

Bank Competition and Opacity

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Motivation

When banks manipulate financial statements to smooth earnings, circumvent capital requirements, and reduce taxes, investors are unable to accurately evaluate their performance. Bank opacity impedes sound governance and also hampers regulators' ability to ensure the safety and soundness of the banking system. As shown by Beatty and Liao (2011), Bushman and Williams (2012), and Huizinga and Laeven (2012), managed financial statements reduce bank stability, impair efficiency, and lower the quality of loan portfolios.

Nonetheless, little is known about the effect of regulation and competition on opacity. While Campbell and Kracaw (1980), Berlin and Loeys (1988), Morgan (2002), and Flannery et al. (2004) examine the comparative opacity of banks and nonfinancial firms, they do not study the determinants of bank opacity. Although Barth et al. (2004, 2009) and Beck et al. (2006) find that banks allocate capital more efficiently in countries with more severe penalties for erroneous disclosures, they do not examine the potential impact of competition on bank opacity. Given the importance of banks for economic growth, the scarcity of research on the market and regulatory determinants of bank opacity is surprising and consequential.

In our recent paper, “Competition and Bank Opacity,” we provide the first evaluation of how regulatory reforms that lower barriers to competition impact the quality of information disclosed by banks, and thereby assess conflicting theories about the effect of competition on opacity. Some theories indicate that increased competition compels banks to strengthen corporate governance—thereby elevating the quality of financial statements—in order to minimize the cost of raising capital. Similarly, research has found that competition can boost the quality of financial statements by facilitating comparisons with peer firms; it is easier to compare firms when they compete in similar markets. The availability of more reliable benchmarks facilitates more effective governance. Indeed, based on a field survey of 169 chief financial officers, Dichev et al. (2013), peer-firm comparisons are among the most important tools for detecting earnings management, a crucial step toward inducing bank holding companies (BHCs) to be more transparent.

In contrast, other theories predict that an intensification of competition will increase opacity in one of two ways. One view holds that competition will encourage firms to manipulate financial statements to deter potential rivals from entering the marketplace. Another holds that competition spurs executives to engage in unethical behavior, including the use of more aggressive accounting practices, to extract as much from the firm as possible before competition puts it out of business. Thus, theory provides contradicting perspectives on how competition shapes corporate reporting policies.

In this paper, we summarize of our research in Jiang, Levine, and Lin (2015), in which we evaluate the impact on opacity of regulatory reforms that intensify bank competition. In Section 2, we describe our methods. Section 3 presents the results and Section 4 concludes.

Methodology

To study how opacity is affected by regulatory reforms that lower barriers to competition, we need (a) measures of opacity and other bank characteristics and (b) exogenous regulatory reforms that change the competitive pressure on banks. By exogenous reforms, we mean reforms that intensify competition among banks but are not themselves triggered by either competition among banks or other factors that simultaneously change bank competition and the regulatory reforms. Such exogenous, regulatory-induced intensification of competition helps identify and isolate the impact of bank competition on opacity.

2.1 Measures of bank opacity and other bank characteristics

The Federal Reserve provides consolidated balance sheets and income statements for BHCs and their subsidiary banks on a quarterly basis starting in June 1986. Our sample contains 27,137 observations of quarterly statements issued by 911 BHCs headquartered in one of 48 states or the District of Columbia. Consistent with the literature on U.S. bank deregulation, we exclude Delaware and South Dakota from our sample because they changed their laws to encourage the entry and formation of credit-card banks. We also separately examine the subsidiary banks of these BHCs. This yields a sample of 55,015 bank-quarter observations on 2,879 banks belonging to 881 BHCs over the period from the third quarter of 1986 through 2006.

To construct a measure of bank opacity—the degree to which banks manipulate their financial statements—we use accounting models of loan-loss provisions (LLPs). The LLPs are the major mechanism through which banks manage both earnings and regulatory capital. The accounting literature, as discussed in Beatty and Liao (2014), uses econometric models to explain LLPs with fundamental determining variables. These models typically use information on changes in a bank’s nonperforming loans, such as loan size and growth, as well as changes in the economy of the state in which bank is headquartered. This includes changes in measures such as real estate prices, economic growth, and unemployment.

After estimating an accounting model of LLPs, we collected the errors from that estimation. That is, we calculated the difference between each bank’s actual LLP and the model’s prediction in each period. These errors are “abnormal” LLPs, or those which are not accounted for by fundamental bank-level and state-level determinants. If banks manipulate their LLPs to smooth earnings or satisfy regulatory capital requirements, this will show up in bigger (absolute values of) abnormal returns because the accounting models do not address such manipulations. An extensive accounting literature uses errors from such models to proxy for earnings management, as discussed in Beatty and Liao (2014).

We then compute the natural logarithm of the absolute value of these abnormal LLPs and use this as our empirical proxy of bank opacity. We use the absolute value of the errors because both positive and negative errors may reflect discretionary manipulation of LLPs. We use the natural logarithm because this makes it easier to interpret the results.

With this procedure, we construct measures of bank opacity for each subsidiary bank in every BHC and for each consolidated BHC, which is based on the consolidated financial accounts of the aggregate BHC. In this way, we provide the basis for analyses at both a more aggregate level (the BHC) and at a more granular level (the individual bank). To conduct such analyses, however, we need an exogenous change in the competitive pressures facing individual bank subsidiaries and BHCs.

2.2 Regulatory-induced competition

We construct two types of measures of the regulatory-induced competitive pressures facing banks. The first type of measure focuses on regulatory changes that influence competition among banks within a state, and varies by state and time. The second gauges how regulatory changes differentially affect the competitive pressures facing each individual bank, and varies by bank and time.

For both, it is crucial to review the process of interstate deregulation that spurred competition. During the last quarter of the 20th century, federal and state authorities reduced regulations that restricted the ability of banks to establish subsidiary banks and branches in other states. These policy changes made it easier for banks to cross state borders to enter new markets, resulting in greater competition that reduced interest rates on loans, increased interest rates on deposits, and did so without boosting loan delinquency rates (Jayaratne and Strahan, 1996, 1998).

From 1978 through 1995, states engaged in this process either by opening their markets unilaterally or by signing reciprocal bilateral and multilateral agreements, allowing out-of-state BHCs to enter their markets through acquisitions or by creating new subsidiaries. This process of deregulation by states ended with the federal Riegle-Neal Act, which was passed in 1994 and took effect the

following year. It eliminated restrictions on BHCs establishing subsidiary bank networks across state boundaries.

2.2.1 Regulatory changes that influence competition at the state-year level

There are several ways to date interstate bank deregulation in an individual state. Most researchers simply define a state as “deregulated” after it first lowers barriers to interstate banking with at least one other state. In our analyses, INTER equals 1 (one) for BHCs headquartered in a state in the years after deregulation and 0 (zero) otherwise. More recently, Goetz et al. (2013) create a measure of interstate bank deregulation that varies over time for each state.

Based on this work, we construct the following measure of interstate bank deregulation: $Ln(\# \text{ of States})_{jt}$ equals the natural logarithm of one plus the number of states whose banks can enter state j in year t . This measure evolves in a state-specific manner because some states unilaterally opened their borders and others proceeded with a multi-year process of bilateral and multilateral arrangements with other states.

2.2.2 Regulatory changes that influence competition at the bank-time level

There are potentially important limitations to the state-time regulatory reform measures that we just defined: They are not computed at the BHC or bank subsidiary level. Rather, they measure regulatory-induced changes in competitive pressures throughout an entire state. Even if these regulatory reforms are negatively associated with opacity, this does not necessarily imply that they reduced it by intensifying competition. Perhaps deregulation induced other policy reforms or was accompanied by changes in other factors that enhanced disclosure quality among banks within the state. Perhaps these other changes, not increased competition among banks, influence bank opacity.

In light of this concern, we developed a new strategy for constructing bank subsidiary and BHC specific measures of competition that vary over time. This strategy builds on the “gravity model,” which predicts that the costs to a business of opening a new site are positively associated with the distance between the business’s headquarters and the site. For example, after state j allows BHCs in state i to enter and establish subsidiaries, two subsidiaries in state j may face different competitive pressures from state i , depending on their distance to state i . For example, when California deregulates with Arizona, the banks in Southern California may face greater competitive pressures from BHCs in Arizona than banks in northern California. A large body of evidence validates the “gravity model” by showing that distance influences such investment decisions, including the decision of BHCs to open subsidiaries in other states (Goetz et al., 2013, 2015). We build a BHC-specific-time measure of deregulation-induced competition by integrating this gravity model into the process of interstate bank deregulation.

More formally, we first construct measures of the competitive environment associated with interstate banking facing each subsidiary. For each subsidiary, in each period, we identify those states whose BHCs can enter the subsidiary’s state. We then weight each of those states by the inverse of its distance to the subsidiary.

That is, we calculate the interstate bank competitive pressures facing a subsidiary, s , located in state j in period t as:

$$SUB_DIS_{s,j,t} = \sum_i [I_{j,i,t} / DIS_{s,i}],$$

where $I_{j,i,t}$ equals 1 if BHCs from state i are allowed to establish subsidiaries in state j in period t , and zero otherwise; and, $DIS_{s,i}$ equals the distance between subsidiary s and state i .

Second, we aggregate the subsidiary measures of competition to the BHC level and calculate the interstate bank competitive pressures facing BHC, b , located in state k in period t . We do this by identifying all of the subsidiaries in each BHC, i.e., all s within each b , and performing the following calculation:

$$BHC_DIS_{b,k,t} = \sum_{s \in b} \ln[SUB_DIS_{s,j,t}] * P_{s,b,t},$$

where $P_{s,b,t}$ is the proportion of assets of each subsidiary, s , within BHC, b , in period t , relative to the total assets of all of BHC b 's subsidiaries.¹ Thus, for each BHC in each period:

$$1 = \sum_{s \in b} P_{s,b,t},$$

A novel component of this approach is that it measures the time-varying, regulatory-induced competitive pressures facing each individual BHC and subsidiary bank.

2.3 Empirical methodology

We examine the impact of a regulatory-induced intensification of competition on bank opacity using (a) measures of competition that vary across U.S. states and (b) measures of competition that vary across individual banks. A key advantage of the bank-specific measures of competition is that we can control for *all* time-varying national and state characteristics as well as all time-invariant traits of each bank. When using the basic state-time measures of competition, we can control only for time-varying national characteristics and the time-invariant features of individual banks. More formally, when examining the state-time measures of competition, we control for time and bank fixed effects; and, when examining the bank-time measures of competition, we control for state-time and bank fixed effects.

Besides controlling for all of these characteristics, we also control for many bank characteristics. Specifically, we control for the size of the bank, past loan loss provisions, and the capital asset ratio of the bank. In robustness tests, we also control for bank profit and the nature of each bank's loan portfolio, e.g., the proportion of real estate, commercial and industrial, agriculture, individual, and foreign loans. The results hold in all cases.

1. In those cases where $SUB_DIS_{s,j,t} = 0$, we include the value as 0.000001.

Results

3.1 A picture says it all

To begin, consider a very simple result in which we examine a state-time measure of regulatory-induced competition. Figure 1 illustrates the evolution of bank opacity before and after a state first allows banks from any other state to enter and compete with “domestic” banks. In the figure, we set year zero (0) equal to the year in which a state first allows banks from another state to enter, i.e., when INTER switches from 0 to 1. We estimate the level of bank opacity before and after the regulatory change and plot the results. Thus, in the figure, time for each state is centered at year zero, such that one quarter before deregulation is -1 and one quarter after deregulation is +1, and so forth for the period 10 quarters before and after the regulatory reform. In the figure, we also provide the 95 percent confidence interval so that it is easy to assess whether the estimated change in opacity after the regulatory change is statistically significant.

Figure 1 has two significant messages that are confirmed by many additional tests conducted in Jiang, Levine, and Lin (2015). First, there is a distinct drop in the time series of abnormal accruals of LLPs when states start interstate bank deregulation. That is, the regulatory-induced intensification of competition among banks in the state induces a drop in opacity. Second, there is no evidence of trends in opacity before interstate bank deregulation. It is not that there are changes going on in bank opacity before the state deregulates restrictions on bank competition. Rather, there is a sharp reduction in bank opacity only after the state removes restrictions on interstate bank competition.

The economic impact is large. To get a sense, consider the ratio of our estimate of the degree to which a bank manipulates its earnings (bank opacity) to its profit (earnings before taxes and provisions in millions of U.S. dollars). We find that the average value of this ratio before a state deregulates is 0.28; i.e., earnings management accounts for about 28 percent of profits. After a state initially deregulates, this falls by more than half to about 13 percent. This result is consistent with the view that regulatory-induced competition induces a big drop in the degree to which BHCs manipulate their financial statements.

3.2 More results from state-time analyses

In addition to constructing these graphical analyses, we also examined the impact of regulatory-induced competition on bank opacity while controlling for many other factors using the methodology above. As discussed, we examine a measure of regulatory-induced competition that varies over time for each state: $\text{Ln}(\# \text{ of States})_{jt}$ equals the natural logarithm of 1 plus the number of states whose banks can enter state j in year t .

We find a negative, statistically significant, and economically large impact of competition on bank opacity. As states allow banks from more and more other states to compete in their “domestic” market, bank opacity falls further and further, giving markets easier access to accurate information. The impact is economically large. When moving from a situation in which a state does not allow out-of-state competition to one in which it allows banks from all states to enter, we find that bank opacity falls by more than 40 percent.

3.3 Results: BHC-specific and bank-specific measures of competition

We also use the BHC-specific and subsidiary-specific measures of deregulation-induced competition and discover that the competition measures are strongly and negatively associated with bank opacity. In these analyses, we differentiate among BHCs and subsidiaries within the same state that differ in terms of their distance to other states. These results hold when controlling for state-time fixed effects and bank fixed effects, as well as an assortment of time-varying BHC and subsidiary traits. Thus, the results are not driven by changes in regulatory policies or any other factors at the state-time level; rather, they are driven by the differential impact of interstate banking reforms on BHCs and subsidiaries within a state that arise because of their differential distance to competitors. The findings suggest that deregulation that intensified competition reduced bank opacity.

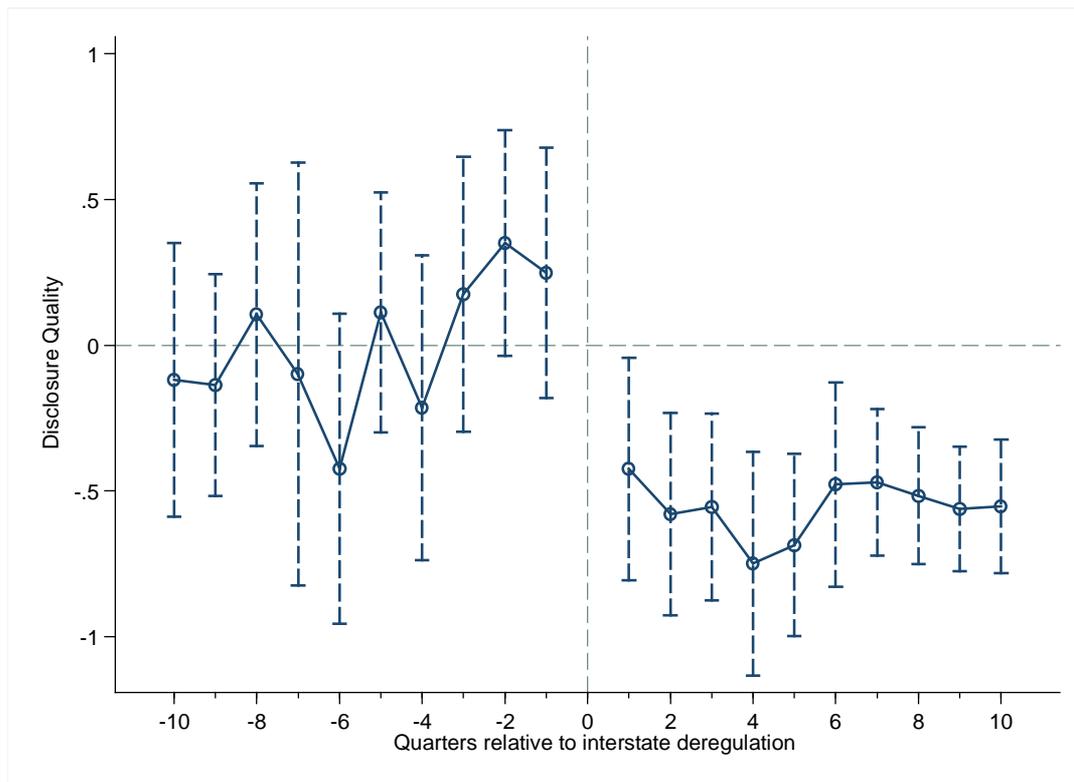
These findings are robust to several factors. We were concerned that the results might reflect changes in the actual quality of loans rather than earnings management. However, we find that deregulation does not explain actual loan charge-offs. Consistent with the view that competition reduces opacity, we find that the deregulation explains abnormal LLPs but not loan charge-offs. We were also concerned that the results might reflect BHCs expanding into different states and not the effects of competition. However, all of the results hold when limiting the sample to BHCs that never expand into other states. In this way, we focus only on changes in the competitive pressures, not the actual expansion of banks. Across many samples and when employing an array of control variables, we find that regulatory reforms that lowered barriers to competition decreased abnormal accruals of loan-loss provisions.

Conclusion

This paper contributes to our understanding of how regulatory reforms that permit competition among banks influence the private governance and regulatory oversight. Theory provides conflicting predictions about the impact of regulatory reforms that intensify competition on bank opacity. Some models predict that competition will induce bank executives to manipulate information either to hinder the entry of potential competitors or to extract as many private rents as possible in the short run because competition makes the long-run viability of the bank uncertain. Other models stress that competition will enhance efficiency, reduce managerial slack, and force banks to disclose more accurate information. We provide the first evaluation of the next impact of competition on disclosure quality.

We find that bank regulatory reforms that reduced barriers to competition reduced bank opacity. The findings are consistent with the view that exposing BHCs to greater competition will facilitate the monitoring of banks, bringing potential benefits to governance and regulation.

FIGURE 1: Evolution of Disclosure Quality Around Interstate Bank Deregulation



Note: This figure plots the impact of interstate bank deregulation on bank opacity, which is measured as the natural logarithm of the absolute value of residuals as defined in the paper. The figure examines interstate deregulation indicator, *INTER*, which is a dummy variable that equals 1 if a BHC is headquartered in a state that has passed an interstate bank deregulation, and 0 otherwise. For each state, 0 is when a state deregulates, i.e., when *INTER* switches from 0 to 1. We consider a 20-quarter window, spanning from 10 quarters before until 10 quarters after deregulation. The solid line denotes the estimated impact of *INTER* on bank opacity, while the dashed lines represent 95 percent confidence intervals. The graph is normalized by the pre-deregulation (periods 10 through 1) mean, so that the average value bank opacity across the 10 quarters before deregulation is set equal to 0 for illustrative purposes.

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