

# Internet Appendix - How Collateral Affects Small Business Lending: The Role of Lender Specialization

## Appendix IA1 Data Appendix

### *IA1.1 Data Construction*

**Sample Restrictions** I start with the universe of secured lending in Texas available from the Texas Secretary of State Website. This is a sample of 9.3 million loans. First, I restrict the sample to only new loan originations. This results in a sample of 5.5 million loans. The sample is then restricted to business loan originations (UCC filings are made for both individual debtors (consumer loans) as well as for business loans). This leaves a sample of 2.9 million loans. I then drop loans that were originated before 2002 or after 2016, dropping another 1.2 million observations. Finally, I drop loans without collateral descriptions or missing lender information. Thus, my final sample before matching to the Census data contains 995,657 new loan originations between 2002 and 2016.

**Data Cleaning** The downloaded raw data is based on the text used in the original UCC filing which is usually unformatted and non-uniform. Therefore, I clean the raw UCC filing information for uniform borrower and lender name. There is a need to clean lender names to track the various loans made by the same lender. Borrower names have to be cleaned for more accurate matching to the Census data.

First, I first remove punctuations and special characters. Then, for lenders with at least 250 loans in the sample, I manually map the various combinations of the names to a common moniker. Through this process, I obtain clean lender names for 75% of the total sample. For the remaining loans, I automate the cleaning by removing common trailing patterns (LLC, Inc, Ltd etc.), expanding abbreviations, and fixing typos in the names to generate common lender names. For bank holding companies with subsidiaries, I match them under a common bank name (for example, loans made by Wells Fargo Bank and loans made by Wells Fargo Leasing as classified as Wells Fargo loans).

I drop from my sample lending backed by government agencies, such as the Small Business Administration backed loans, or liens held by government agencies such as the Internal Revenue Service. I further drop filings made by UCC filing agencies such as Corporation Service Company (CSC). These services make filings on behalf of their lender customers, and thus makes it impossible to identify the true loan originator.

Similarly, on the borrower side, I clean debtor names by removing common trailing and

leading patterns. After merging to the Census data, I drop all firms in FIRE industries (financial, and real estate firms; NAICS code 52 and 53) from the sample. I also drop firms with 0 employment and payroll from the sample.

## IA1.2 Comparison to Other Data Sources

**CRA data** The most commonly used data on small business lending is the data collected under the Community Reinvestment Act (henceforth, CRA data). While there is overlap between the UCC data and the CRA data, there are also significant differences that I highlight below.

First, my data covers bank, finance companies, and other nonbank lenders. The CRA data only covers lending by banks whose assets exceed \$1 billion.

Second, my data is collected from UCC filings. Lenders make UCC filings to preserve priority in bankruptcy. The CRA data is collected under the Community Reinvestment Act. The CRA data is used to compute a bank's CRA rating, which is relevant to banks because it determines whether regulators approve proposed mergers and acquisitions. Hence, banks have incentives to report lending in certain areas and there is anecdotal evidence that banks adjust their reported lending according to these incentives.<sup>35</sup> Hence, reporting incentives may affect the quality of the CRA data when used to measure new credit.

Third, the CRA data includes both secured and unsecured credit while UCC filings, by definition, are only made for secured transactions. This means I do not cover unsecured credit to businesses. My understanding is that the main source of unsecured credit are credit cards issued to small businesses.<sup>36</sup>

Fourth, my data identifies new loan originations. The CRA data reports changes in credit limits as new lending even if the change does not result in lending. Moreover, the CRA data counts loan refinancing as new loan originations, while the UCC filings do not. Hence, there is a concern that the CRA may overstate changes in new lending.

Fifth, my data covers all secured lending irrespective of loan size. The CRA data only includes commercial and industrial loans (C&I loans) of less than \$1 million. The Government Accountability Office (GAO) has pointed out that the \$1 million cut-off (which has remained unchanged since 1992) may undercount lending and that the cut-off in loan size rather than firm size may mismeasure actual lending to small businesses.<sup>37</sup>

Sixth, the CRA data are collected at different levels of aggregation. The UCC data is at the loan-level and be matched to lender and firm characteristics. It also contains information on the underlying collateral. The UCC data, however, does not include information on loan

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<sup>35</sup>See for example, <https://www.wsj.com/articles/never-mind-the-ferrari-showroom-bank-regulators-say-this-a-poor-neighborhood-1495108800>

<sup>36</sup>For credit lines and business credit cards, the CRA calculates the loan amount as the total credit limit of the line. As of 2013, there were 28.3 million business cards. Source - The 2013 Federal Reserve Payments Study, which can be found at <https://www.frb services.org/assets/news/research/2013-fed-res-paymt-study-detailed-rpt.pdf>

<sup>37</sup><https://www.gao.gov/reports/GAO-18-312/>

amount. CRA data is collected at the bank-county level and cannot be matched to firm characteristics and does not contain collateral information.

Taken together, the two datasets appear to be complementary. My data has detailed information at the firm-level and regarding collateral but misses information on loan amount and unsecured lending. CRA data includes unsecured lending but cannot be matched at the firm-level and has no information on collateral and larger loans. The CRA data covers banks, while the UCC data includes finance companies and other nonbank lenders. Both datasets may suffer from potential reporting biases. At a minimum, the UCC data provides a way to assess the validity of the widely used CRA data.

**Syndicated loan data** Another commonly used data source on business lending comes from DealScan. DealScan covers syndicated lending to large businesses. The average size of a syndicated loan in 2016 was \$417 million, with 90% of the loans over \$10 million. Syndicated loan borrowers are large with mean annual sales of \$9 billion in 2016. While syndicated lending is covered by the UCC filings, it only constitutes a small fraction of the number of loans. In 2016, there were about 4,300 syndicated loans made to 2,400 companies. For comparison, there were 1.25 million loans made to over 790,000 firms in the U.S. in the universe of UCC data. Syndicated loans account for less than 0.35% of the UCC data.

### *IA1.3 Example Collateral Descriptions*

#### **Examples on lien on specific (real) assets**

*1 john deere 6210 **utility tractor** s/n l06210 p2220681 john deere 620 **loader**  
s/n w00620 x008907*

*one (1) 1999 ford model f350 **truck** vin# 1fdwf36f6xee66983 one (1) 2000 ford  
mode l f350 **truck** vin# 1fdwf36f2yeb69887 one (1) john deere model 550h **crawler  
dozer** s/n t0550hx878428 one (1) ingersoll rand model sd100 **roller** s/n 160632  
one (1) ingersoll rand model sd100f **roller** s/n 160766 one (1) caterpillar model  
416c **loader backhoe** s/n 4zn21386 one (1) dynaweld **lowboy** vin#4u181dix7y1038915  
one (1) **freightliner** model fl70 **truck** vin# 1fv6hlba4tl601168 one (1) terex  
model rt230xl 30 ton rough terrain **crane** s/n 12218 one (1) 1994 **freightliner**  
model fld12064sd **tractor truck** vin# 1fuyfsyb8rh763880 one (1) komatsu model  
br350jg **crusher** s/n 12 67 one (1) caterpillar model d8r **dozer** s/n 7xm04399  
one (1) caterpillar model 81 5f **compactor** s/n 1gn00742 one (1) caterpillar  
model 140h **motor grader** s/n 9tn008 74 one (1) ingersoll rand model sd100f*

**compactor** s/n 160297 complete with all present and future attachments, accessories, replacement parts, repairs, additions and all proceeds thereof.

1 9 channel dvmr with cd, 250gb hd1 ups **battery** backup 450va capacity1 jvc low light digital color **camera** with auto iris varifocal lens and outdoor housing and mount

1. 250 acres of irrigated **wheat** located on section 449, block 1-t, t& no ry. co. survey, sherman county, texas ("section 449");2. 114 acres of dry land **wheat** located on section 449;3. 2 anhydrous **storage tanks** located on section 449; and 4. 1 moline **irrigation motor** and 1 caterpillar **motor** located on section 449.

one (1) manitex model m22101 **hydraulic boom crane** s/n 45161 complete with all present and future attachments, accessories, replacement parts, repairs, additions and all proceeds thereof.

#### **Examples of blanket liens**

*all inventory, equipment, accounts (including but not limited to all health-care -insurance receivables), chattel paper, instruments (including but not limited to all promissory notes), letter-of-credit rights, letters of credit, documents, deposit accounts, investment property, money, other rights to payment and performance, and general intangibles (including but not limited to all software and all payment intangibles); all attachments, accessions, accessories, fittings, increases, tools, parts, repairs, supplies, and commingled goods relating to the foregoing property, and all additions, replacements of and substitutions for all or any part of the foregoing property; all insurance refunds relating to the foregoing property; all good will relating to the foregoing property; all records and data and embedded software relating to the foregoing property, and all equipment, inventory and software to utilize, create, maintain and process any such records and data on electronic media; and all supporting obligations relating to the foregoing property; all whether now existing or hereafter arising, whether now owned or hereafter acquired or whether now or hereafter subject to any rights in the foregoing property; and all products and proceeds (including but not limited to all insurance payments) of or relating to the foregoing property. including but not limited to all business assets of mdj floorings, inc. located at 10641 harwin dr. #500, houston, texas 77036; and wherever located.*

*all of debtor's **accounts, notes, drafts, acceptances, instruments, chattel paper and general intangibles**, and all guaranties and suretyship agreements relating thereto and all security for the payment or performance thereof, whether now existing or hereafter arising; all proceeds, monies, income, benefits, collections and products thereof and thereon and attributable or accruing thereto; all goods which give rise or may give rise thereto, including, without limitation, all re turned or repossessed goods and other goods the sale or delivery of which gave rise or may give rise to any of such **accounts, notes, drafts, acceptances, instruments, chattel paper or general intangibles**, including the right of stoppage in transit, and the products and proceeds thereof; and all rights of debtor, whether or not earned by performance, under contracts to sell or lease goods or render services, and all proceeds thereof.*

*all debtors assets and properties wherever located, including without limitation **all equipment** of any kind or nature, **all vehicles, vehicle parts and inventory** now owned or hereafter acquired, without limitation, purchase money inventory, the purchase of which was financed or floorplanned by dealer services corporation for debtor of whatever kind or nature, and all returns, repossessions, exchanges, substitutions, attachments, additions, accessions, accessories, replacements , and proceeds thereof; **all accounts receivable, chattel paper, and general intangibles** now owned or hereafter acquired by debtor together with the proceeds thereof; all of debtors documents, books and records relating to the foregoing.*

*all **inventory, chattel paper, accounts, contract rights, equipment, general intangibles and fixtures**; together with following specifically described property: **furniture and machinery**; whether any of the foregoing is owned now or acquired later; all accessions, additions, replacements and substitutions relating to any of the foregoing; all records of any kind relating to any of the foregoing; all proceeds relating to any of the foregoing (including insurance, general intangibles and other account proceeds)*

## Appendix IA2 Dictionary of Real Assets

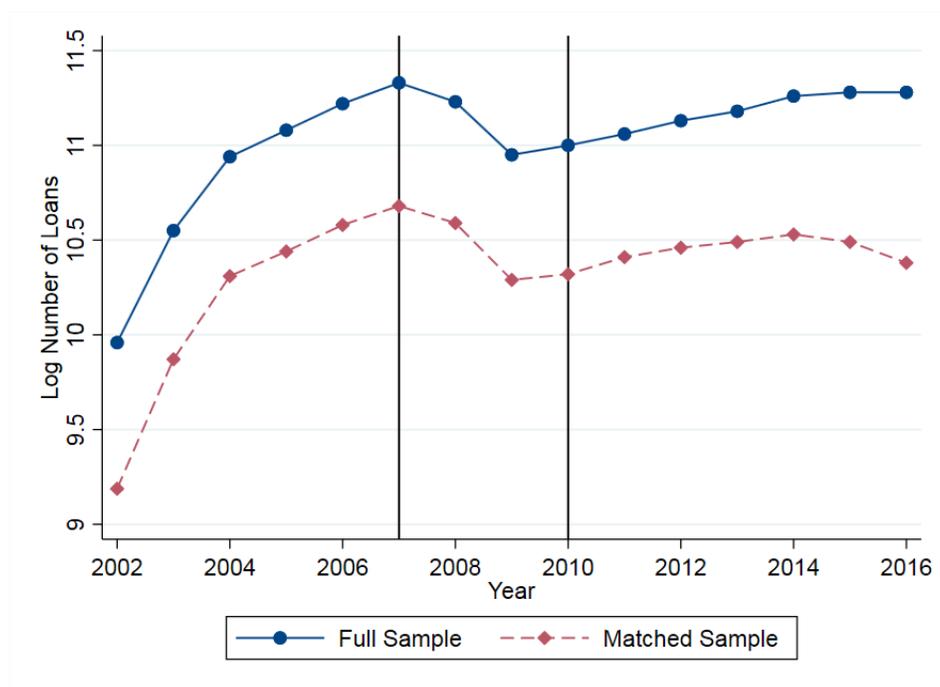
adapter, aircraft, airframe, alarm, ale, alloy, alum, aluminum, amplifier, antenna, apple, appliance, arrow, art, asphalt, atv, audio, auto, automobile, automotive, avionics, axle, backhoe, bailee, ball, band, barrel, basket, battery, beam, bed, beef, bell, belt, beverage, bike, bin, blade, blast, blaster, blender, blinds, blocks, blower, bluetooth, boat, boiler, bolt, bottle, box, bracket, brakes, brass, bread, bridge, broom, brush, buckets, buggy, bulls, burner, bus, bush, cab, cabinet, cable, cad, cage, calves, camera, canopy, car, carbon, card, carpet, carriage, carriers, cars, cart, cartridge, casing, cassette, cattle, cell, cellular, cement, chains, chair, chamber, charger, chassis, chemical, chiller, chip, chipper, chisel, chrome, chute, circuit, clamp, cleaner, clothing, coil, coin, compactor, components, compressor, computer, concrete, condenser, conditioner, condominium, cone, connector, console, container, controller, converter, conveyors, coolant, cooler, copier, cord, cordless, corn, cotton, counters, coupler, cows, cpu, craft, crane, crawler, crop, crude, crusher, cultivator, cup, cutter, cycle, cylinder, deck, dental, desk, desktop, diamond, diesel, dig, digger, digital, dishes, dishwashers, disk, dispenser, dock, dodge, dome, door, dozer, drain, drapes, drawers, drill, drilling, drink, drives, drugs, drum, dryer, duct, dumbbell, electric, electrical, electronic, elevator, embroidery, encumbrancer, engine, ethernet, excavator, exhaust, exploration, extinguisher, extraction, extractor, fab, fabric, fans, farm, fax, feed, feeder, fence, fertilizer, fiber, fiberglass, film, filters, flatbed, fleet, flex, flight, floor, floppy, fluid, forklift, forks, frame, freezer, freight, freightliner, fryer, fuel, furance, fuse, gas, gasoline, gator, gauge, gear, generator, genset, gin, glass, gold, golf, goods, grain, granite, graphic, grill, grinder, gun, hammer, handpiece, handsets, hardware, harvester, hat, hauler, hay, header, headsets, heater, heating, highway, hoe, hog, hopper, hose, hustler, hvac, hydraulic, hydro, hydrocarbons, ice, imagerunner, imaging, incinerators, inkjet, inverter, iron, irrigation, jack, jaws, jet, jewelry, keyboard, kitchenware, knife, lamb, laminator, lamp, land, laptop, laser, laserjet, latex, lathe, laundry, lcd, lead, leather, led, lever, lift, lighting, lights, liquid, liquor, livestock, loader, lock, log, loop, lots, lowboy, lube, macbook, magnet, mast, medicine, merchandise, mercury, metal, meters, microfiche, microfilm, microwave, milk, milling, mineral, mining, mirror, mixer, mobile, modem, modular, monitor, motor, motorgrader, mouse, mower, mud, needle, network, nylon, oak, oil, oilfield, optical, optiplex, orange, oven, oxygen, package, pad, paint, paintings, pallet, panel, pencil, peripheral, petroleum, phone, photograph, pickup, pipes, pivot, plane, plant, planter, plasma, plat, plate, platinum, plow, plumbing, pneumatic, pool, ports, pot, poultry, print, printer, printing, probing, propane, propeller, pulse, pump, quad, rack, radio, rafts, rail, railroad, rake, rams, ranch, recorder, refrigerator, rice, rings, ripper, robot, rock, rod, roll, rollers, roof, rotary, router, rubber, saddle, sand,

sander, sapphire, satellite, savings, scale, scanner, scanning, scissor, scraper, screens, screw, scrubber, seats, seed, sensor, server, sewer, shaft, sheets, shelf, shell, shifter, ship, shipment, shippers, shipping, shredder, shuttle, signage, silver, sink, skid, skidder, skidsteer, software, solar, spindle, sprayer, sprinkler, ssd, stabilizer, stacker, stainless, stationary, steam, steel, steer, stone, stool, storage, store, stoves, strap, stream, stripper, strobe, structures, swap, sweeper, swing, switchboards, systems, table, tablet, tank, tanker, tape, taps, technology, telehandler, telephone, telescopic, television, tents, terminal, thermal, thumb, timber, tire, titan, titles, tooling, tools, tower, track, tractor, trailer, trailmobile, trainer, transformers, transmission, tray, treadmill, trench, trimble, trimmer, trolley, truck, trucking, trunk, trust, tube, tubing, tv, ultrasonic, ultrasound, upholstery, vacuum, valve, van, vehicle, ventilating, vessel, wagon, walls, walnut, ware, warehouse, washer, welding, wheat, wheel, wheeler, whet, widescreen, wifi, wind, window, wine, wing, wire, wireless, wiring, wood, wrench,

## Appendix IA3 Additional Figures

Figure IA1: Match Rates

Figure plots the number of loans in the full sample of UCC-1 filings and the matched UCC-LBD sample.



## Appendix IA4 Additional Tables

Table IA1: Firm-Lender Lending - Dynamic Difference-in-difference

This table studies the effect of borrower-lender collateral match on access to credit in the aftermath of the 2008 financial crisis. The sample consists of borrower-lender pairs in Texas with a lending relationship between 2002-07.

$$y_{flt} = \alpha_f + \gamma_l + \delta_t + \beta_t \text{ Firm-Lender Collateral Match}_{fl} \times \mathbf{1}_t + \epsilon_{fci}$$

where firm  $f$ , lender  $l$ , and year  $t$ . The dependent variable is an indicator that takes value of one if the firm-lender pair is observed to have a loan in a given year, scaled by frequency of loans between the pair in the pre-crisis period. Firm-Lender Collateral Match Quality captures the level of collateral specialization of the lender in the borrower's collateral. Standard errors clustered at lender level.

	(1)	(2)	(3)	(4)	(5)
	Scaled	Scaled	Scaled	Scaled	Scaled
	Loan	Loan	Loan	Loan	Loan
Firm-Lender Collateral Match x 2002	-0.105 (0.074)	-0.122*** (0.037)	-0.046 (0.103)	-0.097* (0.058)	0.006 (0.044)
Firm-Lender Collateral Match x 2003	-0.114** (0.056)	-0.016 (0.044)	-0.055 (0.086)	0.009 (0.065)	-0.009 (0.059)
Firm-Lender Collateral Match x 2004	-0.122*** (0.047)	-0.093* (0.054)	-0.062 (0.070)	-0.068 (0.076)	-0.160** (0.074)
Firm-Lender Collateral Match x 2005	-0.053 (0.045)	0.02 (0.044)	0.009 (0.062)	0.048 (0.068)	-0.037 (0.070)
Firm-Lender Collateral Match x 2006	0.052 (0.047)	0.055 (0.041)	0.116** (0.045)	0.085 (0.061)	0.102 (0.067)
Firm-Lender Collateral Match x 2007	-0.064 (0.046)	-0.031 (0.044)	-	-	0.078 (0.071)
Firm-Lender Collateral Match x 2008	0.291*** (0.043)	0.256*** (0.039)	0.355*** (0.056)	0.287*** (0.045)	0.143** (0.057)
Firm-Lender Collateral Match x 2009	0.278*** (0.052)	0.275*** (0.037)	0.342*** (0.072)	0.306*** (0.050)	0.172*** (0.043)
Firm-Lender Collateral Match x 2010	0.197*** (0.054)	0.154*** (0.037)	0.261*** (0.081)	0.184*** (0.054)	0.049 (0.051)
Firm-Lender Collateral Match x 2011	0.061 (0.053)	0.067* (0.037)	0.123** (0.057)	0.095* (0.056)	0.122** (0.049)
Firm-Lender Collateral Match x 2012	0.042	0.013	0.102**	0.042	0.05

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Table IA1 – *Continued from previous page*

	(1)	(2)	(3)	(4)	(5)
	Scaled	Scaled	Scaled	Scaled	Scaled
	Loan	Loan	Loan	Loan	Loan
	(0.048)	(0.040)	(0.047)	(0.055)	(0.049)
Firm-Lender Collateral Match x 2013	0.101*** (0.038)	0.077* (0.040)	0.160*** (0.053)	0.105* (0.054)	0.101** (0.051)
Firm-Lender Collateral Match x 2014	0.112*** (0.037)	0.098** (0.040)	0.170*** (0.052)	0.124** (0.055)	0.127** (0.050)
Firm-Lender Collateral Match x 2015	0.038 (0.032)	-0.015 (0.031)	0.095* (0.050)	0.012 (0.049)	0.011 (0.051)
Firm-Lender Collateral Match x 2016	0.019 (0.033)	-0.007 (0.033)	0.075 (0.051)	0.018 (0.051)	0.017 (0.056)
Observations	514000	514000	514000	514000	302000
Firm FE	Y	Y	N	N	N
Lender FE	Y	N	N	N	Y
Year FE	Y	N	Y	N	N
Lender x Year FE	N	Y	N	Y	Y
Firm x Lender FE	N	N	Y	Y	N
Firm x Year FE	N	N	N	N	Y
$R^2$	0.141	0.244	0.16	0.264	0.541

Table IA2: Firm Relationship Lending - Dynamic Difference-in-difference

This table studies the effect of collateral match on access to credit in the aftermath of the 2008 financial crisis. The sample consists of borrowers in Texas with a lending relationship between 2002-07.

$$y_{ft} = \alpha_f + \delta_t + \beta_t \text{ Firm Collateral Match}_{fl} \times \mathbf{1}_t + \epsilon_{fci}$$

where firm  $f$ , and year  $t$ . The dependent variable is an indicator that takes value of one if the firm is observed to have a loan in a given year from its pre-crisis relationship lenders, scaled by frequency of loans to the firm in the pre-crisis period. Firm Collateral Match is created as a weighted average of firm-lender collateral match values. Firm-lender collateral match captures the level of collateral specialization of each of the borrower's pre-crisis (2002-07) relationship lenders. Standard errors clustered at firm level.

	(1)	(2)	(3)
	Scaled	Scaled	Scaled
	Loan	Loan	Loan
Firm Collateral Match x 2002	-0.033 (0.030)	-0.001 (0.048)	0.016 (0.051)
Firm Collateral Match x 2003	0.057* (0.034)	0.092* (0.051)	0.102* (0.055)
Firm Collateral Match x 2004	-\$0.015 (0.034)	0.024 (0.052)	0.022 (0.057)
Firm Collateral Match x 2005	0.05 (0.032)	0.093* (0.049)	0.109** (0.054)
Firm Collateral Match x 2006	0.033 (0.030)	0.082* (0.045)	0.081 (0.050)
Firm Collateral Match x 2007	-0.050* (0.029)	-	-
Firm Collateral Match x 2008	0.182*** (0.026)	0.232*** (0.035)	0.223*** (0.038)

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Table IA2 – *Continued from previous page*

	(1)	(2)	(3)
	Scaled	Scaled	Scaled
	Loan	Loan	Loan
Firm Collateral Match x 2009	0.102*** (0.022)	0.152*** (0.035)	0.138*** (0.037)
Firm Collateral Match x 2010	0.114*** (0.023)	0.162*** (0.035)	0.160*** (0.038)
Firm Collateral Match x 2011	0.102*** (0.023)	0.150*** (0.035)	0.144*** (0.038)
Firm Collateral Match x 2012	0.112*** (0.023)	0.161*** (0.036)	0.161*** (0.038)
Firm Collateral Match x 2013	0.127*** (0.023)	0.181*** (0.036)	0.180*** (0.038)
Firm Collateral Match x 2014	0.136*** (0.023)	0.192*** (0.035)	0.184*** (0.038)
Firm Collateral Match x 2015	0.084*** (0.021)	0.139*** (0.035)	0.134*** (0.038)
Firm Collateral Match x 2016	0.078*** (0.021)	0.133*** (0.035)	0.121*** (0.038)
Observations	309000	309000	309000
Firm FE	N	Y	Y
Year FE	Y	Y	N
County x Industry x Year FE	N	N	Y
$R^2$	0.145	0.213	0.29

Table IA3: Firm Total Lending - Dynamic Difference-in-difference

This table studies the effect of collateral match on access to credit in the aftermath of the 2008 financial crisis. The sample consists of borrowers in Texas with a lending relationship between 2002-07.

$$y_{ft} = \alpha_f + \delta_t + \beta_t \text{ Firm Collateral Match}_{fl} \times \mathbf{1}_t + \epsilon_{fci}$$

where firm  $f$ , and year  $t$ . The dependent variable is an indicator that takes value of one if the firm is observed to have a loan in a given year, scaled by frequency of loans to the firm in the pre-crisis period. Firm Collateral Match is created as a weighted average of firm-lender collateral match values. Firm-lender collateral match captures the level of collateral specialization of each of the borrower's pre-crisis (2002-07) relationship lenders. Standard errors clustered at firm level.

	(1)	(2)	(3)
	Scaled	Scaled	Scaled
	Loan	Loan	Loan
Firm Collateral Match x 2002	-0.029 (0.032)	0.015 (0.050)	0.024 (0.053)
Firm Collateral Match x 2003	0.058* (0.034)	0.108** (0.052)	0.109* (0.056)
Firm Collateral Match x 2004	-0.011 (0.034)	0.036 (0.052)	0.034 (0.057)
Firm Collateral Match x 2005	0.049 (0.032)	0.092* (0.049)	0.114** (0.054)
Firm Collateral Match x 2006	0.034 (0.029)	0.082* (0.045)	0.08 (0.050)
Firm Collateral Match x 2007	-0.050* (0.029)	-	-
Firm Collateral Match x 2008	0.087*** (0.031)	0.138*** (0.038)	0.108*** (0.041)
Firm Collateral Match x 2009	0.123***	0.173***	0.144***

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Table IA3 – *Continued from previous page*

	(1)	(2)	(3)
	Scaled	Scaled	Scaled
	Loan	Loan	Loan
	(0.030)	(0.039)	(0.042)
Firm Collateral Match x 2010	0.080*** (0.030)	0.129*** (0.040)	0.121*** (0.042)
Firm Collateral Match x 2011	0.046 (0.031)	0.095** (0.040)	0.094** (0.043)
Firm Collateral Match x 2012	0.085*** (0.032)	0.134*** (0.041)	0.146*** (0.043)
Firm Collateral Match x 2013	0.128*** (0.033)	0.183*** (0.042)	0.159*** (0.044)
Firm Collateral Match x 2014	0.072** (0.033)	0.131*** (0.041)	0.107** (0.044)
Firm Collateral Match x 2015	0.01 (0.033)	0.071* (0.043)	0.047 (0.045)
Firm Collateral Match x 2016	0.031 (0.033)	0.094** (0.042)	0.068 (0.044)
Observations	309000	309000	309000
Firm FE	N	Y	Y
Year FE	Y	Y	N
County x Industry x Year FE	N	N	Y
$R^2$	0.061	0.16	0.24

Table IA4: Distress Lending

This table examines the interaction between lender specialization and bank capitalization on access to credit around the 2008 financial crisis. The sample consists of borrower-lender pairs in Texas with a lending relationship between 2002-07. Sample is restricted to loans made by banks (commercial bank, nonbank-sub subsidiary of bank holding company, or a credit union). Regression takes the following form:

$$y_{flt} = \alpha_{fl} + \delta_t + \beta_{1t} \text{ Firm-Lender Collateral Match}_{fl} \times \mathbf{1}_t + \beta_{2t} \text{ Firm-Lender Collateral Match}_{fl} \times \mathbf{1}_t \times \text{Low Cap}_l + \epsilon_{fci}$$

for firm  $f$ , lender  $l$  and year  $t$ . The dependent variable is an indicator that takes value of one if the firm-lender pair is observed to have a loan in a given year, scaled by frequency of loans between the pair in the pre-crisis period. Firm-Lender Collateral Match Quality captures the level of collateral specialization of the lender in the borrower's collateral, and is measured based on pre-crisis (2002-07) loans between the borrower and lender. Low Cap takes a value of 1 for banks with below median Tier-1 Capital Ratio in 2006. Regression includes firm, lender, and year fixed effects.  $\mathbf{1}_t$  takes value 1 in year  $t$  and is zero otherwise.

	(1)	(2)
	Scaled	Scaled
	Loan	Loan
Firm-Lender Collateral Match x 2002	-0.442 (0.465)	-0.374 (0.697)
Firm-Lender Collateral Match x 2003	-0.572** (0.288)	-0.505 (0.524)
Firm-Lender Collateral Match x 2004	-0.207 (0.218)	-0.137 (0.353)
Firm-Lender Collateral Match x 2005	0.041 (0.253)	0.116 (0.286)
Firm-Lender Collateral Match x 2006	0.076 (0.328)	0.151 (0.178)
Firm-Lender Collateral Match x 2007	-0.077 (0.299)	0

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Table IA4 – *Continued from previous page*

	(1)	(2)
	Scaled	Scaled
	Loan	Loan
Firm-Lender Collateral Match x 2008	0.827*** (0.198)	0.904*** (0.280)
Firm-Lender Collateral Match x 2009	0.643** (0.252)	0.720* (0.409)
Firm-Lender Collateral Match x 2010	0.255 (0.304)	0.333 (0.536)
Firm-Lender Collateral Match x 2011	-0.253 (0.181)	-0.177 (0.249)
Firm-Lender Collateral Match x 2012	-0.011 (0.197)	0.066 (0.246)
Firm-Lender Collateral Match x 2013	0.493** (0.193)	0.567* (0.322)
Firm-Lender Collateral Match x 2014	0.509*** (0.187)	0.579* (0.321)
Firm-Lender Collateral Match x 2015	0.093 (0.124)	0.162 (0.296)
Firm-Lender Collateral Match x 2016	0.157 (0.136)	0.225 (0.302)
Collateral Match x Low Cap x 2002	-0.21 (0.238)	-0.431 (0.326)

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Table IA4 – *Continued from previous page*

	(1)	(2)
	Scaled	Scaled
	Loan	Loan
Collateral Match x Low Cap x 2003	-0.399*** (0.145)	-0.621** (0.245)
Collateral Match x Low Cap x 2004	-0.039 (0.116)	-0.26 (0.176)
Collateral Match x Low Cap x 2005	0.112 (0.132)	-0.106 (0.152)
Collateral Match x Low Cap x 2006	0.068 (0.164)	-0.15 (0.109)
Collateral Match x Low Cap x 2007	0.217 (0.150)	0
Collateral Match x Low Cap x 2008	0.305** (0.121)	0.089 (0.148)
Collateral Match x Low Cap x 2009	0.103 (0.141)	-0.114 (0.200)
Collateral Match x Low Cap x 2010	-0.049 (0.162)	-0.265 (0.254)
Collateral Match x Low Cap x 2011	-0.181 (0.133)	-0.398** (0.168)
Collateral Match x Low Cap x 2012	0.030 (0.111)	-0.187 (0.135)
Collateral Match x Low Cap x 2013	0.251**	0.032

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Table IA4 – *Continued from previous page*

	(1)	(2)
	Scaled	Scaled
	Loan	Loan
	(0.109)	(0.161)
Collateral Match x Low Cap x 2014	0.273** (0.106)	0.053 (0.160)
Collateral Match x Low Cap x 2015	0.124 (0.079)	-0.096 (0.147)
Collateral Match x Low Cap x 2016	0.134 (0.085)	-0.086 (0.150)
Observations	242000	242000
Firm FE	Y	N
Lender FE	Y	N
Year FE	Y	Y
Lender x Year FE	N	N
Firm x Lender FE	N	Y
$R^2$	0.18	0.189

Table IA5: Employment Results - Dynamic Diff-in-diff

This table examines the effect of collateral match on employment at the firm level. Sample is restricted to firms with a loan between 2002-07. Dependent variable is the employment of the firm as of March scaled by the average employment of the firm in the pre-crisis period (2002-07). Similarity is measured based on real assets pledged by the firm between 2002 and 2007. Regression is at the firm level.

$$\text{Scaled Employment}_{f_{cit}} = \alpha + \beta_t \text{Firm Similarity}_f \times \mathbf{1}_t + \beta_2 X_f + \gamma_{cit} + \epsilon_{fci}$$

	(1)	(2)	(3)
	Scaled	Scaled	Scaled
	Employment	Employment	Employment
Firm Similarity x 2001	-0.099 (0.077)	-0.149** (0.073)	-0.082 (0.071)
Firm Similarity x 2002	-0.023 (0.052)	-0.056 (0.054)	-0.027 (0.052)
Firm Similarity x 2003	-0.038 (0.053)	-0.021 (0.050)	-0.020 (0.046)
Firm Similarity x 2004	-0.003 (0.057)	0.022 (0.047)	-0.009 (0.056)
Firm Similarity x 2005	0.083** (0.039)	0.062 (0.038)	0.111** (0.044)
Firm Similarity x 2006	0.040 (0.062)	0.004 (0.072)	0.072 (0.058)
Firm Similarity x 2007	0.052 (0.087)	0.177** (0.075)	0.107 (0.089)
Firm Similarity x 2008	0.233** (0.118)	0.363*** (0.092)	0.318*** (0.086)
Firm Similarity x 2009	0.358***	0.332***	0.373***

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Table IA5 – *Continued from previous page*

	(1)	(2)	(3)
	Scaled	Scaled	Scaled
	Employment	Employment	Employment
	(0.129)	(0.106)	(0.102)
Firm Similarity x 2010	0.279** (0.134)	0.259** (0.125)	0.209 (0.128)
Firm Similarity x 2011	0.413*** (0.144)	0.384** (0.156)	0.404*** (0.132)
Firm Similarity x 2012	0.411** (0.186)	0.331** (0.153)	0.367** (0.148)
Firm Similarity x 2013	0.417** (0.184)	0.179 (0.180)	0.341** (0.152)
Firm Similarity x 2014	0.386* (0.200)	0.309 (0.202)	0.266 (0.184)
Firm Similarity x 2015	0.326 (0.228)	0.101 (0.225)	0.080 (0.205)
Firm Similarity x 2016	0.539** (0.213)	0.217 (0.241)	0.151 (0.208)
Observations	303000	303000	303000
Year FE	Y	N	N
County x Industry x Year FE	N	Y	N
County x Year Industry x Year FE	N	N	Y
Firm Controls	N	Y	Y
Weighted	Y	Y	Y
$R^2$	0.047	0.372	0.175