Market Contestability and Payout Policy

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Abstract

We analyze the impact of market contestability on payout policy by exploiting plausibly exogenous changes in interstate geographical restrictions on branch expansion of financial institutions. Leveraging branch-level data on bank deposits enables us to capture the exposure of each bank to state-level branching restrictions. We provide evidence of a negative impact of branching restrictions on payout ratios, which occurs only for banks with a low degree of market power, suggesting that competition is indeed driving our results. We test two potential channels: a "charter-value" channel, which predicts that contestability decreases charter values and leads to risk-shifting; and a "signaling" channel, which predicts that managers increase payout ratios to signal to the market that they do not expect a long-term decrease in profitability as a result of heightened market contestability. We do not find robust evidence that high-risk banks raise payout ratios more than low-risk banks when market contestability increases. Rather, we find support for the signaling hypothesis, in that market contestability boosts the probability of dividend increases, while share repurchases, which lack an ongoing commitment, do not increase. Moreover, the price reaction to dividend cuts is statistically significant only when market contestability is high, and unlisted banks (which cannot be punished by the stock market) do not react to changes in market contestability.

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1. Introduction

Recent papers have examined the nexus between competition and dividend policy (Hoberg, Phillips, and Prabhala, 2014; Grullon, Larkin, and Michaely, 2019; Valta, 2012). These studies usually employ measures of competition at the industry level based on market structure. For example, Valta (2012) employs the Herfindahl-Hirschman Index (HHI), which finds a theoretical justification in the so-called Structure-Conduct-Performance (SCP) paradigm (Bain, 1956). The SCP posits that competition is inversely related to concentration, and firms in more concentrated markets are able to obtain higher profits because of market power. According to the SCP, therefore, market structure is the only determinant of competition. An alternative measure of market power is Lerner's (1934) index, recently employed by Grullon, Larking, and Michaely (2019) to estimate the impact of product-market competition on payout policy.

However, measuring precisely the impact of competition poses two challenges: first, competition is hard to measure, because of the dearth of data at the market-level for multi-market firms; second, it is hard to establish causality between competition and dividend policy, because of the potential impact of omitted variables that may be correlated with competition.

In this paper, we borrow from the theory of contestable markets (Baumol, Panzar, and Willig, 1982) to elicit the impact of an increase in competition on payout policy. Empirical evidence on this new theory suggests that indicators of competition based solely on market structure do not capture the fact that the threat of new entrants is a key driver of firm conduct (Claessens and Laeven, 2004).

Consistent with recent literature on the impact of competition (Chu, 2018; Nguyen, Hagendorff, and Eshraghi, 2018), we exploit bank-level variation in competitive pressure due to staggered state-level regulatory reforms that followed the enactment of the Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) to estimate the effect of market contestability on payout policy. We argue that the IBBEA generated shocks exogenous to banks' dividend policy, because the main objective of the IBBEA was to improve consumers' welfare (Medley, 2013). For example, Richard Kovacevich, chief executive of Minneapolis-based Norwest Corp., stated that the purpose of the regulation was to allow "to serve our customers wherever they are, wherever they want to be, and doing it faster, better and at a lower cost" (Cobb, Dahl, and Fettig, 1995).[1]

We combine data for the Branch Restriction Index (BRI, Rice and Strahan, 2010) and branch-level data on deposits to construct a bank-level BRI which enables us to capture the causal impact of competition on payout policy. Rice and Strahan (2010) construct the BRI on the basis of deregulation events at the state level. To the best of our knowledge, while there may be similar exogenous changes in competition in non-financial industries, branch-level or establishment-level data is not easy to obtain, rendering our setup uniquely suited to address this econometric challenge. Our main finding is that the exogenous increase in market contestability caused by the IBBEA boosts banks' payout ratios.

This finding can be explained by a "charter value" (also named "franchise value" in the banking literature) channel and/or a "signaling" hypothesis. The former may operate as follows: when the threat of new entrants becomes stronger, banks' charter values decrease, and this can lead to an incentive to reduce bank capital (Keeley, 1990) and increase bank risk-taking (Bushman, Hendricks, and Williams, 2016). Since market contestability depresses charter values, this prediction is consistent with the theoretical model by Acharya, Le, and Shin (2017) which highlights that when charter value is below a critical threshold, shareholders benefit from dividend payments that shift default risk to creditors. This prediction is also consistent with the

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[1] Interstate branching is generally considered a more cost-effective route than interstate banking to pursue geographic expansion, particularly for small banks (Aguirregabiria, Clark, and Wang, 2016). For instance, significantly lower costs are involved when an out-of-state branch is purchased or created compared with the acquisition of a whole out-of-state operating bank. However, the IBBEA had a heterogeneous effect across the US since it allowed states to erect barriers against the expansion of out-of-state banks through branching activities. States could even opt-out from the act.

arguments provided by Berger, El Ghoul, Guedhami, and Raluca (2018), who find that the IBBEA led to a decrease in banks' charter values and a higher cost of equity. While there are already theoretical and empirical contributions on the impact of charter value on bank dividend policy (Onali, 2014 and Acharya, Le, and Shin, 2017), there is currently no evidence on the impact of an increase in market contestability on dividend policy.

The signaling hypothesis predicts that an increase in market contestability because of the IBBEA might encourage listed banks to increase payout ratios: as competitive pressure increases, managers might attempt to convince investors that their bank is able to withstand competition from banks in other states by increasing payout ratios. In other words, increasing payout ratios can be a way to signal to the market that bank managers do not expect a long-term decrease in profitability as a result of increased competition from new entrants from other states.[2]

Importantly, the main prediction of the signaling hypothesis is the same as the charter value hypothesis: payout ratios should increase in periods when market contestability increases. To disentangle the impact of low charter values from that of signaling, we test which hypothesis is most likely supported by our data in several ways. First of all, if the charter value hypothesis is valid, the correlation between market contestability and payout ratios should hold even for unlisted banks. On the other hand, if it holds only for listed banks but not for unlisted banks, it is likely that the signaling hypothesis is valid and the charter value hypothesis is not.

Second, as pointed out by Floyd, Li, and Skinner (2015), share repurchases do not entail an ongoing commitment, and therefore the signaling hypothesis predicts that market contestability should increase payout ratios based on cash dividends, but not share repurchase ratios (for example, the ratio of share repurchases to total assets). If the charter value hypothesis is valid,

[2] Similarly, banks might signal "safer" profits, as in Michaely, Rossi, and Weber (2018).

however, even share repurchase ratios should increase, because both cash dividends and share repurchases shift risk from shareholders to creditors.

Third, we test whether the degree of interstate restrictions on branching activities affects the price reaction to dividend announcements and the probability of an increase in dividends. If the signaling hypothesis is correct, the price reaction should be stronger in a period of high market contestability. Finally, we test if default risk, credit risk, or systematic risk affects the impact of market contestability on bank payout ratios, to understand whether the channel through which competition affects payout policy is related to risk-shifting incentives driven by a drop in charter values.

We provide evidence of a negative relationship between the BRI (which is negatively correlated with market contestability) and six proxies of dividend payout ratios and total payout ratios (which consider both dividends and share repurchases), suggesting that an increase in market contestability leads to higher payout ratios. This result is robust to different econometric methodologies and different types of fixed effects.

Our findings suggest that risk does not have a consistent effect on the relationship between market contestability and bank payout ratios, while we find support for the signaling hypothesis. First, we show that the increase in the payout ratios occurs only for listed banks, but not for unlisted banks, consistent with the signaling hypothesis, but contrary to the view that the increase in payout ratios is due to risk-shifting motives as a result of a drop in charter values. Second, we show that the banks that tend to increase dividend payout ratios as a result of changes in the BRI are those that are in more competitive environments, while share repurchases do not increase as markets become more contestable. Finally, banks that avoid dividend cuts in periods of high market contestability are rewarded by a significant increase in stock prices.

We run a battery of tests to identify the channel through which the IBBEA affects the payout ratios of U.S. banks. We employ the Lerner index, the bank-level HHI, and the Boone indicator (which are negatively correlated with competition) to split our sample into two sub-samples: one with low values and one with high values of the variables considered. In addition, banks with a lower profitability tend to react more strongly to the IBBEA deregulation, corroborating the hypothesis that competition drives down charter values and increases the signaling power of dividends, leading to stronger incentives to use payouts as a signal of banks' solvency.

Placebo tests rule out the probability that the changes in payout ratios that we document are purely coincidental. Finally, we show that changes in payout ratios did not cause changes in the BRI, consistent with changes in market contestability driven by the IBBEA being exogenous to bank dividend policy.

Our findings are important because Floyd, Li, and Skinner (2015) provide evidence that banks increased payout ratios to historically high levels before the financial crisis and used dividends as a signaling device. In this respect, banks are different from industrial firms: the payout policy of industrial firms is driven more by agency costs of free cash flows rather than signaling motives (Floyd, Li, and Skinner, 2015). Our paper provides evidence that bank deregulation may have prompted banks to increase payout ratios, plausibly because of signaling reasons. Dividends signal to external stakeholders, such as minority shareholders, that their banks are safe. Such a signaling motive becomes particularly relevant when the competitive pressure is high, because this may be perceived by external stakeholders as a potential threat to bank performance.

Our findings contribute to two strands of literature. Specifically, we contribute to the literature on competition and dividend policy by providing a missing link to recent contributions about dividend policy, competition, risk-shifting, and signaling. In particular, we show that greater market contestability resulting from the IBBEA interstate branching deregulation leads to an increase in payout ratios. We also demonstrate that the increase in payout ratios occurs for banks with low market power and profitability, suggesting that increased competitive pressure leads banks to increase payout ratios. Therefore, we are the first to show that an exogenous shock in competition leads to an increase in payout ratios.

We also contribute to the literature on competition in the banking sector. Banking competition is a key topic in the banking literature because of the complex relationship between banking competition and economic growth (Diallo and Koch, 2018), and between banking competition and financial stability (Bikker, Shaffer, and Spierdijk, 2012). Moreover, recent contributions document that banking competition has a positive effect on local economic growth and employment (Garmaise and Moskowitz, 2006). To shed light on the importance of the potential impact of banking competition on the real economy, we focus on the impact of market contestability on bank dividend policy.

2. Institutional background and hypothesis development

2.1 The Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA)

The IBBEA, introduced in 1994, removed limits to interstate bank expansion and boosted market contestability by allowing out-of-state banks to own both in-state banks (interstate banking) and, more importantly, branches in other states (interstate branching).[3]

The implications of the IBBEA were far-reaching with respect to interstate branching: according to Johnson and Rice (2008), the number of out-of-state branches grew from 62 to 24,728 between 1994 and 2005. However, individual states could still impose restrictions on interstate banking and branching. Such heterogeneity across states in the implementation of the IBBEA restrictions is used by Rice and Strahan (2010) to construct the BRI at the state level:

[3] While interstate banking was already permitted in most states before these reforms, interstate branches were uncommon (Rice and Strahan, 2010).

the index ranges between zero and four, depending on whether a specific type of entry barrier was in force or not in a state. In particular, for the period before deregulation, the BRI takes the value of four, and decreases if a state eliminates one or more entry barriers. Rice and Strahan (2010) provide a comprehensive description of the provisions adopted by the different states over the period 1994-2005 to limit interstate branching.

Prior literature documents the significant impact of the IBBEA interstate branching deregulation on bank strategies, credit supply, and corporate financial policies. For instance, interstate branching reforms lead to an increase in the concentration of deposits (Aguirregabiria, Clark, and Wang, 2016), bank risk (Bushman, Hendricks, and Williams, 2016), and the cost of equity capital of banks (Berger, El Ghoul, Guedhami, and Raluca, 2018). They also boost credit supply (Rice and Strahan, 2010; Favara and Imbs, 2015) and firm productivity (Krishnan, Nandy, and Puri, 2015), and reduce corporate innovation (Cornaggia, Mao, Tian, and Wolfe, 2015).

The IBBEA provides a unique opportunity to test the impact of exogenous shocks in market contestability because when individual states decide to allow banks *from other states* to enter the local market, current and future profitability for the incumbent banks is likely to decrease: as Keeley (1990) predicts, competition depresses profits because the new entrants decrease the market power of incumbent banks. For this reason, the state-level implementation of the IBBEA constitutes an exogenous shock to banks' charter values: it is plausible that sudden increases in competitive pressure from banks in other states (as a result of the IBBEA) reduce charter value.

2.2 The charter value hypothesis

One of the crucial changes in international bank regulation following the 2007-2009 financial crisis is the imposition of restrictions on under-capitalized banks. The main reason for such a change is the possibility that bank shareholders may engage in risk-shifting by paying dividends (Acharya, Gujral, Kulkarni, and Shin, 2011; Acharya, Le, and Shin, 2017), at the expense of bank creditors.

In this paper, we argue that the exogenous shock to charter values can affect payout ratios, because of the role of charter values in shaping risk-taking incentives for banks (Keeley, 1990) and because dividends in banks can be a way for bank shareholders to shift default risk to creditors (Acharya, Gujral, Kulkarni, and Shin, 2011; Acharya, Le, and Shin, 2017).

Keeley (1990) predicts that banks with a low charter value are more inclined to take excessive risks, because in the event of bank liquidation the loss is smaller than for banks with high charter values. Moreover, for banks with low charter values, actions that might deplete the value of their assets (such as dividend payments) can be a way to shift risk to creditors. This happens because dividends decrease the value of both equity and debt, but only the shareholders receive the dividend, while the bondholders do not (Ronn and Verma, 1986). Government bailout guarantees (implicit or explicit) exacerbate this problem because paying dividends reduces the value of bank assets and increases the value of the government guarantee (Merton, 1977).

Acharya, Le, and Shin (2017) highlight the role played by banks' charter values in determining the equilibrium level of dividend payout ratios. In their model, to maximize the total value of assets, banks should not pay dividends at all, because dividends increase the probability of liquidation, which leads to the loss of charter value. However, from the perspective of bank shareholders, when default risk is nontrivial, the optimal dividend policy depends on charter value: if the charter value is lower than a critical threshold, it makes sense to pay all available cash to shareholders in the form of dividends, so that default risk is transferred to creditors; if the charter value is above the threshold, on the other hand, it makes sense to have a no-dividend policy, to minimize the probability that the charter value will be lost. Consistent with this hypothesis, Onali (2014) shows that high charter values tend to dampen risk-shifting for banks with high default risk, suggesting that there is a negative relationship between payout ratios and charter values.

The previous considerations lead to our main hypothesis:

Charter value hypothesis: **The BRI is negatively correlated with banks' payout ratios.**

2.3 The signaling hypothesis

One may argue that banks may distribute a larger percentage of earnings to their shareholders when the market is more competitive to signal their strength to the stock market (Floyd, Li, and Skinner, 2015). In banking, the signaling motive might be stronger than for non-financial firms because banks typically hold intangible assets that are hard to value (loans). The importance of the signalling motive in banking is supported by Bessler and Nohel (1996), who provide evidence of stronger negative effects of dividend cuts in banking with respect to non-financial firms.

Importantly, for banks with low market power and profitability, the signaling motive for increasing payout ratios is stronger. Therefore, the charter value channel and the signaling channel are not mutually exclusive. Moreover, one may argue that signaling motives may also be related to a lack of profitability and a low charter value or market power: less profitable banks, or banks with a low charter value and market power, may need to reassure the market that they are confident in their future performance.

Signaling hypothesis: **The BRI is negatively correlated with banks' payout ratios.**

We test our hypotheses using a bank-level BRI, where state-level BRI is weighted on the basis of branch-level data on deposits (*Bank BRI*). In robustness tests, we test these two hypotheses using a dummy equal to one for quarters where there is a deregulation event in a certain state (and thereafter), and zero otherwise (*BRI dummy*).

Since both hypotheses suggest a negative correlation between the BRI and the banks' payout ratios, in further tests we investigate the impact of variables related to bank risk and signaling to understand which of the two hypotheses can better explain our results.

3. Data and methodology

3.1 Sample construction

Since we do not have data at the branch level for deposits before 1994, which prevents us from calculating the bank-level BRI, our sample period starts from 1994. We choose 2006 as the end of our sample period, to avoid the potential effects on banking competition of the 2007-2009 financial crisis (Cornaggia, Mao, Tian, and Wolfe, 2015). Our sample period is the same as that used by Nguyen, Hagendorff, and Eshraghi (2018).

We start with all U.S. banks listed on the NYSE, Amex, and NASDAQ during 1994Q1 to 2006Q4, available on the Compustat Bank Fundamentals Quarterly database. We obtain stock data from CRSP and bank deposit information from the Summary of Deposits data supplied by the Federal Deposit Insurance Corporation (FDIC). The Summary of Deposits data provides information on the value of deposits held by individual bank branches and the states in which the branches are located. We use this information to build a bank-level BRI. We exclude banks located in the states of Delaware and South Dakota because of their special tax incentives for banks (Dick and Lehnert, 2010), as well as those with a negative book value of equity (Kick, Celerier, and Ongena, 2017).

After excluding observations without available financial and stock data, our final sample consists of 14,173 bank-quarter observations for 684 banks. Table 1 shows the main steps of our sample construction.

[insert Table 1 here]

3.2 Construction of dependent and independent variables

We use dividends and total payouts to examine the payout decision of banks in response to the introduction of the IBBEA. Specifically, we scale cash dividends (Compustat item *dvcq*) and total payouts (the sum of dividends and repurchases)[4] by total assets (*atq*), market capitalization (*prcc_f*cshoq*), and book common equity (*ceqq*), respectively. This gives us six proxies for the payout ratio as our dependent variable: dividends by assets (*DTA*), dividends by market capitalization (*DMV*), dividends by book common equity (*DCE*), total payouts by assets (*TTA*), total payouts by market capitalization (*TMV*), total payouts by book common equity (*TCE*).

Our main variable of interest is the weighted-average Branch-Restriction Index (BRI), as developed by Rice and Strahan (2010). The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state.[5]

While competition proxies should go hand-in-hand, it has been shown that they may be uncorrelated (Calderon and Schaeck, 2016). To improve the robustness of our analysis and verify that we are capturing the impact of changes in competitive pressure rather than that of

[4] Repurchases is measured as purchase of common stock. Since the Compustat data item *prstkcy* is measured on a year-to-date basis, the number reported for each quarter, apart from the first quarter, cumulates all purchases of its current and previous quarters within the same year. We thus take the difference between quarters to obtain the quarterly purchases of common and preferred stock for each quarter, minus the reduction of the book value of preferred stock (*pstkq*). The value of share repurchases is set to 0 if missing or negative.

[5] Similar to Goetz, Laeven, and Levine (2016), we link CRSP/Compustat data with data from the Summary of Deposits database using the CRSP–FRB link from the New York Federal Reserve Bank (FRB) website (http://www.newyorkfed.org/research/banking_research/datasets.html).

omitted variables, we consider three variables that are common in the banking competition literature: the Lerner index (*Lerner*), the HHI estimated at the bank level (*Bank HHI*), and the Boone indicator (*Boone*). All these three variables are estimated at the bank level. For *Bank HHI*, we exploit branch-level data on deposits to estimate the weighted-average HHI for each bank. Definitions of *Lerner*, *Boone*, and *Bank HHI* are provided in Appendix 2. Importantly, all these variables are negatively correlated with competition. For example, a higher value for the Lerner index indicates a higher degree of market power for a certain bank, and thus a lower competitive pressure on that bank.

Our regression models control for other variables that in the corporate finance literature or in the banking literature have been found to affect dividend policy: the market-to-book ratio, bank size, cash flow to assets, cash holdings, retained earnings, leverage, bank age, and systematic risk (Fama and French, 2001; Fenn and Liang, 2001; Grullon and Michaely, 2002; Hoberg and Prabhala, 2009; Hoberg, Phillips and Prabhala, 2014).

We calculate the market-to-book ratio (*MTB*) as the bank's market value (total assets (*atq*) minus the book value of equity[6] and plus market capitalization (*prcc_f*cshoq*)) over total assets. Bank size (*Size*) is defined as the log of market capitalization (inflation-adjusted). Cash flow to assets (*Cash flow*) is computed as the current operating earnings before income tax (*coeitq*) plus all other current operating expenses (*ocoeq*) minus non-recurring income (*nriq*), divided by total assets. *Cash holdings* are computed as cash and due from banks (*cdbtq*) plus federal funds sold and securities purchased under agreement to resell (*ffsspq*), divided by total assets. *Retained earnings* are equal to the value of retained earnings (*req*) divided by total assets. *Leverage* is computed as long-term debt (*dlttq*) plus debt in current liabilities (*dlcq*),

[6] Book value of equity is the stockholders' equity (*seqq*) minus preferred stock (*prefsk*, which is equal to the liquidation value of preferred stock, *pstklq*, or the book value of preferred stock, *pstkq*, if missing). If data on *seqq* is missing, we consider the total of shareholders' common equity (*ceqq*) plus purchase of common and preferred stock (*pstkq*) minus *prefsk*. If data on *ceqq* minus *pstkq* is also missing, book value of equity is computed from total assets (*atq*) minus total liabilities (*ltq*) minus *prefsk*.

divided by the bank's market value. *Bank age* (in years)[7] is computed as the difference between a given quarterly date and the bank's beginning date of stock data in CRSP. *Systematic risk* is defined as the standard deviation of the predicted value retrieved by regressing the daily stock returns in excess of the risk free rate on the market risk premium computed using the value-weighted market return. We winsorize all dependent and independent variables at the 1st and 99th percentile.

Table 2 presents the descriptive statistics of all the variables included in our regression models. As shown in Panel A, the average payout ratios (which are shown in percentages) tend to be significantly different for banks that enter other states (non-single-state banks, or NSS) and banks that do not have branches in other states (single-state banks, or SS). In particular, SS banks tend to have significantly lower values for all our payout ratio proxies (*DTA*, *DMV*, *DCE*, *TTA*, *TMV*, and *TCE*). NSS banks are also larger, older and on average have a higher value of *Retained earnings*. A positive correlation between these variables and payout ratios is consistent with the life-cycle theory of dividends (DeAngelo, DeAngelo, and Stulz, 2006). Therefore, these results suggest that NSS banks tend to have higher payout ratios than SS banks because they are at a later stage of the life cycle relative to SS banks. NSS banks also have a higher value for *Lerner* and *Boone* than SS banks, consistent with the view that banks that enter other states tend to have higher market power and are more efficient.

Panel B of Table 2 reports the correlation matrix for the competition proxies based on market structure and market power: *Lerner*, *Boone*, and *Bank HHI*. As expected, the correlation coefficients are positive and statistically significant. The magnitude of the coefficients is low, consistent with previous literature on banking competition (Calderon and Schaeck, 2016), providing support for the need to use multiple measures of competition.

[insert Table 2 here]

[7] Since we use quarterly data, *Bank age* is not necessarily an integer value.

Figure 1 shows that the ratio of NSS banks to total banks changes over time. It is clear that in 1998 the importance of NSS banks increased dramatically, jumping from around 17% of our sample in 1997 to around 26% in 1998. This is most likely due to the fact that states had the option to opt-out of or opt-in to the IBBEA any time between September 1994 and 1 June 1997 (Johnson and Rice, 2008). Importantly, it seems that after the initial increase in the proportion of NSS banks, SS banks become more common in our sample.

Figure 2 shows that there is a fall in the proportion of NSS banks from 1999 to 2004. This reflects the fact that a net total of 43 SS banks enter and 16 NSS banks exit our sample during this period.[8] Another explanation for the increase in the proportion of SS banks could be the conversion of NSS banks to SS banks. During the 1999 to 2004 period, 47 banks converted from being NSS banks to SS banks, whilst 36 banks converted from being SS banks to NSS banks. Therefore, although less important, the net conversion of NSS banks to SS banks also contributes to the increase in the proportion of SS banks.

[insert Figures 1 and 2 here]

3.3 Baseline regressions

Following previous literature on the determinants of payout policy (Fenn and Liang, 2001), we employ tobit regressions to allow for the censored nature of the payout ratio. The econometric model we employ is as follows:

$$Y_{isq} = \alpha + \beta_1 BankBRI_{isq} + \delta Controls_{isq} + \gamma_{sy} + \varepsilon_{isq} \quad (1)$$

where i denotes bank, s state, y year, and q quarter, and Y_{isq} is a proxy for the payout ratio (*DTA, DMV, DCE, TTA, TMV, TCE*). To assign banks to a state, we choose the state where the

[8] It should be noted that a number of our control variables require data from multiple databases (Compustat and CRSP) and over historical time periods. Such data coverage issues, i.e., missing values either across databases or over time, affect the entry time of some banks into our sample. More precisely, during the 1999 to 2004 period, IPOs and data coverage account for 94 and 102 SS banks, respectively, entering our sample. In contrast, delisting and data coverage result in 144 and 9 SS banks, respectively, exiting the sample. Similarly, during the 1999 to 2004 period, IPOs and data coverage account for 2 and 9 NSS banks, respectively, entering our sample. A total of 24 and 3 NSS banks exit the sample during this period due to delisting and data coverage, respectively.

bank held most of its deposits.[9] *Bank BRI* is the bank-level weighted-average BRI (Rice and Strahan, 2010), where the weight is based on the fraction of deposits for bank *i* in a certain state. *Controls* is a vector of bank-specific control variables borrowed from the literature on payout policy (and described above), δ is a vector of coefficients, one for each variable included in *Controls*, and γ_{sy} denotes state-year fixed effects (FE). In our main regressions, we cluster the standard errors at the bank level.[10]

In addition to (1), we also employ a specification where we replace *Bank BRI* with *BRI dummy*:

$$Y_{isq} = \alpha + \beta_1 BRIdummy_{sq} + \delta Controls_{isq} + \gamma_{sy} + \varepsilon_{isq} \quad (2)$$

This setup is similar to that used by Chava, Oettl, Subramanian, and Subramanian (2013) and Nguyen, Hagendorff, and Eshraghi (2018), although the latter study employs a slightly different definition for *BRI dummy*.[11]

Importantly, for both (1) and (2), we include in our tobit regressions state-year FE, similar to Nguyen, Hagendorff, and Eshraghi (2018).[12] In so doing, we allow for time-varying unobservable characteristics that are idiosyncratic to that state. In particular, the inclusion of state-year FE enables us to rule out that our results are due to state-level events (such as new state-level regulations) concomitant to events related to the implementation of the IBBEA. Moreover, they rule out that trends in investor preferences for dividends (catering theory, Baker and Wurgler, 2004) drive our results.

[9] Using the state where the headquarters are located, as indicated by Compustat, produces virtually the same results.
[10] Robustness tests using state-level clustering produce virtually the same results.
[11] In Table 13 we report results based on the definition employed in Nguyen, Hagendorff, and Eshraghi (2018).
[12] Using state-quarter FE would result in almost perfect collinearity with the main explanatory variables *Bank BRI* and *BRI dummy*.

To improve the robustness of our results, however, we also use specifications where we include bank FE (denoted λ_i), which allow for bank-specific time-invariant unobservable characteristics.[13]

$$Y_{isq} = \alpha + \beta_1 BankBRI_{isq} + \delta Controls_{isq} + \lambda_i + \varepsilon_{isq} \quad (3)$$

$$Y_{isq} = \alpha + \beta_1 BRIdummy_{sq} + \delta Controls_{isq} + \lambda_i + \varepsilon_{isq} \quad (4)$$

4. Results

4.1 Main results

Tables 3 and 4 report the results of our baseline regression models: Table 3 considers *Bank BRI* as the main explanatory variable, while in Table 4 we employ *BRI dummy* as the main explanatory variable. In both tables, Panel A considers only state-year FE, while Panel B considers bank FE.

For all specifications, the results suggest that the deregulation increases both dividend ratios and total payout ratios (which include share repurchases). These results support the view that market contestability has a positive impact on payout ratios.[14]

In addition to having a statistically significant relationship between changes in *Bank BRI* and payout ratios, the magnitude of the impact of changes in *Bank BRI* is moderate but not economically negligible. For example, the marginal effects (untabulated) for *Bank BRI* in the first column of Table 3, Panel A, is -0.00342 meaning that a decrease (increase) in *Bank BRI* by one standard deviation (1.534, as reported in Table 2) leads to an increase (decrease) in *DTA* by 0.005 percentage points (-0.00342 *1.534). Given that the average for *DTA* is 0.1 percentage

[13] It is generally understood that the maximum likelihood estimator of a standard panel Tobit model with FE produces coefficients that are biased and inconsistent. However, Greene (2004) shows that the "incidental parameters problem" does not affect substantially the coefficient estimates when the number of observations for each cluster is larger than 20. In our dataset there are on average 20 observations per bank. In our robustness tests we consider Honorè's estimator as an alternative to the standard Tobit model with FE.

[14] We also run regressions with both bank FE and state-year FE. The magnitude of the coefficients on *Bank BRI* and *BRI dummy* do not change substantially. Since Honoré's (1992) estimator cannot be used with a two-way FE model, and because of very large t-statistics with the tobit estimator, we decide to use only models with state-year FE and bank FE separately in the remainder of our analysis.

points, a decrease (increase) by one standard deviation in *Bank BRI* increases (decreases) *DTA* by around 5% of its sample mean. Similarly, the marginal effects for *Bank BRI* in the second column of Table 3, Panel A, is -0.0239, and a decrease by one standard deviation in *Bank BRI* increases *DMV* by around 5.7% of the sample mean for *DMV*.[15]

[insert Tables 3 and 4 here]

4.2 Threats to identification

A potential concern for the validity of our approach, based on the exogeneity of the deregulation events relative to bank dividend policy, is that state regulators may have considered bank payout ratios as a factor affecting their decisions regarding the degree to which competition in that state should be restricted. If this were true, there would be reverse causality between the *BRI* and bank payout ratios.

Table 5 reports results of regressions where *Bank BRI* is regressed against several proxies for payout ratios and macroeconomic variables.

$$BankBRI_{isy} = \alpha + \beta_1 Y_{isy-1} + \gamma_{sq} + \varepsilon_{isq} \tag{5a}$$

$$BankBRI_{isy} = \alpha + \beta_1 Y_{isy-1} + \theta MacroVars_{sy-1} + \gamma_{sq} + \varepsilon_{isq} \tag{5b}$$

where Y_{isy-1} is the lag of any of the proxies for payout ratios used before, and θ is a vector of coefficients for state-level macroeconomic variables: *Political balance*, *GDP per capita*, *GDP percentage change*, and *Unemployment rate* (definitions are provided in the appendix, Table A.1).

These regressions are testing for evidence of reverse causality. That is, for the possibility that payout ratios determine the degree of branching restrictiveness in a state. Since all of the coefficients on the proxies for payout ratios are insignificant, our results do not provide support for reverse causality.

[15] In Tables S.1 and S.2 (provided in the Online Supplementary Appendix) we run robustness checks using Honorè's estimator as an alternative to the standard Tobit model with FE. The results are virtually the same as those reported in Tables 3 and 4.

[insert Table 5 here]

Table 6 reports results of regressions where the dependent variable is a dummy variable equal to one if state *s* introduces the IBBEA in quarter q, and zero for observations before the deregulation takes place (*State BRI dummy*). Since our aim is to test whether the timing of the introduction depends on the payout ratios of banks in that state, a state is dropped from the analysis for the periods from q+1 onwards. The branching law dummy is regressed against several proxies for state-level payout ratios, calculated as the weighted-average values of the annual values of payout ratios (*WDTA*, *WDMV*, *WDCE*, *WTTA*, *WTMV*, and *WTCE*), and macroeconomic variables.

$$State\ BRI\ dummy_{sq} = \alpha + \beta_1 Y_{sq-1} + \theta MacroVars_{sy-1} + \lambda_s + \varepsilon_{sq} \quad (6a)$$

$$State\ BRI\ dummy_{sq} = \alpha + \beta_1 Y_{sq-1} + \theta MacroVars_{sy-1} + \gamma_q + \varepsilon_{sq} \quad (6b)$$

The coefficients on the state-level payout ratios are, once again, insignificant, mitigating reverse causality concerns.

[insert Table 6 here]

We also investigate the possibility that we are capturing events that do not affect only banking institutions but also nonbank financial firms. Table 7 reports the results for a sample of 239 nonbank financial firms (SIC codes 6170-6200, 6300-6411, 6700-6799). Panel A reports the results where the main explanatory variable is the *BRI dummy,* while Panel B reports the results for the *BRI*. We focus on the results for the *BRI dummy* because for nonbank financial firms we cannot know in which states that firm is operating, and therefore we cannot compute the BRI for each nonbanking firm. For this reason, we must use the state-level BRI provided by Rice and Strahan (2010). The coefficients on the *BRI dummy* and the *BRI* are insignificant at the 5% in all specifications except for one, suggesting that the deregulation affected the payout policy of bank financial institutions, rather than nonbank institutions. These findings rule out that other concomitant events affecting the whole financial industry (or all firms) might have driven our results.

[insert Table 7 here]

4.3 The role of market structure and market power

The results provided so far are consistent with both the *charter value hypothesis* and the *signaling hypothesis*. In this section, we aim to investigate further whether banks that respond to changes in the BRI are doing so because of an increase in competitive pressure in their market due to the IBBEA.

First of all, we examine the role of market structure and market power. Importantly, the Lerner index and the Boone index correlate positively with future profitability, and low values for these indices should correspond to low charter values. For this reason, we would expect that the banks with a value for the Lerner index lower than the median may be more affected by the IBBEA, because they have a low degree of market power and thus are more likely to be affected by new entrants. If we find that only banks with a low value of the Lerner index increase payout ratios, this will support that the IBBEA is indeed the stimulus for causing changes in payout ratios. The same reasoning applies with respect to the Boone index and, to the extent to which market concentration in a state is positively correlated with a bank's market power, the bank-level HHI.[16] Similarly, if the *charter value hypothesis* or the *signaling hypothesis* is correct, banks with low values of *ROA* should increase payout ratios as a result of interstate deregulation.

We estimate our baseline regressions again, after splitting the sample into two sub-samples: for the first sub-sample, we consider only observations for which the Lerner index (or the *Bank HHI*, or the Boone indicator, or the *ROA*) is below or equal to the sample median; and for the

[16] This is calculated as the weighted-average HHI for a bank, considering the HHI of the states where the bank is located, and where the weight depends on the deposit of that bank in that state.

second sub-sample we consider only observations for which the variable of interest is above the sample median.

The results reported in Table 8, Panel A, for the sample splits based on the Lerner index suggest that banks with a lower degree of market power react more strongly to changes in interstate bank branching laws. In fact, the coefficient remains negative and significant for observations for which the Lerner index is below or equal to the sample median (banks with low market power), but it becomes insignificant for observations for which the Lerner index is above the sample median (banks with high market power). Since for banks with a low degree of market power charter value is likely to be lower, these findings support the view that an increase in banking competition, and a resulting decrease in market power and charter value (Keeley, 1990), lead to an incentive for banks to increase their payout ratios. The results for the bank-level HHI and for the Boone indicator also suggest that it is competition that is driving the increase in payout ratios: the results tend to be significant only for banks in less concentrated markets (*Bank HHI* is below the sample median) and banks in more profit-efficient markets (the Boone indicator is below the median).

The results for *ROA* suggest that less profitable banks are the only ones for which the negative coefficient on *Bank BRI* is significant. Since banks with less market power are also likely to be less profitable (as competition tends to squeeze bank profits), these results suggest that banks with lower mark-ups, profits, and charter values tend to increase payout ratios when the degree of market contestability increases.

4.4 The role of potential geographic expansion

When we test the *charter value hypothesis* and the *signaling hypothesis* using the BRI as an indicator of market contestability, we assume implicitly that banks in a certain state respond to a potential threat from banks from other states, which causes a reduction in charter value.

However, one might argue that, if two or more states deregulate at the same time, we might be capturing the positive effect on charter values and the signaling of potential expansion in other states. In fact, deregulation events tend to cluster over time for many states, suggesting that in some cases we might have captured the effect of the possibility to establish branches in other states, rather than the threat of new entrants.

For example, the 1st of June 1997 is identified as the effective date of deregulation by Rice and Strahan (2010) for the following states: Arkansas, Colorado, Florida, Georgia, Hawaii, Illinois, Indiana, Kentucky, Louisiana, Minnesota, Mississippi, New Hampshire, New York, and Tennessee. Therefore, a bank located in Tennessee might experience a reduction in charter value, because of the potential entry of other banks in its state, but it might also experience an increase in charter value because it can potentially enter markets in other states. In certain cases, the two effects might offset each other.

For this reason, we also examine whether the results are driven by large banks that exploit the deregulation to enter markets in other states. To isolate the effects of entry of banks from other states, rather than the effects of entering new states, we split the sample into banks that do not have branches in other states (*SS*) over our sample period, and banks that enter other states (*NSS*).

The results reported in Panel B of Table 8 suggest that single-state (*SS*) banks tend to increase payout ratios as the *Bank BRI* decreases, while for non-single state (*NSS*) banks the coefficient on *Bank BRI* is insignificant. This finding rules out that our results are due to banks that exploit the deregulation to enter markets in other states. On the other hand, our findings suggest that banks that are under threat of competition from banks in other states tend to increase their payout ratios.

[insert Table 8 here]

4.5 Risk-shifting or signaling?

To understand whether our main results are due to risk-shifting incentives as a result of a drop in charter values, we use variables related to bank risk to perform sample-split regressions. If the charter value hypothesis is correct, only high-risk banks should increase payout ratios, while low-risk banks should not have the incentive to shift risk by increasing payout ratios. In particular, we consider default risk (proxied by *Z-score (ln)* and *LnDD*), credit risk (proxied by *NPL*), and *Systematic risk*. We report these results in Table 9.

[insert Table 9 here]

The results for the sample splits based on *Z-score (ln)* are significant only for banks that are closer to default, supporting the *charter value hypothesis*. However, the results for the proxies for default risk (*LnDD*) and credit risk (*NPL*) seem to suggest that riskier banks are less likely to increase payout ratios as the BRI decreases. This result does not support the *charter value hypothesis*. Moreover, the coefficients on *Systematic risk* are in most cases insignificant, regardless of whether banks with high or low *Systematic risk* are considered. These results do not support the hypothesis that banks increased payout ratios because of risk-shifting reasons.

We also test whether signaling incentives are at the root of our main findings. If the motivation underlying the increase in payout ratio is to signal to the market that the bank is strong, the payout policy of unlisted banks should not be affected by interstate deregulations, and the coefficient on *Bank BRI* should be insignificant in regressions where dividend payout ratios and total payout ratios are the dependent variables. For this reason, we run our baseline regressions on a sample of unlisted Bank Holding Companies (BHC).[17]

[17] We consider BHC, rather than other types of banks, to avoid including in our sample very small banks that may have very different characteristics from our main sample. Moreover, in our regressions we cannot consider the same control variables as for listed banks, because of the lack of market-data for unlisted banks (for example, the market-to-book ratio or systematic risk). Since one may argue that we do not consider only listed BHC in our main regressions, we also run our baseline models for listed non-BHC banks. The results are virtually the same as those reported in Tables 3 and 4.

In Table 10 we report the results of regressions on unlisted banks.[18] The results indicate that for unlisted banks the coefficient on *Bank BRI* is insignificant, which may suggest that only listed banks increase the payout ratio when the competitive pressure increases. This result is consistent with a signaling hypothesis.[19]

[insert Table 10 here]

In Table 11 we examine the price reaction to dividend announcements. In particular, using Fama-French-Carhart regressions, we estimate Cumulative Abnormal Returns (CARs) for 7-day (-3,+3) and 11-day (-5,+5) windows and we regress them on a dummy equal to one if the dividend per share (DPS) increases or remains the same as for the previous quarter, and zero otherwise (*No dividend cut*). We report the results separately for different values of *Bank BRI:* in the first column we report the results for $Bank\ BRI < 1$, in the second column for $1 < Bank\ BRI \leq 2$, in the third column for $2 < Bank\ BRI \leq 3$, in the fourth column for $3 < Bank\ BRI \leq 4$, in the fifth column for $0 < Bank\ BRI \leq 2$, and in the sixth column for $2 < Bank\ BRI \leq 4$. The intuition underlying these tests is the following: if the *signaling hypothesis* is supported, then banks should try to avoid dividend cuts when the degree of competitive pressure is high (that is, for low levels of *Bank BRI*), because cutting the DPS would result in a negative price reaction.

[insert Table 11 here]

The results for the 11-day window suggest that for low levels of competitive pressure ($2 < Bank\ BRI \leq 3$, $3 < Bank\ BRI \leq 4$, and $2 < Bank\ BRI \leq 4$), the coefficient on *No dividend cut* is insignificant. On the other hand, for high levels of competitive pressure (*Bank BRI* < 1, 1 <

[18] We collect this data set from the call reports (forms FR Y-9C). The variable definitions are reported in Table A.1, Panel B (Appendix 1). For a source of the definitions of these variable, we refer the reader to: Rampini, Viswanathan, and Vuillemey (2016) – for *DTA*, *DBE*, *TTA*, *TBE*, *Size*, and *Profitability*; Chernobai, Ozdagli, and Wang (2018) – for the definitions of total assets, *Size*, *Profitability* and *Risk*; Minton, Stulz, and Williamson (2009) – for the definitions of total assets and *Leverage*; Calomiris and Nissim (2007) – for the definitions of common equity and *Cash holdings*; and Hirtle (2004) – for the definitions of the share repurchases measures.

[19] In Table S.3, S.4, and S.5 in the Online Supplementary Appendix we run robustness checks using Honorè's estimator as an alternative to the standard Tobit model with FE. The results are virtually the same as those reported in Tables 8, 9, and 10.

Bank BRI ≤ 2, and 0 < *Bank BRI* ≤ 2), the coefficient on *No dividend cut* is significant. These results suggest that when the competitive pressure from banks in other states is relatively high, banks that do not cut dividends are rewarded by an increase in share prices.[20]

The results for the 7-day window are consistent with those for the 11-day window, although the coefficient on *No dividend cut* is significant only for 0 < *Bank BRI* ≤ 2.

If banks in more competitive environments are incentivized to exploit the signaling power of dividends, the probability of an increase in dividends should be lower as the *Bank BRI* increases. To test whether this is the case, we run probit regressions to examine the impact of *Bank BRI* on the probability of a dividend increase. The results reported in Table 12 confirm our intuition. The marginal effects for *Bank BRI* are between -0.026 and -0.029, suggesting that a decrease (increase) in *Bank BRI* by one standard deviation (1.534) increases (decreases) the probability of a dividend increase by more than 4%.

[insert Table 12 here]

As pointed out by Floyd, Li, and Skinner (2015), stock repurchases do not entail the commitment to distribute cash in the future, unlike cash dividends. For this reason, if the signaling hypothesis is true, competition should not affect share repurchases. We test this conjecture by running regressions where the dependent variable is the ratio of stock repurchases to total assets (*RTA*). For consistency with our previous regressions, we also use the ratios stock repurchases to market value of equity (*RMV*) and stock repurchases to book value of equity (*RCE*). The results for the regressions using state-year FE are insignificant, while those using bank FE suggest a *negative* impact of market contestability on the stock repurchase ratios. These results suggest that stock repurchases do not increase in periods of greater market contestability, consistent with the signaling hypothesis. Moreover, these results suggest that

[20] These results are not due to a correlation between *Bank BRI* and the variable *No dividend cut*. In particular, the percentage of cases for which the variable is equal to zero is: 3.82% for *Bank BRI* ≤ 1; 5.02% for 1 < *Bank BRI* ≤ 2; 4.73% for 2 < *Bank BRI* ≤ 3; and 6.11% for 3 < *Bank BRI* ≤ 4.

the positive impact of market contestability on total payout ratios (*TTA*, *TMV*, and *TCE*) reported in section 4.1 is driven by the impact on cash dividends, rather than share repurchases.

[insert Table 13 here]

4.6 Alternative definition for the BRI dummy

In Table 14 we report the main results using an alternative definition of *BRI dummy* which we borrow from Nguyen, Hagendorff, and Eshraghi (2018). We name this new variable *BRI dummy 2*. As reported in Nguyen, Hagendorff, and Eshraghi (2018), this variable equals one if a state removes barriers to single branch acquisition and/or state-wide deposit cap on branch acquisition at any given time. Deregulation events refer to the date on which a state began to permit interstate branching, as per the IBBEA of 1994. When we use this alternative specification, our results remain virtually unaltered, in terms of both economic and statistical significance of our coefficients.

[insert Table 14 here]

5. Conclusions

We investigate changes in payout ratios for a large sample of U.S. listed banks following exogenous changes in the degree of market contestability. We provide evidence that, as a result of an increase in competitive pressure due to the IBBEA, banks increase payout ratios. Moreover, we show that the increase in payout ratios is significant for banks with low market power and profitability, suggesting that the driver of the increase in bank payout ratios is indeed the increase in the competitive pressure resulting from the IBBEA.

We do not find robust results on the impact of bank risk on the relationship between the degree of market contestability and payout ratios, suggesting that risk-shifting might not have been the main driver of the increase in payout ratios.

However, our findings suggest that signalling might have been the key factor affecting the payout decisions of banks. In fact, our results are valid only for listed banks, while the results for unlisted banks are insignificant, supporting the view that banks increase payout ratios as a signaling device. We also show that in periods related to fiercer competition banks are more likely to increase dividends, and those that avoid dividend cuts are rewarded by the market with an increase in share prices around dividend announcements.

Our results support the view that banks use dividends to signal their ability to withstand competition to outside shareholders and indicate that payout policy in banks represent an important signaling device which becomes more important when competition increases. Our findings are also consistent with the ones provided by Grullon, Larkin, and Michaely (2019) for non-financial firms, in that they show that competition has a positive impact on payout ratios. However, Grullon, Larkin, and Michaely (2019) ascribe their findings to agency costs of free cash flow. The main reason for this discrepancy is, in our view, the importance of signaling for banks: as explained by Floyd, Li, and Skinner (2015), banks' assets and liabilities are inherently opaque, and therefore the signaling power of dividends is particularly important.

To conclude, it is important to stress that our sample consists mainly the U.S. depository institutions, which during our sample period are subject to potential restrictions in dividends as a result of Prompt Corrective Actions (PCA). Such potential restrictions might affect the dividend policy of these institutions, and this might be one of the reasons behind the absence of clear support for the charter value hypothesis in our data. Future research is required to investigate whether in the absence of PCA (or similar measures) an increase in competitive pressure results in a higher payout ratio.

References

Acharya, V. V., Gujral, I., Kulkarni, N., and Shin, H.S., 2011. Dividends and bank capital in the financial crisis of 2007-2009. *NBER Working Paper*.

Acharya, V. V., Le, H. T., and Shin, H. S., 2017. Bank Capital and Dividends Externalities. *Review of Financial Studies, 30*(3), pp. 988-1018.

Aguirregabiria, V., Clark, R. and Wang, H., 2016. Diversification of geographic risk in retail bank networks: evidence from bank expansion after the Riegle-Neal Act. *The RAND Journal of Economics*, *47*(3), pp. 529-572.

Anginer, D., Demirguc-Kunt, A., and Zhu, M., 2014. How does competition affect bank systemic risk? *Journal of Financial Intermediation*, *23*, pp. 1-26.

Bain, J. (1956). Barriers to New Competition, Cambridge MA, Harvard University Press.

Baumol, W. J., Panzar J. C., and R. D. Willig (1982). Contestable Markets and the Theory of Industry Structure. San Diego, CA: Harcourt Brace.

Baker, M., and Wurgler, J., 2004. A catering theory of dividends. *Journal of Finance*, *59*(3), pp. 1125-1165.

Berger, A. N., El Ghoul, S., Guedhami, O., and Raluca, A. R., 2018. Competition and Banks' Cost of Equity Capital: Evidence from Relatively Exogenous Differences in Regulation (November 26, 2018). Available at SSRN: https://ssrn.com/abstract=3290940 or http://dx.doi.org/10.2139/ssrn.3290940

Bessler, W., and Nohel, T., 1996. The stock market reaction to dividend cuts and omissions by commercial banks. *Journal of Banking and Finance*, *20*, pp. 1485-1508.

Bharath, S. T., and Shumway, T., 2008. Forecasting Default with the Merton Distance to Default Model. *Review of Financial Studies*, *21*(3), 1339-1369.

Bikker, J. A., Shaffer, S., and Spierdijk, L., 2012. Assessing competition with the Panzar-Rosse model: the role of scale, costs, and equilibrium. *Review of Economics and Statistics, 94*(4), pp. 1025-1044.

Bushman, R. M., Hendricks, B. E., and Williams, C. D., 2016. Bank competition: Measurement, Decision-Making, and Risk-Taking. *Journal of Accounting Research, 54*(3), pp. 777-826.

Calderon, C., and Schaeck, K., 2016. The Effects of Government Interventions in the Financial Sector on Banking Competition and the Evolution of Zombie Banks. *Journal of Financial and Quantitative Analysis, 51*(4), pp. 1391-1436.

Calomiris, C. W., and Nissim, D., 2007. Activity-based valuation of bank holding companies. *NBER Working paper 12918*.

Chava, S., Oettl, A., Subramanian, A. and Subramanian, K.V., 2013. Banking deregulation and innovation. *Journal of Financial Economics*, *109*(3), pp.759-774.

Chernobai, A., Ozdagli, A., and Wang, J., 2018. Business Complexity and Risk Management: Evidence from Operational Risk Events in U.S. Bank Holding Companies. *Working Paper.*

Chu, Y., 2018. Banking deregulation and credit supply: Distinguishing the balance sheet and the competition channels. *Journal of Financial Intermediation*, *35*(Part A), pp. 102-119.

Claessens, S., and Laeven, L., 2004. What Drives Bank Competition? Some International Evidence. *Journal of Money, Credit, and Banking*, *36*(3), pp. 563-583.

Cobb, C., Dahl, D. S., and Fettig, D., 1995. Interstate branch banking: Opt in or opt out? Offsite link. *Federal Reserve Bank of Minneapolis fedgazette*.

Cornaggia, J., Mao, Y., Tian, X. and Wolfe, B., 2015. Does banking competition affect innovation? *Journal of Financial Economics*, *115*(1), pp.189-209.

DeAngelo, H., DeAngelo, L., and Stulz, R., 2006. Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. *Journal of Financial Economics*, *81*(2), pp. 227-254.

Diallo, B., and Koch, W., 2018. Bank Concentration and Schumpeterian Growth: Theory and International Evidence. *Review of Economics and Statistics*, *100*(3), pp. 489-501.

Dick, A.A. and Lehnert, A., 2010. Personal Bankruptcy and Credit Market Competition. *Journal of Finance*, *65*(2), pp. 655-685.

Fama, E., and French, K., 2001. Disappearing dividends: changing firm characteristics or lower propensity to pay? *Journal of Financial Economics, 60*(1), pp. 3-44.

Favara, G. and Imbs, J., 2015. Credit supply and the price of housing. *American Economic Review*, *105*(3), pp.958-92.

Fenn, G.W. and Liang, N., 2001. Corporate payout policy and managerial stock incentives. *Journal of Financial Economics*, *60*(1), pp.45-72.

Floyd, E., Li, N., and Skinner, D. J., 2015. Payout policy through the financial crisis: The growth of repurchases and the resilience of dividends. *Journal of Financial Economics*¸ *118*(2), pp. 299-316.

Garmaise, M. J., and Moskowitz, T. J., 2006. Bank Mergers and Crime: The Real and Social Effects of Credit Market Competition. *Journal of Finance*, *61*(2), pp. 495-538.

Goetz, M. R., Laeven, L., and Levine, R., 2016. Does the geographic expansion of banks reduce risk? *Journal of Financial Economics*, *120*(2), pp. 346-362.

Greene, W., 2004. The behaviour of the maximum likelihood estimator of limited dependent variable models in the presence of fixed effects. *The Econometrics Journal*, *7*(1), pp. 98-119.

Grullon, G., and Michaely, R., 2002. Dividends, share repurchases, and the substitution hypothesis. *Journal of Finance, 57*(4), pp. 1649-1684.

Grullon, G., Larkin, Y., and Michaely, R., 2019. Dividend Policy and Product Market Competition. *Working Paper.*

Hirtle, B., 2004. Stock repurchases and bank holding company performance. *Journal of Financial Intermediation*, *13*, pp. 28-57.

Hoberg, G., and Prabhala, N., 2009. Disappearing dividends, catering, and risk. *Review of Financial Studies*, *22*(1), pp. 79-116.

Hoberg, G., Phillips, G., and Prabhala, N., 2014. Product Market Threats, Payouts, and Financial Flexibility. *Journal of Finance*, *69*(1), pp. 293-324.

Honoré, B. E., 1992. Trimmed Lad and Least Squares Estimation of Truncated and Censored Regression Models with Fixed Effects. *Econometrica*, *60*(3), pp. 533-565.

Johnson, C. A. and Rice, T., 2008. Assessing a decade of interstate bank branching. *Washington & Lee Law Review, 65*, pp.73-127.

Keeley, M.C., 1990. Deposit insurance, risk, and market power in banking. *The American Economic Review*, pp. 1183-1200.

Kick, T., Celerier, C., and Ongena, S., 2017. Changes in the cost of bank equity and the supply of bank credit. *Working Paper.*

Krishnan, K., Nandy, D.K. and Puri, M., 2014. Does financing spur small business productivity? Evidence from a natural experiment. *Review of Financial Studies, 28*(6), pp. 1768-1809.

Lerner, A. P., 1934. The Concept of Monopoly and the Measurement of Monopoly Power. *Review of Economic Studies*, *1*(3), pp. 157-175.

Medley, B., 2013. Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994. Federal Reserve History. Available at: https://www.federalreservehistory.org/essays/riegle_neal_act_of_1994

Merton, R. C., 1977. An analytical derivation of the cost of deposit insurance and loan guarantees. *Journal of Banking and Finance*, *1*(2), pp. 3-11.

Michaely, R., Rossi, S., and Weber, M., 2018. The information content of dividends: safer profits, not higher profits. *Working paper.*

Minton, B. A., Stulz, R., and Williamson, R., 2009. How Much Do Banks Use Credit Derivatives to Hedge Loans? *Journal of Financial Services Research*, *35*, pp. 1-31.

Nguyen, D. D., Hagendorff, J., and Eshraghi, A., 2018. Does a CEO's Cultural Heritage Affect Performance under Competitive Pressure? *Review of Financial Studies*, *31*(1), pp. 97-141.

Onali, E., 2014. Moral Hazard, Dividends, and Risk in Banks. *Journal of Business Finance & Accounting*, *41*(1-2), pp. 128-155.

Rampini, A. A., Viswanathan, S., and Vuillemey, G., 2016. Risk Management in Financial Institutions. *Working Paper.*

Rice, T., and Strahan, P.E., 2010. Does Credit Competition Affect Small-Firm Finance? *Journal of Finance*, *65*(3), pp. 861-889.

Ronn, E. I., and Verma, A. K., 1986. Pricing risk-adjusted deposit insurance: an option based model. *Journal of Finance*, *41*(4), pp. 871-895.

Schaeck, K. and Cihák, M., 2014. Competition, efficiency, and stability in banking. *Financial Management*, *43*(1), pp. 215-241.

Valta, P., 2012. Competition and the cost of debt. *Journal of Financial Economics*, *105*(3), pp. 661-682.

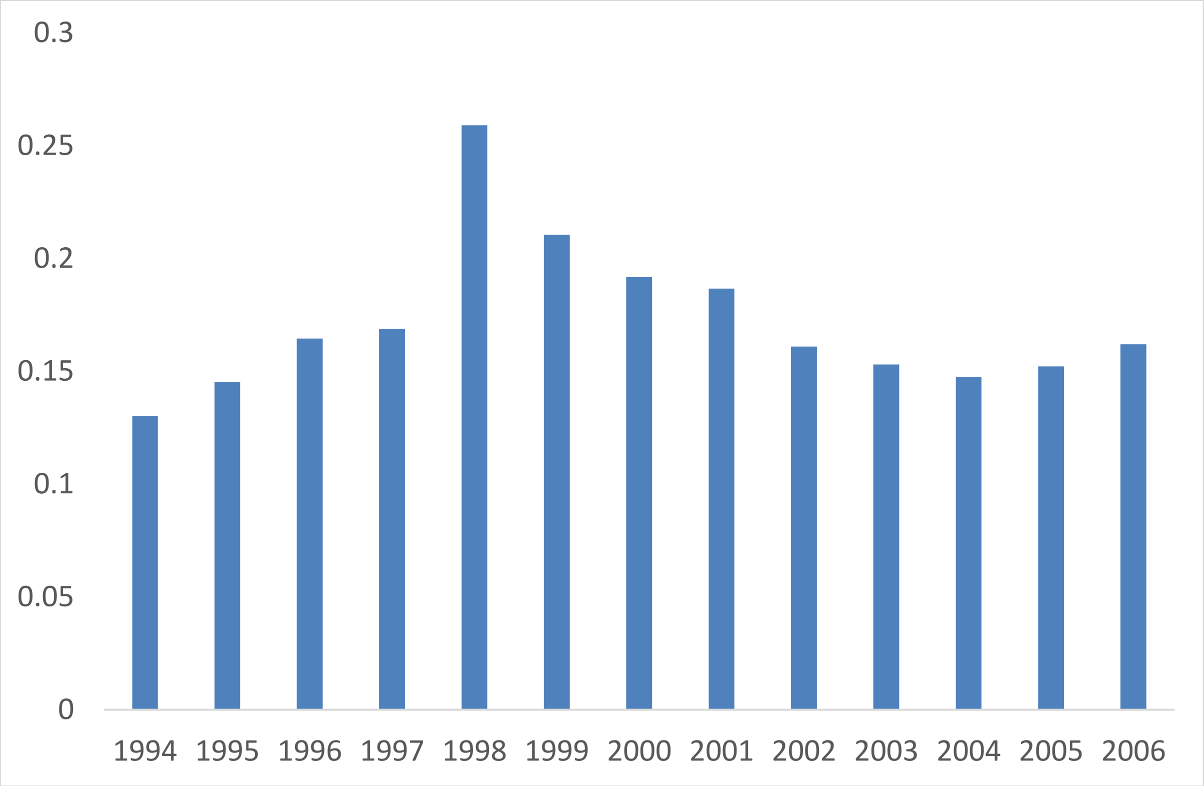

Figure 1. Ratio of non-single state banks to total banks.
The figure presents the ratio of the number of banks which operate branches in multiple states (non-single state banks) to the total number of banks for each year in our sample.

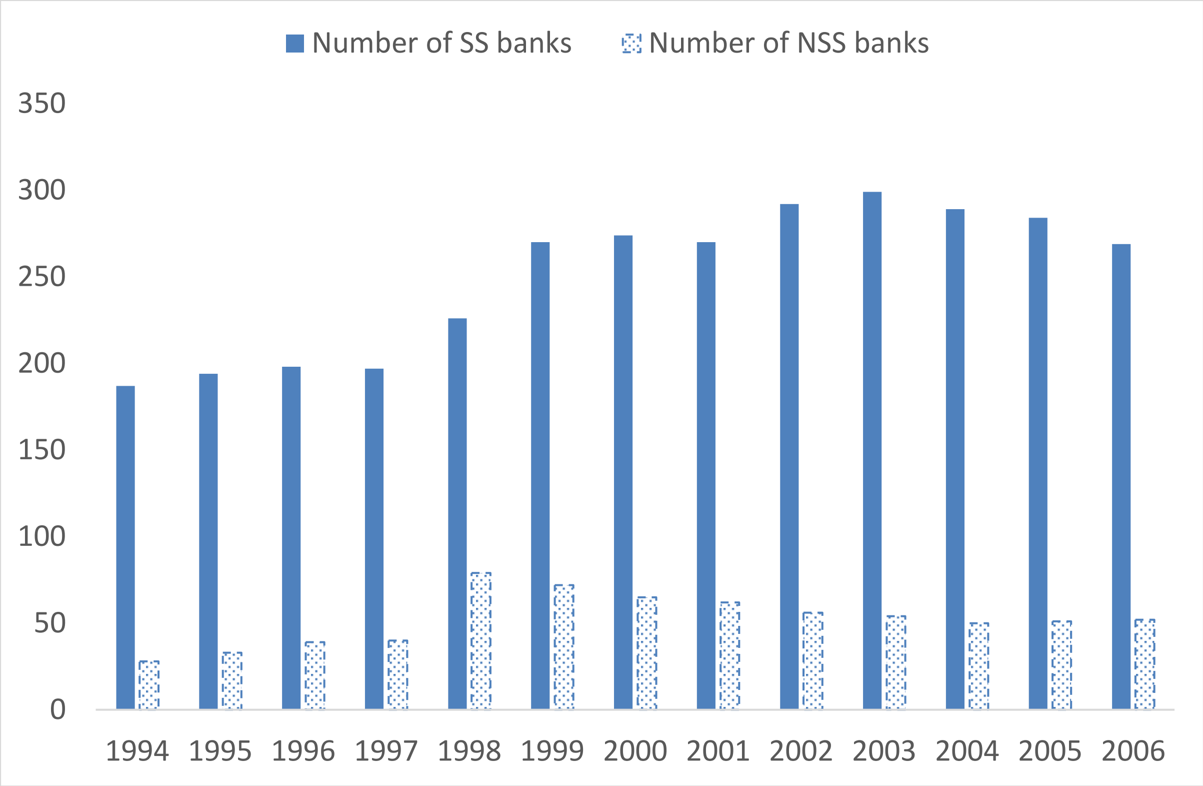

Figure 2. Number of non-single state banks and single state banks.
The figure presents the number of banks which operate branches in multiple states (non-single state banks) and the number of banks which operate branches in a single state (single state banks) for each year in our sample.

Table 1
Steps of sample construction. Sample period: 1994Q1 – 2006Q4.

	Search criterion	No. of Banks	Obs.
Step 1	Listed banks from Compustat Bank (Quarterly) with primary securities in NYSE/AMEX or NASDAQ	1,266	31,172
Step 2	Excluding: banks without common stock data in CRSP	1,252	30,746
Step 3	Excluding: states Delaware and South Dakota	1,245	30,446
Step 4	Excluding: negative book value of equity	1,245	30,444
Step 5	Information availability: bank-level BRI	750	19,113
Step 6	Information availability: market capitalization	750	19,097
Step 7	Information availability: payout ratio	745	17,123
Step 8	Information availability: control variables (including cash holdings, cash flow, retain earnings, leverage)	701	15,017
Step 9	Information availability: systematic risk	684	14,173

Table 2
Summary statistics.
Panel A of this table reports the mean (*Mean*), minimum (*Min*), median (*Median*), maximum (*Max*), standard deviation (*S.D.*), and number of observations (*Obs.*) for the main variables included in the analysis. The last three columns of this table report the average for each variable separately for non-single state (*Mean NSS*) and for single-state (*Mean SS*) banks, as well as the difference (*Difference*) between *Mean NSS* and *Mean SS*. Panel B of this table summarizes the Spearman rank correlations between the variables measuring competition. The payout ratios proxies are expressed in percentages. Variable definitions are summarized in Table A.1 in Appendix 1. Two-sided t-tests are conducted on *Difference* and each of the Spearman rank correlations between the competition variables. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

	Mean	*Min*	*Median*	*Max*	*S.D.*	*Obs.*	*Mean NSS*	*Mean SS*	*Difference*
Panel A: Summary statistics for all variables									
DTA	0.104	0	0.093	0.52	0.086	14,173	0.127	0.099	0.028***
DMV	0.641	0	0.612	2.929	0.485	14,173	0.734	0.622	0.112***
DCE	1.170	0	1.077	5.588	0.937	14,173	1.463	1.109	0.354***
TTA	0.118	0	0.097	0.638	0.11	14,173	0.143	0.113	0.031***
TMV	0.716	0	0.642	3.475	0.593	14,173	0.814	0.696	0.118***
TCE	1.322	0	1.118	7.001	1.192	14,173	1.637	1.256	0.381***
Bank BRI	1.869	0	2	4	1.534	14,173	2.042	1.832	0.210***
BRI dummy	0.871	0	1	1	0.335	14,173	0.868	0.871	-0.003
MTB	1.074	0.972	1.066	1.264	0.058	14,173	1.089	1.07	0.019***
Size	5.365	2.751	5.025	10.776	1.635	14,173	7.077	5.006	2.071***
Cash flow	0.007	0.001	0.007	0.015	0.002	14,173	0.007	0.007	0.001***
Cash holdings	0.059	0.011	0.047	0.233	0.042	14,173	0.059	0.059	-0.001
Retained earnings	0.044	-0.026	0.042	0.118	0.029	14,173	0.048	0.043	0.005***
Leverage	0.116	0	0.1	0.378	0.086	14,173	0.149	0.109	0.04***
Bank age	10.424	1	8.25	33.5	8.008	14,173	16.545	9.139	7.406***
Systematic risk	0.004	0	0.003	0.016	0.004	14,173	0.007	0.004	0.003***
Lerner	0.246	0.027	0.244	0.455	0.079	13,744	0.254	0.244	0.010***
Boone	-3.218	-17.202	-2.735	-0.103	2.35	13,456	-2.595	-3.338	0.743***
Bank HHI	0.106	0.003	0.079	0.901	0.108	14,173	0.099	0.108	-0.009***

Panel B: Correlation matrix for competition variables		
	Lerner	*Boone*
Boone	0.323***	
Bank HHI	0.126***	0.023***

Table 3

Baseline regressions of dividend and payout ratios on *Bank BRI* and a set of control variables.

This table reports parameter estimates for the panel Tobit models, with fixed effects, described in Eq. (1) and Eq. (3). The dependent variables are: in column 1, total cash dividends divided by total assets (*DTA*); in column 2, total cash dividends divided by market capitalization (*DMV*); in column 3, total cash dividends divided by book common equity (*DCE*); in column 4, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in column 5, total payouts divided by market capitalization (*TMV*); in column 6, total payouts divided by book common equity (*TCE*). *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. Definitions of control variables can be found in Table A.1 in Appendix 1. All variables are winsorized at the 1st and 99th percentile. Panel A reports estimates for panel Tobit models with state-year fixed effects. Panel B reports estimates for panel Tobit models with bank fixed effects only. The sample includes 684 banks from the universe of banks in Compustat Bank (SIC codes 6020-6163). Standard errors are clustered at the bank level and t-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Panel A: With State-Year FE	(1)	(2)	(3)	(4)	(5)	(6)
	DTA	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
Bank BRI	-0.004**	-0.028**	-0.043*	-0.005**	-0.038***	-0.057**
	(-1.966)	(-2.286)	(-1.929)	(-2.245)	(-2.759)	(-2.166)
MTB	0.307***	-1.373***	4.048***	0.299***	-1.745***	4.151***
	(5.247)	(-4.565)	(6.089)	(4.139)	(-4.857)	(5.220)
Size	0.006**	0.031**	0.059**	0.009***	0.052***	0.085***
	(2.463)	(2.029)	(2.191)	(2.969)	(2.854)	(2.580)
Cash flow	9.420***	45.437***	79.515***	11.096***	52.660***	96.115***
	(7.856)	(7.379)	(6.969)	(9.093)	(7.933)	(7.629)
Cash holdings	-0.270***	-1.835***	-3.172***	-0.312***	-2.038***	-3.651***
	(-3.943)	(-4.818)	(-4.277)	(-4.111)	(-4.905)	(-4.460)
Retained earnings	0.612***	3.198***	3.686***	0.866***	4.427***	5.917***
	(6.188)	(5.593)	(3.516)	(7.535)	(6.948)	(4.989)
Leverage	-0.044	0.097	0.448	-0.033	0.213	0.657*
	(-1.379)	(0.493)	(1.262)	(-0.925)	(0.979)	(1.671)
Bank age	0.001***	0.009***	0.019***	0.002***	0.011***	0.028***
	(3.126)	(3.704)	(4.063)	(3.533)	(4.021)	(4.806)
Systematic risk	-0.942*	-6.217**	-10.590*	-1.804***	-11.928***	-21.145***
	(-1.799)	(-2.040)	(-1.760)	(-2.702)	(-3.231)	(-2.839)
Standard errors	Bank	Bank	Bank	Bank	Bank	Bank
Bank FE	NO	NO	NO	NO	NO	NO
State-year FE	YES	YES	YES	YES	YES	YES
Banks	684	684	684	684	684	684
Observations	14,173	14,173	14,173	14,173	14,173	14,173
Panel B: With Bank FE	*DTA*	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
Bank BRI	-0.007***	-0.039***	-0.079***	-0.003*	-0.016	-0.033*
	(-5.441)	(-4.735)	(-5.418)	(-1.676)	(-1.628)	(-1.783)
Controls	YES	YES	YES	YES	YES	YES
Standard errors	Bank	Bank	Bank	Bank	Bank	Bank
Bank FE	YES	YES	YES	YES	YES	YES
State-year FE	NO	NO	NO	NO	NO	NO
Banks	684	684	684	684	684	684
Observations	14,173	14,173	14,173	14,173	14,173	14,173

Table 4

Baseline regressions of dividend and payout ratios on *BRI dummy* and a set of control variables.

This table reports parameter estimates for the panel Tobit models described in Eq. (2) and Eq. (4). The dependent variables are: in column 1, total cash dividends divided by total assets (*DTA*); in column 2, total cash dividends divided by market capitalization (*DMV*); in column 3, total cash dividends divided by book common equity (*DCE*); in column 4, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in column 5, total payouts divided by market capitalization (*TMV*); in column 6, total payouts divided by book common equity (*TCE*). The *BRI dummy* variable equals one for quarters where there is a deregulation event in the state in which a bank primarily operates (and thereafter), and zero otherwise. The state where a bank primarily operates corresponds to the state in which the largest proportion of deposits are held. Deregulation events refer to the date on which a state began to permit interstate branching, as per the IBBEA of 1994. These dates can be found in Table 1 of Rice and Strahan (2010). Definitions of control variables can be found in Table A.1 in Appendix 1. The dependent variables and all control variables are winsorized at the 1st and 99th percentile. Panel A reports estimates for panel Tobit models with state-year fixed effects. Panel B reports estimates for panel Tobit models with bank fixed effects only. The sample includes 684 banks from the universe of banks in Compustat Bank (SIC codes 6020-6163). Standard errors are clustered at the bank level and t-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Panel A: With State-Year FE	(1)	(2)	(3)	(4)	(5)	(6)
	DTA	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
BRI dummy	0.020***	0.102***	0.200***	0.022***	0.117***	0.212***
	(4.091)	(3.419)	(3.907)	(4.116)	(3.618)	(3.863)
MTB	0.305***	-1.382***	4.027***	0.296***	-1.753***	4.133***
	(5.195)	(-4.581)	(6.044)	(4.099)	(-4.868)	(5.186)
Size	0.006**	0.031**	0.059**	0.009***	0.052***	0.085***
	(2.465)	(2.029)	(2.193)	(2.971)	(2.855)	(2.581)
Cash flow	9.417***	45.378***	79.477***	11.088***	52.553***	96.000***
	(7.849)	(7.360)	(6.955)	(9.089)	(7.911)	(7.620)
Cash holdings	-0.271***	-1.840***	-3.180***	-0.313***	-2.045***	-3.661***
	(-3.952)	(-4.826)	(-4.285)	(-4.122)	(-4.914)	(-4.469)
Retained earnings	0.611***	3.194***	3.680***	0.865***	4.421***	5.909***
	(6.185)	(5.588)	(3.512)	(7.534)	(6.944)	(4.986)
Leverage	-0.045	0.096	0.446	-0.033	0.212	0.655*
	(-1.386)	(0.488)	(1.256)	(-0.930)	(0.975)	(1.666)
Bank age	0.001***	0.009***	0.019***	0.002***	0.011***	0.028***
	(3.115)	(3.688)	(4.051)	(3.520)	(4.002)	(4.793)
Systematic risk	-0.945*	-6.244**	-10.626*	-1.809***	-11.964***	-21.195***
	(-1.806)	(-2.049)	(-1.767)	(-2.709)	(-3.241)	(-2.846)
Standard errors	Bank	Bank	Bank	Bank	Bank	Bank
Bank FE	NO	NO	NO	NO	NO	NO
State-year FE	YES	YES	YES	YES	YES	YES
Banks	684	684	684	684	684	684
Observations	14,173	14,173	14,173	14,173	14,173	14,173
Panel B: With Bank FE	*DTA*	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
BRI dummy	0.032***	0.191***	0.367***	0.012**	0.081**	0.143**
	(7.804)	(6.861)	(7.855)	(2.238)	(2.537)	(2.490)
Controls	YES	YES	YES	YES	YES	YES
Standard errors	Bank	Bank	Bank	Bank	Bank	Bank
Bank FE	YES	YES	YES	YES	YES	YES
State-year FE	NO	NO	NO	NO	NO	NO
Banks	684	684	684	684	684	684
Observations	14,173	14,173	14,173	14,173	14,173	14,173

Table 5

Regressions of *Bank BRI* on payout ratios.

This table reports parameter estimates for the panel regression models described in Eq. (5a) and Eq. (5b), where *Bank BRI* is the dependent variable and dividend and payout ratios are the independent variables for Eq. (5a). Additional macroeconomic variables are added as independent variables to Eq.(5b). *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. The independent variables are: total cash dividends divided by total assets (*DTA*); total cash dividends divided by the market capitalization (*DMV*); total cash dividends divided by the market value of common equity (*DCE*); total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); total payouts divided by market capitalization (*TMV*); total payouts divided by common equity (*TCE*). Note, annual values of the payout ratios are used each quarter. More precisely, the sum of each payout ratio over the current and prior three quarters is used as independent variable. Four macroeconomic variables are considered: *Political balance*, *GDP per capita*, *GDP percentage change*, and *Unemployment rate* (definitions are provided in appendix, Table A.1). All variables are winsorized at the 1st and 99th percentile. All models are estimated using OLS with state-quarter fixed effects. The sample includes 649 banks from the universe of banks in Compustat Bank (SIC codes 6020-6163). Standard errors are clustered at the bank level and t-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

	Dependent variable: *Bank BRI*											
DTA_{t-1}	0.026						0.026					
	(1.136)						(1.164)					
DMV_{t-1}		-0.001						0.001				
		(-0.176)						(0.183)				
DCE_{t-1}			0.002						0.002			
			(0.878)						(1.033)			
TTA_{t-1}				0.018						0.017		
				(1.099)						(1.049)		
TMV_{t-1}					-0.001						-0.000	
					(-0.464)						(-0.188)	
TCE_{t-1}						0.001						0.001
						(0.805)						(0.885)
Political balance $_{t-1}$							-0.468	-0.470	-0.470	-0.469	-0.470	-0.470
							(-1.409)	(-1.408)	(-1.412)	(-1.407)	(-1.406)	(-1.411)
GDP per capita $_{t-1}$							0.000	0.000	0.000	0.000	0.000	0.000
							(0.687)	(0.675)	(0.689)	(0.690)	(0.667)	(0.690)
GDP percentage change $_{t-1}$							0.063***	0.063***	0.063***	0.063***	0.063***	0.063***
							(2.946)	(2.943)	(2.952)	(2.939)	(2.944)	(2.946)
Unemployment rate $_{t-1}$							0.089**	0.088**	0.088**	0.088**	0.088**	0.088**
							(2.539)	(2.525)	(2.538)	(2.527)	(2.523)	(2.527)
Constant	1.986***	2.002***	1.992***	1.990***	2.003***	1.994***	0.827	0.847	0.831	0.831	0.855	0.834
	(160.177)	(206.203)	(221.898)	(227.178)	(291.556)	(290.034)	(1.205)	(1.233)	(1.211)	(1.211)	(1.248)	(1.216)
Standard errors	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank	Bank
Banks	649	649	649	649	649	649	630	630	630	630	630	630
Observations	12,067	12,067	12,067	12,067	12,067	12,067	11,946	11,946	11,946	11,946	11,946	11,946
Adjusted R-squared	0.987	0.986	0.987	0.987	0.986	0.987	0.987	0.987	0.987	0.987	0.987	0.987

Table 6
State-level probit regressions of the state interstate branching laws on payout ratios.
This table reports parameter estimates for the panel regression model described in Eq. (6a) and Eq. (6b), where *BRI dummy* is the dependent variable and the independent variables are dividend and payout ratios and macroeconomic variables. *BRI dummy* is a dummy variable equal to one when a state starts implementing the IBBEA ("effective dates" in Rice and Strahan, 2010) and zero before that quarter (a state is dropped out of the sample for subsequent quarters). The effective dates of the implementation of IBBEA for each state can be found in Table 1 of Rice and Strahan (2010). The independent variables are one-quarter lagged, including: weighted average values of the annual values of payout ratios, calculated using a 4-quarter rolling window (*WDTA*, *WDMV*, *WDCE*, *WTTA*, *WTMV*, *WTCE*), *Political balance*, *GDP per capita*, *GDP percentage change*, and *Unemployment rate* (definitions are provided in appendix, Table A.1). All variables are winsorized at the 1st and 99th percentile. All models are estimated using probit models with fixed effects. Standard errors are clustered at the state level and z-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

	Dependent variable: State BRI dummy											
$WDTA_{t-1}$	4.138						-0.011					
	(1.455)						(-0.011)					
$WDMV_{t-1}$		0.602						0.008				
		(1.149)						(0.051)				
$WDCE_{t-1}$			0.111						-0.060			
			(0.409)						(-0.599)			
$WTTA_{t-1}$				3.369						-0.149		
				(1.233)						(-0.186)		
$WTMV_{t-1}$					0.484						-0.011	
					(1.029)						(-0.075)	
$WTCE_{t-1}$						0.092						-0.061
						(0.346)						(-0.623)
Political balance $_{t-1}$	0.906	0.827	0.718	0.848	0.787	0.719	-0.328	-0.324	-0.359	-0.347	-0.332	-0.358
	(0.570)	(0.607)	(0.466)	(0.534)	(0.560)	(0.462)	(-0.505)	(-0.513)	(-0.555)	(-0.526)	(-0.523)	(-0.554)
GDP per capita $_{t-1}$	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.000*	0.000*	0.000	0.000*	0.000*	0.000
	(5.207)	(4.407)	(4.467)	(5.009)	(4.598)	(4.447)	(1.697)	(1.714)	(1.576)	(1.694)	(1.704)	(1.577)
GDP percentage change $_{t-1}$	-0.549***	-0.535***	-0.497***	-0.532***	-0.517***	-0.496***	-0.277**	-0.277**	-0.284**	-0.277**	-0.278**	-0.284**
	(-3.601)	(-2.913)	(-3.424)	(-3.646)	(-3.196)	(-3.436)	(-2.184)	(-2.198)	(-2.194)	(-2.170)	(-2.198)	(-2.195)
Unemployment rate $_{t-1}$	-1.445	-1.466	-1.109	-1.345	-1.354	-1.095	-0.048	-0.048	-0.057	-0.050	-0.049	-0.057
	(-1.132)	(-0.920)	(-0.896)	(-1.091)	(-0.919)	(-0.890)	(-0.318)	(-0.312)	(-0.376)	(-0.328)	(-0.323)	(-0.378)
Constant	-48.526***	-48.786***	-44.319***	-47.194***	-47.584***	-44.067***	-1.123	-1.179	-0.537	-1.012	-1.067	-0.524
	(-3.125)	(-3.569)	(-2.860)	(-2.988)	(-3.395)	(-2.829)	(-0.580)	(-0.589)	(-0.269)	(-0.537)	(-0.539)	(-0.264)
Fixed effects	State	state	state	state	state	state	Quarter	quarter	quarter	quarter	quarter	quarter
Standard errors	Bank	bank	bank	bank	bank	bank	Bank	bank	bank	bank	bank	bank
Observations	279	279	279	279	279	279	153	153	153	153	153	153
Pseudo R-squared	0.395	0.393	0.386	0.392	0.391	0.386	0.435	0.435	0.437	0.435	0.435	0.438

Table 7

Baseline regressions of dividend and payout ratios on *BRI dummy* or *Bank BRI* and a set of control variables for non-bank financial firms.

This table reports parameter estimates for the panel Tobit models. The dependent variables are: in column 1, total cash dividends divided by total assets (*DTA*); in column 2, total cash dividends divided by the market capitalization (*DMV*); in column 3, total cash dividends divided by the book value of common equity (*DCE*); in column 4, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in column 5, total payouts divided by market capitalization (*TMV*); in column 6, total payouts divided by book common equity (*TCE*). The *BRI dummy* variable equals one for quarters where there is a deregulation event in the state in which a bank primarily operates (and thereafter), and zero otherwise. The state where a bank primarily operates corresponds to the state in which the largest proportion of deposits are held. Deregulation events refer to the date on which a state began to permit interstate branching, as per the IBBEA of 1994. These dates can be found in Table 1 of Rice and Strahan (2010). *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. Definitions of control variables can be found in Table A.1 in Appendix 1. The dependent variables and all control variables are winsorized at the 1st and 99th percentile. Panel A reports estimates for panel Tobit models where the *BRI dummy* is included as an independent variable. Panel B reports estimates for panel Tobit models where the *Bank BRI* is included as an independent variable. The sample includes 239 non-bank financial firms which are publicly listed (SIC codes 6170-6200, 6300-6411, 6700-6799). Standard errors are clustered at the firm level and t-statistics are reported in parentheses. Constant included but not reported. State-year fixed effects included for both Panel A and Panel B. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Panel A:	(1)	(2)	(3)	(4)	(5)	(6)
BRI dummy	*DTA*	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
BRI dummy	-0.043	-0.080	-0.096	0.101	0.134	0.367
	(-0.997)	(-1.577)	(-1.040)	(0.903)	(1.075)	(1.261)
MTB	0.118***	-0.089***	0.151***	0.448***	-0.235***	0.692***
	(4.509)	(-3.044)	(2.654)	(4.062)	(-3.970)	(2.681)
Size	0.039***	0.051***	0.165***	0.068**	0.117***	0.467***
	(2.819)	(2.758)	(4.792)	(2.480)	(3.315)	(5.610)
Cash flow	2.618***	0.346	3.476*	9.563***	3.809*	20.988***
	(2.715)	(0.326)	(1.670)	(3.875)	(1.905)	(3.393)
Cash holdings	-0.131	-0.253	-0.299	0.261	0.503*	0.921
	(-0.796)	(-1.438)	(-0.775)	(0.957)	(1.667)	(1.113)
Retained earnings	0.298**	0.148	0.346	0.736***	0.445**	0.534
	(2.485)	(0.935)	(1.411)	(3.642)	(2.078)	(0.867)
Leverage	-0.060	-0.107	0.063	0.301	0.386	0.853
	(-0.438)	(-0.453)	(0.142)	(1.012)	(0.878)	(0.899)
Bank age	-0.001	0.001	0.003	0.001	-0.001	0.000
	(-0.415)	(0.411)	(0.389)	(0.181)	(-0.184)	(0.029)
Systematic risk	-13.313***	-11.111*	-27.199**	-21.300**	-13.471	-50.895*
	(-3.466)	(-1.849)	(-2.470)	(-2.444)	(-1.198)	(-1.870)
Panel B:	(1)	(2)	(3)	(4)	(5)	(6)
Bank BRI	*DTA*	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
BRI	-0.012	0.008	-0.130	0.035	-0.069*	-0.252***
	(-0.237)	(0.095)	(-0.915)	(1.242)	(-1.805)	(-2.639)
MTB	0.118***	-0.089***	0.151***	0.449***	-0.234***	0.693***
	(4.489)	(-3.054)	(2.643)	(4.068)	(-3.964)	(2.688)
Size	0.039***	0.051***	0.165***	0.068**	0.118***	0.468***
	(2.814)	(2.750)	(4.787)	(2.488)	(3.323)	(5.619)
Cash flow	2.624***	0.357	3.489*	9.553***	3.796*	20.952***
	(2.718)	(0.336)	(1.675)	(3.873)	(1.901)	(3.391)
Cash holdings	-0.130	-0.252	-0.297	0.259	0.501*	0.916
	(-0.792)	(-1.433)	(-0.771)	(0.953)	(1.662)	(1.108)
Retained earnings	0.298**	0.148	0.345	0.737***	0.446**	0.536
	(2.482)	(0.931)	(1.408)	(3.644)	(2.082)	(0.871)
Leverage	-0.059	-0.105	0.065	0.299	0.384	0.847
	(-0.433)	(-0.447)	(0.145)	(1.007)	(0.874)	(0.894)
Bank age	-0.001	0.001	0.003	0.001	-0.001	0.000
	(-0.416)	(0.410)	(0.388)	(0.183)	(-0.183)	(0.031)
Systematic risk	-13.298***	-11.085*	-27.165**	-21.335**	-13.515	-51.025*
	(-3.462)	(-1.844)	(-2.467)	(-2.448)	(-1.202)	(-1.875)
Standard errors	Firm	Firm	Firm	Firm	Firm	Firm
State-year FE	YES	YES	YES	YES	YES	YES
Firms	239	239	239	239	239	239
Observations	5,931	5,931	5,931	5,931	5,931	5,931

Table 8

Sample split regressions.

This table reports parameter estimates for the panel Tobit models described in Eq. (1) with state-year fixed effects. In Panel A, we report results for regressions where the sample is split such that banks that had either a value greater than (Above) or a value less than or equal to (Below) the median value for a particular bank characteristic are used. The bank characteristics used to split the samples include: the Lerner Index (*Lerner*); the bank-level Herfindahl-Hirschman Index (*Bank HHI*); the bank-level Boone indicator (*Boone*); and the return on assets (*ROA*). In Panel B, we report results for regressions where the sample is split into banks that do not have branches in more than one state, single-state banks (*SS*), and banks with branches in more than one state, non-single-state banks (*NSS*). The dependent variables are: in columns 1-2, total cash dividends divided by total assets (*DTA*); in columns 3-4, total cash dividends divided by market capitalization (*DMV*); in columns 5-6, total cash dividends divided by the book value of common equity (*DCE*); in columns 7-8, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in columns 9-10, total payouts divided by market capitalization (*TMV*); in columns 11-12, total payouts divided by book common equity (*TCE*). We report parameter estimates for *Bank BRI*. *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. Control variables are included in the model and their inclusion is indicated by a "YES" in the row labelled Control Variables. The definition of the control variables can be found in Table A.1 in Appendix 1. State-year fixed effects are included in the model and their inclusion is indicated by a "YES" in the row labelled State-year FE. The dependent variables and all control variables are winsorized at the 1st and 99th percentile. The sample of banks are from the universe of banks in Compustat Bank (SIC codes 6020-6163). The number of banks included in each regression is given in the row labelled Banks. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Panel A: Sample Split Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		DTA	*DTA*	*DMV*	*DMV*	*DCE*	*DCE*	*TTA*	*TTA*	*TMV*	*TMV*	*TCE*	*TCE*
		Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
Lerner	*Bank BRI*	-0.006**	-0.003	-0.042***	-0.014	-0.076***	-0.012	-0.007**	-0.005	-0.049***	-0.028	-0.081**	-0.038
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	588	538	588	538	588	538	588	538	588	538	588	538
Bank HHI	*Bank BRI*	-0.004*	-0.003	-0.030**	-0.016	-0.049*	-0.026	-0.005*	-0.006*	-0.042***	-0.031*	-0.063**	-0.058*
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	520	465	520	465	520	465	520	465	520	465	520	465
Boone	*Bank BRI*	-0.005**	-0.002	-0.028*	-0.021	-0.052**	-0.021	-0.006**	-0.002	-0.037**	-0.023	-0.067**	-0.013
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	330	280	330	280	330	280	330	280	330	280	330	280

Table 8 continued													
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Sample Split Variable		*DTA*	*DTA*	*DME*	*DME*	*DCE*	*DCE*	*TTA*	*TTA*	*TME*	*TME*	*TCE*	*TCE*
		Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
ROA	*Bank BRI*	-0.006**	-0.004	-0.040**	-0.022	-0.083**	-0.024	-0.008**	-0.004	-0.057***	-0.026	-0.109***	-0.028
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	607	541	607	541	607	541	607	541	607	541	607	541
Panel B: Sample Split Variable		*DTA*	*DTA*	*DME*	*DME*	*DCE*	*DCE*	*TTA*	*TTA*	*TME*	*TME*	*TCE*	*TCE*
		SS	NSS	SS	NSS	SS	NSS	SS	NSS	SS	NSS	SS	NSS
Single State	*Bank BRI*	-0.004***	0.000	-0.022**	-0.014	-0.039**	0.001	-0.005***	-0.007	-0.026**	-0.047	-0.044**	-0.064
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	620	162	620	162	620	162	620	162	620	162	620	162

Table 9

Sample split regressions using risk-shifting proxies.

This table reports parameter estimates for the panel Tobit models described in Eq. (1) with state-year fixed effects. We report results for regressions where the sample is split such that banks that had either a value greater than (Above) or a value less than or equal to (Below) the median value for a particular bank characteristic are used. The bank characteristics used to split the samples include: the natural logarithm of the Merton distance to default, calculated using the methodology in Bharath and Shumway (2008) (*LnDD*); the natural logarithm of the Z-score, calculated as the sum of the capital to asset ratio and the ROA divided by the standard deviation of the ROA (*Z Score (ln)*); the non-performing loan ratio, calculated as the ratio of non-performing assets to total assets (*NPL*); and systematic risk (*Systematic risk*). The dependent variables are: in columns 1-2, total cash dividends divided by total assets (*DTA*); in columns 3-4, total cash dividends divided by market capitalization (*DMV*); in columns 5-6, total cash dividends divided by the book value of common equity (*DCE*); in columns 7-8, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in columns 9-10, total payouts divided by market capitalization (*TMV*); in columns 11-12, total payouts divided by book common equity (*TCE*). We report parameter estimates for *Bank BRI*. *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. Control variables are included in the model and their inclusion is indicated by a "YES" in the row labelled Control Variables. The definition of the control variables can be found in Table A.1 in Appendix 1. State-year fixed effects are included in the model and their inclusion is indicated by a "YES" in the row labelled State-year FE. The dependent variables and all control variables are winsorized at the 1st and 99th percentile. The sample of banks are from the universe of banks in Compustat Bank (SIC codes 6020-6163). The number of banks included in each regression is given in the row labelled Banks. *** denotes $p<0.01$, ** denotes $p<0.05$, and * denotes $p<0.1$.

Sample Split Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		DTA	*DTA*	*DMV*	*DMV*	*DCE*	*DCE*	*TTA*	*TTA*	*TMV*	*TMV*	*TCE*	*TCE*
		Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
LnDD	*Bank BRI*	-0.001	-0.005**	-0.030	-0.026*	-0.028	-0.054**	-0.003	-0.005*	-0.045*	-0.030*	-0.056	-0.054*
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	584	618	584	618	584	618	584	618	584	618	584	618
Z Score (ln)	*Bank BRI*	-0.008*	-0.004	-0.072***	-0.022	-0.100**	-0.043	-0.009*	-0.007	-0.083***	-0.041*	-0.112*	-0.080
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	571	506	571	506	571	506	571	506	571	506	571	506
NPL	*Bank BRI*	-0.008**	0.000	-0.053***	-0.001	-0.083**	0.004	-0.009**	-0.001	-0.066***	-0.007	-0.102**	-0.004
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	531	556	531	556	531	556	531	556	531	556	531	556
Systematic risk	Bank BRI	-0.003	-0.005	-0.012	-0.047*	-0.022	-0.072	-0.003	-0.007	-0.014	-0.066**	-0.025	-0.101*
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	563	553	563	553	563	553	563	553	563	553	563	553

Table 10

Regressions of dividend and payout ratios on *Bank BRI* and a set of control variables for unlisted bank holding companies (BHC).

This table reports parameter estimates for the panel Tobit models, with fixed effects, described in Eq. (1) and Eq. (3). The dependent variables are: in column 1, total cash dividends divided by total assets (*DTA*); in column 2, total cash dividends divided by book equity (*DBE*); in column 3, total dividends plus share repurchases (*total payouts 1*) divided by total assets (*TTA1*); in column 4, total dividends plus share repurchases net of treasury stock sales (*total payouts 2*) divided by total assets (*TTA2*); in column 5, *total payouts 1* divided by book equity (*TBE1*); in column 6, *total payouts 2* divided by book equity (*TBE2*). *Bank BRI* is constructed as follows. The default setting for a BHC in a given year is a value of 4. We first assign each state-quarter BRI to BHC-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the BHC-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a BHC may have branches in several states. Therefore, we construct the BHC-level BRI to be a weighted-average of the BRI values for each state in which a BHC has deposits, where the weight applied is the proportion of total deposits held in any given state. Definitions of control variables can be found in Table A.1 in Appendix 1. All variables are winsorized at the 1st and 99th percentile. Panel A reports estimates for panel Tobit models with state-year fixed effects. Panel B reports estimates for panel Tobit models with BHC fixed effects only. The sample includes 1,254 BHCs which are not publicly listed. Standard errors are clustered at the BHC level and t-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Panel A: with state-year FE	(1)	(2)	(3)	(4)	(5)	(6)
	DTA	*DBE*	*TTA1*	*TTA2*	*TBE1*	*TBE2*
Bank BRI	0.000	0.000	0.000	0.000	0.000	0.000
	(0.265)	(0.271)	(0.387)	(0.268)	(0.337)	(0.209)
Size	-0.000	-0.001	-0.000	-0.000	0.000	-0.000
	(-1.437)	(-1.176)	(-0.206)	(-0.327)	(0.137)	(-0.010)
Profitability	0.515***	6.033***	0.520***	0.519***	6.172***	6.161***
	(15.687)	(15.118)	(15.035)	(15.035)	(14.513)	(14.502)
Cash holdings	-0.001	-0.013	-0.002	-0.002	-0.017	-0.016
	(-1.350)	(-1.245)	(-1.588)	(-1.551)	(-1.465)	(-1.429)
Retained earnings	0.001	0.023	0.003	0.003	0.044*	0.044*
	(0.709)	(1.027)	(1.392)	(1.404)	(1.758)	(1.771)
Leverage	0.003	0.140***	0.005**	0.005**	0.184***	0.182***
	(1.361)	(5.118)	(2.009)	(1.987)	(6.177)	(6.146)
Bank age	0.000***	0.000***	0.000**	0.000**	0.000**	0.000**
	(2.955)	(2.611)	(2.419)	(2.422)	(2.066)	(2.077)
Risk	0.009	0.392	-0.024	-0.022	0.009	0.042
	(0.219)	(0.876)	(-0.541)	(-0.486)	(0.018)	(0.088)
Standard errors	BHC	BHC	BHC	BHC	BHC	BHC
BHC FE	NO	NO	NO	NO	NO	NO
State-Year FE	YES	YES	YES	YES	YES	YES
BHCs	1,254	1,254	1,254	1,254	1,254	1,254
Observations	19,402	19,402	19,402	19,402	19,402	19,402

Panel B: with BHC FE	(1)	(2)	(3)	(4)	(5)	(6)
	DTA	*DBE*	*TTA1*	*TTA2*	*TBE1*	*TBE2*
Bank BRI	0.000	0.000	0.000	0.000	0.000	0.000
	(1.371)	(1.314)	(0.732)	(0.765)	(0.677)	(0.734)
Controls	YES	YES	YES	YES	YES	YES
Standard errors	BHC	BHC	BHC	BHC	BHC	BHC
BHC FE	YES	YES	YES	YES	YES	YES
State-Year FE	NO	NO	NO	NO	NO	NO
BHCs	1,254	1,254	1,254	1,254	1,254	1,254
Observations	19,402	19,402	19,402	19,402	19,402	19,402

Table 11

Price reaction to announcements of stable or increasing dividends per share (DPS).

This table reports the results of regressions where CARs are the dependent variable and the independent variable is a dummy equal to one if the DPS is the same as last quarter, or higher, and zero otherwise (*No dividend cut*). The CARs are estimated using the following model:

$$r_{it} - r_{ft=}\alpha_i + \beta_i(r_{mt-}r_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \beta_{io}MOM_t + \varepsilon_{it}$$

where r_{it} is the daily return on security *i*, r_{mt} is the daily return on the market portfolio (proxied by the value-weighted return on all NYSE, AMEX, and NASDAQ stocks (from CRSP), r_{ft} is the one-month Treasury bill rate, SMB_t is the Fama-French Small-Minus-Big factor, HML_t is the Fama-French High-Minus-Low factor, and MOM_t is the momentum factor. The CARs are estimated for the windows (-3,+3) and (-5,5), that is, three days before and after the date of the announcement of the dividend (including the date of the announcement), and five days before and after the date of the announcement of the dividend (including the date of the announcement). We consider an estimation window of 100 days (between –160 and –60 days before the announcement dates) and at least 70 days of valid returns.

	Bank BRI < 1	*1 < Bank BRI ≤ 2*	*2 < Bank BRI ≤ 3*	*3 < Bank BRI ≤ 4*	*0 < Bank BRI ≤ 2*	*2 < Bank BRI ≤ 4*
Panel A	CAR(-3,3)	CAR(-3,3)	CAR(-3,3)	CAR(-3,3)	CAR(-3,3)	CAR(-3,3)
No dividend cut	0.011	0.009	0.003	-0.002	0.011**	0.001
	(1.536)	(1.135)	(0.484)	(-0.354)	(2.047)	(0.189)
Constant	0.036**	0.004	0.010	-0.006	0.001	-0.008
	(2.134)	(0.150)	(0.571)	(-0.254)	(0.058)	(-0.335)
Observations	1,412	856	1,968	1,736	2,268	3,704
Adjusted R-squared	-0.023	0.055	-0.007	-0.011	0.008	-0.010
State-year FE	YES	YES	YES	YES	YES	YES
	Bank BRI < 1	*1 < Bank BRI ≤ 2*	*2 < Bank BRI ≤ 3*	*3 < Bank BRI ≤ 4*	*0 < Bank BRI ≤ 2*	*2 < Bank BRI ≤ 4*
Panel B	CAR(-5,5)	CAR(-5,5)	CAR(-5,5)	CAR(-5,5)	CAR(-5,5)	CAR(-5,5)
No dividend cut	0.020**	0.020**	0.007	0.000	0.021***	0.004
	(2.302)	(2.114)	(1.010)	(0.083)	(3.301)	(0.862)
Constant	0.020	-0.024	0.034	-0.010	-0.026	-0.014
	(1.010)	(-0.807)	(1.521)	(-0.364)	(-0.837)	(-0.455)
Observations	1,412	856	1,968	1,736	2,268	3,704
Adjusted R-squared	-0.021	0.054	-0.003	-0.009	0.011	-0.006
State-year FE	YES	YES	YES	YES	YES	YES

Table 12

Probit regressions of *Dividend increase* on *Bank BRI.*

This table reports parameter estimates for Probit regressions where the dependent variable, *Dividend increase,* takes the value of 1 if there is an increase in the dividend per share, and 0 otherwise. *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. Additional control variables are included in the model, and their definition can be found in Table A.1 in Appendix 1. All of the independent variables are one-quarter lagged. Standard errors are clustered either at the bank or at the state level. Robust z-statistics in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

	(1)	(2)	(4)	(5)
	Dividend increase	*Dividend increase*	*Dividend increase*	*Dividend increase*
Bank BRI	-0.078***	-0.087**	-0.078**	-0.087**
	(-2.592)	(-2.480)	(-2.261)	(-2.291)
MTB		0.805*		0.805
		(1.756)		(1.527)
Size		0.055***		0.055**
		(2.677)		(2.509)
Cash flow		37.713***		37.713***
		(3.904)		(3.332)
Cash holdings		-0.905		-0.905
		(-1.380)		(-1.029)
Retained earnings		-2.151***		-2.151**
		(-2.815)		(-2.290)
Leverage		-0.003		-0.003
		(-0.008)		(-0.008)
Bank age		-0.013***		-0.013***
		(-3.947)		(-3.569)
Systematic risk		3.725		3.725
		(0.694)		(0.922)
Constant	-0.530***	-1.696***	-0.530***	-1.696***
	(-3.568)	(-3.557)	(-16.130)	(-3.517)
Observations	12,785	10,874	12,785	10,874
Fixed Effects	state-year	state-year	state-year	state-year
Standard errors	Bank	Bank	State	State
Pseudo R-squared	0.0344	0.0461	0.0344	0.0461

Table 13
Regressions of stock repurchases ratios on *Bank BRI* and a set of control variables.
This table reports parameter estimates for the OLS models with fixed effects. The dependent variables are: in column 1, total share repurchases divided by total assets (*RTA*); in column 2, total share repurchases divided by market capitalization (*RMV*); in column 3, total share repurchases divided by book common equity (*RCE*). *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. Definitions of control variables can be found in Table A.1 in Appendix 1. All variables are winsorized at the 1st and 99th percentile. Panel A reports estimates for panel Tobit models with state-year fixed effects. Panel B reports estimates for panel Tobit models with bank fixed effects only. The sample includes 684 banks from the universe of banks in Compustat Bank (SIC codes 6020-6163). Standard errors are clustered at the bank level and t-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

	(1)	(2)	(3)	(4)	(5)	(6)
	RTA	*RMV*	*RCE*	*RTA*	*RMV*	*RCE*
Bank BRI	-0.001	-0.008	-0.014	0.005***	0.025***	0.050***
	(-0.550)	(-1.182)	(-1.029)	(4.081)	(4.587)	(3.549)
MTB	-0.003	-0.283*	0.293	0.127**	0.476**	1.720**
	(-0.092)	(-1.729)	(0.796)	(2.317)	(1.996)	(2.453)
Size	0.002	0.013	0.005	-0.022***	-0.104***	-0.275***
	(1.081)	(1.282)	(0.254)	(-3.370)	(-3.552)	(-3.411)
Cash flow	0.991*	4.463*	9.692*	0.178	0.163	-0.200
	(1.930)	(1.795)	(1.826)	(0.248)	(0.045)	(-0.026)
Cash holdings	-0.010	-0.065	-0.102	-0.098**	-0.434**	-1.091**
	(-0.491)	(-0.643)	(-0.467)	(-2.209)	(-2.098)	(-2.020)
Retained earnings	0.236***	1.186***	2.178***	-0.086	-0.909	-1.240
	(4.905)	(5.085)	(4.543)	(-0.591)	(-1.286)	(-0.704)
Leverage	0.015	0.136**	0.264**	-0.070**	-0.335**	-0.765**
	(1.229)	(2.053)	(2.051)	(-2.352)	(-2.339)	(-2.053)
Bank age	0.001*	0.003*	0.010***	0.010***	0.050***	0.111***
	(1.854)	(1.909)	(3.174)	(8.332)	(9.432)	(7.987)
Systematic risk	-0.752*	-4.922**	-8.736*	-1.705***	-9.181***	-20.479***
	(-1.900)	(-2.396)	(-1.903)	(-3.606)	(-3.923)	(-3.628)
Standard errors	Bank	Bank	Bank	Bank	Bank	Bank
Bank FE	NO	NO	NO	YES	YES	YES
State-year FE	YES	YES	YES	NO	NO	NO
Banks	684	684	684	684	684	684
Observations	14,173	14,173	14,173	14,173	14,173	14,173

Table 14

Baseline regressions of dividend and payout ratios on *BRI dummy 2* and a set of control variables.

This table reports parameter estimates for the panel Tobit models described in Eq. (2) and Eq. (4). The dependent variables are: in column 1, total cash dividends divided by total assets (*DTA*); in column 2, total cash dividends divided by market capitalization (*DMV*); in column 3, total cash dividends divided by book common equity (*DCE*); in column 4, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in column 5, total payouts divided by market capitalization (*TMV*); in column 6, total payouts divided by book common equity (*TCE*). The *BRI dummy 2* variable equals one if a given state at any given time removes barriers to single branch acquisition and/or state-wide deposit cap on branch acquisition. Deregulation events refer to the date on which a state began to permit interstate branching, as per the IBBEA of 1994. These dates can be found in Table 1 of Rice and Strahan (2010). Definitions of control variables can be found in Table A.1 in Appendix 1. The dependent variables and all control variables are winsorized at the 1st and 99th percentile. Panel A reports estimates for panel Tobit models with state-year fixed effects. Panel B reports estimates for panel Tobit models with bank fixed effects only. The sample includes 667 banks from the universe of banks in Compustat Bank (SIC codes 6020-6163). Standard errors are clustered at the bank level and t-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Panel A: With State-Year FE	(1)	(2)	(3)	(4)	(5)	(6)
	DTA	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
BRI dummy 2	0.019***	0.102***	0.187***	0.020***	0.113***	0.196***
	(3.871)	(3.357)	(3.678)	(3.838)	(3.462)	(3.612)
MTB	0.310***	-1.364***	4.030***	0.296***	-1.749***	4.074***
	(5.108)	(-4.386)	(5.855)	(3.983)	(-4.724)	(4.981)
Size	0.006**	0.032**	0.061**	0.010***	0.054***	0.091***
	(2.395)	(1.967)	(2.144)	(2.989)	(2.824)	(2.627)
Cash flow	9.475***	46.621***	80.277***	11.097***	53.924***	96.836***
	(7.606)	(7.254)	(6.795)	(8.663)	(7.742)	(7.360)
Cash holdings	-0.262***	-1.753***	-2.984***	-0.307***	-1.980***	-3.489***
	(-3.630)	(-4.386)	(-3.832)	(-3.860)	(-4.552)	(-4.082)
Retained earnings	0.618***	3.179***	3.701***	0.862***	4.358***	5.820***
	(6.162)	(5.459)	(3.463)	(7.394)	(6.728)	(4.816)
Leverage	-0.042	0.130	0.504	-0.031	0.254	0.719*
	(-1.262)	(0.637)	(1.366)	(-0.839)	(1.130)	(1.772)
Bank age	0.001***	0.009***	0.020***	0.002***	0.012***	0.029***
	(3.164)	(3.790)	(4.079)	(3.413)	(3.980)	(4.692)
Systematic risk	-1.063*	-6.935**	-12.210*	-1.840***	-12.400***	-22.145***
	(-1.959)	(-2.190)	(-1.954)	(-2.674)	(-3.255)	(-2.884)
Standard errors	Bank	Bank	Bank	Bank	Bank	Bank
Bank FE	NO	NO	NO	NO	NO	NO
State-year FE	YES	YES	YES	YES	YES	YES
Banks	667	667	667	667	667	667
Observations	13,604	13,604	13,604	13,604	13,604	13,604
Panel B: With Bank FE	*DTA*	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
BRI dummy 2	0.029***	0.171***	0.323***	0.010*	0.069**	0.119*
	(6.313)	(5.609)	(6.229)	(1.753)	(1.983)	(1.921)
Controls	YES	YES	YES	YES	YES	YES
Standard errors	Bank	Bank	Bank	Bank	Bank	Bank
Bank FE	YES	YES	YES	YES	YES	YES
State-year FE	NO	NO	NO	NO	NO	NO
Banks	667	667	667	667	667	667
Observations	13,604	13,604	13,604	13,604	13,604	13,604

Appendix 1

Table A.1

Variable definitions. Panel A contains definitions of variables constructed using CRSP and Compustat. These variables are used with the sample of listed commercial banks. Panel B contains definitions of variables constructed using data from the call reports, obtained from the Federal Reserve Bank of Chicago at a quarterly frequency (forms FR Y-9C).

Panel A: Variables constructed using CRSP and Compustat	
DTA	Cash dividends (*dvcq*) scaled by total assets (*acq*).
DMV	Cash dividends (*dvcq*) scaled by market capitalization (*MVE*). *MVE* is the fiscal-end price (*prcc_f*) times shares outstanding (*csho*).
DCE	Cash dividends (*dvcq*) scaled by book common equity (*ceqq*).
TTA	Total payouts scaled by total assets (*acq*). Total payouts are the sum of cash dividends and share repurchases. Share repurchases is measured as purchase of common and preferred stock (the Compustat data item *prstkcy*) minus the reduction of the book value of preferred stock (*pstkq*). As *prstkcy* is a year-to-date data, which means the number reported for each quarter, apart from the first quarter, cumulates all purchases of its current and previous quarters within the same year. We thus take the difference between quarters to obtain the quarterly purchases of common and preferred stock for each quarter. The value of share repurchases is set to 0 if missing or negative.
TMV	Total payouts scaled by *MVE*.
TCE	Total payouts scaled by book common equity (*ceqq*).
RTA	Share repurchases of common and preferred stock (the Compustat data item *prstkcy*) minus the reduction of the book value of preferred stock (*pstkq*), divided by total assets (*acq*). Since *prstkcy* is a year-to-date data, we take the difference between quarters to obtain the quarterly purchases of common and preferred stock for each quarter. The value is set to 0 if it is negative. The value of share repurchases is set to 0 if missing or negative.
RMV	Total share repurchases scaled by *MVE*.
RCE	Total share repurchases scaled by book common equity (*ceqq*).
Bank BRI	Weighted average Branch Restriction Index (BRI), developed by Rice and Strahan (2010). *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state Data on branch deposits for each bank was obtained from Call Report data.
BRI dummy	*BRI dummy* is equal to one for quarters where there is a deregulation event in the state in which a bank primarily operates (and thereafter), and zero otherwise. The state where a bank primarily operates corresponds to the state in which the largest proportion of deposits are held. Deregulation events refer to the date on which a state began to permit interstate branching, as per the IBBEA of 1994. These dates can be found in Table 1 of Rice and Strahan (2010).
BRI dummy 2	*BRI dummy 2* is equal to one if a state removes, at any given time, barriers to single branch acquisition and/or state-wide deposit cap on branch acquisition (Nguyen, Hagendorff, and Eshraghi, 2018).
MTB	Bank's market-to-book ratio (= (*atq* + book value of equity (*BE*) + market value of equity (*MVE*))/*atq*). *BE* is the stockholders' equity (*seqq*) minus preferred stock (*PREFSK*, equals to the liquidation value of preferred stock, *pstklq*, or the book value of preferred stock, *pstkq*, if missing). If *seqq* is missing, it is the total of shareholders' common equity (*ceqq*) plus purchase of common and preferred stock (*pstkq*) minus *PREFSK*. If both *seqq* and *ceqq* are missing, book value of equity is computed from total assets (Compustat item *atq*) minus total liabilities (*ltq*) minus *PREFSK*.
Size	Log of market capitalization, adjusted for inflation.
Cash flow	Cash flow to assets is computed as the current operating earnings before income tax (*coeitq*) plus all other current operating expenses (*ocoeq*) minus non-recurring income (*nriq*), divided by total assets (*atq*).
Cash holdings	Cash holdings are computed as cash and due from banks (*cdbtq*) plus federal funds sold and securities purchased under agreement to resell (*ffsspq*), divided by total assets (*atq*).
Retained earnings	Retained earnings (*req*) divided by total assets (*atq*).
Leverage	Long-term debt (*dlttq*) plus debt in current liabilities (*dlcq*), divided by the bank's market value (see the variable *MTB* for the calculation of market value).
Bank age	Bank age (in year-quarters) is computed as the difference between a given quarterly date and the bank's beginning date of stock data in CRSP.
Systematic risk	Systematic risk is defined as the standard deviation of the predicted value retrieved by regressing the daily stock returns in excess of risk free rate on the value-weighted market return.
Z-score (ln)	Z-score (ln) is the natural log of the ratio of ROA plus the capital ratio, divided by the standard deviation of ROA.

Continues in next page

Table A.1 continued from previous page	
Panel B: Variables constructed using BHC data	
DTA	Cash dividends (*BHCK4460*) scaled by total assets (*BHCK2170*).
DBE	Cash dividends (*BHCK4460*) scaled by book equity (total equity capital (*BHCK3210*) minus preferred stock and related surplus (*BHCK3283*)).
TTA1	Total payouts (cash dividends (*BHCK4460*) plus repurchases (*BHCK4783*)) scaled by total assets (*BHCK2170*).
TTA2	Total net payouts (cash dividends (*BHCK4460*) plus repurchases (*BHCK4783*) minus sale of treasury stock (*BHCK4782*)) scaled by total assets (*BHCK2170*).
TBE1	Total payouts (cash dividends (*BHCK4460*) plus repurchases (*BHCK4783*)) scaled by book equity (total equity capital (*BHCK3210*) minus preferred stock and related surplus (*BHCK3283*)).
TBE2	Total net payouts (cash dividends (*BHCK4460*) plus repurchases (*BHCK4783*) minus sale of treasury stock (*BHCK4782*)) scaled by book equity (total equity capital (*BHCK3210*) minus preferred stock and related surplus (*BHCK3283*)).
Size	Log of total assets (*BHCK2170*).
Profitability	Net income (*BHCK4340*) scaled by total assets (*BHCK2170*).
Cash holdings	Between 1994 and 1996:
	(*BHCK0081*-Noninterest-bearing balances and currency and coin + *BHCK0395*-Interest-bearing balances in US offices + *BHCK0397*-Interest-bearing balances in foreign offices, edge and agreement subsidiaries and ibfs + *BHCK0276*-Federal funds sold + *BHCK0277*-Securities purchased under agreements to resell) / *BHCK2170*-Total assets.
	Between 1997 and 2001:
	(*BHCK0081*-Noninterest-bearing balances and currency and coin + *BHCK0395*-Interest-bearing balances in US offices + *BHCK0397*-Interest-bearing balances in foreign offices, edge and agreement subsidiaries and ibfs + *BHCK1350*-Federal funds sold and securities purchased under agreements to resell in domestic offices of the bank and of its edge and agreement subsidiaries, and in ibfs) / *BHCK2170*-Total assets.
	From 2002 onwards:
	(*BHCK0081*-Noninterest-bearing balances and currency and coin + BHCK0395-Interest-bearing balances in US offices + *BHCK0397*-Interest-bearing balances in foreign offices, edge and agreement subsidiaries and ibfs + *BHDMB987*-Federal funds sold in domestic offices + *BHCKB989*-Securities purchased under agreements to resell) / *BHCK2170*-Total assets.
Retained earnings	Retained earnings (*BHCK3247*) scaled by total assets (*BHCK2170*).
Leverage	Total liabilities (total assets (*BHCK2170*) minus total equity capital (*BHCK3210*)) scaled by total assets (*BHCK2170*).
Bank age	Number of years since commencement of existence (*RSSD9052).*
Risk	Standard deviation of quarterly *Profitability*, computed using the past four quarters.
Panel C: State-level variables	
WDTA, WDMV, WDCE, WTTA, WTMV, WTCE	Weighted average values of the annual values of payout ratios. For each payout ratio, we use the sum of the ratio over the current and prior three quarters.
Political balance	Political balance variable is to measure the political climate. It is a ratio of the number of Democrats to the total number of Democrats and Republicans in the House of Representatives for each state.
GDP per capita	Real GDP per capita (source: Bureau of Economic Analysis) is (((GDP in level*1000000)/Population)*100)/GDP Deflator in 2005 dollars. GDP deflator data is from Federal Reserve Economic Data.
GDP percentage change	The GDP percentage change is the change of GDP in percentage (source: Bureau of Economic Analysis).
Unemployment rate	Unemployment rate by state (source: Bureau of Labor Statistics).

Appendix 2

We estimate three alternative bank-level proxies for competition.

Lerner Index

Firstly, we estimate the Lerner index for each bank in the dataset. The Lerner index measures the market power of each bank and is defined by:

$$L_{it} = \frac{P_{it} - MC_{it}}{P_{it}} \tag{A.2.1}$$

where P_{it} is the output price and MC_{it} is the marginal cost of bank *i* at time *t*. To estimate the output price we divide total revenue by total assets.[21] To estimate marginal cost we follow Anginer, Demirguc-Kunt, and Zhu (2014) and differentiate a log cost function for each bank.

The log cost function we estimate is,

$$\begin{aligned}\log(C_{it}) = {} & \alpha + \beta_1 \log(Q_{it}) + \beta_2 (\log(Q_{it}))^2 + \beta_3 \log(W_{1,it}) + \beta_4 \log(W_{2,it}) + \beta_5 \log(W_{3,it}) \\ & + \beta_6 \log(Q_{it}) \log(W_{1,it}) + \beta_7 \log(Q_{it}) \log(W_{2,it}) + \beta_8 \log(Q_{it}) \log(W_{3,it}) \\ & + \beta_9 (\log(W_{1,it}))^2 + \beta_{10} (\log(W_{2,it}))^2 + \beta_{11} (\log(W_{3,it}))^2 + \beta_{12} \log(W_{1,it}) \log(W_{2,it}) \\ & + \beta_{13} \log(W_{1,it}) \log(W_{3,it}) + \beta_{14} \log(W_{2,it}) \log(W_{3,it}) + \beta_{15} \tau_t + \beta_{16} \tau_t^2 + \beta_{17} \tau_t \log(Q_{it}) \\ & + \beta_{18} \tau_t \log(W_{1,it}) + \beta_{19} \tau_t \log(W_{2,it}) + \beta_{20} \tau_t \log(W_{3,it}) + \lambda_i + \varepsilon_{it},\end{aligned}$$

where C_{it} is the total cost, Q_{it} is total assets, $W_{1,it}$ is the ratio of interest expense to total assets, $W_{2,it}$ is personnel expenses divided by total assets, $W_{3,it}$ is the ratio of administrative and other operating expenses to total assets, τ_t is a time trend and λ_i are bank fixed effects. The terms involving a time trend are including to capture how improvements in technology over time affect costs. The following Compustat data items were used to construct the variables: *xintq* (interest expense), *xlrq* (personnel expense) and *ocoeq* (administrative and other operating expenses). When estimating the log cost function, we also impose the following homogeneity constraints:

$$\begin{aligned}\beta_3 + \beta_4 + \beta_5 &= 1 \\ \beta_6 + \beta_7 + \beta_8 &= 0 \\ \beta_9 + \beta_{12} + \beta_{13} &= 0 \\ \beta_{10} + \beta_{12} + \beta_{14} &= 0 \\ \beta_{11} + \beta_{13} + \beta_{14} &= 0.\end{aligned}$$

The marginal cost can then be estimated by taking the derivative of the log cost function with respect to Q_{it},

[21] We use the *iditq* (total revenue from interest), *tniiq* (total non-interest revenue) and *atq* (total assets) data items from Compustat.

$$MC_{it} = \frac{\partial C_{it}}{\partial Q_{it}} = \left(\frac{C_{it}}{Q_{it}}\right) \times \left(\beta_1 + 2\beta_2 \log(Q_{it}) + \beta_6 \log(W_{1,it}) + \beta_7 \log(W_{2,it}) + \beta_8 \log(W_{3,it}) + \beta_{17}\tau_t\right)$$

(A.2.2)

Herfindahl-Hirschman Index

Secondly, we estimate a bank-level Herfindahl-Hirschman index (HHI). To compute the bank-level HHI, we first estimate a state-level HHI based on the deposits held in each state,

$$HHI_s = \frac{Dps_s^2}{\sum_{s=1}^{n} Dps_s^2},$$

where Dps_s is the amount of deposits, in dollars, held in state s. It should be noted that Dps_s is computed using the Summary of Deposits data made available by the Federal Deposit Insurance Corporation (FDIC). The bank-level HHI is then computed by,

$$bank\ HHI_i = \sum_{s=1}^{n} prop.Dps_{s,i} \times HHI_s,$$

where $prop.Dps_{s,i}$ is the proportion of deposits held in state s by bank i. In other words, the bank-level HHI is a weighted average of the state-level HHI, where the weights for each bank are determined by the proportion of deposits held in each state.

Boone Indicator

Thirdly, we estimate a bank-level Boone indicator using the following regression,

$$ln\pi_{i,t} = \alpha_i + \beta_i lnc_{i,t} + u_{i,t}, \quad \text{(A.2.3)}$$

where β_i is the bank-level Boone indicator, $\pi_{i,t}$ is bank profitability and $c_{i,t}$ is the average cost faced by bank i.[22] The estimated Boone indicator β_i is negative. Lower values, i.e., more negative values, of β_i signify a bank is less efficient and faces more intense competition.

Although theoretically marginal costs should be used to estimate the Boone indicator, we follow Schaeck and Cihák (2014) and use average cost.[23] Specifically, $c_{i,t}$ is the ratio of average cost to total income for bank i. Average cost is the sum of interest expense, personnel expense and administrative and other operating expenses. Total income is the sum of total

[22] We estimated an alternative specification in which time fixed effects were included, as per the estimation in Schaeck and Cihák (2014). However, the results we obtained did not change qualitatively. For parsimony, we exclude time fixed effects.

[23] When estimating the Boone indicator, we tried running the regression in Equation (A.2.3) using marginal costs estimated from Equation (A.2.2). However, in order to ensure a sufficient number of observations were available to estimate both Equations (A.2.2) and (A.2.3), a relatively large number of banks were dropped, resulting in a sample which was not representative of the one used to estimate our baseline regressions.

revenue from interest and total non-interest revenue. We also follow Schaeck and Cihák (2014) and use ROA as a proxy for profitability.

The Compustat data items used to construct average costs and total income are identical to those defined for the Lerner index. The Compustat data items used to construct ROA are *niq* (net income) and *atq* (total assets).

Market Contestability and Payout Policy

Supplementary Appendix (not for publication)

Table S.1
Baseline regressions of dividend and payout ratios on *Bank BRI* and a set of control variables using Honorè's estimator.
This table reports parameter estimates for the panel Tobit models, with fixed effects, described in Eq. (1). All models are estimated using Honorè's (1992) estimator. The dependent variables are: in column 1, total cash dividends divided by total assets (*DTA*); in column 2, total cash dividends divided by market capitalization (*DMV*); in column 3, total cash dividends divided by book common equity (*DCE*); in column 4, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in column 5, total payouts divided by market capitalization (*TMV*); in column 6, total payouts divided by book common equity (*TCE*). *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. Definitions of control variables can be found in Table A.6 in Appendix 1. All variables are winsorized at the 1st and 99th percentile. Panel A reports estimates for panel Tobit models with state-year fixed effects. Panel B reports estimates for panel Tobit models with bank fixed effects only. The sample includes 684 banks from the universe of banks in Compustat Bank (SIC codes 6020-6163). Standard errors are clustered at the bank level and t-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Panel A: With State-Year FE	(1)	(2)	(3)	(4)	(5)	(6)
	DTA	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
Bank BRI	-0.003	-0.023**	-0.036*	-0.005**	-0.032**	-0.050*
	(-1.639)	(-2.373)	(-1.667)	(-2.328)	(-2.386)	(-1.847)
MTB	0.339***	-1.531***	4.473***	0.335***	-1.963***	4.683***
	(11.330)	(-9.251)	(10.143)	(7.912)	(-8.638)	(9.017)
Size	0.005***	0.023***	0.043***	0.008***	0.043***	0.066***
	(3.904)	(3.229)	(2.787)	(4.144)	(4.489)	(3.568)
Cash flow	9.871***	45.780***	80.824***	11.798***	52.600***	97.795***
	(10.931)	(9.279)	(9.542)	(10.967)	(8.725)	(9.644)
Cash holdings	-0.178***	-1.407***	-2.289***	-0.197***	-1.492***	-2.523***
	(-5.096)	(-7.663)	(-6.179)	(-4.443)	(-6.072)	(-5.822)
Retained earnings	0.493***	2.526***	2.140***	0.738***	3.603***	4.125***
	(9.018)	(12.247)	(3.588)	(10.604)	(10.243)	(6.781)
Leverage	-0.040**	0.122	0.597***	-0.027	0.244	0.851***
	(-2.229)	(0.897)	(3.032)	(-1.076)	(1.508)	(3.496)
Bank age	0.001***	0.008***	0.016***	0.002***	0.010***	0.026***
	(4.126)	(6.958)	(5.953)	(4.394)	(5.388)	(6.532)
Systematic risk	-0.713*	-5.647**	-7.965*	-1.543***	-10.890***	-17.962***
	(-1.860)	(-2.244)	(-1.727)	(-2.747)	(-3.548)	(-2.967)
Standard errors	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap
Bank FE	NO	NO	NO	NO	NO	NO
State-year FE	YES	YES	YES	YES	YES	YES
Banks	684	684	684	684	684	684
Observations	14,173	14,173	14,173	14,173	14,173	14,173
Panel B: With Bank FE	*DTA*	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
BRI	-0.008***	-0.044***	-0.085***	-0.004**	-0.022**	-0.042***
	(-6.247)	(-6.295)	(-6.017)	(-2.092)	(-2.131)	(-2.915)
Controls	YES	YES	YES	YES	YES	YES
Standard errors	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap
Bank FE	YES	YES	YES	YES	YES	YES
State-year FE	NO	NO	NO	NO	NO	NO
Banks	684	684	684	684	684	684
Observations	14,173	14,173	14,173	14,173	14,173	14,173

Table S.2
Baseline regressions of dividend and payout ratios on *BRI dummy* and a set of control variables using Honorè's estimator.
This table reports parameter estimates for the panel Tobit models described in Eq. (2). All models are estimated using Honorè's (1992) estimator. The dependent variables are: in column 1, total cash dividends divided by total assets (*DTA*); in column 2, total cash dividends divided by market capitalization (*DMV*); in column 3, total cash dividends divided by book common equity (*DCE*); in column 4, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in column 5, total payouts divided by market capitalization (*TMV*); in column 6, total payouts divided by book common equity (*TCE*). The *BRI dummy* variable equals one for quarters where there is a deregulation event in the state in which a bank primarily operates (and thereafter), and zero otherwise. The state where a bank primarily operates corresponds to the state in which the largest proportion of deposits are held. Deregulation events refer to the date on which a state began to permit interstate branching, as per the IBBEA of 1994. These dates can be found in Table 1 of Rice and Strahan (2010). Definitions of control variables can be found in Table A.1 in Appendix 1. The dependent variables and all control variables are winsorized at the 1st and 99th percentile. Panel A reports estimates for panel Tobit models with state-year fixed effects. Panel B reports estimates for panel Tobit models with bank fixed effects only. The sample includes 684 banks from the universe of banks in Compustat Bank (SIC codes 6020-6163). Standard errors are clustered at the bank level and t-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Panel A: With	(1)	(2)	(3)	(4)	(5)	(6)
State-Year FE	*DTA*	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
BRI dummy	0.023***	0.109***	0.230***	0.024***	0.116***	0.237***
	(5.145)	(4.117)	(4.788)	(3.114)	(3.644)	(3.692)
MTB	0.328***	-1.570***	4.377***	0.323***	-1.645***	4.316***
	(8.895)	(-8.314)	(13.034)	(8.868)	(-8.695)	(12.388)
Size	0.005***	0.025***	0.045**	0.006***	0.029***	0.052***
	(4.380)	(2.721)	(2.469)	(4.175)	(3.091)	(3.714)
Cash flow	9.957***	46.158***	81.481***	10.122***	47.633***	83.729***
	(11.202)	(9.606)	(8.527)	(10.569)	(9.349)	(8.542)
Cash holdings	-0.178***	-1.412***	-2.276***	-0.176***	-1.396***	-2.309***
	(-5.220)	(-7.659)	(-6.978)	(-4.535)	(-5.989)	(-6.384)
Retained earnings	0.494***	2.546***	2.124***	0.455***	2.315***	1.697***
	(10.830)	(7.356)	(4.203)	(9.566)	(9.013)	(2.870)
Leverage	-0.041*	0.117	0.594***	-0.044*	0.108	0.568***
	(-1.901)	(1.077)	(3.316)	(-1.913)	(0.912)	(2.634)
Bank age	0.001***	0.008***	0.016***	0.001***	0.007***	0.016***
	(4.770)	(5.994)	(6.063)	(3.333)	(5.136)	(6.719)
Systematic risk	-0.800**	-6.032**	-8.889*	-0.768*	-5.952**	-8.431**
	(-2.363)	(-2.100)	(-1.888)	(-1.815)	(-2.198)	(-2.432)
Standard errors	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap
Bank FE	NO	NO	NO	NO	NO	NO
State-year FE	YES	YES	YES	YES	YES	YES
Banks	684	684	684	684	684	684
Observations	14,140	14,140	14,140	14,140	14,140	14,140
Panel B: With Bank FE	*DTA*	*DMV*	*DCE*	*TTA*	*TMV*	*TCE*
BRI dummy	0.034***	0.211***	0.390***	0.033***	0.206***	0.378***
	(8.462)	(9.027)	(8.584)	(6.748)	(6.281)	(6.491)
Controls	YES	YES	YES	YES	YES	YES
Standard errors	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap
Bank FE	YES	YES	YES	YES	YES	YES
State-year FE	NO	NO	NO	NO	NO	NO
Banks	684	684	684	684	684	684
Observations	14,140	14,140	14,140	14,140	14,140	14,140

Table S.3
Regressions of dividend and payout ratios on *Bank BRI* and a set of control variables for unlisted bank holding companies (BHC) using Honorè's estimator.
This table reports parameter estimates for the panel Tobit models, with fixed effects, described in Eq. (1) and (3). All models are estimated using Honorè's (1992) estimator. The dependent variables are: in column 1, total cash dividends divided by total assets (*DTA*); in column 2, total cash dividends divided by book equity (*DBE*); in column 3, total dividends plus share repurchases (*total payouts 1*) divided by total assets (*TTA1*); in column 4, total dividends plus share repurchases net of treasury stock sales (*total payouts 2*) divided by total assets (*TTA2*); in column 5, *total payouts 1* divided by book equity (*TBE1*); in column 6, *total payouts 2* divided by book equity (*TBE2*). *Bank BRI* assigns to each BHC in each quarter the BRI of the state in which a BHC operates. If a BHC operates in multiple states, then a weighted average of the BRIs for the states in which the BHC operates is used. Each quarter, the weights in the calculation of *Bank BRI* are set equal to the proportion of deposits held in each state by a BHC. The values of BRI for each state can be found in Table 1 of Rice and Strahan (2010). Definitions of control variables can be found in Table A.1 in Appendix 1. All variables are winsorized at the 1st and 99th percentile. Panel A reports estimates for panel Tobit models with state-year fixed effects. Panel B reports estimates for panel Tobit models with BHC fixed effects only. The sample includes 1,254 BHCs which are not publicly listed. Standard errors are clustered at the BHC level and t-statistics are reported in parentheses. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Panel A: with State-Year FE	(1)	(2)	(3)	(4)	(5)	(6)
	DTA	*DBE*	*TTA1*	*TTA2*	*TBE1*	*TBE2*
Bank BRI	0.000	0.000	0.000	0.000	0.001	0.000
	(0.321)	(0.455)	(0.518)	(0.494)	(0.660)	(0.503)
Size	-0.000***	-0.002***	-0.000***	-0.000***	-0.001*	-0.001**
	(-6.816)	(-6.569)	(-2.773)	(-2.935)	(-1.898)	(-2.068)
Profitability	0.724***	8.610***	0.730***	0.731***	8.811***	8.824***
	(26.110)	(26.421)	(22.406)	(25.850)	(24.733)	(25.497)
Cash holdings	-0.001*	-0.008	-0.001	-0.001*	-0.009	-0.008
	(-1.799)	(-1.427)	(-1.557)	(-1.950)	(-1.404)	(-1.265)
Retained earnings	-0.001	-0.000	0.003*	0.003**	0.047***	0.047**
	(-1.038)	(-0.025)	(1.776)	(2.006)	(2.601)	(2.435)
Leverage	0.001	0.213***	0.004**	0.004**	0.294***	0.291***
	(0.511)	(17.139)	(2.228)	(2.254)	(13.489)	(12.150)
Bank age	0.000***	0.000***	0.000***	0.000***	0.000**	0.000**
	(4.087)	(3.060)	(2.866)	(2.677)	(2.403)	(2.356)
Risk	0.116***	1.641***	0.090**	0.095**	1.268**	1.332**
	(3.267)	(3.277)	(2.125)	(2.346)	(2.113)	(2.096)
Standard errors	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap
BHC FE	NO	NO	NO	NO	NO	NO
State-Year FE	YES	YES	YES	YES	YES	YES
BHCs	1,254	1,254	1,254	1,254	1,254	1,254
Observations	19,402	19,402	19,402	19,402	19,402	19,402
Panel B: with BHC FE	(1)	(2)	(3)	(4)	(5)	(6)
	DTA	*DBE*	*TTA1*	*TTA2*	*TBE1*	*TBE2*
Bank BRI	0.000	0.000	0.000	0.000	-0.000	0.000
	(1.007)	(0.731)	(0.108)	(0.175)	(-0.025)	(0.099)
Controls	YES	YES	YES	YES	YES	YES
Standard errors	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap	Bootstrap
BHC FE	YES	YES	YES	YES	YES	YES
State-Year FE	NO	NO	NO	NO	NO	NO
BHCs	1,254	1,254	1,254	1,254	1,254	1,254
Observations	19,402	19,402	19,402	19,402	19,402	19,402

Table S.4

Sample split regressions using Honorè's estimator.

This table reports parameter estimates for the panel Tobit models described in Eq. (1) with state-year fixed effects. All models are estimated using Honorè's (1992) estimator. In Panel A, we report results for regressions where the sample is split such that banks that had either a value greater than (Above) or a value less than or equal to (Below) the median value for a particular bank characteristic are used. The bank characteristics used to split the samples include; the Lerner Index (*Lerner*); the bank-level Herfindahl-Hirschman Index (*Bank HHI*); the bank-level Boone indicator (*Boone*); and the return on assets (*ROA*). In Panel B, we report results for regressions where the sample is split into banks that do not have branches in more than one state, single-state banks (*SS*), and banks with branches in more than one state, non-single-state banks (*NSS*). The dependent variables are: in columns 1-2, total cash dividends divided by total assets (*DTA*); in columns 3-4, total cash dividends divided by market capitalization (*DMV*); in columns 5-6, total cash dividends divided by the book value of common equity (*DCE*); in columns 7-8, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in columns 9-10, total payouts divided by market capitalization (*TMV*); in columns 11-12, total payouts divided by book common equity (*TCE*). We report parameter estimates for *Bank BRI*. *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. Control variables are included in the model and their inclusion is indicated by a "YES" in the row labelled Control Variables. The definition of the control variables can be found in Table A.1 in Appendix 1. State-year fixed effects were included in the model and their inclusion is indicated by a "YES" in the row labelled State-year FE. The dependent variables and all control variables are winsorized at the 1st and 99th percentile. The sample of banks are from the universe of banks in Compustat Bank (SIC codes 6020-6163). The number of banks included in each regression is given in the row labelled Banks. Standard errors are bootstrapped. *** denotes $p<0.01$, ** denotes $p<0.05$, and * denotes $p<0.1$.

Panel A: Sample Split Variable		(1) *DTA*	(2) *DTA*	(3) *DMV*	(4) *DMV*	(5) *DCE*	(6) *DCE*	(7) *TTA*	(8) *TTA*	(9) *TMV*	(10) *TMV*	(11) *TCE*	(12) *TCE*
		Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
Lerner	*Bank BRI*	-0.003	-0.006	-0.018	-0.066**	-0.038	-0.081	-0.007**	-0.007	-0.037**	-0.073***	-0.075**	-0.089
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	588	522	588	522	588	522	588	522	588	522	588	522
Bank HHI	*Bank BRI*	-0.003	-0.004	-0.026	-0.016	-0.044	-0.028	-0.005	-0.006**	-0.037*	-0.030**	-0.058	-0.059*
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	514	460	514	460	514	460	514	460	514	460	514	460
Boone	*Bank BRI*	-0.005*	-0.001	-0.025	-0.017	-0.052**	-0.014	-0.006**	-0.001	-0.033**	-0.018	-0.068*	-0.005
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	421	483	421	483	421	483	421	483	421	483	421	483
ROA	*Bank BRI*	-0.006	-0.003	-0.041*	-0.016	-0.086**	-0.017	-0.008	-0.003	-0.055**	-0.020	-0.113**	-0.019
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	600	533	600	533	600	533	600	533	600	533	600	533
Panel B: Sample Split Variable		*DTA*	*DTA*	*DME*	*DME*	*DCE*	*DCE*	*TTA*	*TTA*	*TME*	*TME*	*TCE*	*TCE*
		SS	*NSS*	*SS*	*NSS*	*SS*	*NSS*	*SS*	*NSS*	*SS*	*NSS*	*SS*	*NSS*
Single State	*Bank BRI*	-0.005***	-0.022***	-0.040***	-0.005***	-0.025***	-0.045**	0.000	-0.014	0.000	-0.007	-0.048	-0.063
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	Banks	620	162	620	162	620	162	620	162	620	162	620	162

Table S.5
Sample split regressions using risk-shifting proxies and Honorè's estimator.
This table reports parameter estimates for the panel Tobit models described in Eq. (1) with state-year fixed effects. All models are estimated using Honorè's (1992) estimator. We report results for regressions where the sample is split such that banks that had either a value greater than (Above) or a value less than or equal to (Below) the median value for a particular bank characteristic are used. The bank characteristics used to split the samples include: the natural logarithm of the Merton distance to default, calculated using the methodology in Bharath and Shumway (2008) (*LnDD*); the natural logarithm of the Z-score, calculated as the sum of the capital to asset ratio and the ROA divided by the standard deviation of the ROA (*Z Score (ln)*); the non-performing loan ratio, calculated as the ratio of non-performing assets to total assets (*NPL*); and systematic risk (*Systematic risk*). The dependent variables are: in columns 1-2, total cash dividends divided by total assets (*DTA*); in columns 3-4, total cash dividends divided by market capitalization (*DMV*); in columns 5-6, total cash dividends divided by the market value of common equity (*DCE*); in columns 7-8, total payouts (total dividends plus share repurchases) divided by total assets (*TTA*); in columns 9-10, total payouts divided by market capitalization (*TMV*); in columns 11-12, total payouts divided by common equity (*TCE*). We report parameter estimates for *Bank BRI*. *Bank BRI* is constructed as follows. The default setting for a bank in a given year is a value of 4. We first assign each state-quarter BRI to bank-quarter observations using the state branching restrictions index and the related effective date given in Table 1 of Rice and Strahan (2010). Then, we calculate the bank-level BRI (*Bank BRI*) in a given quarter, which takes into consideration the fact that a bank may have branches in several states. Therefore, we construct the bank-level BRI to be a weighted-average of the BRI values for each state in which a bank has deposits, where the weight applied is the proportion of total deposits held in any given state. Control variables are included in the model and their inclusion is indicated by a "YES" in the row labelled Control Variables. The definition of the control variables can be found in Table A.1 in Appendix 1. State-year fixed effects are included in the model and their inclusion is indicated by a "YES" in the row labelled State-year FE. The dependent variables and all control variables are winsorized at the 1st and 99th percentile. The sample of banks are from the universe of banks in Compustat Bank (SIC codes 6020-6163). The number of banks included in each regression is given in the row labelled Banks. *** denotes $p<0.01$, ** denotes $p<0.05$, and * denotes $p<0.1$.

Sample Split Variable		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		DTA	*DTA*	*DMV*	*DMV*	*DCE*	*DCE*	*TTA*	*TTA*	*TMV*	*TMV*	*TCE*	*TCE*
		Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
LnDD	*Bank BRI*	-0.000	-0.004*	-0.024	-0.022	-0.019	-0.046	-0.002	-0.004	-0.040*	-0.024	-0.050	-0.042
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	No Banks	575	608	575	608	575	608	575	608	575	608	575	608
Z Score (ln)	*Bank BRI*	-0.006	-0.003	-0.066***	-0.018	-0.081*	-0.038	-0.007	-0.007*	-0.073**	-0.037**	-0.089	-0.075**
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	No Banks	440	450	440	450	440	450	440	450	440	450	440	450
NPL	*Bank BRI*	-0.008**	0.000	-0.049***	0.001	-0.079***	0.004	-0.009**	-0.000	-0.062***	-0.004	-0.097**	-0.002
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	No Banks	523	548	523	548	523	548	523	548	523	548	523	548
Systematic risk	*Bank BRI*	-0.003	-0.003	-0.014	-0.036*	-0.025	-0.054	-0.003	-0.005	-0.015	-0.051	-0.026	-0.079
	Control Variables	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	State-year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	No Banks	488	472	488	472	488	472	488	472	488	472	488	472