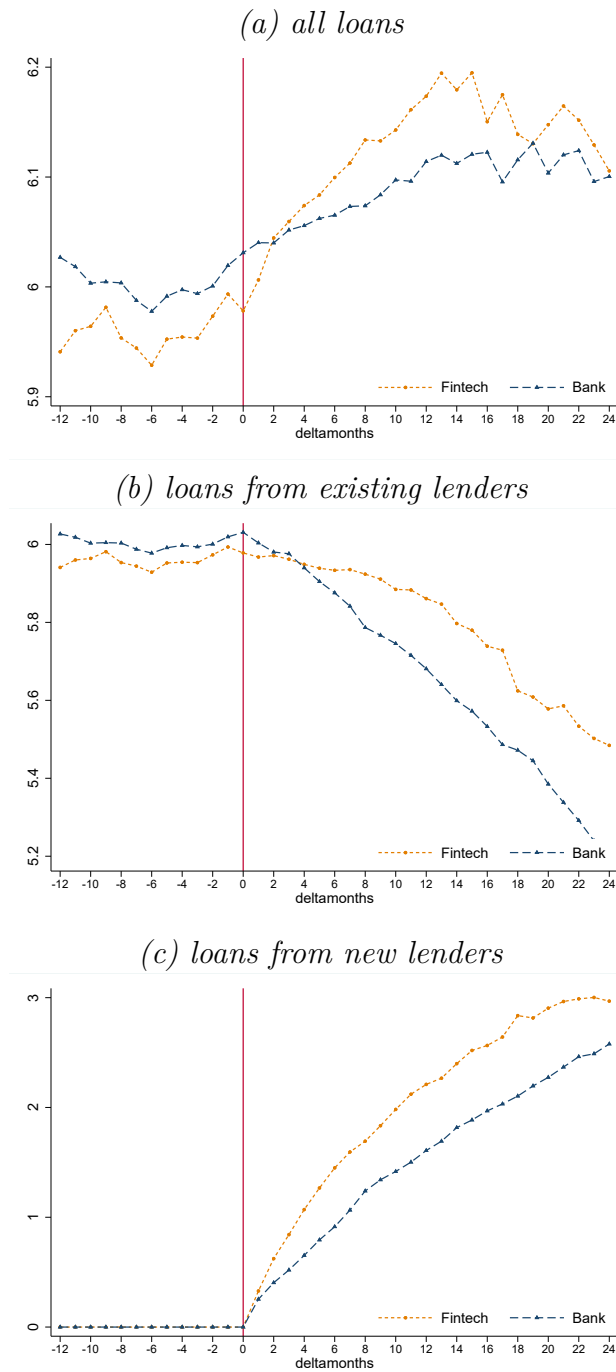
FIGURE 5  
Credit dynamics of FinTech borrowers by loan category



Notes: This figure presents the credit dynamics of FinTech borrowers by loan categories in the 36-month window around the FinTech loan grant. The top two panels present loans extended by new lenders and pre-existing lender, respectively. The bottom two panels present the patterns of credit line balance and long-term loans. In all panels, the loan amount is measured in logarithms.

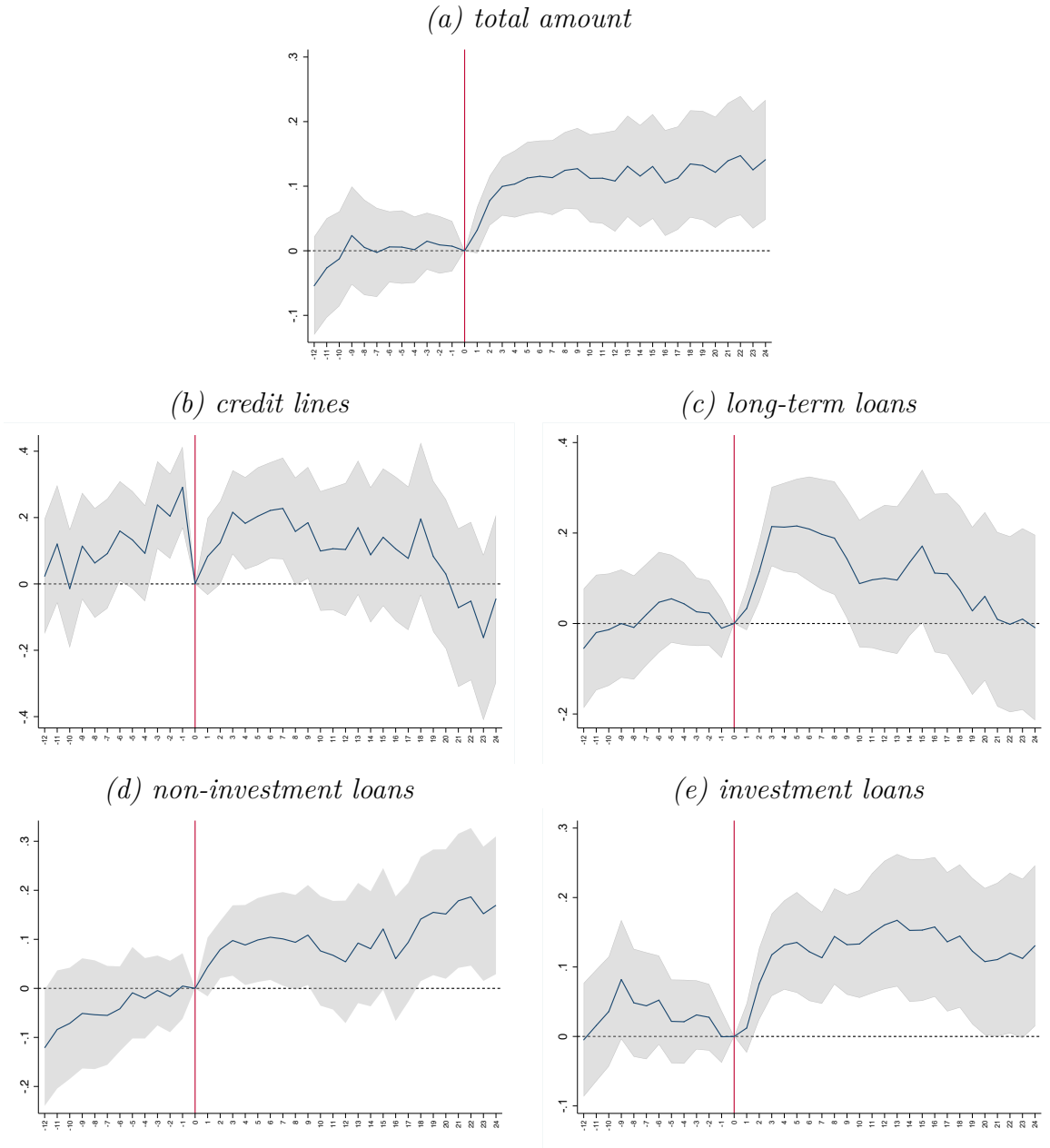


FIGURE 6  
Credit dynamics by lender type



Notes: This figure presents the total loan amount by lender type in the *matched* sample. The top, middle and bottom panels present the amount of loans by all lenders, pre-existing, and new lenders, respectively. The orange dots represent the FinTech borrowers, while the blue triangles represent the control group—bank borrowers. In all panels, the loan amount is measured in logarithms.

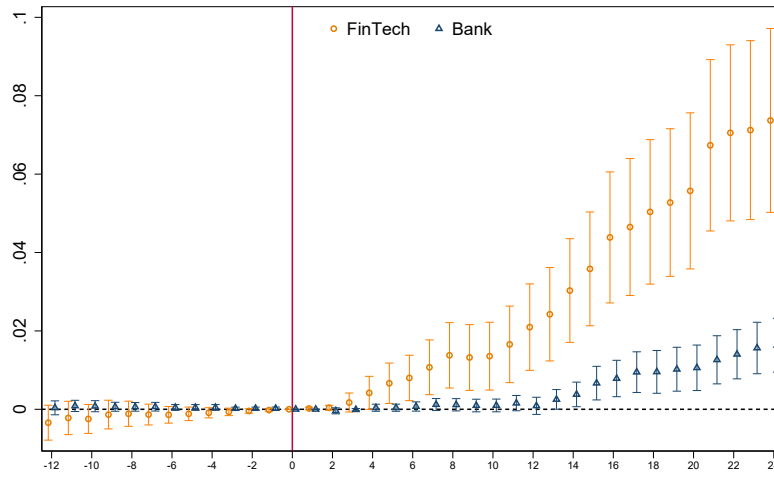
FIGURE 7  
Credit dynamics by loan types



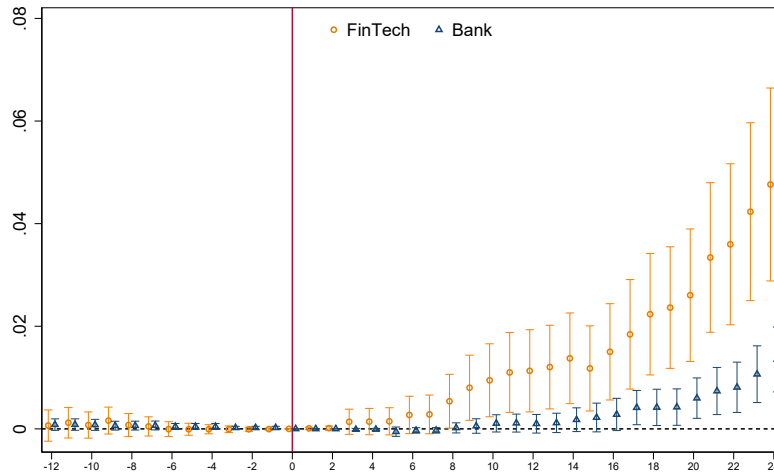
Notes: This figure presents the regression coefficient from equation 3. Panel (a) shows the total bank lending. Panels (b) and (c) show the regression coefficients for credit lines and long-term loans, respectively. Panels (d) and (e) present the regression coefficients for when the new loan is for non-investment and investment purposes, respectively. In all panels, the loan amount is measured in logarithms.

FIGURE 8  
Firm liquidations

(a) bankruptcy filings



(b) liquidations



Notes: This figure presents the probability of entering bankruptcy procedures (panel a) and that of final liquidations (panel b). The orange dots represent the FinTech borrowers, while the blue triangles represent the control group—bank borrowers.

TABLE 1  
FinTech loans characteristics

	Min	Mean	p50	Max	S.D.	Count
<i>Loan terms</i>						
Loan amount (000' euro)	1.00	151.24	50.00	100.00	342.08	2,109
Interest rate (%)	0.00	9.13	8.10	37.22	4.24	2,109
Maturity (months)	3	38	36	84	16	2,109
<i>Investors</i>						
Number of banks	0	0	0	1	0	2,109
Share of banks	0.00	11.30	0.00	100.00	25.27	2,109
Number of legal entities	0	2	0	37	5	2,109
Share of legal entities	0.00	1.62	0.00	100.00	7.68	2,109
Number of individuals	0	506	322	5141	559	2,109
Share of individuals	0.00	87.07	100.00	100.00	25.71	2,109

NOTE.—This table presents the descriptive statistics of FinTech loans. Loan amount is in thousands of euro. Interest rate is annualized and expressed in percentage points and is annualized. Loan maturity is in month. Investors can be individuals, banks, or other legal entities such as FinTech platforms themselves.

TABLE 2  
FinTech loans characteristics by borrower type

	Banked	Unbanked	Difference	<i>t</i> -statistic
<i>Loan terms</i>				
Loan size (000' euro)	159.53	92.32	-67.21	-2.97**
Interest rate (%)	9.42	7.05	-2.37	-8.60***
Maturity (months)	37	49	12.22	12.13***
<i>Investors</i>				
Number of banks	0	0	-0.03	-1.02
Share of banks	11.46	10.12	-1.35	-0.81
Number of legal entities	2	1	-1.75	-5.73***
Share of legal entities	1.74	0.73	-1.00	-1.98*
Number of individuals	536	294	-241.67	-6.59***
Share of individuals	86.78	89.14	2.36	1.39

NOTE.—This table presents the descriptive statistics on loans characteristics obtained by FinTech borrowers with and without banking relationship at the time of the FinTech application. Loan amount is in thousands of euro. Interest rate is expressed in percentage points. Loan maturity is in months.

TABLE 3  
Comparing FinTech and bank loans

	(1)	(2)	(3)	(4)	(5)
	Loan size (000')	Maturity (months)	Rate (%)	Short-term rate(%)	Long-term rate(%)
FinTech	60.00*** (27.32)	0.61 (0.58)	7.43*** (421.01)	6.31*** (118.43)	7.45*** (339.48)
Maturity			0.00*** (43.76)	-0.00*** (-3.00)	0.00*** (5.43)
Loan size			-0.00*** (-42.16)	-0.00*** (-14.45)	-0.00*** (-31.83)
Constant	40.00*** (289.30)	37.27*** (451.40)	1.72*** (975.18)	1.71*** (690.92)	1.84*** (380.71)
Year FE	Y	Y	Y	Y	Y
N	514,884	332,137	332,137	184,547	147,590
R-sq	0.01	0.00	0.40	0.21	0.47

NOTE.—This table shows the difference in average loan size, interest rate and maturity between FinTech loans and bank loans. The regression sample only includes uncollateralized, fixed-term loans originated between 2016-2020.



TABLE 4  
Comparing FinTech and Bank Borrowers

	(a) FinTech & Bank (1)	(b) Bank-only (2)	(a)-(b) (3)	<i>t</i> -statistic (4)
Asset	8.019	7.910	0.109	1.483
Age	10.980	12.022	-1.042	-1.566
Working capital	0.239	0.267	-0.029	-2.820**
EBIT	0.051	0.054	-0.003	-0.677
Sales	1.313	1.426	-0.113	-2.130*
Debt	0.410	0.355	0.055	5.274***
Net income	0.038	0.050	-0.011	-2.991**
Fixed assets	0.201	0.184	0.017	1.795
Cash flow	0.071	0.069	0.002	0.480
Wage	0.892	0.726	0.166	0.895
R&D expenditure	0.007	0.003	0.004	3.633***
R&D output	0.008	0.003	0.004	4.099***
Collateral	0.227	0.295	-0.068	-5.648***
Employment	2.709	2.690	0.019	0.308
Investment	4.127	3.638	0.489	2.973**
Salaries	6.405	6.308	0.097	1.167
Added value	6.791	6.803	-0.012	-0.199
Turnover	7.944	7.821	0.123	1.596
N	413	2,910	3,323	3,323

NOTE.—This table presents firm characteristics for FinTech-bank borrowers and bank-only borrowers as defined in Section 4. *Assets* are measured in logarithm. *Working capital*, *EBIT*, *Debt*, *Net income*, *Investment*, *Fixed assets*, *Cash flow*, *R&D*, and *Collateral* are all normalized by total assets.

TABLE 5  
Credit by lender type

	All Lenders	New Lenders	Existing Lenders
<i>Panel A. Loan amount</i>			
FinTech × Post	0.07*** (3.40)	0.29*** (3.85)	0.05** (2.13)
Post	0.00 (0.37)	0.53*** (14.64)	-0.07*** (-5.26)
R-sq	0.98	0.57	0.97
<i>Panel B. Number of banks</i>			
FinTech × Post	0.09*** (3.15)	0.07*** (4.12)	0.02 (0.76)
Post	0.07*** (5.22)	0.11*** (14.27)	-0.04*** (-3.84)
R-sq	0.98	0.57	0.98
Firm-Year FE	Y	Y	Y
N	39,309	39,309	39,309

NOTE.—This table presents the evolution of the total amount of loans (Panel A) and number of banks (Panel B) by lender type for firms in the matched sample. Column 1 presents the regression coefficient of Equation 2, using total loan amount as the outcome variable. Columns 2 and 3 use the amount of loans extended by pre-existing and new lenders as outcome variables. *t* statistics in parentheses. Significance levels 10%, 5%, and 1% are denoted by \*, \*\*, and \*\*\*, respectively.

TABLE 6  
Credit by loan category

	Credit Lines		Long-term Loans	
	Existing Lenders	New Lenders	Existing Lenders	New Lenders
	(1)	(2)	(3)	(4)
FinTech $\times$ Post	-0.02 (-0.52)	0.05** (2.21)	0.09** (2.19)	0.14** (2.47)
Post	-0.06*** (-3.27)	0.05*** (4.50)	-0.04* (-1.83)	0.26*** (9.69)
Firm-Year FE	Y	Y	Y	Y
N	39,309	39,309	39,309	39,309
R-sq	0.83	0.41	0.96	0.56

NOTE.—This table presents the evolution of the loan amount in various categories for firms in the matched sample. Columns 1-2 present the impact on subsequent credit lines by either pre-existing lenders (column 1) or new lenders (column 2), while columns 3-4 present the impact on long-term loans.  $t$  statistics in parentheses. Significance levels 10%, 5%, and 1% are denoted by \*, \*\*, and \*\*\*, respectively.

TABLE 7  
Credit by credit score category

	Credit lines (1)	Long-term loans (2)
<i>Panel A. Firms without a credit score</i>		
FinTech × Post	-0.03 (-0.52)	0.10** (2.03)
Post=1	0.01 (0.34)	0.03 (1.23)
Firm-Year FE	Y	Y
N	23,206	23,206
R-sq	0.78	0.96
<i>Panel B. Firms with a credit score</i>		
FinTech × Post	0.02 (0.24)	0.12* (1.78)
Post=1	-0.08** (-2.07)	0.07* (1.71)
Firm-Year FE	Y	Y
N	15,834	15,834
R-sq	0.83	0.95

NOTE.—This table presents credit dynamics for firms with and without a credit score in the matched sample. Columns 1 presents the dynamics of credit lines, and column 2 presents that of long-term loans. Firm-year fixed effects are included. *t* statistics in parentheses. Significance levels 10%, 5%, and 1% are denoted by \*, \*\*, and \*\*\*, respectively.

TABLE 8  
Firm Growth and Employment

	Assets (1)	Investments (2)	Sales (3)	Employment (4)	Wage (5)
FinTech $\times$ Post	0.07*** (4.21)	0.16 (1.19)	0.07*** (3.45)	0.03* (1.77)	0.06** (2.32)
Post	-0.01* (-1.87)	-0.03 (-0.46)	-0.02*** (-2.73)	-0.01 (-1.12)	-0.01 (-1.27)
Firm FE	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y
N	45,992	21,542	45,992	45,010	45,992
R-sq	0.99	0.85	0.98	0.97	0.97

NOTE.—This table presents firm outcomes, measured at annual frequency in the four-year window around the new loan grant. All outcome variables are measured in logarithms.  $t$  statistics in parentheses. We include firm fixed effect and industry-year fixed effects in all columns. Significance levels 10%, 5%, and 1% are denoted by \*, \*\*, and \*\*\*, respectively.

## REFERENCES

- Agarwal, Sumit, and Robert Hauswald, 2010, Distance and private information in lending, *The Review of Financial Studies* 23, 2757–2788.
- Balyuk, Tetyana, 2019, Financial innovation and borrowers: Evidence from peer-to-peer lending, *Rotman School of Management Working Paper* .
- Balyuk, Tetyana, Allen N. Berger, and Johan Hackney, 2020, What is fueling fintech lending? the role of banking market structure, *working paper* .
- Berger, Allen N, and Gregory F Udell, 1995, Relationship lending and lines of credit in small firm finance, *Journal of business* 351–381.
- Berger, Allen N, and Gregory F Udell, 2002, Small business credit availability and relationship lending: The importance of bank organisational structure, *The economic journal* 112, F32–F53.
- Bord, Vitaly, Victoria Ivashina, and Ryan Taliaferro, 2015, Large banks and the transmission of financial shocks, *Available at SSRN* .
- Buchak, Greg, Gregor Matvos, Tomasz Piskorski, and Amit Seru, 2018, Fintech, regulatory arbitrage, and the rise of shadow banks, *Journal of Financial Economics* 130, 453–483.
- Chakraborty, Atreya, and Charles X Hu, 2006, Lending relationships in line-of-credit and nonline-of-credit loans: Evidence from collateral use in small business, *Journal of Financial Intermediation* 15, 86–107.
- Chaney, Thomas, David Sraer, and David Thesmar, 2012, The collateral channel: How real estate shocks affect corporate investment, *American Economic Review* 102, 2381–2409.
- Chava, Sudheer, Nikhil Paradkar, and Yafei Zhang, 2019, Winners and losers of market-place lending: evidence from borrower credit dynamics, *Georgia Tech Scheller College of Business Research Paper* .
- Chen, Brian S, Samuel G Hanson, and Jeremy C Stein, 2017, The decline of big-bank lending to small business: Dynamic impacts on local credit and labor markets, Technical report, National Bureau of Economic Research.
- Cortés, Kristle R, Yuliya Demyanyk, Lei Li, Elena Loutskina, and Philip E Strahan, 2020, Stress tests and small business lending, *Journal of Financial Economics* 136, 260–279.
- Davydenko, Sergei A, and Julian R Franks, 2008, Do bankruptcy codes matter? a study of defaults in france, germany, and the uk, *The Journal of Finance* 63, 565–608.
- Degryse, Hans, Vasso Ioannidou, and Erik von Schedvin, 2016, On the nonexclusivity of loan contracts: An empirical investigation, *Management Science* 62, 3510–3533.

- Di Maggio, Marco, and Vincent W Yao, 2018, Fintech borrowers: Lax-screening or cream-skimming, *Harvard Business School and Georgia State University Working Paper* .
- Donaldson, Jason Roderick, Denis Gromb, and Giorgia Piacentino, 2019, The paradox of pledgeability, *Journal of Financial Economics* .
- Fazzari, Steven, R Glenn Hubbard, and Bruce C Petersen, 1987, Financing constraints and corporate investment, Technical report, National Bureau of Economic Research.
- Gopal, Manasa, and Philipp Schnabl, 2020, The rise of finance companies and fintech lenders in small business lending, *Available at SSRN* .
- Hadlock, Charles J, and Joshua R Pierce, 2010, New evidence on measuring financial constraints: Moving beyond the kz index, *The Review of Financial Studies* 23, 1909–1940.
- Petersen, Mitchell A, and Raghuram G Rajan, 2002, Does distance still matter? the information revolution in small business lending, *The journal of Finance* 57, 2533–2570.
- Strahan, Philip E, and James P Weston, 1998, Small business lending and the changing structure of the banking industry, *Journal of Banking & Finance* 22, 821–845.
- Tang, Huan, 2019, Peer-to-peer lenders versus banks: substitutes or complements?, *The Review of Financial Studies* 32, 1900–1938.
- Vallee, Boris, and Yao Zeng, 2019, Marketplace lending: a new banking paradigm?, *The Review of Financial Studies* 32, 1939–1982.





# I ADDITIONAL TABLES

TABLE B.1  
List of FinTech lending platforms in the sample

Platform	loan size	APR	maturity	# lender per project	# borrowers	# loans
A	488	9.12	47	029	330	398
B	110	6.89	38	349	480	558
C	62	13.27	32	628	367	458
D	78	10.35	45	531	134	157
E	52	7.40	27	162	126	197
F	31	7.52	44	156	88	215
G	40	7.93	28	222	84	97
H	211	4.00	5	192	4	4
I	48	9.12	53	154	14	14

Notes: This table present descriptive statistics on the 10 platforms in our sample. Information on their market share, total loan amount, the dates of the first and last loans, and average loan characteristics are presented.

TABLE B.2  
Decompose credit growth by lender type

	All lenders	New lenders	Existing lenders
FinTech $\times$ Post	0.04** (2.29)	0.01* (1.83)	0.03* (1.86)
Post	-0.05*** (-3.52)	0.02*** (8.61)	-0.07*** (-5.11)
Firm-Year FE	Y	Y	Y
N	35,745	35,745	35,745
R-sq	0.18	0.16	0.18

NOTE.—This table presents the decomposition of the growth in total credit amount. Column 1 present the monthly growth rates in total credit amount. Columns 2 and 3 present that for loans by new and existing lenders, respectively. Significance levels 10%, 5%, and 1% are denoted by \*, \*\*, and \*\*\*, respectively.

TABLE B.3  
FIBEN credit score categories

Credit score	Description	Default probability
3++	The company's ability to meet its financial commitments is deemed excellent	0.05%
3+	The company's ability to meet its financial commitments is deemed very good	0.09%
3	The company's ability to meet its financial commitments is deemed good	0.27%
4+	The company's ability to meet its financial commitments is deemed to be quite good given the absence of major financial imbalances. There are however moderate factors of uncertainty or fragility	0.57%
4	The company's ability to meet its financial commitments is deemed to be fair given the absence of financial imbalances. There are however moderate factors of uncertainty or fragility	1.91%
5+	The company's ability to meet its financial commitments is deemed to be fairly good	4.55%
5	The company's ability to meet its financial commitments is deemed to be poor	10.07
6	The company's ability to meet its financial commitments is deemed to be very poor	14.67%
7	The company's ability to meet its commitments is a specific cause for concern. At least one reported trade bill payment incident	31.73%
8	The company's ability to meet its financial commitments is at risk given the trade bill payment incidents reported	51.52%
9	The company's ability to meet its financial commitments is compromised as the reported trade bill payment incidents point severe cash flow problems	-
P	The company is the subject of insolvency proceedings (recovery or judicial liquidation proceedings)	-
0	The rating is given to firms that have not been analysed by Banque de France rating team over the observation period	-

Notes: This table provides a description of the credit score categories and their associated projected default probability over a three-year horizon