

CHAPTER 4

THE ROLE OF FINTECH IN THE PAYCHECK PROTECTION PROGRAM

Blake Rayfield, Hasib Ahmed, Nicolas Duvernois
and Lois Rayfield

ABSTRACT

The relationship between borrowers and lenders can reveal a lot of information regarding loan pricing, information costs, and competition. In this study, the authors investigate the impact of FinTech lenders on Paycheck Protection Program (PPP) loan disbursement. Specifically, the authors investigate financial technology companies' ability to provide loans at greater distances, expanding the available resources for businesses struggling during the Covid-19 pandemic. The authors find that not only were FinTechs able to lend at greater distances, but also they provided loans to firms that were younger and had less bank competition in their headquarters' zip codes. The results remain consistent and are generalizable to the complete population of PPP loans.

Keywords: Financial technology; Paycheck Protection Program; Covid-19; borrower–lender distance; small business and government subsidies

1. INTRODUCTION

Relationships between borrowers and lenders reveal information regarding loan pricing, information costs, and competition. Studies found that lender distance causes information asymmetry, leading to pricing differences (Hollander & Verriest, 2016) and other loan differences. Past evidence and early anecdotal evidence show that even during a crisis, lender distance and borrower relationships play a role in credit availability (Cotugno, Monferrà, & Sampagnaro, 2013; NYT, 2020). This study investigates the relationship between borrowers and lenders during the Covid-19 crisis. Emphasis is placed on the role of financial technology in distributing loans that are farther in distance, an effect that persists after controlling for market competition and other firm-level factors.

The Paycheck Protection Program (PPP) was passed as part of the Coronavirus Aid, Relief, and Economic Security Act (CARES Act), and was motivated by the resulting economic depression. The Act provided low-interest loans to businesses to continue operations and payroll for workers. Companies could apply for loan forgiveness if the qualifications were met.¹ A common theme of the fiscal stimulus was the federal government's ability to leverage banks' existing financial structure. Unlike prior programs, the PPP only allowed banks to be administrators of the program, federal government promising to purchase the loans after origination.² The federal government enabled banks to disperse PPP funds directly to customers that met the eligibility requirements and did not have to create a loan infrastructure during a crisis.

Unlike previous disaster recovery efforts, financial technology companies were able to provide loans directly to customers. In addition to traditional lenders, the Small Business Administration (SBA) approved seven FinTech lenders to provide PPP loans.³ These independent (from banks) lenders do not collect deposit through checking accounts. Financial services they provide ensure access to some funds from users and the rest is borrowed fund. Borrowers secure loans from them online, whereas traditional banks often expect borrowers to show up in bank premises. FinTechs provided loans directly to affected businesses and coordinated with traditional banks to offer new customer leads and workflow enhancements.

There are several reasons why FinTechs can provide loans from greater distances. Operational efficiencies (Petersen & Rajan, 2002) decrease overhead costs for FinTechs. Many firms only have one to three branches (or offices) in large markets (New York, Chicago, or Los Angeles). The low overhead allows FinTechs' to invest more in their digital infrastructure and process efficiencies. However, the preliminary evidence indicates that after controlling for the number of bank branches, FinTechs continue to produce loans that are greater in distance than comparable bank peers. Marketing and selection bias may also cause FinTechs to lend at a greater distance. The low number of branches cause financial technology firms to invest heavily in marketing. Only through a robust marketing effort are they able to reach distant firms.

This study shows the impact of FinTech lenders on PPP loan disbursement. Emphasis is placed on the FinTechs ability to provide loans at greater distances, expanding the available resources for businesses struggling during the Covid-19 pandemic. Results show that loans given at greater distances were distributed to younger firms, received a bank loan from a financial technology firm, or had received private equity funding in the past. The results remain consistent and are generalizable to the full population of PPP loans.

2. BACKGROUND

Providing capital to small businesses during regular economic times is seen as an essential and primary driver of job and economic growth. During a pandemic, debt capital can act as a lifeline for small businesses and prevent job losses. While access to capital is essential, not all businesses have the same access due to competition, distance, and overall market share. When a lender is not readily available near a small business, more costs and burdens are placed on small businesses in the form of travel costs.

Borrower–lender distance can create both soft and hard costs of lending (extensively reviewed in Liberti & Petersen, 2019). For example, a bank may face hard costs of higher default rates or higher information acquisition costs. At the same time, banks may face soft costs associated with borrower–lender relationship differences (Liberti & Petersen, 2019). These costs are shown in DeYoung, Frame, Glennon, McMillen, and Nigro (2008) where the authors find that lender distance is positively associated with borrower default. Furthermore, they find that loans made on hard information may lead to better outcomes than loans based on soft information. Cotugno et al. (2013) provided evidence that borrower–lender distance is relevant during a financial crisis, and that distance can cause less credit availability. In case of relationship formation, borrowers go with a local lender while using government loan guarantees to form a relationship. DeYoung et al. (2008) found that borrowers use government loan guarantees to form a connection with a local source of financing.

For a borrower, increase physical distances can increase loan acquisition costs, for example, related to transportation (Cotugno et al., 2013; DeYoung et al., 2008; DeYoung et al., 2008; among others). In underserved and unbanked areas of the country, lender distance can play an outsized role. During a normal economic cycle, small businesses in underbanked/unbanked areas are more challenged at securing the necessary funds to continue operations or increase investment regardless of credit score, due to low competition (DeYoung, et al., 2008).

This chapter is a preliminary investigation into the relation between borrower–lender distance during the Covid-19 crisis. The literature indicates that distance conveys important information to lenders in the form of soft and hard borrowing costs. In addition, distance plays a role in the borrower–lender relationship during standard economic times, and the effect remained in place during prior economic crises.

Financial technology lenders differ from traditional banks for efficiency gains among other benefits; therefore, this study investigates whether financial technology increases the distance between lenders and borrowers. To investigate this relationship, we use data from the SBAs', PPP loan program.

3. DATA

The SBA released data on the 662,516 PPP loans given to small businesses where the principal amount was between \$150,000 and \$10 million US dollars. While several loans were provided to small businesses of less than \$150,000, data was not provided on the businesses that received those funds.

Before beginning the process of matching firms and banks, we remove firms that self-identify as non-profits, sole proprietors, or religious institutions. Because not all institutions self-identify, a rudimentary analysis of the firm name is done to remove firms that are not of interest to this study (e.g., firms containing the word "Church"). The resulting sample leaves us primarily with corporations, Limited Liability Corporations, and Subchapter S corporations. Firm data is then collected from Thompson Reuter's Eikon using PermId.⁴

The data collected consists of firm-level information for public firms and private entities. Because most firms remaining in the resulting sample are not public, many data points are missing values for revenues or full-time employees. The data is supplemented when possible by collecting the firm incorporation year from OpenCorporates and, if necessary, individual Secretary of State offices. The resulting sample of firms with complete data is 33,400 firms that receive PPP funds between April 1, 2020 and August 8, 2020. Table 1 displays the summary statistics for the variables used in our study.

3.1. Firm-level Variables

Panel A of Table 1 reports the summary statistics for firm-level control variables used in this study. Two estimates of firm size are employed. First, Panel A reports the average company revenue to be 155.99 million, while the median is 13 million. Second, Panel A reports the number of full-time employees is skewed with a mean of 254 employees and a median of 0.

Eikon indicates firms who currently, or have in the past, have been the recipient of private equity financing. Firms that are the recipient of private equity financing have alternate pathways to obtain funding. Six percent of the sample has been the recipient of private equity financing. The average firm in our sample is aged 32.35 years, with the median being 29.

These variables are chosen because they represent proxies for both firm size, an essential factor in the business credit market, and firm age. It may be possible to collect other firm-level information for some firms; the data we have collected gives us a better sample to judge the population of PPP loans. We expect older and larger firms to have existing relationship with a bank or branch near their business. That makes them less likely to secure loans from long distance than

Table 1. Summary Statistics.

Variable	Mean	Median	SD	Min.	Max.
Panel A: Firm-level Variables					
Firm age	32.35	29.00	19.61	0.00	202.00
Number of employees	254.00	0.00	25,500.00	0.00	4,620,000.00
Revenue	155.99	13.00	918.00	0.00	73,200.00
FinTech	0.01	60.00	0.11	0.00	1.00
Private equity	0.06	0.00	0.24	0.00	1.00
Corporation	0.58	1.00	0.49	0.00	1.00
Panel B: Bank-level Variables					
BankCompetition	9.22	7.00	7.96	0.00	63.00
HHI Index	0.24	0.16	0.23	0.00	1.00
Panel C: Loan Distance Metrics					
Log(TravelDistance)	5.53	5.93	1.94	0.00	9.48
Log(TravelTraffic)	9.18	9.45	1.7	0.00	13.21
Log(Distance)	5.31	5.76	2.02	0.00	9.25
Log(TravelDistanceBranch)	6.90	6.43	1.86	0.00	13.26
Log(TravelTrafficBranch)	6.94	6.43	1.85	0.00	13.29
Log(BranchDistance)	2.10	1.59	2.44	0.00	8.99
Panel D: Sample Loan Range					
LoanRange			Frequency	Sample %	Cumulative
\$5–10 Million			1,361	4.07	4.07
\$2–5 Million			4,903	14.68	18.75
\$1–2 Million			6,953	20.82	39.57
\$350,000–1 Million			12,146	36.37	75.94
\$150,000–350,000 Million			8,037	24.06	100
Total			33,400	100	

Table 1 describes summary statistics for variables used in this study. The sample consists of 33,400 unique firms that received PPP funds from the SBA during the 2020 Covid-19 pandemic. Panel A reports firm-level control variables used in this study: Firm age is the number of years a firm is operating; the Number of employees is full-time employees in a firm; Revenue is as reported in 2019; FinTech is equal to 1 if a firm received a PPP loan from a SBA-approved financial technology (non-bank lender); Private equity is equal to 1 if the firm has been identified as currently or has received private equity funding; and Corporation is equal to 1 if the firm has been identified as a corporate organization type. Panel B reports bank-level variables: BankCompetition is a bank's market share estimated by dividing the number of branches of a bank by the total branches in a zip code; HHI is the Herfindahl–Hirschman index, which is the market share of banks in the zip code; Panel C exhibits borrower–lender distance metrics. All traffic times are reported as the average traffic as reported by Bing; TravelDistance is driving distance between lender HQ and small business address in minutes; TravelTraffic is driving distance with average traffic; and Distance is haversine distance with average traffic. Panel D reports PPP loan ranges. With the exception of distance metrics, all variables are reported in non-logged form. Detailed definitions of variables are reported in the Appendix.

small firms. FirmAge, NumEmp, and Revenue are thus expected to be negatively related (if any) to distance measures. We use LoanRange as another control variable, because businesses are more likely to receive larger loans from sources closer to them. Access to private equity (PrivateEq) and whether the borrower is a corporation (corporation) are dummy variables expected to be negatively related to distance measures.

3.2. Lender-level Variables

We collected basic lender information, such as address and branch location, from several sources, including the FDIC and the individual lender web page. Panel B displays the lender-level variables used in this study.

Following Degryse and Ongena (2005), bank-level competition is estimated using a Herfindahl–Hirschman index (HHI).

$$H = \sum_{i=1}^N S_i^2 \quad (1)$$

where S_i is bank i 's market share, computed by dividing the number of bank branches of bank i by total number of bank branches in each zip code and N is the number of banks in each zip code.

We modified the variable to include only PPP granting institutions (banks with at least one PPP loan granted). This measure represents the level of banking competition in a borrower's zip code. Along with HHI, we use the number of bank branches located in a borrower's zip code (competition) as a measure of competition among lenders. Higher competition among lenders will pressure banks to reach borrowers at greater distance. We expect to see positive relationship between competition variables and distance variables. Including these controls will ensure that the positive relationship between distance and FinTech is not arising from competition.

3.3. Measures of Distance

The primary measure of distance utilized in this study is borrower–lender driving distance. This measure serves as an estimate of how far the borrower has to travel (hard cost). In addition, the distance between borrower and the lenders Headquarters (HQ) is employed (a possibly more important measure because of the lack of soft information transmission). We use driving distance between lender and small business address (Log(TravelDistance) and Log(TravelDistanceBranch)), driving distance with average traffic between lender and small business address (Log(TravelTraffic) and Log(TravelTrafficBranch)), and haversine distance with average traffic between lender and small business address (Log(Distance) and Log(BranchDistance)).

3.4. Methodology

We test whether FinTechs were able to lend at greater distances due to their efficiency gains during the Covid-19 crisis. We test whether they provided loans to firms that were younger and had less bank competition in their headquarters' zip codes. The approach utilized in this study is regressing different measures of distances on FinTech dummy variable, and borrower and lender-level variables. We set up an OLS model as follows to examine FinTechs' ability to reach far and underserved markets.

$$\text{Distance}_i = a_i + b_1 \text{FinTech} + \sum_{j=1}^n b_j \text{Controls}_j + e_i \quad (2)$$

where Distance is each of the six distance measures, FinTech is equal to 1 if a business received a PPP loan from a FinTech lender. Borrower and lender-level variables described previously are control variables. We expect b_1 to be positive due to FinTechs' ability to reach borrowers further from their HQ as well as branches compared to traditional banks. We also expect a negative coefficient for FirmAge and a positive coefficient for PrivateEq, because younger firms and firms receiving private equity funding in the past are more likely to travel further to secure a loan.

We test the baseline effect of financial technology firms on lender distance by using firm-level variables as controls. We add lender-level variables (competition as well as interaction of competition and FinTech) in our regression to highlight that competition is not driving FinTech lenders' ability to reach borrowers at greater distance.

4. RESULTS

4.1. Financial Technology and Loan Distance

The first examination is the relation between financial technology and loan distance as reported in Table 2, columns 1–6. Because we have two proxies similar to firm size, the number of employees, and the total revenues, we include both in separate regressions. In addition to firm size, controls for the LoanRange, PrivateEq, Corporation, and state-level and industry-level effects are included.

In columns 1 and 2, the results show that loans provided by financial technology firms were given at a greater distance. This interpretation is consistent among all the specifications in Table 2. The results remain consistent in columns 3 and 4, where the independent variable is the log travel time, including average traffic. In columns 5 and 6, the independent variable is the log of the distance between the borrower and lender HQ in kilometers. Regardless of the specification, we find a consistent relation between financial technology lenders and loan distance, positive and significant.

The results also indicate a significant negative relation between the loan amount (LoanRange) and loan distance. Because the largest loan range (\$5–10 million) is encoded as 1, the negative relationship can be interpreted as borrowers requesting larger loans do so at banks that are nearer in distance. Firm age is negative and significant, as older firms work with closer banks. The indicator variable for private equity is positive and significant; firms with access to private equity can access capital from a greater distance.

Many borrowers may work with local lenders to secure a loan rather than the lender's HQ. The literature places emphasis on the relationships between lenders and borrowers as crucial in the loan process and pricing. When a lender works

Table 2. Financial Technology and Loan Distance.

	Dependent Variable					
	Log(TravelDistance)		Log(TravelTraffic)		Log(Distance)	
	(1)	(2)	(3)	(4)	(5)	(6)
FinTech	1.126*** (0.000)	1.125*** (0.000)	1.119*** (0.000)	1.118*** (0.000)	1.239*** (0.000)	1.238*** (0.000)
LoanRange	-0.0792*** (0.000)	-0.0832*** (0.000)	-0.0809*** (0.000)	-0.0849*** (0.000)	-0.0934*** (0.000)	-0.0980*** (0.000)
Log(FirmAge)	-0.216*** (0.000)	-0.213*** (0.000)	-0.219*** (0.000)	-0.216*** (0.000)	-0.242*** (0.000)	-0.238*** (0.000)
PrivateEq	0.218*** (0.000)	0.218*** (0.000)	0.219*** (0.000)	0.218*** (0.000)	0.244*** (0.000)	0.243*** (0.000)
Corporation	0.0111 (0.551)	0.0106 (0.569)	0.00994 (0.593)	0.00946 (0.610)	0.00962 (0.652)	0.00898 (0.673)
Log(Revenue)	0.0101 (0.143)		0.00982 (0.152)		0.0133 (0.092)	
Log(NumEmp)		0.00343 (0.710)		0.00312 (0.735)		0.00591 (0.575)
State effects	YES	YES	YES	YES	YES	YES
Industry effects	YES	YES	YES	YES	YES	YES
N	33,400	33,400	33,400	33,400	33,400	33,400

Table 2 shows the relationship between borrower–lender distance and several firm/bank-specific factors. In each column, the dependent variable is a measure of distance between the borrower and the bank HQ (Log(TravelDistance), Log(TravelTraffic), or Log(Distance)). The independent variables include several firm-specific variables collected from various sources. The main variable of interest is FinTech, an indicator variable equal to 1 if the firm receives a loan from a financial technology company. PrivateEq and Corporation are equal to 1 if the firm received a PPP loan from a FinTech, or currently or has received private equity funding, or if the firm has been identified as a corporation. LoanRange is the range around of money borrowed from the PPP. FirmAge is the number of years a firm is operating, Revenue is estimated as reported in 2019, and NumEmp is full-time employees in a firm. State effects and Industry effects are included in each regression. The results show that loans given at greater distances were distributed to younger firms, received a bank loan from a financial technology firm, or had received private equity funding in the past.

*, **, and *** indicate significance at 10%, 5%, and 1% level.

with a local branch, the connection should play a role in the funding process. As such, we recreate Table 2 using the distance between the borrower and the lenders' closest branch. These results will grow the distance between financial technology firms and lenders because most financial technology firms have no physical locations. The results of this analysis are shown in Table 3.

Similar to the primary results of Table 2, Table 3 shows a similar effect of financial technology. Loans provided by financial technology firms were given at a greater distance. As expected, the magnitude of this relationship is greater. We observe a similar relation between the control variables used in this study and the borrower–lender distance for further consistency. A negative and significant association between loan range and firm age and a positive and significant association between access to private equity and distance is observed in all columns of Table 3.

Table 3. Financial Technology and Branch Distance.

	Dependent Variable					
	Log(TravelDistanceBranch)		Log(TravelTrafficBranch)		Log(DistanceBranch)	
	(1)	(2)	(3)	(4)	(5)	(6)
FinTech	3.513*** (0.000)	3.513*** (0.000)	3.492*** (0.000)	3.491*** (0.000)	4.086*** (0.000)	4.085*** (0.000)
LoanRange	-0.0652*** (0.000)	-0.0658*** (0.000)	-0.0677*** (0.000)	-0.0684*** (0.000)	-0.0716*** (0.000)	-0.0717*** (0.000)
Log(FirmAge)	-0.265*** (0.000)	-0.264*** (0.000)	-0.272*** (0.000)	-0.271*** (0.000)	-0.306*** (0.000)	-0.305*** (0.000)
PrivateEq	0.520*** (0.000)	0.519*** (0.000)	0.519*** (0.000)	0.518*** (0.000)	0.617*** (0.000)	0.616*** (0.000)
Corporation	0.0338 (0.105)	0.0332 (0.111)	0.0310 (0.134)	0.0303 (0.143)	0.0308 (0.191)	0.0300 (0.203)
Log(Revenue)	0.0129 (0.095)		0.0137 (0.074)		0.0162 (0.063)	
Log(NumEmp)		0.0134 (0.194)		0.0142 (0.166)		0.0183 (0.117)
State effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	33,400	33,400	33,400	33,400	33,400	33,400

Table 3 shows the relationship between borrower–lender distance and several firm/bank-specific factors. In each column, the dependent variable measures distance between the borrower and the closest lender branch. In each column, we include the travel distance in minutes, the travel distance with traffic in minutes, and the distance in kilometers. The independent variables include several firm-specific variables collected from various sources. The main variable of interest is FinTech, an indicator variable equal to 1 if the firm receives a loan from a financial technology company. PrivateEq and Corporation are equal to 1 if the firm received a PPP loan from a FinTech, or currently or has received private equity funding, or if the firm has been identified as a corporation. LoanRange is the range around of money borrowed from the PPP. FirmAge is the number of years a firm is operating, Revenue is estimated as reported in 2019, and NumEmp is full-time employees in a firm. State effects and Industry effects are included in each regression.

*, **, and *** indicate significance at 10%, 5%, and 1% level.

4.2. Financial Technology and Competition

The previous results show a clear relation between financial technology and lender distance. The connection holds whether considering the lenders HQ or closest branch. In this section, we show that financial technology firms distributed loans to firms, regardless of other lender competition. Lender competition can play an outsized role in the distribution of PPP funds. Access to banking resources is not evenly distributed across the United States. Lender competition could affect the distance between borrowers and lenders.

While including the same control variables used in Tables 2 and 3, we investigate bank competition's role using two different measures of bank competition. The first can be considered an equally-weighted measure of bank competition. To define the first measure, we count the number of PPP lenders and their branches on a zip code level. This count variable will be higher when more branches are

offering PPP loans in a given zip code. The second measure, a market-weighted measure, is similar to the measure of competition employed in Degryse and Ongena (2005), a bank-level HHI. Each bank's market share is computed as the summed squared number of bank branches of each bank's zip code. Table 4 shows the results of this analysis; for brevity, we have excluded control variables from the table; however, they are included in Table 4. All control variables are consistent with prior analysis.

In Table 4, Panel A, the independent variable is the log of borrower–lender HQ distance. When including the first proxy for competition (Competition), the positive and significant relation between financial technology and borrower distance remains consistent. Also, a positive and significant association between competition and distance is observed. In Panel B, the independent variable is the borrower–lender branch distance. Consistent with prior results, a significant and positive relationship remains concerning financial technology and competition.

Panel C employs a different measure of lender-level competition. The zip code level HHI index will be larger when there is less bank competition in a given zip code; therefore, we observe a positive and significant coefficient associated with a greater distance due to less lender competition. In column 1 (2), the independent variable is the borrower–lender HQ (branch) distance. In both columns 1 and 2, we observe a positive and significant coefficient for HHI, indicating less lender competition resulting in a greater distance between borrowers and lenders. The coefficient of financial technology remains substantial. We also include an interaction variable between competition and financial technology (FinTech \times HHI). The positive and significant coefficient we observe on this interaction term provides preliminary evidence that borrowers borrowed from financial technology firms, had a greater distance between themselves and their lender in low-competition areas. These results indicate that financial technology firms played an important role in distributing funds in low-lender competition areas.

In prior studies, borrow–lender distance could lead to price discrimination (Degryse & Ongena, 2005). However, the results of Table 4 provide preliminary indications that FinTechs played a mitigating role by providing loans at greater distances. In addition, the results complement the findings of other literature concerning the SBA lender–borrower relationship (DeYoung, et al., 2008).

5. CONCLUSION AND AVENUES FOR FURTHER RESEARCH

5.1. Conclusion

This study investigates the role of distance and PPP loan disbursement during the 2020 Covid-19 crisis. We are also able to identify the role of financial technology firms in loan disbursement, which was not available in prior crises.

The results provide preliminary evidence on factors that affect loan distance. Factors that lead to a greater distance include firms that are backed by private

Table 4. Loan Distance and Bank Competition.

Panel A: HQ distance and the number of competitor branches in zip code			
	Log (TravelDistance)	Log (TravelTraffic)	Log (Distance)
	(1)	(2)	(3)
FinTech	1.127*** (0.000)	1.119*** (0.000)	1.241*** (0.000)
Competition	0.0120*** (0.000)	0.0124*** (0.000)	0.0137*** (0.000)
Control variables included	Yes	Yes	Yes
Panel B: Branch distance and the number of competitor branches in zip code			
	Log (TravelDistanceBranch)	Log (TravelTrafficBranch)	Log (DistanceBranch)
	(1)	(2)	(3)
FinTech	3.517*** (0.000)	3.494*** (0.000)	4.091*** (0.000)
Competition	0.00435** (0.002)	0.00619*** (0.000)	0.00431** (0.007)
Control variables included	Yes	Yes	Yes
Panel C: HHI bank competition			
	Log (TravelDistance)	Log (TravelDistanceBranch)	Log (CompetitorDistance)
	(1)	(2)	(3)
FinTech × HHI	0.292*** (0.000)	0.292*** (0.000)	0.303*** (0.000)
FinTech	3.496*** (0.000)	3.496*** (0.000)	4.040*** (0.000)
HHI	0.187*** (0.000)	0.187*** (0.000)	-0.241*** (0.000)
Control variables included	Yes	Yes	Yes

Table 4 shows the relationship between competition and FinTech lenders. In each column, the dependent variable measures distance between the borrower and the bank HQ or a bank branch. For each distance measure, we include the travel distance in minutes, the travel distance with traffic in minutes, and the distance in kilometers. The independent variables include several firm-specific variables collected from various sources. The main variable of interest is FinTech, an indicator variable equal to 1 if the firm receives a loan from a financial technology company. Competition is the number of competitor branches at the zip code level, and HHI is the Herfindahl–Hirschman index, which is the bank’s market share in the zip code. Panel A shows the relationship between bank HQ distance and the number of competitor branches in zip code. Panel B shows the branch distance and the number of competitor branches in zip code. Panel C shows the interaction between competition and financial technology.

*, **, and *** indicate significance at 10%, 5%, and 1% level.

equity as well as firms that choose to borrow from financial technology firms. Factors that lead to shorter loan distances include age (older firms) and firms with greater employees or revenues. Further investigation into the role of financial technology and market competition indicates that financial technology dispersed loans in locations where market competition was lower, providing more options for small business.

Overall, this research supports the growing literature that borrower–lender distance is becoming greater overtime. Unlike prior crisis, FinTech firms played a role in dispersing loans from greater distances, allowing firms in low market competition areas to have greater access to capital.

5.2. Avenues for Further Research

Additional analysis is possible as more data becomes available from the SBA. Beyond the apparent omissions of detail (exact loan amount information, among others), no information is provided regarding when the PPP loan approval decision was finalized. Future research should capitalize on more available information.

Data on borrower–bank relationships also provide a promising avenue for future research. Prior research investigated the impact of borrower–lender relationships during the economic crisis (Cotugno et al., 2013), and there is early anecdotal information regarding the benefits of borrower–lender relationships and PPP loans (NYT, 2020). However, without a full investigation, the question is still open: did pre-existing relationships help banks secure PPP funds?

NOTES

1. Information on loan forgiveness as of Aug 4th is found at <https://www.sba.gov/sites/default/files/2020-08/PPP%20Loan%20Forgiveness%20FAQs%208-4-20-508.pdf>
2. <https://www.sba.gov/funding-programs/loans/coronavirus-relief-options/paycheck-protection-program>
3. https://www.sba.gov/sites/default/files/articles/FinTech_Lenders_.pdf
4. <https://permid.org/>

REFERENCES

- Agarwal, S., & Hauswald, R. (2010). Distance and private information in lending. *The Review of Financial Studies*, 23, 2757–2788.
- Cotugno, M., Monferrà, S., & Sampagnaro, G. (2013). Relationship lending, hierarchical distance and credit tightening: Evidence from the financial crisis. *Journal of Banking & Finance*, 37, 1372–1385.
- Cowley, S., & Koeze, E. (2021, October 11). 1 Percent of P.P.P. Borrowers Got Over One-Quarter of the Loan Money. *New York Times*. Retrieved from <https://www.nytimes.com/2020/12/02/business/paycheck-protection-program-coronavirus.html>. Accessed on August 15, 2022.
- Degryse, H., & Ongena, S. (2005). Distance, lending relationships, and competition. *The Journal of Finance*, 60, 231–266.
- DeYoung, R., Frame, W. S., Glennon, D., McMillen, D. P., & Nigro, P. (2008). Commercial lending distance and historically underserved areas. *Journal of Economics and Business*, 60(1–2), 149–164.

- Hollander, S., & Verriest, A. (2016). Bridging the gap: the design of bank loan contracts and distance. *Journal of Financial Economics*, 119, 399–419.
- Liberti, J. M., & Petersen, M. A. (2019). Information: Hard and soft. *Review of Corporate Finance Studies*, 8, 1–41.
- Petersen, M. A., & Rajan, R. G. (2002). Does distance still matter? The information revolution in small business lending. *The Journal of Finance*, 57, 2533–2570.

APPENDIX: DEFINITION OF VARIABLES

Variables	Definition	Source
Panel A: Loan Distance Metrics		
Log (TravelDistance)	One plus the log driving distance between lender HQ and small business address. Lender HQ is the HQ address as reported to the FDIC. Small business address is the address as reported by the SBA	FDIC Institutions & Locations Data, SBA PPP Loan Data, and Bing
Log (TravelTraffic)	One plus the log driving distance with average traffic between lender HQ and small business address	FDIC Institutions & Locations Data, SBA PPP Loan Data, and Bing
Log (Distance)	One plus the log haversine distance with average traffic between lender HQ and small business address	FDIC Institutions & Locations Data, SBA PPP Loan Data, and Other Sources
Log (TravelDistanceBranch)	One plus the log driving distance the small business address and the closest branch	FDIC Institutions & Locations Data, SBA PPP Loan Data, and B
Log (TravelTrafficBranch)	One plus the log driving distance with average traffic between the small business address and the closest branch	FDIC Institutions & Locations Data, SBA PPP Loan Data, and Other Sources
Log (BranchDistance)	One plus the log haversine distance between the small business address and the closest branch	
Panel B: Firm Variables		
Log (FirmAge)	The log transformation of firms age	OpenCorporates, TR Eikon, and individual Secretary of State offices
Log (NumEmp)	The log transformation of the number of full-time employees as reported in 2019	TR Eikon
Log(Revenue) PrivateEq	The log transformation of the firms' revenue estimates as reported in 2019 A variable equal to 1 if the firm has been identified as currently or has received private equity funding	TR Eikon TR Eikon
FinTech	A variable equal to 1 if a firm received a PPP loan from an SBA-approved financial technology (non-bank lender)	SBA PPP Loan Data
Corporation	A variable equal to 1 if the firm has been identified as a corporation organization type	OpenCorporates, TR Eikon, and individual Secretary of State offices
LoanRange	A range around of money borrowed from the PPP	SBA PPP Loan Data
Panel C: Bank-level Variables		
HHI Index	Herfindahl index as defined by Degryse and Ongena (2005). The number of branches (minus the lenders) in the borrowers' zip code	FDIC Institutions & Locations Data and SBA PPP Loan Data
BankCompetition (competition)	Number of bank branches located in the borrowers' zip code	FDIC Institutions & Locations Data and SBA PPP Loan Data