

Eça, Afonso; Ferreira, Miguel A.; Prado, Melissa Porras; Rizzo, Emanuele

Working Paper

The real effects of FinTech lending on SMEs: Evidence from loan applications

ECB Working Paper, No. 2639

Provided in Cooperation with:

European Central Bank (ECB)

Suggested Citation: Eça, Afonso; Ferreira, Miguel A.; Prado, Melissa Porras; Rizzo, Emanuele (2022) : The real effects of FinTech lending on SMEs: Evidence from loan applications, ECB Working Paper, No. 2639, ISBN 978-92-899-4972-9, European Central Bank (ECB), Frankfurt a. M.,
<https://doi.org/10.2866/992620>

This Version is available at:

<https://hdl.handle.net/10419/261173>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



EUROPEAN CENTRAL BANK

EUROSYSTEM

Working Paper Series

Afonso Eça, Miguel A. Ferreira,
Melissa Porras Prado, A. Emanuele Rizzo

The real effects of FinTech lending on SMEs: evidence from loan applications

ECB – Lamfalussy
Fellowship Programme

No 2639 / February 2022

Disclaimer: This paper should not be reported as representing the views of the European Central Bank (ECB). The views expressed are those of the authors and do not necessarily reflect those of the ECB.

ECB Lamfalussy Fellowship Programme

This paper has been produced under the ECB Lamfalussy Fellowship programme. This programme was launched in 2003 in the context of the ECB-CFS Research Network on “Capital Markets and Financial Integration in Europe”. It aims at stimulating high-quality research on the structure, integration and performance of the European financial system.

The Fellowship programme is named after Baron Alexandre Lamfalussy, the first President of the European Monetary Institute. Mr Lamfalussy is one of the leading central bankers of his time and one of the main supporters of a single capital market within the European Union.

Each year the programme sponsors five young scholars conducting a research project in the priority areas of the Network. The Lamfalussy Fellows and their projects are chosen by a selection committee composed of Eurosystem experts and academic scholars. Further information about the Network can be found at <http://www.eufinancial-system.org> and about the Fellowship programme under the menu point “fellowships”.

Abstract

We show that FinTech lending affects credit markets and real economic activity using a unique data set of a Peer-to-Business platform for which we have the universe of loan applications. We find that FinTech serves high quality and creditworthy small businesses who already have access to bank credit. Firms use FinTech to obtain long-term unsecured loans and reduce their exposure to banks with less liquid assets, stable funds, and capital. We find that access to FinTech spurs firm growth, employment and investment relative to firms that get their loan application rejected. In addition, firms with access to FinTech increase leverage and substitute long-term bank debt with FinTech debt. Our findings suggest that FinTech allows firms to preserve financial flexibility, reduce their bank dependence and exposure to banking shocks.

JEL Classification: G21, G23, O33

Keywords: FinTech, Small business lending, Firm growth, Debt structure, Bank relationships

Non-Technical Summary

Credit markets have gone through a revolution with the rise of web-based lending platforms. While small and medium enterprises (SMEs) have traditionally depended on banks for credit, individual investors are increasingly providing credit to SMEs through Peer-to-Business (P2B) platforms. As technology changes the competitive landscape of financial intermediation, it raises important questions about the impact of FinTech on SMEs financing and investment policies.

The aim of this Discussion Paper is to shed light on these questions. We are in a unique position to study the role of new FinTech lending models for financial intermediation thanks to our access to a data set from a leading independent P2B platform (*Raize*) in Portugal that directly links retail investors to SME borrowers. We combine these data with administrative databases that report financial statements for the universe of non-financial firms, financial statements for banks, and matched bank-firm loans from the Central Credit Register. Thus, our data contain comprehensive information about both the firms who manage to borrow through the P2B platform and the firms who apply but get rejected by the platform, including financial data and the characteristics of the banks serving these firms.

Our first set of results show that P2B platforms cater to high quality, high profitability, and low credit risk firms. Importantly, we find that firms who apply for P2B funding are significantly more likely to already have bank debt in their balance sheet and, at the same time, are firms with less overdue debt. This suggests that P2B platforms directly compete with banks for the same segment of firms and do not cater to different, riskier firms. A second set of results allows us to shed further light on the reason why firms decide to apply to the FinTech platform. We study the characteristics of the banks that have a lending relationship with the SMEs in our sample. We find that SMEs are more likely to apply for FinTech lending if they have relationships with banks with less stable sources of funding, lower liquidity of assets, and lower capital ratios. This indicates that one of the reasons why firms switch to FinTech is to reduce their exposure to banks that are less able to absorb shocks and more likely to cut lending activity during liquidity crises. These results highlight the importance of banks' quality and their resilience to shocks in the decision to access FinTech lending platforms.

Next, we explore the effects of obtaining FinTech lending on firm outcomes. We find that following FinTech lending firms grow faster compared to the rejected applicants. Firms that access FinTech lending experience an 8.2 percentage points increase in asset growth, a 5.1 percentage points increase in employment growth, and a 5.8 percentage points increase in sales growth relative to the control group of rejected applicants. We also find an increase in investment of 1.5

percentage points of assets relative to firms with rejected applications. In addition, we do not observe any significant impact of FinTech loans on profitability, which indicates that FinTech loans contribute to firm growth without sacrificing profitability.

We observe an important impact of FinTech lending also on firms' debt structure. Firms that access the FinTech platform increase their leverage by 4.9 percentage points relative to rejected firms. This increase is reflected in both long-term and short-term leverage. In addition, net of FinTech loans, we find a 6.4 percentage points decrease in long-term bank leverage and a 2.1 percentage points increase in short-term bank leverage relative to the control group of rejected applicants. Thus, our findings suggest that access to FinTech lending allows firms to expand their debt capacity and substitute long-term bank lending with long-term FinTech lending. Since FinTech loans are unsecured, these results point also at another important determinant of firms' choice to apply to FinTech platforms. Specifically, there are several reasons why SMEs may prefer to finance their growth with long-term debt. For example, they want to avoid the refinancing risk inherent in short-term debt. However, most SMEs are limited in their availability of collateral, and tighter regulation and higher capital requirements make long-term unsecured loans to SMEs unattractive to banks. FinTech provides firms with an alternative to access unsecured long-term financing.

The access to P2B platform allows SMEs to diversify their pool of lenders. P2B loans allow firms to add new bank relationships, and reduce their dependence on a single bank, as indicated by a drop in the share of firm debt accounted by its main bank. While obtaining a P2B loan seems to increase the firm's overall cost of debt, we find a reduction in the cost of bank debt (i.e., cost of debt excluding P2B loans).

Overall, our results indicate that FinTech lending platforms are beneficial to SMEs, but for reasons that are not necessarily the ones expected ex-ante. FinTech platforms do not seem to serve young, untested firms with no prior access to the banking system. Thus, the benefits of FinTech do not seem to lie in increased financial inclusion of small businesses. FinTech, however, does allow high quality SMEs to finance their growth and, at the same time, diversify their lending relationships. Our results suggest that the SMEs who apply to FinTech platforms want to reduce their exposure to shocks to the banking system, which may curtail their available financing and, ultimately, adversely affect their growth. The fact that SMEs are interested in securing long-term FinTech debt also aligns well the notion that firms in our sample want to protect themselves against credit supply shocks.

1. Introduction

The rise of FinTech lending platforms is changing the provision of financial services worldwide. While small and medium enterprises (SMEs) have traditionally relied on banks for their financing needs, today SMEs can also obtain financing through Peer-to-Business (P2B) platforms, which are technology-enabled platforms that allow a direct match between borrowers and lenders. As new technologies change the financial intermediation landscape, they raise new important questions for both policymakers and academics. What drives firms' decision to access FinTech platforms? What are the effects of FinTech lending on firm growth and investment policy? What are the effects of FinTech lending on firm financial policy?

We address these questions using a unique data set from a leading independent P2B platform (*Raize*) in Portugal that directly links retail investors to SME borrowers. We obtain access to the universe of loan applications to the platform, and we combine these data with a set of administrative databases. Specifically, we enrich our data with financial statements for the universe of Portuguese non-financial firms, financial statements for banks operating in Portugal, and matched bank-firm loans from the Central Credit Register. As a result, our final data set contains comprehensive information about both the firms who manage to borrow through the P2B platform and the firms who apply but get rejected by the platform, including financial data and the characteristics of the banks serving these firms.

Since the start of the platform in 2016 till 2019, we observe that 3,197 firms apply to access the P2B platform and 40% of those applications are accepted. The median loan is €20,000 and accounts for 17% of the firm's assets and 30% of the firm's debt, indicating that FinTech loans are an economically significant source of debt financing for SMEs. The P2B loans have, on average, long-term maturity (three years) and an average interest rate of 7%, which appears to be significantly higher than the interest paid on the other types of debt that firms in our sample obtain from traditional financing sources.

We start by studying the P2B platform clientele, comparing FinTech applicants versus the non-applicant firms in our sample. In exploring the characteristics of FinTech applicants versus

the non-applicant firms in our sample, we find that P2B platforms cater to high quality, larger SMEs, with high profitability. Importantly, we find that firms who apply for P2B funding are significantly more likely to already have bank debt in their debt structure. We also observe that the larger volumes of bank debt in their balance sheet are mostly accounted for by long-term debt and, despite greater leverage, these firms display lower levels of overdue debt. These results are in contrast to the traditional financial intermediation literature (e.g., Sharpe (1990)), which suggests that competition should lead newcomers to allocate capital toward lower quality and younger firms. In addition, our results deviate from the existing empirical findings on peer-to-peer (P2P) platforms, which indicate that FinTech serves a riskier unexplored market segment in consumer loans (de Roure, Pelizzon, and Tasca (2016), Hau, Huang, Shan, and Sheng (2019), Di Maggio and Yao (2021)), and mortgage origination (Buchak, Matvos, Piskorski, and Seru (2018), (Fuster, Plosser, Schnabl, and Vickery (2019))).

Our results, however, also suggest that firms who apply to the P2B platforms are closer to their maximum debt capacity. Their larger leverage ratios are accompanied by lower interest coverage ratios, less availability of unused debt, and less availability of fixed assets to serve as collateral. In this respect, the choice to obtain a FinTech loan can be rationalized in the context of DeAngelo, DeAngelo, and Whited (2011) model as reflecting a desire to minimize the impact of future financial constraints. Preserving financial flexibility is a predominant concern of firms (Graham and Harvey (2001)), and the diversification of financing sources is one way to maintain financial flexibility (Jang (2017)). Therefore, firms may switch to FinTech to finance their growth through a new financing source that does not deplete their debt capacity and preserve financial flexibility.

A second set of results allows us to shed further light on the reason why firms decide to apply to the FinTech platform. We study the characteristics of the banks that have a lending relationship with the SMEs in our sample, thus focusing on the role the banking sector plays in the decision to switch to FinTech credit. We find that SMEs are more likely to access P2B lending if they have relationships with banks with less stable sources of funding, lower liquidity

of assets, and lower capital ratios. This indicates that one of the reasons why firms switch to FinTech is to reduce their exposure to banks that are less able to absorb shocks and more likely to cut lending activity during liquidity crises (Khwaja and Mian (2008), Ivashina and Scharfstein (2010)). These results highlight the importance of banks' quality in the decision to access P2B platforms, and thus contribute to the literature that emphasizes the bank-level determinants of lending relationships (e.g., Gopalan, Udell, and Yerramilli (2011), Paravisini, Rappoport, and Schnabl (2015), Schwert (2018)). Schwert (2018), in particular, shows that firms with access to capital markets borrow from banks with less capital, while bank-dependent firms are matched with better capitalized banks. Our results therefore are consistent with the view that FinTech plays the role of an alternative source of external financing for SMEs, which allows firms to protect themselves against the risk of adverse banking shocks.

Next, we explore the effects of obtaining FinTech lending on firm outcomes. It is empirically challenging to study how firms use the P2B loans as unobservable borrower characteristics may affect both the likelihood of obtaining FinTech lending and firm-level outcomes. If this is the case we would observe differences in outcomes even in the absence of FinTech financing. We make three empirical choices to address this concern. First, when we examine the consequences for firms of accessing FinTech lending we restrict the sample to the set of firms that apply for a loan with the P2B platform. By focusing on loan applications, we are able to study the implications of obtaining a FinTech loan holding fixed the demand for FinTech credit. Second, to further reduce concerns of heterogeneity between firms that obtain P2B loans and the comparison group of firms whose loan application is rejected, we use a propensity score matching approach. Thus, we exploit variation coming solely from the comparison between firms that obtain a P2B loan and a similar set of firms that had the same intention to access the platform but were rejected. Finally, the regressions use changes of the dependent variable or include firm fixed effects to control for time-invariant unobserved heterogeneity at the firm level.

We find that firms increase assets, employment and sales following FinTech lending. Firms that access FinTech lending experience a 7.4 percentage points increase in asset growth, a 5.1

percentage points increase in employment growth, and a 5.7 percentage point increase in sales growth relative to the control group of rejected applicants. We also find an increase in investment of 1.5 percentage points of assets relative to firms with rejected applications. In addition, we do not observe any significant impact of P2B loans on profitability, which indicates that P2B loans contribute to firm growth without sacrificing profitability.

We also show that firms significantly change their capital structure and debt structure following FinTech lending. Firms that access the P2B platform increase leverage. We find that leverage increases by 4.9 percentage points for firms with a FinTech loan approved relative to rejected firms. This increase is reflected in both long-term and short-term leverage. Interestingly, we observe a reduction in the proportion of secured debt. In addition, net of FinTech loans, we find that firms decrease long-term bank debt, and increase short-term bank debt. We find a 6.4 percentage points decrease in long-term bank leverage and a 2.1 percentage points increase in short-term bank leverage relative to the control group of rejected applicants. Thus, our findings suggest that access to FinTech lending allows firms to expand their debt capacity and substitute long-term bank lending with long-term FinTech lending.

These changes in capital structure accord well with our conclusions regarding firms' decision to access the FinTech platform outlined above. Firms that apply for a FinTech loan have already larger levels of long-term debt. At the same time, there are several reasons why small firms may prefer to keep financing their growth with long-term debt. For example, they want to avoid the refinancing risk inherent in short-term debt (see e.g., Diamond (1991), Diamond (1993), Brunnermeier and Yogo (2009)). To the extent that FinTech firms are closer to their maximum debt capacity but want to secure additional long-term funding, FinTech loans represent a viable option. The fact that FinTech loans are unsecured represents another attractive feature of P2B platforms. On the one hand, firms that apply to the P2B platform have less fixed assets, which suggests that they have less availability of collateral. However, tighter regulation and higher capital requirements make long-term unsecured loans to SMEs unattractive to banks (Acharya, Berger, and Roman (2018), Cortés, Demyanyk, Li, Loutskina, and Strahan (2020), Chernenko,

Erel, and Prilmeier (2019a)). On the other hand, even firms with availability of collateral may avoid pledging their assets to retain financial and operational flexibility. Unpledged collateral is often used as financial slack (see e.g., Myers and Majluf (1984)) or insurance (Rampini and Viswanathan (2013)). Similarly, firms may shy away from secured loans to avoid the connected limits to their flexibility to sell or redeploy assets (Mello and Ruckes (2017)). In this respect, FinTech provides firms with an alternative to access unsecured long-term financing, and offers them the possibility to release pledged assets by paying off secured long-term bank loans.

We also observe that the access to the P2B platform allows SMEs to further diversify their pool of lenders. P2B loans allow firms to add new bank relationships, and reduce their dependence on a single bank, as indicated by a drop in the share of firm debt accounted by its main bank. In addition, firms appear to start new relationships with more resilient banks. These results thus provide another point of connection with our proposed drivers of firms' access to FinTech platforms. By diversifying their financing sources firms achieve both higher financial flexibility and protect themselves against the risk of lending cut caused by liquidity shocks.

In exploring the consequences for firms' cost of debt, we find that obtaining a P2B loan seems to increase the firms' overall cost of debt. However, we find a reduction in the cost of bank debt (i.e., cost of debt excluding P2B loans). In terms of economic magnitude, we find that firms accessing the P2B platform benefit from a 5 basis points reduction in the cost of bank debt compared to the set of rejected applicants. The results that firms who access the P2B platform are able both to increase (short-term) bank debt and decrease its cost can be rationalized in light of the conclusions in Crouzet (2018). Crouzet (2018) shows theoretically that firms may choose to borrow from markets to increase their scale of operation. This in turn raises the liquidation value of firms, relaxes their bank borrowing constraint, and makes bank debt cheaper. Our results about the increase in bank debt and decrease in the cost of bank debt, jointly considered with the observed growth in firm size, thus suggest that P2B lending may be playing the role that market debt has in Crouzet (2018) model.

We contribute to the recent literature on FinTech business lending. Using aggregate debt

offering at the regional or county level, several papers suggest that FinTech took over traditional financial intermediaries' market share when it comes to business lending (see Gopal and Schnabl (2020), Balyuk, Berger, and Hackney (2020), and Cortés, Demyanyk, Li, Loutskina, and Strahan (2020)). Large banks reduced the lending to small businesses as they faced strong regulatory burdens and hefty losses, leaving room for FinTech lenders. Our paper adds to this literature by showing that FinTech credit allows firms to increase leverage and change their debt structure. SMEs with access to P2B loans switch from long-term bank debt to short-term bank debt to maintain financial flexibility. We also contribute by showing that an important determinant of SMEs choice to access FinTech platform is to diversify away from banks that are more vulnerable to liquidity shocks and, as a consequence, more likely to cut credit supply to SMEs. In addition, consistent with FinTech lending reducing firm's bank dependence and exposure to bank distress, we find significant effects on assets, investment, employment, and sales.

Our results have important policy implications for the architecture of the financial system, and specifically regarding the development of market-based platforms. FinTech platforms do not seem to serve young, untested firms with no prior access to the banking system. Thus, the benefits of FinTech do not appear to lie in increased financial inclusion of small businesses. FinTech, however, does allow high quality SMEs to finance their growth and, at the same time, diversify their lending relationships. Our results suggest that the SMEs who apply to FinTech platforms want to maintain their financial flexibility and reduce their exposure to shocks to the banking system, which may curtail their available financing and, ultimately, adversely affect their growth. The fact that SMEs are interested in securing long-term FinTech debt also aligns well the notion that firms in our sample want to protect themselves against credit supply shocks.

2. Literature Review

How different are nontraditional lenders such as FinTech platforms from banks? Does FinTech substitute or complement traditional financial intermediaries? Do they cater to the same or different (riskier) clientele? And what are the effects on firm policies? So far the literature

provides mixed evidence on these questions.

The literature has been studying the role of FinTech in providing financial services to individuals in the context of mortgage loan originations (Buchak, Matvos, Piskorski, and Seru (2018), Fuster, Plosser, Schnabl, and Vickery (2019)) and consumer credit (see, among others, Danisewicz and Elard (2018), de Roure, Pelizzon, and Thakor (2019), Balyuk (2019)). In the context of residential mortgage loans, Buchak, Matvos, Piskorski, and Seru (2018) find that FinTech lenders are less likely to serve less creditworthy FHA borrowers and higher unemployment regions. Erel and Liebersohn (2020) suggest the opposite, as they show that in lower-income areas and in areas with fewer banks, more borrowers turned to online nonbank loans for their Paycheck Protection Program (PPP) loan during the COVID-19 recession period. de Roure, Pelizzon, and Thakor (2019) examine German peer-to-peer lending (Auxmoney) and conclude that such platforms serve a retail segment neglected by German commercial banks. Thakor (2020) argues P2P lenders will not replace banks anytime soon, but will rather take some market share away from banks when banks are capital constrained, and for borrowers who do not have collateral to access secured loans.

Regarding consumer credit, the literature suggests that FinTech differs from banks in that it caters to less creditworthy consumers, thereby extending the credit offer to individuals. For example, Di Maggio and Yao (2021) study the differences between banks and FinTech lenders using unique consumer loan data from a large credit bureau. They find that FinTech lenders tend to originate loans to less creditworthy individuals, which are more likely to default. By doing so, FinTech lenders gather data to improve their credit models, and subsequently increase their market share by extending credit to higher-quality borrowers. Hau, Huang, Shan, and Sheng (2019) show theoretically that FinTech credit is relatively more attractive for individual borrowers with low credit scores who are often excluded from the banking sector. Several other papers explore the relation between the availability of local bank credit and the propensity of consumers to borrow from peer-to-peer (P2P) networks to study the differences in the adoption of FinTech credit across regions. Tang (2019) exploits a regulatory change that caused banks

to tighten their lending criteria to study whether banks and P2P lenders are substitutes or complements. Using the data available by the Lending Club, Tang (2019) finds that P2P lending is a substitute for bank lending in that it serves infra-marginal bank borrowers, but complements bank lending with respect to small loans.

The role of FinTech platforms vis-à-vis banks in the context of small business lending is even less clear. Chen, Hanson, and Stein (2017) argue that after the 2007-2009 financial crisis, large banks reduced the lending to small business as they faced strong regulatory burdens and losses, leaving room for non-bank lenders. Gopal and Schnabl (2020) find a substitution effect due to the reduction in the supply of credit to SMEs by banks. They find that the reduction in bank lending in the aftermath of 2007-2009 financial crises was almost perfectly offset by an increase in lending by non-bank lenders, especially independent finance companies. This view is consistent with the results in Cortés, Demyanyk, Li, Loutskina, and Strahan (2020), who argue that regulatory burden and stress tests lead large bank to move away from risky small business lending. They find that banks exit markets where they do not have a local presence, and simply raise interest rates where they have a local branch. Banks capitalize on their local presence and relationship with firms and can afford to raise interest rates on these firms as it is costly for them to switch. They also find that aggregate lending to SMEs does not decrease as there is a substitution effect from large banks to small banks, which suggests it leaves room for non-bank lenders.

Chernenko, Erel, and Prilmeier (2019b) is one of the first study to analyze the terms of direct loans by non-bank lenders to publicly-traded medium sized firms during the 2010-2015 period. They show that non-bank lenders provide relatively more credit to unprofitable businesses, catering to a riskier market segment than traditional banks. Beaumont, Tang, and Vansteenberghe (2021) document that FinTech platforms improve SMEs access to finance by relaxing firms' collateral constraints. At the same time, they find higher rate default rates among FinTech borrowers, which suggests that the pool of FinTech borrowers is riskier than that served by banks. In a different setting, Balyuk, Berger, and Hackney (2020) argue that FinTech's competitive advantage

lies in more efficient processing of hard information, and it has the potential to substitute certain types of bank lending. Using data at the county level, they find that the increase in FinTech loans comes at the expense of loans of large/out-of-market banks, rather than small/in-market banks. This is consistent with FinTech being more competitive than large/out-of-market banks, who rely on hard information. FinTech's comparative advantage seems to be reduced when it comes to small/in-market banks, which exploit soft information and relationship banking.

3. Data

3.1 FinTech P2B Platform

The data we use in this study come from an independent Portuguese P2B platform (*Raize*) that extends loans to Portuguese SMEs. The activity of this FinTech platform is concentrated in financing small firms and start ups. They claim to offer loans to young companies that are already in operation, with financial capacity and potential for growth. In the case of SMEs, the platform promises approval within 48 hours and financing within 5 days for loans with maturity between 1 to 60 months. The platform offers savings of up to 80% of banking commissions and no prepayment penalties. Investors in the platform receive a fixed rate.

The business model of the platform is based on fees that are charged both to investors and SMEs raising debt. SMEs pay an origination fee of 3% to 4% of the loan. In other words, if a company gets a €20,000 loan, Raize will actually transfer to the company €19,200 (net of its commission). While there is no application fee, firms pay an annual management fee: SMEs pay an annual management fee for each loan outstanding (approximately 0.25% over outstanding capital balance). If loans are in arrears companies also pay a fee for lateness in payments. Investors are charged a servicing fee of around 0.5% per year over assets under management.

The platform counts more than 53,919 investors who made an average gross return of 6.38% over the sample period (2016-2019). The platform follows a pure matching model, investors directly select prospective loans based on a range of credit information, such as loan purpose,

borrower industry, loan term, borrower income and other credit quality information. The platform also provides an assessment of the credit quality by means of a rating. The platform allows for repayment without penalties to borrowers, but does not provide any credit guarantees in the form of insurance, dedicated guarantee, or provision fund.

We have access to all the 1,291 loans extended from the outset of the platform in December 2016 through September 2019. We also obtain access to all the 1,906 rejected applications over the same period. Table 1, Panel A reports summary statistics for variables related to the P2B platform. The median loan extended by the platform is €20,000 euro, with a 7% rate and maturity of 36 months. The smallest loan is €4,000, while the maximum amount is €315,000. The minimum interest rate is 3% and the highest rate is 10.29%. Although we do not observe the interest rate on the firms' other outstanding loans, we compute the firm-level interest rate using available financial statements information. Using this proxy of a firm overall interest payments, we observe that the P2B loans are more expensive than the other loans obtained by the firms in our sample, with the difference in median equal to 4.65%.

3.2 Firm-Level Data

We collect accounting firm-level information from the Central Balance Sheet (*Central de Balanços*) data, managed by the Bank of Portugal. It consists of a repository of yearly financial statements on the universe of non-financial corporations operating in Portugal from 2014 to 2019. The data include information on balance sheet statement, income statement, and cash flow statement.

We focus on SMEs (i.e., firms with less than 250 employees) over our sample period and we apply the following additional filters to the sample. First, we limit our sample to firms that are organized as public or private limited liability companies, as these are the only legal forms that characterize firms that use FinTech financing. Second, we compile the list of industry affiliations of firms that received FinTech financing. Then, if a firm in the Central Balance Sheet database does not operate in one of such industries, we drop the firm from our sample. Third, we exclude firms operating in regions where none of the firms in our FinTech sample is headquartered.

After applying these filters, we are left with 462,296 firms, corresponding to 1,761,444 firm-year observations. After matching with the P2B platform's data, we identify 931 firms and 5,116 firm-year observations pertaining to firms that obtain a P2B loan. We also identify 8,991 firm-year observations pertaining to 1,696 firms whose application for a P2B loan was rejected. Table 1, Panel B reports summary statistics for firm-level variables in our sample.

3.3 Bank-Firm Data

In some of our tests, we use information from the Central Credit Registry (*Central de Responsabilidades de Crédito*) combined with the banks' balance sheet data from the Bank Supervisory Database managed by the Bank of Portugal. The Central Credit Registry provides confidential information on all credit exposures above €50 to non-financial companies by all banks operating in Portugal. The Central Credit Registry data include loan-level information, such as the identity of the lender, the borrower, and the loan amount. The Bank Supervisory Database reports, on a consolidated basis, a wide range of information on banks' financial statements. We aggregate these data at the firm level, thus the bank variables used in the tests below reflect value-weighted averages across the banks with a lending relationship with firm i , where the weights are given by the outstanding amount of debt extended by bank j to firm i at time t . We report summary statistics of bank variables in Table 1, Panel C.

3.4 External Validity

Before moving to our empirical analysis, in this subsection we discuss the similarity between *Raize* and other European P2B platforms, as well as between the Portuguese banking sector and that of the Eurozone. The goal is to address concerns about the external validity of our results. In general, the Portuguese banking sector displays similar averages compared to the Eurozone in several key metrics. The most relevant difference is a more conservative loan to deposit ratio – 85% as compared to 102% in the Eurozone – which is mainly due to Troika intervention in the past decade. Assets to GDP (183% vs 177%), loans to GDP (116% vs 106%) are in line with

the European average.¹ We use the whole universe of banks in Orbis over our sample period to compare the capital ratios of banks in Portugal to those of banks in the other main economies of the Eurozone and the UK. Table IA1 shows that financial institutions in Portugal are similar in all capital ratios to the main European economies and to UK. Overall, the Portuguese banking sector appears to be representative of that of European countries in general.

When it comes to FinTech platforms, in Europe there are more than 146 P2P lending platforms, about half of those are business focused (P2B). In Portugal, there are 3 platforms of which *Raize* is the only one offering standard P2B services.² Based on total funding volume Portugal's crowdfunding market ranks number 30 in Europe, and it ranks number 64 in the worldwide crowdfunding statistics.³ *Raize* business and operational model is very similar to the leading alternative lenders that focus on small business lending in Europe and the UK. *Raize* has an average loan size that is similar to other European countries when differences in GDP across countries are accounted for. Moreover, its credit risk adjusted performance of more than 5% per year is in line with the other European leading platforms.

4. Results

In this section, we start by examining the characteristics of firms who received FinTech financing versus those who raise debt from banks. We then explore how the firms use the new capital and whether it affects firm growth, investment policy, and financial policy.

4.1 Which Firms Obtain FinTech Loans?

In our first set of results, we study the firms' choice to access the P2B platform. We explore the characteristics of firms that apply for P2B loans, as well as their banks, relative to other firms in our sample.

¹Source: EBF Facts and Figures 2020.

²Goparity focuses on funding socially responsible investments and Younited Credit is a P2P platform.

³The total funding volume is of €14.8 million in 2018, up from €8.3 million in 2017. See the latest report by Cambridge Centre for Alternative Finance (CCAF) here.

4.1.1 The Role of Firm Characteristics

In Table 2 we start with univariate statistics. Panel A compares accounting-level variables between the sample of firms applying for a P2B loan and the other firms in our sample. The table shows that firms who decide to access the P2B platform are larger in number of employees and total assets, but they are on average younger. Firms that submit a loan application to the P2B platform are also more profitable as proxied by return on assets (ROA), and have larger ratios of fixed assets, CAPEX, and net working capital over assets. The P2B firms have a lower current ratio, hold less cash, and have a lower interest coverage ratio. P2B firms use significantly more leverage, both short-term and long-term. At the same time these firms have lower levels of overdue debt, which suggests that they are not riskier firms. These firms display also lower levels of unused debt, and longer average debt maturity. In sum, these univariate results suggest that firms that decide to access the P2B platform are higher-quality firms: larger firms, with access to bank debt, less overdue debt, and higher profitability.

As a second step, we examine whether these results are robust to a multivariate setting in which we are able to control for firm, time, and industry fixed effects. Specifically, we run the following firm-level regression:

$$\begin{aligned} P2B\ Application_{i,t} = & \alpha_i + \alpha_{j,t} + \beta_1 Employees_{i,t-1} + \beta_2 ROA_{i,t-1} + \beta_3 Current\ Ratio_{i,t-1} \\ & + \beta_4 Interest\ Coverage_{i,t-1} + \beta_5 Fixed\ Assets_{i,t-1} + \beta_6 Cash_{i,t-1} + \beta_7 Leverage_{i,t-1} + \epsilon_{i,t} \end{aligned} \quad (1)$$

where $P2B\ Application_{i,t}$ is a dummy variable that takes a value of one for firms that submit a loan application to the P2B platform in the year of the application, and zero otherwise. We report results of a model with year fixed effects (Columns (1), (3), and (5)), or with year and firm fixed effects (Columns (2), (4), and (6)), which absorb time-invariant unobserved firm heterogeneity.

The estimates in Table 3 confirm the majority of the univariate results. Firms applying for P2B financing are larger and have higher profitability. They are characterized by a greater use of external funding, as indicated by less cash, lower interests coverage, and higher leverage. In

Columns (3) and (4) we observe that the larger level of bank debt of firms applying for a P2B loan is reflected mostly in long-term leverage. In the last two columns, we observe that P2B firms have less overdue debt, indicating that they are not riskier firms. Moreover, they also have less unused debt, which coupled with a greater use of external funding suggests that these firms are characterized by less residual debt capacity.

Overall, our results suggest that firms access to P2B loans are high quality firms that already had access to bank financing. This evidence is thus in contrast with previous studies predicting that FinTech should be mostly used by firms that cannot access bank financing (see Thakor (2020)). At the same time, the literature on the importance of financial flexibility to firms (see e.g., Graham and Harvey (2001), DeAngelo and DeAngelo (2007), Jang (2017)) offers a first potential reason why firms switch to FinTech credit. The firms that apply to the P2B platform may value the access to FinTech credit as it allows them to finance their activities without further depleting their debt capacity, and preserving their financial flexibility.

4.1.2 The Role of Bank Characteristics and Lending Relationships

In this subsection, we compare the characteristics of the banks that finance the firms that submit applications to P2B loans with those of the banks that serve the other firms in our sample. Schwert (2018) shows that endogenous matching occurs in the loan market: while bank-dependent firms borrow from well-capitalized banks, firms with access to public debt markets borrow from banks with less capital. In this sense, FinTech may constitute an alternative financing source for SMEs akin to capital market debt. If that is the case, we would expect SMEs that have relationships with less capitalized banks to be more likely to switch to FinTech lending.

In Panel B of Table 2, we explore univariate comparisons of bank characteristics using variables aggregated at the firm-level. The value-weighted averages are computed across all banks with a lending relationship with the firm, where the weights are given by the outstanding amount of debt. Firms with access to the FinTech platform tend to have relationships with banks with less deposits, lower liquidity, and smaller capital ratios. Firms with a greater number of bank

relationships, firms with a lower concentration of bank debt, and firms that do not have a single bank accounting for a large portion of their debt are more likely to apply for a P2B loan.

In Table 4, we explore the robustness of those results to a multivariate setting with different sets of fixed effects. We again adopt specification in Equation (1), adding the bank-related variables as explanatory variables. The dependent variable is $P2B\ Application_{i,t}$, as defined in the previous subsection. In Panel A, we analyze a set of bank variables related to bank liquidity and bank capital as in Ivashina and Scharfstein (2010) and Irani, Iyer, Meisenzahl, and Peydro (2021), including: bank deposits, bank loans, the sum of bank cash and short-term investments (all variables scaled by bank total assets), as well as bank Tier 1 ratio.⁴

The estimates in Table 4, Panel A show a pattern consistent with the univariate results. In line with the results of Schwert (2018), firms are more likely to access the FinTech platform to raise debt when they have lending relationships with banks with a smaller ratio of deposits to assets, less liquid banks, and banks with a lower Tier 1 capital ratio. Moreover, firms that have relationships with banks with a higher loan to asset ratio are more likely to resort to the P2B platforms to raise external capital. These findings indicate that the characteristics of banks and in particular their funding capacity matter for the choice of accessing FinTech platform. Firms served by banks with less stable funding, and banks with a higher transformation ratio are more likely to rely on P2B funding.

This consistent set of results suggests a second potential reason why firms decide to switch to FinTech credit. As documented in Ivashina and Scharfstein (2010) and Irani, Iyer, Meisenzahl, and Peydro (2021), among others, banks funded with less deposits, less liquid banks, and banks with lower capital ratios are the banks that are most affected by recessions and liquidity shocks. In this respect, SMEs might be using the FinTech platform to diversify their exposure to the banking sector, and reduce their dependence on banks that are more likely to cut lending in case of adverse shocks.

To further explore the role of the banking sector in the decision to access the P2B platform,

⁴The level of aggregation is the firm, thus the bank variables used in the analyses below reflect value-weighted averages across the banks with a lending relationship with firm i , where the weights are given by the outstanding amount of debt extended by bank j to firm i at time t .

in Panel B we focus on bank lending relationships. We observe that having multiple relationships with the banking sector increases the likelihood of applying to the FinTech platform. In the last four columns, we explore the concentration of lending relationships. We find that lower debt concentration is associated with a higher likelihood of switching to the P2B platform. These results suggest that firms that apply to the P2B platform are less likely to rely on relationship banking.

4.2 How Do Firms Use FinTech Loans?

In this section we study how firms use the P2B funding. Specifically, we examine the effect of FinTech loans on firm outcomes and lending relationships.

4.2.1 Empirical Approach

It is empirically challenging to determine the consequences of P2B financing. Specifically, the main concern is that firms obtaining financing from the P2B platform are different from the other firms in our sample in some unobserved dimension correlated with the outcomes that we study. If that is the case, we would observe the same different firm outcomes even absent the P2B financing. We make three empirical choices to address this concern. First, in the following analyses we restrict the sample to the set of firms that apply for a P2B loan to the FinTech platform. Using loan applications, loan demand for FinTech loans is given and observed, and the platform has to decide only on the granting of each loan (loan supply) based on firm characteristics. Second, to further reduce concerns of unobservable heterogeneity between firms that obtain P2B loans and the comparison group of firms, we adopt a propensity score matching approach. These first two choices imply that in our analyses we exploit variation coming solely from the comparison between firms that obtain a P2B loan and a similar set of firms that had a similar intention to access the platform but were rejected. More in detail, we select for each firm that access the FinTech platform the five closest matches among the set of rejected applicants, and we construct the propensity score using all variables included in the analysis of Table 3

column (1).⁵ Finally, we either use first differences or include firm fixed effects, which absorb time-invariant unobserved heterogeneity.

In the following subsections, we report the estimates of the following specification:

$$Y_{i,t} = \alpha_i + \alpha_{pt} + \beta_1 P2B \text{ Financing}_{i,t} + X_{i,t-1}\gamma + \epsilon_{i,t} \quad (2)$$

where $Y_{i,t}$ is an outcome for firm i at time t . $P2B \text{ Financing}_{i,t}$ is a dummy variable that takes value of one for firms that receive a FinTech loan starting from the year of the financing, and zero otherwise. α_i are firm fixed effects. α_{pt} are propensity score group-by-year fixed effects, which make sure that coefficients are estimated out of variation within each set of matches. $X_{i,t-1}$ is a matrix of firm-level covariates, which includes all the variables used in Equation (1).

4.2.2 Firm Growth and Investment

We start by analyzing the impact of obtaining P2B financing on firm growth. Table 5 shows that firms obtaining FinTech funding grow faster as compared to the firms in the rejected sample. In the first five columns of the table we use (log) growth rates as dependent variables, and we observe that firms obtaining P2B funding have significantly higher growth rates of total assets, fixed assets, net working capital, number of employees, and sales than firms that got their applications rejected. We also observe firms with a P2B loan having larger ratios of CAPEX over total assets. At the same time, we do not find a significant impact of P2B loans on profitability. This indicates that firms accessing the P2B platform are able to grow without sacrificing their profitability.

In terms of economic magnitude, Column (1) shows that assets of a firm that obtains P2B financing increase by 7.4 percentage points more than otherwise similar firms that applied to the P2B platform but got rejected. Columns (2) and (3) show that fixed assets and net working capital growth is higher at 8.9 and 3.7 percentage points respectively. Firms who obtain FinTech loans increase employment growth by 5.1 percentage points (Column (4)), and sales growth by

⁵Estimates of logit regressions for propensity score matching are reported in the last column of Table IA2.

5.7 percentage points (Column (5)) relative to firms with rejected applications. We also find an increase in the investment rate in Column (6) as capital expenditures increase by 1.5 percentage points of assets relative to firms with rejected applications. Column (7) shows no significant effect on return on assets.

In Table IA3 of the Internet Appendix we repeat the analysis of Table 5 using symmetric growth rates. In Table IA4 we perform a similar analysis using variables in log levels and adding firm fixed effects. The estimates are robust to the use of these alternative specifications.

4.2.3 Firm Leverage and Debt Structure

In this section we explore how obtaining FinTech credit influences the firm leverage and debt structure. In Table 6 we study the impact of P2B financing on leverage, both long-term and short-term leverage. In all three measures we include the amount of P2B loans firms obtain from the platform. We find that the availability of a P2B loan leads to a significant increase in leverage. Firms that access the FinTech platform display 5 percentage points (Column (1)) increase in leverage compared to the set of firms that applied to the P2B platform but got rejected. The coefficient reflecting the impact of P2B loans on long-term leverage is also positive and significant, reflecting an increase equal to 1.3 percentage points (Column (2)). This result is probably not surprising since more than 90% of the P2B loans extended by the platform have a maturity greater than one year, and thus are classified as long-term debt. More interesting is the impact on short-term leverage, as we find a significant increase of 2.2% (Column (3)). In the last column of Table 6, we study the impact on the proportion of secured debt in the firms' balance sheet. Interestingly we observe a significant reduction in secured debt, equal to 2.1 percentage points.

Table 7 performs the same analysis of Table 6 but excluding from firm debt the amount of P2B loans they obtain from the platform. Column (1) shows that when we exclude P2B financing, firms that obtain access to the platform do not increase their leverage compared to the sample of rejected applicants. At the same time, Column (2) shows that net of the P2B loan,

firms decrease the amount of long-term bank financing in their balance sheet. The reduction in long-term bank leverage is 6.4 percentage points compared to the firms in our sample of rejected applicants. Finally, firms with access to the FinTech platform increase the short-term bank leverage by 2.1 percentage points. Thus, SMEs use the P2B debt to reduce their long-term debt exposure and, at the same time, switch to bank debt with shorter maturity.

These results, therefore, suggest that firms consider FinTech funding as a substitute for long-term bank financing. After they obtain a loan from the P2B platform, they reduce the long term exposure to the banking system, and instead supplement the FinTech loan with additional short-term bank debt.

Results in this section are also closely connected to the evidence in Section 4.1.1. There, we document that firms that apply to the P2B platform are closer to their maximum debt capacity compared to the other firms in our sample. Therefore their decision to switch to FinTech credit might be driven by their desire to obtain additional funding but, at the same time, preserve their financial flexibility. This decision makes even more sense if firms are specifically interested in obtaining additional long-term financing. For example, firms might prefer to finance their growth with long-term debt to avoid the risk that changes in market conditions or capital market imperfections could result in refinancing at a significantly higher interest rate (e.g., Harford, Klasa, and Maxwell (2014)). However, due to tighter regulation and higher capital requirements banks are less likely to grant unsecured loans to SMEs (Acharya, Berger, and Roman (2018), Cortés, Demyanyk, Li, Loutskina, and Strahan (2020), Chernenko, Erel, and Prilmeier (2019a)). There are two reasons why secured debt might be less attractive to SMEs. First, SMEs might not have large availability of collateral. As a matter of fact, Table 3 documents that this is precisely the case for firms that apply to the FinTech platform. Second, even firms with available collateral might be wary of pledging their assets. Keeping unpledged collateral is a common way of retaining financial and operational flexibility. Unpledged collateral is often used as financial slack (see e.g., Myers and Majluf (1984)) or insurance (Rampini and Viswanathan (2013)). Similarly, firms may want to avoid the connected limits to their flexibility to sell or redeploy assets (Mello and Ruckes

(2017)). To sum up, P2B platforms offer firm an alternative to obtain long-term unsecured debt and, at the same time, retain financial flexibility. In addition, as documented in Table 6, firms may use FinTech funds to release pledged assets by paying off bank debt.

4.2.4 Lending Relationships

In the previous section we find that firms use FinTech funding to increase leverage. In addition, these firms manage their exposure to the banking sector by switching from long-term bank debt to short-term bank debt. In this section, we further explore the relationships between firms accessing the P2B platform and the banking sector.

In the first column of Table 8, we use as dependent variable the firm's number of lending relationships (excluding P2B lending). The estimates show that after obtaining P2B financing SMEs increase the number of lending relationships. Since the variable excludes the new P2B relationship, the increase is not simply caused by the new connection to the FinTech platform, but it appears to be driven by additional links to the banking system. Specifically, the P2B loan allows firms to add on average 0.3 new relationships, which corresponds to a roughly 30% increase compared to the sample average of 1 relationships. Firms that obtain a P2B loan also significantly reduce the concentration of their debt in the hands of their largest lender. In Column (2) of Table 8 we analyze the fraction of a firm debt accounted for by a firm's largest bank relationship. We find a significant decrease in the concentration of debt by a single bank for firms accessing the P2B platform, as compared to the other firms in the sample of applicants. Thus, P2B lending seems to allow firms to diversify their exposure to the banking system and reduce debt concentration.

The results of Section 4.1.2 suggest that firms apply for a P2B loan in order to diversify away from banks that are more likely to cut lending in times of crises. The first two columns of Table 8 confirm that firms with a P2B loan manage to increase their lending relationships and reduce debt concentration. A question remains, however, as to whether they are also successful in starting relationships with more resilient banks. In the remaining columns of Table 8 we try

to answer this question. While the results do not indicate a significant change in the average deposit-to-assets ratio, we do find that the average loan-to-assets ratio of banks that lend to firms with a P2B loan is lower than for other firms in the sample. Moreover, banks that lend to firms accessing the P2B platform are, on average, more liquid. To sum up, firms appear partially successful in their efforts to improve the quality of their pool of lenders.

4.2.5 Cost of Debt

In the Table 9 we study the effect of FinTech lending on the cost of debt of firms. Columns (1) and (2) use as dependent variable the total funding costs including the costs of P2B loans, while Columns (3) and (4) use as dependent variable the funding costs excluding P2B loans (i.e., the cost of bank loans only). We find a significant and positive impact of P2B loans on the firms' overall cost of debt of about 5 basis points. This is not surprising, as the cost of P2B financing is typically more expensive than a bank loan (see Table 1). At the same time, Columns (3) and (4) show a negative and significant coefficient, which indicates that the firms accessing the FinTech platform benefit from a reduction of 5 basis points in the cost of bank financing compared to the set of rejected applicants. Therefore, firms accessing the P2B platform benefit from a reduction in the costs of bank funding, probably as a benefit of a more diversified pool of lenders.

5. Conclusion

We study the impact of FinTech lending on firm growth, investment, and financing using a proprietary data set from a leading independent P2B platform including both accepted and rejected loan applications. We combine this data set with with detailed administrative data on the universe of firms, banks, and loans. We uncover four novel empirical findings about the effects of FinTech credit on small businesses.

First, we find that P2B platforms serve high quality and creditworthy SMEs who already have access to bank credit. When we compare the characteristics of firms that access P2B lending to firms who borrow from traditional financial intermediaries, we find that firms that borrow

through P2B platforms are larger, more profitable, have lower credit risk, and have prior lending relationships with the banking sector.

Second, the liquidity and solvency ratios of relationship banks are key in the firm's decision to raise debt through a P2B platform. Firms served by banks with less liquid assets, stable funding, and capital are more likely to access P2B funding. Moreover, the longer the lending relationship with a bank the more likely is the firm to access FinTech lending.

Third, FinTech lending has a positive effect on firm growth and investment. We find that FinTech loans allow SMEs to increase assets, employment, and sales relative to SMEs with rejected loan applications. However, FinTech lending does not seem to deteriorate firm profitability even though the cost of FinTech debt is higher than the cost of bank debt.

Finally, we find a significant impact of FinTech lending on firms' financial policy. We find that firms use the availability of FinTech debt to increase both short-term and long-term leverage. SMEs substitute long-term bank debt with FinTech debt and reduce the proportion of secured debt following a P2B loan. FinTech provides firms with an alternative to access unsecured long-term financing and release pledged assets to retain financial and operational flexibility. In addition, the availability of P2B funds allows firms to increase the number of bank relationships and reduce their dependence on their main bank. Our findings suggest that FinTech lending competes with traditional financial intermediaries in financing SMEs, and allows SMEs to diversify away from the banking sector and reduce their exposure to banking shocks.

References

- Acharya, Viral V., Allen N. Berger, and Raluca A. Roman, 2018, Lending implications of us bank stress tests: Costs or benefits?, *Journal of Financial Intermediation* 34, 58–90.
- Balyuk, Tetyana, 2019, Financial innovation and borrowers: Evidence from peer-to-peer lending, *Working Paper*.
- , Allen N. Berger, and John Hackney, 2020, What is fueling fintech lending? the role of banking market structure, *Working Paper*.
- Beaumont, Paul, Huan Tang, and Eric Vansteenberghe, 2021, The role of fintech in small business lending, Discussion paper Working paper.
- Brunnermeier, Markus K., and Motohiro Yogo, 2009, A note on liquidity risk management, *American Economic Review* 99, 578–83.
- 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.
- 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, Working Paper 23843 National Bureau of Economic Research.
- Chernenko, Sergey, Isil Erel, and Robert Prilmeier, 2019a, Why do firms borrow directly from nonbanks?, Discussion paper National Bureau of Economic Research.
- , 2019b, Why do firms borrow directly from nonbanks?, *Working Paper*.
- 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.
- 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.

- Crouzet, Nicolas, 2018, Aggregate implications of corporate debt choices, *Review of Economic Studies* 85, 1635–1682.
- Danisewicz, Piotr, and Ilaf Elard, 2018, The real effects of financial technology: Marketplace lending and personal bankruptcy, *Working Paper*.
- de Roure, Calebe, Lorian Pelizzon, and Paolo Tasca, 2016, How does p2p lending fit into the consumer credit market?, *Bundesbank Discussion Paper No. 30/2016*.
- de Roure, Calebe, Lorian Pelizzon, and Anjan V. Thakor, 2019, P2P lenders versus banks: Cream skinning or bottom fishing?, SAFE Working Paper Series 206.
- DeAngelo, Harry, and Linda DeAngelo, 2007, Capital structure, payout policy, and financial flexibility, *Marshall School of Business Working Paper* pp. 02–06.
- , and Toni M. Whited, 2011, Capital structure dynamics and transitory debt, *Journal of Financial Economics* 99, 235–261.
- Di Maggio, Marco, and Vincent Yao, 2021, Fintech borrowers: Lax screening or cream-skimming?, *Review of Financial Studies* 34, 4565–4618.
- Diamond, Douglas W., 1991, Debt maturity structure and liquidity risk, *Quarterly Journal of Economics* 106, 709–737.
- , 1993, Seniority and maturity of debt contracts, *Journal of Financial Economics* 33, 341–368.
- Erel, Isil, and Jack Liebersohn, 2020, Does fintech substitute for banks? evidence from the paycheck protection program, Working Paper 27659 National Bureau of Economic Research.
- Fuster, Andreas, Matthew Plosser, Philipp Schnabl, and James Vickery, 2019, The role of technology in mortgage lending, *The Review of Financial Studies* 32, 1854–1899.
- Gopal, Manasa, and Philipp Schnabl, 2020, The rise of finance companies and fintech lenders in small business lending, *Working Paper, NYU Stern School of Business*.

- Gopalan, Radhakrishnan, Gregory F. Udell, and Vijay Yerramilli, 2011, Why do firms form new banking relationships?, *Journal of Financial and Quantitative Analysis* 46, 1335–1365.
- Graham, John R., and Campbell R. Harvey, 2001, The theory and practice of corporate finance: Evidence from the field, *Journal of Financial Economics* 60, 187–243.
- Harford, Jarrad, Sandy Klasa, and William F. Maxwell, 2014, Refinancing risk and cash holdings, *Journal of Finance* 69, 975–1012.
- Hau, Harald, Yi Huang, Hongzhe Shan, and Zixia Sheng, 2019, How fintech enters china’s credit market, *AEA Papers and Proceedings* 109, 60–64.
- Irani, Rustom M., Rajkamal Iyer, Ralf R. Meisenzahl, and Jose-Luis Peydro, 2021, The rise of shadow banking: Evidence from capital regulation, *Review of Financial Studies* 34, 2181–2235.
- Ivashina, Victoria, and David Scharfstein, 2010, Loan syndication and credit cycles, *American Economic Review* 100, 57–61.
- Jang, Yeejin, 2017, International corporate diversification and financial flexibility, *Review of Financial Studies* 30, 4133–4178.
- Khwaja, Asim Ijaz, and Atif Mian, 2008, Tracing the impact of bank liquidity shocks: Evidence from an emerging market, *American Economic Review* 98, 1413–42.
- Mello, Antonio S., and Martin Ruckes, 2017, Collateral in corporate financing, Discussion paper Working Paper.
- Myers, Stewart C., and Nicholas S. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have, *Journal of financial economics* 13, 187–221.
- Paravisini, Daniel, Veronica Rappoport, and Philipp Schnabl, 2015, Specialization in bank lending: Evidence from exporting firms, Discussion paper National Bureau of Economic Research.

- Rampini, Adriano A., and S. Viswanathan, 2013, Collateral and capital structure, *Journal of Financial Economics* 109, 466–492.
- Schwert, Michael, 2018, Bank capital and lending relationships, *Journal of Finance* 73, 787–830.
- Sharpe, Steven A., 1990, Asymmetric information, bank lending, and implicit contracts: A stylized model of customer relationships, *Journal of Finance* 45, 1069–1087.
- Tang, Huan, 2019, Peer-to-Peer Lenders Versus Banks: Substitutes or Complements?, *Review of Financial Studies* 32, 1900–1938.
- Thakor, Anjan V., 2020, Fintech and banking: What do we know?, *Journal of Financial Intermediation* 41, 100833.

Table A1: Variable definitions

Variable	Definition
<i>Firm-Level Independent Variables</i>	
Employees (log)	Logarithm of the number of paid and unpaid employees of the company. Source: Central Balance Sheet Database.
Assets (M€)	Firm total assets in thousands of euro. Source: Central Balance Sheet Database.
ROA	Return on assets, defined as EBITDA over total assets. Source: Central Balance Sheet Database.
Current Ratio	Defined as current assets over short-term debt. Source: Central Balance Sheet Database.
Interest Coverage	The ratio of a firm EBITDA over interest expenses. Source: Central Balance Sheet Database.
Fixed Assets	The ratio of firm fixed assets over total assets. Source: Central Balance Sheet Database.
Cash	The ratio of cash and bank deposits over total assets. Source: Central Balance Sheet Database.
Leverage	The ratio of short-term debt plus long-term debt over total assets. Source: Central Balance Sheet Database.
Overdue Debt	The ratio of all debt exposures recorded as non-performing over total assets. Source: Central Credit Responsibility.
Debt Maturity	The ratio of non-current debt over total debt (the sum of current and non-current debt). Source: Central Balance Sheet Database.
<i>Firm-Level Dependent Variables (Table 5)</i>	
Assets	Logarithm of the firm total assets in year t minus the logarithm of total assets in $t-1$. Source: Central Balance Sheet Database.
Fixed Assets	Logarithm of the firm fixed assets in year t minus the logarithm of fixed assets in $t-1$. Source: Central Balance Sheet Database.
NWC	Logarithm of the firm net working capital in year t minus the net working capital in $t-1$. We define NWC as inventories plus trade receivables minus account payables. Source: Central Balance Sheet Database.
Employees	Logarithm of the number of paid and unpaid employees of the company in year t minus the logarithm of employees in $t-1$. Source: Central Balance Sheet Database.
Sales	Logarithm of the firm sales in year t minus the logarithm of sales in $t-1$. Source: Central Balance Sheet Database.
CAPEX	Ratio of CAPEX over total assets. We define CAPEX as the difference in tangible assets between two consecutive years plus amortization and depreciation. Source: Central Balance Sheet Database.
ROA	Return on assets, defined as EBITDA over total assets. Source: Central Balance Sheet Database.
<i>Other Firm-Level Dependent Variables</i>	
Leverage (Table 6)	The ratio of short-term debt plus long-term debt over total assets. Source: Central Balance Sheet Database.
Long-Term Leverage (Table 6)	The ratio of non-current debt (maturity > 1 year) over total assets. Source: Central Balance Sheet Database.
Short-Term Leverage (Table 6)	The ratio of current debt (maturity \leq 1 year) over total assets. Source: Central Balance Sheet Database.
Long-Term Leverage (Table 7)	The ratio of non-current debt (maturity > 1 year) minus non-current P2B debt over total assets. Source: Central Balance Sheet Database.
Short-Term Leverage (Table 7)	The ratio of current debt (maturity \leq 1 year) minus current P2B debt over total assets. Source: Central Balance Sheet Database.

Continued on next page

– continued from previous page

Variable	Definition
Leverage (Table 7)	The ratio of current and non-current debt minus P2B debt over total assets. Source: Central Balance Sheet Database.
Cost of Debt	The ratio of interest expenses over total debt (sum of current and non-current debt). Source: Central Balance Sheet Database.
Cost of Debt Net P2B	The ratio of interest expenses minus the cost of P2B funding over total debt (sum of current and non-current debt minus the P2B loan). Source: Central Balance Sheet Database.
<i>Lending Relationships Variables</i>	
Bank ROA	Firm-level average of the ratio of bank ROA over bank total assets. The average is computed across all banks doing business with the firm at time $t - 1$, and we use as weight the size of the loan extended by each bank to the firm. Source: Central Credit Responsibility.
Bank Deposit	Firm-level average of the ratio of bank deposits over bank total assets. The average is computed across all banks doing business with the firm at time $t - 1$, and we use as weight the size of the loan extended by each bank to the firm. Source: Central Credit Responsibility.
Bank Loan	Firm-level average of the ratio of bank loans over bank total assets. The average is computed across all banks doing business with the firm at time $t - 1$, and we use as weight the size of the loan extended by each bank to the firm. Source: Central Credit Responsibility.
Bank Liquidity	Firm-level average of the ratio of bank cash and short-term assets over bank total assets. The average is computed across all banks doing business with the firm at time $t - 1$, and we use as weight the size of the loan extended by each bank to the firm. Source: Central Credit Responsibility.
Tier 1 Capital	Firm-level average of the banks' Tier 1 Capital ratio. The average is computed across all banks doing business with the firm at time $t - 1$, and we use as weight the size of the loan extended by each bank to the firm. Source: Central Credit Responsibility.
Number of Relationships	The number of active financing relationships of a firm, excluding the financing relationship with the P2B platform. Source: Central Credit Responsibility.
Top Relationship	The largest financing relationship (in percentage term) of a firm, without considering the P2B platform. Source: Central Credit Responsibility.
Relationship Length	The average length of the relationships a firm has with its bank lenders, excluding the financing relationship with the P2B platform. The average is computed across all banks doing business with the firm at time $t - 1$, and we use as weight the size of the loan extended by each bank to the firm. Source: Central Credit Responsibility.

Table 1: Summary Statistics

This table reports summary statistics. The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. Moreover, we restrict our sample to firms that either apply to the P2B platform or raise debt through traditional financial intermediaries (i.e., banks). Panel A reports statistics for the sample of firms who receive P2B funding. Panel B reports statistics about firm-level variables. Panel C shows statistics for bank-related variables aggregated at the firm-level, using the value of loans outstanding as weights. Detailed definitions for the variables in this table is provided in the Appendix A1.

Panel A: P2B Platform Variables						
	Observations	Mean	SD	P25	P50	P75
P2B Loan Amount	931	22460.66	19696.86	15000.00	20000.00	25000.00
P2B Debt / Assets	931	0.17	0.20	0.05	0.10	0.21
P2B Debt / Liabilities	931	0.29	0.31	0.06	0.18	0.43
P2B Loan Maturity	931	34.29	10.28	24.00	36.00	36.00
P2B Cost of Debt	931	7.08	1.54	6.09	7.08	8.34
Cost of Debt	931	6.90	6.82	3.22	4.90	8.19
Panel B: Firm Variables						
	Observations	Mean	SD	P25	P50	P75
Employees (log)	364,630	4.12	7.20	1.00	2.00	4.00
Assets (€ thousand)	364,630	947.18	8595.17	49.09	151.32	472.19
Firm Age	364,630	11.84	12.07	3.00	8.00	17.00
ROA	364,630	-0.03	0.47	-0.01	0.05	0.14
Current Ratio	364,630	3.72	7.68	0.81	1.51	3.12
Interest Coverage	364,630	41.81	186.97	0.00	0.00	12.66
Cash	364,630	0.18	0.24	0.02	0.09	0.26
Fixed Assets	364,630	0.24	0.27	0.01	0.13	0.39
CAPEX	364,630	0.06	0.11	0.00	0.00	0.07
NWC	364,630	0.17	0.23	0.00	0.02	0.30
Leverage	364,630	0.15	0.25	0.00	0.00	0.24
Long-Term Leverage	364,630	0.20	0.27	0.00	0.07	0.31
Short-Term Leverage	364,630	0.09	0.18	0.00	0.00	0.09
Unused Debt	364,630	0.20	0.32	0.00	0.00	0.31
Overdue Debt	364,630	0.05	0.21	0.00	0.00	0.00
Secured Debt	364,630	0.10	0.26	0.00	0.00	0.00
Average Debt Maturity	364,630	1.97	0.92	1.00	2.00	3.00
Panel C: Lending Relationships Variables						
	Observations	Mean	SD	P25	P50	P75
Bank Deposit	293,533	0.58	0.17	0.50	0.61	0.70
Bank Loan	293,533	0.63	0.09	0.59	0.63	0.67
Bank Liquidity	293,533	0.20	0.08	0.16	0.20	0.25
Tier 1 Capital	293,533	12.16	5.49	10.57	11.98	13.33
Number of Relationship	364,630	1.62	1.85	0.00	1.00	2.00
HHI Relationships	364,630	0.79	0.27	0.54	1.00	1.00
Top Relationships	364,630	0.84	0.22	0.67	1.00	1.00
Relationship Duration	364,630	3.41	2.11	2.00	3.00	5.00

Table 2: Univariate Comparisons

This table reports univariate comparisons between firms that apply for P2B financing and other firms in our sample that raise debt through traditional financial intermediaries. The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. Panel A reports statistics for firm-level accounting variables. Panel B shows statistics for bank-related variables aggregated at the firm-level, using the value of loans outstanding as weights. For the sample of P2B firms we measure all variables before firms obtain their first P2B loan. Moreover, we restrict our sample to firms that either apply to the P2B platform or raise debt through traditional financial intermediaries (i.e., banks). *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

Panel A: Firm Variables				
	P2B Firms	Other Firms	Difference	
Employees	5.795	4.819	0.976***	(0.000)
Assets (€ thousand)	877.766	478.246	399.520***	(0.000)
Firm Age	9.355	11.890	-2.535***	(0.000)
ROA	-0.013	-0.010	-0.003	(0.630)
Current Ratio	2.751	3.723	-0.972***	(0.000)
Interest Coverage	30.888	50.296	-19.408***	(0.000)
Fixed Assets	0.245	0.218	0.027***	(0.000)
Cash	0.136	0.193	-0.057***	(0.000)
CAPEX	0.053	0.040	0.013***	(0.000)
NWC	0.192	0.178	0.014***	(0.000)
Leverage	0.204	0.117	0.086***	(0.000)
Long-Term Debt	0.204	0.141	0.062***	(0.000)
Short-Term Debt	0.105	0.081	0.024***	(0.000)
Unused Debt	0.144	0.192	-0.048***	(0.000)
Overdue Debt	0.017	0.048	-0.031***	(0.000)
Secured Debt	0.123	0.082	0.041***	(0.000)
Average Debt Maturity	2.228	1.884	0.345***	(0.000)

Panel B: Bank Variables				
	P2B Firms	Other Firms	Difference	
Bank Deposit	0.547	0.577	-0.029***	(0.000)
Bank Loan	0.636	0.633	0.003*	(0.013)
Bank Liquidity	0.197	0.203	-0.006***	(0.000)
Tier 1 Capital	11.732	12.158	-0.426***	(0.000)
Bank Equity	0.082	0.083	-0.001	(0.064)
Number of Relationships	2.297	1.586	0.711***	(0.000)
HHI Relationships	0.637	0.798	-0.161***	(0.000)
Top Relationships	0.714	0.845	-0.130***	(0.000)

Table 3: What Type of Firms Obtain FinTech Funding? Firm Characteristics

This table studies the characteristics of firms that apply for a loan to the P2B platform as compared to the characteristics of other firms in our sample that raise debt through traditional financial intermediaries. The dependent variable is an indicator variable for firms that apply for P2B funding. Industry-year fixed effects are defined using the Portuguese classification of economic activities (CAE3). The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. Moreover, we restrict our sample to firms that either apply to the P2B platform or raise debt through traditional financial intermediaries (i.e., banks). *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

	(1)	(2)	(3)	(4)	(5)	(6)
Employees (log)	0.069*** (5.05)	0.569*** (7.54)	0.058*** (4.18)	0.548*** (7.22)	0.059*** (4.08)	0.562*** (7.37)
ROA	0.126*** (5.62)	0.204*** (3.14)	0.097*** (4.32)	0.197*** (3.04)	0.119*** (5.32)	0.208*** (3.21)
Current Ratio	-0.004*** (-3.60)	-0.002 (-0.85)	-0.004*** (-3.83)	-0.003 (-0.97)	-0.004*** (-4.17)	-0.002 (-0.87)
Interests Coverage	-0.001*** (-4.62)	-0.001 (-1.38)	-0.001*** (-4.37)	-0.001 (-1.28)	-0.001*** (-4.43)	-0.001 (-1.29)
Fixed Assets	-0.142*** (-2.80)	-0.125 (-0.59)	-0.212*** (-4.18)	-0.240 (-1.11)	-0.186*** (-3.68)	-0.133 (-0.62)
Cash	-0.684*** (-16.04)	-0.597*** (-4.30)	-0.653*** (-15.28)	-0.597*** (-4.28)	-0.689*** (-16.10)	-0.607*** (-4.38)
Leverage	1.177*** (16.86)	1.631*** (9.80)	1.034*** (14.62)	1.569*** (9.38)	1.182*** (16.23)	1.618*** (9.69)
Short-Term Leverage			0.040 (1.54)	-0.077 (-1.64)		
Long-Term Leverage			0.335*** (10.10)	0.300*** (3.81)		
Overdue Debt					-0.530*** (-13.84)	-0.486*** (-4.24)
Unused Debt					-0.317*** (-11.73)	-0.208*** (-2.96)
Secured Debt					0.033 (0.58)	-0.101 (-0.70)
Year FE	X	X	X	X	X	X
Firm FE		X		X		X
Observations	364,630	256,500	364,630	256,500	364,630	256,500
Adjusted R^2	0.109	0.457	0.109	0.457	0.109	0.457

Table 4: What Type of Firms Obtain FinTech Funding? Lending Relationships

This table studies the lending relationships of firms that apply for a P2B loan as compared to the relationships of other firms in our sample that raise debt through traditional financial intermediaries. Panel A studies the characteristics of the banks that provide funding to firms with P2B loans. In Panel B, we study the characteristics of the relationships between the firms that apply for a P2B loan and their banks. In both panels, the dependent variable is an indicator variable for firms that apply for P2B funding. Industry-year fixed effects are defined using the Portuguese classification of economic activities (CAE3). The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. Moreover, we restrict our sample to firms that either apply to the P2B platform or raise debt through traditional financial intermediaries (i.e., banks). *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

Panel A								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Bank Deposit	-0.644*** (-7.74)	-1.095*** (-3.83)						
Bank Loan			0.811*** (5.75)	1.791*** (4.24)				
Bank Liquidity					-0.629*** (-3.88)	-0.838* (-1.66)		
Tier 1 Capital							-0.004* (-1.88)	-0.018** (-2.43)
Controls	X	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X	X
Firm FE		X	X	X		X		X
Observations	293,533	193,248	293,533	193,248	293,533	193,248	293,533	193,248
Adjusted R^2	0.11	0.46	0.11	0.46	0.11	0.46	0.11	0.46

Panel B						
	(1)	(2)	(3)	(4)	(5)	(6)
Number of Relationships	0.202*** (17.10)	0.522*** (14.19)				
HHI Relationships			-0.438*** (-15.23)	-0.319*** (-7.08)		
Top Relationships					-0.377*** (-13.04)	-0.276*** (-6.08)
Controls	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Firm FE		X	X	X		X
Observations	364,630	256,500	364,630	256,500	364,630	256,500
Adjusted R^2	0.07	0.44	0.07	0.43	0.07	0.43

Table 5: The Use of FinTech Funding: Firm Growth

This table investigates how firms use the funds obtained through the P2B platform. The dependent variables are the (log) growth of firm assets; the (log) growth of firm fixed assets; the (log) growth of net working capital (NWC); the (log) growth of firm employees; the (log) growth of firm sales; CAPEX over total assets; and ROA. We regress these variables on *P2B Lending*, an indicator variable that takes value one for firms that receive P2B funding in the years after the deal. In this table we restrict the sample to firms that apply for P2B funding, therefore comparing accepted and rejected applicants. PS Group-Year FE are propensity score group-by-year fixed effects, which make sure that coefficients are estimated out of variation within each set of matches. We select for each firm that access the FinTech platform the five closest matches among the set of rejected applicants, and we construct the propensity score using all variables included in the analysis of firm level determinants (Table 3). The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

	Assets Growth (1)	Fixed Assets Growth (2)	NWC Growth (3)	Employees Growth (4)	Sales Growth (5)	CAPEX (6)	ROA (7)
P2B Financing	0.074*** (6.27)	0.089*** (4.54)	0.037*** (3.78)	0.051*** (4.55)	0.057*** (4.69)	0.015*** (3.33)	-0.001 (-0.75)
Controls	X	X	X	X	X	X	X
PS Group-Year FE	X	X	X	X	X	X	X
Firm FE						X	X
Observations	13,301	13,301	13,301	13,301	13,301	13,301	13,301
Adjusted R^2	0.05	0.02	0.00	0.05	0.06	0.38	0.44

Table 6: The Use of FinTech Funding: Leverage

This table investigates how firms use the funds obtained through the P2B platform. The dependent variables are variables describing the liability side of firms' balance sheet, including: the ratio of total debt to total assets (Leverage); the ratio of long-term debt to assets (Long-Term Leverage); the ratio of short-term debt to assets (Short-Term Leverage). We regress these variables on *P2B Lending*, an indicator variable that takes value 1 for firms that receive P2B funding in the years after the deal. In this table we restrict the sample to firms that apply for P2B funding, therefore comparing accepted and rejected applicants. PS Group-Year FE are propensity score group-by-year fixed effects, which make sure that coefficients are estimated out of variation within each set of matches. We select for each firm that access the FinTech platform the five closest matches among the set of rejected applicants, and we construct the propensity score using all variables included in the analysis of firm level determinants (Table 3). The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

	Leverage (1)	Long-Term Leverage (2)	Short-Term Leverage (3)	Secured Debt (4)
P2B Financing	0.049*** (6.18)	0.013* (1.86)	0.022*** (3.93)	-0.021** (-2.49)
Controls	X	X	X	X
Firm FE	X	X	X	X
PS Group-Year FE	X	X	X	X
Observations	13,301	13,301	13,301	13,301
Adjusted R^2	0.56	0.58	0.46	0.67

Table 7: The Use of FinTech Funding: Leverage Net of P2B Debt

This table investigates how firms use the funds obtained through the P2B platform. The dependent variables are variables describing the liability side of firms' balance sheet, including: the ratio of total debt to total assets (Leverage); the ratio of long-term debt to assets (Long-Term Leverage); the ratio of short-term debt to assets (Short-Term Leverage). In this table we analyze the firm debt excluding the loan obtained from the FinTech platform, thus we subtract the amount of P2B funding before computing the dependent variables. We regress these variables on *P2B Lending*, an indicator variable that takes value 1 for firms that receive P2B funding in the years after the deal. In this table we restrict the sample to firms that apply for P2B funding, therefore comparing accepted and rejected applicants. PS Group-Year FE are propensity score group-by-year fixed effects, which make sure that coefficients are estimated out of variation within each set of matches. We select for each firm that access the FinTech platform the five closest matches among the set of rejected applicants, and we construct the propensity score using all variables included in the analysis of firm level determinants (Table 3). The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

	Leverage (1)	Long-Term Leverage (2)	Short-Term Leverage (3)
P2B Financing	-0.005 (-0.68)	-0.059*** (-8.19)	0.022*** (3.80)
Controls	X	X	X
Firm FE	X	X	X
PS Group-Year FE	X	X	X
Observations	13,301	13,301	13,301
Adjusted R^2	0.56	0.58	0.46

Table 8: The Use of FinTech Funding: Lending Relationships

This table investigates how firms use the funds obtained through the P2B platform. The dependent variables are variables describing the characteristics of the firms' lending relationships. These include: number of relationships, the share of a firm's debt accounted for by its top lender, the value-weighted average of banks' ROA; the value-weighted average of banks' deposits over assets; the value-weighted average of banks' loans over assets; the value-weighted average of banks' short-term assets plus cash over assets. We regress these variables on *P2B Lending*, an indicator variable that takes value 1 for firms that receive P2B funding in the years after the deal. In this table we restrict the sample to firms that apply for P2B funding, therefore comparing accepted and rejected applicants. PS Group-Year FE are propensity score group-by-year fixed effects, which make sure that coefficients are estimated out of variation within each set of matches. We select for each firm that access the FinTech platform the five closest matches among the set of rejected applicants, and we construct the propensity score using all variables included in the analysis of firm level determinants (Table 3). The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

	Number of Relationships (1)	Top Relationship (2)	Bank Deposit (3)	Bank Loans (4)	Bank Liquidity (5)	Bank Tier1 (6)
P2B Financing	0.328*** (5.43)	-0.019** (-2.09)	0.002 (0.39)	-0.029*** (-8.11)	0.027*** (8.97)	0.057 (0.19)
Controls	X	X	X	X	X	X
Firm FE	X	X	X	X	X	X
PS Group-Year FE	X	X	X	X	X	X
Observations	13,301	13,301	13,301	13,301	13,301	13,301
Adjusted R^2	0.84	0.74	0.71	0.58	0.60	0.49

Table 9: The Use of FinTech Funding: Cost of Debt

This table investigates how firms use the funds obtained through the P2B platform. The dependent variables are variables describing the firms' funding costs. These include: the ratio of interest expenses over total assets, and the ratio of interest expenses minus the cost of P2B funds over total assets. We regress these variables on *P2B Lending*, an indicator variable that takes value 1 for firms that receive P2B funding in the years after the deal. In this table we restrict the sample to firms that apply for P2B funding, therefore comparing accepted and rejected applicants. PS Group-Year FE are propensity score group-by-year fixed effects, which make sure that coefficients are estimated out of variation within each set of matches. We select for each firm that access the FinTech platform the five closest matches among the set of rejected applicants, and we construct the propensity score using all variables included in the analysis of firm level determinants (Table 3). The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

	Cost of Debt		Cost of Debt Net P2B	
	(1)	(2)	(3)	(4)
P2B Lending	0.005*** (3.96)	0.004*** (3.47)	-0.005** (-3.73)	-0.005*** (-4.56)
Debt Maturity		0.034*** (29.78)		0.032*** (28.51)
Controls	X	X	X	X
Firm FE	X	X	X	X
PS Group-Year FE	X	X	X	X
Observations	13,301	13,301	13,301	13,301
Adjusted R^2	0.47	0.54	0.48	0.54

Internet Appendix for “The Real Effects of FinTech Lending”

Afonso Eça, Miguel A. Ferreira, Melissa Porras Prado and A. Emanuele Rizzo

This Internet Appendix reports the supplementary results as described below:

- Table IA1: Comparison of Bank Capital Ratios across Countries
- Table IA2: What Type of Firms Obtain FinTech Funding? Applications Sample
- Table IA3: The Use of FinTech Funding - Firm Growth
- Table IA4: The Use of FinTech Funding - Firm Growth - Level Variables

Table IA1: Comparison of Bank Capital Ratios across Countries

This table compares bank capital ratios for the main eurozone economies and for UK.

Country	N	Total Capital Ratio	Tier 1	Equity/Assets	Equity/Net loan	Profit Margin	Net loan/Assets
Germany	3844	21,29	18,30	14,52	33,62	17,67	55,81
Luxembourg	327	30,78	27,27	20,64	75,97	29,73	38,74
Netherlands	251	28,09	27,51	21,32	60,19	38,97	56,00
Portugal	339	23,59	22,69	15,70	46,29	20,93	46,51
Spain	480	25,69	18,52	15,06	44,13	21,19	47,14
Greece	48	25,18	24,39	18,61	56,43	8,12	62,60
Italy	1341	20,57	19,83	12,54	34,02	9,61	54,05
France	1172	20,95	16,43	15,20	51,04	29,29	57,42
United Kingdom	1605	46,91	24,13	31,63	72,37	32,23	51,37
European Average		25,03	22,64	16,91	50,09	20,89	51,55

Table IA2: What Type of Firms Obtain FinTech Funding? Applications Sample

This table uses logit regressions to study the characteristics of firms that apply for a loan to the P2B platform. The dependent variable is an indicator variable for firms that obtain P2B funding. We limit the sample to firms that apply for P2B funding, thus comparing rejected and accepted applicants. Industry-year fixed effects are defined using the Portuguese classification of economic activities (CAE3). The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. Coefficients are reported as odds ratio. *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Employees (log)	1.049*** (3.44)	4.889*** (5.58)	0.972*** (3.14)	4.897*** (5.54)	0.837*** (2.70)	4.653*** (5.29)	15.451*** (3.72)
ROA	4.113*** (10.02)	3.092*** (4.22)	3.939*** (9.46)	3.093*** (4.22)	3.996*** (9.71)	3.082*** (4.22)	113.361*** (6.35)
Current Ratio	0.004 (0.11)	-0.062 (-1.09)	-0.002 (-0.06)	-0.063 (-1.10)	-0.006 (-0.16)	-0.064 (-1.13)	0.151 (0.25)
Interests Coverage	0.002 (1.11)	0.002 (1.14)	0.002 (1.28)	0.002 (1.15)	0.002 (1.07)	0.002 (1.08)	0.009 (0.44)
Fixed Assets	3.037*** (3.03)	0.763 (0.33)	2.551** (2.49)	0.669 (0.29)	3.106*** (3.04)	0.680 (0.29)	40.213*** (2.93)
Cash	3.719*** (3.00)	1.030 (0.52)	3.907*** (3.12)	0.980 (0.49)	3.458*** (2.81)	0.825 (0.42)	39.718*** (2.04)
Leverage	-0.908 (-0.91)	-1.631 (-1.08)	-1.510 (-1.43)	-1.671 (-1.09)	-0.917 (-0.91)	-1.372 (-0.90)	-7.067 (-0.48)
Short-Term Leverage			0.076 (0.09)	-0.396 (-0.32)			
Long-Term Leverage			1.701** (2.19)	0.209 (0.15)			
Overdue Debt					-8.641*** (-6.10)	-7.770*** (-3.49)	
Unused Debt					4.153*** (3.64)	4.893*** (2.66)	
Secured Debt					0.823 (0.81)	0.067 (0.04)	
Year FE	X	X	X	X	X	X	X
Firm FE		X		X		X	
Observations	11,137	11,070	11,137	11,070	11,137	11,070	11,137
Adjusted R^2	0.066	0.311	0.067	0.311	0.069	0.313	0.058

Table IA3: The Use of FinTech Funding: Firm Growth (Symmetric Growth Rates)

This table investigates how firms use the funds obtained through the P2B platform. The dependent variables are the (symmetric) growth of firm assets; the (symmetric) growth of firm fixed assets; the (symmetric) growth of net working capital (NWC); the (symmetric) growth of firm employees; the (symmetric) growth of firm sales. We regress these variables on *P2B Lending*, an indicator variable that takes value one for firms that receive P2B funding in the years after the deal. In this table we restrict the sample to firms that apply for P2B funding, therefore comparing accepted and rejected applicants. The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

	Assets Growth (1)	Fixed Assets Growth (2)	NWC Growth (3)	Employees Growth (4)	Sales Growth (5)
P2B Financing	0.070*** (6.42)	0.092*** (4.37)	0.077*** (3.80)	0.062*** (4.64)	0.077*** (5.05)
Controls	X	X	X	X	X
PS Group-Year FE	X	X	X	X	X
Observations	13,301	13,301	13,301	13,301	13,301
Adjusted R^2	0.05	0.02	0.00	0.08	0.10

Table IA4: The Use of FinTech Funding: Firm Growth (Levels)

This table investigates how firms use the funds obtained through the P2B platform. The dependent variables are the logarithm of firm assets; the logarithm of firm fixed assets; the logarithm of net working capital (NWC); the logarithm of firm employees; the logarithm of firm sales. We regress these variables on *P2B Lending*, an indicator variable that takes value one for firms that receive P2B funding in the years after the deal. In this table we restrict the sample to firms that apply for P2B funding, therefore comparing accepted and rejected applicants. The sample period is 2014-2019. We exclude financial firms and utilities, as well as firms with more than 250 employees. *t*-statistics based on standard errors clustered at the firm level are shown in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively. Detailed definitions for the variables in this table is provided in the Appendix A1.

	Assets (log) (1)	Fixed Assets (log) (2)	NWC (log) (3)	Employees (log) (4)	Sales (log) (5)
P2B Financing	0.120*** (5.06)	0.101*** (4.04)	0.22* (1.67)	0.066*** (5.28)	0.163*** (6.55)
Controls	X	X	X	X	X
Firm FE	X	X	X	X	X
PS Group-Year FE	X	X	X	X	X
Observations	13,301	13,301	13,301	13,301	13,301
Adjusted R^2	0.90	0.27	0.68	0.90	0.86

Acknowledgements

We thank Vincenzo Pezone and Marcelo Rezende; conference participants at ACPR Chair Conference 2021, the Spanish Finance Forum, and Lubrafin; and seminar participants at BI Norwegian Business School, Nova SBE for helpful comments. Ferreira is an independent board member at BPI Assset Management and acknowledges financial support from the Fundação para a Ciência e Tecnologia (FCT) and Banco BPI/Fundação la Caixa Chair in Responsible Finance. Rizzo acknowledges financial support from the European Central Bank (ECB) under the Lamfalussy Fellowship Programme.

Afonso Eça

Nova School of Business and Economics, Cascais, Portugal; email: afonso.eca@novasbe.pt

Miguel A. Ferreira

Nova School of Business and Economics, Cascais, Portugal; Centre for Economic Policy Research, London, United Kingdom; email: miguel.ferreira@novasbe.pt

Melissa Porras Prado

Nova School of Business and Economics, Cascais, Portugal; Centre for Economic Policy Research, London, United Kingdom; email: melissa.prado@novasbe.pt

A. Emanuele Rizzo

Nova School of Business and Economics, Cascais, Portugal; email: emanuele.rizzo@novasbe.pt

© European Central Bank, 2022

Postal address 60640 Frankfurt am Main, Germany

Telephone +49 69 1344 0

Website www.ecb.europa.eu

All rights reserved. Any reproduction, publication and reprint in the form of a different publication, whether printed or produced electronically, in whole or in part, is permitted only with the explicit written authorisation of the ECB or the authors.

This paper can be downloaded without charge from www.ecb.europa.eu, from the [Social Science Research Network electronic library](#) or from [RePEc: Research Papers in Economics](#). Information on all of the papers published in the ECB Working Paper Series can be found on the [ECB's website](#).

PDF

ISBN: 978-92-899-4972-9

ISSN: 1725-2806

doi: 10.2866/992620

QB-AR-22-004-EN-N