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# Piercing through Opacity: Relationships and Credit Card Lending to Consumers and Small Businesses during Normal Times and the COVID-19 Crisis

Finance Working Paper N° 912/2023
June 2023

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## Abstract

We build a bridge between relationship lending and transactions lending – investigating relationship effects on contract terms for credit cards, a relatively pure transactions lending technology. Using one million+ accounts, we find during normal times, consumers with relationships obtain better terms, but small businesses with relationships do not. Both groups obtain improved terms during COVID-19, consistent with intertemporal smoothing – relationship borrowers obtain more favorable terms during crises, paid for by worse terms in normal times. Among other findings, CARES Act impediments to reporting consumer delinquencies to credit bureaus designed to protect customers reduced informational value of credit scores, penalizing safer consumers.



Keywords: Credit cards, household finance, consumers, small businesses, relationship lending, banks, credit terms, cross-sec-tional smoothing, financial crises, COVID-19, intertemporal smoothing
JEL Classifications: D12, G01, G20, G28



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## 1. Introduction

Loan applicants often lack sufficient quantity and quality of public information needed to assess their creditworthiness. This requires lenders to pierce through applicants' informational opacity by generating additional private information to make informed credit decisions. Banks employ transactions and relationship lending technologies to do so. Transactions lending is largely based on hard quantitative information such as credit scores, collateral values, and financial ratios acquired around the time of loan application. Relationship lending relies on soft, qualitative information about borrowers, as well as hard information such as cash flows on past loans and deposits provided to these same loan applicants. Both types of relationship information are collected starting at first contact on any of these past services (e.g., Sharpe, 1990; Rajan, 1992; Boot, 2000; Boot and Thakor, 2000; Stein, 2002; Mester, Nakamura, and Renault, 2007; Norden and Weber, 2010).

Transactions and relationship lending are generally covered in separate literatures. We build a bridge between these literatures by investigating the effects of relationship information on contract terms for credit cards. Credit card lending is considered one of the purest forms of transactions lending, as it is largely based on hard information from externally sourced credit scores (e.g., Durkin and Elliehausen, 2010). Banks may pierce through the informational opacity of credit card applicants by adding private relationship information to credit scores to help determine credit card contract terms.

We ask whether and how relationships affect two key credit card terms, annual percentage rate (APR) spreads and credit limits. To generate the most comprehensive research and policy implications, we address this question separately for consumer and small business credit cards, and for normal times and the COVID-19 crisis. We use over one million accounts of newly issued credit cards over seven years.

We find during normal times, consumers with relationships obtain better credit card terms, while small business relationship borrowers experience worse terms. Relatively safe relationship consumers and small businesses both obtain improved terms during COVID-19. The results are highly robust and consistent with an intertemporal smoothing feature of relationship lending – more favorable terms for relationship borrowers during crises, paid for in some cases by worse terms in normal times. Ours is the first application of intertemporal smoothing to credit cards.

We perform additional analyses yielding novel research and policy results. For consumers, tests suggest banking relationships based on prior deposits, loans, and other services excluding credit cards provide more benefits than relationships founded on prior credit cards. A new policy finding is that impediments to reporting consumer delinquencies to credit bureaus imposed by the 2020 CARES Act reduced the informational value of credit scores and penalized safer consumers.

The effects of relationship information on credit card terms is important to study. Most relationship lending studies use commercial credit and support the bright side of relationships in which



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relationship borrowers obtain better contract terms than other borrowers (e.g., Petersen and Rajan, 1994; Berger and Udell, 1995; López-Espinoza, Mayordomo and Moreno, 2017), Others support the dark side in which relationship borrowers obtain worse terms than others as banks exercise market power over their private information (e.g., Petersen and Rajan, 1995). Kysucky and Norden (2016) provide a meta-analysis and review of this literature.

Extending relationship lending research to credit card markets is also important because these markets are large, vital to the economy, and key to bank profitability and risk (e.g., Agarwal, An, Cordell, and Roman, 2020). Most U.S. consumers and small businesses have credit cards and much of U.S. GDP runs through credit card spending. Banks earn high profits from credit card fees and interest revenues, but banks also experience high charge-off rates on these unsecured credits (e.g., Agarwal, Chomsisengphet, and Liu, 2010; Massoud, Saunders, and Scholnick, 2011; Santikian, 2014; Stango and Zinman, 2016; Harris, Kahn, and Nissim, 2018).[2] It is argued that credit card market growth contributes to the democratization of credit, but also increases consumer defaults and bankruptcies (e.g., Gross and Souleles, 2002; Livshits, Mac Gee, and Tertilt, 2016). Agarwal and Zhang (2016) review the credit card literature.

The COVID-19 crisis provides an attractive research laboratory for studying the benefits and costs of relationship information to borrowers and for researching the intertemporal smoothing feature noted above. The health issues and government restrictions affected the real economy more directly than the banks. Prior crises, such as the Global Financial Crisis (GFC), directly impaired the banks, making disentangling banking problems from relationship issues difficult. Empirical studies of the effects of commercial lending relationships during prior crises or other times of stress often find beneficial effects for relationship borrowers during these times, consistent with intertemporal smoothing (e.g., Jimenez, Ongena, Peydro, and Saurina, 2012; Sette and Gobbi, 2015; Bolton, Freixas, Gambacorta, and Mistrulli, 2016; Beck, Degryse, De Haas, and van Horen, 2018; Banerjee, Gambacorta, and Sette, 2021). Others exploit this advantage of COVID-19 for commercial credit, but not for credit cards (e.g., Berger, Bouwman, Norden, Roman, Udell, and Wang, 2022, Berger, Feldman, Langford, and Roman, 2022).

We use the exogeneity advantage of COVID-19 to test whether the relationship lending feature of intertemporal smoothing extends to the transaction lending cases of credit cards for consumers and small businesses. Theory by Bolton, Freixas, Gambacorta, and Mistrulli (2016) suggests banks may engage in intertemporal smoothing – providing more favorable credit terms to relationship borrowers during crises than during normal times.[3] This implicit insurance may be provided to some relationship borrowers to

[2] Related credit card research examines consumer behavior and behavioral biases that lenders may exploit to maximize profits (e.g., Gross and Souleles, 2002; Liberman, 2016; Keys and Wang, 2019; Ru and Schoar, 2020).

[3] Similar theoretical predictions follow from Thakor (2005), who focuses on the lending effects of loan commitments that tie banks to their relationship borrowers.



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ease them through crises. Such insurance may be paid for by worse credit terms to these relationship borrowers during normal times, boosting bank profits in advance. Alternatively, the compensation for the insurance may come in the form of expected future profits from preserving relationships with long-term value to the banks. Our results are consistent with both forms of intertemporal smoothing.

We formulate hypotheses regarding the effects of relationships on credit terms for credit card customers during normal times and how these effects change during crises. We test these hypotheses separately for consumers and small businesses using a large supervisory dataset of newly originated credit card accounts. We exploit monthly loan-level data from the Federal Reserve's FR Y-14M dataset and other sources from June 2013 through June 2020 to examine the effects of relationships on credit card APR spreads and credit limits. Because of the size – over 500 million observations each month – we employ stratified random samples – 0.5% for consumers and 5% for small businesses due to the much larger number of consumer credit cards – similar to prior literature (e.g., Keys and Wang, 2019).

To test our hypotheses, we run regressions for two distinct sample periods. For normal times, we regress credit terms on relationship measures, controls, and fixed effects using data from June 2013 through February 2020. To assess changes during the COVID-19 crisis, we employ difference-in-difference (DID) models with interaction terms between the relationship and COVID-19 measures for a pre+during COVID-19 crisis sample spanning November 2019 through June 2020, which includes four months before and four months after the approximate start of the COVID-19 crisis.

We find that relationships do affect credit card terms. During normal times, consumers with relationships receive better terms than non-relationship consumers, while small businesses with relationships receive more adverse terms than non-relationship small businesses. We are the first to compare consumers and small businesses in this fashion.

During the COVID-19 crisis, both groups obtain additional shared benefits relative to normal times from lower APR spreads, consistent with intertemporal smoothing, and small businesses with relationships additionally benefit from higher credit limits. The evidence also suggests cross-sectional smoothing favoring consumer relationship customers over small business relationship customers during normal times, but less so during the COVID-19 crisis.

We address four important identification issues: omitted variables, measurement error, reverse causality, and sample selection. For omitted variable biases, we saturate the main regressions with a comprehensive set of controls for demand and supply factors and fixed effects and provide robustness checks with additional controls and fixed effects. We confront possible bias from the imprecise measurement of relationships by checking the sensitivity of our results to several alternative relationship proxies. Reverse causality may arise if customers choose relationships based on expectations regarding the future terms of credit. We tackle this using instrumental variables, employing physical proximity



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between customers and nearest bank branches as an instrument satisfying relevance and exogeneity requirements. Sample selection biases may arise because relationships may be determined in part by variables that also affect the credit term dependent variables. We deal with this using propensity score matching (PSM), a Heckman (1979) procedure, and falsification tests. Our main findings are robust to addressing all of these identification challenges and additional robustness checks.

In additional analyses, we decompose information from relationships in three ways: credit card and conventional bank relationships, seven types of conventional relationships (deposit, investment, mortgage, auto loan, student loan, other loan, and multi-product relationships), and their effects over time. In most cases, conventional bank relationships based on past provision of deposits, non-credit card lending, and multi-product relationships are more beneficial than past credit card relationships, possibly reflecting more bank monitoring associated with the provision of these other services. Importantly, the shared benefits from conventional relationships are remarkably stable during both normal times and the COVID-19 crisis, particularly for consumers. We also examine how the favorability of information on customer risk obtained from past credit card accounts affects terms on new credit cards. We find that those credit card customers showing higher risks in the past experience higher spreads and lower limits. Another analysis focusing on current customer risk at the time of origination suggests that banks shift their orientation more toward managing risks than seeking continuing profitability from risky relationship customers during the crisis, consistent with procyclical bank lending behavior (e.g., Berger and Udell, 2004; Thakor, 2015, 2016).

We also show that CARES Act impediments to reporting consumer delinquencies to credit bureaus may have unintended consequences by reducing the informational value of consumer credit scores. We find that the usual relations between customer risk and credit card terms flip, i.e., better credit scores become associated with higher spreads, lower limits, and more delinquencies, penalizing relatively safe consumers during the crisis.

We also differentiate between relatively short and long credit card relationships as informational benefits may materialize only after the passage of time (Lopez-Espinosa, Mayordomo, and Moreno, 2017). We find that customers with longer relationships fare better in normal times and during the crisis.

In the remainder of the paper, Section 2 reviews relevant literature, develops our hypotheses, and motivates our tests. Section 3 describes the data, and Section 4 lays out our methodology. We present our main empirical results in Section 5 and robustness checks in Section 6. Section 7 provides important additional analyses in which we examine the sources of relationship information, the favorability of relationship information, and customer risk. Section 8 summarizes further empirical checks for the COVID-19 crisis. Section 9 shows that features of the CARES Act created unintended consequences on credit card lending to consumers. Section 10 concludes and discusses implications for the different parties.



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The Online Appendix includes additional robustness tests and analyses on existing credit card accounts, as opposed to the new originations studied in the main body of the paper.

## 2. Literature, Hypotheses, and Key Related Topics on Bank Relationships with Credit Card Customers

This section provides the motivation for our empirical analyses to follow, with discussions of relevant research, hypothesis development, and key related topics.

### *2.1 Relevant Research Literature*

We contribute to several strands of literature. First, we add to the findings on bank relationship lending, which is extensive for conventional commercial lending, but scarce for credit card lending. The only prior study on relationships and U.S. credit cards of which we are aware focuses on customer defaults (Agarwal, Chomsisengphet, Liu, Song, and Souleles, 2018), rather than on credit terms, our main focus. Some studies on consumer lending in other countries also consider bank relationships. These focus on default prediction (e.g., Norden and Weber, 2010; Puri, Rocholl, and Steffen, 2017; Hibbeln, Norden, Usselmann, and Gürtler, 2020), credit supply or loan officer behavior (Chakravarty and Scott, 1999; Puri and Rocholl, 2008; Berg, Puri, and Rocholl, 2020). None investigate credit cards or differential effects during normal times versus crises as we do.

Second, as noted, we break new research ground in comparing relationship effects on consumer versus small business credit card customers. The only paper of which we are aware that uses data on both credit card customer types analyzes how the Credit Card Accountability, Responsibility, and Disclosure Act of 2009 affects consumer costs and uses small business credit cards as a control group (Agarwal, Chomsisengphet, Mahoney, and Stroebel, 2015). The CARD Act limits lenders' abilities to increase interest rates and fees on consumer credit card accounts, but not on small business accounts, one of many legal differences discussed further in Section 2.

Third, we add to the research by comparing multiple types of relationships. While some prior studies do so for commercial or consumer credit (e.g., Berger and Udell, 1995; Mester, Nakamura, and Renault, 2007; Norden and Weber, 2010), only one does so for U.S. credit cards (Agarwal, Chomsisengphet, Liu, Song, and Souleles, 2018). We complement this research by comparing credit card relationships and conventional bank relationships both together and separately.

Fourth, we add to the research about the impact of the COVID-19 crisis on credit markets. Research on credit cards during the COVID-19 crisis does not consider effects of relationship lending (e.g., Andersen, Hansen, Johannesen, and Sheridan, 2020; Coibion, Gorodnichenko, and Weber, 2020; Horvath, Kay, and Wix, 2020; Surico, Känzig, and Hacioglu, 2020). Only one paper studies the changes in the effects of banking relationships between normal times and the COVID-19 crisis, but it focuses on conventional commercial loans rather than credit cards (Berger, Bouwman, Norden, Roman, Udell, and



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Wang, 2022). Some studies investigate bank-firm relationships and COVID-19's Paycheck Protection Program (PPP) (e.g., Amiram and Rabetti, 2020; Bartik, Cullen, Glaeser, Luca, Stanton, and Sunderam; 2020; Li and Strahan, 2020).

Finally, we contribute to research on the determinants of consumer and small business credit. Consumer credit studies focus on consumer, lender, regulatory, and market factors other than relationships except as noted previously (e.g., Mian and Sufi, 2009; Rajan, Seru, and Vig, 2015; Agarwal, Chomsisengphet, Mahoney, and Stroebel, 2015, 2018; Brown, Grigsby, van der Klaauw, Wen, and Zafar, 2016; Ramcharan, Verani, and Van den Heuvel, 2016; Stango and Zinman, 2016; Akey, Heimer, and Lewellen, 2021; Agarwal, Li, Roman, and Sorokina, 2022; Benetton, Buchak, and Robles-Garcia, 2022; Matcham, 2022). Small business lending studies, including the relationship studies discussed previously, focus on many determinants of credit supply, but they usually do not include credit cards (e.g., Petersen and Rajan, 2002; Cortés, Demyanyk, Li, Loutskina, and Strahan, 2020; Levine, Lin, Peng, and Xie, 2020).

### *2.2 Hypotheses*

Our first hypothesis essentially takes the main question about the benefits of relationship lending from the vast literature on bank relationships with commercial borrowers and applies it for the first time to relationships with credit card customers. Our second hypothesis addresses the extent to which such benefits may change during the crucial periods of crises.

**H1: Benefits from Relationships with Credit Card Customers during Normal Times.** Banks obtain benefits from the private information acquired over the course of relationships with credit card customers during normal times, similar to the benefits generated by bank relationships with commercial borrowers established in the theoretical literature (e.g., Rajan, 1992; Boot and Thakor, 1994). Banks may share some of the benefits with cardholders through more attractive credit terms, such as lower APR spreads or higher credit card limits, over the durations of the relationships. Such intertemporal smoothing would be consistent with many empirical findings on commercial lending relationships (e.g., Petersen and Rajan, 1994; Berger and Udell, 1995; Cole, 1998; Bharath, Dahiya, Saunders, and Srinivasan, 2007, 2011). Banks may also offer harsher credit terms over the course of relationships with credit card customers to the extent that hold-up problems due to bank market power and customer switching costs empirically dominate, as found in other empirical studies of commercial lending (e.g., Petersen and Rajan, 1995; Degryse and Van Cayseele, 2000; Ioannidou and Ongena, 2010; Schenone, 2010; Hong, Hunt, and Serfes, 2018).

**H2: Changes in Benefits from Relationships with Credit Card Customers during Crises.** Both the benefits to banks from relationships and the extent to which they share these benefits may differ during crises, so the treatment of credit card customers may change relative to normal



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times. Hence, there may be changes in intertemporal smoothing for these customers. On the one hand, relationship customers may obtain relatively better credit terms during crises. Such improved treatment could reflect that relationship information becomes more valuable during times of market distress when information derived from conventional models, market prices, and credit scores may be less reliable. This could also occur because banks provide additional intertemporal smoothing or crisis insurance benefits to their relationship customers, as discussed in the literature (e.g., Fried and Howitt, 1980; Berlin and Mester, 1999; Bolton, Freixas, Gambacorta, and Mistrulli, 2016). On the other hand, banks may reduce benefits shared with relationship borrowers during crises to provide short-term boosts to their profits to help bolster bank equity capital to help them survive in troubled times. Charging higher spreads to raise bank profits and equity capital may only work for relationship customers, who often face switching costs. The extant empirical research on relationships with commercial borrowers during crises is less well established than the normal-times literature (see discussion in the Introduction).

### *2.3 Differences in the Effects of Relationships Across Types of Credit Card Customers*

We also allow for the possibility of cross-sectional smoothing in which relationships with either consumer or small business credit card customers are associated with more bank sharing of relationship benefits. *Ex ante*, either consumers or small businesses may be favored over the other in normal times or crises.

Consumers may benefit relative to small businesses due to the legal and economic differences between consumer and small business customer accounts discussed previously. The 2009 CARD Act and other legal protections that only apply to consumers may protect them from exploitation of market power in terms of interest rate increases charged by their relationship banks. Consumers may also benefit more because they tend to borrow relatively more on their credit cards, while small businesses more often use credit on their cards as a last resort. Consumers with relationships may also offer relatively more cross-selling opportunities to banks and may have lower bank switching costs that reduce bank market power over them, so banks may give them more attractive terms to help retain the profits from this lending. The risks from lending on consumer credit cards may also be less cyclical, more predictable, and more easily diversified for banks, while small business credit card loans may more often be disbursed to riskier firms that have difficulty obtaining conventional commercial credit. Small businesses also may more often experience the dark side of their relationships because of higher switching costs associated with more financial constraints, fewer financing alternatives driven by more opaque prospects, and bundling together various financial services from their banks. Moreover, small businesses may have greater needs for intertemporal liquidity insurance than consumers, resulting in less favorable credit card terms in normal times. For these reasons, banks may be incentivized to provide better terms to relationship consumers than to their small businesses relationship customers (e.g., Kamakura, Ramaswami, and Srivastava, 1991;



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Calem and Mester, 1995; Akçura and Srinivasan, 2005; Li, Sun, and Wilcox, 2005; Calem, Gordy, and Mester, 2006; Li, Sun, and Montgomery, 2011; Brush, Dangol, and O'Brien, 2012; Santikian, 2014; Agarwal, Chomsisengphet, Liu, Song, and Souleles, 2018).

In contrast, small business cardholders may get more relationship benefits than consumers. The legal protections that only apply to consumers may discourage banks from providing consumers with advantageous terms to retain them. Some small business credit cards also have repayment protection from owner guarantees in addition to small business revenues. Small businesses may also be associated with superior cross-selling opportunities in terms of future profitable conventional credit and non-credit products than consumers (e.g., debt and equity underwriting services) if they become successful (e.g., Kanatas and Qi, 2003; Petersen and Rajan, 1994; Bharath, Dahiya, Saunders, and Srinivasan, 2007).

Government policies during the COVID-19 crisis also differed between consumers and small businesses. Stimulus payments and extended unemployment benefits for consumers versus Paycheck Protection Program (PPP) forgivable loans for small businesses undoubtedly also affected the bank profitability of these two types of credit cards.

### *2.3 Differences in the Effects of Types of Relationships*

We compare multiple types of relationships that represent potential sources of information for banks. While some prior studies do so for commercial or consumer credit (e.g., Berger and Udell, 1995; Mester, Nakamura, and Renault, 2007; Norden and Weber, 2010; Puri, Rocholl, and Steffen, 2017; Hibbeln, Norden, Usselmann and Gürtler, 2020; Berger, Bouwman, Norden, Roman, Udell, and Wang, 2022), only one does so for U.S. credit cards (Agarwal, Chomsisengphet, Liu, Song, and Souleles, 2018).

We complement this research by examining the sources of information from relationships in normal times and during the COVID-19 crisis in three ways. We compare credit card and conventional bank relationships as they may provide different information about customer risk. Customer default risk results from negative income shocks or positive expenditure shocks (Gross and Souleles, 2002; Chatterjee, Corbae, Nakajima, and Ríos-Rull, 2007). Credit card accounts provide information primarily about the downside, with limited upside information (a credit card bill is paid or not; or rolled over or not), while conventional bank relationships may offer broader and deeper, symmetric information about customer risk. We also decompose conventional bank relationships into seven types – deposit, investment, mortgage, auto loan, student loan, other loan and multi-product relationships. This decomposition suggests which sources of information banks use for monitoring customer risk and how they affect contract terms.

### *2.4 Differentiating Between Reductions in Informational Opacity Versus Information Favorability*

In the literature on bank relationships with commercial borrowers, the benefits to banks from the private information acquired over the course of relationships is viewed as residing almost exclusively in the



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reduction in informational opacity about the borrowers, as opposed to whether this information is favorable or unfavorable. The reduction in opacity allows the banks to improve their screening and monitoring in order to make better decisions on whether to grant credit and on the terms of credit. The empirical studies as well as the theory primarily consider measures of relationship existence or strength as proxies for the improvement in information, rather than the favorability of this information.

We are aware of only a few exceptions – some studies mention that borrowers with very unfavorable relationship information do not have their loans renewed, so existing relationships are more often associated with favorable information. Berger and Udell (1995) note that their empirical results may in part reflect this survivorship effect, similar to the selection-over-time mechanism in the theoretical contribution in Diamond (1991). No prior studies of either bank relationships with commercial or credit card customers to our knowledge employ measures of relationship information favorability.

We are able to differentiate between the effects of reduced informational opacity versus information favorability for relationships for the first time because we have performance data from past credit card relationships of the bank with the same borrower. Specifically, we are able to generate "high risk" and "low risk" indicators from this relationship information that may inform the bank as to the likelihood that these borrowers may repay their existing credit card debt. In particular, customer past due status, credit scores, and utilization rates on past credit cards may be indicative of current credit risk. Thus, to the extent that the customer was past due, had lower prior scores, and was more extended, the bank would offer harsher credit terms, *ceteris paribus*. We include these relationship information favorability indicators along with conventional relationship measures in the same regressions to compare the effects of reductions in informational opacity versus information favorability.

## 3. Data

We discuss data sources and uses in Section 3.1 and variables and summary statistics in Section 3.2.

### *3.1 Data Sources and Uses*

Our main data source is the Federal Reserve's supervisory Y-14M monthly loan-level data, which contain detailed information on all consumer and small business credit cards extended by large bank holding companies (BHCs) subject to DFAST/CCAR stress tests and having material credit card portfolios in the U.S. We refer to these institutions henceforth as "banks" for expositional ease.[4] The dataset is available from June 2013 and includes a rich set of customer and loan characteristics, and customer geographical

[4] Banks with over $50 billion in assets were initially required to report, but the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA) in 2019 increased the reporting size threshold to $100 billion starting in 2019:Q4. Since most of our normal times sample is before 2019:Q4, we use all of these banks in this first analysis, but for our crisis analysis, we focus only on banks with assets over $100 billion that exist in both the pre- and post-periods. Our results are robust to using banks over $100 billion in all analyses. They are also robust to including only banks that exist in all 8/8 years or full calendar years (7/8 years: only six months of 2013 data since reporting in Y-14M only started in June 2013).



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location down to the ZIP code. Customer identity is anonymized, but most accounts include a customer identifier that can be tracked within the same bank over time to assemble our relationship variables.

This credit card dataset is very large, more than 500 million observations per month. We therefore employ stratified random loan-level samples of 0.5% and 5% for consumers and small businesses, respectively, for new accounts that are nationally representative across U.S. states as well as across banks' portfolios. The banks in the FR Y-14M are dominant players in the credit cards market, holding a combined market share of over 70% as of December 2019,[5] so the accounts are likely representative of the market as a whole. Although the FR Y-14M is reported on a monthly basis, most of our data are as of the day the new account was granted. We keep only observations in which: 1) a customer ID is available; 2) an account holder's address is in a U.S. state or territory; 3) credit card type is general purpose or private label for consumers, and business card for businesses; 4) product type is not health-care-related; 5) the balance does not have to be repaid in full each billing cycle, i.e., true credit cards only; 6) the account is revolving; 7) the loan is not subject to SOP 03-03 accounting (i.e., it is not a purchased credit-impaired loan or a purchased loan with evidence of deteriorating credit quality since origination); 8) the account is not acquired via an M&A; 9) the loan is owned by a bank;[6] 10) the issued card is not a replacement credit card for broken, stolen, lost, or for fraud reasons;[7] 11) the credit score is between 300 and 900 to remove reporting errors; 12) the APR and credit limit are available; and 13) the account is active.

We merge the FR Y-14M data with bank characteristics from the most recent quarterly Y-9C reports and monthly county-level macroeconomic variables from Haver Analytics/U.S. Bureau of Labor Statistics and CoreLogic Solutions. We use Johns Hopkins University Coronavirus Center, the Economic Tracker of Chetty, Friedman, Hendren, and Stepner (2020), the University of Washington government activity restrictions from Adolph, Amano, Bang-Jensen, Fullman, and Wilkerson (2021) for additional measures of the COVID-19 crisis. We also employ FDIC Summary of Deposits, FFIEC Census Demographic Data, and CFPB customer complaints data for additional analyses.

For our normal-times analysis, we include FR Y-14M data from June 2013 through February 2020. The data screens result in consumer and small business regression samples of 806,278 and 282,371 observations, respectively, for between 19 and 20 unique banks over 81 months with complete information on customer, loan, bank, and county characteristics.

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[5] This is based on market share assessments of these banks' balances in the FR Y-14M compared to the credit card balances in the Federal Reserve Bank of New York Quarterly Report on Household Debt and Credit as of 2019:Q4 available at https://www.newyorkfed.org/medialibrary/interactives/householdcredit/data/pdf/hhdc_2019q4.pdf and https://www.newyorkfed.org/microeconomics/hhdc.html, having information on the total credit card market.

[6] We drop loans by credit unions and non-bank subsidiaries because those entities may have different business models.

[7] To identify potential replacement cards for broken, stolen, lost, or for fraud reasons, we look at whether a customer gets a new card in a month but closes any of the existing credit card accounts in a three-month window centered around the new card issuance. Excluding these cases causes us to lose less than 1% of the observations.



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For evaluating the changes brought on by the COVID-19 crisis, we consider that the crisis started on March 1, 2020, the day after the Governor of Washington first declared a state of emergency in the U.S. For our pre+during-COVID-19 crisis sample, we use four months before and four months after COVID-19 started, spanning November 2019 through June 2020. The data screens leave us with consumer and small business pre+during COVID crisis regression samples of 61,688 and 34,221 observations, respectively, for between 15 and 16 unique banks over 8 months.

### *3.2 Variables and Summary Statistics*

Table 1 Panels A and B provide detailed definitions and summary statistics, respectively, for the variables in our main regression samples. The statistics are reported separately for consumers and small businesses during normal times (Panel B.1) and the pre+during COVID-19 crisis samples (Panel B.2).[8] For brevity, we discuss here only the means of the most important variables.

Our main dependent variables are two key credit card terms, *APR Spread* over U.S. Treasuries with similar maturities and *Ln(1+Limit)*, the natural log of one plus the account's credit limit. Our key independent variable is *BANK_REL_3Y*, a dummy for whether the borrower has a relationship with the bank over the previous three years.

The average consumer has an *APR Spread* of 13.833% and 14.831% in the normal times and pre+during COVID-19 samples, respectively, while having a *Ln(1+ Limit)* of 8.316 ($7,118.61 unlogged) and 8.372 ($7,457.49 unlogged) in the two sample periods, respectively. Our main relationship measure, *BANK_REL_3Y*, indicates that on average 35.0% and 33.1% of the loans are issued to relationship consumers in the normal times and pre+during COVID-19 samples, respectively. As for key consumer characteristics, the average consumer has safe credit scores of 730.647 and 735.046, annual incomes of $102,308.40 and $130,366.60, and utilization ratios of 10.6% and 9.0% during normal times and pre+during COVID-19 samples, respectively.[9]

Relative to consumers, small businesses have lower mean *APR Spread* of 10.983% and 12.208% in the normal times and pre+during COVID-19 samples, respectively, and higher *Ln(1+ Limit)* of 9.239 ($13,888.98 unlogged) and 9.218 ($14,021.93 unlogged), respectively. More businesses than consumers have bank relationships in both periods, with means of *BANK_REL_3Y* of 56.3% and 54.3% in the normal times and the pre+during COVID-19 samples, respectively. The average small business appears safer than the average consumer with a somewhat higher average credit score of 761.228 and 766.302, a higher annual income of $192,295.10 and $308,427.00 (reflecting business rather than individual income), and

[8] We check key statistics such as credit score and annual income for consumers and small businesses in the pre- and during COVID-19 periods separately and find them to be roughly similar.

[9] Around 88% of the credit card accounts in our consumer and small business Y-14M samples have FICO scores, while the rest have other types of credit scores. In unreported results, we reestimate including only accounts with FICO scores, and our results remain consistent with our main findings.



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utilization ratios of 4.8% and 5.2% in the normal times and pre+during COVID-19 samples, respectively.

## 4. Methodology

Section 4.1 describes the model used to test H1 regarding the effects of bank relationships on credit terms for consumer and small business credit cards during normal times (June 2013 – February 2020). Section 4.2 explains our DID regression model to evaluate H2 regarding changes between normal times and the COVID-19 crisis. Tests of H2 use the pre+during COVID-19 crisis sample (November 2019 – June 2020).

### *4.1 Regression Equations for Normal Times (H1)*

We examine the effects of bank relationships on credit terms for new credit card originations for consumer and small business accounts **<u>during normal times</u>** by estimating equations of the following form using data from June 2013 through February 2020:

$$\begin{aligned} Y_{c,b,m,t} = \; & \beta_0 + \beta_1 Relationship_{c,b,pre} + \\ & \beta_2 Customer\ Characteristics_{c,t} + \beta_3 Loan\ Characteristics_{c,b,m,t} + \\ & \beta_4 Bank\ Characteristics_{b,t=mr} + \beta_5 Local\ Market\ Characteristics_{m,t=mr} + \\ & \beta_6 Local\ Market\ FE_m + \beta_7 Bank\ FE_b + \beta_8 Year-Month\ FE_t + \varepsilon_{c,b,m,t}. \end{aligned} \tag{1}$$

$Y_{c,b,m,t}$ is a credit term (alternatively *APR Spread* or *Ln(1+Limit))*, provided to customer *c* by bank *b* in local market *m* at time *t*. $Relationship_{c,b,pre}$ indicates a preexisting relationship between customer *c* and bank *b*. Our main regressions use *BANK_REL_3Y*, a dummy that equals 1 if the customer has another credit card with the bank in the prior three years[10] and/or a conventional relationship based on past provision of deposits; investments; mortgage, auto, student, or other loans; or multiple products. The dataset does not specify exact dates for past conventional services.

To alleviate potential omitted variable issues, the model is saturated with controls for demand and supply factors, including *Customer*, *Loan*, *Bank*, and *Local Market Characteristics*, and local market (county) fixed effects, bank fixed effects, and time (year-month) fixed effects. *Customer Characteristics* are measured as of the origination date or the FR Y-14M report month end and include credit score, annual income categories, and the card's utilization ratio. *Loan Characteristics* are measured at origination time *t* and are composed of indicators for joint account, many authorized users, variable interest rate, secured, credit card type, and card source channels. For *Bank Characteristics*, we include the most recent (t=mr) bank size, age, and ratios for bank capital, liquidity, nonperforming loans, earnings, and loans to assets.

[10] While the dataset is only available from June 2013 onward, it includes historical relationship information that pre-dates the start of the dataset. Specifically, in each month, the data indicates whether a customer already had a credit card relationship with the bank It also includes historical information from the credit card account such as past origination date, which helps us determine when the relationship started. Similarly, the dataset shows in each month whether a conventional bank relationship existed at the time the new credit card was granted. We then define the overall relationship variable *BANK_REL_3Y* based on these two sources of information. In Section 6.2, we also measure customer-bank relationships considering definitions incorporating credit card relationship data from prior four years, five years, two years, one year, or any year prior to new credit card issuance, and obtain similar results.



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*Local Market Characteristics* contains the most recent (t=mr) unemployment rate, the house price index (HPI), and the one-month change in the HPI. Standard errors are clustered at the county level.[11]

Equation (1) is estimated separately for two credit terms, *APR Spread* and *Ln(1+Limit)*, and is also estimated separately for consumer and small business credit card customers, reflecting that these credit terms and customer types are very different. Although it is not shown in the equations for brevity, in all cases in which *APR Spread* is the dependent variable, we include *Ln(1+Limit)* on the right-hand side. This follows the common research practice of treating interest rates as the last credit term determined.

We test H1 by examining the coefficient on *Relationship*, $\beta_1$. Significantly negative estimates of $\beta_1$ in the *APR Spread* equations and significantly positive $\beta_1$ estimates in the *Ln(1+Limit)* equations would be consistent with shared benefits (lower spreads and higher limits). Significant differences in findings between consumers and small businesses may be taken to indicate cross-sectional smoothing that favors consumers over small businesses or *vice versa*.

***4.2 Regression Equations for Evaluating Changes during the COVID-19 Crisis (H2)***

We next test hypotheses about changes during the **COVID-19 crisis** by estimating equations of the following form for the pre+during COVID-19 crisis sample spanning November 2019 through June 2020:

$$\begin{aligned} Y_{c,b,m,t} = \; & \delta_0 + \delta_1 Relationship_{c,b,pre} + \\ & \delta_2 Relationship_{c,b,pre} \times COVID-19\ Crisis_t + \\ & \delta_3 Customer\ Characteristics_{c,t} + \delta_4 Loan\ Characteristics_{c,b,m,t} + \\ & \delta_5\ Bank\ Characteristics_{b,t=mr} + \ \delta_6 Local\ Market\ Characteristics_{m,t=mr} + \\ & \delta_7 Local\ Market\ FE_m + \ \delta_8 Bank\ FE_b + \delta_9 Year-Month\ FE_t + \zeta_{c,b,m,t}. \end{aligned} \tag{2}$$

Equation (2) is also estimated separately for *APR spread* and *Ln(1+Limit)*, and for consumers and small businesses. The only specification changes from equation (1) are the time period and the addition of the *Relationship* × *COVID-19 Crisis* DID term. *COVID-19 Crisis* by itself is excluded because of collinearity with the year-month fixed effects.[12] We focus here on the estimates of $\delta_2$, the coefficient on the DID term. We test whether there are additional shared benefits during crises, i.e., whether there is intertemporal smoothing, based on the sign and significance of $\delta_2$. Significantly negative estimates in the *APR spread* equations and significantly positive estimates in the *Ln(1+Limit)* equations would suggest intertemporal

[11] Results are robust to alternative clustering of standard errors by County and Customer or by Year-Month and Bank × County in the current specification and also with alternative fixed effects such as Bank×County and Year-Month or Bank×County×Year-Month. We do not cluster by bank alone because of a very small number of banks in the sample. Abadie, Athey, Imbens and Wooldridge (2017) argue that it is not necessarily the best choice to cluster standard errors in the dimension with the smallest number of outcomes because it may mechanically lead to insignificant results. Similarly, Bertrand, Duflo, and Mullainathan (2004) and Hansen (2007) suggest that a lot of clusters are needed when using clustered standard errors to correct for the bias in estimating standard errors due to within-cluster correlations.

[12] In unreported tests, we alternatively estimate regressions with a *COVID-19 Crisis* dummy included in the model and without *Year-Month* fixed effects. This model yields similar results to our main findings.



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smoothing for relationship customers in crises. We again also test for cross-sectional smoothing between consumers and small businesses.

## 5. Main Results for the Effects of Bank Relationships on Credit Card Terms

We present our main results for new credit card originations. Section 5.1 shows results for normal times, and Section 5.2 focuses on the COVID-19 crisis.

### *5.1 Relationship Effects on New Credit Card Customers during Normal Times*

Table 2 Panel A shows the main results for equation (1) using ordinary least squares (OLS) regressions: it shows how relationships affect credit card terms (APR spread and limit) for consumers and small businesses during normal times. Results are reported using specifications that include customer, loan, bank and county controls. Regressions including only fixed effects yield similar results.

We focus on the coefficient on the relationship term, *BANK_REL_3Y*, which shows how credit card terms differ between relationship and non-relationship customers. This coefficient is statistically significant at the 1% level across all models and suggests that relationships matter during normal times for terms for both consumers and small businesses but highlight very different effects for these two groups of customers. For consumers, relationships are associated with more attractive terms (lower APR spreads and higher credit limits), consistent with the bright side of relationships as stated in H1. In contrast, relationships are associated with less attractive terms for small businesses (higher spreads and lower limits), which speaks against H1. Taken together, these results indicate cross-sectional smoothing in normal times favoring consumer relationship customers, as banks provide benefits to consumers with relationships but penalize small business relationship customers.[13] The harsher terms for small business relationship customers could be explained by a dark side of small business relationships, but may more likely reflect payment for intertemporal smoothing insurance, given that small businesses with relationships gain relative to others during COVID-19. We also acknowledge that measurement error may play a role. As in most banking relationship research, we cannot rule out bundled pricing so that small businesses receive normal-times benefits through unobserved favorable terms on other services.

Results are economically significant. Starting with consumers and using the full specifications in columns (1)-(2), banks provide 0.525 percentage point lower spreads and 9.2% higher credit limits to consumer relationships, *ceteris paribus*. For small businesses in columns (3)-(4), banks charge 1.069

[13] One may expect that the results for the smallest firms are similar to the consumer results. Additional analyses in which we include "Low Income" (income <$25K) as a firm size proxy and double and triple interactions reveal that this is true. This means that the results for bigger small firms are even more starkly different compared to what we present.



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percentage point higher spreads and provide 10.5% lower limits to relationship customers.[14,15]

Thus, during normal times, banks appear to share benefits to retain their consumer credit card relationship customers but exercise market power over their small business relationship customers. This may occur because banks are more eager to retain relationship consumers since they provide more cross-selling opportunities, they are relatively simple to evaluate, and their risks are more easily diversified. This is opposed to small businesses which have more difficulty switching banks, may more easily divert funds into riskier projects, and may be subject to more agency issues and have more opaque prospects.

### *5.2 Changes in Relationship Effects during the COVID-19 Crisis*

Table 2 Panel B shows our main results for equation (2) with the same pattern of columns. The coefficients of interest are on the DID interactions *BANK_REL_3Y × COVID-19 Crisis*, which show the difference in effects of relationships on credit card terms during the COVID-19 crisis relative to normal times. The findings suggest that both consumer and small business credit card customers benefit from relationships during COVID-19 relative to normal times. Consumers obtain lower spreads but no change in limits, while small businesses obtained better spread and limit terms. These findings are consistent with shared benefits and banks engaging in intertemporal smoothing for both customer types as stated in H2. Thus, banks may provide implicit insurance benefits during the COVID-19 crisis – despite the observed level differences in benefits – to retain both sets of relationship customers. Finally, there are no cross-sectional smoothing effects during the COVID-19 crisis, as both customer types benefit.

The results are also economically significant. Starting with consumers, the coefficients on the interaction terms *BANK_REL_3Y × COVID-19 Crisis* suggest economically significant additional benefits for consumers with relationships during the COVID-19 crisis. Based on these estimates, relationship consumers receive 0.815 percentage point lower spreads but no effects on limits. For small businesses, the corresponding estimates imply that banks provide significant 0.322 percentage point lower spreads and 11.3% higher limits.[16]

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[14] In unreported results, we also run tests using the dollar amount of the limit instead of using *Ln(1+Limit)*. We find that the coefficients keep their sign and statistical significance, but their magnitude becomes substantially larger. During normal times, we find that the coefficient of *BANK_REL_3Y* is 810.1 for consumers and the corresponding coefficient for small businesses is -1,259.9. The effects correspond to +11.3% for consumers and -9.1% for small businesses relative to their respective means.

[15] Comparing the sizes of the coefficients on the relationship term and those on the customer credit variables allows for an interesting contrast between the effects of relationship information and the hard information from credit scoring. For example, in Table 2 column (1), the coefficients of -0.525, -0.417, -1.320, and -2.402 on *BANK_REL_3Y*, *Customer Credit Score [580, 660)*, *Customer Credit Score [660, 720)*, and *Customer Credit Score ≥720*, respectively, suggest that the effects of having a relationship in reducing APR spreads for consumers is roughly comparable to that of a modest increase in credit score from the subprime category to the [580, 660) credit score category, but much smaller than the effect of shifting from subprime to prime. Analogous comparisons using the coefficients in the other columns suggest that relationship information plays a reasonably comparable role to credit scoring for spreads, but it is less consequential for credit limits, possibly due to the role of limits in controlling credit risks.

[16] In unreported results, we also run tests using the dollar amount of the limit instead of using ln(1+Limit). We find that the coefficients keep their sign and statistical significance, but their magnitude becomes substantially larger. For the COVID-19 crisis, we find that the coefficient of *BANK_REL_3Y* is 789.6 and the one of *BANK_REL_3Y × COVID-19 Crisis* is 122.6



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### *5.3 Graphical Representation of the Main Effects of Relationships for Credit Card Customers*

Figure 1 provides a graphical representation of the main effects of relationships for credit card customers. It plots regression coefficients on *BANK_REL_3Y* and *BANK_REL_3Y × COVID-19 Crisis* from Table 2 Panel A with their 95th confidence intervals, representing normal times effects of relationships for consumers and small businesses, and changes in these effects during the COVID-19 crisis.[17] Panel A presents results for *APR Spread*, while Panel B gives findings for *Ln(1+Limit).* The two bars on the left side show normal times (*BANK_REL_3Y* coefficients), and the two on the right show changes during the COVID-19 crisis (*BANK_REL_3Y×COVID-19 Crisis* coefficients). Consumer relationship effects are shown with light blue bars, while the small business relationship effects are shown with dark red bars. Panel A shows that, during normal times, banks provide lower APR spreads to consumer relationship customers, but higher APR spreads to small business relationship customers. Both consumer and small business relationship customers benefit from relationships during the COVID-19 crisis relative to normal times in terms of lower APR spreads. Panel B shows that, during normal times, banks provide higher credit card limits to consumer relationship customers but lower credit limits to small business relationship customers. During the COVID-19 crisis, we find relationship benefits for small business customers in terms of higher credit card limits relative to normal times.

## 6. Identification Challenges

This section addresses key identification challenges in our setting: omitted variable bias (Section 6.1), measurement error (Section 6.2), reverse causality (Section 6.3), and sample selection bias (Section 6.4).

### *6.1 Omitted Variable Bias*

In our setting, omitting important credit demand and supply factors that might be correlated with relationships may significantly bias the relationship coefficients. For example, we cannot directly observe borrower leverage. We address this issue in the main analysis by saturating the model with demand and supply controls, including customer, loan, bank, and local market characteristics, as well as fixed effects for banks, local markets, and year-month. Realizing that this may be insufficient, we perform several additional analyses. We first use additional controls that may affect credit terms: a customer behavioral score from the FR Y-14M, proxying for bank-assessed customer past credit account behavior, as an additional control for customer risk,[18] a proxy for high leverage (a dummy =

(+1.5% relative to the pre-crisis mean) for consumers; the corresponding coefficients for small businesses are -2,477.8 and 1,326.8 (+9.0% relative to the pre-crisis mean), respectively.

[17] We show both normal times and crisis findings from Table 3 for the pre+during COVID-19 sample here in order to display mutually consistent findings for the two time periods, but our main findings for normal times in the text earlier are for the normal times sample.

[18] We do not include this variable in the main analysis for two reasons. First, bank reporting of this variable is not mandatory, and hence, it is imperfectly populated. Second, banks may use different scales. Despite this, at every bank, a higher behavioral



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1 if a customer has income above 100K and credit score less than 660), and the number of credit card complaints against the bank from the Consumer Financial Protection Bureau (CFPB). The results are similar to the main results (see Online Appendix Table OA.1 Panels A – C). Next, we replace the fixed effects used in the main specification (bank, county, and year-month), with alternative granular fixed effects. We use County × Year-Month FE to better control for credit demand factors in local markets over time; Bank × Year-Month FE to better control for credit supply factors over time; Bank × County × Year-Month to better compare credit card terms among customers from the same bank in the same county for credit cards originated in the same month; ZIP FE while also clustering the standard errors by ZIP; and Credit Score Dummies × Year-Month FE, in addition to bank and county fixed effects to help compare credit card terms for customers of similar credit risk in the same origination month. Our main findings are confirmed in all of these robustness checks (see Online Appendix Table OA.1 Panels D-H). We also perform instrumental variable analysis (see Section 6.3).

### *6.2 Measurement Error*

The relationship variables are not precisely measured, but rather they are approximations based on information in the FR Y-14M dataset. Measurement error could result in biased estimates. We confront this potential problem by replacing our main relationship proxy, *BANK_REL_3Y*, with indicators for whether the customer has had a previous credit card relationship or conventional bank relationship with the bank in the past four years, five years, two years, one year, or any prior year. Our main findings are robust to the use of these alternative relationship proxies (see Online Appendix Table OA.1 Panel J). Furthermore, we show that customers with longer credit card relationships are generally better off than those with shorter relationships (Table OA.1, Panel K). This finding is robust to using two and three years as cut-offs and consistent with the view that relationships pay off for customers after some time, as shown by Lopez-Espinosa, Mayordomo and Moreno (2017).

### *6.3 Reverse Causality*

Relationship coefficients may be biased if customers choose relationship banks based on contract terms they expect on future credit cards (e.g., Bharath, Dahiya, Saunders, and Srinivasan, 2011; Prilmeier, 2017; Beck, Degryse, De Haas, and van Horen, 2018). We address this concern using instrumental variable analysis. This analysis also helps to mitigate concerns about a potential omitted variable bias (due to omitting variables that are determinants of contract terms and correlated with the existence of relationships). We use *Ln(1+Closest Bank Distance)*, the natural log of one plus the geographical distance in miles between the customer residence ZIP code and the closest bank branch as an instrument for

score corresponds to higher credit quality. To address these concerns, we include a flag for missing values and rescale the variable between 0 and 1, so scores are scaled in the same way and rank-order default risk in same direction across banks.



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relationship existence, *BANK_REL_3Y*.[19]

The instrument must be relevant: bank-customer distance should be correlated with relationship existence. There are economic reasons to believe that the shorter this distance, the more likely it will be that the customer has established a relationship with the bank. One reason may be convenience. Recall that our main relationship variable is broadly defined and includes conventional as well as past credit card relationships. The convenience factor is fairly straightforward for deposits and other conventional relationships, but convenience may also play a role for some customers who prefer opening credit card accounts in person. Another reason may be that physical proximity facilitates the bank's collection of soft information on customers (e.g., Kwast, Starr-McCluer, and Wolken, 1997; Amel and Starr-McCluer, 2002; Amel and Brevoort, 2005; Berger, Miller, Petersen, Rajan, and Stein, 2005; Brevoort and Wolken, 2008; Bharath, Dahiya, Saunders, and Srinivasan, 2011; Dass and Massa, 2011; Prilmeier, 2017). The test results we report below confirm the relevance of the instrument.

The instrument must also satisfy the exclusion restriction: geographical distance should not directly have a causal effect on credit card terms. There are strong reasons to believe that this holds. Customers do not control terms nearby banks provide. While customers have choices of where to reside, it seems unlikely that they would relocate to be closer to a relationship bank. A concern may be that the bank may use more cautious lending practices when dealing with distant customers because its information about such customers may not be as good. If so, distance would be positively correlated with creditworthiness, which then might result in better credit card terms. To address this, we examine the relation between customer credit quality (in terms of credit score, income and utilization ratio) and distance. We find that consumers and small businesses located closer to the bank are more, rather than less, creditworthy than distant ones during normal times and the COVID-19 crisis. Importantly, however, this holds for both relationship and non-relationship borrowers.

Our instrumental variable regression setup follows Wooldridge's (2002) three-step dummy endogenous model, used in prior studies of relationship lending (e.g., Bharath, Dahiya, Saunders, and Srinivasan, 2011; Prilmeier, 2017). In the first step, we use a probit model to predict the probability of forming a relationship using the instrument discussed previously, *Ln(1+Closest Bank Distance)*, and then the fitted value is used as the actual instrument in the first stage of a 2SLS estimation for the normal times estimation. Similarly, we use the fitted value and the fitted value interacted with the COVID-19 crisis as the actual instruments for the COVID-19 crisis estimates.[20]

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[19] Distance between points is calculated using the latitude and longitude of the centroid of each zip code for the customer and the bank branches using VINCENTY in Stata (e.g., Nichols, 2007).

[20] Wooldridge (2002, Section 18.4.1) describes this procedure and notes that it is useful when the potentially endogenous variable $X$ is binary, since the estimation is typically inefficient when 2SLS is used directly for this case. Improved efficiency may be obtained by regressing $X$ on the included and excluded instruments via probit or logit, predicting the probability $\hat{X}$, then



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Table 3 Panel A, columns (1) and (4) contain the first-stage probit results for consumers and small businesses, respectively, during normal times; columns (7) and (10) contain the information for the COVID-19 crisis. The first-stage results confirm that *Ln(1+Closest Bank Distance)* is negatively significantly (at the 1% level) related to bank relationships during normal times and the COVID-19 crisis. It indicates that relationship formation is more likely the smaller the distance between the customer and the bank. To assess the suitability of the instrument, we perform two statistical tests. A Kleibergen-Paap rk *LM* underidentification test indicates that the models are well identified (null rejected at the 1% level in all cases). A Kleibergen-Paap *F*-test of the excluded exogenous variable in the first-stage regression confirms that our instrument is relevant (null rejected at the 1% level in all cases).

Table 3 Panel A, columns (2)-(3) and (5)-(6) contain the last-stage IV regressions for consumers and small businesses, respectively, during normal times. The results indicate that effects of bank relationships on spreads and limits are significant and show shared benefits for consumers and hold-up problems for small businesses, consistent with our main normal times findings. We find that consumers with relationships obtain 4.5 percentage points lower spreads and 36.3% higher limits during normal times. Small businesses with relationships receive 4.0 percentage points higher spreads and 46.3% lower limits during such times.

Reverse causality may also plague the relationship coefficient in the COVID-19 crisis. The variable of interest during the crisis is not the relationship variable per se, but rather the interaction between relationship and the COVID-19 shock (equation (2)). This interaction term may not be subject to significant reverse causality because relationships could not have been made in anticipation of the COVID-19 shock, since these were essentially unpredictable (e.g., Berger, Bouwman, Norden, Roman, Udell, and Wang, 2022). There is one possible exception: relationships that started in 2020 are potentially endogenous. An untabulated analysis purges such observations and finds results similar to the main results. Nonetheless, while reverse causality should not be a concern during the COVID-19 crisis, we do perform our IV regressions as well.

Table 3 Panel A columns (8)-(9) and (11)-(12) show last-stage IV regressions to examine changes in the effects of relationships on credit card terms during the COVID-19 crisis. They indicate benefits from bank relationships for both consumer and small business credit card customers during the COVID-19 crisis, consistent with our earlier OLS evidence. The IV estimates are again much larger in absolute

using $\hat{X}$ as the single instrument in 2SLS estimation. This yields consistent coefficients and correct standard errors. We follow this approach, using probit to predict the probability of a customer forming a relationship. We instrument *BANK_REL_3Y* by the relationship variable dummy fitted value, while we instrument *BANK_REL_3Y×COVID-19 Crisis* by the product of the relationship variable dummy fitted value and the COVID-19 crisis dummy. As indicated in Wooldridge (2002, pp. 236-237), this method is not the same as the forbidden regression, as we use the obtained variables as instruments and not as regressors. To avoid the incidental parameter problems associated with probit and other nonlinear models with many fixed effects, we exclude county and bank fixed effects in the first-stage probit model (e.g., Greene, 2004).



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value terms than the OLS estimates. The coefficients on the interaction terms imply that banks charge 1.0 percentage point lower spreads to consumers with relationships and give 1.8 percentage point lower spreads and 20.8% higher limits to small businesses with relationships during the COVID-19 crisis.

The IV estimates are much larger in absolute value than the OLS estimates, which is not unusual (e.g., Bharath, Dahiya, Saunders, and Srinivasan, 2011). Jiang (2017) suggests that this may be due to strong local average treatment effects (LATE). In our case, customers with credit cards from a physically close bank may have the most relationship effects.

### *6.4 Sample Selection Bias*

The fourth identification challenge is sample selection bias: relationships are not randomly assigned, and relationship determinants may affect credit terms. Thus, our main results may spuriously reflect differences in characteristics of relationship and non-relationship customers. To address this, we use propensity score matching, Heckman's (1979) two-stage self-selection model, and falsification tests.

#### *6.4.1 Propensity Score Matching (PSM)*

We first address potential self-selection bias using PSM following Rosenbaum and Rubin (1983) and Lawrence, Minutti-Meza, and Zhang (2011). We employ one-to-one matching without replacement using 1% caliper. We match relationship customers (treated group) to the nearest non-relationship customers (untreated control group) based on all controls used in our main specification (except fixed effects) plus the distance instrument *Ln(1+Closest Bank Distance)* used in the IV analysis above. We then apply OLS regressions to the propensity-score matched samples for consumers and small businesses to control for the potential bias that the treatment and control groups differ across observable dimensions.

Table 3 Panel B reports PSM results for normal times and changes during the COVID-19 crisis. We continue to find better credit card terms for relationship consumers and worse terms for relationship small businesses. We also continue to find increased benefits from relationships during the crisis for both consumers and businesses. This evidence helps dispel the competing explanation that our main results spuriously reflect differences in characteristics of relationship and non-relationship customers.

#### *6.4.2 Heckman's (1979) Two-Stage Self-Selection Model*

We next employ a Heckman (1979) two-step procedure, which controls for a selection bias by incorporating the relationship formation decision into the econometric estimation. The first stage replicates the first stage of the IV analysis to predict relationships (not shown). Table 3 Panel C shows the final stage, which adds the self-selection parameter (inverse Mills ratio) to the main regression model. All results controlling for potential selection bias in this fashion support our main results.

#### *6.4.3 Falsification Tests*

The third approach to dealing with selection bias employs falsification tests. We obtain empirical distributions of the bank relationship variable separately for consumers and small businesses, and then



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randomly assign customers into relationship treatment following these distributions. Table 3 Panel D shows the results from these falsifications tests. The coefficient estimates of *BANK_REL_3Y_FALSE* and *BANK_REL_3Y_FALSE* × *COVID-19 Crisis* are insignificant in all cases, alleviating concerns that alternative explanations other than true bank relationships drive the results.

## 7. Additional Analyses

We next show results of three additional analyses. Section 7.1 investigates different bank relationship dimensions, the sources of information that help banks reduce informational opacity. Section 7.2 analyzes how favorability of information from relationships can affect results. Finally, Section 7.3 examines how our main effects differ by customer risk at the time of credit card origination.

### *7.1 Different Dimensions of Relationships*

We now investigate whether and how different dimensions of bank relationships affect the way banks set credit card terms. For example, banks may provide their credit card customers with more benefits when their relationships are based on past credit cards than on conventional bank products (such as deposits, investments, or loans). This may occur because the private information generated by past credit card relationships is more valuable for evaluating credit card customers or because prior credit card approval is an informative signal of future profitable experience. Alternatively, banks may provide their credit card customers with more benefits when the relationship is based on conventional bank products, because the private information generated by conventional relationships is more valuable. For example, prior research suggests that checking account information is much more valuable than credit card relationship information in predicting borrower default (e.g., Mester, Nakamura, and Renault, 2007; Norden and Weber, 2010; Puri, Rocholl and Steffen, 2017; Agarwal et al., 2018; Hibbeln, Norden, Usselmann, and Gürtler, 2020). It may also be the case that some non-credit card products allow bank officers and representatives to produce soft information. This could be quite distinct from the underwriting and monitoring of credit cards that may be associated with less bank contact and less soft information production – though still associated with the production of hard private information.

To address this, we re-estimate equations (1) and (2), decomposing the relationship variable in three different ways. We first decompose our main relationship variable, *BANK_REL_3Y*, into *CARD_BANK_REL_3Y* and *CONVENTIONAL_BANK_REL*, indicating whether the customer had a credit card relationship with the bank in the past three years or a conventional bank relationship covering non-credit card products (timing not known) and report results in Table 4 Panels A-B.[21]

A customer may have either, both, or neither types of relationships. We further decompose

[21] In unreported tests, we also try an alternative continuous relationship measure for the credit card relationships, *LN(1+CARD_BANK_REL LENGTH YEARS)*, the natural logarithm of 1 plus the number of years since the credit card relationship was started and obtain similar results to using the binary credit card relationship variable.



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*CONVENTIONAL_BANK_REL* into seven relationship types: *DEPOSIT_REL*, *INVESTMENT_REL*, *MORTGAGE_REL*, *AUTO_REL*, *STUDENT_REL*, *OTHERLOAN_REL*, and *MULTI_PRODUCT_REL*, denoting past deposits, investment accounts, mortgages, auto loans, student loans, other loans, or multiple product accounts, respectively. Online Appendix Table OA.1 Panels Q1-Q2 show a decomposition of our main relationship variables over time, while Online Appendix Table OA.1 Panels R1-R2 show supplementary decompositions over time when differentiating between credit card and conventional bank relationships.[22]

Table 4 Panel A shows results for customers with existing credit card versus conventional bank relationships, while Panel B shows results for the decomposition of the conventional bank relationships. The results show that during normal times, conventional bank relationships provide most of the benefits – lower spreads and higher limits – to both consumers and small businesses, and these findings are primarily driven by relationships based on deposit accounts, investment accounts, and/or multiple products. Credit card relationships are more often associated with disadvantages – higher spreads for both customer groups and lower limits for small businesses. Findings also indicate a continuation of benefits from conventional bank relationships for consumers during the COVID-19 crisis. However, for small businesses, both conventional bank relationships (particularly deposits and multiple products) and credit card relationships provide benefits, but credit card relationships benefits are greater.

The difference in results between consumers and small businesses may be due to changes in the value of credit card information for the two groups during the COVID-19 crisis. Consumer credit card information may have become less valuable due to CARES Act credit bureau reporting restrictions (tested in Section 9) and a drop in mean utilization from 9.6% to 7.8% (derived from subdividing the pre+during sample, not tabulated). At the same time, small business credit card data may have become more valuable as CARES Act restrictions did not apply to small businesses, and mean utilization ratios increased from 5.0% to 5.8% (again based on the pre+during sample).

In a third analysis, we examine how relationship effects vary over time. We examine the main relationship variable and its decomposition into credit card and conventional bank relationships over time. Panel R further decomposes conventional relationships into seven relationship types. The analyses are performed year-by-year during normal times and month-by-month during the COVID-19 crisis.

Online Appendix Table OA1, Panel Q1 focuses on normal times. We replace the *BANK_REL_3Y* variable with interactions between *BANK_REL_3Y* and dummies for each of the years during normal times from 2013 through 2020 (the last year comprising only January and February). First, we find that our main conclusions remain intact – consumers with relationships obtain more favorable terms, while relationship

[22] Table OA1, Panel R3 reports additional month-by-month tests for the COVID-19 crisis, which also yield consistent results.



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small businesses receive worse terms. Specifically, for consumers with relationships, we find lower spreads in most of the years (2013-2018) and higher limits (2013-2020). Consistently, conventional bank relationships result in lower spreads and higher limits in all years (except for the spread in 2020). Decomposing further by relationship type, these benefits are mainly due to deposit and multi-product relationships; mortgage relationships show mixed effects. However, credit card relationships result in higher spreads and higher limits for consumers in all years 2013-2020 (insignificant positive effect on the limit in 2020). For small businesses with relationships, we always find higher spreads (2013-2020) and lower limits (2013-2020). Conventional bank relationships result in mixed effects on the spreads and positive effects on the limit, mainly due to multi-product relationships. Credit card relationships yield consistently higher spreads and lower limits.

Panel Q2 shows the effects of relationships over the months of the crisis. We replace the COVID-19 Crisis variable with dummies for each of the months of the crisis from March through June 2020 and also interact these indicators with BANK_REL_3Y. We find again that our main conclusions are unchanged – relationship consumer and small business customers fare better than others during the crisis relative to normal times, consistent with shared benefits and intertemporal smoothing with few changes over time. Specifically, the benefits from overall bank relationships are weak or even reversed in March 2020, but then they become progressively stronger in April, May, and June 2020 for both consumers and small businesses. Decomposing by relationship type, for consumers, conventional bank relationships provide a lower spread during April-June 2020 and a higher limit in March 2020 (offset by a substantially higher APR spread in March). These benefits are mainly due to deposit relationships and multi-product relationships. Credit card relationships lead to lower limits for consumers in March-May 2020 and an increase in the spread (despite a slightly smaller spread in March). For small businesses, there are consistent beneficial effects from conventional bank relationships and credit card relationships on the spread and limit. These effects are mainly due to deposit relationships.

### *7.2 Results by Information Favorability*

We now directly test the effect of information favorability from relationships and distinguish it from the reduction of the informational opacity effect. This analysis is novel and virtually absent in the relationship lending literature. In Table 5 Panels A-D, we consider the favorability of information from relationships for consumers and small businesses during normal times and changes during the COVID-19 crisis, respectively. Specifically, we decompose the *BANK_REL_3Y* dummy into a conventional bank relationship dummy, *CONVENTIONAL_BANK_REL*, with no explicit favorability content, and two "low risk" and "high risk" credit card relationship dummies, *CARD_BANK_REL_3Y_LOWRISK* and *CARD_BANK_REL_3Y_HIGHRISK*, that reflect favorable and unfavorable information garnered over the course of credit card relationships. To capture low-risk or high-risk information, we consider measures of



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the customer's past due status (past due ≥60 days; past due ≥ 90 days), average past credit score (<580 (subprime)), and average credit card utilization ratio (≥ 90%). Past due status and utilization ratio are private information. The credit score is public information, but its history is private information. All these measures are computed for credit card relationship customers over the past three years.

Results in Table 5 show that the conventional bank relationship coefficients remain basically unchanged when compared to our main findings, but this is not the case for the credit card relationships that incorporate information favorability. For normal times, we find that high risk credit card relationships for consumers result in substantially higher spreads and lower limits, while low risk ones result in higher limits. Interestingly, we find higher spreads also for low-risk credit card relationships. For small businesses during normal times, we find that both high risk and low risk credit card relationships result in higher spreads and lower limits, but the adverse effects are in all but one case magnified for the customers with high-risk relationships. For the COVID-19 analysis, we find that consumers with high-risk credit card relationships show a more pronounced decline in the limit than those with low-risk credit card relationships. For small businesses, we find that high risk credit card relationships result in higher spreads and (sometimes) lower limit, while low risk credit card relationships result consistently in shared benefits such as lower spreads and higher limit. Overall, these findings indicate that credit card relationship borrowers with favorable information obtain rewards (lower spread and/or higher limit) and those with unfavorable information obtain penalties (higher spread and/or lower limit).

***7.3 Results by Customer Risk***

We next examine how our main results differ by customer risk using three risk measures: *Customer Credit Score*, *Customer Income*, and *Utilization Ratio*. We estimate regressions separately for *Customer Credit Score* ranges of < 580, [580,660), [660,720), and ≥720; *Customer Income* ranges of <25K, [25K, 50K), [50K,100K), [100K, 150K), and ≥150K; and *Utilization Ratios* of ≥90%, [50%, 90%), and <50%, so that customer risk is decreasing in each subsequent range for the three indicator variables. These risk variables are measured at the time of the credit card origination (utilization at the end of the origination month).

Table 6 Panels A and B show the findings for normal times and changes during the crisis, respectively. To conserve space, we show multiple regressions in each panel that vary by customer group and credit term, with the consumer regressions shown before the small business regressions, and within each customer category, *APR Spread* is followed by *Ln(1+Limit)*. As above, we present only coefficients for the key independent variables, suppressing reporting the controls.

Normal times results in Table 6 Panel A suggest that banks generally charge lower spreads to riskier relationship customers, although with a few exceptions. To be clear, these are lower spreads relative to non-relationship customers, as opposed to lower spreads overall. While we cannot say definitively why banks might reward relatively risky relationship credit card customers with lower rates during normal



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times, banks may want to retain these customers because of high profitability. Related research indeed suggests that riskier customers tend to be more profitable for lenders (e.g., Bond, Musto, and Yilmaz, 2009; Agarwal, Chomsisengphet, Mahoney, and Stroebel, 2015; DiMaggio and Yao, forthcoming). In contrast, the results also often suggest that banks tend to give these riskier relationship customers lower limits. A possible explanation is that the banks may try to manage their risk exposures from retaining these riskier relationship customers at lower spreads by capping their losses with lower credit limits.

Turning to Panel B, for small businesses, we show "N/A" in column (1) for credit scores below 580. This is because there are too few small business loan originations with the lowest credit scores during the COVID-19 crisis in our 5% random sample to estimate coefficients on *BANK_REL_3Y* × *COVID-19 Crisis*. We therefore combine the bottom two categories in columns (2) for credit scores < 660 for our small business estimations in this Panel. The results in Panel B often suggest better credit terms (spreads and limits) for safer relationship customers (consumers and small businesses), although fewer of the coefficients are statistically significant. These findings may reflect that banks shift their orientation more toward managing risks than seeking continuing profitability from risky relationship customers during the crisis. Such a shift would be consistent with extant research on procyclical bank lending behavior (e.g., Berger and Udell, 2004; Thakor, 2015, 2016; Benmelech, Meisenzahl, and Ramcharan, 2017).[23,24,25]

### *7.4 Effects of Negative Shocks to Bank Capital on Relationship and Non-Relationship Customers*

We further consider exogenous events that negatively affected bank capital during normal times and how they influence the credit card terms offered to relationship vs. non-relationship customers. These additional tests are motivated by evidence showing that borrowers who have a greater need for relationship loans tend to prefer banks with higher capital ratios (e.g., Schwert, 2018). We use two exogenous events. First, we consider the introduction of the GSIB surcharge for banks in 2016 (e.g., Favara, Ivanov, and Rezende, 2021) and use an implementation surcharge dummy equal to one for GSIB banks from 2016

[23] In unreported checks, *BANK_REL_3Y* means pre- and during-COVID-19 by credit score ranges show a higher decrease in relationship customers (consumers and small businesses) in lower score categories but increase or lower decrease for higher score customers during COVID-19 relative to pre-COVID-19, again suggestive of bank pro-cyclical behavior during the crisis.

[24] In unreported analyses, we also test the effects by customer financial constraints rather than risk, by jointly considering credit score and utilization ratio or low income and utilization ratio. For normal times, we find that financially constrained consumers with relationships obtain significantly lower spreads and higher limits, although the limit increase is smaller than for financially unconstrained relationship consumers. Financially constrained small businesses with relationships face smaller increases in spreads, while the findings on the limit are mixed. For the COVID-19 crisis, we do not find any shared benefits for financially constrained relationship consumers and mixed results for small businesses.

[25] We also analyze the conditional variance of credit terms of relationship vs. non-relationship customers. Evidence on market-wide learning in commercial lending (Botsch and Vanasco, 2019) suggests a higher variance because of reduced information opacity for relationship customers. We check this prediction and find that the variance of the APR spread is lower for relationship customers in normal times and during the COVID-19 crisis. For the conditional variance of the limit there is no clear pattern. Our finding can be explained in two ways: We focus on credit card lending and bank-specific customer relationship information rather than syndicate lending and market-wide learning.



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onwards.[26] Second, we consider whether banks failed in stress tests, which is publicly announced in the stress test reports. We expect that these capital shocks to banks have adverse effects on the terms offered to relationship customers. The coefficient of interest is the interaction term of the relationship measure and the bank capital shock. For both shocks to bank capital, we indeed find adverse effects on APR spreads for consumers and small businesses with existing bank relationships. We find mixed effects on the limit. Both shocks have beneficial effects on limits for relationship consumers and adverse or insignificant effects for relationship small businesses. Hence, consumers with relationships face mixed responses of banks to capital shocks, while small businesses with relationships experience undesirable responses. One explanation for the mixed response vis-à-vis relationship consumers may be that banks try to offset the higher APR spread with a higher limit (that consumers may ultimately not use, while small businesses would use it). See Online Appendix Table OA.1 Panel I for a tabulation of the results.

**8. Additional Analyses for the COVID-19 Crisis Only**

We conduct four additional analyses that apply to the COVID-19 crisis only (see details in Online Appendix Section OA.2). First, we examine whether our main results for the COVID-19 crisis are sensitive to using alternative samples. In our main analysis, we used a four-month pre-COVID period to match the length of our four-month COVID-19 period. Instead, here we: i) subtract two months from our pre-period, effectively starting in January 2020 as other researchers use beginning of 2020 as a baseline for effects during the COVID-19 crisis; ii) add two months to our pre-period, starting in September 2019; iii) consider the pre-period to have the exact same length as the COVID-crisis period but move it one year earlier; that is, we use March 1 through June 30 2019, to attenuate concerns about seasonality. The alternative samples continue to show shared benefits for both consumer and small business relationships during the COVID-19 crisis relative to normal times (see Online Appendix Table OA.2 Panel A).

We also provide results when replacing the main COVID-19 dummy (equal to one from March 1, 2020, onward) with five alternative measures of COVID-19 intensity reflecting government-activity restrictions or public health crisis severity that vary over time and across individual U.S. states or counties. These are: i) *US Restrictions Index*, a national restrictions index (0-10); ii) *State Restrictions Index*, a state restrictions index (0-10), based on the customer state and including 10 possible mandated time-varying statewide COVID-19 restrictions (the number of restrictions is 0 before the start of the COVID-19 crisis (March 1, 2020)); iii) *GPS State Immobility*, showing Google GPS time spent inside (rather than outside) of residential locations in a state relative to beginning of 2020; iv) *County New Cases/100K Pop*; and v) *County New Deaths/100K Pop*, the number of newly confirmed COVID-19 cases or deaths, respectively

[26] We obtain similar results using the continuous surcharge percentage implemented for GSIB banks from 2016 onwards. Not reported for brevity.



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per 100K population in the customer county.[27] Results using these five alternative COVID-19 crisis show consistent results with our main findings (see Online Appendix Table OA.2 Panels B1-B2).

Finally, we assess the impact of the Paycheck Protection Program (PPP) on our results and whether relationship customers fare differently during the COVID-19 crisis when the lending bank is more or less heavily involved in PPP. First, we reestimate our main regressions for changes during the COVID-19 crisis while controlling for *PPP Loans/Total Assets*, the ratio of PPP loans to bank total assets, and find that our main findings are unaffected. Next, we interact an indicator *High PPP* (for banks with above 75th percentile PPP loans relative to total assets) with our relationship and COVID-19 variables. The coefficients on the triple interaction terms, *BANK_REL_3Y × COVID-19 Crisis × High PPP*, show that while our main results are not affected, relationship customers borrowing from high PPP banks face harsher terms (higher APR spread and lower credit card limits) than those borrowing from other banks during the COVID-19 crisis. This suggests that high PPP involvement may disincentivize banks from providing benefits to their relationship customers (see Online Appendix Table OA.2 Panel C1-C2).

## 9. Potentially Unintended Consequences of the 2020 CARES Act

A key public policy issue during crises is increased borrower financial constraints, often due to deteriorations in economic conditions that affect their creditworthiness, credit supply reductions owing to lender concerns about their own financial conditions, or both. Governments often provide policy responses to address these increased constraints, and many such responses occurred during the COVID-19 crisis. We assess the effects of one particular COVID-19 policy and how it affected one of main outcomes studied in this paper – the effects of the crisis on credit card customers. We specifically address how the CARES Act provision that limits reporting of consumer credit information to rating agencies affects consumer financial constraints – as measured by their APR spreads, credit limits, and delinquencies – and how these effects differ by consumer riskiness.

### *9.1 Effects of the 2020 CARES Act, Consumer Delinquency Reporting Provision*

As discussed previously, the 2020 CARES Act does not allow banks to report consumer delinquencies to the credit bureaus when making forbearance accommodations (e.g., payment deferrals) to consumers related to the COVID-19 crisis – a prohibition intended to protect consumers (e.g., Cherry, Jiang, Matvos, Piskorski, and Seru, 2021).[28] A potential unintended consequence is that consumer credit scores may have become less informative during the crisis, penalizing safer consumers with better credit scores.

[27] Results are robust to using measures with total COVID-19 cases and deaths instead of new cases and deaths.

[28] CARES Act Section 4021 amends the Fair Credit Reporting Act (FCRA) to protect a consumer's credit score. When a lender makes an accommodation for a consumer account related to COVID-19 (e.g., defers one or more payments, allows partial payments, forbears any delinquent amounts, modifies a loan or contract, or any other assistance or relief to a consumer affected by COVID-19 beginning on January 31, 2020, and ending 120 days after the national emergency ends), the lender must report the account as current to the credit bureaus unless the account was delinquent before the accommodation was made. See p. 209 of https://www.congress.gov/116/bills/hr748/BILLS-116hr748enr.pdf.



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To address this, we estimate the following regression model using the pre+during COVID-19 crisis sample from November 2019 through June 2020:

$$\begin{aligned} Y_{c,b,m,t} = \; & \psi_0 + \psi_1 Relationship_{c,b,pre} \times Post\ CARES\ Act_t + \psi_2 Relationship_{c,b,pre} + \\ & \psi_{3,1} Credit\ Score\left[580,660\right)_{c,t} \times Post\ CARES\ Act_t + \\ & \psi_{3,2} Credit\ Score\left[660,720\right)_{c,t} \times Post\ CARES\ Act_t + \\ & \psi_{3,3} Credit\ Score \geq 720_{c,t} \times Post\ CARES\ Act_t + \\ & \psi_{4,1} Credit\ Score\left[580,660\right)_{c,t} + \psi_{4,2} Credit\ Score\left[660,720\right)_{c,t} + \psi_{4,3} Credit\ Score \geq 720_{c,t} + \\ & \psi_5 Other\ Customer\ Characteristics_{c,t} + \psi_6 Loan\ Characteristics_{c,b,m,t} + \\ & \psi_7 Bank\ Characteristics_{b,t=mr} + \psi_8 Local\ Market\ Characteristics_{m,t=mr} + \\ & \psi_9 Local\ Market\ FE_m + \psi_{10} Bank\ FE_b + \psi_{11} Year-Month\ FE_t + \tau_{c,b,m,t}. \end{aligned} \tag{3}$$

Equation (3) is estimated for consumers only, since the CARES Act provision only applies to this group.[29] As before for credit card terms, *Y* is alternatively *APR spread* and *Ln(1+Limit)*. In addition, we also consider consumer delinquency for existing accounts (described in more detail in Online Appendix Section OA.5) proxied by *30 Days Past Due*, an indicator equal to 1 if an existing credit card account becomes 30 days or more delinquent.[30] The variables of interest are *Customer Credit Score* range dummies interacted with the *Post CARES Act* dummy (=1 after March 27, 2020, when the CARES Act was signed into law). The credit score dummies capture scores in the ranges of <580 (left out category), [580,660), [660,720), and ≥720. Finding that consumer credit card customers with higher credit scores obtain worse credit terms or have a higher delinquency rate after the CARES Act implementation would suggest an atrophy of the value of consumer credit scores due to the Act.

Table 7 shows the results. Figure 2 gives a pictorial representation. It plots regression coefficients on the key variables of interest from Table 7 columns (1)-(3): the consumer credit score range dummies (left out category: credit score <580) and their interactions with *Post-CARES Act*, with their 95th confidence intervals. In each panel, the three bars on the left show credit score range coefficients before the CARES Act, and the three on the right show changes after the CARES Act implementation. Credit score ranges are represented by bars in different colors.

The results show that Pre-CARES Act higher credit scores are associated with lower spreads and higher limits as well as lower delinquency rates, as expected. However, the effects are different after the CARES Act implementation during the COVID-19 crisis.

The interaction terms between the top two credit score categories and *Post CARES Act* are positive

[29] The implications for small business customers who are sometimes evaluated based on consumer scores of their owners are less clear cut because the extent to which banks rely on these scores versus business information is not known.

[30] In unreported tests, we use *60 Days Past Due*, an indicator equal to 1 if an existing credit card account becomes 60 days or more delinquent and find consistent results.



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and significant for spreads and negative and significant for limits. We also observe the credit score interactions for all non-subprime categories are positive and significant for delinquency rates. This suggests that the information value of consumer credit scores has deteriorated during the crisis and harms the safer consumers with the high credit scores. In terms of economic magnitudes, focusing on the top two credit score categories (i.e., those with credit scores in the ranges [660,720) and ≥720), we find they pay over 1.2 percentage point more, experience a decrease in credit limit of 6.3%-20.9% compared to the subprime category (<580 credit scores), and show around 6.5% higher delinquency rates relative to the subprime group all else equal.[31] Thus, the expected relations – higher credit scores are associated with better terms and lower delinquency rates – become weaker after the CARES Act, again consistent with a decrease in the informational value of the scores after the Act. Alternatively, all these results may also be regarded as either deterioration in the credit score value of the higher score consumers or a cross-subsidization of the lower score consumers. We are the first, to our knowledge, to document this important potentially unintended consequence of the 2020 CARES Act.

***9.2 Forbearance Accommodations in the 2020 CARES Act***

Finally, we examine another potential consequence of the 2020 CARES Act – COVID-19 forbearance accommodations for existing credit card customers.[32] Banks may always provide forbearance to customers that experience temporary hardship. While the use of such accommodations is relatively infrequent during normal times, they are a prominent part of the CARES Act policies during the COVID-19 crisis (e.g., Cherry, Jiang, Matvos, Piskorski, and Seru, 2021).[33] We now examine if banks were more likely to engage in forbearance with their relationship customers. The answer is unclear since banks could alternatively choose to exploit their relationship customers.

We measure credit card forbearances several ways, following Cordell, Hossain, and Roy (2020). We use: *All Forbearances*, an indicator for whether the account is in any type of forbearance/non-payment workout status; *Forb Reduced Rate*, APR rates reduced to 10% or lower; *Forb $0 Min Pay*, customer having nonzero balance but being allowed $0 minimum payment; *Forb Defer Pay*, payment deferral for accounts with nonzero balances; *Forb Waive Late Fees*, waived late fees; *Forb Waive Interest*, waived interest payments; and *Forb Other*, all other types of forbearance. Online Appendix Table OA.7 shows the results. The Post CARES Act results in Panel A suggest that consumers with relationships are more likely to be granted credit card forbearances consistent with shared benefits, while small businesses with

[31] Results are robust to using 60 days past due instead of 30 days past due as proxy for customer delinquency.

[25] This analysis on forbearances is not applicable for new originations.

[33] The CARES Act mandated that lenders provide forbearance accommodations for customers that experience temporary hardship. While the official rules primarily applied to mortgages, home equity products, and student loans, banks also offered a wide range of accommodations in credit cards. These credit card accommodations were included in the Y-14M data collection for existing accounts. Unreported data means suggest that forbearance accommodations are about ten times more frequent during the COVID-19 crisis than normal times.



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relationships are less likely to obtain these consistent with hold-up problems. These results support cross-sectional smoothing favoring consumer relationship customers during normal times.

The COVID-19 crisis results in Panel B show that both consumers and small businesses with relationships are more likely to be granted credit card forbearances: they were more likely to get a waiver for the $0 minimum payment requirement, were allowed to defer payments, and experience other forbearances. The forbearance accommodations are shared benefits to relationship customers in need during the COVID-19 crisis and support intertemporal smoothing for both consumer and small business relationships.

**10. Conclusions and Implications**

We build a bridge between relationship lending and transactions lending literatures. We do so by using a large dataset on the effects of relationships on contract terms for credit card lending, an important type of transactions lending. We also take advantage of the exogeneity of COVID-19 over other crises to test whether an intertemporal smoothing feature of relationships applies to this transaction lending technology. We eschew a summary of the research and policy results in favor of a closing discussion of some implications of our results for various parties.

Our findings that consumer credit card customers with existing relationships obtain better credit terms during normal times and benefit even more during the COVID-19 crisis suggest that relationship credit card consumers consider staying with their banks. Our findings also imply that non-relationship consumers may consider the benefits of establishing such relationships, particularly relationships based on deposits and/or other non-credit card services that provide most of the shared benefits. However, safer consumers may be wary of crisis policy interventions, such as CARES Act restrictions on reporting consumer delinquencies, that reduce the informational value of their credit scores and raise the relative costs of credit to them.

For small business credit card customers, the implications of our findings are less clear. The harsher terms for small business relationship customers during normal times may be too costly. However, they could be worthwhile advance payments for intertemporal smoothing insurance benefits in subsequent crises. Small businesses might weigh these costs and benefits from credit card relationships.

For both consumers and small businesses, it may also be advisable to consider costs and benefits of credit card relationships that may accrue in pricing or other treatment on other services from their relationship banks.

Turning to banks, our perhaps surprising result that the value of relationship information extends in a significant way to transactions loans like credit cards suggests that this information might be profitably deployed in other transaction lending contexts, such as credit scoring on other consumer and small business lending, financial statement lending, and fixed-asset collateral lending. The extent to which



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banks are already doing so is not known. In addition, banks may want to be aware of some of the potential consequences for their credit card customer behaviors. The relatively less attractive terms for small business relationship customers during normal times may result in losing some of these customers in the long run.

Shadow banks, including FinTech platforms that lend to consumers and small businesses, may wish to consider the value of private information generated by relationship lending when designing their marketing and lending decision strategies. Most of these non-bank lenders are thought to employ very little in the way of relationship information, which may put them at competitive disadvantages.

Our findings may also suggest some future directions for researchers. As indicated, our results raise the possibility that relationship information may play key roles and complement the use of other transaction lending technologies that researchers might investigate. In addition, we have only scratched the surface of other issues that could be further explored, including differences between consumer and small business credit card markets, competition and market power issues in these markets, and more general issues concerning bank behavior in normal times and crises.

Finally, our results may also inform policymakers regarding the potential unintended consequences of policies such as the CARES Act provisions that interfere with risk reporting to credit bureaus studied here.



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**Data Availability**

Code replicating the tables and figures in this article can be found in Berger, A. N., Bouwman, C.H.S., Norden, L., Roman, R.A., Udell, G.F., Wang, T., 2023, in the Harvard Dataverse, (view at https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/59KE89).

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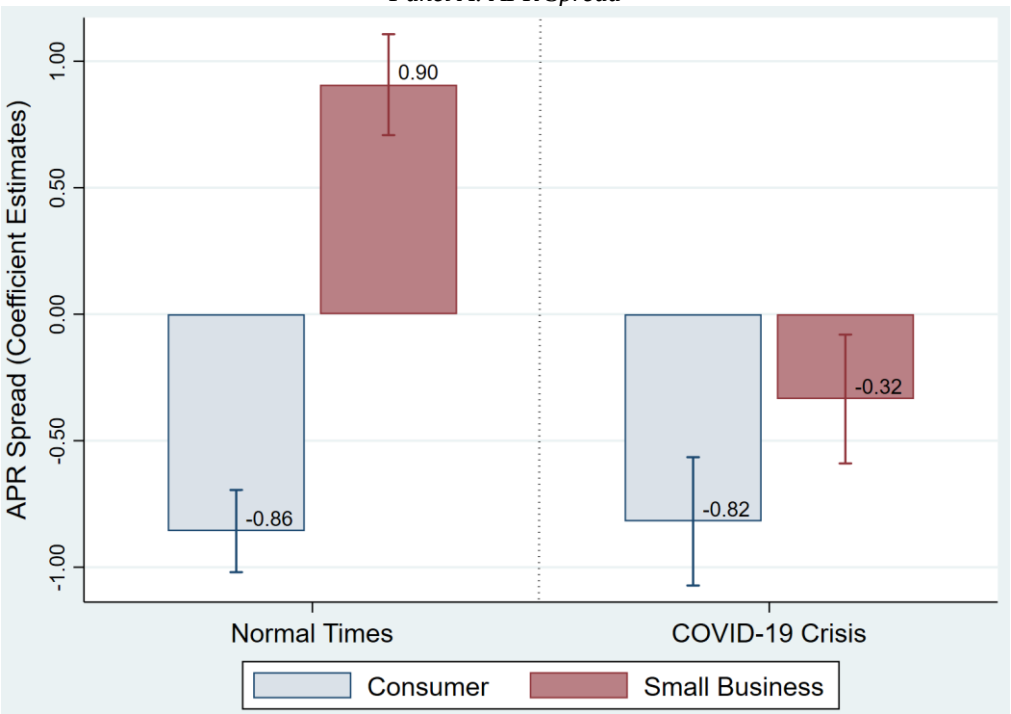
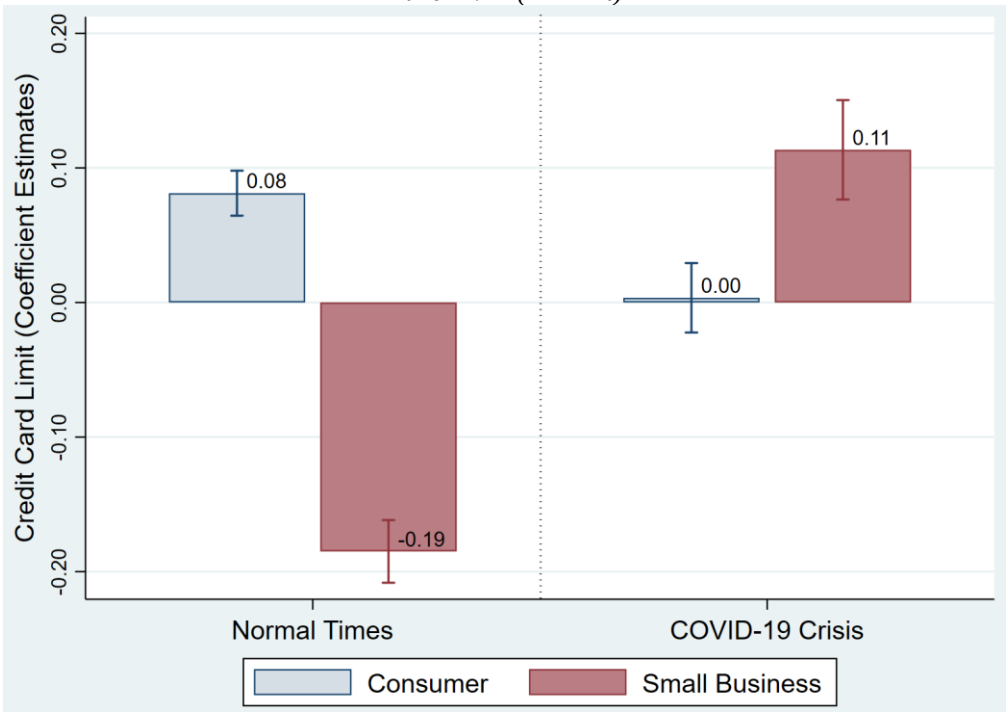
## Figure 1: Effects on Credit Supply to Credit Card Customers

Regression coefficient estimates for *BANK_REL_3Y* (relationship variable) and its interaction with the *COVID-19 Crisis* dummy (= 1 from March 1, 2020 onward) from Table 3 together with their 95th confidence intervals for *APR Spread* and credit card limit *Ln(1+Limit)* for new originations during normal times and changes during the COVID-19 crisis. All variables are defined in Table 1.

*Panel A: APR Spread*




*Panel B: Ln(1+Limit)*



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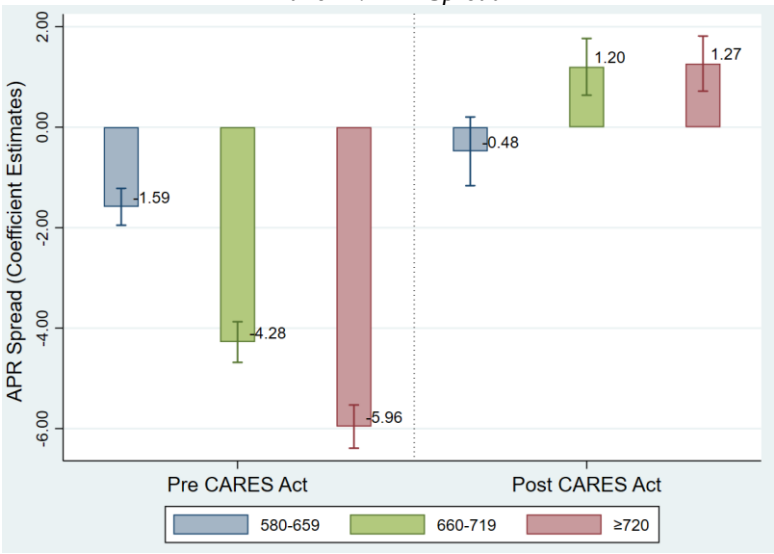
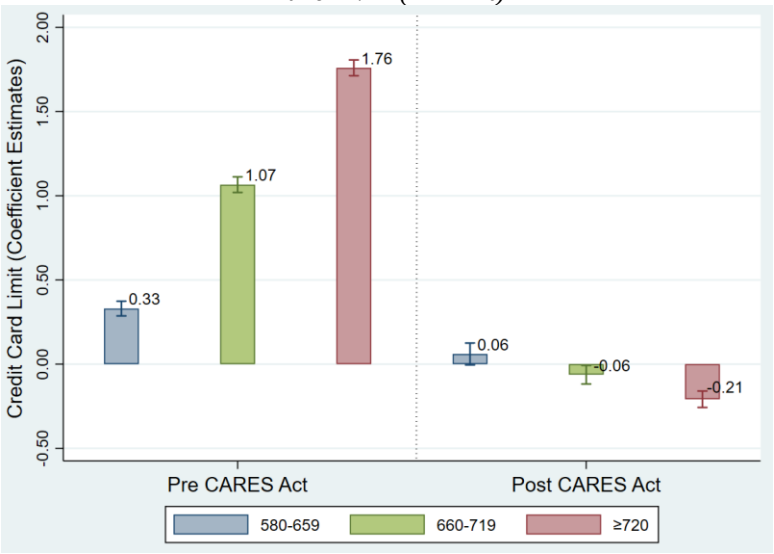
## Figure 2: Atrophy in the Value of Consumer Credit Scores

Regression coefficient estimates for the interactions between *Customer Credit Score* range dummies with Post CARES Act (= 1 after March 27, 2020, when the Act was signed into law) from Table 8 together with their 95th confidence intervals for *APR Spread* and *Ln(1+Limit)* for new originations and *30 Days Past Due (DPD)* for existing accounts during the COVID-19 crisis sample. All variables are defined in Table 1.

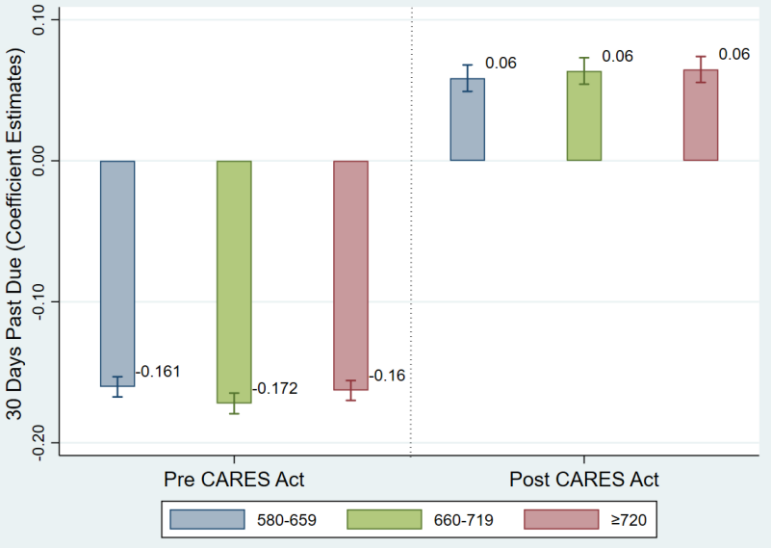
*Panel A: APR Spread*




*Panel B: Ln(1+Limit)*




*Panel C Delinquency (30 Days Past Due)*



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## Table 1: Variable Definitions and Summary Statistics

*Panel A: Variable Definitions*

| Variable | Definition | Source/ Authors' Calculation Based on: |
|---|---|---|
| **Main Customer and Loan Characteristics** | | |
| APR Spread | The interest rate spread over the constant rate Treasury bonds with a similar maturity. | FR Y-14M; St. Louis FRED |
| Ln(1+Limit) | The natural log of 1 plus the origination credit limit on the account. | FR Y-14M |
| BANK_REL_3Y | =1 if the customer has another credit card with the bank in the prior 3 years and/or a conventional relationship with the bank based on past provision of deposits; investments; mortgage, auto, student, or other loans; or multiple products. The exact prior dates for past conventional services are not specified in the dataset. | FR Y-14M |
| COVID-19 Crisis | =1 from March 1, 2020, onward based on origination date. | John Hopkins University / FR Y-14M |
| Customer Credit Score | Customer credit score at origination. | FR Y-14M |
| Customer Credit Score < 580 *(left-out category)* | =1 if customer credit score below 580. | |
| Customer Credit Score [580, 660) | =1 if customer credit score between 580 and 660. | FR Y-14M |
| Customer Credit Score [660_720) | =1 if customer credit score between 660 and 720. | FR Y-14M |
| Customer Credit Score ≥720 | =1 if customer credit score above 720. | FR Y-14M |
| Customer Income < 25K *(left-out category)* | =1 if customer income below $25k. | |
| Customer Income [25K, 50K) | =1 if customer income between $25k and $50k. | FR Y-14M |
| Customer Income [50K, 100K) | =1 if customer income between $50k and $100k. | FR Y-14M |
| Customer Income [100K, 150K) | =1 if customer income between $100k and $150k. | FR Y-14M |
| Customer Income ≥150K | =1 if customer income above $150k. | FR Y-14M |
| Customer Utilization Ratio | Outstanding balance divided by credit limit. | FR Y-14M |
| Joint Account | =1 if joint account. | FR Y-14M |
| Many Authorized Users | =1 if the account has 3 or more authorized users. | FR Y-14M |
| Variable Rate | =1 if the account has a variable interest rate. | FR Y-14M |
| Secured | =1 if the account is secured. | FR Y-14M |
| Promotional | =1 if the account has a promotional APR. | FR Y-14M |
| General Purpose | =1 if card type is general purpose. | FR Y-14M |
| Cobrand | =1 if card type is cobrand. | FR Y-14M |
| Affinity | =1 if card type is affinity. | FR Y-14M |
| Other Card *(left-out category)* | =1 if card type is student card and other private label card. | |
| Customer Init: Branch Application | =1 if the customer initiated the application by filling out an application at the branch. | FR Y-14M |
| Customer Init: Other Application | =1 if the customer initiated the application through a channel other than filling out an application at the branch. | FR Y-14M |
| Bank Init: Pre-Approved Offer | =1 if the bank initiated a pre-approved offer. | FR Y-14M |
| Bank Init: Invitation to Apply | =1 if the bank invited the customer to apply. | FR Y-14M |
| Other Init *(left-out category)* | =1 if the card application was initiated through another channel than the four listed above or if the channel is unknown. | |
| **Bank Characteristics** | | |
| Bank Size | The natural log of bank total assets. | FR Y9C |
| Bank Age | The bank age in years. | FR Y9C |
| Bank Total Assets ($bill.) | Bank total assets. | FR Y9C |
| Capital Ratio | Bank's capital ratio, calculated as bank equity capital/total assets. | FR Y9C |
| Liquidity Ratio | Bank's liquid asset ratio, calculated as (cash + marketable securities)/total assets. | FR Y9C |
| NPL Ratio | Nonperforming loans to total loans. | FR Y9C |
| Earnings | Bank's ROE (net income over total equity). | FR Y9C |
| Loans Ratio | Ratio of total loans to total assets. | FR Y9C |
| **Local market indicators** | | |
| Cnty Unemployment | Unemployment rate at county level monthly; supplement with state when not available for county. | Haver Analytics/BLS |
| Cnty HPI | County House Price Index. | CoreLogic Solutions |
| Cnty Change in HPI | Change in the House Price Index (HPI) at county level monthly; supplement with state when not available for county. | CoreLogic Solutions |



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| Additional Variables Used in Other Analyses | Definition | Source/ Authors' Calculation Based on: |
|---|---|---|
| **Other Customer, Loan, or Bank Characteristics** | | |
| Ln(1+Closest Bank Distance) | Natural log of one plus the distance in miles between the customer ZIP and the closed bank branch. | FR Y-14M, Summary of Deposits |
| BANK_REL_4Y | =1 if the customer has a previous relationship with the bank in the past 4 years (credit card and/or conventional relationship). | FR Y-14M |
| BANK_REL_5Y | =1 if the customer has a previous relationship with the bank in the past 5 years (credit card and/or conventional relationship). | FR Y-14M |
| BANK_REL_PRE | =1 if the customer has a previous relationship in any of the prior years (credit card and/or conventional relationship). | FR Y-14M |
| CARD_BANK_REL_3Y | =1 if the customer has a previous credit card relationship with the bank in the past 3 years. | FR Y-14M |
| CONVENTIONAL_BANK_REL | =1 if the customer has a previous conventional bank relationship based on past provision of deposits; investments; mortgage, auto, student, or other loans; or multiple products. | FR Y-14M |
| DEPOSIT_REL | =1 if the customer has a previous conventional bank relationship based on past provision of deposits. | FR Y-14M |
| INVESTMENT_REL | =1 if the customer has a previous conventional bank relationship based on past provision of investments. | FR Y-14M |
| MORTGAGE_REL | =1 if the customer has a previous conventional bank relationship based on past provision of mortgage products. | FR Y-14M |
| AUTO_REL | =1 if the customer has a previous conventional bank relationship based on past provision of auto loans. | FR Y-14M |
| STUDENT_REL | =1 if the customer has a previous conventional bank relationship based on past provision of student loans. | FR Y-14M |
| OTHERLOAN_REL | =1 if the customer has a previous conventional bank relationship based on past provision of other loans. | FR Y-14M |
| MULTI_PRODUCT_REL | =1 if the customer has a previous conventional bank relationship based on past provision of multiple banking products. | FR Y-14M |
| PPP Loans/Total Assets | Ratio of bank PPP Loans in 2020:Q2 divided by bank total assets. | FR Y9C |
| Behavioral Score | The behavioral score on the account if available scaled between 0 and 1. | FR Y-14M |
| Behavioral Score_Missing | Indicator for accounts with missing behavioral score. | FR Y-14M |
| Ln(1+ Num CC Complaints) | Natural log of one plus number of credit card complaints received by the bank in a month. | CFPB Complaints Database |
| **Other Crisis Indicators** | | |
| US Restrictions Index | National restrictions index, the state-population weighted average of the individual U.S. state restrictions for COVID-19 over time. | University of Washington |
| State Restrictions Index | An index capturing 10 different mandated statewide state restrictions with potential impact on economic activity: (1) Emergency Declaration; (2) Stay at Home; (3) Non-essential Business Close; (4) Other Business Close; (5) Restaurant Restrictions; (6) School Close; (7) Gathering Restrictions; (8) Travel Restrictions; (9) Quarantine/Case Isolation Orders, and (10) Bar Restrictions. We add a 1 for each restriction that is present in a state. Thus, index values range from 0 to 10, with 10 being the most restrictive. | University of Washington |
| GPS State Immobility | GPS immobility indexed to Jan 3-Feb 6, 2020, showing time spend inside (rather than outside) of residential locations. | Chetty, Friedman, Hendren, Stepner (2020) |
| County New Cases/100K Pop | New cases/(population/100,000), The rate of the state population that is newly infected per 100K population. | Johns Hopkins University |
| County New Deaths/100K Pop | Total deaths/(population/100,000), The rate of the state population that died per 100K population. | Johns Hopkins University |



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*Panel B: Summary Statistics*

Summary statistics for variables used in the analysis for our consumer and small business samples during normal times (June 2013 – February 2020) in Panel B.1 and changes during the COVID-19 crisis (November 2019 – June 2020: pre+during COVID-19) in Panel B.2. Loan origination data come from the FR Y-14M credit card dataset We use a 0.5% random sample for consumer accounts and a 5% random sample for small business accounts. Variables are defined in Table 1 Panel A.

*Panel B.1: Normal Times Samples*

| | **Consumer Sample** | | **Small Business Sample** | |
|---|---|---|---|---|
| **Sample** | (0.5% Random Sample: 805,433 obs) | | (5% Random Sample: 281,034 obs) | |
| **Variable** | **mean** | **sd** | **mean** | **sd** |
| APR Spread | 13.833 | 9.774 | 10.983 | 8.783 |
| Ln(1+Limit) | 8.316 | 1.183 | 9.239 | 0.841 |
| Limit ($) | 7,118.613 | 7,107.143 | 13,888.980 | 10,900.620 |
| BANK_REL_3Y | 0.350 | 0.477 | 0.563 | 0.496 |
| Customer Credit Score *(not used in regr.)* | 730.647 | 71.570 | 761.228 | 60.095 |
| Customer Credit Score < 580 *(left-out category)* | 0.022 | 0.146 | 0.007 | 0.084 |
| Customer Credit Score [580, 660) | 0.141 | 0.348 | 0.042 | 0.200 |
| Customer Credit Score [660_720) | 0.279 | 0.448 | 0.194 | 0.396 |
| Customer Credit Score ≥720 | 0.559 | 0.497 | 0.757 | 0.429 |
| Ln(1+Customer Income) *(not used in regr.)* | 10.943 | 1.112 | 11.315 | 1.732 |
| Customer Income < 25K *(left-out category)* | 0.119 | 0.324 | 0.110 | 0.313 |
| Customer Income [25K, 50K) | 0.276 | 0.447 | 0.100 | 0.300 |
| Customer Income [50K, 100K) | 0.375 | 0.484 | 0.289 | 0.453 |
| Customer Income [100K, 150K) | 0.118 | 0.323 | 0.151 | 0.358 |
| Customer Income ≥150K | 0.112 | 0.315 | 0.350 | 0.477 |
| Customer Utilization Ratio | 0.106 | 0.237 | 0.048 | 0.177 |
| Joint Account | 0.018 | 0.134 | 0.681 | 0.466 |
| Many Authorized Users | 0.004 | 0.062 | 0.122 | 0.327 |
| Variable Rate | 0.944 | 0.230 | 0.993 | 0.083 |
| Secured | 0.021 | 0.143 | 0.011 | 0.106 |
| Promotional | 0.235 | 0.424 | 0.187 | 0.390 |
| General Purpose | 0.699 | 0.459 | 0.840 | 0.366 |
| Cobrand | 0.250 | 0.433 | 0.159 | 0.366 |
| Affinity | 0.034 | 0.180 | 0.000 | 0.005 |
| Other Card *(left-out category)* | 0.018 | 0.132 | 0.000 | 0.000 |
| Customer Init: Branch Application | 0.532 | 0.499 | 0.342 | 0.474 |
| Customer Init: Other Application | 0.145 | 0.352 | 0.247 | 0.431 |
| Bank Init: Pre-Approved Offer | 0.148 | 0.355 | 0.081 | 0.273 |
| Bank Init: Invitation to Apply | 0.103 | 0.305 | 0.252 | 0.434 |
| Other Init: *(left-out category)* | 0.072 | 0.258 | 0.078 | 0.268 |
| Bank Size | 20.678 | 1.210 | 21.041 | 1.010 |
| Bank Age | 56.924 | 39.542 | 65.478 | 39.880 |
| Capital Ratio | 0.113 | 0.016 | 0.108 | 0.013 |
| Liquidity Ratio | 0.253 | 0.055 | 0.255 | 0.043 |
| NPL Ratio | 0.019 | 0.011 | 0.017 | 0.010 |
| Earnings | 0.122 | 0.071 | 0.125 | 0.074 |
| Loans Ratio | 0.518 | 0.165 | 0.471 | 0.141 |
| Cnty Unemployment | 4.841 | 1.765 | 4.474 | 1.626 |
| Cnty HPI | 182.153 | 50.900 | 199.270 | 56.478 |
| Cnty Change in HPI | 0.003 | 0.010 | 0.003 | 0.009 |
| *Additional:* | | | | |
| Bank Total Assets ($bill.) *(not used in regr.)* | 1581.196 | 1090.552 | 1913.745 | 1012.673 |
| Borrower Income ($) *(not used in regr.)* | 102,308.4 | 2,156,987.0 | 192,295.1 | 1,177,828.0 |
| Ln(1+Closest Bank Distance) | 2.824 | 2.781 | 1.841 | 2.594 |
| Closest Bank Distance (miles) | 286.910 | 575.574 | 201.899 | 508.236 |
| CARD_BANK_REL_3Y | 0.158 | 0.365 | 0.293 | 0.455 |
| CONVENTIONAL BANK_REL | 0.251 | 0.434 | 0.346 | 0.476 |
| DEPOSIT_REL | 0.148 | 0.355 | 0.173 | 0.378 |
| INVESTMENT_REL | 0.003 | 0.055 | 0.002 | 0.041 |
| MORTGAGE_REL | 0.009 | 0.095 | 0.005 | 0.068 |
| AUTO_REL | 0.008 | 0.087 | 0.004 | 0.062 |
| STUDENT_REL | 0.001 | 0.034 | 0.000 | 0.011 |
| OTHERLOAN_REL | 0.001 | 0.034 | 0.002 | 0.039 |
| MULTI_PRODUCT_REL | 0.081 | 0.273 | 0.161 | 0.368 |



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*Panel B.2: Pre+During COVID-19 Samples*

| Sample | Consumer Sample (0.5% Random Sample) | | | | | | Small Business Sample (5% Random Sample) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pre+During COVID-19 (61,621 obs)* | | *Pre-COVID-19 (40,942 obs)* | | *During COVID-19 (20,679 obs)* | | *Pre+During COVID-19 (34,082 obs)* | | *Pre-COVID-19 (23,074 obs)* | | *During COVID-19 (11,008 obs)* | |
| **Variable** | **mean** | **sd** | **mean** | **sd** | **mean** | **sd** | **mean** | **sd** | **mean** | **sd** | **mean** | **sd** |
| APR Spread | 14.831 | 10.094 | 14.993 | 9.938 | 14.509 | 10.388 | 12.208 | 9.133 | 11.810 | 9.401 | 13.043 | 8.486 |
| Ln(1+Limit) | 8.372 | 1.212 | 8.384 | 1.239 | 8.346 | 1.158 | 9.218 | 0.858 | 9.268 | 0.849 | 9.114 | 0.868 |
| Limit ($) | 7,457.493 | 6,950.780 | 7721.072 | 7261.089 | 6935.638 | 6258.926 | 14,021.930 | 11,693.280 | 14628.490 | 11976.980 | 12750.510 | 10967.240 |
| BANK_REL_3Y | 0.331 | 0.470 | 0.329 | 0.470 | 0.333 | 0.471 | 0.543 | 0.498 | 0.554 | 0.497 | 0.519 | 0.500 |
| COVID-19 Crisis | 0.336 | 0.472 | 0.000 | 0.000 | 1.000 | 0.000 | 0.323 | 0.468 | 0.000 | 0.000 | 1.000 | 0.000 |
| Customer Credit Score *(not used in regr.)* | 735.046 | 72.918 | 734.676 | 73.451 | 735.777 | 71.847 | 766.302 | 56.150 | 765.920 | 57.068 | 767.101 | 54.170 |
| Customer Credit Score < 580 *(left-out category)* | 0.026 | 0.158 | 0.025 | 0.156 | 0.027 | 0.162 | 0.002 | 0.043 | 0.001 | 0.036 | 0.003 | 0.055 |
| Customer Credit Score [580, 660) | 0.127 | 0.333 | 0.135 | 0.342 | 0.112 | 0.315 | 0.033 | 0.179 | 0.036 | 0.187 | 0.026 | 0.159 |
| Customer Credit Score [660_720) | 0.252 | 0.434 | 0.249 | 0.433 | 0.258 | 0.438 | 0.177 | 0.382 | 0.182 | 0.386 | 0.168 | 0.374 |
| Customer Credit Score ≥720 | 0.595 | 0.491 | 0.590 | 0.492 | 0.603 | 0.489 | 0.788 | 0.409 | 0.780 | 0.414 | 0.803 | 0.397 |
| Ln(1+Customer Income) *(not used in regr.)* | 11.112 | 0.814 | 11.125 | 0.804 | 11.087 | 0.833 | 11.792 | 1.183 | 11.796 | 1.169 | 11.783 | 1.212 |
| Customer Income < 25K *(left-out category)* | 0.081 | 0.273 | 0.078 | 0.269 | 0.086 | 0.281 | 0.038 | 0.192 | 0.038 | 0.192 | 0.039 | 0.194 |
| Customer Income [25K, 50K) | 0.251 | 0.433 | 0.247 | 0.431 | 0.258 | 0.438 | 0.080 | 0.271 | 0.079 | 0.270 | 0.081 | 0.273 |
| Customer Income [50K, 100K) | 0.395 | 0.489 | 0.397 | 0.489 | 0.391 | 0.488 | 0.264 | 0.441 | 0.264 | 0.441 | 0.266 | 0.442 |
| Customer Income [100K, 150K) | 0.134 | 0.341 | 0.136 | 0.343 | 0.132 | 0.338 | 0.170 | 0.376 | 0.167 | 0.373 | 0.176 | 0.381 |
| Customer Income ≥150K | 0.138 | 0.345 | 0.141 | 0.348 | 0.133 | 0.339 | 0.447 | 0.497 | 0.451 | 0.498 | 0.438 | 0.496 |
| Customer Utilization Ratio | 0.090 | 0.222 | 0.096 | 0.228 | 0.078 | 0.210 | 0.052 | 0.229 | 0.050 | 0.217 | 0.058 | 0.252 |
| Joint Account | 0.009 | 0.097 | 0.008 | 0.087 | 0.013 | 0.114 | 0.573 | 0.495 | 0.614 | 0.487 | 0.487 | 0.500 |
| Many Authorized Users | 0.005 | 0.067 | 0.004 | 0.066 | 0.005 | 0.070 | 0.105 | 0.307 | 0.112 | 0.315 | 0.092 | 0.289 |
| Variable Rate | 0.591 | 0.492 | 0.889 | 0.314 | 0.000 | 0.000 | 0.653 | 0.476 | 0.964 | 0.186 | 0.000 | 0.000 |
| Secured | 0.023 | 0.150 | 0.017 | 0.127 | 0.036 | 0.187 | 0.006 | 0.075 | 0.004 | 0.066 | 0.008 | 0.092 |
| Promotional | 0.216 | 0.411 | 0.206 | 0.404 | 0.236 | 0.425 | 0.188 | 0.391 | 0.185 | 0.389 | 0.193 | 0.394 |
| General Purpose | 0.652 | 0.476 | 0.632 | 0.482 | 0.691 | 0.462 | 0.767 | 0.422 | 0.772 | 0.419 | 0.757 | 0.429 |
| Cobrand | 0.326 | 0.469 | 0.347 | 0.476 | 0.285 | 0.451 | 0.233 | 0.422 | 0.228 | 0.419 | 0.243 | 0.429 |
| Affinity | 0.004 | 0.064 | 0.004 | 0.064 | 0.004 | 0.065 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Other Card *(left-out category)* | 0.018 | 0.133 | 0.017 | 0.130 | 0.020 | 0.140 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Customer Init: Branch Application | 0.631 | 0.482 | 0.614 | 0.487 | 0.666 | 0.472 | 0.421 | 0.494 | 0.420 | 0.494 | 0.422 | 0.494 |
| Customer Init: Other Application | 0.100 | 0.300 | 0.107 | 0.309 | 0.087 | 0.282 | 0.161 | 0.368 | 0.163 | 0.369 | 0.157 | 0.364 |
| Bank Init: Pre-Approved Offer | 0.111 | 0.315 | 0.106 | 0.308 | 0.121 | 0.327 | 0.097 | 0.296 | 0.094 | 0.292 | 0.103 | 0.304 |
| Bank Init: Invitation to Apply | 0.124 | 0.330 | 0.137 | 0.344 | 0.099 | 0.298 | 0.076 | 0.265 | 0.091 | 0.287 | 0.045 | 0.207 |
| Other Init: *(left-out category)* | 0.032 | 0.177 | 0.035 | 0.185 | 0.027 | 0.161 | 0.245 | 0.430 | 0.232 | 0.422 | 0.272 | 0.445 |
| Bank Size | 20.676 | 1.216 | 20.623 | 1.207 | 20.780 | 1.227 | 20.725 | 1.206 | 20.818 | 1.172 | 20.529 | 1.253 |
| Bank Age | 58.483 | 40.698 | 57.697 | 41.812 | 60.039 | 38.350 | 85.010 | 53.788 | 80.320 | 51.934 | 94.841 | 56.227 |
| Capital Ratio | 0.107 | 0.019 | 0.111 | 0.018 | 0.099 | 0.017 | 0.107 | 0.013 | 0.108 | 0.013 | 0.105 | 0.012 |
| Liquidity Ratio | 0.243 | 0.048 | 0.236 | 0.049 | 0.257 | 0.042 | 0.235 | 0.039 | 0.228 | 0.040 | 0.250 | 0.033 |
| NPL Ratio | 0.010 | 0.003 | 0.010 | 0.003 | 0.010 | 0.003 | 0.009 | 0.002 | 0.009 | 0.002 | 0.009 | 0.002 |
| Earnings | 0.109 | 0.077 | 0.138 | 0.069 | 0.049 | 0.054 | 0.139 | 0.083 | 0.163 | 0.080 | 0.088 | 0.062 |
| Loans Ratio | 0.523 | 0.171 | 0.530 | 0.173 | 0.509 | 0.167 | 0.514 | 0.162 | 0.506 | 0.167 | 0.530 | 0.150 |
| Cnty Unemployment | 5.119 | 4.164 | 3.465 | 1.144 | 8.393 | 5.740 | 4.817 | 4.000 | 3.325 | 1.038 | 7.945 | 5.731 |
| Cnty HPI | 208.604 | 54.473 | 207.716 | 54.204 | 210.364 | 54.960 | 222.538 | 58.096 | 221.815 | 58.153 | 224.053 | 57.949 |
| Cnty Change in HPI | 0.003 | 0.009 | 0.003 | 0.009 | 0.004 | 0.009 | 0.003 | 0.009 | 0.003 | 0.009 | 0.004 | 0.009 |
| *Additional:* | | | | | | | | | | | | |



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| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bank Total Assets ($bill.) *(not used in regr.)* | 1608.240 | 1157.329 | 1536.721 | 1135.440 | 1749.840 | 1186.870 | 1679.201 | 1171.840 | 1761.903 | 1140.764 | 1505.848 | 1216.383 |
| Borrower Income ($) *(not used in regr.)* | 130,366.6 | 3,659,879 | 137,584.3 | 4,356,178 | 116,076.4 | 1,530,992 | 308,427 | 1,766,757 | 311,454 | 1,934,243 | 302,082.1 | 1,349,921 |
| Ln(1+Closest Bank Distance) | 3.065 | 2.807 | 3.158 | 2.837 | 2.882 | 2.735 | 2.908 | 3.113 | 2.741 | 3.051 | 3.258 | 3.211 |
| Closest Bank Distance (miles) | 322.452 | 605.177 | 339.883 | 612.139 | 287.942 | 589.648 | 427.678 | 697.611 | 388.164 | 673.123 | 510.505 | 739.551 |
| CARD_BANK_REL_3Y | 0.163 | 0.369 | 0.174 | 0.379 | 0.140 | 0.347 | 0.313 | 0.464 | 0.334 | 0.472 | 0.270 | 0.444 |
| CONVENTIONAL_BANK_REL | 0.226 | 0.418 | 0.214 | 0.410 | 0.250 | 0.433 | 0.302 | 0.459 | 0.296 | 0.456 | 0.314 | 0.464 |
| DEPOSIT_REL | 0.138 | 0.345 | 0.131 | 0.338 | 0.152 | 0.359 | 0.250 | 0.433 | 0.246 | 0.431 | 0.259 | 0.438 |
| INVESTMENT_REL | 0.002 | 0.048 | 0.002 | 0.044 | 0.003 | 0.056 | 0.001 | 0.033 | 0.001 | 0.032 | 0.001 | 0.037 |
| MORTGAGE_REL | 0.008 | 0.091 | 0.007 | 0.084 | 0.011 | 0.104 | 0.003 | 0.058 | 0.004 | 0.060 | 0.003 | 0.055 |
| AUTO_REL | 0.009 | 0.095 | 0.008 | 0.089 | 0.011 | 0.106 | 0.003 | 0.057 | 0.004 | 0.063 | 0.002 | 0.040 |
| STUDENT_REL | 0.001 | 0.037 | 0.001 | 0.035 | 0.002 | 0.040 | 0.000 | 0.011 | 0.000 | 0.013 | 0.000 | 0.000 |
| OTHERLOAN_REL | 0.002 | 0.040 | 0.001 | 0.038 | 0.002 | 0.044 | 0.005 | 0.072 | 0.005 | 0.068 | 0.006 | 0.079 |
| MULTI_PRODUCT_REL | 0.065 | 0.246 | 0.063 | 0.243 | 0.069 | 0.253 | 0.039 | 0.193 | 0.037 | 0.188 | 0.043 | 0.202 |



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## Table 2: Relationship Effects on Credit Card Customers: Normal Times and Changes During COVID-19

Regressions analyzing the effects of relationships on credit card terms (*APR Spread* and *Ln(1+Limit)*) for new originations during normal times (Panel A) and changes during the COVID-19 crisis (Panel B). Loan origination data are from the FR Y-14M credit card dataset. Normal times sample period: June 2013 - February 2020; pre+during COVID-19 sample period: November 2019 – June 2020. We use a 0.5% random sample for consumer accounts and a 5% random sample for small business accounts. Customer and loan controls are measured at the origination time or the FR Y-14M report month-end; bank characteristics are lagged one quarter; local market controls are measured at the county level. All regressions include Bank, County, and Month-Year fixed effects. Variables are defined in Table 1 Panel A. Heteroskedasticity-robust *t*-statistics clustered at the county level are in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Panel A: Normal Times Sample | | | | Panel B: Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| **BANK_REL_3Y** | -0.525*** | 0.092*** | 1.069*** | -0.105*** | -0.859*** | 0.081*** | 0.902*** | -0.185*** |
| | (-8.951) | (36.803) | (29.991) | (-27.704) | (-10.358) | (9.534) | (8.881) | (-15.468) |
| **BANK_REL_3Y × COVID-19 Crisis** | | | | | -0.815*** | 0.004 | -0.322** | 0.113*** |
| | | | | | (-6.294) | (0.269) | (-2.479) | (5.989) |
| Customer & Loan Controls | | | | | | | | |
| Ln(1+Limit) | -0.596*** | | -0.644*** | | -0.988*** | | -0.643*** | |
| | (-12.884) | | (-19.355) | | (-18.142) | | (-13.021) | |
| Customer Credit Score [580, 660) | -0.417*** | 0.305*** | -0.739*** | 0.234*** | -1.680*** | 0.343*** | -3.945*** | 0.363*** |
| | (-5.830) | (39.837) | (-4.729) | (7.699) | (-9.476) | (16.183) | (-4.888) | (2.640) |
| Customer Credit Score [660_720) | -1.320*** | 0.976*** | -1.119*** | 0.634*** | -4.084*** | 1.061*** | -4.247*** | 0.743*** |
| | (-16.485) | (127.741) | (-7.240) | (18.190) | (-20.358) | (46.025) | (-5.216) | (5.395) |
| Customer Credit Score ≥720 | -2.402*** | 1.692*** | -2.552*** | 1.105*** | -5.736*** | 1.722*** | -5.739*** | 1.228*** |
| | (-28.022) | (219.467) | (-16.143) | (31.370) | (-27.071) | (73.278) | (-7.110) | (8.961) |
| Customer Income [25K, 50K) | 0.423*** | 0.352*** | -0.152*** | 0.132*** | 0.770*** | 0.393*** | -0.047 | 0.067*** |
| | (11.729) | (100.828) | (-2.856) | (12.959) | (5.932) | (30.190) | (-0.274) | (2.778) |
| Customer Income [50K, 100K) | 0.901*** | 0.759*** | 0.273*** | 0.335*** | 1.200*** | 0.835*** | 0.471*** | 0.228*** |
| | (20.412) | (139.430) | (5.320) | (33.168) | (9.414) | (65.854) | (3.118) | (10.686) |
| Customer Income [100K, 150K) | 1.058*** | 1.029*** | 0.524*** | 0.448*** | 1.264*** | 1.133*** | 0.824*** | 0.345*** |
| | (20.008) | (147.126) | (7.954) | (42.764) | (8.570) | (73.893) | (5.141) | (15.093) |
| Customer Income ≥150K | 1.375*** | 1.268*** | 0.912*** | 0.683*** | 1.458*** | 1.344*** | 1.109*** | 0.603*** |
| | (22.958) | (128.045) | (14.116) | (65.425) | (9.666) | (79.697) | (7.276) | (27.672) |
| Customer Utilization Ratio | 3.881*** | -0.460*** | 3.136*** | -0.434*** | 5.031*** | -0.455*** | 1.911*** | -0.306*** |
| | (45.581) | (-75.638) | (6.011) | (-6.120) | (31.096) | (-27.612) | (3.787) | (-4.906) |
| Joint Account | 1.834*** | 0.031*** | -0.084 | -0.300*** | 6.112*** | 0.102*** | -0.746*** | -0.346*** |
| | (21.668) | (3.871) | (-1.361) | (-20.700) | (18.700) | (2.826) | (-4.719) | (-6.078) |
| Many Authorized Users | 0.560*** | 0.275*** | 0.745*** | 0.107*** | 0.992** | 0.159*** | 0.393*** | 0.163*** |
| | (4.709) | (20.284) | (14.207) | (17.295) | (2.372) | (3.935) | (3.235) | (9.190) |
| Variable Rate | -10.027*** | -0.291*** | -1.594*** | -0.105*** | -7.592*** | -0.054*** | 0.460*** | 0.001 |
| | (-57.888) | (-34.870) | (-5.697) | (-3.234) | (-35.933) | (-3.788) | (2.742) | (0.030) |
| Secured | 4.082*** | -1.132*** | 5.703*** | -1.263*** | 2.764*** | -1.055*** | 7.235*** | -1.354*** |
| | (38.804) | (-147.834) | (36.357) | (-64.748) | (14.478) | (-42.085) | (16.308) | (-15.425) |
| Promotional | -6.713*** | 0.193*** | -6.301*** | 0.045*** | -6.689*** | 0.184*** | -4.233*** | 0.028* |
| | (-94.166) | (23.391) | (-57.327) | (5.547) | (-53.757) | (14.757) | (-29.456) | (1.786) |
| General Purpose | 4.124*** | 0.676*** | 4.600** | 0.136 | 5.067*** | 0.595*** | -5.528*** | -0.117*** |
| | (43.695) | (94.375) | (2.554) | (0.534) | (17.079) | (23.161) | (-36.335) | (-7.440) |
| Cobrand | 9.491*** | 0.795*** | 9.902*** | 0.181 | 9.797*** | 0.618*** | | |
| | (59.585) | (69.555) | (5.553) | (0.710) | (33.988) | (23.157) | | |
| Affinity | -1.425*** | 0.572*** | | | 5.520*** | 0.625*** | | |
| | (-10.695) | (54.480) | | | (11.213) | (12.051) | | |
| Customer Init: Branch Application | -1.307*** | -0.060*** | 1.196*** | -0.093*** | -1.584*** | -0.040** | 0.427 | -0.176*** |
| | (-11.310) | (-8.124) | (6.377) | (-10.144) | (-7.060) | (-2.126) | (1.310) | (-4.032) |
| Customer Init: Other Application | -5.264*** | -0.024** | -1.380*** | -0.008 | -4.432*** | -0.031 | -2.092*** | 0.012 |
| | (-35.176) | (-2.225) | (-5.812) | (-0.863) | (-16.698) | (-1.564) | (-5.831) | (0.257) |
| Bank Init: Pre-Approved Offer | -7.835*** | 0.009 | -0.115 | 0.061*** | -7.850*** | 0.027 | 0.543* | -0.055 |
| | (-59.320) | (1.166) | (-0.575) | (5.474) | (-31.543) | (1.373) | (1.713) | (-1.183) |
| Bank Init: Invitation to Apply | -6.168*** | 0.111*** | 0.807*** | 0.083*** | -3.840*** | 0.026 | -2.460*** | 0.084* |
| | (-47.991) | (12.310) | (4.602) | (8.467) | (-16.178) | (1.245) | (-5.794) | (1.701) |
| Bank Controls (Lagged 1 quarter) | | | | | | | | |
| Bank Size | -5.613*** | -0.349*** | 6.614*** | 0.153 | -9.455*** | -0.402*** | 3.135 | 0.368 |
| | (-10.339) | (-8.619) | (7.500) | (1.225) | (-8.422) | (-4.121) | (0.780) | (0.633) |
| Bank Age | 0.380*** | 0.048*** | -0.312** | 0.032* | 3.617*** | 0.174*** | 1.812*** | 0.140** |
| | (5.985) | (5.882) | (-2.451) | (1.844) | (10.720) | (4.947) | (5.465) | (2.202) |
| Capital Ratio | 88.612*** | -3.723*** | 18.020*** | 2.478*** | 161.544*** | 3.897** | 108.420*** | 6.260 |
| | (31.297) | (-15.416) | (2.839) | (3.125) | (10.612) | (2.353) | (3.108) | (1.134) |
| Liquidity Ratio | 5.806*** | 1.350*** | 53.833*** | 3.073*** | 1.696 | -6.124*** | -22.705** | 0.768 |
| | (6.855) | (14.851) | (46.157) | (19.322) | (0.234) | (-8.979) | (-2.188) | (0.415) |
| NPL Ratio | 116.753*** | -4.358*** | 55.600*** | -1.650* | 249.930*** | -70.104*** | 135.648 | -26.168 |
| | (26.570) | (-15.871) | (9.013) | (-1.887) | (3.076) | (-8.558) | (1.057) | (-1.617) |
| Earnings | -3.263*** | 0.739*** | 16.389*** | 0.429*** | -9.015*** | -0.637*** | -12.067*** | 0.819** |
| | (-13.154) | (21.515) | (21.769) | (4.631) | (-7.666) | (-5.073) | (-4.130) | (2.278) |
| Loans Ratio | 2.803** | 3.192*** | 65.298*** | 1.283*** | 57.339*** | 0.286 | 24.253** | -1.149 |
| | (2.091) | (25.980) | (24.046) | (4.521) | (10.416) | (0.490) | (2.046) | (-0.680) |



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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Local Market Controls (Lagged 1 mo) | | | | | | | | |
| Cnty Unemployment | -0.108*** | -0.001 | 0.011 | -0.003 | 0.061** | 0.004*** | 0.032** | 0.006** |
| | (-4.230) | (-0.331) | (0.441) | (-0.780) | (2.556) | (2.669) | (2.477) | (2.409) |
| Cnty HPI | 0.011*** | 0.000*** | 0.002 | 0.001** | -0.018 | -0.002 | -0.025 | 0.005** |
| | (4.571) | (5.165) | (0.972) | (2.382) | (-0.803) | (-1.060) | (-1.475) | (2.292) |
| Cnty Change in HPI | -0.785 | -0.102 | 0.862 | -0.097 | -3.524 | 0.345 | 7.002* | -0.401 |
| | (-0.888) | (-1.118) | (0.683) | (-0.709) | (-0.823) | (1.007) | (1.750) | (-0.723) |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.528 | 0.613 | 0.589 | 0.320 | 0.529 | 0.648 | 0.636 | 0.248 |



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## Table 3: Effects on Credit Card Customers during Normal Times and Changes during the COVID-19 Crisis – Robustness of Main Results

Regressions analyzing the effects of relationships on credit card terms during normal times and changes during the COVID-19 crisis using several robustness tests. Panel A presents results from instrumental variable (IV) analyses using *Ln(1+Closest Bank Branch)* as an instrument for relationships. The instrument for relationship existence is *Ln(1+Closest Bank Distance)*, the natural log of one plus the geographical distance in miles between the customer residence ZIP code and the closest bank branch. Kleibergen-Paap rk Wald *F* statistic and Kleibergen-Paap rk *LM* statistic test for instrument weakness and under-identification to ascertain instrument validity. Panel B presents results from propensity score matched (PSM) analyses using 1:1 matching without replacement and 1% caliper. Panel C presents Heckman (1979) selection model results from the outcome equations which also incorporate the lambda (inverse mills ratio). Panel D presents results from falsification tests in which we randomly assign relationship status to customers while maintaining the original distribution. Loan origination data are from the FR Y-14M credit card dataset. Normal times sample period: June 2013 - February 2020; pre+during COVID-19 sample period: November 2019 – June 2020. We use a 0.5% random sample for consumer accounts and a 5% random sample for small business accounts. Customer and loan controls are measured at the origination time or the FR Y-14M report month-end; bank characteristics are lagged one quarter; local market controls are measured at the county level. All regressions include Bank, County, and Month-Year fixed effects. Variables are defined in Table 1 Panel A. Heteroskedasticity-robust *t*-statistics clustered at the county level are in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

*Panel A: Instrumental Variable (IV) Analysis (as in Wooldridge (2002) Section 18.4.1, pp. 236-237)*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | | | Pre+During COVID-19 Crisis Sample | | | | | |
| | 1st Stage Probit | IV Last (3rd) Stage | | 1st Stage Probit | IV Last (3rd) Stage | | 1st Stage Probit | IV Last (3rd) Stage | | 1st Stage Probit | IV Last (3rd) Stage | |
| | **Consumer Accounts** | | | **Small Business Accounts** | | | **Consumer Accounts** | | | **Small Business Accounts** | | |
| **Dependent Variable:** | BANK_REL_3Y | APR Spread | Ln(1+ Limit) | BANK_REL_3Y | APR Spread | Ln(1+ Limit) | BANK_REL_3Y | APR Spread | Ln(1+ Limit) | BANK_REL_3Y | APR Spread | Ln(1+ Limit) |
| **Independent Variables:** | | | | | | | | | | | | |
| Ln(1+Closest Bank Distance) | -0.175*** | | | -0.123*** | | | -0.158*** | | | -0.110*** | | |
| | (-43.322) | | | (-27.984) | | | (-27.571) | | | (-15.710) | | |
| BANK_REL_3Y | | -4.475*** | 0.363*** | | 3.978*** | -0.463*** | | -5.236*** | 0.263*** | | 6.463*** | 0.278 |
| | | (-16.962) | (11.637) | | (3.565) | (-4.595) | | (-8.290) | (4.806) | | (2.857) | (0.975) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | | | | -1.030*** | -0.014 | | -1.803*** | 0.208*** |
| | | | | | | | | (-2.636) | (-0.325) | | (-3.913) | (3.393) |
| Ln(1+Limit) | NO | YES | NO | NO | YES | NO | NO | YES | NO | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| County, Bank FE | NO | YES | YES | NO | YES | YES | NO | YES | YES | NO | YES | YES |
| Month-Year FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,480 | 805,433 | 805,433 | 281,338 | 281,027 | 281,027 | 62,077 | 61,621 | 61,621 | 34,682 | 34,082 | 34,082 |
| Pseudo / Adjusted R-squared | 0.203 | 0.346 | 0.513 | 0.176 | 0.267 | 0.206 | 0.165 | 0.312 | 0.512 | 0.125 | 0.141 | 0.124 |
| Weak ID Kleibergen-Paap rk Wald *F* statistic | | 1853.0*** | 1893.0*** | | 406.1*** | 398.7*** | | 255.1*** | 256.2*** | | 27.5*** | 25.5*** |
| Underident Kleibergen-Paap rk *LM* statistic | | 297.2*** | 295.0*** | | 193.9*** | 188.9*** | | 243.4*** | 241.9*** | | 52.7*** | 50.3*** |

*Panel B: Propensity Score Matching (PSM) without Replacement and 1% Caliper*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.376*** | 0.089*** | 1.186*** | -0.102*** | -0.375*** | 0.086*** | 0.908*** | -0.186*** |
| | (-5.823) | (27.966) | (33.910) | (-27.051) | (-3.682) | (8.371) | (8.343) | (-14.718) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -1.140*** | 0.003 | -0.311** | 0.098*** |
| | | | | | (-6.896) | (0.171) | (-2.146) | (4.647) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 479,855 | 479,855 | 243,565 | 243,565 | 36,061 | 36,061 | 29,532 | 29,532 |
| Adjusted R-squared | 0.474 | 0.623 | 0.553 | 0.279 | 0.459 | 0.666 | 0.625 | 0.241 |



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*Panel C: Heckman (1979) Selection Model – Outcome Equation*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -2.712*** | 0.335*** | 3.656*** | -0.253*** | -3.991*** | 0.286*** | 4.790*** | -0.157 |
| | (-12.133) | (15.208) | (7.693) | (-7.194) | (-10.127) | (7.385) | (5.092) | (-1.300) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.767*** | 0.000 | -0.294** | 0.113*** |
| | | | | | (-5.953) | (0.031) | (-2.250) | (6.008) |
| *Inv Mills Ratio* | 1.332*** | -0.148*** | -1.575*** | 0.091*** | 1.897*** | -0.124*** | -2.374*** | -0.017 |
| | (10.954) | (-11.268) | (-5.517) | (4.348) | (7.831) | (-5.595) | (-4.083) | (-0.235) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,026 | 281,026 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.529 | 0.613 | 0.590 | 0.322 | 0.530 | 0.648 | 0.636 | 0.248 |

*Panel D: Falsification Tests: Randomly Assign Relationship Status to the Customers*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | 0.000 | 0.001 | -0.031 | 0.001 | 0.065 | 0.003 | -0.057 | 0.006 |
| | (0.015) | (0.637) | (-1.338) | (0.498) | (0.927) | (0.406) | (-0.730) | (0.611) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.036 | -0.018 | 0.037 | -0.028 |
| | | | | | (-0.270) | (-1.255) | (0.330) | (-1.487) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 803,354 | 803,354 | 280,209 | 280,209 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.531 | 0.612 | 0.586 | 0.317 | 0.527 | 0.647 | 0.634 | 0.241 |



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## Table 4: Decompositions of Relationships during Normal Times and Changes during the COVID-19 Crisis

Regressions analyzing the effects of relationships on credit card terms (*APR Spread* and *Ln(1+Limit)*) during normal times and changes during the COVID-19 crisis when decomposing relationships into prior credit card relationships and conventional bank relationships (based on past provision of deposits, investments, mortgage, auto, student, or other loans, or multiple products) in Panel A; conventional bank relationships split into individual components in Panel B. Loan origination data are from the FR Y-14M credit card dataset. Sample period: June 2013 - February 2020. We use a 0.5% random sample for consumer accounts and a 5% random sample for small business accounts. Customer and loan controls are measured at the origination time or the FR Y-14M report month-end; bank characteristics are lagged one quarter; local market controls are measured at the county level. All regressions include Bank, County, and Month-Year fixed effects. Variables are defined in Table 1 Panel A. Heteroskedasticity-robust *t*-statistics clustered at the county level are in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

*Panel A: Decomposition by Conventional Bank vs. Credit Card Relationships*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Decompositions of Bank Relationships** | | | | | | | |
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| CARD_BANK_REL_3Y | 0.654*** | 0.033*** | 1.806*** | -0.181*** | 0.124 | 0.034*** | 1.432*** | -0.239*** |
| | (19.764) | (13.007) | (40.759) | (-38.222) | (1.262) | (3.324) | (12.155) | (-16.154) |
| CONVENTIONAL_BANK_REL | -1.050*** | 0.097*** | -0.078 | 0.013*** | -1.215*** | 0.084*** | -0.018 | -0.050*** |
| | (-12.926) | (26.437) | (-1.611) | (3.144) | (-10.920) | (7.449) | (-0.173) | (-3.692) |
| CARD_REL_3Y × COVID-19 Crisis | | | | | 0.038 | -0.036** | -0.424*** | 0.076*** |
| | | | | | (0.256) | (-2.182) | (-2.759) | (3.385) |
| CONVENTIONAL_BANK_REL × COVID-19 Crisis | | | | | -0.986*** | 0.024 | -0.197 | 0.073*** |
| | | | | | (-6.174) | (1.542) | (-1.344) | (3.518) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.529 | 0.612 | 0.592 | 0.324 | 0.530 | 0.648 | 0.637 | 0.253 |



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*Panel B: Decomposition by Dimensions of Conventional Bank Relationships*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Decompositions of Bank Relationships** | | | | | | | |
| | Normal Times Sample | | Pre+During COVID-19 Crisis Sample | | | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| CARD_BANK_REL_3Y | 0.663*** | 0.034*** | 1.801*** | -0.180*** | 0.131 | 0.035*** | 1.434*** | -0.240*** |
| | (20.418) | (13.946) | (40.673) | (-38.292) | (1.342) | (3.402) | (12.205) | (-16.030) |
| CARD_REL_3Y × COVID-19 Crisis | | | | | 0.091 | -0.035** | -0.434*** | 0.075*** |
| | | | | | (0.610) | (-2.130) | (-2.867) | (3.303) |
| DEPOSIT_REL | -0.993*** | 0.052*** | 0.103* | -0.009* | -1.380*** | 0.058*** | -0.043 | -0.054*** |
| | (-10.183) | (12.293) | (1.958) | (-1.758) | (-9.563) | (4.561) | (-0.364) | (-3.617) |
| INVESTMENT_REL | -1.186*** | 0.210*** | 0.085 | 0.105*** | -0.347 | 0.178** | 1.414 | 0.218 |
| | (-6.876) | (14.883) | (0.298) | (2.767) | (-0.465) | (2.349) | (1.375) | (1.122) |
| MORTGAGE_REL | 0.252** | 0.044*** | 0.547*** | 0.075*** | -1.158** | -0.058 | 0.523 | -0.224** |
| | (2.069) | (5.411) | (3.188) | (4.184) | (-2.359) | (-1.321) | (0.773) | (-2.239) |
| AUTO_REL | 0.158 | 0.009 | 0.955*** | -0.003 | -0.909* | 0.072** | 1.836** | 0.006 |
| | (1.473) | (0.964) | (4.669) | (-0.123) | (-1.778) | (2.170) | (2.402) | (0.070) |
| STUDENT_REL | -0.036 | 0.048** | -0.765 | -0.135 | -1.501* | 0.093 | -1.118 | -0.093 |
| | (-0.154) | (2.059) | (-0.850) | (-1.313) | (-1.771) | (1.101) | (-1.594) | (-0.689) |
| OTHERLOAN_REL | -0.481*** | 0.024 | -1.043*** | -0.221*** | -0.748 | -0.131 | -0.299 | -0.534*** |
| | (-2.689) | (1.138) | (-3.648) | (-4.652) | (-1.011) | (-1.505) | (-0.827) | (-5.726) |
| MULTI_PRODUCT_REL | -1.627*** | 0.202*** | -0.496*** | 0.055*** | -1.051*** | 0.161*** | -0.248 | 0.073** |
| | (-16.823) | (33.909) | (-9.318) | (10.318) | (-6.645) | (9.432) | (-1.119) | (2.469) |
| DEPOSIT_REL × COVID-19 Crisis | | | | | -1.594*** | 0.026 | -0.232 | 0.074*** |
| | | | | | (-8.128) | (1.405) | (-1.456) | (3.303) |
| INVESTMENT_REL × COVID-19 Crisis | | | | | 0.360 | 0.030 | 1.264 | 0.125 |
| | | | | | (0.248) | (0.247) | (0.624) | (0.319) |
| MORTGAGE_REL × COVID-19 Crisis | | | | | 1.493* | 0.165*** | -0.583 | 0.206 |
| | | | | | (1.698) | (2.855) | (-0.447) | (1.205) |
| AUTO_REL × COVID-19 Crisis | | | | | -1.467 | 0.068 | 1.955 | 0.023 |
| | | | | | (-1.642) | (1.211) | (1.301) | (0.138) |
| STUDENT_REL × COVID-19 Crisis | | | | | 1.512 | 0.098 | | |
| | | | | | (0.888) | (0.915) | | |
| OTHERLOAN_REL × COVID-19 Crisis | | | | | -0.844 | -0.096 | -0.273 | 0.162 |
| | | | | | (-0.737) | (-0.685) | (-0.465) | (1.146) |
| MULTI_PRODUCT_REL × COVID-19 Crisis | | | | | -0.124 | 0.002 | 0.066 | 0.070 |
| | | | | | (-0.476) | (0.083) | (0.198) | (1.427) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.530 | 0.613 | 0.593 | 0.324 | 0.531 | 0.648 | 0.637 | 0.255 |



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## Table 5: Effects of Low-Risk vs. High-Risk Credit Card Relationships during Normal Times and Changes during the COVID-19 Crisis

Regressions analyzing the effects of relationships on credit card terms during normal times (Panel A consumers; Panel B small businesses) and changes during the COVID-19 crisis (Panel C consumers; Panel D small businesses) when further decomposing bank credit card relationships into good and bad past history over the previous three years based on customer card delinquency status (ever been in 60 or 90 days past due (DPD)), average credit score (above or below 580), and average utilization ratio (above or below 90%). Loan origination data are from the FR Y-14M credit card dataset. Sample period: June 2013 - February 2020. We use a 0.5% random sample for consumer accounts and a 5% random sample for small business accounts. Customer and loan controls are measured at the origination time or the FR Y-14M report month-end; bank characteristics are lagged one quarter; local market controls are measured at the county level. All regressions include Bank, County, and Month-Year fixed effects. Variables are defined in Table 1 Panel A. Heteroskedasticity-robust *t*-statistics clustered at the county level are in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

*Panel A: Consumers during Normal Times*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Consumer Accounts: Decomposition of Bank Relationships** | | | | | | | |
| **PAST RISK HISTORY** | **60DPD [0, 1]** | | **90DPD [0, 1]** | | **580 Credit Score [≥, <]** | | **90% Util Ratio [<, ≥]** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| CARD_BANK_REL_3Y_LOWRISK | 0.617*** | 0.037*** | 0.617*** | 0.037*** | 0.623*** | 0.042*** | 0.645*** | 0.040*** |
| | (17.517) | (14.464) | (17.525) | (14.358) | (17.965) | (17.090) | (18.470) | (14.996) |
| CARD_BANK_REL_3Y_HIGHRISK | 1.590*** | -0.073*** | 1.916*** | -0.099*** | 0.805*** | -0.145*** | 0.349** | -0.144*** |
| | (10.300) | (-4.349) | (10.515) | (-5.097) | (5.260) | (-10.121) | (2.352) | (-10.830) |
| CONVENTIONAL_BANK_REL | -1.044*** | 0.097*** | -1.044*** | 0.097*** | -1.044*** | 0.096*** | -1.048*** | 0.096*** |
| | (-12.867) | (26.448) | (-12.869) | (26.428) | (-12.842) | (26.174) | (-12.910) | (26.342) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 805,433 | 805,433 | 805,433 | 805,433 | 805,433 | 805,433 |
| Adjusted R-squared | 0.529 | 0.613 | 0.529 | 0.613 | 0.529 | 0.613 | 0.529 | 0.613 |

*Panel B: Small Businesses during Normal Times*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Small Business Accounts: Decomposition of Bank Relationships** | | | | | | | |
| **PAST RISK HISTORY** | **60DPD [0, 1]** | | **90DPD [0, 1]** | | **580 Credit Score [≥, <]** | | **90% Util Ratio [<, ≥]** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| CARD_BANK_REL_3Y_LOWRISK | 1.756*** | -0.179*** | 1.753*** | -0.178*** | 1.744*** | -0.174*** | 1.769*** | -0.178*** |
| | (40.248) | (-37.224) | (40.373) | (-36.995) | (40.511) | (-36.234) | (41.058) | (-35.601) |
| CARD_BANK_REL_3Y_HIGHRISK | 2.831*** | -0.567*** | 4.080*** | -0.815*** | 5.163*** | -1.225*** | 1.424*** | -0.637*** |
| | (7.112) | (-10.867) | (7.900) | (-12.788) | (13.342) | (-24.898) | (4.358) | (-16.370) |
| CONVENTIONAL_BANK_REL | -0.072 | 0.013*** | -0.072 | 0.013*** | -0.073 | 0.014*** | -0.076 | 0.013*** |
| | (-1.493) | (3.090) | (-1.489) | (3.094) | (-1.516) | (3.144) | (-1.570) | (3.142) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 281,034 | 281,034 | 281,034 | 281,034 | 281,034 | 281,034 | 281,034 | 281,034 |
| Adjusted R-squared | 0.592 | 0.324 | 0.592 | 0.324 | 0.592 | 0.326 | 0.592 | 0.324 |



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*Panel C: Consumers during the COVID-19 Crisis*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Consumer Accounts: Decomposition of Bank Relationships** | | | | | | | |
| **PAST RISK HISTORY** | **60DPD [0, 1]** | | **90DPD [0, 1]** | | **580 Credit Score [≥, <]** | | **90% Util Ratio [<, ≥]** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| CARD_BANK_REL_3Y_LOWRISK × COVID-19 Crisis | 0.070 | -0.029* | 0.060 | -0.029* | 0.058 | -0.033* | 0.077 | -0.039** |
| | (0.448) | (-1.659) | (0.388) | (-1.732) | (0.376) | (-1.890) | (0.489) | (-2.349) |
| CARD_BANK_REL_3Y_HIGHRISK × COVID-19 Crisis | -0.762 | -0.177** | -0.580 | -0.203** | -0.632 | -0.050 | -1.763** | -0.087 |
| | (-1.173) | (-2.278) | (-0.774) | (-2.353) | (-0.925) | (-0.643) | (-2.185) | (-0.830) |
| CONVENTIONAL_BANK_REL × COVID-19 Crisis | -0.990*** | 0.023 | -0.989*** | 0.023 | -0.988*** | 0.023 | -0.995*** | 0.025 |
| | (-6.197) | (1.484) | (-6.189) | (1.475) | (-6.186) | (1.494) | (-6.208) | (1.575) |
| CARD_BANK_REL_3Y_GOOD | 0.057 | 0.040*** | 0.064 | 0.040*** | 0.060 | 0.050*** | 0.074 | 0.047*** |
| | (0.576) | (3.654) | (0.645) | (3.736) | (0.577) | (4.594) | (0.717) | (4.473) |
| CARD_BANK_REL_3Y_BAD | 1.295*** | -0.090** | 1.302*** | -0.124*** | 1.211*** | -0.279*** | 1.413*** | -0.266*** |
| | (3.413) | (-2.308) | (3.091) | (-2.944) | (3.625) | (-8.476) | (4.313) | (-6.722) |
| CONVENTIONAL_BANK_REL | -1.207*** | 0.083*** | -1.208*** | 0.083*** | -1.210*** | 0.083*** | -1.206*** | 0.082*** |
| | (-10.861) | (7.420) | (-10.875) | (7.430) | (-10.856) | (7.426) | (-10.829) | (7.260) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 |
| Adjusted R-squared | 0.530 | 0.648 | 0.530 | 0.648 | 0.530 | 0.648 | 0.530 | 0.648 |

*Panel D: Small Businesses during the COVID-19 Crisis*

| | (1) | (2) | (3) | (4) | (5) | (6) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|
| | **Small Business Accounts: Decomposition of Bank Relationships** | | | | | | | |
| **PAST RISK HISTORY** | **60DPD [0, 1]** | | **90DPD [0, 1]** | | **580 Credit Score [≥, <]** | | **90% Util Ratio [<, ≥]** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| CARD_BANK_REL_3Y_LOWRISK × COVID-19 Crisis | -0.430*** | 0.078*** | -0.418*** | 0.079*** | -0.413*** | 0.076*** | -0.403*** | 0.081*** |
| | (-2.804) | (3.491) | (-2.746) | (3.519) | (-2.714) | (3.370) | (-2.598) | (3.517) |
| CARD_BANK_REL_3Y_HIGHRISK × COVID-19 Crisis | 2.862* | -0.131 | 3.408** | -0.541** | 3.889** | -0.334 | 2.181 | -0.068 |
| | (1.734) | (-0.558) | (2.103) | (-2.122) | (2.318) | (-1.185) | (1.547) | (-0.248) |
| CONVENTIONAL_BANK_REL × COVID-19 Crisis | -0.191 | 0.073*** | -0.194 | 0.073*** | -0.194 | 0.073*** | -0.193 | 0.073*** |
| | (-1.303) | (3.490) | (-1.324) | (3.503) | (-1.318) | (3.485) | (-1.311) | (3.489) |
| CARD_BANK_REL_3Y_GOOD | 1.400*** | -0.229*** | 1.397*** | -0.229*** | 1.405*** | -0.228*** | 1.364*** | -0.232*** |
| | (11.851) | (-15.601) | (11.812) | (-15.574) | (11.877) | (-15.312) | (11.160) | (-15.302) |
| CARD_BANK_REL_3Y_BAD | 2.153** | -0.497*** | 2.835** | -0.572*** | 2.870** | -1.005*** | 0.532 | -0.409*** |
| | (2.072) | (-3.862) | (2.495) | (-3.561) | (1.993) | (-5.227) | (0.520) | (-2.671) |
| CONVENTIONAL_BANK_REL | -0.024 | -0.050*** | -0.024 | -0.050*** | -0.024 | -0.049*** | -0.020 | -0.050*** |
| | (-0.229) | (-3.673) | (-0.229) | (-3.663) | (-0.227) | (-3.646) | (-0.185) | (-3.665) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 |
| Adjusted R-squared | 0.637 | 0.252 | 0.637 | 0.252 | 0.637 | 0.253 | 0.637 | 0.252 |



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## Table 6: Effects by Customer Risk at Time of Application during Normal Times and Changes during the COVID-19 Crisis

Regressions analyzing the effects of relationships on credit card terms during normal times (Panel A) and changes during the COVID-19 crisis (Panel B) using subsamples by customer risk indicators based on customer credit score, customer income, and utilization ratio. Loan origination data are from the FR Y-14M credit card dataset. Sample period: June 2013 - February 2020. We use a 0.5% random sample for consumer accounts and a 5% random sample for small business accounts. Customer and loan controls are measured at the origination time or the FR Y-14M report month-end; bank characteristics are lagged one quarter; local market controls are measured at the county level. All regressions include Bank, County, and Month-Year fixed effects. Variables are defined in Table 1 Panel A. Heteroskedasticity-robust *t*-statistics clustered at the county level are in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

*Panel A: Normal Times* ***(Full Specifications with Controls and Fixed Effects Coefficients Suppressed)***

| | **Customer Risk Indicators** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Credit Score** | | | | **Customer Income** | | | | | **Utilization Ratio** | | |
| | <580 | [580, 660) | [660,720) | ≥720 | <25K | [25K, 50K) | [50K, 100K) | [100K, 150K) | ≥150K | ≥90% | [50%, 90%) | <50% |
| **Independent Variables:** | **Consumer Accounts, Dependent Variable = APR Spread** | | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| BANK_REL_3Y | -0.614*** | -1.728*** | -1.015*** | -0.253*** | -0.751*** | -0.716*** | -0.522*** | -0.581*** | -0.436*** | -1.292*** | -1.079*** | -0.456*** |
| | (-5.087) | (-21.733) | (-12.512) | (-5.331) | (-8.125) | (-7.874) | (-8.946) | (-10.526) | (-7.610) | (-12.014) | (-13.030) | (-7.500) |
| Observations | 17,047 | 113,191 | 224,204 | 449,891 | 95,716 | 222,483 | 301,669 | 94,608 | 89,331 | 24,678 | 43,528 | 736,096 |
| Adjusted R-squared | 0.679 | 0.596 | 0.642 | 0.503 | 0.611 | 0.570 | 0.527 | 0.506 | 0.470 | 0.782 | 0.766 | 0.518 |
| | **Consumer Accounts, Dependent Variable = Ln(1+Limit)** | | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| BANK_REL_3Y | 0.041*** | 0.098*** | 0.144*** | 0.091*** | 0.082*** | 0.065*** | 0.065*** | 0.086*** | 0.077*** | 0.048*** | 0.073*** | 0.110*** |
| | (3.462) | (14.003) | (30.286) | (28.544) | (13.047) | (15.941) | (17.658) | (14.498) | (14.124) | (3.505) | (6.793) | (41.716) |
| Observations | 17,047 | 113,191 | 224,204 | 449,891 | 95,716 | 222,483 | 301,669 | 94,608 | 89,331 | 24,678 | 43,528 | 736,096 |
| Adjusted R-squared | 0.335 | 0.469 | 0.291 | 0.326 | 0.598 | 0.596 | 0.563 | 0.501 | 0.477 | 0.662 | 0.653 | 0.575 |
| | **Small Business Accounts, Dependent Variable = APR Spread** | | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| BANK_REL_3Y | -0.184 | 0.779*** | 0.441*** | 1.130*** | 0.808*** | 1.106*** | 1.420*** | 1.180*** | 0.882*** | 0.453* | 0.223* | 1.065*** |
| | (-0.653) | (4.835) | (6.928) | (30.396) | (10.954) | (11.147) | (25.490) | (15.396) | (18.491) | (1.761) | (1.659) | (31.523) |
| Observations | 1,784 | 11,195 | 54,099 | 212,563 | 30,320 | 27,623 | 80,896 | 41,833 | 97,928 | 1,905 | 5,873 | 272,456 |
| Adjusted R-squared | 0.655 | 0.605 | 0.669 | 0.576 | 0.830 | 0.667 | 0.583 | 0.545 | 0.502 | 0.745 | 0.744 | 0.592 |
| | **Small Business Accounts, Dependent Variable = Ln(1+Limit)** | | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| BANK_REL_3Y | -0.139*** | -0.108*** | -0.027*** | -0.095*** | 0.006 | -0.040*** | -0.099*** | -0.106*** | -0.122*** | -0.197*** | -0.160*** | -0.102*** |
| | (-3.378) | (-6.228) | (-3.770) | (-24.857) | (0.508) | (-4.418) | (-16.523) | (-13.793) | (-22.490) | (-4.919) | (-7.802) | (-27.956) |
| Observations | 1,784 | 11,195 | 54,099 | 212,563 | 30,320 | 27,623 | 80,896 | 41,833 | 97,928 | 1,905 | 5,873 | 272,456 |
| Adjusted R-squared | 0.705 | 0.573 | 0.285 | 0.183 | 0.509 | 0.333 | 0.295 | 0.216 | 0.195 | 0.420 | 0.365 | 0.315 |



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*Panel B: Changes in Effects during the COVID-19 crisis* ***(Full Specification with Controls and Fixed Effects Coefficients Suppressed)***

| | Customer Risk Indicators | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Credit Score** | | | | **Customer Income** | | | | | **Utilization Ratio** | | |
| | <580 | [580, 660) | [660,720) | ≥720 | <25K | [25K, 50K) | [50K, 100K) | [100K, 150K) | ≥150K | ≥90% | [50%, 90%) | <50% |
| **Independent Variables:** | **Consumer Accounts, Dependent Variable = APR Spread** | | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| BANK_REL_3Y × COVID-19 Crisis | -0.822 | -0.320 | -1.108*** | -0.724*** | -1.338** | -0.742** | -0.774*** | -1.302*** | -0.849** | 0.468 | -0.206 | -0.805*** |
| | (-1.062) | (-0.736) | (-3.869) | (-4.487) | (-2.282) | (-2.417) | (-3.579) | (-3.321) | (-2.319) | (0.354) | (-0.271) | (-6.119) |
| BANK_REL_3Y | -0.303 | -2.192*** | -1.603*** | -0.479*** | -1.825*** | -0.900*** | -0.812*** | -0.786*** | -0.563*** | -0.452 | -0.749** | -0.801*** |
| | (-0.971) | (-8.862) | (-8.761) | (-4.686) | (-4.437) | (-4.924) | (-6.306) | (-3.702) | (-3.113) | (-0.732) | (-1.972) | (-8.984) |
| Observations | 1,211 | 7,322 | 15,057 | 36,337 | 4,473 | 14,952 | 23,963 | 7,858 | 8,127 | 1,264 | 2,581 | 56,959 |
| Adjusted R-squared | 0.626 | 0.578 | 0.633 | 0.493 | 0.690 | 0.578 | 0.517 | 0.497 | 0.464 | 0.785 | 0.772 | 0.518 |
| | **Consumer Accounts, Dependent Variable = Ln(1+Limit)** | | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| BANK_REL_3Y × COVID-19 Crisis | -0.100 | -0.042 | 0.002 | 0.013 | -0.140*** | 0.002 | 0.019 | 0.050 | 0.067* | -0.255** | -0.139* | 0.019 |
| | (-1.258) | (-1.048) | (0.058) | (0.716) | (-2.658) | (0.075) | (0.898) | (1.245) | (1.713) | (-2.221) | (-1.923) | (1.350) |
| BANK_REL_3Y | 0.086** | 0.083*** | 0.154*** | 0.082*** | 0.108*** | 0.040** | 0.045*** | 0.033 | 0.065*** | 0.142** | 0.031 | 0.075*** |
| | (2.178) | (2.849) | (7.571) | (8.047) | (2.969) | (2.171) | (3.276) | (1.215) | (2.804) | (1.984) | (0.688) | (8.181) |
| Observations | 1,211 | 7,322 | 15,057 | 36,337 | 4,473 | 14,952 | 23,963 | 7,858 | 8,127 | 1,264 | 2,581 | 56,959 |
| Adjusted R-squared | 0.512 | 0.576 | 0.352 | 0.386 | 0.583 | 0.647 | 0.593 | 0.503 | 0.419 | 0.811 | 0.767 | 0.621 |
| | Credit Score | | | | Customer Income | | | | | Utilization Ratio | | |
| | N/A | <660 | [660,720) | ≥720 | <25K | [25K, 50K) | [50K, 100K) | [100K, 150K) | ≥150K | ≥90% | [50%, 90%) | <50% |
| | **Small Business Accounts, Dependent Variable = APR Spread** | | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| BANK_REL_3Y × COVID-19 Crisis | N/A | -0.220 | -0.247 | -0.357** | -1.031 | -0.181 | -0.459* | -0.312 | -0.014 | 0.341 | -0.029 | -0.345*** |
| | N/A | (-0.260) | (-0.743) | (-2.315) | (-1.526) | (-0.380) | (-1.869) | (-0.985) | (-0.066) | (0.362) | (-0.042) | (-2.601) |
| BANK_REL_3Y | N/A | 0.460 | 0.811*** | 0.822*** | 0.834** | 0.994*** | 1.366*** | 0.887*** | 0.475*** | 0.448 | 0.704 | 0.962*** |
| | N/A | (0.767) | (3.483) | (7.531) | (2.156) | (2.723) | (8.306) | (3.914) | (3.653) | (0.613) | (1.505) | (9.355) |
| Observations | N/A | 978 | 5,702 | 26,705 | 1,091 | 2,377 | 8,658 | 5,474 | 14,915 | 187 | 667 | 32,843 |
| Adjusted R-squared | N/A | 0.637 | 0.687 | 0.627 | 0.803 | 0.724 | 0.668 | 0.641 | 0.586 | 0.817 | 0.722 | 0.638 |
| | **Small Business Accounts, Dependent Variable = Ln(1+Limit)** | | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| BANK_REL_3Y × COVID-19 Crisis | N/A | 0.135 | 0.059 | 0.122*** | 0.220** | 0.077 | 0.106*** | 0.133*** | 0.115*** | 0.142 | -0.093 | 0.116*** |
| | N/A | (1.223) | (1.291) | (6.362) | (2.128) | (0.980) | (3.075) | (2.738) | (3.908) | (0.372) | (-0.725) | (6.118) |
| BANK_REL_3Y | N/A | -0.046 | -0.057* | -0.183*** | 0.058 | -0.107*** | -0.186*** | -0.206*** | -0.182*** | 0.030 | 0.004 | -0.178*** |
| | N/A | (-0.830) | (-1.946) | (-14.725) | (1.061) | (-2.681) | (-9.040) | (-7.597) | (-9.137) | (0.188) | (0.044) | (-13.850) |
| Observations | N/A | 978 | 5,702 | 26,705 | 1,091 | 2,377 | 8,658 | 5,474 | 14,915 | 187 | 667 | 32,843 |
| Adjusted R-squared | N/A | 0.563 | 0.286 | 0.196 | 0.272 | 0.286 | 0.268 | 0.208 | 0.231 | 0.274 | 0.328 | 0.262 |



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## Table 7: Tests of Atrophy in the Value of Consumer Credit Scores Due to the CARES Act during the COVID-19 Crisis

Establishing atrophy in the value of consumer credit scores due to the CARES Act by analyzing the changes in the value of credit scores on credit card terms and delinquencies for consumers during the COVID-19 crisis. Loan origination data are from the FR Y-14M credit card dataset. Sample period: June 2013 - February 2020. We use a 0.5% random sample for consumer accounts and a 5% random sample for small business accounts. Customer and loan controls are measured at the origination time or the FR Y-14M report month-end; bank characteristics are lagged one quarter; local market controls are measured at the county level. All regressions include Bank, County, and Month-Year fixed effects. Variables are defined in Table 1 Panel A. Heteroskedasticity-robust *t*-statistics clustered at the county level are in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

| | (1) | (2) | (3) |
|---|---|---|---|
| | | **Consumer Accounts** | |
| | **New Originations** | | **Existing Accounts** |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | 30 Days Past Due |
| **Independent Variables:** | | | |
| BANK_REL_3Y × Post CARES Act | -1.799*** | -0.012 | 0.002 |
| | (-10.403) | (-0.767) | (3.842) |
| BANK_REL_3Y | -0.738*** | 0.084*** | -0.005*** |
| | (-9.399) | (10.575) | (-9.094) |
| Customer Credit Score [580, 660) × Post CARES Act | -0.481 | 0.060* | 0.059*** |
| | (-1.380) | (1.818) | (12.267) |
| Customer Credit Score [660, 720) × Post CARES Act | 1.202*** | -0.063** | 0.064*** |
| | (4.177) | (-2.222) | (13.380) |
| Customer Credit Score ≥720 × Post CARES Act | 1.266*** | -0.209*** | 0.065*** |
| | (4.530) | (-8.372) | (13.862) |
| Customer Credit Score [580, 660) | -1.585*** | 0.330*** | -0.161*** |
| | (-8.479) | (14.852) | (-43.845) |
| Customer Credit Score [660, 720) | -4.277*** | 1.066*** | -0.172*** |
| | (-20.725) | (45.059) | (-46.173) |
| Customer Credit Score ≥720 | -5.959*** | 1.760*** | -0.163*** |
| | (-27.143) | (73.397) | (-45.194) |
| Ln(1+Limit) | YES | NO | YES |
| Customer/Loan/Bank/County Controls | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES |
| Observations | 61,621 | 61,621 | 1,136,185 |
| Adjusted R-squared | 0.530 | 0.649 | 0.124 |



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# <u>Online Appendix for</u>

**"Piercing through Opacity:**

**Relationships and Credit Card Lending to Consumers and Small Businesses**

**during Normal Times and the COVID-19 Crisis"**

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## Online Appendix: Additional Analyses

We show extra robustness tests of our main findings in Section OA.1, results for other credit card terms in Section OA.2, additional robustness checks for the COVID-19 crisis in Section OA.3, investigate the heterogeneity of the main findings in Section OA.4, and analyze existing credit card account data in OA.5.

### *OA.1 Extra Robustness Tests of Main Results*

We analyze the effects of relationships on credit card terms during normal times and changes during the COVID-19 crisis through several additional tests presented in Online Appendix Table OA1. First, as mentioned in Section 6.1, Panel A and Panel B control for additional variables such as *Behavioral Score*, *High Leverage1*, an indicator equal to one if a customer had income above 100K and credit score less than 660 (in unreported analysis we use *High Leverage2*, an indicator equal to one if a customer had income above 150K and credit score less than 660, and find similar results), and *Ln(1+ Num CC Complaints)*, the natural log of the number of credit card complaints against the bank using the CFPB complaints dataset. Second, Panels D – H present results from alternative specifications with various combinations of fixed effects included and the results are shown in Section 6.1. Third, Panel I shows effects of two capital shocks, the introduction of the GSIB capital surcharge and the stress tests public bank failure announcements, and the results are discussed in Section 6.3. Fourth, Panel J shows results with alternative relationship variables, indicators for whether the customer had another credit card with the bank in the prior four, five, or two years, one year, or any prior period and/or a conventional relationship with the bank. The results are discussed in Section 6.2. Fifth, Panel K shows results for customers with relatively short or long credit card relationships vs. no relationships, using a cut-off point of 3 years (in unreported analysis we find similar results for a cut-off point of 2 years).

In addition to the tests mentioned above, we further investigate different options of clustering standard errors. The main analysis uses heteroskedasticity-robust *t*-statistics clustered at the county level. Table OA.1 Panel L instead double-clusters the error terms by *County* and *Customer* to better account for the level of variation in credit card terms. The results are similar to the main results.

Moreover, we test whether the main results still hold using slightly different samples. The main findings are based on a sample that includes banks subject to stress tests and having material credit card portfolios in the U.S. Panel M excludes banks with very different business models, i.e., primary business is credit card lending and do less in other bank activities. Panel NM only includes banks that exist in both the consumer and small business credit card samples. Panel ON excludes customers potentially affected by fraud in any of their credit card accounts in FR Y-14M (new and



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existing) in a particular month. To identify these, we use the FR Y-14M indicator for whether there is potential fraud/fraud investigation on an account. Our main results are confirmed in all these additional tests performed. Panel P shows effects for other credit card terms. Panel Q decomposes main bank relationships over time (including normal times and the COVID-19 Crisis). Panel R decomposes bank relationships by granular conventional bank relationships over time (including normal times and the COVID-19 Crisis).

***OA.2 Other Credit Card Terms***

Relationship credit card customers may also incur shared benefits or hold-up problems using credit terms other than APR spread and credit card limit. Hence, we also investigate effects on other credit terms for relationship customers during normal times and COVID-19 times. These terms are: *Log(1+ CashAdv Limit)*, the logarithm of one plus cash advance limit on the account; *Rewards*, an indicator for cards offering rewards; *Promo*, an indicator for promotional APR accounts; and *Annual Fee*, an indicator for accounts that charge an annual fee. These are reported in Online Appendix Table OA.1, Panels N1-N2.

In normal times, we find that relationship consumers receive a higher cash advance limit, more rewards, more promotions, and higher annual fees, suggesting shared benefits in all but one case. Small businesses that are relationship customers receive a lower cash advance limit, more rewards, more promotions, and higher annual fees, suggesting a mix of hold-up problems and shared benefits. During COVID-19 times, relationship consumers receive higher cash advance limit and lower promotions, suggesting partial shared benefits. Small businesses as relationship customers receive higher cash advance limit, more rewards, lower promotions, and lower annual fee, denoting benefits in all but one case. Thus, results in normal times and the COVID-19 crisis are at least partially consistent with the results on APR spread and limits. During normal times, consumers more often get a bright side of relationships, while during COVID-19, both customers groups generally benefit relative to normal times.

***OA.3 Additional Analyses on the COVID-19 Crisis***

We conduct four additional analyses that focus on the COVID-19 crisis and report results in Online Appendix Table OA2. First, we examine whether our main results for the COVID-19 crisis are sensitive to using three alternative samples and report results in Table OA2, Panel A. In our main analysis, to obtain a balanced pre+during COVID-19 crisis sample, we consider a four-month pre-COVID period to match the length of our four-month COVID-19 period. Here, we re-estimate the regression models subtracting two months from our pre-period, effectively starting in January 2020 as



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other researchers use the beginning of 2020 as a baseline for effects during the COVID-19 crisis (e.g., Chetty, Friedman, Hendren, and Stepner, 2020). Alternatively, we add two months to our pre-period, effectively starting in September 2019. Finally, we consider the pre-period to have the exact same length as the COVID-crisis period but move it one year earlier; that is, we use March 1 through June 30 2019, to attenuate concerns about seasonality. These three alternative samples continue to show shared benefits for both consumer and small business relationships during the COVID-19 crisis relative to normal times.

Next, we replace the main COVID-19 dummy (equal to one from March 1, 2020, onward) with five alternative measures of COVID-19 intensity reflecting government-activity restrictions or public health crisis severity that vary over time and across individual U.S. states or counties as in Berger, Bouwman, Norden, Roman, Udell, and Wang (2022). The first two measures focus on the intensity of the government activity restrictions: *US Restrictions Index*, a national restrictions index, and *State Restrictions Index*, a state restrictions index, based on the state of the customer. We create the latter using raw data on states' start and end (or expiry) dates on 10 possible mandated statewide COVID-19 restrictions: (1) Emergency declaration; (2) Stay at Home; (3) Non-essential Business Close; (4) Other Business Close; (5) Restaurant Restrictions; (6) Bar Restrictions; (7) School Close; (8) Gathering Restrictions; (9) Travel Restrictions; and (10) Quarantine/Case Isolation orders. For each state, we add 1 for each government-activity restriction present in a state. Thus, index values range from 0 to 10, with 10 being the most restrictive. The number of restrictions is 0 before the start of the COVID-19 crisis (March 1, 2020). The national index is a state-population weighted average of the ten individual state restrictions. The third measure is *GPS State Immobility*, which shows Google GPS time spent inside (rather than outside) of residential locations in a state relative to the beginning of 2020. The last two measures focus on the severity of the health crisis. *County New Cases/100K Pop* and *County New Deaths/100K Pop* are the number of newly confirmed COVID-19 cases or deaths, respectively per 100K population in the county of the customer.[34] Results using these five alternative COVID-19 crisis measures, shown in Table OA2, Panels B1-B2, show consistent results with our main findings.

We then assess the impact of the Paycheck Protection Program (PPP) on our results and whether relationship customers fare differently during the COVID-19 crisis when the bank extending the loan is more or less heavily involved in the PPP program. This program could affect the demands for and supplies of credit for consumers and small businesses, given that most of the funds are designed for payroll and therefore affect the consumers who work in these small businesses. We obtain PPP loan

[34] Results are robust to using measures with total COVID-19 cases and deaths instead of new cases and deaths.



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amounts from the FR-Y9C in 2020:Q2. We conduct two sets of tests. We first simply re-estimate our main regressions for changes during the COVID-19 crisis while controlling for the ratio of PPP loans to bank total assets, *PPP Loans/Total Assets*. These results are reported in Table OA1, Panel C1 and indicate that our main findings are unaffected. Next, to understand whether relationship customers fare differently during the COVID-19 crisis when the issuing bank is more or less heavily involved in the PPP program, in Table OA1, Panel C2, we interact an indicator *High PPP* (for banks with above 75th percentile PPP loans relative to total assets) with *BANK_REL_3Y*, *COVID-19 Crisis*, and *BANK_REL_3Y×COVID-19 Crisis*. The coefficients on the triple interaction terms, *BANK_REL_3Y × COVID-19 Crisis × High PPP*, show that while our main results are not affected, relationship customers borrowing from high PPP banks face less favorable terms (higher APR spread and lower credit card limits) than those borrowing from other banks during the COVID-19 crisis. This suggests that high PPP involvement may disincentivize banks from providing favorable treatment to their relationship customers.

***OA.4 Heterogeneous Effects by Bank and County Characteristics***

The main results are obtained while including numerous control variables. This approach may mask interesting heterogeneity of the results. We therefore next investigate whether our results differ by important bank and county characteristics. We do so by interacting the key exogenous variables – *BANK_REL_3Y*, *COVID-19 Crisis*, and *BANK_REL_3Y×COVID-19 Crisis* – with a dummy for a high or low value of a selected bank characteristic (bank size, capital, liquidity, ROE, credit card complaints, concentration in non-prime or subprime) or county characteristic (unemployment rate, county income and county minority percent).[35] For normal times, we focus on *BANK_REL_3Y × Bank/County Characteristic*, while for changes during COVID-19, we concentrate on *BANK_REL_3Y × COVID-19 Crisis × Bank/County Characteristic* to capture how our main results vary with that characteristic. Online Appendix Table OA.3, Panels A-G focus on bank characteristics, while Panels H-J address county heterogeneity.

Results in Table OA.3 Panel A suggest that relationship customers from smaller banks mostly fare better relative to large bank relationship customers during normal times, but this is reversed during the COVID-19 crisis. Three of the four key interaction terms show statistically significantly better terms (lower spreads and higher limits) during normal times, while three of the four are statistically significantly worse in the crisis. The normal times results are generally consistent with the literature's finding that smaller banks more often share relationship benefits, but the COVID-19 findings are not.

[35] County income and minority percent are based on data from the American Community Surveys (ACS).



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Results for bank financial health in Table OA.3 Panels B, C, D, and E mostly suggest that banks in worse financial health (lower capital, liquidity, core deposits, core deposits, and earnings)[36] tend to provide worse credit terms to relationship customers during normal times, possibly due to their own constraints. They do offer some pockets of shared benefits during the COVID-19 crisis, suggesting some bright side of relationships when customers are in need. In addition, Table OA.3 Panel F shows that banks having received more credit card complaints are associated with worse credit card terms during normal times and with minimal evidence of better terms during the COVID-19 crisis. The slightly better effects during the crisis may reflect pressures from complaints against banks potentially leading to slight improvements. Finally, in Table OA3 Panel G, banks with higher concentration in nonprime customers (credit scores < 720) – which may be seeking more profitability – tend to provide more shared benefits during normal times, but effects are more mixed during the COVID-19 crisis.

Turning to county heterogeneity, results in Table OA.3 Panels H, I and J suggest that relationship customers in counties with high unemployment rates and low income generally obtain better credit card terms during normal times, which may be consistent with banks seeking more profitability from these customer groups. During the COVID-19 crisis, benefits appear to be larger for counties with high unemployment rates, but no significant effects are observed for low-income counties. Finally, only mixed effects apply to customers in counties with high minority representation during both normal times and the crisis.

### *OA.5. Analysis of Existing Credit Card Accounts (as Opposed to New Originations)*

Our main analysis focuses on newly originated credit cards. The advantage of new originations is that all the information provided in the FR Y-14M is recent. An analysis of existing accounts is more challenging because some of the data on rates, limits, and controls may be stale, which may weaken the results. Nonetheless, we now employ data on a sample of existing accounts also drawn from the FR Y-14M to examine how relationships affect credit terms for existing credit card accounts (Section OA.5.1). We also analyze how these effects differ by customer risk characteristics (Section OA.5.2), and examine the impact of forbearance accommodations during the COVID-19 crisis (results are summarized in Section 9.2 ).

#### *OA.5.1 Effects of Relationships on Credit Terms on Existing Accounts (as Opposed to New Originations)*

Given the very large FR Y-14M credit card dataset for existing accounts, our analyses use a 0.1%

[36] Bank financial information is from the Y-9C reports, while core deposits are from the Uniform Bank Performance Report (UBPR). Prior literature shows that core deposits are a mechanism that enhances relationship lending, as these deposits create funding and informational synergies (e.g., Berlin and Mester, 1999; Norden and Weber, 2010).



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random sample for consumers (9.97 million observations) and a 1% random sample for small businesses (5.55 million observations). We keep only accounts that are over 12 months old to avoid potential overlap with terms set on new accounts that may last for up to one year after origination. Table OA.4 shows summary statistics on this dataset, which we do not discuss for brevity.

We apply equations (1) and (2) to see if our main results extend to the existing accounts. Our key dependent variables, *APR Spread* and *Ln(1+Limit)*, are the same as in the main analysis, except that the *APR Spread* is the APR spread over the constant rate Treasury rate with a similar maturity structure at account cycle-end date.[37] As before, *BANK_REL_3Y* equals 1 if the customer has another credit card with the bank in the prior 3 years and/or has a conventional relationship with the bank. The *COVID-19 Crisis* dummy is based on account cycle-end date instead of origination date. We make a few alterations and additions to the controls to better capture the state of existing accounts. We include refreshed *Customer Credit Score* dummies when available and use the origination score for those that do not report a refreshed one. We also include a control for *Months Since Last Refresh* to assess how old the credit score information on the account is. Because accounts can be of varying ages with implications for credit terms, we include dummies for account age for the ranges [3, 5 years), [5, 10 years), and ≥10 years, with (1, 3 years) being the left-out category. We include a *Securitized* dummy indicating if the existing account was securitized (not an issue for new accounts) and an indicator for account delinquency (60 days past due or more over the past three years), *Ever 60dpd Previous 3 Years*. All other controls, fixed effects, and clustering are the same as in our new originations analysis.

Online Appendix Table OA.5 shows main effects for normal times and changes during the COVID-19 crisis. The coefficients suggest that during normal times, banks provide lower spreads and higher limits to relationship consumer than to other consumers, again consistent shared benefits as stated in H1. For small businesses with relationships, banks provide lower credit limits but no significantly different spreads, some limited evidence hold-up problems and speaking against H1. Again, the results jointly support cross-sectional smoothing favoring consumer relationship customers." Overall, the normal times effects for existing accounts are consistent with the main new originations results, but the coefficients are much smaller in magnitude and the results are weaker overall. These findings are not surprising, given the arguments above about the influences of stale information on existing accounts. The changes during the COVID-19 crisis show even weaker results. There are fewer significant effects and they are very small in magnitude. The findings provide limited

[37] The account cycle end-date (or account statement closing date) is the date on which transactions are accumulated for billing purposes and any account activities and delinquencies are normally reported to the credit bureaus.



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support for intertemporal smoothing as in H2, again likely due to stale information.

***OA.5.2 Results by Customer Risk on Existing Accounts (as Opposed to New Originations)***

We next show how results for existing accounts differ by customer risks using four risk indicators, of which only the first one is similar to those employed for new originations in Section 7.2. Our first risk indicator is again credit score, with two categories (<720, ≥720) for subprime and prime.[38] Second, we divide the sample into not securitized and securitized, realizing that the bank bears the risk and earns profits only on the non-securitized cards. Third, we split accounts by account age (1, 3 years), [3, 5 years), [5, 10 years), and ≥10 years), whereby younger accounts are expected to be riskier. Finally, we divide accounts by customer payment behavior into Revolver (unpaid balances from month to month), Transactor (paid in full each month), and Dormant (no activity from month to month). Clearly, revolvers impose the most credit risk on banks and provide the most profits in normal times. Results are shown in Online Appendix Table OA.6.

The normal-times findings in Table OA.6 Panel A for existing accounts are mostly consistent with those for new originations in Table 6 Panel B, but are somewhat weaker, consistent with expectations. During normal times, banks provide preferential treatment to riskier relationship consumers in terms of both spreads and limits, consistent with arguments above about trying to retain more profitable risky relationship consumers. However, the effects of customer risks on loan terms for relationship small businesses is less clear. The crisis results in Table OA.6 Panel B suggest minor movements toward less favorable treatment of riskier relationship consumers (higher spreads and lower limits), consistent with more risk management during the crisis. Again, the effects of relationship status on credit terms do not seem to differ substantially across the risk categories for small businesses.

[38] For brevity, we include only two categories here for credit score, covering subprime and prime. Results using more detailed ranges are consistent and available upon request.



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## Table OA.1: Extra Robustness Tests of Main Results

This table analyzes the effects of relationships on credit card terms during normal times and changes during the COVID-19 crisis using several robustness tests. Panel A controls for *Behavioral Score*, Panel B controls for *High Leverage1*, indicator equal to one if a customer had income above 100K and credit score less than 660, and Panel C controls for *Ln(1+ Num CC Complaints)*, the natural log of the number of credit card complaints against the bank using the CFPB complaints dataset. Panels D – H present results from alternative specifications with: *County × Year-Month FE* (Panel D); *Bank × Year-Month FE* (Panel E), *Bank × County × Year-Month FE* (Panel F); *ZIP FE* and error clustering at the ZIP level (Panel G); *Credit Score Dummies × Year-Month FE* and bank and county fixed effects (Panel H). Panel I shows effects of two capital shocks, the introduction of bank GSIB capital surcharge and the stress tests public bank failure announcements. The uninteracted dummy for introduction of the surcharge in 2016 is absorbed in these regressions. Further investigations (not shown) reveal that this dummy is aborbed exactly when we control for both bank fixed effects and time-varying bank characteristics, suggesting that decisions to impose these subcharges is coincident to bank identity and the bank characteristics for which we control. Panel J shows results with alternative relationship variables: *BANK_REL_4Y*, *BANK_REL_5Y*, and *BANK_REL_PRE*, dummies that equal 1 if the customer has another credit card with the bank in the prior four years, five years, two years, one year, or any prior period and/or a conventional relationship with the bank. Panel K shows results for relatively short and long relationships versus no relationships. Panel L uses double clustering by county and consumer. Panel M excludes banks with different business models (primary business is credit cards). Panel N focuses on banks that exist in both consumer and small business samples. Panel O excludes customers potentially affected by fraud in any of their accounts. Panel P shows effects for other credit card terms. Panel Q decomposes main bank relationships over time (including normal times and the COVID-19 Crisis). Panel R decomposes bank relationships by granular conventional bank relationships over time (including normal times and the COVID-19 Crisis). Unless specified otherwise, in each panel, columns (1)-(4) show results during normal times, while columns (5)-(8) show changes during the COVID-19 crisis. The loan origination data are from the FR Y-14M credit card dataset and cover the period June 2013 through February 2020 for normal times, and the period November 2019 through June 2020 for changes during the COVID-19 crisis. We use a 0.5% random sample for consumer accounts and a 5% random sample for small business accounts. The dependent variables are: *APR Spread*, interest rate spread over the constant rate Treasury bonds with a similar maturity and *Ln(1+Limit)*, the natural log of 1 plus the origination credit limit on the account. The key explanatory variable are *BANK_REL_3Y* and *BANK_REL_3Y × COVID-19 Crisis*, where *BANK_REL_3Y* is a dummy that equals 1 if the customer has another credit card with the bank in the prior three years and/or a conventional relationship with the bank (based on past provision of deposits; investments; mortgage, auto, student, or other loans; or multiple products), and *COVID-19 Crisis* is a dummy that equals 1 from March 1, 2020, onward. We include a broad set of customer and loan controls measured at the origination time or the FR Y-14M report month end: *Customer Credit Score* dummies, *Customer Income* dummies, *Customer Utilization Rate*, joint account, many authorized users, variable interest rate account, secured card, promotional card, dummies for credit card purpose, and dummies for the channel through which the card was opened. We also include a number of bank characteristics, all lagged one quarter: bank size, bank age, capital ratio, and liquidity ratio, the ratio of non-performing loans, earnings, the ratio of loans to assets. Three local market controls are included, measured at the county level: *Cnty Unemployment*, *Cnty HPI*, and *Cnty Change in HPI*. All regressions include Bank, County, and Month-Year fixed effects. All variables are defined in Table 1. Heteroskedasticity-robust *t*-statistics clustered at county level are reported in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

*Panel A: Control for the Behavioral Score*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.523*** | 0.091*** | 1.087*** | -0.105*** | -0.789*** | 0.078*** | 0.921*** | -0.186*** |
| | (-9.021) | (36.333) | (30.709) | (-27.742) | (-9.424) | (9.190) | (8.972) | (-15.608) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.886*** | 0.007 | -0.344*** | 0.116*** |
| | | | | | (-6.873) | (0.519) | (-2.669) | (6.277) |
| Behavioral Score | -1.143*** | 0.282*** | -1.271*** | -0.028** | -0.783*** | 0.146*** | -1.779*** | 0.247*** |
| | (-12.566) | (32.637) | (-12.691) | (-2.416) | (-3.992) | (5.087) | (-5.329) | (4.000) |
| Behavioral Score_Missing | -2.499*** | 0.275*** | -1.900*** | 0.185*** | -3.108*** | 0.152*** | -2.047*** | 0.394*** |
| | (-33.163) | (37.349) | (-32.755) | (20.379) | (-21.055) | (7.262) | (-17.052) | (22.988) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.530 | 0.614 | 0.591 | 0.322 | 0.533 | 0.648 | 0.637 | 0.257 |



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*Panel B: Control for High Leverage1*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.493*** | 0.165*** | 1.060*** | -0.092*** | -0.723*** | 0.107*** | 0.923*** | -0.147*** |
| | (-8.742) | (39.071) | (29.737) | (-23.066) | (-8.663) | (9.861) | (9.009) | (-11.268) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.863*** | 0.017 | -0.308** | 0.130*** |
| | | | | | (-6.673) | (1.005) | (-2.346) | (6.487) |
| High Leverage1 | 1.716*** | -0.580*** | 1.655*** | -0.566*** | 2.007*** | -0.534*** | 1.594*** | -0.576*** |
| | (25.949) | (-52.418) | (16.203) | (-30.131) | (8.455) | (-18.607) | (6.163) | (-16.647) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.524 | 0.339 | 0.584 | 0.186 | 0.516 | 0.405 | 0.630 | 0.126 |

*Panel C: Control for the Credit Card Complaints against the Banks (public data from the CFPB)*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.524*** | 0.092*** | 1.070*** | -0.105*** | -0.859*** | 0.081*** | 0.902*** | -0.184*** |
| | (-8.930) | (36.776) | (29.980) | (-27.689) | (-10.375) | (9.535) | (8.892) | (-15.451) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.812*** | 0.004 | -0.322** | 0.113*** |
| | | | | | (-6.282) | (0.275) | (-2.481) | (5.982) |
| Ln(1+ Num CC Complaints) | -0.338*** | 0.009 | 0.570*** | 0.041*** | 0.475* | 0.013 | -0.215 | -0.055 |
| | (-6.868) | (1.583) | (5.351) | (3.905) | (1.785) | (0.462) | (-0.751) | (-1.110) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.528 | 0.613 | 0.589 | 0.320 | 0.529 | 0.648 | 0.636 | 0.248 |

*Panel D: Alternative Specification: County × Year-Month FE*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.464*** | 0.092*** | 1.065*** | -0.103*** | -0.845*** | 0.082*** | 0.841*** | -0.181*** |
| | (-7.360) | (34.363) | (27.045) | (-24.240) | (-10.171) | (9.388) | (7.840) | (-14.449) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.707*** | 0.006 | -0.239* | 0.113*** |
| | | | | | (-5.196) | (0.459) | (-1.718) | (5.600) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank FE | YES | YES | YES | YES | YES | YES | YES | YES |
| County × Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 757,625 | 757,625 | 254,671 | 254,671 | 57,573 | 57,573 | 31,624 | 31,624 |
| Adjusted R-squared | 0.530 | 0.614 | 0.590 | 0.322 | 0.530 | 0.649 | 0.631 | 0.246 |



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*Panel E: Alternative Specification: Bank × Year-Month FE*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.389*** | 0.094*** | 1.242*** | -0.113*** | -0.289*** | 0.085*** | 0.906*** | -0.178*** |
| | (-7.115) | (37.609) | (35.909) | (-29.954) | (-3.722) | (10.165) | (8.674) | (-14.777) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -1.449*** | 0.006 | -0.340** | 0.092*** |
| | | | | | (-10.151) | (0.451) | (-2.415) | (4.836) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank × Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| County FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,411 | 805,411 | 281,020 | 281,020 | 61,621 | 61,621 | 34,079 | 34,079 |
| Adjusted R-squared | 0.563 | 0.619 | 0.605 | 0.327 | 0.576 | 0.650 | 0.637 | 0.251 |

*Panel F: Alternative Specification: Bank × County × Year-Month FE*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.103*** | 0.093*** | 1.309*** | -0.103*** | -0.313*** | 0.084*** | 0.940*** | -0.172*** |
| | (-4.043) | (35.447) | (35.102) | (-25.695) | (-3.292) | (8.172) | (8.883) | (-12.973) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -1.101*** | 0.020 | -0.488*** | 0.122*** |
| | | | | | (-5.540) | (1.078) | (-2.710) | (5.045) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank × County × Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 613,564 | 613,564 | 215,947 | 215,947 | 45,260 | 45,260 | 26,892 | 26,892 |
| Adjusted R-squared | 0.587 | 0.627 | 0.600 | 0.329 | 0.596 | 0.652 | 0.624 | 0.253 |

*Panel G: Alternative Specification: ZIP FE and Cluster by ZIP*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.527*** | 0.090*** | 1.020*** | -0.101*** | -0.852*** | 0.082*** | 0.836*** | -0.182*** |
| | (-24.522) | (41.980) | (34.864) | (-29.261) | (-9.151) | (8.667) | (8.351) | (-14.319) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.809*** | -0.003 | -0.250* | 0.111*** |
| | | | | | (-5.019) | (-0.210) | (-1.664) | (5.143) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, ZIP, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 800,574 | 800,574 | 276,045 | 276,045 | 57,305 | 57,305 | 30,555 | 30,555 |
| Adjusted R-squared | 0.529 | 0.616 | 0.591 | 0.328 | 0.524 | 0.649 | 0.634 | 0.255 |



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*Panel H: Alternative Specification: Credit Score Dummies × Year-Month FE*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.537*** | 0.092*** | 1.055*** | -0.105*** | -0.865*** | 0.081*** | 0.889*** | -0.184*** |
| | (-9.097) | (36.803) | (29.593) | (-27.538) | (-10.373) | (9.545) | (8.731) | (-15.305) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.791*** | 0.003 | -0.300** | 0.110*** |
| | | | | | (-6.093) | (0.202) | (-2.289) | (5.836) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Credit Score dummies × Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.534 | 0.613 | 0.590 | 0.322 | 0.530 | 0.649 | 0.636 | 0.249 |

*Panel I: Bank Capital Shocks*

| | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
|---|---|---|---|---|---|---|---|---|
| | GSIB Surcharge Shock | | | | Failed Stress Test Shock | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y x Bank GSIB Surcharge | 0.190*** | 0.059*** | 0.833*** | -0.022*** | | | | |
| | (3.446) | (13.334) | (15.835) | (-2.792) | | | | |
| Bank GSIB Surcharge | NA | NA | NA | NA | | | | |
| | NA | NA | NA | NA | | | | |
| BANK_REL_3Y x Bank Failed | | | | | 0.961*** | 0.079*** | 0.921*** | 0.005 |
| | | | | | (14.805) | (9.005) | (9.160) | (0.510) |
| Bank Failed | | | | | 0.955*** | -0.128*** | -1.222*** | -0.025** |
| | | | | | (19.102) | (-23.605) | (-12.335) | (-2.352) |
| BANK_REL_3Y | -0.587*** | 0.072*** | 0.704*** | -0.096*** | -0.607*** | 0.085*** | 0.999*** | -0.105*** |
| | (-9.331) | (23.183) | (17.591) | (-21.294) | (-10.222) | (33.493) | (26.930) | (-25.858) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 805,433 | 805,433 | 281,034 | 281,034 |
| Adjusted R-squared | 0.529 | 0.613 | 0.590 | 0.320 | 0.529 | 0.613 | 0.590 | 0.320 |



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*Panel J: Alternative Relationship Proxies*

*Panel J.1: Normal Times*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Consumer Accounts** | | | | | | **Small Business Accounts** | | | |
| **Dependent Variable:** | APR Spread | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) | APR Spread | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | | | | | |
| BANK_REL_4Y | -0.502*** | | | 0.097*** | | | 1.025*** | | | -0.094*** | | |
| | (-8.968) | | | (38.439) | | | (29.552) | | | (-24.082) | | |
| BANK_REL_5Y | | -0.487*** | | | 0.100*** | | | 0.989*** | | | -0.085*** | |
| | | (-9.036) | | | (38.951) | | | (28.418) | | | (-21.783) | |
| BANK_REL_PRE | | | -0.642*** | | | 0.099*** | | | 0.569*** | | | -0.018*** |
| | | | (-12.959) | | | (34.104) | | | (16.701) | | | (-4.643) |
| Ln(1+Limit) | YES | YES | YES | NO | NO | NO | YES | YES | YES | YES | YES | YES |
| Customer/Loan/ Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 805,433 | 805,433 | 805,433 | 805,433 | 281,034 | 281,034 | 281,034 | 281,034 | 281,034 | 281,034 |
| Adjusted R-squared | 0.528 | 0.528 | 0.528 | 0.613 | 0.613 | 0.613 | 0.589 | 0.589 | 0.587 | 0.320 | 0.319 | 0.317 |

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | | | **Consumer Accounts** | | | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_2Y | -0.575*** | | 0.083*** | | 1.024*** | | -0.112*** | |
| | (-9.212) | | (31.155) | | (30.681) | | (-30.141) | |
| BANK_REL_1Y | | -0.659*** | | 0.075*** | | 0.861*** | | -0.111*** |
| | | (-9.326) | | (24.470) | | (26.665) | | (-28.636) |
| Ln(1+Limit) | YES | YES | NO | NO | YES | YES | NO | NO |
| Customer/Loan/ Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 805,433 | 805,433 | 281,034 | 281,034 | 281,034 | 281,034 |
| Adjusted R-squared | 0.528 | 0.528 | 0.612 | 0.612 | 0.589 | 0.588 | 0.321 | 0.320 |



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*Panel J.2: Changes during the COVID-19 Crisis*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Consumer Accounts** | | | | | | **Small Business Accounts** | | | | | |
| **Dependent Variable:** | APR Spread | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) | APR Spread | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | | | | | |
| BANK_REL_4Y × COVID-19 Crisis | -0.854*** | | | -0.008 | | | -0.348*** | | | 0.102*** | | |
| | (-6.653) | | | (-0.632) | | | (-2.814) | | | (5.537) | | |
| BANK_REL_5Y × COVID-19 Crisis | | -0.848*** | | | -0.013 | | | -0.380*** | | | 0.097*** | |
| | | (-6.608) | | | (-1.014) | | | (-3.128) | | | (5.200) | |
| BANK_REL_PRE × COVID-19 Crisis | | | -0.831*** | | | -0.018 | | | -0.452*** | | | 0.112*** |
| | | | (-6.494) | | | (-1.485) | | | (-3.599) | | | (5.695) |
| BANK_REL_4Y | -0.863*** | | | 0.092*** | | | 1.017*** | | | -0.164*** | | |
| | (-10.583) | | | (10.934) | | | (11.339) | | | (-13.454) | | |
| BANK_REL_5Y | | -0.849*** | | | 0.099*** | | | 1.029*** | | | -0.146*** | |
| | | (-10.526) | | | (12.042) | | | (11.155) | | | (-12.196) | |
| BANK_REL_PRE | | | -0.973*** | | | 0.109*** | | | 0.752*** | | | -0.055*** |
| | | | (-12.269) | | | (12.386) | | | (7.712) | | | (-4.375) |
| Ln(1+Limit) | YES | YES | YES | NO | NO | NO | YES | YES | YES | NO | NO | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 |
| Adjusted R-squared | 0.529 | 0.529 | 0.530 | 0.648 | 0.648 | 0.649 | 0.636 | 0.636 | 0.635 | 0.247 | 0.246 | 0.242 |

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Consumer Accounts** | | | | **Small Business Accounts** | | | |
| **Dependent Variable:** | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_2Y × COVID-19 Crisis | -0.835*** | | 0.012 | | -0.254** | | 0.116*** | |
| | (-6.299) | | (0.883) | | (-2.089) | | (6.172) | |
| BANK_REL_1Y × COVID-19 Crisis | | -0.969*** | | 0.023 | | -0.185 | | 0.094*** |
| | | (-6.711) | | (1.614) | | (-1.367) | | (4.889) |
| BANK_REL_2Y | -0.848*** | | 0.064*** | | 0.799*** | | -0.192*** | |
| | (-9.774) | | (7.104) | | (8.301) | | (-17.618) | |
| BANK_REL_1Y | | -0.744*** | | 0.053*** | | 0.603*** | | -0.193*** |
| | | (-7.838) | | (5.350) | | (5.694) | | (-16.783) |
| Ln(1+Limit) | YES | YES | NO | NO | YES | YES | NO | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 61,621 | 61,621 | 34,082 | 34,082 | 34,082 | 34,082 |
| Adjusted R-squared | 0.529 | 0.529 | 0.648 | 0.647 | 0.635 | 0.635 | 0.249 | 0.249 |



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*Panel K: Decomposition by Conventional Bank vs. Credit Card Relationships (Relationship Length of up to 3 years and above 3 years)*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Decompositions of Bank Relationships** | | | | | | | |
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| CARD_BANK_REL_≤3Y | 0.515*** | 0.026*** | 1.297*** | -0.122*** | -0.303** | 0.005 | 1.162*** | -0.159*** |
| | (14.801) | (8.807) | (22.693) | (-18.303) | (-2.514) | (0.420) | (7.098) | (-6.844) |
| CARD_BANK_REL_> 3Y | -0.021 | 0.132*** | 0.948*** | -0.012** | -0.301*** | 0.155*** | 0.980*** | -0.000 |
| | (-0.717) | (27.752) | (22.533) | (-2.176) | (-3.331) | (15.580) | (8.290) | (-0.004) |
| CONVENTIONAL_BANK_REL | -0.990*** | 0.078*** | 0.017 | -0.007 | -1.097*** | 0.058*** | 0.040 | -0.082*** |
| | (-11.908) | (20.838) | (0.319) | (-1.623) | (-9.746) | (5.213) | (0.375) | (-5.880) |
| CARD_REL_≤3Y × COVID-19 Crisis | | | | | 0.312 | -0.024 | -0.107 | 0.049 |
| | | | | | (1.547) | (-1.151) | (-0.501) | (1.394) |
| CARD_REL_>3Y × COVID-19 Crisis | | | | | -0.723*** | -0.055*** | -0.635*** | 0.068*** |
| | | | | | (-4.837) | (-3.688) | (-4.570) | (3.155) |
| CONVENTIONAL_BANK_REL × COVID-19 Crisis | | | | | -0.915*** | 0.031** | -0.218 | 0.077*** |
| | | | | | (-5.667) | (1.973) | (-1.495) | (3.670) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.529 | 0.614 | 0.588 | 0.319 | 0.530 | 0.650 | 0.635 | 0.246 |

*Panel L: Cluster by County and Customer*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | Cluster by County and Customer | | | | Cluster by County and Customer | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.525*** | 0.092*** | 1.069*** | -0.105*** | -0.859*** | 0.081*** | 0.902*** | -0.185*** |
| | (-8.951) | (36.800) | (29.986) | (-27.693) | (-10.358) | (9.534) | (8.881) | (-15.468) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.815*** | 0.004 | -0.322** | 0.113*** |
| | | | | | (-6.294) | (0.269) | (-2.479) | (5.989) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.528 | 0.613 | 0.589 | 0.320 | 0.529 | 0.648 | 0.636 | 0.248 |



Electronic copy available at: https://ssrn.com/abstract=3829240

*Panel M: Exclude Banks with Different Business Model*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | Exclude Banks with Different Business Model | | | | Exclude Banks with Different Business Model | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.292*** | 0.097*** | 1.171*** | -0.105*** | -0.290*** | 0.095*** | 0.945*** | -0.203*** |
| | (-5.204) | (36.425) | (29.008) | (-23.228) | (-3.499) | (10.966) | (6.844) | (-15.528) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -1.169*** | -0.004 | -0.365** | 0.106*** |
| | | | | | (-8.738) | (-0.295) | (-2.154) | (4.702) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 669,659 | 669,659 | 247,729 | 247,729 | 49,825 | 49,825 | 24,004 | 24,004 |
| Adjusted R-squared | 0.471 | 0.628 | 0.579 | 0.333 | 0.452 | 0.662 | 0.613 | 0.248 |

*Panel N: Include only Banks that Exist in Both Consumer and Small Business Credit Card Samples*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | Include only Banks that Exist in Both Consumer and Small Business Samples | | | | Include only Banks that Exist in Both Consumer and Small Business Samples | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.523*** | 0.092*** | 1.070*** | -0.105*** | -0.871*** | 0.080*** | 0.902*** | -0.185*** |
| | (-8.923) | (36.926) | (30.023) | (-27.695) | (-10.478) | (9.391) | (8.881) | (-15.468) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.802*** | 0.002 | -0.322** | 0.113*** |
| | | | | | (-6.145) | (0.126) | (-2.480) | (5.989) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 803,660 | 803,660 | 281,021 | 281,021 | 61,356 | 61,356 | 34,080 | 34,080 |
| Adjusted R-squared | 0.528 | 0.613 | 0.589 | 0.320 | 0.529 | 0.649 | 0.636 | 0.248 |

*Panel O: Exclude Customers Potentially Affected by Fraud in Any of Their Accounts*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | Exclude Customers Potentially Affected by Fraud | | | | Exclude Customers Potentially Affected by Fraud | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.539*** | 0.093*** | 1.060*** | -0.103*** | -0.893*** | 0.083*** | 0.907*** | -0.183*** |
| | (-9.152) | (37.045) | (30.118) | (-26.986) | (-10.659) | (9.887) | (9.030) | (-15.278) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.796*** | 0.001 | -0.315** | 0.110*** |
| | | | | | (-6.186) | (0.098) | (-2.446) | (5.911) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 800,104 | 800,104 | 276,994 | 276,994 | 60,984 | 60,984 | 33,639 | 33,639 |
| Adjusted R-squared | 0.529 | 0.613 | 0.592 | 0.321 | 0.530 | 0.648 | 0.638 | 0.248 |



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*Panel P: Other Credit Card Terms*

*Panel P1: Other Credit Card Terms during Normal Times*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | | **Consumer Accounts** | | | | **Small Business Accounts** | | |
| **Dependent Variable:** | Ln(1+Cash Limit) | Rewards | Promo | Annual Fee | Ln(1+Cash Limit) | Rewards | Promo | Annual Fee |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | 0.531*** | 0.097*** | 0.069*** | 0.001*** | -0.081*** | 0.013*** | 0.056*** | 0.001*** |
| | (55.550) | (53.364) | (36.301) | (32.603) | (-7.329) | (14.580) | (21.778) | (24.924) |
| Ln(1+Limit) | NO | NO | NO | NO | NO | NO | NO | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 804,109 | 805,433 | 805,433 | 805,433 | 281,034 | 281,034 | 281,034 | 281,034 |
| Adjusted R-squared | 0.570 | 0.434 | 0.270 | 0.119 | 0.478 | 0.310 | 0.539 | 0.211 |

*Panel P2: Other Credit Card Terms during the COVID-19 Crisis*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | | **Consumer Accounts** | | | | **Small Business Accounts** | | |
| **Dependent Variable:** | Ln(1+Cash Limit) | Rewards | Promo | Annual Fee | Ln(1+Cash Limit) | Rewards | Promo | Annual Fee |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × COVID-19 Crisis | 0.236*** | 0.001 | -0.012* | -0.000 | 0.078* | 0.011** | -0.015* | -0.001*** |
| | (6.960) | (0.183) | (-1.878) | (-0.988) | (1.931) | (2.527) | (-1.959) | (-3.388) |
| BANK_REL_3Y | 0.440*** | 0.101*** | 0.052*** | 0.002*** | -0.167*** | -0.003* | 0.052*** | 0.002*** |
| | (24.764) | (23.582) | (11.486) | (8.889) | (-6.109) | (-1.740) | (9.229) | (15.826) |
| Ln(1+Limit) | NO | NO | NO | NO | NO | NO | NO | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 61,621 | 61,621 | 34,082 | 34,082 | 34,082 | 34,082 |
| Adjusted R-squared | 0.566 | 0.507 | 0.220 | 0.126 | 0.644 | 0.541 | 0.467 | 0.246 |



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*Panel Q: Decomposition of Bank Relationships over Time*
*Panel Q1: Effects during Normal Times*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Decompositions of Bank Relationships** | | | | | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × Y2013 | -2.655*** | 0.109*** | 2.057*** | -0.048*** | | | | |
| | (-24.766) | (13.612) | (16.634) | (-3.799) | | | | |
| BANK_REL_3Y × Y2014 | -0.847*** | 0.051*** | 1.924*** | -0.095*** | | | | |
| | (-9.285) | (9.326) | (20.378) | (-7.724) | | | | |
| BANK_REL_3Y × Y2015 | -0.449*** | 0.077*** | 0.719*** | -0.107*** | | | | |
| | (-4.710) | (15.969) | (9.771) | (-12.608) | | | | |
| BANK_REL_3Y × Y2016 | -0.510*** | 0.110*** | 0.886*** | -0.085*** | | | | |
| | (-6.213) | (23.206) | (12.068) | (-10.509) | | | | |
| BANK_REL_3Y × Y2017 | -0.494*** | 0.110*** | 1.102*** | -0.088*** | | | | |
| | (-7.841) | (23.140) | (12.684) | (-11.158) | | | | |
| BANK_REL_3Y × Y2018 | -0.313*** | 0.096*** | 0.717*** | -0.098*** | | | | |
| | (-5.143) | (17.941) | (12.576) | (-14.436) | | | | |
| BANK_REL_3Y × Y2019 | 0.125** | 0.091*** | 1.118*** | -0.131*** | | | | |
| | (2.261) | (17.983) | (22.233) | (-19.795) | | | | |
| BANK_REL_3Y × Y2020 | 1.224*** | 0.122*** | 1.071*** | -0.173*** | | | | |
| | (9.381) | (10.961) | (8.544) | (-12.300) | | | | |
| CARD_REL_3Y × Y2013 | | | | | 0.839*** | 0.091*** | 2.434*** | -0.103*** |
| | | | | | (8.307) | (7.911) | (18.857) | (-7.784) |
| CARD_REL_3Y × Y2014 | | | | | 0.772*** | 0.013** | 2.453*** | -0.149*** |
| | | | | | (10.859) | (2.093) | (22.924) | (-12.546) |
| CARD_REL_3Y × Y2015 | | | | | 0.481*** | 0.006 | 1.271*** | -0.129*** |
| | | | | | (6.788) | (1.031) | (11.298) | (-10.972) |
| CARD_REL_3Y × Y2016 | | | | | 0.765*** | 0.067*** | 2.222*** | -0.123*** |
| | | | | | (13.131) | (11.064) | (22.286) | (-10.864) |
| CARD_REL_3Y × Y2017 | | | | | 0.629*** | 0.048*** | 2.872*** | -0.177*** |
| | | | | | (12.328) | (8.072) | (27.395) | (-17.374) |
| CARD_REL_3Y × Y2018 | | | | | 0.602*** | 0.014** | 1.318*** | -0.189*** |
| | | | | | (11.980) | (2.028) | (20.954) | (-24.772) |
| CARD_REL_3Y × Y2019 | | | | | 0.493*** | 0.018*** | 1.573*** | -0.217*** |
| | | | | | (8.392) | (3.143) | (26.438) | (-30.969) |
| CARD_REL_3Y × Y2020 | | | | | 0.812*** | 0.019 | 1.029*** | -0.272*** |
| | | | | | (4.777) | (1.350) | (6.571) | (-15.927) |
| CONVENTIONAL_BANK_REL × Y2013 | | | | | -3.745*** | 0.065*** | 0.163 | 0.029* |
| | | | | | (-28.735) | (7.725) | (1.209) | (1.784) |
| CONVENTIONAL_BANK_REL × Y2014 | | | | | -1.501*** | 0.050*** | 0.297*** | -0.013 |
| | | | | | (-12.853) | (8.404) | (3.406) | (-1.067) |
| CONVENTIONAL_BANK_REL × Y2015 | | | | | -0.791*** | 0.085*** | -0.213*** | -0.043*** |
| | | | | | (-6.867) | (16.047) | (-2.864) | (-4.826) |
| CONVENTIONAL_BANK_REL × Y2016 | | | | | -1.116*** | 0.092*** | -0.465*** | 0.004 |
| | | | | | (-11.164) | (14.570) | (-6.106) | (0.500) |
| CONVENTIONAL_BANK_REL × Y2017 | | | | | -1.136*** | 0.121*** | -0.666*** | 0.041*** |
| | | | | | (-12.876) | (19.572) | (-8.108) | (5.311) |
| CONVENTIONAL_BANK_REL × Y2018 | | | | | -0.796*** | 0.128*** | -0.192** | 0.045*** |
| | | | | | (-9.199) | (19.951) | (-2.146) | (5.804) |
| CONVENTIONAL_BANK_REL × Y2019 | | | | | 0.079 | 0.116*** | 0.240*** | 0.017** |
| | | | | | (1.007) | (18.676) | (2.703) | (2.082) |
| CONVENTIONAL_BANK_REL × Y2020 | | | | | 1.377*** | 0.153*** | 0.487*** | -0.013 |
| | | | | | (10.866) | (11.957) | (4.030) | (-0.811) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 277,562 | 277,562 | 805,433 | 805,433 | 277,562 | 277,562 |
| Adjusted R-squared | 0.529 | 0.613 | 0.591 | 0.324 | 0.531 | 0.613 | 0.595 | 0.328 |



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*Panel Q2: Changes during the COVID-19 Crisis*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | **Decompositions of Bank Relationships** | | | | | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × COVID-19 Crisis_Mar 2020 | 0.567*** | 0.032 | 0.034 | 0.048* | | | | |
| | (2.860) | (1.561) | (0.189) | (1.959) | | | | |
| BANK_REL_3Y × COVID-19 Crisis_Apr 2020 | -2.019*** | -0.003 | -0.468** | 0.084** | | | | |
| | (-7.353) | (-0.134) | (-2.244) | (2.399) | | | | |
| BANK_REL_3Y × COVID-19 Crisis_May 2020 | -1.740*** | -0.007 | -0.805*** | 0.182*** | | | | |
| | (-6.739) | (-0.319) | (-3.296) | (4.501) | | | | |
| BANK_REL_3Y × COVID-19 Crisis_Jun 2020 | -1.242*** | -0.034 | -0.686** | 0.296*** | | | | |
| | (-4.310) | (-1.218) | (-2.335) | (7.346) | | | | |
| CARD_REL_3Y × COVID-19 Crisis_Mar 2020 | | | | | -0.414* | -0.045* | -0.358* | 0.026 |
| | | | | | (-1.914) | (-1.882) | (-1.838) | (0.953) |
| CARD_REL_3Y × COVID-19 Crisis_Apr 2020 | | | | | 0.859*** | -0.062* | 0.064 | 0.091** |
| | | | | | (2.723) | (-1.948) | (0.248) | (2.147) |
| CARD_REL_3Y × COVID-19 Crisis_May 2020 | | | | | -0.001 | -0.058* | -0.982*** | 0.199*** |
| | | | | | (-0.002) | (-1.675) | (-3.300) | (4.481) |
| CARD_REL_3Y × COVID-19 Crisis_Jun 2020 | | | | | 0.410 | 0.044 | -0.763* | 0.112** |
| | | | | | (1.162) | (1.286) | (-1.676) | (1.974) |
| CONVENTIONAL_BANK_REL × COVID-19 Crisis_Mar 2020 | | | | | 0.984*** | 0.068*** | 0.205 | 0.031 |
| | | | | | (4.361) | (2.740) | (1.109) | (1.214) |
| CONVENTIONAL_BANK_REL × COVID-19 Crisis_Apr 2020 | | | | | -2.911*** | 0.032 | -0.884*** | 0.001 |
| | | | | | (-8.655) | (1.203) | (-3.206) | (0.040) |
| CONVENTIONAL_BANK_REL × COVID-19 Crisis_May 2020 | | | | | -2.128*** | 0.016 | -0.464 | 0.111** |
| | | | | | (-7.040) | (0.611) | (-1.599) | (2.233) |
| CONVENTIONAL_BANK_REL × COVID-19 Crisis_Jun 2020 | | | | | -1.699*** | -0.060** | -0.562* | 0.268*** |
| | | | | | (-5.510) | (-1.993) | (-1.826) | (5.654) |
| BANK_REL_3Y | -0.843*** | 0.081*** | 0.903*** | -0.184*** | | | | |
| | (-10.162) | (9.566) | (8.889) | (-15.491) | | | | |
| CARD_REL_3Y | | | | | 0.105 | 0.033*** | 1.423*** | -0.240*** |
| | | | | | (1.066) | (3.286) | (12.101) | (-16.140) |
| CONVENTIONAL_BANK_REL | | | | | -1.139*** | 0.085*** | -0.004 | -0.049*** |
| | | | | | (-10.328) | (7.584) | (-0.042) | (-3.607) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 34,082 | 34,082 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.530 | 0.648 | 0.636 | 0.249 | 0.531 | 0.648 | 0.637 | 0.253 |



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*Panel R: Decomposition of Bank Relationships by Granular Conventional Bank Relationships Over Time*
*Panel R1: Effects during Normal Times*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | **Decompositions of Bank Relationships** | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | |
| CARD_REL_3Y × Y2013 | 0.862*** | 0.090*** | 2.461*** | -0.100*** |
| | (8.544) | (7.966) | (18.941) | (-7.657) |
| CARD_REL_3Y × Y2014 | 0.787*** | 0.016** | 2.462*** | -0.147*** |
| | (11.046) | (2.448) | (22.761) | (-12.366) |
| CARD_REL_3Y × Y2015 | 0.505*** | 0.010 | 1.252*** | -0.127*** |
| | (7.125) | (1.613) | (11.137) | (-10.917) |
| CARD_REL_3Y × Y2016 | 0.734*** | 0.068*** | 2.175*** | -0.125*** |
| | (12.609) | (11.304) | (22.290) | (-10.770) |
| CARD_REL_3Y × Y2017 | 0.636*** | 0.048*** | 2.832*** | -0.178*** |
| | (12.435) | (8.047) | (26.850) | (-17.333) |
| CARD_REL_3Y × Y2018 | 0.604*** | 0.014** | 1.322*** | -0.186*** |
| | (12.165) | (2.107) | (21.085) | (-23.866) |
| CARD_REL_3Y × Y2019 | 0.459*** | 0.018*** | 1.581*** | -0.218*** |
| | (7.875) | (3.223) | (26.365) | (-30.902) |
| CARD_REL_3Y × Y2020 | 0.776*** | 0.020 | 1.064*** | -0.272*** |
| | (4.555) | (1.445) | (6.844) | (-15.886) |
| DEPOSIT_REL × Y2013 | -4.096*** | 0.010 | 0.007 | -0.011 |
| | (-24.512) | (1.010) | (0.050) | (-0.608) |
| DEPOSIT_REL × Y2014 | -1.563*** | -0.006 | 0.456*** | -0.052*** |
| | (-11.525) | (-0.849) | (4.886) | (-3.681) |
| DEPOSIT_REL × Y2015 | -0.814*** | 0.029*** | 0.046 | -0.067*** |
| | (-6.043) | (4.892) | (0.515) | (-6.145) |
| DEPOSIT_REL × Y2016 | -0.736*** | 0.060*** | -0.073 | -0.011 |
| | (-7.759) | (7.838) | (-0.792) | (-1.071) |
| DEPOSIT_REL × Y2017 | -1.118*** | 0.096*** | -0.390*** | 0.026** |
| | (-10.849) | (12.814) | (-3.590) | (2.501) |
| DEPOSIT_REL × Y2018 | -0.911*** | 0.089*** | -0.184* | 0.006 |
| | (-8.185) | (11.712) | (-1.773) | (0.604) |
| DEPOSIT_REL × Y2019 | 0.349*** | 0.059*** | 0.355*** | 0.003 |
| | (3.845) | (7.960) | (3.865) | (0.353) |
| DEPOSIT_REL × Y2020 | 1.568*** | 0.097*** | 0.565*** | -0.003 |
| | (9.919) | (6.364) | (4.237) | (-0.191) |
| INVESTMENT_REL × Y2013 | 0.360 | 0.247*** | 0.755 | 0.172 |
| | (0.599) | (4.670) | (0.793) | (0.996) |
| INVESTMENT_REL × Y2014 | 1.139** | 0.262*** | 0.236 | -0.001 |
| | (2.416) | (6.384) | (0.277) | (-0.006) |
| INVESTMENT_REL × Y2015 | 0.222 | 0.183*** | -0.440 | 0.072 |
| | (0.491) | (4.535) | (-0.744) | (0.976) |
| INVESTMENT_REL × Y2016 | -2.191*** | 0.198*** | -0.404 | 0.095 |
| | (-6.969) | (5.939) | (-0.521) | (1.072) |
| INVESTMENT_REL × Y2017 | -3.652*** | 0.215*** | -0.075 | 0.243** |
| | (-10.472) | (6.162) | (-0.103) | (2.554) |
| INVESTMENT_REL × Y2018 | -2.121*** | 0.226*** | -1.246 | 0.180 |
| | (-5.480) | (5.024) | (-1.432) | (1.518) |
| INVESTMENT_REL × Y2019 | -1.402*** | 0.179*** | 1.694** | 0.001 |
| | (-3.394) | (4.265) | (2.076) | (0.016) |
| INVESTMENT_REL × Y2020 | 2.061** | 0.014 | 0.055 | 0.463* |
| | (2.076) | (0.121) | (0.056) | (1.646) |
| MORTGAGE_REL × Y2013 | 2.739*** | 0.017 | -0.093 | 0.045 |
| | (8.242) | (0.579) | (-0.190) | (0.812) |
| MORTGAGE_REL × Y2014 | 4.023*** | 0.044* | 0.021 | 0.125*** |
| | (14.671) | (1.958) | (0.058) | (2.912) |
| MORTGAGE_REL × Y2015 | 3.734*** | 0.047** | -0.013 | 0.122*** |
| | (13.612) | (2.041) | (-0.036) | (2.792) |
| MORTGAGE_REL × Y2016 | -1.686*** | 0.064*** | -0.041 | 0.123** |
| | (-8.341) | (3.213) | (-0.099) | (2.401) |
| MORTGAGE_REL × Y2017 | -1.691*** | 0.095*** | -0.194 | 0.004 |
| | (-8.386) | (4.196) | (-0.438) | (0.074) |
| MORTGAGE_REL × Y2018 | -2.359*** | 0.044** | 1.833*** | 0.054 |
| | (-9.924) | (2.551) | (3.297) | (1.041) |
| MORTGAGE_REL × Y2019 | -1.952*** | -0.024 | 1.790*** | 0.039 |
| | (-8.189) | (-1.190) | (4.151) | (0.702) |
| MORTGAGE_REL × Y2020 | 0.420 | -0.022 | -0.147 | -0.088 |
| | (0.668) | (-0.383) | (-0.160) | (-0.871) |
| AUTO_REL × Y2013 | 0.983** | 0.061 | 1.014 | 0.010 |
| | (2.528) | (1.585) | (1.026) | (0.078) |
| AUTO_REL × Y2014 | 1.552*** | 0.012 | 1.104** | -0.030 |
| | (4.936) | (0.483) | (2.014) | (-0.492) |
| AUTO_REL × Y2015 | 1.657*** | 0.047* | -0.229 | -0.042 |
| | (5.214) | (1.820) | (-0.406) | (-0.619) |



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| | | | | |
|---|---|---|---|---|
| AUTO_REL × Y2016 | -0.180 | -0.100*** | -0.295 | -0.018 |
| | (-0.829) | (-4.375) | (-0.542) | (-0.340) |
| AUTO_REL × Y2017 | -0.038 | -0.007 | 1.161** | 0.082 |
| | (-0.171) | (-0.315) | (2.234) | (1.356) |
| AUTO_REL × Y2018 | -1.276*** | 0.013 | 1.395*** | -0.055 |
| | (-4.584) | (0.563) | (2.953) | (-1.002) |
| AUTO_REL × Y2019 | -0.997*** | 0.064*** | 1.434*** | 0.035 |
| | (-3.900) | (3.073) | (3.119) | (0.541) |
| AUTO_REL × Y2020 | 0.484 | 0.088** | 2.954*** | -0.023 |
| | (0.805) | (1.996) | (2.966) | (-0.182) |
| STUDENT_REL × Y2013 | 2.048** | -0.025 | 3.301 | -0.235*** |
| | (2.158) | (-0.262) | (1.198) | (-6.968) |
| STUDENT_REL × Y2014 | 1.217** | 0.013 | -1.017 | -0.212 |
| | (2.138) | (0.240) | (-1.571) | (-1.236) |
| STUDENT_REL × Y2015 | 2.353*** | 0.100 | 1.817 | -0.314 |
| | (3.445) | (1.620) | (1.055) | (-1.029) |
| STUDENT_REL × Y2016 | 0.699 | -0.092 | -0.589 | 0.031 |
| | (1.387) | (-1.541) | (-0.217) | (0.236) |
| STUDENT_REL × Y2017 | -1.056** | 0.096* | -4.965* | 0.005 |
| | (-2.352) | (1.698) | (-1.822) | (0.020) |
| STUDENT_REL × Y2018 | -1.530*** | 0.163*** | -3.827*** | -0.137 |
| | (-2.618) | (2.832) | (-24.235) | (-0.994) |
| STUDENT_REL × Y2019 | -1.589*** | 0.033 | -3.161 | -0.335 |
| | (-3.163) | (0.607) | (-1.396) | (-0.688) |
| STUDENT_REL × Y2020 | -6.434*** | 0.183 | 0.037 | -0.094 |
| | (-5.296) | (1.427) | (0.075) | (-0.558) |
| OTHERLOAN_REL × Y2013 | 0.616 | 0.046 | -0.958 | 0.610*** |
| | (0.745) | (0.464) | (-0.841) | (4.972) |
| OTHERLOAN_REL × Y2014 | 0.457 | 0.007 | -0.573 | 0.073 |
| | (0.864) | (0.108) | (-0.856) | (0.595) |
| OTHERLOAN_REL × Y2015 | 0.704 | -0.010 | -0.295 | 0.128 |
| | (1.447) | (-0.199) | (-0.277) | (1.082) |
| OTHERLOAN_REL × Y2016 | -0.047 | 0.040 | -0.153 | -0.014 |
| | (-0.103) | (0.626) | (-0.123) | (-0.109) |
| OTHERLOAN_REL × Y2017 | -1.259*** | 0.017 | 1.099* | 0.535** |
| | (-2.901) | (0.299) | (1.703) | (2.368) |
| OTHERLOAN_REL × Y2018 | -1.076*** | 0.058 | -2.091** | 0.450*** |
| | (-2.670) | (0.934) | (-2.387) | (4.292) |
| OTHERLOAN_REL × Y2019 | -0.708* | 0.042 | -1.218*** | -0.360*** |
| | (-1.801) | (0.954) | (-2.598) | (-5.041) |
| OTHERLOAN_REL × Y2020 | -5.862*** | -0.064 | -0.744 | -0.426*** |
| | (-5.062) | (-0.531) | (-1.227) | (-4.172) |
| MULTI_PRODUCT_REL × Y2013 | -4.827*** | 0.171*** | 0.389 | 0.100*** |
| | (-28.055) | (13.867) | (1.570) | (3.818) |
| MULTI_PRODUCT_REL × Y2014 | -2.591*** | 0.150*** | -0.195 | 0.070*** |
| | (-17.317) | (16.716) | (-1.278) | (3.781) |
| MULTI_PRODUCT_REL × Y2015 | -1.670*** | 0.193*** | -0.616*** | -0.015 |
| | (-11.592) | (20.709) | (-6.811) | (-1.402) |
| MULTI_PRODUCT_REL × Y2016 | -2.009*** | 0.184*** | -0.908*** | 0.025*** |
| | (-14.654) | (18.724) | (-10.736) | (2.978) |
| MULTI_PRODUCT_REL × Y2017 | -1.284*** | 0.198*** | -1.084*** | 0.067*** |
| | (-9.357) | (19.210) | (-12.906) | (7.364) |
| MULTI_PRODUCT_REL × Y2018 | -0.395*** | 0.240*** | -0.437*** | 0.104*** |
| | (-3.072) | (23.303) | (-4.411) | (10.404) |
| MULTI_PRODUCT_REL × Y2019 | -0.121 | 0.259*** | -0.138 | 0.081*** |
| | (-0.970) | (25.826) | (-1.313) | (6.984) |
| MULTI_PRODUCT_REL × Y2020 | 1.407*** | 0.311*** | -0.135 | 0.032 |
| | (6.290) | (15.220) | (-0.471) | (0.707) |
| Ln(1+Limit) | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 277,562 | 277,562 |
| Adjusted R-squared | 0.533 | 0.613 | 0.595 | 0.329 |



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*Panel R2: Changes during the COVID-19 Crisis*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | **Decompositions of Bank Relationships** | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | |
| CARD_REL_3Y × COVID-19 Crisis_Mar 2020 | -0.396* | -0.045* | -0.338* | 0.021 |
| | (-1.846) | (-1.896) | (-1.755) | (0.761) |
| CARD_REL_3Y × COVID-19 Crisis_Apr 2020 | 0.808** | -0.061* | 0.039 | 0.091** |
| | (2.575) | (-1.919) | (0.147) | (2.157) |
| CARD_REL_3Y × COVID-19 Crisis_May 2020 | 0.151 | -0.060* | -0.963*** | 0.203*** |
| | (0.483) | (-1.704) | (-3.264) | (4.528) |
| CARD_REL_3Y × COVID-19 Crisis_Jun 2020 | 0.496 | 0.048 | -0.747 | 0.131** |
| | (1.401) | (1.384) | (-1.613) | (2.268) |
| DEPOSIT_REL × COVID-19 Crisis_Mar 2020 | 0.571** | 0.057* | 0.260 | 0.027 |
| | (2.174) | (1.912) | (1.244) | (0.994) |
| DEPOSIT_REL × COVID-19 Crisis_Apr 2020 | -3.216*** | 0.026 | -1.011*** | -0.003 |
| | (-8.566) | (0.848) | (-3.445) | (-0.066) |
| DEPOSIT_REL × COVID-19 Crisis_May 2020 | -3.025*** | 0.053* | -0.595* | 0.099* |
| | (-8.469) | (1.697) | (-1.810) | (1.885) |
| DEPOSIT_REL × COVID-19 Crisis_Jun 2020 | -2.448*** | -0.066** | -0.668** | 0.294*** |
| | (-6.596) | (-1.993) | (-2.135) | (6.179) |
| INVESTMENT_REL × COVID-19 Crisis_Mar 2020 | 2.414 | 0.111 | 0.448 | -0.158 |
| | (0.996) | (0.582) | (0.245) | (-0.524) |
| INVESTMENT_REL × COVID-19 Crisis_Apr 2020 | -2.326 | 0.230 | 1.863 | 0.055 |
| | (-0.896) | (1.513) | (0.426) | (0.048) |
| INVESTMENT_REL × COVID-19 Crisis_May 2020 | 4.575** | -0.152 | 2.535 | 0.813 |
| | (2.546) | (-0.906) | (0.560) | (1.322) |
| INVESTMENT_REL × COVID-19 Crisis_Jun 2020 | -3.352 | -0.111 | | |
| | (-1.276) | (-0.504) | | |
| MORTGAGE_REL × COVID-19 Crisis_Mar 2020 | 1.089 | 0.178** | -0.531 | 0.349** |
| | (0.658) | (2.165) | (-0.371) | (2.087) |
| MORTGAGE_REL × COVID-19 Crisis_Apr 2020 | -2.154 | 0.172 | 0.409 | -0.585** |
| | (-1.268) | (1.629) | (0.162) | (-2.131) |
| MORTGAGE_REL × COVID-19 Crisis_May 2020 | 2.751* | 0.122 | -0.535 | 1.620*** |
| | (1.871) | (1.287) | (-0.728) | (15.170) |
| MORTGAGE_REL × COVID-19 Crisis_Jun 2020 | 3.438** | 0.157* | -7.419*** | -0.341*** |
| | (2.249) | (1.656) | (-8.660) | (-3.173) |
| AUTO_REL × COVID-19 Crisis_Mar 2020 | 1.112 | 0.078 | 3.303** | 0.085 |
| | (0.947) | (0.840) | (2.084) | (0.413) |
| AUTO_REL × COVID-19 Crisis_Apr 2020 | -5.271*** | 0.052 | -0.366 | -0.194 |
| | (-3.227) | (0.554) | (-0.137) | (-0.720) |
| AUTO_REL × COVID-19 Crisis_May 2020 | -1.581 | 0.190** | -1.285 | 0.611*** |
| | (-1.023) | (2.112) | (-1.511) | (6.144) |
| AUTO_REL × COVID-19 Crisis_Jun 2020 | -0.988 | -0.056 | | |
| | (-0.651) | (-0.589) | | |
| STUDENT_REL × COVID-19 Crisis_Mar 2020 | 5.073** | -0.022 | | |
| | (1.976) | (-0.118) | | |
| STUDENT_REL × COVID-19 Crisis_Apr 2020 | 1.014 | 0.224* | | |
| | (0.438) | (1.915) | | |
| STUDENT_REL × COVID-19 Crisis_May 2020 | 0.867 | 0.114 | | |
| | (0.785) | (0.930) | | |
| STUDENT_REL × COVID-19 Crisis_Jun 2020 | -1.988 | 0.135 | | |
| | (-0.352) | (0.498) | | |
| OTHERLOAN_REL × COVID-19 Crisis_Mar 2020 | -0.284 | -0.092 | 0.222 | 0.148 |
| | (-0.207) | (-0.446) | (0.299) | (0.782) |
| OTHERLOAN_REL × COVID-19 Crisis_Apr 2020 | 0.257 | 0.123 | -0.925 | 0.033 |
| | (0.111) | (0.653) | (-1.140) | (0.154) |
| OTHERLOAN_REL × COVID-19 Crisis_May 2020 | -2.387* | -0.209 | -0.259 | 0.360 |
| | (-1.674) | (-0.925) | (-0.249) | (1.539) |
| OTHERLOAN_REL × COVID-19 Crisis_Jun 2020 | -3.609 | -0.471* | -0.235 | 0.129 |
| | (-1.462) | (-1.827) | (-0.205) | (0.463) |
| MULTI_PRODUCT_REL × COVID-19 Crisis_Mar 2020 | 1.590*** | 0.082** | -0.289 | 0.039 |
| | (4.598) | (2.167) | (-0.646) | (0.565) |
| MULTI_PRODUCT_REL × COVID-19 Crisis_Apr 2020 | -1.817*** | 0.023 | 0.056 | 0.154* |
| | (-3.320) | (0.438) | (0.081) | (1.654) |
| MULTI_PRODUCT_REL × COVID-19 Crisis_May 2020 | -1.423*** | -0.093* | 0.110 | 0.068 |
| | (-2.643) | (-1.873) | (0.167) | (0.798) |
| MULTI_PRODUCT_REL × COVID-19 Crisis_Jun 2020 | -0.942* | -0.082 | 0.186 | 0.118 |
| | (-1.837) | (-1.546) | (0.275) | (1.193) |
| CARD_REL_3Y | 0.114 | 0.034*** | 1.421*** | -0.240*** |
| | (1.158) | (3.365) | (12.080) | (-16.047) |
| DEPOSIT_REL | -1.306*** | 0.059*** | -0.023 | -0.052*** |
| | (-9.130) | (4.679) | (-0.192) | (-3.534) |
| INVESTMENT_REL | -0.275 | 0.179** | 1.428 | 0.216 |
| | (-0.368) | (2.366) | (1.388) | (1.114) |
| MORTGAGE_REL | -1.073** | -0.056 | 0.527 | -0.223** |



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| | | | | |
|---|---|---|---|---|
| | (-2.194) | (-1.271) | (0.777) | (-2.241) |
| AUTO_REL | -0.859* | 0.073** | 1.837** | 0.005 |
| | (-1.682) | (2.191) | (2.405) | (0.061) |
| STUDENT_REL | -1.497* | 0.093 | -1.154 | -0.086 |
| | (-1.762) | (1.095) | (-1.635) | (-0.632) |
| OTHERLOAN_REL | -0.747 | -0.131 | -0.306 | -0.533*** |
| | (-1.009) | (-1.500) | (-0.845) | (-5.720) |
| MULTI_PRODUCT_REL | -0.975*** | 0.163*** | -0.232 | 0.073** |
| | (-6.166) | (9.523) | (-1.048) | (2.478) |
| Ln(1+Limit) | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.532 | 0.648 | 0.638 | 0.256 |

*Panel R3: Changes during the COVID-19 Crisis*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | **Decompositions of Bank Relationships** | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | |
| CARD_REL_3Y × Nov 2019 | 0.196 | 0.024 | 1.201*** | -0.263*** |
| | (1.055) | (1.181) | (6.149) | (-9.373) |
| CARD_REL_3Y × Dec 2019 | -0.228 | 0.042** | 1.553*** | -0.243*** |
| | (-1.286) | (2.327) | (8.169) | (-10.077) |
| CARD_REL_3Y × Jan 2020 | 0.157 | 0.055*** | 1.626*** | -0.209*** |
| | (0.858) | (2.913) | (8.336) | (-8.627) |
| CARD_REL_3Y × Feb 2020 | 0.325 | 0.008 | 1.293*** | -0.248*** |
| | (1.543) | (0.384) | (6.644) | (-11.751) |
| CARD_REL_3Y × Mar 2020 | -0.297 | -0.010 | 1.088*** | -0.217*** |
| | (-1.416) | (-0.446) | (6.443) | (-8.683) |
| CARD_REL_3Y × Apr 2020 | 0.924*** | -0.027 | 1.465*** | -0.147*** |
| | (3.011) | (-0.890) | (6.430) | (-3.925) |
| CARD_REL_3Y × May 2020 | 0.262 | -0.025 | 0.462 | -0.035 |
| | (0.841) | (-0.759) | (1.574) | (-0.835) |
| CARD_REL_3Y × Jun 2020 | 0.609* | 0.082** | 0.681 | -0.107** |
| | (1.820) | (2.518) | (1.483) | (-1.982) |
| DEPOSIT_REL × Nov 2019 | -2.009*** | 0.025 | -0.011 | -0.057** |
| | (-8.640) | (1.112) | (-0.052) | (-2.424) |
| DEPOSIT_REL × Dec 2019 | -1.797*** | 0.089*** | 0.112 | -0.017 |
| | (-7.879) | (3.913) | (0.571) | (-0.595) |
| DEPOSIT_REL × Jan 2020 | -1.774*** | 0.041* | -0.109 | -0.028 |
| | (-8.474) | (1.748) | (-0.574) | (-1.143) |
| DEPOSIT_REL × Feb 2020 | 0.632*** | 0.075*** | -0.051 | -0.098*** |
| | (2.715) | (3.558) | (-0.264) | (-4.084) |
| DEPOSIT_REL × Mar 2020 | -0.678*** | 0.114*** | 0.232 | -0.027 |
| | (-2.742) | (4.092) | (1.138) | (-1.176) |
| DEPOSIT_REL × Apr 2020 | -4.499*** | 0.085*** | -1.040*** | -0.056 |
| | (-12.122) | (2.938) | (-3.585) | (-1.446) |
| DEPOSIT_REL × May 2020 | -4.310*** | 0.113*** | -0.620* | 0.047 |
| | (-12.368) | (3.722) | (-1.881) | (0.915) |
| DEPOSIT_REL × Jun 2020 | -3.725*** | -0.007 | -0.690** | 0.241*** |
| | (-10.273) | (-0.226) | (-2.341) | (5.245) |
| INVESTMENT_REL × Nov 2019 | -2.027 | 0.532*** | 3.915** | 0.316 |
| | (-1.388) | (5.552) | (2.247) | (1.599) |
| INVESTMENT_REL × Dec 2019 | -1.355 | 0.257** | 1.696 | -0.238 |
| | (-0.846) | (2.158) | (0.714) | (-0.582) |
| INVESTMENT_REL × Jan 2020 | -0.897 | 0.196 | -2.118 | -0.107 |
| | (-0.816) | (1.358) | (-0.960) | (-0.437) |
| INVESTMENT_REL × Feb 2020 | 2.844* | -0.195 | -0.720 | 0.625 |
| | (1.854) | (-1.099) | (-0.498) | (1.448) |
| INVESTMENT_REL × Mar 2020 | 2.242 | 0.288* | 1.870 | 0.061 |
| | (0.950) | (1.646) | (1.170) | (0.258) |
| INVESTMENT_REL × Apr 2020 | -2.597 | 0.410*** | 3.291 | 0.275 |
| | (-1.052) | (3.261) | (0.776) | (0.243) |
| INVESTMENT_REL × May 2020 | 4.344*** | 0.027 | 3.963 | 1.033* |
| | (2.646) | (0.180) | (0.888) | (1.772) |
| INVESTMENT_REL × Jun 2020 | -3.655 | 0.068 | | |
| | (-1.484) | (0.330) | | |
| MORTGAGE_REL × Nov 2019 | -1.450 | 0.140* | -0.036 | -0.332** |
| | (-1.505) | (1.806) | (-0.026) | (-2.241) |
| MORTGAGE_REL × Dec 2019 | -1.417 | -0.209** | 1.917 | -0.356 |
| | (-1.600) | (-2.343) | (1.611) | (-1.499) |
| MORTGAGE_REL × Jan 2020 | -2.971*** | -0.179** | -0.850 | 0.032 |
| | (-3.043) | (-2.239) | (-0.505) | (0.214) |
| MORTGAGE_REL × Feb 2020 | 1.730* | 0.054 | 0.602 | -0.189 |
| | (1.917) | (0.703) | (0.460) | (-1.396) |
| MORTGAGE_REL × Mar 2020 | 0.137 | 0.120* | -0.006 | 0.128 |



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| | | | | |
|---|---|---|---|---|
| | (0.089) | (1.654) | (-0.005) | (0.916) |
| MORTGAGE_REL × Apr 2020 | -3.265** | 0.116 | 0.941 | -0.805*** |
| | (-1.966) | (1.240) | (0.399) | (-3.241) |
| MORTGAGE_REL × May 2020 | 1.654 | 0.067 | -0.010 | 1.398*** |
| | (1.161) | (0.713) | (-0.029) | (29.930) |
| MORTGAGE_REL × Jun 2020 | 2.323 | 0.102 | -6.882*** | -0.565*** |
| | (1.507) | (1.175) | (-15.164) | (-9.506) |
| AUTO_REL × Nov 2019 | -1.063 | 0.171** | 0.172 | 0.071 |
| | (-0.988) | (2.056) | (0.116) | (0.443) |
| AUTO_REL × Dec 2019 | -0.357 | 0.042 | 1.265 | 0.090 |
| | (-0.419) | (0.557) | (0.838) | (0.544) |
| AUTO_REL × Jan 2020 | -2.521*** | 0.070 | 3.141** | 0.002 |
| | (-2.955) | (1.150) | (2.390) | (0.011) |
| AUTO_REL × Feb 2020 | 0.400 | 0.028 | 3.302** | -0.171 |
| | (0.419) | (0.405) | (2.180) | (-0.923) |
| AUTO_REL × Mar 2020 | 0.308 | 0.150* | 5.137*** | 0.094 |
| | (0.288) | (1.828) | (3.670) | (0.508) |
| AUTO_REL × Apr 2020 | -6.159*** | 0.125 | 1.478 | -0.186 |
| | (-4.105) | (1.387) | (0.587) | (-0.720) |
| AUTO_REL × May 2020 | -2.457* | 0.264*** | 0.561* | 0.623*** |
| | (-1.687) | (3.007) | (1.697) | (12.696) |
| AUTO_REL × Jun 2020 | -1.847 | 0.016 | | |
| | (-1.279) | (0.182) | | |
| STUDENT_REL × Nov 2019 | -0.173 | -0.110 | | |
| | (-0.112) | (-0.554) | | |
| STUDENT_REL × Dec 2019 | 0.331 | 0.015 | -3.831*** | 0.185*** |
| | (0.200) | (0.125) | (-13.303) | (3.915) |
| STUDENT_REL × Jan 2020 | 0.440 | 0.259 | -0.537 | -0.139 |
| | (0.369) | (0.980) | (-0.998) | (-0.951) |
| STUDENT_REL × Feb 2020 | -6.149*** | 0.260** | | |
| | (-4.554) | (2.481) | | |
| STUDENT_REL × Mar 2020 | 3.586 | 0.070 | | |
| | (1.453) | (0.393) | | |
| STUDENT_REL × Apr 2020 | -0.487 | 0.317*** | | |
| | (-0.227) | (3.960) | | |
| STUDENT_REL × May 2020 | -0.614 | 0.206* | | |
| | (-0.758) | (1.839) | | |
| STUDENT_REL × Jun 2020 | -3.515 | 0.228 | | |
| | (-0.650) | (0.887) | | |
| OTHERLOAN_REL × Nov 2019 | 3.970*** | -0.192 | -0.062 | -0.430 |
| | (3.445) | (-0.981) | (-0.078) | (-1.546) |
| OTHERLOAN_REL × Dec 2019 | -0.906 | -0.366* | 0.371 | -0.731*** |
| | (-0.710) | (-1.855) | (0.503) | (-4.763) |
| OTHERLOAN_REL × Jan 2020 | -0.253 | -0.025 | -1.151* | -0.728*** |
| | (-0.227) | (-0.123) | (-1.653) | (-4.852) |
| OTHERLOAN_REL × Feb 2020 | -4.594*** | 0.034 | -0.650 | -0.213 |
| | (-3.710) | (0.245) | (-1.155) | (-1.481) |
| OTHERLOAN_REL × Mar 2020 | -1.015 | -0.224 | -0.079 | -0.383** |
| | (-0.870) | (-1.196) | (-0.120) | (-2.436) |
| OTHERLOAN_REL × Apr 2020 | -0.477 | -0.009 | -1.232 | -0.501*** |
| | (-0.218) | (-0.054) | (-1.631) | (-2.591) |
| OTHERLOAN_REL × May 2020 | -3.130*** | -0.340* | -0.562 | -0.173 |
| | (-2.585) | (-1.699) | (-0.607) | (-0.862) |
| OTHERLOAN_REL × Jun 2020 | -4.298* | -0.606** | -0.572 | -0.405 |
| | (-1.830) | (-2.515) | (-0.539) | (-1.535) |
| MULTI_PRODUCT_REL × Nov 2019 | -1.910*** | 0.182*** | -0.459 | 0.129*** |
| | (-5.557) | (5.050) | (-0.923) | (2.733) |
| MULTI_PRODUCT_REL × Dec 2019 | -1.869*** | 0.181*** | -0.318 | 0.152** |
| | (-6.303) | (5.973) | (-0.718) | (2.147) |
| MULTI_PRODUCT_REL × Jan 2020 | -1.290*** | 0.130*** | -0.276 | 0.009 |
| | (-4.938) | (4.727) | (-0.679) | (0.144) |
| MULTI_PRODUCT_REL × Feb 2020 | 1.327*** | 0.154*** | 0.065 | 0.013 |
| | (4.310) | (4.849) | (0.152) | (0.204) |
| MULTI_PRODUCT_REL × Mar 2020 | 0.676** | 0.243*** | -0.521 | 0.111* |
| | (1.969) | (6.768) | (-1.451) | (1.894) |
| MULTI_PRODUCT_REL × Apr 2020 | -2.798*** | 0.185*** | -0.175 | 0.229*** |
| | (-5.110) | (3.894) | (-0.253) | (2.709) |
| MULTI_PRODUCT_REL × May 2020 | -2.401*** | 0.070 | -0.117 | 0.142* |
| | (-4.687) | (1.453) | (-0.192) | (1.699) |
| MULTI_PRODUCT_REL × Jun 2020 | -1.916*** | 0.081* | -0.041 | 0.193** |
| | (-3.752) | (1.661) | (-0.060) | (2.052) |
| Ln(1+Limit) | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.534 | 0.648 | 0.638 | 0.256 |



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## Table OA.2: Additional Analyses – Changes in Effects on Credit Card Customers during the COVID-19 Crisis

This table analyzes changes in the effects of relationships on credit card terms during the COVID-19 crisis using several additional robustness tests. The loan origination data are from the FR Y-14M credit card dataset and cover four months before and four months after COVID-19 started (after the first declaration of emergency by government officials in Washington state on Feb 29, 2020), spanning November 2019 through June 2020. We use a 0.5% random sample for consumer accounts and a 5% random sample for business accounts. Panel A shows results using three alternative samples: 1) subtract two months from our baseline pre-COVID-19 period, effectively starting on January 2020; 2) adding two extra months to our baseline pre-COVID-19 period, effectively starting on September 2020; 3) consider the pre-COVID-19 period to be same exact time that the COVID-crisis period is but one year earlier in 2019, that is March 1 through June 30 2019. Panel B1-B2 shows results using alternative COVID-19 continuous measures focused on government-activity restrictions and health intensity at the national, state, or county level. Panel C1-C2 shows results when controlling for the ratio of PPP loans to bank total assets, *PPP Loans/Total Assets*, as well as when we interact an indicator *High PPP* (for banks with above 75th percentile PPP loans relative to total assets) with *BANK_REL_3Y*, *COVID-19 Crisis*, and *BANK_REL_3Y×COVID-19 Crisis*. The dependent variables are: *APR Spread*, interest rate spread over the constant rate Treasury bonds with a similar maturity and *Ln(1+Limit)*, natural log of 1 plus the origination credit limit on the account. The key explanatory variable are *BANK_REL_3Y* and *BANK_REL_3Y × COVID-19 Crisis*, where *BANK_REL_3Y* is a dummy that equals 1 if the customer has another credit card with the bank in the prior three years and/or a conventional relationship with the bank (based on past provision of deposits; investments; mortgage, auto, student, or other loans; or multiple products), and *COVID-19 Crisis* is a dummy that equals 1 from March 1, 2020, onward. We include a broad set of customer and loan controls measured at the origination time or the FR Y-14M report month-end: *Customer Credit Score* dummies, *Customer Income* dummies, *Customer Utilization Rate*, joint account, many authorized users, variable interest rate account, secured card, promotional card, dummies for credit card purpose, and dummies for the channel through which the card was opened. We also include a number of bank characteristics, all lagged one quarter: bank size, bank age, capital ratio, and liquidity ratio, the ratio of non-performing loans, earnings, the ratio of loans to assets. Three local market controls are included, measured at the county level: *Cnty Unemployment*, *Cnty HPI*, and *Cnty Change in HPI*. All regressions include Bank, County, and Month-Year fixed effects. All variables are defined in Table 1. Heteroskedasticity-robust *t*-statistics clustered at county level are reported in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

*Panel A: Different Pre+During COVID-19 Samples*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample | Start in 2020:M1 (Subtract 2 months) | | | | Start in 2019:M9 (Add 2 months) | | | | Same time in 2019 (Start in 2019:M3-2019:M6) | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| | APR | Ln | APR | Ln | APR | Ln | APR | Ln | APR | Ln | APR | Ln |
| **Dependent Variable:** | Spread | (1+Limit) | Spread | (1+Limit) | Spread | (1+Limit) | Spread | (1+Limit) | Spread | (1+Limit) | Spread | (1+Limit) |
| **Independent Variables:** | | | | | | | | | | | | |
| BANK_REL_3Y × COVID-19 Crisis | -0.698*** | 0.014 | -0.354** | 0.085*** | -0.795*** | 0.004 | -0.346*** | 0.105*** | -1.748*** | 0.043*** | -0.278** | 0.050*** |
| | (-4.480) | (0.864) | (-2.257) | (4.191) | (-5.979) | (0.348) | (-2.898) | (5.818) | (-11.934) | (3.275) | (-2.180) | (2.680) |
| BANK_REL_3Y | -0.995*** | 0.077*** | 0.962*** | -0.169*** | -0.796*** | 0.083*** | 0.944*** | -0.170*** | -0.110 | 0.049*** | 0.998*** | -0.122*** |
| | (-7.904) | (6.442) | (7.089) | (-10.854) | (-9.988) | (11.905) | (10.906) | (-17.534) | (-1.143) | (5.596) | (10.655) | (-11.914) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 40,539 | 40,539 | 23,256 | 23,256 | 82,395 | 82,395 | 45,832 | 45,832 | 61,960 | 61,960 | 34,452 | 34,452 |
| Adjusted R-squared | 0.511 | 0.639 | 0.645 | 0.253 | 0.535 | 0.653 | 0.628 | 0.245 | 0.574 | 0.632 | 0.657 | 0.246 |



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*Panel B: Different Measures of Crisis: Crisis Intensity*

*Panel B1: Consumer Accounts*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Intensity Indicator | US Restrictions Index | State Restrictions Index | GPS State Immobility | County New Cases /100K Pop | County New Deaths /100K Pop | US Restrictions Index | State Restrictions Index | GPS State Immobility | County New Cases /100K Pop | County New Deaths /100K Pop |
| **Dependent Variable:** | APR Spread | APR Spread | APR Spread | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | | | |
| BANK_REL_3Y × COVID-19 Crisis (Intensity Indicator) | -0.251*** | -0.237*** | -9.045*** | -0.038*** | -0.303** | 0.001 | 0.001 | 0.034 | -0.000 | -0.019* |
| | (-10.370) | (-9.679) | (-9.914) | (-2.871) | (-2.234) | (0.424) | (0.385) | (0.424) | (-0.443) | (-1.815) |
| BANK_REL_3Y | -0.695*** | -0.718*** | -0.750*** | -1.064*** | -1.107*** | 0.080*** | 0.080*** | 0.080*** | 0.083*** | 0.084*** |
| | (-8.628) | (-8.903) | (-9.461) | (-14.428) | (-15.764) | (9.768) | (9.889) | (10.026) | (11.369) | (11.873) |
| COVID-19 Crisis (Intensity Indicator) | 0.138*** | 0.063** | 0.563 | 0.000 | -0.114* | -0.016*** | -0.013*** | -0.458*** | -0.000 | -0.010* |
| | (3.727) | (2.083) | (0.586) | (0.143) | (-1.818) | (-4.791) | (-4.329) | (-5.152) | (-0.723) | (-1.676) |
| Ln(1+Limit) | YES | YES | YES | YES | YES | NO | NO | NO | NO | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 | 61,621 |
| Adjusted R-squared | 0.530 | 0.530 | 0.530 | 0.529 | 0.529 | 0.648 | 0.648 | 0.648 | 0.648 | 0.648 |

*Panel B2: Small Business Accounts*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Intensity Indicator | US Restrictions Index | State Restrictions Index | GPS State Immobility | County New Cases /100K Pop | County New Deaths /100K Pop | US Restrictions Index | State Restrictions Index | GPS State Immobility | County New Cases /100K Pop | County New Deaths /100K Pop |
| **Dependent Variable:** | APR Spread | APR Spread | APR Spread | APR Spread | APR Spread | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | | | |
| BANK_REL_3Y × COVID-19 Crisis (Intensity Indicator) | -0.059*** | -0.050** | -1.430** | -0.019** | -0.227** | 0.021*** | 0.021*** | 0.564*** | 0.003*** | 0.052*** |
| | (-2.884) | (-2.566) | (-2.006) | (-2.285) | (-2.128) | (6.162) | (6.370) | (5.103) | (2.752) | (3.349) |
| BANK_REL_3Y | 0.892*** | 0.880*** | 0.857*** | 0.835*** | 0.821*** | -0.182*** | -0.183*** | -0.173*** | -0.155*** | -0.154*** |
| | (9.372) | (9.364) | (9.196) | (10.072) | (9.952) | (-15.743) | (-15.943) | (-15.654) | (-16.293) | (-16.203) |
| COVID-19 Crisis (Intensity Indicator) | -0.009 | -0.015 | -1.279 | 0.006 | 0.049 | -0.015*** | -0.017*** | -0.423*** | -0.001* | -0.031*** |
| | (-0.233) | (-0.480) | (-1.338) | (0.985) | (0.579) | (-3.329) | (-4.101) | (-3.471) | (-1.691) | (-2.810) |
| Ln(1+Limit) | YES | YES | YES | YES | YES | NO | NO | NO | NO | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 | 34,082 |
| Adjusted R-squared | 0.636 | 0.636 | 0.636 | 0.636 | 0.636 | 0.249 | 0.249 | 0.248 | 0.248 | 0.248 |



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*Panel C: PPP Lending*

*Panel C1: Control for PPP Lending*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | |
| BANK_REL_3Y × COVID-19 Crisis | -0.863*** | 0.002 | -0.322** | 0.113*** |
| | (-6.634) | (0.176) | (-2.479) | (5.991) |
| BANK_REL_3Y | -0.843*** | 0.081*** | 0.902*** | -0.185*** |
| | (-10.187) | (9.606) | (8.879) | (-15.466) |
| PPP Loans/Total Assets | -924.709*** | -23.519*** | -29.881 | 7.668 |
| | (-11.416) | (-2.716) | (-0.113) | (0.187) |
| Ln(1+Limit) | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.530 | 0.648 | 0.636 | 0.248 |

*Panel C2: Interactions with High PPP Lending (PPP Loans/Total Assets ≥ P75)*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | |
| BANK_REL_3Y × COVID-19 Crisis × High PPP | 2.286*** | -0.072** | 0.321 | -0.006 |
| | (7.326) | (-2.100) | (0.961) | (-0.131) |
| High PPP | 0.994*** | 0.008 | -0.387 | 0.112* |
| | (4.736) | (0.325) | (-0.902) | (1.749) |
| COVID-19 Crisis × High PPP | -2.707*** | -0.039* | -0.758*** | -0.016 |
| | (-12.132) | (-1.809) | (-3.028) | (-0.428) |
| BANK_REL_3Y × High PPP | 1.666*** | 0.048** | 0.685*** | -0.145*** |
| | (8.872) | (2.277) | (2.920) | (-5.884) |
| BANK_REL_3Y | -1.212*** | 0.070*** | 0.731*** | -0.145*** |
| | (-13.201) | (7.203) | (8.344) | (-10.670) |
| BANK_REL_3Y × COVID-19 Crisis | -1.365*** | 0.016 | -0.415*** | 0.109*** |
| | (-8.440) | (1.060) | (-3.300) | (4.731) |
| Ln(1+Limit) | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES |
| Observations | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.532 | 0.648 | 0.636 | 0.249 |



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## Table OA.3: Heterogeneous Effects by Bank and County Characteristics

This table examines how the effects of relationships on credit card terms differ by bank and county characteristics. Panels A-F focus on bank characteristics (smaller bank size, low capital ratio, low liquidity ratio, low core deposits ratio, low profitability (ROE), high CFPB customer credit card complaints, high non-prime customer concentration, using the median of the characteristic as a cutoff). Panels G-I focus on county characteristics (high unemployment rate, low family income, high minority percent, using the median of the characteristic as a cutoff). In each panel, Columns (1)-(4) show results during normal times, while columns (5)-(8) show changes during the COVID-19 crisis. The loan origination data come from the FR Y-14M credit card dataset and cover the period June 2013 through February 2020 for normal times, and the period November 2019 through June 2020 for changes during the COVID-19 crisis. We use a 0.5% random sample for consumer accounts and a 5% random sample for small business accounts. The dependent variables are: *APR Spread*, interest rate spread over the constant rate Treasury bonds with a similar maturity and *Ln(1+Limit)*, natural log of 1 plus the origination credit limit on the account. The key explanatory variables are interactions of a bank/county characteristic and *BANK_REL_3Y* and *BANK_REL_3Y × COVID-19 Crisis*, where *BANK_REL_3Y* is a dummy that equals 1 if the customer has another credit card with the bank in the prior three years and/or a conventional relationship with the bank (based on past provision of deposits; investments; mortgage, auto, student, or other loans; or multiple products), and *COVID-19 Crisis* is a dummy that equals 1 from March 1, 2020, onward. We include a broad set of customer and loan controls measured at the origination time or the FR Y-14M report month-end: *Customer Credit Score* dummies, *Customer Income* dummies, *Customer Utilization Rate*, joint account, many authorized users, variable interest rate account, secured card, promotional card, dummies for credit card purpose, and dummies for the channel through which the card was opened. We also include a number of bank characteristics, all lagged one quarter: bank size, bank age, capital ratio, and liquidity ratio, the ratio of non-performing loans, earnings, the ratio of loans to assets. Three local market controls are included, measured at the county level: *Cnty Unemployment*, *Cnty HPI*, and *Cnty Change in HPI*. All regressions include Bank, County, and Month-Year fixed effects. All variables are defined in Table 1. Heteroskedasticity-robust *t*-statistics clustered at county level are reported in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

*Panel A: Effects - Smaller Size (< Median) Banks*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × Smaller Bank | -2.932*** | -0.075*** | -1.991*** | 0.053*** | -2.737*** | -0.121*** | -0.961*** | 0.075*** |
| | (-36.037) | (-15.175) | (-25.234) | (6.795) | (-14.274) | (-7.144) | (-4.879) | (3.127) |
| BANK_REL_3Y × COVID-19 Crisis × Smaller Bank | | | | | 4.058*** | -0.050* | 1.037*** | 0.020 |
| | | | | | (12.475) | (-1.675) | (3.717) | (0.547) |
| Smaller Bank | 3.000*** | 0.059*** | -0.270** | -0.139*** | -5.216*** | -0.280*** | | |
| | (36.689) | (8.797) | (-2.100) | (-11.096) | (-14.727) | (-8.926) | | |
| COVID-19 Crisis × Smaller Bank | | | | | 0.106 | 0.116*** | 0.168 | -0.067** |
| | | | | | (0.503) | (5.738) | (0.776) | (-2.299) |
| BANK_REL_3Y | 0.661*** | 0.122*** | 1.903*** | -0.126*** | 0.439*** | 0.137*** | 1.246*** | -0.211*** |
| | (12.013) | (40.596) | (35.447) | (-24.205) | (4.150) | (12.158) | (7.746) | (-15.714) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -2.342*** | 0.015 | -0.617*** | 0.084*** |
| | | | | | (-13.707) | (0.906) | (-2.805) | (3.514) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.532 | 0.613 | 0.593 | 0.321 | 0.535 | 0.649 | 0.636 | 0.249 |



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*Panel B: Effects - Low Capital (< Median) Banks*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × Low Capital Bank | 1.074*** | 0.030*** | 1.834*** | -0.084*** | -1.979*** | 0.186*** | 1.243*** | -0.165*** |
| | (14.899) | (6.780) | (22.208) | (-10.092) | (-11.148) | (11.430) | (6.722) | (-7.743) |
| BANK_REL_3Y × COVID-19 Crisis × Low Capital Bank | | | | | -0.662** | -0.033 | -1.192*** | 0.058 |
| | | | | | (-2.314) | (-1.117) | (-4.530) | (1.546) |
| Low Capital Bank | -2.747*** | -0.014*** | -0.123* | 0.048*** | -0.692*** | -0.048* | -0.510** | 0.112*** |
| | (-50.015) | (-3.318) | (-1.698) | (5.010) | (-2.875) | (-1.904) | (-2.143) | (3.056) |
| COVID-19 Crisis × Low Capital Bank | | | | | 0.581** | 0.018 | -0.457* | 0.000 |
| | | | | | (2.526) | (0.756) | (-1.914) | (0.012) |
| BANK_REL_3Y | -1.113*** | 0.075*** | 0.005 | -0.056*** | 0.107 | -0.011 | 0.133 | -0.086*** |
| | (-21.520) | (18.604) | (0.099) | (-11.047) | (0.956) | (-0.968) | (1.275) | (-4.950) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.015 | -0.003 | 0.475*** | 0.079*** |
| | | | | | (-0.083) | (-0.140) | (2.610) | (2.730) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.531 | 0.612 | 0.591 | 0.321 | 0.531 | 0.649 | 0.636 | 0.250 |

*Panel C: Effects - Low Liquidity (< Median) Banks*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × Low Liquidity Bank | 0.582*** | -0.077*** | 0.014 | -0.050*** | 1.115*** | 0.019 | 0.502*** | 0.018 |
| | (7.198) | (-17.827) | (0.175) | (-7.242) | (6.029) | (1.120) | (2.887) | (0.831) |
| BANK_REL_3Y × COVID-19 Crisis × Low Liquidity Bank | | | | | 0.494* | -0.107*** | -0.312 | 0.074* |
| | | | | | (1.651) | (-3.276) | (-1.275) | (1.929) |
| Low Liquidity Bank | 0.277*** | -0.012*** | -0.885*** | -0.078*** | -0.082 | 0.069*** | -1.488** | -0.074 |
| | (6.593) | (-2.802) | (-16.331) | (-11.312) | (-0.509) | (4.515) | (-2.360) | (-0.751) |
| COVID-19 Crisis × Low Liquidity Bank | | | | | -0.886*** | -0.083*** | 0.610** | -0.073** |
| | | | | | (-4.129) | (-4.035) | (2.441) | (-2.064) |
| BANK_REL_3Y | -0.760*** | 0.124*** | 1.042*** | -0.078*** | -1.520*** | 0.073*** | 0.651*** | -0.194*** |
| | (-9.253) | (39.129) | (15.270) | (-14.643) | (-10.235) | (5.600) | (4.332) | (-12.652) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.632*** | 0.026 | -0.156 | 0.084*** |
| | | | | | (-3.389) | (1.414) | (-0.862) | (3.725) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.528 | 0.613 | 0.586 | 0.320 | 0.530 | 0.648 | 0.636 | 0.249 |



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*Panel D: Effects – Low Core Deposits (<Median) Banks*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × Low Core Deposit Bank | 1.577*** | 0.015*** | 1.134*** | -0.085*** | -0.821*** | 0.052*** | 0.455** | 0.021 |
| | (21.355) | (2.604) | (15.834) | (-11.621) | (-4.642) | (2.714) | (2.438) | (0.942) |
| BANK_REL_3Y × COVID-19 Crisis x Low Core Deposit Bank | | | | | -0.540** | 0.010 | -0.464* | -0.007 |
| | | | | | (-2.049) | (0.300) | (-1.779) | (-0.179) |
| Low Core Deposit Bank | 0.025 | -0.031*** | -2.046*** | 0.098*** | -0.433*** | -0.074*** | 0.590 | 0.053 |
| | (0.366) | (-3.850) | (-23.651) | (8.675) | (-2.594) | (-3.085) | (1.083) | (0.764) |
| COVID-19 Crisis × Low Core Deposit Bank | | | | | -0.417* | 0.078*** | 0.603*** | -0.015 |
| | | | | | (-1.885) | (2.699) | (2.842) | (-0.344) |
| BANK_REL_3Y | -1.121*** | 0.078*** | 0.495*** | -0.050*** | 0.257** | 0.041*** | 0.629*** | -0.183*** |
| | (-15.824) | (19.101) | (9.677) | (-8.435) | (2.300) | (3.584) | (3.830) | (-12.165) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | 0.582*** | 0.010 | -0.025 | 0.112*** |
| | | | | | (4.116) | (0.510) | (-0.119) | (4.638) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 767,424 | 767,424 | 274,313 | 274,313 | 53,575 | 53,575 | 32,641 | 32,641 |
| Adjusted R-squared | 0.528 | 0.619 | 0.578 | 0.312 | 0.614 | 0.672 | 0.605 | 0.239 |

*Panel E: Effects - Low ROE (< Median) Banks*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × Low ROE Bank | 1.949*** | 0.006 | 0.133** | 0.058*** | -2.461*** | -0.053*** | -1.399*** | 0.097*** |
| | (32.232) | (1.481) | (2.392) | (8.794) | (-13.880) | (-3.004) | (-8.073) | (3.835) |
| BANK_REL_3Y × COVID-19 Crisis × Low ROE Bank | | | | | -0.923*** | -0.047 | 0.338 | 0.070* |
| | | | | | (-3.300) | (-1.404) | (1.119) | (1.687) |
| Low ROE Bank | -2.378*** | -0.057*** | -0.776*** | -0.014** | 0.194 | -0.012 | 1.161*** | -0.009 |
| | (-59.788) | (-15.168) | (-10.875) | (-2.067) | (1.220) | (-0.715) | (3.332) | (-0.132) |
| COVID-19 Crisis × Low ROE Bank | | | | | 1.273*** | 0.100*** | 0.389 | -0.024 |
| | | | | | (4.434) | (3.805) | (1.474) | (-0.655) |
| BANK_REL_3Y | -1.561*** | 0.089*** | 1.005*** | -0.135*** | 0.208** | 0.106*** | 1.307*** | -0.211*** |
| | (-21.497) | (26.401) | (23.243) | (-28.309) | (2.106) | (9.536) | (10.228) | (-14.620) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | 0.615*** | 0.048* | 0.004 | 0.017 |
| | | | | | (3.167) | (1.807) | (0.017) | (0.504) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.532 | 0.612 | 0.589 | 0.320 | 0.532 | 0.648 | 0.636 | 0.249 |



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*Panel F: Effects - High CC Complaints (≥ Median) Banks*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × High CC Complaints | 2.171*** | 0.030*** | 1.217*** | -0.124*** | 1.973*** | -0.054*** | 0.399** | -0.098*** |
| | (34.520) | (6.495) | (21.783) | (-17.146) | (10.419) | (-3.313) | (2.381) | (-4.703) |
| BANK_REL_3Y × COVID-19 Crisis × High CC Complaints | | | | | 0.341 | 0.064** | -0.109 | 0.023 |
| | | | | | (1.191) | (2.342) | (-0.419) | (0.559) |
| High CC Complaints | -0.630*** | -0.030*** | -0.162** | 0.107*** | 0.266* | 0.070*** | -0.468*** | 0.021 |
| | (-12.384) | (-7.803) | (-2.361) | (12.965) | (1.803) | (5.077) | (-3.304) | (1.079) |
| COVID-19 Crisis × High CC Complaints | | | | | -2.781*** | -0.177*** | -0.525** | 0.049 |
| | | | | | (-14.548) | (-9.918) | (-2.484) | (1.415) |
| BANK_REL_3Y | -1.713*** | 0.076*** | 0.341*** | -0.031*** | -1.959*** | 0.113*** | 0.667*** | -0.126*** |
| | (-21.549) | (19.972) | (7.443) | (-5.400) | (-14.633) | (8.764) | (6.489) | (-7.400) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -1.025*** | -0.035* | -0.287* | 0.106*** |
| | | | | | (-4.551) | (-1.850) | (-1.694) | (3.071) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.530 | 0.613 | 0.590 | 0.321 | 0.534 | 0.649 | 0.636 | 0.249 |

*Panel G: Effects - High Nonprime (<720 Credit Score) Concentration Banks*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × High Nonprime Concentration | -2.901*** | -0.012** | -2.149*** | 0.075*** | -2.160*** | -0.014 | -1.548*** | 0.205*** |
| | (-51.321) | (-2.522) | (-24.599) | (9.160) | (-12.696) | (-0.770) | (-7.034) | (9.126) |
| BANK_REL_3Y × COVID-19 Crisis × High Nonprime Concentration | | | | | -0.507* | -0.093*** | 1.732*** | -0.132*** |
| | | | | | (-1.820) | (-3.259) | (6.160) | (-3.373) |
| High Nonprime Concentration | 0.825*** | 0.072*** | -1.162*** | -0.136*** | -0.150 | -0.025 | 1.024*** | -0.193*** |
| | (16.385) | (14.495) | (-8.892) | (-11.764) | (-0.581) | (-0.925) | (3.738) | (-5.260) |
| COVID-19 Crisis × High Nonprime Concentration | | | | | 1.997*** | 0.161*** | -0.272 | 0.013 |
| | | | | | (9.831) | (7.814) | (-1.049) | (0.380) |
| BANK_REL_3Y | 0.851*** | 0.098*** | 1.989*** | -0.137*** | 0.334*** | 0.085*** | 1.679*** | -0.286*** |
| | (18.715) | (30.683) | (33.445) | (-24.338) | (2.848) | (6.241) | (8.571) | (-17.261) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.654*** | 0.054*** | -1.133*** | 0.169*** |
| | | | | | (-4.478) | (2.795) | (-4.888) | (6.521) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 280,925 | 280,925 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.532 | 0.613 | 0.592 | 0.321 | 0.532 | 0.648 | 0.637 | 0.251 |



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*Panel H: Effects - High (≥Median) Unemployment Rate (UR) County*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × High UR County | -0.640*** | -0.004 | 0.088 | 0.022*** | -0.169 | 0.014 | -0.015 | -0.010 |
| | (-9.116) | (-0.915) | (1.380) | (3.447) | (-1.088) | (0.922) | (-0.082) | (-0.455) |
| BANK_REL_3Y × COVID-19 Crisis × High UR County | | | | | 0.294 | -0.026 | 0.087 | 0.011 |
| | | | | | (1.155) | (-1.008) | (0.348) | (0.315) |
| High County UR | 0.222*** | -0.005 | -0.095 | -0.009 | 0.426** | 0.009 | -0.106 | 0.021 |
| | (4.671) | (-1.130) | (-1.498) | (-1.340) | (2.007) | (0.496) | (-0.509) | (0.762) |
| COVID-19 Crisis × High County UR | | | | | -0.126 | 0.007 | 0.146 | -0.004 |
| | | | | | (-0.822) | (0.459) | (0.797) | (-0.151) |
| BANK_REL_3Y | -0.209*** | 0.094*** | 1.027*** | -0.116*** | -0.775*** | 0.073*** | 0.908*** | -0.180*** |
| | (-4.205) | (29.716) | (25.591) | (-24.481) | (-6.473) | (6.350) | (6.630) | (-11.537) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.957*** | 0.016 | -0.355* | 0.108*** |
| | | | | | (-5.080) | (0.860) | (-1.951) | (4.379) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,433 | 805,433 | 281,034 | 281,034 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.528 | 0.613 | 0.589 | 0.320 | 0.529 | 0.648 | 0.636 | 0.248 |

*Panel I: Effects - Low (<Median) Family Income County*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × Low Family Income County | -0.313*** | 0.004 | -0.169*** | 0.031*** | -0.189 | 0.026* | 0.082 | 0.038* |
| | (-3.055) | (0.916) | (-3.237) | (4.765) | (-1.231) | (1.675) | (0.416) | (1.679) |
| BANK_REL_3Y × COVID-19 Crisis × Low Family Income County | | | | | 0.283 | 0.000 | -0.178 | -0.055 |
| | | | | | (1.097) | (0.018) | (-0.698) | (-1.489) |
| Low County Income | 0.300** | -0.004 | -0.029 | -0.025*** | -0.491 | 0.063 | -0.801*** | -0.049 |
| | (2.403) | (-0.723) | (-0.347) | (-2.616) | (-0.746) | (0.828) | (-2.848) | (-1.368) |
| COVID-19 Crisis × Low County Income | | | | | 0.452*** | 0.030* | 0.350* | 0.042 |
| | | | | | (2.977) | (1.953) | (1.903) | (1.512) |
| BANK_REL_3Y | -0.376*** | 0.090*** | 1.152*** | -0.121*** | -0.778*** | 0.069*** | 0.861*** | -0.203*** |
| | (-5.735) | (27.187) | (25.574) | (-26.444) | (-7.540) | (6.010) | (7.104) | (-14.125) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.926*** | 0.004 | -0.222 | 0.140*** |
| | | | | | (-5.435) | (0.229) | (-1.265) | (5.178) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,417 | 805,417 | 281,032 | 281,032 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.528 | 0.613 | 0.589 | 0.320 | 0.529 | 0.648 | 0.636 | 0.248 |



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*Panel J: Effects - High (≥Median) Minority Percent County*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y × High Minority Percent County | 0.106 | 0.014*** | 0.104* | 0.007 | 0.036 | -0.004 | -0.252 | 0.001 |
| | (1.258) | (3.062) | (1.774) | (0.885) | (0.234) | (-0.220) | (-1.379) | (0.023) |
| BANK_REL_3Y × COVID-19 Crisis × High Minority Percent County | | | | | -0.440* | 0.024 | 0.386 | 0.003 |
| | | | | | (-1.707) | (0.926) | (1.547) | (0.089) |
| High County Minority | | | | | N/A | N/A | N/A | N/A |
| | | | | | N/A | N/A | N/A | N/A |
| COVID-19 Crisis × High County Minority | | | | | -0.493*** | 0.018 | -0.428** | 0.021 |
| | | | | | (-3.145) | (1.150) | (-2.434) | (0.735) |
| BANK_REL_3Y | -0.581*** | 0.085*** | 1.017*** | -0.109*** | -0.899*** | 0.084*** | 1.027*** | -0.184*** |
| | (-11.675) | (25.692) | (24.078) | (-22.888) | (-7.352) | (7.298) | (8.111) | (-11.221) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.509** | -0.012 | -0.503*** | 0.109*** |
| | | | | | (-2.481) | (-0.636) | (-2.623) | (4.132) |
| Ln(1+Limit) | YES | NO | YES | NO | YES | NO | YES | NO |
| Customer/Loan/Bank/County Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 805,417 | 805,417 | 281,032 | 281,032 | 61,621 | 61,621 | 34,082 | 34,082 |
| Adjusted R-squared | 0.528 | 0.613 | 0.589 | 0.320 | 0.529 | 0.648 | 0.636 | 0.248 |



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## Table OA.4: Additional Summary Statistics for Existing Accounts

Panel A provides additional variable definitions (not covered in Table 1 and pertinent to existing accounts only). Panel B contains summary statistics for our sample of existing credit card accounts (loan age > 12 months) for normal times and changes during the COVID-19 crisis. The existing loan data come from the FR Y-14M credit card dataset and cover the period June 2013 through February 2020 for normal times, and the period November 2019 through June 2020 (pre+during COVID-19) for changes during the COVID-19 crisis. We use a 0.1% random sample for consumer accounts and a 1% random sample for small business accounts.

*Panel A: Additional Variable Definitions*

| Variable | Definition | Source/ Authors' Calculation Based on: |
|---|---|---|
| **Main Customer and Loan Characteristics** | | |
| COVID-19 Crisis | =1 from March 1, 2020, onward based on the account cycle ending date. | Johns Hopkins University / FR Y-14M |
| Customer Credit Score *(regr. use dummies)* | Customer refreshed credit score or credit score at origination when a refreshed score is not available. | FR Y-14M |
| Months Since Last Refresh | Number of months since the last refresh on the credit score. | FR Y-14M |
| Account Age <3 years *(left-out category)* | =1 for accounts that are less than 3 years old, where age is the difference in years between report date and origination date for the account. | FR Y-14M |
| Account Age [3, 5 years) | =1 for accounts 3 to 5 years old, where age is the difference in years between report date and origination date for the account. | FR Y-14M |
| Account Age [5, 10 years) | =1 for accounts 5 to 10 years old, where age is the difference in years between report date and origination date for the account. | FR Y-14M |
| Account Age ≥10 years | =1 for accounts over 10 years old, where age is the difference in years between report date and origination date for the account. | FR Y-14M |
| Securitized | =1 for securitized accounts. | FR Y-14M |
| Ever 60dpd Previous 3 years | =1 for accounts that have been 60 days past due or more in the last 3 years. | FR Y-14M |
| All Forbearances | =1 for whether the account is in any type of forbearance/non-payment workout status. | FR Y-14M |
| Forb Reduced Rate | Forbearance type: reduced rate. | FR Y-14M |
| Forb $0 Min Pay | Forbearance type: $0 minimum payment. | FR Y-14M |
| Forb Defer Pay | Forbearance type: payment deferral. | FR Y-14M |
| Forb Waive Late Fees | Forbearance type: waive late fees. | FR Y-14M |
| Forb Waive Interest | Forbearance type: waive interest. | FR Y-14M |
| Forb Other | Forbearance type: other types not included above. | FR Y-14M |

*Panel B: Summary Statistics*

*Panel B.1: Normal Times Samples*

| | **Consumers** (0.1% Random Sample: 9,970,834 obs) | | **Small Businesses** (1% Random Sample: 5,553,293 obs) | |
|---|---|---|---|---|
| **Variable** | **mean** | **sd** | **mean** | **sd** |
| APR Spread | 16.955 | 5.126 | 15.685 | 4.673 |
| Ln(1+Limit) | 8.555 | 1.129 | 9.157 | 1.053 |
| Limit ($) | 8,529.388 | 7,937.292 | 14,509.540 | 13,195.720 |
| BANK_REL_3Y | 0.336 | 0.472 | 0.500 | 0.500 |
| Customer Credit Score *(not used in regr.)* | 735.304 | 84.848 | 757.172 | 74.885 |
| Customer Credit Score < 580 *(left-out category)* | 0.053 | 0.224 | 0.028 | 0.166 |
| Customer Credit Score [580, 660) | 0.131 | 0.337 | 0.078 | 0.269 |
| Customer Credit Score [660_720) | 0.201 | 0.401 | 0.162 | 0.368 |
| Customer Credit Score ≥720 | 0.615 | 0.487 | 0.732 | 0.443 |
| Months Since Last Refresh | 0.268 | 1.311 | 0.181 | 1.645 |
| Ln(1+Customer Income) *(not used in regr.)* | 10.219 | 2.818 | 10.868 | 2.512 |
| Customer Income < 25K *(left-out category)* | 0.180 | 0.384 | 0.119 | 0.324 |
| Customer Income [25K, 50K) | 0.268 | 0.443 | 0.121 | 0.326 |
| Customer Income [50K, 100K) | 0.357 | 0.479 | 0.344 | 0.475 |
| Customer Income [100K, 150K) | 0.107 | 0.309 | 0.153 | 0.360 |
| Customer Income ≥150K | 0.088 | 0.284 | 0.262 | 0.440 |
| Customer Utilization Ratio | 0.326 | 0.389 | 0.264 | 0.349 |
| Account Age < 3 years *(left-out category)* | 0.327 | 0.469 | 0.313 | 0.464 |
| Account Age [3, 5 years) | 0.217 | 0.412 | 0.225 | 0.418 |
| Account Age [5, 10 years) | 0.284 | 0.451 | 0.329 | 0.470 |
| Account Age ≥10 years | 0.172 | 0.378 | 0.133 | 0.340 |
| Joint Account | 0.027 | 0.162 | 0.244 | 0.430 |
| Many Authorized Users | 0.017 | 0.129 | 0.163 | 0.369 |
| Variable Rate | 0.949 | 0.220 | 0.982 | 0.134 |
| Secured | 0.071 | 0.257 | 0.040 | 0.196 |
| Promotional | 0.008 | 0.091 | 0.004 | 0.066 |
| Securitized | 0.234 | 0.423 | 0.159 | 0.365 |
| Ever 60dpd Previous 3 years | 0.029 | 0.167 | 0.016 | 0.124 |
| General Purpose | 0.779 | 0.415 | 0.814 | 0.389 |



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| | | | | |
|---|---|---|---|---|
| Cobrand | 0.171 | 0.377 | 0.183 | 0.387 |
| Affinity | 0.039 | 0.194 | 0.002 | 0.046 |
| Other Card *(left-out category)* | 0.011 | 0.104 | 0.052 | 0.223 |
| Customer Init: Branch Application | 0.295 | 0.456 | 0.277 | 0.447 |
| Customer Init: Other Application | 0.125 | 0.330 | 0.202 | 0.401 |
| Bank Init: Pre-Approved Offer | 0.301 | 0.459 | 0.194 | 0.395 |
| Bank Init: Invitation to Apply | 0.207 | 0.405 | 0.275 | 0.447 |
| Other Initi *(left-out category)* | 0.073 | 0.261 | 0.052 | 0.223 |
| Bank Size | 20.325 | 1.212 | 20.778 | 1.104 |
| Bank Age | 44.369 | 37.349 | 53.556 | 38.688 |
| Capital Ratio | 0.119 | 0.019 | 0.113 | 0.019 |
| Liquidity Ratio | 0.238 | 0.058 | 0.254 | 0.046 |
| NPL Ratio | 0.016 | 0.009 | 0.017 | 0.009 |
| Earnings | 0.116 | 0.073 | 0.118 | 0.069 |
| Loans Ratio | 0.552 | 0.175 | 0.501 | 0.165 |
| Cnty Unemployment | 4.659 | 1.706 | 4.605 | 1.676 |
| Cnty HPI | 184.142 | 51.289 | 191.185 | 54.429 |
| Cnty Change in HPI | 0.003 | 0.010 | 0.003 | 0.009 |



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*Panel B.2: Pre+During COVID-19 Samples*

| Sample | Consumer Sample (0.5% Random Sample) | | | | | | Small Business Sample (5% Random Sample) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Pre+During COVID-19 (1,316,356 obs)* | | *Pre-COVID-19 (655,733 obs)* | | *During COVID-19 (660,613 obs)* | | *Pre+During COVID-19 (753,888 obs)* | | *Pre-COVID-19 (373,552 obs)* | | *During COVID-19 (380,318 obs)* | |
| **Variable** | **mean** | **sd** | **mean** | **sd** | **mean** | **sd** | **mean** | **sd** | **mean** | **sd** | **mean** | **sd** |
| APR Spread | 18.076 | 5.090 | 17.969 | 5.113 | 18.182 | 5.064 | 16.518 | 4.284 | 16.509 | 4.296 | 16.528 | 4.273 |
| Ln(1+Limit) | 8.629 | 1.146 | 8.624 | 1.144 | 8.634 | 1.148 | 9.349 | 1.042 | 9.344 | 1.042 | 9.355 | 1.042 |
| Limit ($) | 9,245.2 | 8,508.052 | 9198.518 | 8477.066 | 9291.661 | 8538.485 | 17,498.9 | 15,893.0 | 17399.7 | 15862.2 | 17596.390 | 15922.720 |
| BANK_REL_3Y | 0.337 | 0.473 | 0.336 | 0.472 | 0.338 | 0.473 | 0.514 | 0.500 | 0.513 | 0.500 | 0.516 | 0.500 |
| COVID-19 Crisis | 0.502 | 0.500 | 0.000 | 0.000 | 1.000 | 0.000 | 0.504 | 0.500 | 0.000 | 0.000 | 1.000 | 0.000 |
| Customer Credit Score *(not used in regr.)* | 735.850 | 88.496 | 734.549 | 88.610 | 737.143 | 88.362 | 763.473 | 77.469 | 762.608 | 77.233 | 764.323 | 77.692 |
| Customer Credit Score < 580 *(left-out category)* | 0.060 | 0.237 | 0.061 | 0.240 | 0.059 | 0.235 | 0.027 | 0.162 | 0.027 | 0.162 | 0.027 | 0.161 |
| Customer Credit Score [580, 660) | 0.131 | 0.337 | 0.133 | 0.339 | 0.129 | 0.335 | 0.074 | 0.262 | 0.075 | 0.263 | 0.074 | 0.262 |
| Customer Credit Score [660_720) | 0.196 | 0.397 | 0.196 | 0.397 | 0.195 | 0.396 | 0.155 | 0.362 | 0.157 | 0.364 | 0.154 | 0.361 |
| Customer Credit Score ≥720 | 0.614 | 0.487 | 0.609 | 0.488 | 0.618 | 0.486 | 0.743 | 0.437 | 0.741 | 0.438 | 0.745 | 0.436 |
| Months Since Last Refresh | 0.205 | 1.512 | 0.214 | 1.455 | 0.196 | 1.565 | 0.200 | 2.198 | 0.199 | 2.176 | 0.201 | 2.219 |
| Ln(1+Customer Income) | 10.569 | 2.205 | 10.559 | 2.223 | 10.580 | 2.187 | 11.216 | 2.261 | 11.187 | 2.287 | 11.244 | 2.234 |
| Customer Income < 25K *(left-out category)* | 0.147 | 0.354 | 0.148 | 0.355 | 0.146 | 0.353 | 0.067 | 0.250 | 0.073 | 0.260 | 0.061 | 0.239 |
| Customer Income [25K, 50K) | 0.274 | 0.446 | 0.275 | 0.446 | 0.274 | 0.446 | 0.113 | 0.317 | 0.114 | 0.317 | 0.113 | 0.317 |
| Customer Income [50K, 100K) | 0.364 | 0.481 | 0.363 | 0.481 | 0.364 | 0.481 | 0.327 | 0.469 | 0.326 | 0.469 | 0.328 | 0.469 |
| Customer Income [100K, 150K) | 0.115 | 0.320 | 0.115 | 0.319 | 0.116 | 0.320 | 0.167 | 0.373 | 0.166 | 0.372 | 0.169 | 0.375 |
| Customer Income ≥150K | 0.100 | 0.300 | 0.099 | 0.299 | 0.100 | 0.300 | 0.325 | 0.468 | 0.321 | 0.467 | 0.330 | 0.470 |
| Customer Utilization Ratio | 0.317 | 0.384 | 0.331 | 0.389 | 0.302 | 0.377 | 0.245 | 0.348 | 0.254 | 0.355 | 0.236 | 0.341 |
| Account Age < 3 years *(left-out category)* | 0.286 | 0.452 | 0.288 | 0.453 | 0.284 | 0.451 | 0.273 | 0.445 | 0.274 | 0.446 | 0.272 | 0.445 |
| Account Age [3, 5 years) | 0.239 | 0.427 | 0.242 | 0.428 | 0.237 | 0.425 | 0.239 | 0.427 | 0.241 | 0.428 | 0.238 | 0.426 |
| Account Age [5, 10 years) | 0.283 | 0.450 | 0.278 | 0.448 | 0.288 | 0.453 | 0.297 | 0.457 | 0.294 | 0.455 | 0.299 | 0.458 |
| Account Age ≥10 years | 0.191 | 0.393 | 0.191 | 0.393 | 0.191 | 0.393 | 0.191 | 0.393 | 0.191 | 0.393 | 0.191 | 0.393 |
| Joint Account | 0.020 | 0.139 | 0.020 | 0.140 | 0.019 | 0.138 | 0.241 | 0.427 | 0.238 | 0.426 | 0.243 | 0.429 |
| Many Authorized Users | 0.019 | 0.136 | 0.019 | 0.136 | 0.019 | 0.137 | 0.160 | 0.367 | 0.164 | 0.370 | 0.157 | 0.363 |
| Variable Rate | 0.478 | 0.500 | 0.959 | 0.199 | 0.000 | 0.000 | 0.487 | 0.500 | 0.983 | 0.131 | 0.000 | 0.000 |
| Promotional | 0.070 | 0.256 | 0.072 | 0.259 | 0.068 | 0.252 | 0.028 | 0.165 | 0.031 | 0.172 | 0.025 | 0.157 |
| Secured | 0.009 | 0.096 | 0.009 | 0.094 | 0.010 | 0.097 | 0.003 | 0.058 | 0.003 | 0.058 | 0.003 | 0.057 |
| Securitized | 0.152 | 0.359 | 0.154 | 0.361 | 0.150 | 0.357 | 0.096 | 0.295 | 0.098 | 0.297 | 0.094 | 0.292 |
| Ever 60dpd Previous 3 years | 0.032 | 0.176 | 0.033 | 0.178 | 0.032 | 0.175 | 0.016 | 0.126 | 0.016 | 0.126 | 0.016 | 0.126 |
| General Purpose | 0.752 | 0.432 | 0.755 | 0.430 | 0.750 | 0.433 | 0.781 | 0.413 | 0.783 | 0.412 | 0.780 | 0.414 |
| Cobrand | 0.223 | 0.417 | 0.221 | 0.415 | 0.226 | 0.418 | 0.216 | 0.411 | 0.214 | 0.410 | 0.218 | 0.413 |
| Affinity | 0.014 | 0.118 | 0.014 | 0.119 | 0.014 | 0.117 | 0.002 | 0.039 | 0.002 | 0.040 | 0.001 | 0.038 |
| Other Card *(left-out category)* | 0.010 | 0.100 | 0.010 | 0.101 | 0.010 | 0.100 | 0.001 | 0.036 | 0.001 | 0.037 | 0.001 | 0.036 |
| Customer Init: Branch Application | 0.364 | 0.481 | 0.361 | 0.480 | 0.366 | 0.482 | 0.343 | 0.475 | 0.341 | 0.474 | 0.345 | 0.475 |
| Customer Init: Other Application | 0.115 | 0.319 | 0.116 | 0.320 | 0.114 | 0.318 | 0.175 | 0.380 | 0.177 | 0.381 | 0.174 | 0.379 |
| Bank Init: Pre-Approved Offer | 0.229 | 0.420 | 0.230 | 0.421 | 0.227 | 0.419 | 0.144 | 0.351 | 0.145 | 0.352 | 0.144 | 0.351 |
| Bank Init: Invitation to Apply | 0.217 | 0.412 | 0.216 | 0.411 | 0.219 | 0.413 | 0.275 | 0.447 | 0.275 | 0.447 | 0.276 | 0.447 |
| Other Initi *(left-out category)* | 0.075 | 0.264 | 0.077 | 0.267 | 0.073 | 0.261 | 0.062 | 0.241 | 0.063 | 0.242 | 0.061 | 0.240 |
| Bank Size | 20.300 | 1.181 | 20.279 | 1.168 | 20.322 | 1.193 | 20.607 | 1.161 | 20.589 | 1.137 | 20.625 | 1.184 |
| Bank Age | 49.681 | 42.939 | 49.211 | 42.797 | 50.147 | 43.074 | 69.723 | 51.315 | 68.951 | 51.051 | 70.481 | 51.561 |
| Capital Ratio | 0.115 | 0.023 | 0.119 | 0.021 | 0.111 | 0.023 | 0.112 | 0.022 | 0.115 | 0.021 | 0.108 | 0.023 |
| Liquidity Ratio | 0.241 | 0.059 | 0.231 | 0.059 | 0.252 | 0.058 | 0.245 | 0.039 | 0.233 | 0.041 | 0.256 | 0.034 |
| NPL Ratio | 0.010 | 0.003 | 0.010 | 0.003 | 0.010 | 0.003 | 0.010 | 0.002 | 0.010 | 0.002 | 0.010 | 0.003 |
| Earnings | 0.084 | 0.093 | 0.131 | 0.073 | 0.038 | 0.087 | 0.098 | 0.096 | 0.148 | 0.078 | 0.049 | 0.087 |
| Loans Ratio | 0.549 | 0.177 | 0.555 | 0.176 | 0.543 | 0.178 | 0.529 | 0.164 | 0.537 | 0.166 | 0.521 | 0.163 |
| Cnty Unemployment | 6.257 | 5.062 | 3.456 | 1.153 | 9.037 | 5.851 | 6.219 | 5.078 | 3.367 | 1.090 | 9.021 | 5.840 |
| Cnty HPI | 210.046 | 54.969 | 208.252 | 54.259 | 211.828 | 55.608 | 218.147 | 57.277 | 216.238 | 56.608 | 220.025 | 57.865 |
| Cnty Change in HPI | 0.003 | 0.009 | 0.003 | 0.009 | 0.004 | 0.009 | 0.003 | 0.009 | 0.003 | 0.009 | 0.004 | 0.009 |



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## Table OA.5: Effects of Relationships on Credit Terms on *Existing* Accounts

This table examines the effects of relationships on credit card terms for existing accounts (loan age > 12 months). Columns (1)-(4) show results during normal times, while columns (5)-(8) show changes during the COVID-19 crisis. The existing loan data come from the FR Y-14M credit card dataset and cover the period June 2013 through February 2020 for normal times, and the period November 2019 through June 2020 for changes during the COVID-19 crisis. We use a 0.1% random sample for consumer accounts and a 1% random sample for small business accounts. The dependent variables are: *APR Spread*, interest rate spread over the constant rate Treasury bonds with a similar maturity and *Ln(1+Limit)*, natural log of 1 plus the origination credit limit on the account. The key explanatory variables are *BANK_REL_3Y* and *BANK_REL_3Y × COVID-19 Crisis*, where *BANK_REL_3Y* is a dummy that equals 1 if the customer has another credit card with the bank in the prior three years and/or a conventional relationship with the bank (based on past provision of deposits; investments; mortgage, auto, student, or other loans; or multiple products), and *COVID-19 Crisis* is a dummy that equals 1 from March 1, 2020, onward. We include a broad set of consumer and loan controls measured at origination time or most recent account cycle time (if refreshed values are available): *Customer Credit Score* dummies, *Customer Income* dummies, *Customer Utilization Rate*, *Account Age* dummies, joint account, many authorized users, variable interest rate account, secured card, securitized card, indicator for delinquency in last three years, promotional card, dummies for credit card purpose, and dummies for the channel through which the card was opened. We also include a number of bank characteristics, all lagged one quarter: bank size, bank age, capital ratio, and liquidity ratio, the ratio of non-performing loans, earnings, the ratio of loans to assets. Three local market controls are included, measured at the county level: *Cnty Unemployment*, *Cnty HPI*, and *Cnty Change in HPI*. All regressions include Bank, County, and Month-Year fixed effects. All variables are defined in Table 1. Heteroskedasticity-robust *t*-statistics clustered at county level are reported in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Normal Times Sample | | | | Pre+During COVID-19 Crisis Sample | | | |
| | **Consumer Accounts** | | **Small Business Accounts** | | **Consumer Accounts** | | **Small Business Accounts** | |
| **Dependent Variable:** | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) | APR Spread | Ln(1+Limit) |
| **Independent Variables:** | | | | | | | | |
| BANK_REL_3Y | -0.201*** | 0.030*** | 0.032 | -0.136*** | -0.150*** | 0.045*** | 0.098*** | -0.148*** |
| | (-9.931) | (7.282) | (1.233) | (-24.002) | (-6.219) | (9.065) | (3.399) | (-23.116) |
| BANK_REL_3Y × COVID-19 Crisis | | | | | -0.023* | -0.007*** | -0.087*** | -0.001 |
| | | | | | (-1.876) | (-3.726) | (-7.687) | (-0.459) |
| Customer & Loan Controls | | | | | | | | |
| Ln(1+Limit) | -1.022*** | | -0.947*** | | -1.069*** | | -0.832*** | |
| | (-98.223) | | (-67.137) | | (-78.027) | | (-50.935) | |
| Customer Credit Score [580, 660) | 0.435*** | 0.349*** | -0.163*** | 0.425*** | 0.349*** | 0.368*** | -0.360*** | 0.403*** |
| | (17.946) | (55.176) | (-2.899) | (31.808) | (9.328) | (37.078) | (-4.381) | (16.950) |
| Customer Credit Score [660_720) | 0.243*** | 0.822*** | -0.608*** | 0.915*** | 0.324*** | 0.902*** | -0.796*** | 0.912*** |
| | (8.063) | (92.251) | (-9.784) | (54.196) | (7.514) | (79.577) | (-9.029) | (35.978) |
| Customer Credit Score ≥720 | -1.346*** | 1.370*** | -2.238*** | 1.461*** | -1.149*** | 1.450*** | -2.359*** | 1.419*** |
| | (-37.686) | (142.290) | (-35.819) | (76.929) | (-22.968) | (111.415) | (-26.785) | (52.189) |
| Months Since Last Refresh | 0.041*** | -0.006*** | -0.018*** | 0.001 | 0.048*** | -0.010*** | -0.022*** | 0.002 |
| | (4.866) | (-4.014) | (-2.947) | (1.107) | (5.095) | (-5.350) | (-3.737) | (0.984) |
| Customer Income [25k, 50k) | 0.236*** | 0.190*** | -0.246*** | -0.007 | 0.353*** | 0.159*** | -0.103* | -0.095*** |
| | (8.553) | (30.125) | (-4.625) | (-0.569) | (9.322) | (23.064) | (-1.726) | (-6.025) |
| Customer Income [50k, 100k) | 0.210*** | 0.495*** | -0.394*** | 0.301*** | 0.273*** | 0.453*** | -0.293*** | 0.156*** |
| | (7.773) | (82.156) | (-8.708) | (27.273) | (7.226) | (72.259) | (-5.795) | (11.398) |
| Customer Income [100k, 150k) | 0.111*** | 0.744*** | -0.427*** | 0.525*** | 0.161*** | 0.703*** | -0.460*** | 0.364*** |
| | (3.186) | (111.033) | (-8.263) | (44.684) | (3.638) | (79.551) | (-8.575) | (23.792) |
| Customer Income ≥150k | 0.070* | 0.977*** | -0.442*** | 0.741*** | 0.093* | 0.952*** | -0.498*** | 0.606*** |
| | (1.929) | (118.027) | (-8.895) | (63.320) | (1.907) | (90.043) | (-9.887) | (41.913) |
| Customer Utilization Ratio | 0.583*** | 0.032*** | 0.996*** | 0.060*** | 0.715*** | 0.063*** | 0.870*** | 0.102*** |
| | (27.518) | (6.741) | (29.900) | (8.394) | (24.700) | (9.169) | (18.245) | (7.981) |
| Account Age [3, 5 years) | -0.128*** | 0.084*** | -0.248*** | 0.002 | 0.239*** | 0.107*** | -0.066** | 0.114*** |
| | (-10.004) | (28.758) | (-20.271) | (0.596) | (9.207) | (19.732) | (-2.279) | (16.550) |
| Account Age [5, 10 years) | -1.525*** | 0.150*** | -0.932*** | 0.015** | -0.350*** | 0.196*** | -0.765*** | 0.054*** |
| | (-75.930) | (33.391) | (-44.774) | (2.161) | (-12.626) | (31.966) | (-25.039) | (6.670) |
| Account Age ≥10 years | -2.210*** | 0.362*** | -1.484*** | 0.075*** | -2.824*** | 0.323*** | -2.281*** | 0.109*** |
| | (-64.620) | (53.336) | (-40.503) | (6.794) | (-63.647) | (40.418) | (-53.500) | (9.890) |
| Joint Account | -0.133** | 0.253*** | -0.773*** | 0.159*** | -0.376*** | 0.197*** | -0.893*** | 0.245*** |
| | (-2.435) | (23.029) | (-16.629) | (16.259) | (-4.623) | (13.665) | (-18.946) | (19.230) |
| Many Authorized Users | -0.165*** | 0.254*** | -0.175*** | 0.339*** | -0.063 | 0.246*** | -0.097*** | 0.398*** |
| | (-2.587) | (21.503) | (-5.559) | (47.080) | (-0.895) | (18.221) | (-2.827) | (50.189) |
| Variable Rate | 1.392*** | -0.106*** | 2.643*** | -0.033 | 1.581*** | -0.179*** | 2.632*** | 0.041** |
| | (21.383) | (-10.714) | (22.281) | (-1.562) | (12.381) | (-14.379) | (18.383) | (2.034) |
| Promotional | -1.316*** | 0.197*** | -1.369*** | 0.099*** | -2.303*** | 0.194*** | -1.334*** | 0.067*** |



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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (-24.549) | (47.855) | (-20.150) | (11.496) | (-29.172) | (27.972) | (-14.018) | (5.366) |
| Secured | -0.615*** | -1.345*** | -1.782*** | -1.517*** | -0.453*** | -1.394*** | -0.775*** | -1.737*** |
| | (-12.568) | (-84.009) | (-14.220) | (-47.101) | (-7.951) | (-71.670) | (-3.490) | (-34.855) |
| Securitized | -0.916*** | 0.240*** | -1.573*** | 0.096*** | -0.601*** | 0.234*** | -0.769*** | -0.025** |
| | (-29.371) | (43.585) | (-35.677) | (9.782) | (-17.076) | (34.231) | (-16.583) | (-2.287) |
| Ever 60dpd Previous 3 years | -0.108*** | -0.161*** | 1.650*** | -0.175*** | -0.280*** | -0.122*** | 1.182*** | -0.139*** |
| | (-2.780) | (-18.259) | (16.980) | (-9.592) | (-5.080) | (-9.124) | (9.039) | (-4.817) |
| General Purpose | 1.688*** | 0.523*** | 0.595*** | 0.532*** | 1.328*** | 0.448*** | -0.488** | 0.676*** |
| | (32.428) | (32.759) | (2.876) | (8.195) | (16.051) | (23.824) | (-2.172) | (8.777) |
| Cobrand | 1.578*** | 0.631*** | 1.150*** | 0.580*** | 0.978*** | 0.540*** | 0.263 | 0.733*** |
| | (26.159) | (37.100) | (5.545) | (8.883) | (11.529) | (27.055) | (1.160) | (9.376) |
| Affinity | 1.071*** | 0.560*** | 0.207 | 0.289*** | -0.236* | 0.434*** | -1.725*** | 0.228** |
| | (15.673) | (31.901) | (0.736) | (3.783) | (-1.918) | (16.487) | (-4.937) | (2.199) |
| Customer Init: Branch Application | -0.018 | -0.051*** | 0.154*** | -0.053*** | 1.557*** | 0.037*** | 0.150*** | 0.074*** |
| | (-0.382) | (-6.057) | (2.644) | (-4.376) | (19.673) | (3.518) | (2.600) | (4.904) |
| Customer Init: Other Application | -0.839*** | -0.094*** | -0.567*** | -0.031** | 0.759*** | 0.036** | -0.406*** | 0.138*** |
| | (-16.321) | (-7.954) | (-8.914) | (-2.255) | (10.011) | (2.474) | (-6.374) | (8.291) |
| Bank Init: Pre-Approved Offer | -1.608*** | 0.032*** | -0.435*** | -0.003 | 0.081 | 0.095*** | -0.634*** | 0.162*** |
| | (-38.561) | (3.576) | (-6.983) | (-0.223) | (1.167) | (8.521) | (-9.599) | (10.184) |
| Bank Init: Invitation to Apply | -1.319*** | 0.101*** | -0.167** | 0.165*** | 0.245*** | 0.167*** | -0.195*** | 0.371*** |
| | (-31.051) | (11.917) | (-2.447) | (11.971) | (3.393) | (15.546) | (-2.791) | (21.198) |
| Bank Controls (Lagged one quarter) | | | | | | | | |
| Bank Size | -0.656*** | -0.233*** | 0.360* | 0.211*** | 0.853*** | -0.082*** | -1.908*** | -0.187 |
| | (-4.743) | (-9.065) | (1.729) | (4.494) | (6.455) | (-5.393) | (-7.817) | (-0.263) |
| Bank Age | 0.218*** | -0.136*** | 0.106*** | -0.155*** | -0.164 | -0.266*** | 0.306 | 0.143*** |
| | (9.057) | (-17.813) | (3.975) | (-22.693) | (-0.580) | (-3.784) | (0.874) | (2.719) |
| Capital Ratio | -1.027 | -2.614*** | 13.249*** | -0.605* | 3.177*** | -0.526*** | 9.996*** | 0.180 |
| | (-1.086) | (-13.166) | (9.896) | (-1.924) | (2.579) | (-3.082) | (3.880) | (0.018) |
| Liquidity Ratio | -2.781*** | -1.529*** | -7.356*** | -0.664*** | -0.308 | -0.574*** | -23.880*** | 10.124 |
| | (-10.194) | (-22.742) | (-19.404) | (-7.845) | (-0.350) | (-6.099) | (-23.215) | (0.177) |
| NPL Ratio | 9.732*** | 3.962*** | -14.050*** | 5.661*** | 36.525*** | -3.789*** | -73.119*** | 1.271 |
| | (6.563) | (17.273) | (-8.407) | (11.654) | (5.881) | (-3.875) | (-8.337) | (1.598) |
| Earnings | 1.271*** | 0.111*** | -0.958*** | 0.390*** | 0.125 | 0.049*** | 2.294*** | -2.097** |
| | (21.224) | (9.052) | (-9.313) | (15.240) | (1.616) | (3.828) | (14.107) | (-2.506) |
| Loans Ratio | 4.489*** | -0.627*** | -4.250*** | 0.702*** | -2.348*** | -0.391*** | -21.944*** | -0.187 |
| | (13.733) | (-8.425) | (-8.010) | (5.351) | (-4.747) | (-6.154) | (-28.376) | (-0.263) |
| Local Market Controls (Lagged one month) | | | | | | | | |
| Cnty Unemployment | -0.016*** | -0.000 | 0.000 | -0.002 | -0.002** | 0.000 | -0.001 | 0.000 |
| | (-2.620) | (-0.203) | (0.008) | (-1.172) | (-2.066) | (0.128) | (-0.513) | (0.393) |
| Cnty HPI | 0.003*** | 0.001*** | 0.001 | 0.000** | 0.001 | -0.000* | -0.000 | -0.000 |
| | (6.242) | (4.940) | (1.379) | (2.245) | (0.868) | (-1.911) | (-0.374) | (-1.040) |
| Cnty Change in HPI | -0.010 | -0.013 | 0.023 | -0.022 | 0.201 | 0.011 | -0.051 | -0.031 |
| | (-0.085) | (-0.572) | (0.174) | (-0.688) | (1.036) | (0.382) | (-0.208) | (-0.755) |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 9,970,834 | 9,970,834 | 5,553,293 | 5,553,293 | 1,316,356 | 1,316,356 | 753,888 | 753,888 |
| Adjusted R-squared | 0.392 | 0.478 | 0.350 | 0.406 | 0.392 | 0.496 | 0.333 | 0.380 |



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## Table OA.6: Effects of Relationships on Credit Terms on *Existing* Accounts for Customers Split by Risk Characteristics

This table examines the effects of relationships on credit card terms on existing accounts (loan age > 12 months) for customers split by risk characteristics: credit score, securitized status, account age, and account type (revolver (unpaid balances from month to month), transactor (paid in full each month), dormant (no activity from month to month)). Regressions use the full specifications but only the key coefficients are shown for brevity. Panel A shows results during normal times, while Panel B shows changes during the COVID-19 crisis. The existing loan data come from the FR Y-14M credit card dataset and cover the period June 2013 through February 2020 for normal times, and the period November 2019 through June 2020 for changes during the COVID-19 crisis. We use a 0.1% random sample for consumer accounts and a 1% random sample for small business accounts. The dependent variables are: *APR Spread*, interest rate spread over the constant rate Treasury bonds with a similar maturity and *Ln(1+Limit)*, natural log of 1 plus the origination credit limit on the account. The key explanatory variables are *BANK_REL_3Y* and *BANK_REL_3Y × COVID-19 Crisis*, where *BANK_REL_3Y* is a dummy that equals 1 if the customer has another credit card with the bank in the prior three years and/or a conventional relationship with the bank (based on past provision of deposits; investments; mortgage, auto, student, or other loans; or multiple products), and *COVID-19 Crisis* is a dummy that equals 1 from March 1, 2020, onward. Both panels include a broad set of consumer and loan controls measured at origination time or most recent account cycle time (if refreshed values are available): *Customer Credit Score* dummies, *Customer Income* dummies, *Customer Utilization Rate*, *Account Age* dummies, joint account, many authorized users, variable interest rate account, secured card, securitized card, indicator for delinquency in last three years, promotional card, dummies for credit card purpose, and dummies for the channel through which the card was opened. We also include a number of bank characteristics, all lagged one quarter: bank size, bank age, capital ratio, and liquidity ratio, the ratio of non-performing loans, earnings, the ratio of loans to assets. Three local market controls are included, measured at the county level: *Cnty Unemployment*, *Cnty HPI*, and *Cnty Change in HPI*. All regressions include Bank, County, and Month-Year fixed effects. All variables are defined in Table 1. Heteroskedasticity-robust *t*-statistics clustered at county level are reported in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

*Panel A: Normal Times (Full Specification with All Controls and Fixed Effects Suppressed)*

| | **Customer Risk Indicators** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Credit Score | | Securitized | | Account Age | | | | Account Type | | |
| | <720 | ≥720 | No | Yes | (1,3) yrs | [3,5 yrs) | [5,10 yrs) | ≥10 yrs | Revolver | Transactor | Dormant |
| | **Consumer Accounts, Dependent Variable = APR Spread** | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| BANK_REL_3Y | -0.218*** | -0.177*** | -0.284*** | -0.048 | -0.452*** | -0.075*** | -0.087*** | -0.054 | -0.321*** | -0.042 | -0.070** |
| | (-7.787) | (-7.302) | (-13.472) | (-0.915) | (-18.078) | (-3.118) | (-2.895) | (-0.964) | (-12.952) | (-1.464) | (-2.288) |
| Observations | 3,839,686 | 6,131,129 | 7,639,858 | 2,330,968 | 3,256,459 | 2,159,550 | 2,836,393 | 1,718,383 | 5,624,099 | 1,553,532 | 2,793,073 |
| Adjusted R-squared | 0.296 | 0.296 | 0.399 | 0.276 | 0.398 | 0.474 | 0.377 | 0.297 | 0.370 | 0.389 | 0.437 |
| | **Consumer Accounts, Dependent Variable = Ln(1+Limit)** | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| BANK_REL_3Y | 0.048*** | 0.057*** | 0.073*** | -0.051*** | 0.065*** | 0.064*** | 0.036*** | -0.054*** | 0.050*** | 0.046*** | 0.029*** |
| | (7.633) | (11.802) | (15.010) | (-5.214) | (13.798) | (9.368) | (5.037) | (-5.142) | (9.719) | (7.142) | (3.950) |
| Observations | 3,839,686 | 6,131,129 | 7,639,858 | 2,330,968 | 3,256,459 | 2,159,550 | 2,836,393 | 1,718,383 | 5,624,099 | 1,553,532 | 2,793,073 |
| Adjusted R-squared | 0.365 | 0.221 | 0.455 | 0.377 | 0.533 | 0.449 | 0.362 | 0.389 | 0.504 | 0.440 | 0.378 |
| | **Small Business Accounts, Dependent Variable = APR Spread** | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| BANK_REL_3Y | -0.024 | 0.027 | 0.024 | -0.025 | -0.016 | -0.043 | 0.066 | 0.009 | -0.002 | 0.069** | -0.021 |
| | (-0.543) | (0.980) | (0.904) | (-0.330) | (-0.748) | (-1.473) | (1.567) | (0.135) | (-0.061) | (2.367) | (-0.582) |
| Observations | 1,490,668 | 4,062,575 | 4,671,547 | 881,737 | 1,737,763 | 1,249,511 | 1,825,150 | 740,789 | 2,813,825 | 1,354,730 | 1,384,555 |
| Adjusted R-squared | 0.348 | 0.232 | 0.365 | 0.371 | 0.414 | 0.429 | 0.310 | 0.349 | 0.377 | 0.336 | 0.339 |
| | **Small Business Accounts, Dependent Variable = Ln(1+Limit)** | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| BANK_REL_3Y | -0.120*** | -0.116*** | -0.128*** | -0.153*** | -0.133*** | -0.134*** | -0.121*** | -0.156*** | -0.122*** | -0.133*** | -0.105*** |
| | (-10.903) | (-18.372) | (-21.039) | (-9.989) | (-21.179) | (-17.552) | (-14.666) | (-10.206) | (-19.388) | (-18.031) | (-10.952) |
| Observations | 1,490,668 | 4,062,575 | 4,671,547 | 881,737 | 1,737,763 | 1,249,511 | 1,825,150 | 740,789 | 2,813,825 | 1,354,730 | 1,384,555 |
| Adjusted R-squared | 0.377 | 0.197 | 0.374 | 0.420 | 0.422 | 0.398 | 0.356 | 0.444 | 0.440 | 0.304 | 0.295 |
| **All Other Controls & FE** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** |



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*Panel B: Changes during the COVID-19 Crisis (Full Specification with All Controls and Fixed Effects Suppressed)*

| | Customer Risk Indicators | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Credit Score | | Securitized | | Account Age | | | | Account Type | | |
| | <720 | ≥720 | No | Yes | (1,3) yrs | [3,5 yrs) | [5,10 yrs) | ≥10 yrs | Revolver | Transactor | Dormant |
| | **Consumer Accounts, Dependent Variable = APR Spread** | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| BANK_REL_3Y × COVID-19 Crisis | -0.022 | -0.020 | -0.023 | 0.005 | -0.033 | -0.050** | -0.041*** | -0.068*** | -0.017 | -0.036 | -0.034 |
| | (-1.071) | (-1.212) | (-1.611) | (0.240) | (-0.943) | (-2.392) | (-2.769) | (-3.246) | (-0.908) | (-1.511) | (-1.229) |
| BANK_REL_3Y | -0.205*** | -0.099*** | -0.221*** | -0.079 | -0.472*** | -0.111*** | -0.031 | -0.051 | -0.246*** | 0.044 | -0.057 |
| | (-5.782) | (-3.122) | (-8.632) | (-1.068) | (-9.983) | (-2.833) | (-0.788) | (-0.849) | (-8.104) | (1.196) | (-1.255) |
| Observations | 508,426 | 807,870 | 1,115,864 | 200,464 | 376,698 | 315,187 | 372,573 | 251,754 | 736,596 | 249,950 | 329,559 |
| Adjusted R-squared | 0.319 | 0.278 | 0.379 | 0.318 | 0.395 | 0.469 | 0.398 | 0.296 | 0.367 | 0.388 | 0.440 |
| | **Consumer Accounts, Dependent Variable = Ln(1+Limit)** | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| BANK_REL_3Y × COVID-19 Crisis | -0.012*** | -0.005* | -0.009*** | 0.003 | -0.036*** | 0.001 | -0.000 | 0.000 | -0.010*** | 0.006 | -0.000 |
| | (-2.756) | (-1.836) | (-4.047) | (0.844) | (-7.173) | (0.224) | (-0.103) | (0.094) | (-3.022) | (1.039) | (-0.077) |
| BANK_REL_3Y | 0.049*** | 0.084*** | 0.072*** | -0.045*** | 0.027*** | 0.082*** | 0.066*** | -0.020 | 0.062*** | 0.045*** | 0.051*** |
| | (5.687) | (13.988) | (13.298) | (-2.913) | (2.919) | (8.143) | (6.742) | (-1.554) | (9.896) | (5.524) | (4.911) |
| Observations | 508,426 | 807,870 | 1,115,864 | 200,464 | 376,698 | 315,187 | 372,573 | 251,754 | 736,596 | 249,950 | 329,559 |
| Adjusted R-squared | 0.389 | 0.222 | 0.474 | 0.322 | 0.590 | 0.519 | 0.413 | 0.384 | 0.507 | 0.444 | 0.421 |
| | **Small Business Accounts, Dependent Variable = APR Spread** | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| BANK_REL_3Y × COVID-19 Crisis | 0.023 | -0.129*** | -0.084*** | 0.010 | -0.075** | -0.109*** | -0.121*** | -0.060*** | -0.088*** | -0.125*** | -0.012 |
| | (0.796) | (-9.189) | (-6.915) | (0.353) | (-2.544) | (-4.489) | (-6.378) | (-2.890) | (-4.574) | (-5.574) | (-0.438) |
| BANK_REL_3Y | -0.001 | 0.110*** | 0.091*** | -0.086 | -0.017 | 0.185*** | 0.127*** | -0.036 | 0.062 | 0.167*** | 0.014 |
| | (-0.017) | (3.542) | (3.070) | (-0.932) | (-0.357) | (3.878) | (2.967) | (-0.559) | (1.527) | (4.809) | (0.296) |
| Observations | 193,506 | 560,305 | 681,498 | 72,354 | 205,653 | 180,426 | 223,508 | 144,166 | 365,366 | 221,972 | 166,277 |
| Adjusted R-squared | 0.333 | 0.235 | 0.345 | 0.400 | 0.364 | 0.417 | 0.383 | 0.296 | 0.356 | 0.297 | 0.361 |
| | **Small Business Accounts, Dependent Variable = Ln(1+Limit)** | | | | | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| BANK_REL_3Y × COVID-19 Crisis | -0.000 | -0.000 | -0.001 | 0.003 | -0.007 | 0.009 | 0.003 | -0.003 | 0.002 | -0.000 | -0.009 |
| | (-0.067) | (-0.049) | (-0.217) | (0.611) | (-1.163) | (1.401) | (0.691) | (-0.697) | (0.429) | (-0.010) | (-1.324) |
| BANK_REL_3Y | -0.144*** | -0.124*** | -0.148*** | -0.157*** | -0.137*** | -0.149*** | -0.124*** | -0.158*** | -0.142*** | -0.162*** | -0.085*** |
| | (-10.833) | (-18.708) | (-21.421) | (-7.707) | (-13.151) | (-11.860) | (-10.576) | (-10.396) | (-18.247) | (-18.375) | (-6.203) |
| Observations | 193,506 | 560,305 | 681,498 | 72,354 | 205,653 | 180,426 | 223,508 | 144,166 | 365,366 | 221,972 | 166,277 |
| Adjusted R-squared | 0.373 | 0.187 | 0.342 | 0.416 | 0.372 | 0.380 | 0.373 | 0.416 | 0.405 | 0.260 | 0.306 |
| **All Other Controls & FE** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** | **YES** |



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## Table OA.7: Forbearance Accommodations during Normal Times and the COVID-19 Crisis

This table examines whether relationship customers are more likely to be granted forbearance during normal times and the COVID-19 crisis. The focus is on existing credit card accounts (loan age > 12 months). The existing loan data come from the FR Y-14M credit card dataset and cover the period June 2013 through February 2020 for normal times, and the period November 2019 through June 2020 for changes during the COVID-19 crisis. We use a 0.1% random sample for consumer accounts and a 1% random sample for small business accounts. The dependent variables are several forbearance indicators, including *All Forbearances* and subcategories such as *Forb Reduced Rate* (reduced APR rate less or equal to 10 percent), *Forb $0 Min Pay* ($0 minimum payment), *Forb Defer Pay* (payment deferral), *Forb Waive Late Fees* (waiving of late fees), *Forb Waive Interest* (waiving of interest), and *Forb Other* (other forbearance types). The key explanatory variables are *BANK_REL_3Y* and *BANK_REL_3Y × COVID-19 Crisis*, where *BANK_REL_3Y* is a dummy that equals 1 if the customer has another credit card with the bank in the prior three years and/or a conventional relationship with the bank (based on past provision of deposits; investments; mortgage, auto, student, or other loans; or multiple products), and *COVID-19 Crisis* is a dummy that equals 1 from March 1, 2020, onward. In all panels, we include a broad set of consumer and loan controls measured at origination time or most recent account cycle time (if refreshed values are available): *Customer Credit Score* dummies, *Customer Income* dummies, *Customer Utilization Rate*, *Account Age* dummies, joint account, many authorized users, variable interest rate account, secured card, securitized card, indicator for delinquency in last three years, promotional card, dummies for credit card purpose, and dummies for the channel through which the card was opened. We also include a number of bank characteristics, all lagged one quarter: bank size, bank age, capital ratio, and liquidity ratio, the ratio of non-performing loans, earnings, the ratio of loans to assets. Three local market controls are included, measured at the county level: *Cnty Unemployment*, *Cnty HPI*, and *Cnty Change in HPI*. All regressions include Bank, County, and Month-Year fixed effects. All variables are defined in Table 1. Heteroskedasticity-robust *t*-statistics clustered at county level are reported in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

*Panel A: Normal Times*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Consumer Accounts** | | | | | | | **Small Business Accounts** | | | | | | |
| **Dependent Variable:** | All Forbearances | Forb Reduced Rate | Forb $0 Min Pay | Forb Defer Pay | Forb Waive Late Fees | Forb Waive Interest | Forb Other | All Forbearances | Forb Reduced Rate | Forb $0 Min Pay | Forb Defer Pay | Forb Waive Late Fees | Forb Waive Interest | Forb Other |
| **Independent Variables:** | | | | | | | | | | | | | | |
| BANK_REL_3Y | 0.004*** | 0.004*** | 0.001*** | -0.000 | -0.001*** | 0.001* | -0.000 | -0.006*** | -0.006*** | 0.002*** | -0.000** | -0.001** | -0.002* | 0.000 |
| | (4.124) | (4.453) | (7.159) | (-0.056) | (-4.422) | (1.702) | (-0.211) | (-4.906) | (-4.991) | (10.925) | (-1.987) | (-2.448) | (-1.950) | (0.350) |
| Ln(1+Limit) | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Customer/Loan/Bank/ County Controls | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 9,970,834 | 9,970,834 | 9,970,834 | 9,970,834 | 9,970,834 | 9,970,834 | 9,970,834 | 5,553,293 | 5,553,293 | 5,553,293 | 5,553,293 | 5,553,293 | 5,553,293 | 5,553,293 |
| Adjusted R-squared | 0.127 | 0.098 | 0.021 | 0.304 | 0.051 | 0.073 | 0.022 | 0.136 | 0.164 | 0.024 | 0.223 | 0.035 | 0.092 | 0.042 |

*Panel B: Changes during the COVID-19 Crisis*

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Consumer Accounts** | | | | | | | **Small Business Accounts** | | | | | | |
| **Dependent Variable:** | All Forbearances | Forb Reduced Rate | Forb $0 Min Pay | Forb Defer Pay | Forb Waive Late Fees | Forb Waive Interest | Forb Other | All Forbearances | Forb Reduced Rate | Forb $0 Min Pay | Forb Defer Pay | Forb Waive Late Fees | Forb Waive Interest | Forb Other |
| **Independent Variables:** | | | | | | | | | | | | | | |
| BANK_REL_3Y × COVID-19 Crisis | 0.102*** | -0.001* | 0.005*** | 0.104*** | -0.000 | -0.001** | 0.001*** | 0.046*** | -0.012*** | 0.009*** | 0.051*** | 0.002** | 0.001 | 0.001*** |
| | (18.243) | (-1.714) | (10.747) | (18.181) | (-0.188) | (-2.125) | (4.136) | (13.001) | (-12.015) | (12.915) | (16.046) | (2.162) | (1.438) | (3.342) |
| BANK_REL_3Y | -0.045*** | 0.002* | -0.002*** | -0.050*** | 0.000 | 0.003*** | -0.000*** | -0.021*** | 0.001 | -0.003*** | -0.020*** | -0.001 | -0.000 | -0.000*** |
| | (-15.746) | (1.938) | (-6.064) | (-17.556) | (0.004) | (5.654) | (-3.510) | (-10.095) | (1.068) | (-10.333) | (-11.439) | (-1.509) | (-0.537) | (-3.025) |
| Ln(1+Limit) | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Customer/Loan/Bank/ County Controls | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Bank, County, Year-Month FE | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 1,316,356 | 1,316,356 | 1,316,356 | 1,316,356 | 1,316,356 | 1,316,356 | 1,316,356 | 753,888 | 753,888 | 753,888 | 753,888 | 753,888 | 753,888 | 753,888 |
| Adjusted R-squared | 0.253 | 0.112 | 0.024 | 0.351 | 0.046 | 0.037 | 0.014 | 0.213 | 0.121 | 0.049 | 0.320 | 0.032 | 0.038 | 0.011 |



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