Bank Competition and Information Production

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Abstract

We show that competition adversely affects information production in the banking industry. In particular, we observe that the positive abnormal return associated with the announcement of a bank loan is reduced in US states that deregulate interstate branching. The negative effect of competition on information production is present only for informationally opaque firms (i.e., firms with few tangible assets and bank-dependent borrowers) and for banks that rely more on "soft" information (i.e., small banks). Moreover, we find that charge-off rates on small business loans are higher in deregulated states. Our results suggest that competition decreases loan quality because it reduces banks' incentives to invest in information.

Keywords: asymmetric information; competition; bank deregulation; syndicated loans; stock returns
JEL: G12

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1 Introduction

A common view of financial crises rests on the idea that information production by investors varies over the cycle. In the boom period, lax lending standards lead to an inefficient allocation of credit, increasing the chances of the next crisis (Schularik and Taylor, 2012; Mian et al., 2017; Rodano et al., 2018; Gorton and Ordonez, 2018). This can happen, for example, because asset prices are high and collateral values look "too" good, making investors overconfident (Baron and Xiong, 2017; Bordalo et al., 2018). Lending standards could also deteriote as competition increases following a financial liberalization or innovation (Dell'Ariccia and Marquez, 2006). Regardless of its source of variation, information production by lenders is key to understand the credit cycle. But what determines banks' incentives to invest in information?

Economic theory suggests that banks' have special information production abilities that enable them to mitigate asymmetric information frictions by screening and monitoring (Leland and Pyle, 1977; Diamond, 1991). When a bank forms a relationship with a borrower it gives rise to an ex-post information monopoly that "holds-up" the firm (Sharpe, 1990; Rajan, 1992). This form of market power is crucial to explain bank information advantage in lending. If banks cannot extract rents from their borrowers, they will not invest in screening and monitoring.[1] While the adverse effects of competition on information production and lending relationships are well known in theory (Broecker, 1990; Petersen and Rajan, 1995; Boot and Thakor, 2002), direct empirical evidence is scant. In this paper, we present the first market-based evidence of the effects of competition on the information value of bank loans.[2]

Our proxy for lenders' information production is the cumulative abnormal return on the

[1]For example, a monopolistic creditor is in a better position to extend credit to a young or distressed borrower than a lender in a competitive market because the monopolist is able to extract future rents from the borrower (Petersen and Rajan, 1995). A competitive market may instead diminish the value of lending relationships (Boot and Thakor, 2002). Competition also creates a free riding problem when competitors can observe the loans made by others (Petriconi, 2015). The argument that competition limits information production is true in other fields of economics where investment in knowledge is required. For example, in the case of patents, the ability to extract future surpluses generated by the patent is key for the incentives to innovate. In a competitive environment, firms may then be reluctant to innovate.

[2]Hale and Santos (2009) and Schenone (2010) show that banks price the informational monopoly in their loan terms. However, they do not study directly the impact of competition on the value of bank information production.

borrowing firm's stock around the announcement of a bank loan (James, 1987). Using data on syndicated loans from DealScan between 1993 and 2006, we then show that the exogenous increase in *interstate* bank competition following the 1994 deregulation of the U.S. banking sector[3] has eroded the positive information value associated with bank loans. Our baseline estimates show that the cumulative abnormal return after obtaining a loan (0.4% on average in the period 1993-2006) is driven to zero for firms headquartered in a state that opens up to competition. The results are remarkably similar when we compare the loan announcement returns for the *same* firm across time: as the state in which the firm is headquartered opens up to competition, the abnormal returns of future loans obtained by the same firm decline. This is a powerful test of our key hypothesis that indeed bank competition leads to information depletion.[4]

We then test whether the effect of competition varies in the cross-section of information sensitivity by borrowers and lenders. First, theory predicts that informationally opaque borrowers benefit more from lending relationships (Diamond, 1991; Rajan, 1992), as banks can overcome the high degree of asymmetric information. We find that the removal of restrictions to banking competition only affects the stock return of firms that operate in sectors with few tangible assets and of firms that are bank-dependent, i.e. small firms and those with no access to the bond market. Second, small banks are typically considered superior in acquiring "soft" information compared to large banks (Berger et al., 2005, 2017). Consistent with this hypothesis, we find that only the abnormal returns for the loans made by small banks are negatively affected by competition.

[3]While the passage of the Interstate Banking and Branching Efficiency Act (IBBEA) in 1994 was supposed to be the culmination of the branching deregulation that started in the 1970s and 1980s (Jayaratne and Strahan, 1996; Kroszner and Strahan, 1999), US states kept the right to erect barriers to the entry of out-of-state banks, and partially lifted these barriers over the following years in a staggered way. Rice and Strahan (2010) construct a time-varying index to measure these state-level differences in regulation.

[4]It is unlikely that an unobserved factor, such as firm investment opportunities, is driving both our results on stock returns and the deregulation index. First, the coefficient on interstate branching is very stable across specifications, even including firm and industry-time fixed-effects, indicating that deregulation is not correlated with unobserved firm heterogeneity. Moreover, if deregulation positively affected firm investment opportunities, one would expect the abnormal returns to increase following deregulation, whereas we find the opposite.

Finally, we show that the reduction in information production due to increased competition has real effects on ex-post loan performance. Using loan-level data from the Small Business Administration (SBA) (Brown and Earle, 2017; Granja et al., 2019) which contain information on defaults (i.e. charge-offs) for the SBA government guaranteed loans, we find that loans originated in states that deregulate are more likely to be charged off and have higher charge-off rates relative to loans originated in other states, even after controlling for industry-time fixed-effects. This suggests that indeed competition decreases the quality of loans by reducing banks' incentives to screen and monitor.

This paper is related to several different strands of the literature. In a seminal paper James (1987) argues that bank lending is "special" because borrowers experience a positive abnormal stock return following the announcement of a bank loan agreement, whereas there is a non-positive or even negative abnormal returns associated with announcements of private placements or public debt offerings.[5] This evidence is consistent with the idea that banks have an informational advantage over financial markets in reducing asymmetric information and monitoring ex–post performance (Diamond, 1991; Boot, 2000; Ongena and Smith, 2000). More recently, Schwert (2019) finds that, after accounting for their higher seniority, bank loans earn a substantial premium over bonds, indicating that they have some special quality for the borrowing firms. We contribute to this literature by confirming the positive loan abnormal return pattern initially documented by James (1987), persists even 20 years later, albeit it is smaller in magnitude.[6]

Empirically, Ioannidou and Ongena (2010) test the predictions in Sharpe (1990) and von Thadden (2004) that the bank informational monopoly has adverse consequences on the

[5]The latter result is also found in Eckbo (1986). Lummer and McConnell (1989) further expand on James (1987) by showing that announcements of bank loan renewals, as opposed to new loans, are responsible for the positive stock response. This suggests that the bank–borrower relationship has a positive effect on firm's value by reducing asymmetric information over time.

[6]We find an average cumulative abnormal return of 0.25-0.4% in a three or five day period around the event date. James (1987) finds a 1.93% two-day cumulative return in the period 1974-1983. The average decline in the loan abnormal returns in the 1990-2000s period is also discussed in Fields et al. (2006). Similar to our findings, they document a 2-day cumulative abnormal return of about 0.5% in 1990-1999 and 0.13% in 2000-2003.

allocation and cost of capital. Similarly, Hale and Santos (2009) and Schenone (2010) find that when a firm goes for a bond or stock IPO, banks' informational rents decrease. Saidi and Zaldokas (2019) show that patent disclosure induces firms to switch banks, indicating that private information in banking relationships drops with the release of public information. Differently from these papers, we directly test the role of market power in explaining banks' information advantage, exploiting an exogenous shock to bank competition.

An extensive literature has analyzed the impact of interstate branching deregulation on various outcomes, such as: state-level GDP growth (Jayaratne and Strahan, 1996), trade flows (Michalski and Ors, 2012), firm innovation and the mobility of skilled workers (Amore et al., 2013; Chava et al., 2013; Cornaggia et al., 2013; Hombert and Matray, 2017), house prices (Favara and Imbs, 2015; Landier et al., 2017), income distribution and access to finance (Beck et al., 2010; Célérier and Matray, 2018), among others. This is the first paper that studies the effect of competition on the core function of banks, i.e. information production about prospective borrowers, using a market-based measure of information.

Finally, our results speak to the debate on the cost and benefits of competition in financial markets. A large theoretical literature has examined the effect of competition on banks' franchise values and risk-taking (Keeley, 1990; Boyd and De Nicoló, 2005; Martinez-Miera and Repullo, 2010). Recent work on asymmetric information and imperfect competition highlights the potential downside of competition, as it exacerbates adverse selection (Crawford et al., 2018) and decreases welfare (Lester et al., 2019). Closely related to our work, Gissler et al. (2019) show that competition in the consumer credit market leads to an expansion of credit to riskier borrowers at the extensive margin, resulting in higher default rates.[7] We show that competition can have additional adverse effects on asymmetric information because it lowers banks' incentives to screen and monitor.

The paper is organized as follows. Section 2 describes the data and the calculation of

[7]In their paper, the increase in risk-taking is driven primarily by non-banks (credit unions), that start competing with banks for consumer loans (i.e. car loans) after a change in regulation. Thus, consistent with our evidence, an increase in competition from non-banks leads to lower credit quality among non-banks.

the cumulative abnormal returns. Section 3 presents the results of the baseline specification relating bank competition and the loan abnormal return, while section 4 tests for heterogeneity of the effect at the firm and bank level. Section 5 investigates whether loan quality has decreased as a result of deregulation by examining loan-level charge-off rates. Finally, Section 6 concludes.

2 Data

2.1 Banking Deregulation

The US has a long history of imposing restrictions on banks' ability to expand geographically, dating back to colonial times (Kroszner and Strahan, 2014). US states collected fees from granting charters only to the banks headquartered within-state and so they had no incentives to foster competition from out-of-state banks. Before 1970, most states restricted *intrastate* branching, i.e. the ability to expand geographically within state borders, and all states forbade *interstate* branching, i.e. branches could not be owned directly by out-of-state banks.[8]

Between 1970 and 1994, US states began to gradually lift these restrictions, in a staggered manner (Kroszner and Strahan, 1999; Jayaratne and Strahan, 1996). Maine was the first to permit out-of-state banks to acquire in-state banks, with reciprocity, in 1978. It was followed by New York and the majority of other states after 1982. By the end of 1994, all states allowed intrastate branching and most allowed interstate branching, at least in principle. The formalization of the process at the national level happened in 1994, when Congress approved the IBBEA, the federal act that permitted banks to operate across state lines without any formal authorization from the target state.

In practice though, interstate branching was still restricted even after 1994. The IBBEA, in fact, allowed individual states to erect barriers to prevent the entry from out-of-state banks.

[8]Before 1970, bank holding companies could expand within state borders by setting up different bank subsidiaries, but had to operate them separately. This severely limited the ability of banks to grow. For example, this meant that deposits could not be integrated in a single network and each subsidiary had to meet its own capital requirements (Kroszner and Strahan, 1999).

In particular, states were permitted to use any number of the following four restrictions: i) mandating age restrictions on in-state banks that could be purchased (with a limit of no more than 5 years); ii) limiting the amount of deposits any new interstate merged bank could have in-state (up to 30%); iii) not allowing *de novo* interstate branching and iv) not allowing the purchase of individual branches without acquiring the entire bank. These barriers mattered: the market share of deposits from out-of-state banks was only 2.5% in 1994, compared to 46% in 2011 (Keil and Muller, 2019).

Rice and Strahan (2010) create a simple count index of these restrictions in each state and year (from 0 to 4). An increase in the index therefore implies greater competition.[9] The relaxation of the interstate branching restrictions happened in staggered, state-by-state manner like the previous waves of deregulation in the 1980s. Figure 1 shows the histogram of the deregulation changes. There are 55 deregulation episodes for 43 states (8 states never deregulate), of which 33 states deregulate only once, 9 deregulate twice and 1 (Tennessee) deregulates three times. On average, states knock down 1.9 barriers at a time, but the median (and mode) state knocks down only one barrier. Most changes (70%) occur between 1996 and 1998, but in 15 other states, including large states such as Texas, deregulation comes only after 2000.

[INSERT FIGURE 1 HERE]

2.2 Loan announcements

Our primary data source for bank loan announcements is LPC DealScan from 1993 to 2006.[10] One important caveat is that DealScan does not contain the date in which the loan is announced in the popular press, but only the date in which the loan (*PackageID*) was issued.

[9] We reverse the Rice and Strahan (2010) index to allow for an easier interpretation of our results as an increase in competition. Note that all states are considered to be fully restricted (i.e. having a value of 0) before 1993.

[10] We exclude 2007 and 2008 to avoid any financial-crisis induced effects (although in unreported results we find similar results if we include the years of the financial crisis). The last change in branching deregulation from Rice and Strahan (2010) occurs in Illinois in 2005, hence we do not lose any deregulation event by excluding the financial crisis.

For our purposes, we consider the issue date of the loan (*DealActiveDate*) as its announcement date. We start by restricting the sample to US borrowers, excluding those in the financial, real-estate and insurance sector (SIC codes 6000-6700). After applying these filters, we are left with 59323 unique loan tranches (*FacilityID*) that we merge with Compustat using the link file provided by Chava and Roberts (2008). We are able to match 44393 loan tranches to 6742 firms in Compustat.[11] We then obtain stock return data from CRSP using the CRSP-Compustat link file provided by WRDS and we are left with 5621 borrowers with 25274 syndicated loans (*PackageID*). The median firm has about 7 syndicated loans over the period 1993-2006.

We download daily stock return data from CRSP around each loan announcement date. We set an estimation window of 150 days (and require companies to have at least 120 trading days of stock returns to enter the estimation) and a gap of 30 days before the announcement. We then run a Fama-French 3 factor model during the estimation window:

$$ER_{i,t} = \alpha_i + \beta_{m,i} ER_{m,t} + \beta_{SMB,i} SMB_t + \beta_{HML,i} HML_t \tag{1}$$

where $ER_{i,t} = R_{i,t} - R_t^f$ is the excess return of stock i over the risk-free rate, $ER_{m,t}$ is the market excess return and then calculate the abnormal returns as:

$$AR_{i,t} = ER_{i,t} - (\hat{\alpha}_i + \hat{\beta}_{m,i} ER_{m,t} + \hat{\beta}_{SMB,i} SMB_t + \hat{\beta}_{HML,i} HML_t) \tag{2}$$

Finally, we compute the cumulative abnormal return for each announcement $CAR_i = \sum_{\tau_1}^{\tau_2} AR_{i,t}$ by summing the abnormal returns 5 days around the event T ($\tau_1 = T-1, \tau_2 = T+3$).

[INSERT FIGURE 2 HERE]

Our final sample, including the CAR_i for each stock-event, is composed of 17331 loan announcements to 4339 unique firms respectively from 1993 to 2006. Figure 2 plots the

[11] 91% of the 15000 or so unmatched loan tranches are issued by private firms, which means that the link file in Chava and Roberts (2008) covers the majority of pulicly listed firms in DealScan.

average cumulative abnormal returns over a 20 days window around the announcement date. On average, after obtaining a loan, a firm experiences a cumulative abnormal return of about 0.4% in 3 days after the event.[12] These results echo those in James (1987) and Eckbo (1986), albeit for a different sample period.

[INSERT TABLE 1 HERE]

Table 1 provides the summary statistics for the variables used in the empirical estimation. The average CAR_i for 5 days around the event (-1,+3) is around 40 basis points, but there is significant heterogeneity by type of firms, as we will show later. Syndicated deals are large, with on average $369 million per deal, and have an average maturity of 3.75 years.[13] Most deals (53%) are used for general corporate purpose, with repayment of existing debt (21%) or acquisition/takeover (13%) being the two-next most represented category. Because syndicated deals are large, the firms in our matched sample are on average older (21 years old), have a higher market capitalization ($4.4 billion) and have higher book leverage (30% of assets) than the average publicly listed firm in Compustat over the same period.[14] Matching the sample of firms in Dealscan to Mergent FISD we obtain about 1287 firms, representing 45% of the deals in the sample, that have also issued a bond during the sample period ($Bond_Issuer = 1$) and 1660 firms, representing 51% of the deals, have a long-term S&P rating ($Bond_Rating = 1$). Finally, 3657 firms, representing 62% of the sample of loans, are small-cap firms, i.e. those a total market capitalization below the 50^{th} percentile of market capitalization in the NYSE (Fama and French, 1992). Not having access to the bond market or being a small-cap firm is a commonly used measure of bank-dependent borrowers (Chava and Purnanandam, 2011; Schwert, 2018).

[12] The CAR on loan announcements slowly decreases to 0 in about 30 days after the event. The decrease in the cumulative abnormal return is consistent with the long-run decline in stock prices following a loan announcement documented in Billet et al. (2006).

[13] $Deal\_Maturity$ is a weighted average of maturities across loan tranches within the same deal, with the weights equal to the share of the loan tranche out of the deal total. For example, if a deal is structured as a 1-year revolving credit line facility for $150 million and a 5-year term loan for $200 million years, $Deal\_Maturity$ is equal to 3.28 years.

[14] The same figures for 18001 publicly listed firms on Compustat from 1993 to 2006 are: 12 years old, $2 billion in market capitalization and 21% in book leverage.

We obtain balance sheet information on the lead arrangers using the DealScan lender-Compustat link file provided by Schwert (2018). The link file matches DealScan lender names with Compustat *gvkey*s for all lenders with at least 50 loans or at least $10 billion in loan volume in the DealScan-Compustat sample. The link file also aggregates the lenders in DealScan at the parent bank holding company level, keeping track of mergers and acquisition. Most of the lenders in the DealScan sample are subsidiaries of large bank holding companies, hence the lead arrangers (consolidated at the parent holding company) are very large financial companies ($422 billion in total assets on average).

3 Information Production and Competition

3.1 Baseline specification

According to theory, banks are informed lenders that are able to screen and monitor borrowers better than outside, arm's-length financial markets (Diamond, 1991; Rajan, 1992). When a bank makes a private loan to a firm, it acquires information that others cannot observe. A consequence of this asymmetric evolution of information is the potential creation of ex-post monopoly power (Sharpe, 1990; von Thadden, 2004). Hence, banks' advantage in information acquisition rests on their ability to extract monopoly rents from their borrowers. If banks face competition from other lenders, especially from other banks, the information monopoly rents will be lower and banks will invest less in screening and borrowing to start with. Thus, we expect that in areas where banks face more competition, the value of bank loans, as measured by the abnormal return following a loan announcement, should be lower. By examining the different level of bank competition induced by the interstate branching deregulation across states in the US, we find that this is indeed the case.

[INSERT FIGURE 3 HERE]

Figure 3 shows the correlation between the average CAR and the average deregulation

index by Rice and Strahan (2010) at the state level between 1993 and 2006. There is a negative relationship between the abnormal return and the deregulation index: in more competitive states (i.e. a higher value of the index), the abnormal return is lower. The simple regression line has a slope coefficient (t-stat) of -0.19 (-2.88), with an R^2 of 0.13, suggesting that moving from a state with most restrictive (RS Index=0) to least restrictive regulation (RS Index=4) would decrease the average cumulative abnormal return by almost 0.8% ($4 \times 0.19 = 0.76\%$). While admittedly the correlation in the cross-section at the state level is not well identified empirically, it is useful to verify that the results carry over to aggregate data. Interestingly, the aggregate effect is remarkably close to the coefficient we estimate with the more granular data at the loan level below, where we exploit the different timing of the deregulation at state level for the same firm. This suggests that the key cross-sectional differences in the level of the cumulative abnormal returns in our data are indeed driven by the deregulation episodes at the state level.

More formally, we estimate the following specification:

$$CAR_{ifst} = \beta_1 \text{RS Index}_{st} + \gamma' X_{ift-1} + \lambda_s + \lambda_t + \epsilon_{ifst} \tag{3}$$

where CAR_{ifst} is the 5-day (-1,3) cumulative abnormal return for loan announcement i by firm f headquartered in state s in year t. RS Index_{st} is the deregulation index in state s in year t. X_{ift-1} is a vector of deal-specific and lagged firm-specific variables. λ_s and λ_t are state and time fixed-effects, respectively. Controlling for these fixed-effects, the coefficient on the branching restriction index is generated by within-state variation over time. Finally, standard errors are clustered at the state level, given that our variable of interest, RS Index_{st}, varies at that level (Bertrand et al., 2004).[15]

In our preferred set of estimates, we also include a 2-digit industry-year and firm fixed-

[15]Residuals could also be clustered across states and by year, in which case a two-way clustering by state and by year is more appropriate. In robustness tests we use two-way clustering by state and by year, a procedure which yields even lower standard errors. Clustering at firm level makes little difference too. See Table A1 in the Appendix.

effects, exploiting the fact that we observe the same firm obtaining different syndicated loans over the period 1993-2006 (the median firm has about 7 deals). Conditioning on these fixed effects is a powerful test of our key hypothesis: the same firm, facing the same industry-time shock, experiences different abnormal returns depending on how the level of competition in the state varies over time. These types of fixed-effects are also helpful in ruling out any alternative risk-based explanation, such as the fact that firms obtaining a loan would be riskier in some unobservable way than those issuing a bond, and hence carry a risk-premium following a loan announcement.

3.2 Baseline results

[INSERT TABLE 2 HERE]

Table 2 reports our benchmark results. Across all specifications, the key coefficient of interest on the deregulation index is about -0.17, indicating that in a state that is fully opened interstate branching (RS Index=4) the cumulative abnormal return is about 0.68 (0.17×4) percentage points lower than in a state that fully restricts interstate branching (RS Index=0). Compared to the average CAR of 0.4%, this means that fully opening up to competition more than eliminates the positive loan announcement returns. Importantly, going from the combination of state and time fixed-effects in column (1) to industry-time and firm fixed-effects in column (3) has barely any effect on the coefficient on RS Index, suggesting that the the deregulation is not correlated with firm unobservable characteristics or industry-specific shocks.

Among the set of controls, we find that, on average, larger deals and deals used to takeover another company have a higher abnormal return.[16] Moreover, deals obtained by smaller and presumably more bank-dependent firms have a higher abnormal return.

[16]Interestingly, if we did not control for the borrower market capitalization, the coefficient on the deal amount would *not* be significant. This suggests that a loan which is large relative to the size of the firm, not a large loan per se, is perceived as good news by the market.

3.3 Alternative measure of deregulation

The deregulation index is constructed as the sum of the barriers that are removed in a state in a given year. However, one could think that what matters to increase competition is whether the state deregulates, rather than the combination of individual barriers that are removed. In Table 3, columns (1)-(3), we re-estimate the baseline specification replacing the RS Index with a dummy $Dereg_{st}$ equal to one after the states deregulate (i.e, when the RS Index is positive) and zero before. The coefficient in all specifications is around -0.5: this indicates that, when a states deregulate, the average CAR after a loan announcement, which is about 0.4%, is driven down to zero. That is, competition completely eliminates banks incentives to invest in information production.

[INSERT TABLE 3 HERE]

3.4 Identification: Interstate branching and Syndicated Loans

A potential concern with the above estimates is that (i) an unobserved factor, such as firm investment opportunities, is affecting both the deregulation and the abnormal returns or (ii) deregulation is affecting stock returns through alternative channels other than the increase in competition. We find that this is unlikely to be the case. First of all, we note that if the deregulation improved firm investment opportunities, the abnormal return should be higher, not lower, as we find. Second, the coefficient on the RS Index remains stable when we introduce industry-time and firm specific fixed-effects, indicating that unobserved factors at this granular level are not driving our results. Finally, the interstate deregulation, as opposed to the intrastate deregulation, has been shown not to affect the overall level of economic activity (Célérier and Matray, 2018).[17] The interstate deregulation affected the supply of,

[17]This might be surprising in light of previous evidence that branching deregulation spurred economic growth (Jayaratne and Strahan, 1996). But those deregulation events (1977-1992) precede those analyzed here (1994-2006), and represent the first deregulation of regulatory constraints dating back to colonial times, thus they are likely to have had the highest impact on real activity once they were removed. Also, while the literature (Kroszner and Strahan, 1999) has shown that the strength of interest groups in the state can explain the first deregulation wave, the evidence for the interstate branching in the period 1993-2006 is not as

but not demand for, small business lending (Rice and Strahan, 2010) and mortgage lending (Favara and Imbs, 2015). We do not find evidence consistent with an increase in credit supply for syndicated loans, as neither rates decrease nor quantities increase following deregulation (Table A3 in the Appendix).

Another concern is whether interstate branching can be considered as the relevant shock to competition in the market for syndicated loans. After all, these are large loans and they are not issued at the branch level. However, we find that interstate deregulation did affect the composition of lead arrangers over time. For example, before deregulation occurred in Texas in 2000, three of the top ten lead arrangers in the state were local banks. After deregulation, banks from Texas are no longer present, as they are acquired by large, out-of-state banks. More generally, we find that the average fraction of deals syndicated by in-state lead arrangers decreases from 29% in 1993 to 9.6% in 2006. Thus, interstate branching deregulation allowed large banks to grow larger and enter into new markets. The entry of large, out-of-state banks with potentially different screening technologies could also be affecting the borrower stock returns. We explore this possibility in the section below and we show that it is not driving our main results.

3.5 Lender controls and entry by out-of-state lenders

In Table 4 we include lender (i.e. lead arranger) controls along with borrower and deal controls from Table 2 using the DealScan lender-Compustat link file from Schwert (2018).[18] We do not include lender controls in our baseline specification as the sample size is greatly reduced given the imperfect match with lead arrangers' balance sheet information. There appears to be no systematic correlation between lender characteristics and cumulative abnormal returns on the loan, but, importantly, the effect of bank competition is virtually unchanged.

clear (Rice and Strahan, 2010).

[18]Note that the unit of observation in all empirical specification is an individual loan (*Packageid*). Thus, for loans with more than one lead arranger (18% of the cases), the lender controls are simple averages of the lead arranger characteristics within each loan. We exclude all syndicates with more than three lead arrangers for simplicity (only 0.74% of loans have more than two lead arrangers).

[INSERT TABLE 4 HERE]

Including lender information allows to control for some alternative explanations of our findings. For example, deregulation allows the entry of out-of-state lenders with potentially different information technologies compared to in-state lenders. Out-of-state lenders could be relying more on hard rather than soft information because they are more distant from the borrowers (Granja et al., 2018). Then, it is the use of different lending technologies by new out-of-state lender that causes the decrease in the loan abnormal returns, rather than competition per se.

To control for this alternative hypothesis, in columns 4-6 of Table 4 we include a lender×post fixed-effect, i.e. an indicator variable for each lender (or combinations of lenders if there is more than one lead arranger in the syndicate) both before and after the deregulation. In this case, we are controlling for the average screening ability of each syndicate and whether this changes together with the deregulation events. Moreover, in columns 7-9 we further restrict the sample to borrowers who borrowed from out-of-state lenders both before and after the deregulation. In all cases, we find that deregulation decreases the value of bank loans. This suggests that the effect of deregulation on the loan abnormal return is due to increased competition, that affects the ex-ante incentives of all lenders to screen borrowers effectively, rather than the entry of new lenders with low ability to overcome asymmetric information.

We further explore whether the effect of competition vary systematically across specific borrower characteristics below.

4 Information Channel

Theory suggests that banks reduce agency costs associated with lending to opaque borrowers by screening and monitoring (Diamond, 1991; Rajan, 1992). Thus, bank loans should be particularly "special" for informationally opaque borrowers, i.e. the abnormal returns following a loan announcement should be higher for opaque firms. Moreover the loan abnormal returns

should *decrease* especially for informationally opaque firms after deregulation, since the incentives to screen opaque borrowers decrease as lenders face more competition. We find both predictions to be true in the data.

We use three different measures of firm opaqueness: the ratio of tangible to total assets of the sector in which the firm operates, the market cap of the firm and whether the firm has access to the bond market. While the first measure is the most directly related to information (i.e. firms with more tangible assets require less screening and have more collateral), the last two (i.e. small firms and those with no access to the bond market) are measures of bank-dependence, that are generally used as proxies for information opaqueness (Schwert, 2018).

[INSERT FIGURE 4 HERE]

First of all, in Figure 4 we document that the average cumulative abnormal return after obtaining a loan is positive and significant only for small-cap firms or those with no bond rating. The average CARs are about 0.6% for bank-dependent borrowers (50% higher than in the baseline), whereas they are close to zero and non significant for large firms or those with bond ratings. This suggests that bank loans are "special" only for bank-dependent firms.

[INSERT TABLE 5 HERE]

Second, we test whether the effect of competition on the abnormal returns varies across firm characteristics. The results on tangibility are presented in Table 5. In column (1) we interact the deregulation index for the ratio of tangible to total assets at the 2-digit sector level in which the firm operates. The interaction term is positive and significant, indicating that in sectors with more tangible assets, where less information screening is necessary, the effect of competition on loan returns is diminished. For example, for a firm operating in a sector with a below the median ratio of tangible to total assets, the effect of deregulation on the loan abnormal returns is negative and significant, similar to the baseline estimate

(column 2), but it is not significant for a firm in a sector with above the median tangible assets (column 3).

[INSERT TABLE 6 HERE]

The results for bank-dependent borrowers are shown in Table 6. In general, we find that only bank dependent borrowers experience a decrease in the abnormal return associated to a loan announcement after an increase in competition. In fact, the effect of competition for small-cap firms is twice as large as in the baseline, while it is virtually zero and non-significant for mid-to-large cap firms. Similarly, firms that never issue bonds throughout the sample period ($Bond\_Issuer = 0$), or firms that do not have a bond rating ($Bond\_Rating = 0$), experience a strong decline in the abnormal return after deregulation. If a state moves from full restrictions to full deregulation, the cumulative abnormal return for firms with no access to the bond market decreases by 1.16-1.77% (vis-a-vis 0.68% effect in the baseline Table 2). However, for firms that do have access to the bond market ($Bond\_Issuer = 1$ or $Bond\_Rating = 1$), there is no effect of competition on the abnormal return at all.

[INSERT TABLE 7 HERE]

Finally, we expect competition to drive down the abnormal return of loans made by "relationship lenders", i.e. banks whose business model relies on building lending relationships and invest more in "soft" information acquisition about their borrowers. Given that empirical measures of whether a bank is a relationship lender and measures of bank screening intensity are not easily observed (Gustafson et al. (2019)), we use bank size as a proxy for soft information acquisition (Berger et al., 2005). The results are presented in Table 7.

As expected, we find that effect of deregulation depends on bank size: in column (1) the baseline effect for a bank with an average level of total assets is negative and significant, but it is reduced by 0.23% (0.045/0.19*0.01) for a 1% increase in total assets. More explicitly, we find a strong negative effect only the abnormal return of the loans made by banks that are not

one of the top10 lead arrangers by assets (columns 4-5). The results thus indicate that only banks that are better able to produce soft information are affected by changes in competition.

5 Loan Quality

So far, we have shown that competition decreases the information content of bank loans by decreasing bank incentives to invest in information production. An additional implication of our hypothesis is that the quality of the loans originated after the deregulation is lower, i.e. ex-post defaults are higher in deregulated states. However, syndicated loans from DealScan do not allow to track the performance of the loan over time. To this end, we exploit the SBA loan-level of government guaranteed loans to small businesses that contains information on ex-post defaults (charge-offs).

The SBA dataset contains a list of all SBA-guaranteed loans under the 7(a) program from 1991 to today. It also contains loan-level information about the identity and address of the borrowers and lenders as well as loan characteristics such as total amount, the amount of SBA's loan guarantee, initial interest rate, approval date, industry of the borrower (NAICS) and, crucially for our purposes, the loan status (cancelled, charged-off or paid-in-full).[19] The dataset also includes information on the charge-off date and on the amount charged-off by the SBA on its loan guarantee when the loan is charged-off by the bank.

Our hypothesis is that charge-off rates for loans originated in a state after deregulation should be higher than in other states. Formally, we run the following regression:

$$ChargeOff_{ifst} = \beta_1 \text{RS Index}_{st} + \gamma' X_{ifst} + \lambda_s + \lambda_t + \epsilon_{ifst} \tag{4}$$

where $ChargeOff_{ifst}$ is either the charge-off rate (i.e. amount charged-off over total loan amount) or a dummy equal to one if loan i originated at time t and taken by borrower f

[19] Following Brown and Earle (2017), we exclude cancelled loans because the cancellation may be initiated by the borrower. We also exclude all borrowers with no industry information, those in the financial industry, real estate and the public administration.

located in state s is eventually charged-off. RS Index$_{st}$ is the deregulation index and X_{ifst} are loan-level characteristics: the SBA guarantee amount, the (log of) the total loan amount and maturity.[20] In the baseline specification we control for state and year fixed-effects (λ_s, λ_t), but the results are robust to including 2digit industry-year fixed-effects.

The results are presented in Table 8. A state that fully opens up to competition has charge-off rates 0.8 (0.2×4) percentage points higher and a probability of being charged off 1.16% (0.29×4) higher. These effects are significant, but not large: compared to the average default rate in the SBA dataset, deregulation implies an increase of about 6%.[21] However, since the government guarantees a large fraction of the loan amount (50-75% for most loans) and, as a consequence, lenders do not screen or monitor these loans much, we expect these estimates to be a lower bound for the effects of competition on information production.

6 Conclusion

A large literature argues that variation in lenders' lending standards are key to understand the boom and bust cycle. We argue that an important determinant of lenders' incentives to produce information is their local market power. In fact, competition decreases the ability to extract future rents from the borrowers and may thus decrease lenders' incentives to screen and monitor. Empirically, we observe that exogenous increases in local bank competition reduce the positive abnormal return of bank loans. The decrease is present only for informationally-opaque borrowers or banks that rely more on soft information. Moreover, we find that default rates increase in areas that open up to competition.

Our findings are informative regarding the cost and benefits of competition in financial markets. They suggest that bank competition, by eliminating banks' opportunity to hold-up the borrower in a relationship, can have adverse effects on asymmetric information.

[20] Given that the SBA dataset does not include any regulatory identifier on banks or small-business, we cannot easily link the SBA dataset to Compustat or Call Reports. Thus we do not include borrower or lender controls.

[21] Defaults on SBA loans are far from being rare events: the unconditional average of charge-off rates and probabilities are 13% and 18%, respectively (compared to less than 1% default rates for Compustat firms).

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Figure 1: Number of Deregulation changes, 1993-2006

This figure contains the histogram of the number of changes in the Rice and Strahan (2010) deregulation index at the state level between 1993 and 2006.

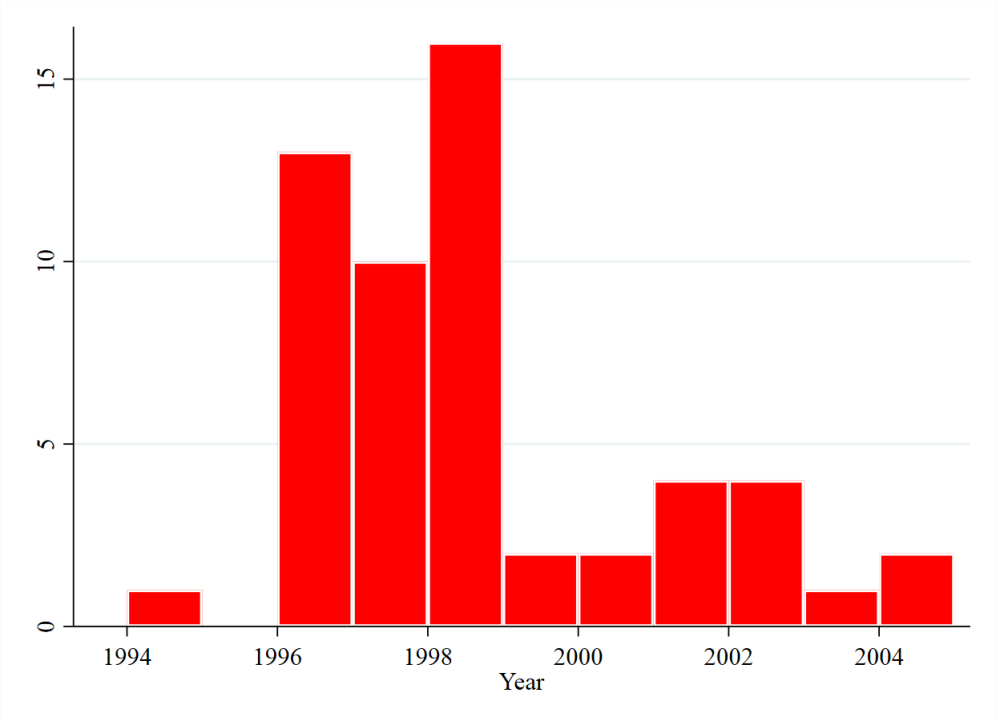


Figure 2: CAR, event window: [-10,+10]

This figure plots the evolution of the average cumulative abnormal returns for a 20-days window around the loan announcement date.

Figure 3: Average CAR and Rice and Strahan (2010) index at state level, 1993-2006

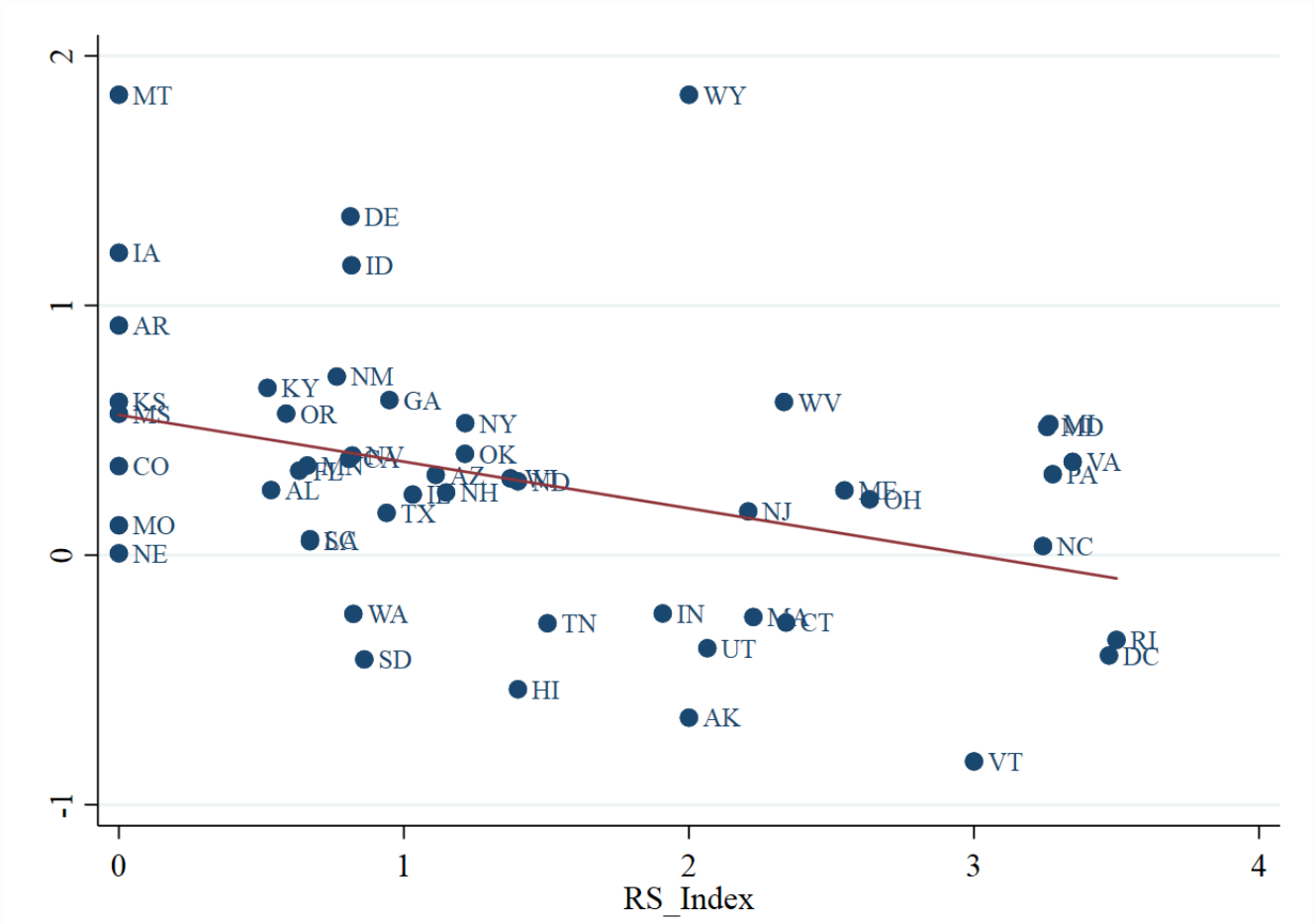
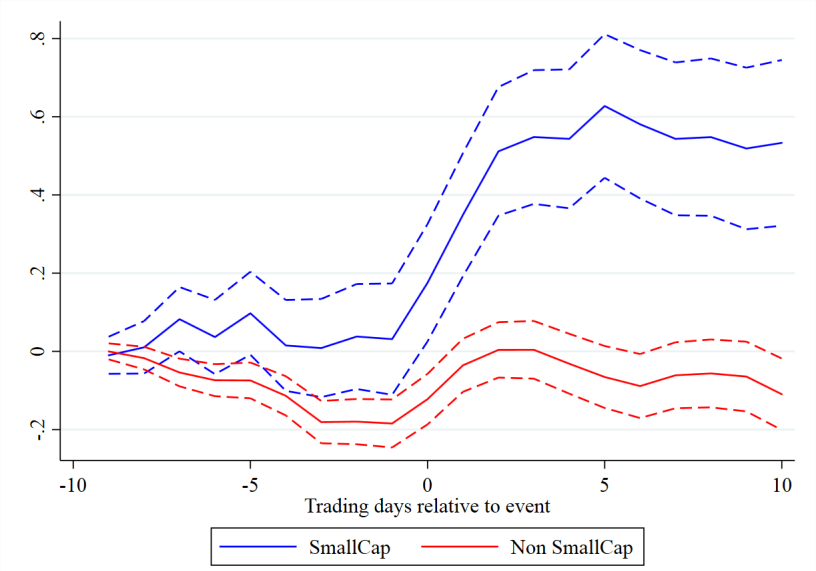


Figure 4: CAR firm heterogeneity

This figure plots the evolution of the average cumulative abnormal returns for a 20-days window around the loan announcement date for bank-dependent firms. Panel (a) splits the sample into small-cap firms, defined as those with market capitalization below the NYSE breakpoints (blue line) and all other firms (red line). Panel (b) splits the sample into firms without a bond rating (blue line) and those with a bond rating (red line)

(a) Small vs Large



(b) No Bond Rating vs Bond Rating

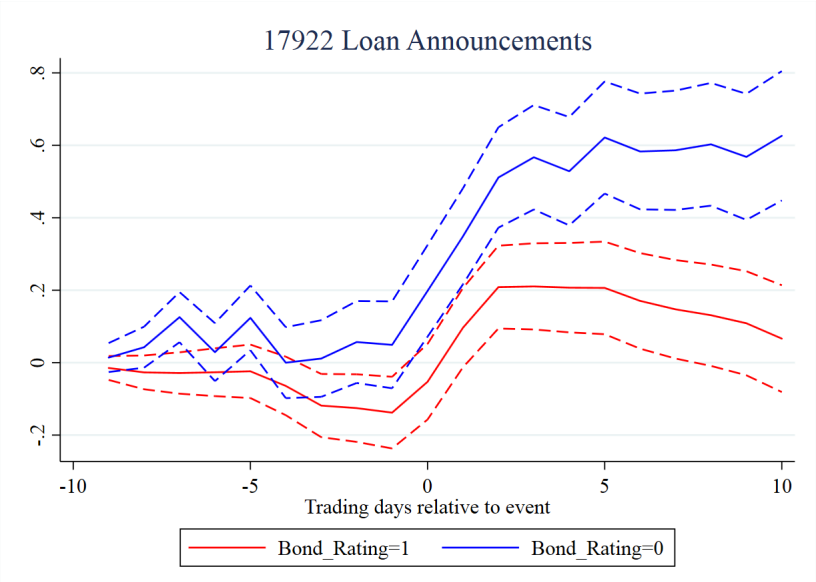


Table 1: **Summary Statistics**

This table presents summary statistics for 17331 loan announcements to 4339 Compustat firms by 90 lead arrangers (parent bank level) from 1993 to 2006. The definitions of firm controls are the following: *age* is years since the first filing date with the SEC (first year in Compustat); $MktVal$ is the stock price × common shares outstanding in million, $prcc\_f \times csho$; $BookLeverage$ is total debt/total assets, $(dlc + dltt)/at$; $Tangibility$ is net property, plant and equipment/total assets, $ppent/at$; $Profitability$ is operating income before depreciation/total assets, $oibdp/at$; $Cash$ is cash holdings and short-term investments/total assets, che/at; $TobinQ$ is market value of equity plus total debt/total assets, $(MktVal + dlc + dltt)/at$; $Bond\_Issuer$ is a dummy equal to 1 if the firm has issued a loan at any point in time during the sample period; $Bond\_Rating$ is a dummy equal to 1 if the borrower has a S&P long-term issuer rating; $Small\_Cap$ is a dummy equal to 1 if the borrower is below the 20^{th} percentile of the NYSE ME breakpoints (Fama and French, 1992).

variable	Obs.	Mean	Std.Dev.	25^{th}	50^{th}	75^{th}
CAR_i	17331	0.408	8.102	-2.963	0.028	3.270
RS_Index	17126	1.454	1.471	0	1	3
Deal Controls						
$Deal\_Amount$ (USD mil.)	17331	369	840	45	138	350
$Deal\_Maturity$ (months)	15746	45.09	29.47	24	38	60
Deal Purpose Indicator:						
Corporate	17331	0.533	0.498	0	1	1
Acquisition	17331	0.136	0.342	0	0	0
Debt Repayment	17331	0.213	0.409	0	0	0
Borrower Controls						
age_t (years)	17290	20.85	16.56	7	14	35
$MktVal_{t-1}$ (USD mil.)	17017	4413	16815	140	584	2347
$BookLeverage_{t-1}$	17033	0.302	0.212	0.154	0.288	0.415
$Tangibility_{t-1}$	17263	0.343	0.240	0.146	0.285	0.518
$Profitability_{t-1}$	17265	0.123	0.138	0.085	0.127	0.174
$Cash_{t-1}$	17314	0.084	0.123	0.012	0.035	0.103
$Tobin\ Q_{t-1}$	17192	1.508	1.640	0.831	1.133	1.704
$Bond\_Issuer$	17331	0.450	0.497	0	0	1
$Bond\_Rating$	17331	0.510	0.499	0	1	1
$Small\_Cap$	17246	0.648	0.484	0	1	1
Lead Arrangers Controls						
$Total\_Assets_{t-1}$ (USD bil.)	13377	422	349	134	281	657
$Tier1\_Ratio_{t-1}$	12252	8.225	1.317	7.58	8.192	8.5
$Cash_{t-1}$	13373	0.117	0.054	0.085	0.116	0.145
$Dep/Assets_{t-1}$	13375	0.553	0.163	0.479	0.578	0.659
$Loan/Assets_{t-1}$	13373	0.487	0.163	0.390	0.517	0.614
% kept by Lead Arranger	5984	43.74	35.15	14.23	28.92	72.66

Table 2: **CAR and Bank Competition**

This table provides estimates for equation (3). The dependent variable is the cumulative abnormal return around the loan announcement date. RS Index is the Rice and Strahan (2010) deregulation index. Deal and borrower controls are defined in Table 1. All borrower controls are one year lagged. Standard errors presented in parentheses are clustered at the state level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
RS Index	-0.171***	-0.186***	-0.174***	-0.167***	-0.183***	-0.172***
	(0.043)	(0.037)	(0.037)	(0.054)	(0.042)	(0.043)
log(Deal Maturity)				0.025	0.079	0.037
				(0.090)	(0.083)	(0.082)
log(Deal Amount)				0.128***	0.115**	0.008
				(0.045)	(0.045)	(0.053)
Purpose: Corporate				0.051	0.031	0.076
				(0.121)	(0.121)	(0.112)
Purpose: Acquisition				0.406**	0.499**	0.472**
				(0.180)	(0.199)	(0.200)
Purpose: Debt Repayment				0.021	0.051	-0.044
				(0.141)	(0.148)	(0.159)
log(1+age)				0.234***	0.226***	0.500
				(0.051)	(0.051)	(0.312)
log(MktVal)				-0.197***	-0.170***	-0.413***
				(0.046)	(0.044)	(0.121)
Tangibility				0.163	0.262	0.194
				(0.219)	(0.358)	(0.673)
Profitability				-0.805	-0.990	-0.280
				(0.780)	(0.802)	(0.990)
Cash				0.560	0.568	0.045
				(0.425)	(0.418)	(1.108)
TobinQ				0.071	0.108**	0.071
				(0.061)	(0.052)	(0.137)
Fixed effects						
State	Yes	Yes	–	Yes	Yes	–
Time	Yes	–	–	Yes	–	–
Industry-Time	No	Yes	Yes	No	Yes	Yes
Firm	No	No	Yes	No	No	Yes
Observations	16854	16819	15649	15079	15039	13831
R^2	0.004	0.051	0.274	0.007	0.056	0.289

Table 3: **CAR and Bank Competition: Alternative Deregulation Measure**

This table provides estimates for equation (3). The dependent variable is the cumulative abnormal return around the loan announcement date. Dereg is a dummy equal to one when the state deregulates (RS Index goes from 0 to positive). Deal and borrower controls are defined in Table 1. All borrower controls are one year lagged. Standard errors presented in parentheses are clustered at the state level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)
Dereg	-0.500***	-0.545***	-0.512***
	(0.143)	(0.130)	(0.161)
Fixed effects			
State	Yes	Yes	–
Time	Yes	–	–
Industry-Time	No	Yes	Yes
Firm	No	No	Yes
Borrower and Deal controls	Yes	Yes	Yes
Observations	15079	15039	13831
R^2	0.007	0.056	0.289

Table 4: **CAR and Bank Competition: Lender Characteristics**

This table provides estimates for equation (3). The dependent variable is the cumulative abnormal return around the loan announcement date. RS Index is the Rice and Strahan (2010) deregulation index. Deal, borrower controls and lender controls are defined in Table 1. Columns 1-3 include the same set of fixed effects as in Table 2, while columns 4-6 add a syndicate-lender× post fixed-effect, where post=1 after deregulation. Out-of-state lenders restricts the sample to borrowers who never borrow from an in-state lead arranger, neither before nor after deregulation. All borrower and lender controls are one year lagged. Standard errors presented in parentheses are clustered at the state level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

							Out-of-State Lenders		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
RS Index	-0.195***	-0.193**	-0.257***	-0.193***	-0.212***	-0.296***	-0.193***	-0.206***	-0.381***
	(0.051)	(0.082)	(0.082)	(0.047)	(0.070)	(0.092)	(0.061)	(0.073)	(0.119)
log(Total Assets)	0.155	0.089	-0.159	0.012	-0.210	-0.632	0.107	-0.034	-0.016
	(0.098)	(0.149)	(0.199)	(0.219)	(0.528)	(0.736)	(0.147)	(0.211)	(0.268)
Tier1 Ratio	-0.048	-0.153**	-0.136	-0.091	-0.269**	-0.221	-0.123	-0.289**	-0.178
	(0.046)	(0.065)	(0.120)	(0.063)	(0.119)	(0.181)	(0.094)	(0.120)	(0.265)
Cash/Assets	1.764	3.567**	-2.766	5.235*	8.238	4.605	0.461	1.385	-4.912
	(1.474)	(1.702)	(2.967)	(2.654)	(5.487)	(6.879)	(2.342)	(2.974)	(4.013)
Deposits/Assets	-1.327	-1.247	-2.633	-2.917	-5.521***	-9.547***	-1.507	-0.299	-3.433**
	(1.046)	(1.348)	(1.782)	(2.036)	(1.647)	(3.058)	(1.345)	(1.455)	(1.689)
Loans/Assets	1.416**	1.546*	0.979	1.799	5.535**	9.209**	0.819	-0.439	0.822
	(0.632)	(0.819)	(1.345)	(1.810)	(2.217)	(4.007)	(0.932)	(1.197)	(1.483)
Fixed effects									
State	Yes	Yes	–	Yes	Yes	–	Yes	Yes	–
Time	Yes	–	–	Yes	–	–	Yes	–	–
Industry-Time	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Firm	No	No	Yes	No	No	Yes	No	No	Yes
Lender-post	No	No	No	Yes	Yes	Yes	No	No	No
Borrower and Deal controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10913	8614	7014	9588	7273	5618	7975	5790	4327
R^2	0.026	0.299	0.564	0.085	0.361	0.643	0.034	0.329	0.616

Table 5: **Firm Opaqueness: Tangibility**

The dependent variable is the cumulative abnormal return around the loan announcement date. RS Index is the Rice and Strahan (2010) deregulation index. TangRatio is the ratio of tangible to total assets (*ppent/at*) at the 2-digit SIC code in which the firm is operating. HighTangRatio is a dummy equal to one if TangRatio is above the median distribution across all sectors (i.e., $\geq$, 0.34). Deal and borrower controls are included but not shown. Standard errors presented in parentheses are clustered at the state level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

		HighTangRatio	
		No	Yes
	(1)	(2)	(3)
RS Index	-0.389***	-0.237***	-0.092
	(0.118)	(0.061)	(0.059)
RS Index × TangRatio	0.590*		
	(0.315)		
Fixed effects			
Industry-Time	Yes	Yes	Yes
Firm	Yes	Yes	Yes
Borrower and Deal controls	Yes	Yes	Yes
Borrower and Deal controls × TangRatio	Yes	–	–
Test of coefficients			
RS Index + RS Index × TangRatio=0.34	-0.183***		
	(0.037)		
Observations	13865	8006	5669
R^2	0.290	0.305	0.286

Table 6: **Firm Opaqueness: Bank-dependent Borrowers**

This table provides estimates for equation (3). The dependent variable is the cumulative abnormal return around the loan announcement date. RS Index is the Rice and Strahan (2010) deregulation index. Deal and borrower controls are included but not shown. Standard errors presented in parentheses are clustered at the state level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	Small Cap		Bond Issuer		Bond Rating	
	No	Yes	Yes	No	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)
RS Index	0.014	-0.347***	-0.105	-0.291***	-0.076	-0.444**
	(0.063)	(0.081)	(0.069)	(0.093)	(0.063)	(0.179)
Fixed effects						
Industry-Time	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Borrower and Deal controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5033	8315	6616	7073	9062	4594
R^2	0.271	0.351	0.263	0.361	0.246	0.408

Table 7: **CAR and Bank Competition: Large vs Small banks**

This table provides estimates for equation (3). The dependent variable is the cumulative abnormal return around the loan announcement date. RS Index is the Rice and Strahan (2010) deregulation index. $log(TotalAssets)$ is the de-meaned log of bank total assets Top10 Bank is a dummy equal to one for the top 10 lead arrangers by total assets. Deal and borrower controls are included but not shown. Standard errors presented in parentheses are clustered at the state level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

				Top10 Bank	
				No	Yes
RS Index	-0.197***	-0.197**	-0.272***	-0.705**	-0.008
	(0.052)	(0.085)	(0.086)	(0.299)	(0.141)
RS Index $\times log(TotalAssets)$	0.045*	0.093**	0.081		
	(0.025)	(0.043)	(0.076)		
Fixed effects					
State	Yes	Yes	–	–	–
Time	Yes	–	–	–	–
Industry-Time	No	Yes	Yes	Yes	Yes
Firm	No	No	Yes	Yes	Yes
Borrower and Deal controls	Yes	Yes	Yes	Yes	Yes
Observations	10913	8614	7014	1246	3019
R^2	0.026	0.300	0.564	0.757	0.624

Table 8: **Loan Quality: SBA Loans**

The dependent variable is the charge-off rate (amount charged off over loan total in %) in columns (1)-(2) and the default probability (=100% when loan is charged-off) in columns (3)-(4). SBA Guarantee is the share of the loan guarantee by the SBA, Log(Loan Amount) and Log(Maturity) are the log of loan amount (gross approval amount) and the maturity (in years). Standard errors presented in parentheses are clustered at the borrower level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	ChargeOff/Total, %		Default=100%	
RS Index	0.185***	0.202***	0.273***	0.298***
	(0.058)	(0.058)	(0.079)	(0.079)
SBA Guarantee	0.145***	0.131***	0.288***	0.265***
	(0.003)	(0.003)	(0.005)	(0.005)
Log(Loan Amount)	1.377***	1.444***	3.668***	3.781***
	(0.041)	(0.041)	(0.056)	(0.056)
Log(Maturity)	-16.319***	-16.627***	-25.056***	-25.566***
	(0.080)	(0.079)	(0.116)	(0.113)
Fixed effects				
Year FE	Y	-	Y	-
State FE	Y	Y	Y	Y
Industry-Year FE		Y		Y
Observations	488312	488307	488312	488307
R^2	0.195	0.203	0.223	0.233

Appendix

Table A1: **CAR and Bank Competition: Alternative Clustering of Standard Errors**

This table provides estimates for equation (3). The dependent variable is the cumulative abnormal return around the loan announcement date. RS Index is the Rice and Strahan (2010) deregulation index. Deal and borrower controls are defined in Table 1 All borrower controls are one year lagged. Standard errors presented in parentheses are clustered at the state and year level in columns (1)-(3) and at firm level in columns (4)-(6). *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	State and Year			Firm		
RS Index	-0.167**	-0.183***	-0.172**	-0.167***	-0.183***	-0.172***
	(0.068)	(0.039)	(0.065)	(0.051)	(0.054)	(0.062)
Fixed effects						
State	Yes	Yes	–	Yes	Yes	–
Time	Yes	–	–	Yes	–	–
Industry-Time	No	Yes	Yes	No	Yes	Yes
Firm	No	No	Yes	No	No	Yes
Borrower and Deal controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15079	15039	13831	15079	15039	13831
R^2	0.007	0.056	0.289	0.007	0.056	0.289

Table A2: **CAR and Bank Competition: WLS by Deals in the State**

This table provides estimates for equation (3) weighted by the number of syndicated loans in each state. The dependent variable is the cumulative abnormal return around the loan announcement date. RS Index is the Rice and Strahan (2010) deregulation index. Deal and borrower controls are defined in Table 1. All borrower controls are one year lagged. Standard errors presented in parentheses are clustered at the state level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

RS Index	-0.162***	-0.196***	-0.211***	-0.145**	-0.183***	-0.199***
	(0.047)	(0.048)	(0.030)	(0.069)	(0.050)	(0.029)
Fixed effects						
State	Yes	Yes	–	Yes	Yes	–
Time	Yes	–	–	Yes	–	–
Industry-Time	No	Yes	Yes	No	Yes	Yes
Firm	No	No	Yes	No	No	Yes
Observations	16854	16819	15649	15079	15039	13831
R^2	0.002	0.058	0.279	0.007	0.069	0.296

Table A3: **Interstate Branching and Credit supply**

The dependent variable is the log of the all-in-drawn spread in columns (1-3) and the log of the deal amount in columns (4-6). RS Index is the Rice and Strahan (2010) deregulation index. Deal and borrower controls are defined in Table 1 All borrower controls are one year lagged. Standard errors presented in parentheses are clustered at the state level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

RS Index	0.018***	0.008	-0.003	0.010	0.021	-0.015
	(0.006)	(0.007)	(0.011)	(0.012)	(0.014)	(0.019)
Fixed effects						
State	Yes	Yes	–	Yes	Yes	–
Time	Yes	–	–	Yes	–	–
Industry-Time	No	Yes	Yes	No	Yes	Yes
Firm	No	No	Yes	No	No	Yes
Borrower and Deal controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13354	10851	9055	14604	12150	10431
R^2	0.558	0.690	0.862	0.680	0.772	0.871