Banking Concentration and Fragility in the United States

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Abstract

Since the recent financial crisis, there has been increased attention to the implications of banking concentration in the United States and other advanced countries. In particular, some have warned that increased concentration poses substantial risks to the commercial banking system. In this paper, we examine how concentration among the largest banks in the United States has affected the stability of the banking system from the mid 1980s through the end of the crisis.

1 Introduction

Since the recent global financial crisis, there has been increasing attention paid to the implications of banking concentration in the United States and other advanced economies. In particular, some have argued that increased concentration poses substantial risks to the commercial banking system. For example, greater concentration could induce institutions to become aware of their "Too Big to Fail" status and incentivize them to take greater risks. However, alternative arguments advanced by the "concentration-stability" hypothesis have suggested that higher degrees of concentration lead to increased stability. For example, this could occur because banks with greater concentration are protected by monopoly rents in periods of financial distress.

Due to these conflicting mechanisms, one is left to empirical analysis to examine how concentration affects banking stability in practice. Existing empirical research tends to study the issue using cross-country data to see if banking concentration is positively correlated with the likelihood of a banking crisis. For example, an early contribution by Beck et al. (2006) finds that banking crises are less likely to take place in countries with greater concentration. In addition, Bretschger et al. (2012) expand the number of countries and find similar results. However, as they point out, their sample includes many more developing countries than advanced countries. Thus, it may be viewed as an open question whether concentration affects the stability of the banking system in advanced countries.

There are also potential issues surrounding what economic conditions actually constitute a banking crisis. Notably, Laeven and Valencia (2008) define a systemic banking crisis to be a period where "a country's corporate and financial sectors experience a large number of defaults and corporations face great difficulties repaying contracts on time." Further, they note: "Using this broad definition of a systemic banking crisis that combines qualitative data with some subjective assessment of the situation, we identify the starting year of systemic banking crises around the world since the year 1970." Thus, as can be observed, part of their assignment involves subjective judgement.

In light of these concerns, the objective of this paper is to study how banking concentration affects fragility in the commercial banking system in the United States. In particular, we investigate whether banking concentration is positively correlated with the probability of a bank failure in the United States since the beginning of the Great Moderation. We also examine how banking concentration affects the number of bank failures and the relative size of failures. In this manner, we can study how concentration not only affects whether a failure occurs but also how it influences the magnitude of banking distress. Such examination does not typically occur in the existing literature which focuses on how concentration is related to the *likelihood* of a banking crisis.

We begin by looking at quarterly observations on bank failures from Otto and Reed (2016). We also include data on failures during the recent financial crisis. These observations are obtained from the Federal Deposit Insurance Corporation of the United States. In addition, we consider whether concentration affects the magnitude of banking failures by studying total assets of failed institutions relative to the size of the commercial banking system. Next, we construct measures of banking concentration using individual bank asset holdings from the Report of Condition and Income (Call Report) Data available from the Federal Reserve Bank of Chicago.[1] Concentration measures may be obtained by looking at total assets for intermediaries that are depository institutions divided by total assets of all commercial banks in the United States. Notably, we study the implications of concentration using measures for the top three, five, and ten commercial banks.

As many have observed, there have been substantial changes in the degree of concentration in the United States over time. Figure 1 presents such evidence for 3-Firm, 5-Firm, and 10-Firm concentration ratios over the sample period. The data indicate that concentration ratios declined during the second half of the 1980s, but consistently increased beginning in the early 1990s. There are several reasons for these changes, but as described by Ennis (2001) and Jayaratne and Strahan (1997), states generally began removing geographic restrictions on banking in the mid 1980s.[2] In particular, Jayaratne and Strahan cite that all states besides Hawaii permitted out-of-state bank holding companies to buy in-state banks by 1990. This culminated in the Riegle-Neal Interstate Banking and Branching Efficiency Act in 1994 which was the final step in banking de-

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[1] https://www.chicagofed.org/banking/financial-institution-reports/commercial-bank-data.

[2] See also Janicki and Prescott (2006).

regulation. In particular, the Act permitted inter-state branching by banks and bank-holding companies. Kroszner and Strahan (1997) emphasize that technological developments reinforced this trend. Thus, it appears that de-regulation and advances in information technology were primary factors in the evolution of the size distribution of the banking sector in the United States in recent years.

We next turn to the data on fragility in the banking system in the United States. We begin by presenting summary statistics for fragility-related variables in Table 1. As can be observed, a bank failure in the United States occurs in nearly 80% of the quarters in the sample. In addition to the summary statistics, please see Figure 2 which presents information on the number of failures over time. In particular, the peak number of failures reached nearly 250 failures during the Savings and Loan Crisis in the first quarter of 1989. In the middle 1990s, the stability of the banking system improved which is indicated by the relatively small number of failures. This tranquility lasted over a decade until 2008 when the collapse of Bear Stearns and Lehman Brothers also coincided with an increase in bank failures. While there were only 30 failures in 2008, the number grew tremendously in 2009 to nearly 150 failures. It increased somewhat further in 2010.

Though the number of failures was generally much higher during the Savings and Loan Crisis than the Financial Crisis of 2008, the magnitude of failures was greater during the Crisis of 2008. Please see Figure 3 which shows the size of failures as a percentage of total assets in the banking system over time. The number barely reached above 1% during the Savings and Loan Crisis, but peaked at over 5% in 2009.

The remainder of the paper is organized in the following manner. Section 2 describes the additional data used in the analysis along with summary statistics and simple partial correlations across all of the variables. Section 3 begins the analysis by presenting empirical results which look at how measures of banking concentration are correlated with the probability of a failure, the number of failures, and the size of failures. The evidence generally suggests that higher degrees of concentration promote the stability of the *overall* banking system.

Given that concentration among the largest firms fosters stability, we next examine which attributes of such banks encourage stability. That is, as concentration promotes stability, which components of a bank's balance sheet matter? Existing empirical research on banking crises across countries does not consider this issue as it omits detailed information on asset holdings among banks. We attempt to answer this question in Section 4 by looking at how different assets on the largest banks' balance sheets play a role. The next question is *why*? In Section 5, we offer some preliminary evidence by looking at how asset holdings among the largest banks affect the overall return on assets in the commercial banking system. Section 6 summarizes the results and offers concluding remarks.

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2 Data

The full sample begins in the first quarter of 1984. This is the first date at which detailed asset holdings are publicly available in SAS Xport files in the Call Report data from the Federal Reserve Bank of Chicago. The dataset runs through the last quarter of 2010. In addition to studying the concentration ratios for the three, five and ten largest commercial banks, we also look at how the composition of the largest banks' balance sheets is related to banking fragility. For example, the 3-Firm Real Estate Loan Ratio represents the fraction of the three largest banks' balance sheets allocated to loans secured by real estate. We also consider the implications of other assets such as Commercial and Industrial Loans (3-Firm C&I Loan Ratio), Loans to Consumers (3-Firm Consumer Loan Ratio), Loans to other Financial Institutions (3-Firm Federal Funds and Reverse Repos Ratio), holdings of Treasuries (3-Firm Treasuries Ratio), and Cash Balances (3-Firm Cash Ratio). Definitions of variables at the 5-Firm and 10-Firm concentration levels follow analogously.

We turn to other control variables in the regressions. To begin, GDP-Growth represents the year on year growth in nominal GDP. The data is seasonally adjusted and available from the Federal Reserve Bank of St. Louis. We consider nominal GDP-Growth because we are primarily interested in how growth in housing prices affects the stability of the banking system. Further, asset returns in the commercial banking system are set in nominal terms. To the extent that asset returns are influenced by the level of macroeconomic activity, nominal GDP-growth seems to be a reasonable proxy. Moreover, separating between the influence of growth in housing prices and overall prices would be difficult to tease out so we focus on controlling for housing inflation. To be specific, we incorporate information on the year on year percentage change in the All-Transactions Housing Price Index from the Federal Housing Finance Agency.[3] In order to control for a measure of stress in the banking system, we include the one-year percentage change in discount window borrowings.

We also control for the size of the commercial banking system in two ways. First, by including information on the total number of commercial banks – this data can be obtained from the Reports of Condition and Income for all Insured U.S. Commercial Banks through the Federal Financial Institutions Examination Council. We also look at the quarterly average of total assets of commercial banks, derived from the Board of Governors of the Federal Reserve System. In keeping with the measure of GDP-Growth, we consider the variable in nominal terms. As we show below, real-estate assets are one of the largest components of banks' balance sheets in the commercial banking system.

As mentioned in the introduction, we consider three different measures of fragility in the banking system. The first is a dummy variable (Fail) for whether a failure of an FDIC-insured institution takes place. The second looks at the number of failures while the third considers the relative size of failures through the total assets of failed institutions scaled by the total assets of all commercial

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[3] Also obtained from the Federal Reserve Bank of St. Louis.

banks (Percentage Assets Failures). Finally, we intend to study how the size distribution of the banking sector affects the return on average assets (ROA) from the Reports of Condition and Income for all Insured Commercial Banks.

To begin, please see Table 1 which presents summary statistics for all of the variables in the regressions we construct. Table 2 proceeds by listing correlations among the main variables to be considered. We first describe correlations with the Fail variable. As one would expect, there is a negative correlation between GDP-Growth and the occurrence of a failure. Growth in housing prices also exhibits a negative correlation. The primary relationship to be studied is the relationship between banking concentration and banking fragility. On the basis of the likelihood of a failure, there appears to be a reasonable negative correlation which loosely supports the hypothesis that concentrated banking systems tend to be more stable. Similar observations emerge from the correlations of the main variables with the number of failures. However, there is a weak positive correlation between the 5-Firm concentration ratio and the size of failures.

3   Evidence on the Probability, Number, and Size of Failures

The analysis begins by looking at the determinants of bank failures in the United States, paying special attention to the role of banking concentration. To begin, the first three columns of Table 3 present basic evidence using a standard linear probability model (LPM) prior to the financial crisis. As one would expect, bank failures are less likely to occur when GDP growth is higher. Moreover, bank failures are more likely to take place when discount window borrowings increase. However, the size of the banking system as measured by the number of commercial banks and total assets in the banking system do not appear to be correlated with the probability of a bank failure. Furthermore, the coefficient estimate for the growth of housing prices is not statistically significant. Finally, none of the measures of banking concentration appear to matter, casting doubt as to whether the concentration of the banking system affects the stability of the banking system.

The remaining three columns of Table 3 present analysis over the same time period using a probit regression model. Prior to the financial crisis, the coefficient estimate for GDP growth continues to have the expected sign and is statistically significant at the 5% level. The number of banks behaves in a similar manner as the LPM but again, none of the measures of concentration are statistically different from zero.

By comparison, Table 4 presents results since 1994 when the Riegel-Neal Act was passed. The evidence from OLS is presented in the first three columns. Over this time frame, macroeconomic performance as exhibited by GDP growth is not correlated with the probability of a failure. Moreover, use of the discount window does not seem to be important. By comparison, the size of the banking system is positively correlated with the likelihood of a failure while growth

in housing prices is negatively correlated. The five-firm concentration ratio is negatively correlated, providing mild evidence that banking concentration improves the stability of the overall banking system.

The last three columns use the probit model. In this specification, the coefficient estimate for both the three and five-firm ratios is negative and statistically significant at conventional levels. Thus, it appears that there is stronger support that higher degrees of concentration promote banking stability using the probit regression model than a simple LPM. In addition, the concentration of the banking sector appears to be more closely related to the probability of a failure in the years since the Riegel-Neal Act was in place.

We next turn to looking at determinants of the number of failures. The analysis begins by studying activity prior to 2008 in the first three columns of Table 5 using OLS. Prior to the financial crisis, neither GDP growth nor growth in discount window lending is statistically significant. However, the coefficient estimates for the banking sector size variables are positive and statistically significant beyond the 1% level. Ironically, the coefficient estimate for the growth of housing prices is positive and also statistically significant beyond the 1% level, running counter to its impact on the probability of a failure. In all three regressions, higher degrees of banking concentration are negatively correlated with the number of bank failures and the coefficient estimate is highly statistically significant. Interestingly, the negative influence is weaker as one considers weaker measures of concentration: the coefficient estimates decrease in magnitude as one moves from the 3-Firm concentration ratio down to the 10-Firm ratio.

Given the non-negative, integer-valued nature of the dependent variable we proceed by analyzing the results using the Poisson regression model in the last three columns. In comparison to the results using OLS, there is mild evidence that higher rates of GDP growth are positively correlated with the number of failures. However, growth in housing prices does not appear to be important, running against the findings from OLS. Nevertheless, observations regarding banking concentration remain the same, providing further support for the idea that higher degrees of banking concentration promote the stability of the overall banking system. As in the regressions using OLS, the point estimates are weaker as one moves down the size distribution of the banking sector.

Results for the period following the Riegel-Neal Act are available in Table 6. The first three columns use OLS. While GDP growth still appears to be uncorrelated with the number of failures, growth in discount window lending is negatively correlated. Interestingly, this runs counter to the results for the likelihood of a failure. One interpretation may be that banks use the discount window when a failure occurs, but the availability of discount window funds prevents further failures. Now, the number of banks is negatively related to the number of failures which is counter-intuitive but the coefficient estimate for growth in housing prices is negative and statistically significant beyond the 1% level. Regardless, higher degrees of concentration are negatively correlated with the number of failures but the point estimate for the coefficient is much weaker than the period before the crisis indicating that banking concentration may not have the same impact on the number of failures after 1994. Results from the

Poisson analysis follow the OLS results.

Given the large numbers for failures that occurred at various points in time, one might argue that a Tobit regression specification would be more appropriate. Such evidence is available in Table 7. Yet, the results continue to convey the same message – higher degrees of concentration promote the stability of the banking system (as measured by the number of failures).

The analysis moves to studying the relative size of failures. Across the whole sample from 1984-2010, the average size of failures is slightly below 0.2% while the maximum in one quarter stands above 5% which took place in the first quarter of 2009. Please see the first three columns of Table 8 which present results using OLS before the recent crisis. Neither GDP growth nor discount window lending appear to be significantly correlated with the relative size of failures if one ignores the financial crisis. The coefficient estimates for the size of the banking system are positive and significant beyond the 1% level. By all three measures of concentration, the evidence suggests that higher degrees of banking concentration are strongly negatively correlated with the size of failures. However, given the censored nature of the dependent variable, a Tobit specification is likely to be more appropriate. Please see the next three columns of the Table. Prior to 2008, the results are very similar to the case of OLS.

We proceed to look at the OLS results in Table 9 for the period since 1994. Under OLS, none of the coefficient estimates are statistically significant in any of the regressions. By comparison, the results are much different in the last three columns following the Tobit specification. First, the coefficient estimate for GDP growth is negative and statistically significant beyond conventional levels in two out of three specifications. By comparison, use of the discount window is highly correlated with a coefficient estimate that is significant beyond the 5% level in all three specifications. Total assets of commercial banks are only significant in one specification. In comparison to the results in Table 8, banking concentration is highly negatively correlated with the size of failures. Again, the evidence continues to support the notion that higher degrees of concentration promote the stability of the banking sector.

4   The Impact of the Composition of the Balance Sheets of the Largest Institutions

Given that concentration among the largest firms fosters stability, we next examine which attributes of such banks encourage stability. That is, as concentration promotes stability, which components of a bank's balance sheet matter? Rather than looking at the largest banks' asset holdings relative to total assets in the banking system, we turn to examining how the *composition* of assets held by the largest institutions affects the stability of the banking system. Existing empirical research on banking crises across countries does not consider this issue as it omits detailed information on asset holdings among banks. We attempt to answer this question by looking at how different assets on the largest banks'

balance sheets play a role.

4.1 Real Estate Loans

We have previously shown that increased concentration of the banking system appears to promote stability – this occurs regardless of the sample period, either excluding the recent financial crisis or the era in which restrictions on inter-state banking were eliminated. Due to the role of the housing sector in the most recent crisis, there has been increased concern that excessive real estate lending among the very largest institutions exposes the banking sector to distress. Thus, we begin by studying if the largest banks' holdings of real estate loans affect the stability of the banking system. In particular, we look at whether holdings of loans secured by real estate (Call Report Code RCFD1410) weighed by total assets (FFIEC 031) among the largest banks has any influence on banking fragility. According to Table 2A, the mean level of holdings of real estate loans across the different measures of concentration is slightly below 20% over the entire sample. By comparison, over nearly the same time frame from 1985-2010, real estate loans represented around 27% of assets held on the balance sheets across the aggregate commercial banking system. Consequently, the numbers indicate that larger banks tend to hold less real estate loans than an average bank.[4] As emphasized by Ghossoub and Reed (2015), large institutions may withhold resources from loan markets as they take into account how their actions affect market returns.

Though there are other important variables in the different specifications that we present, the discussion here will mostly focus on the implications of asset holdings among the largest banks. Please see Table 10 for an analysis of how the largest banks' real estate lending affects the probability of a failure using a standard LPM if one omits the financial crisis. None of the measures of real estate lending by the largest banks appear to be significantly correlated with the probability of a failure. The final three columns of Table 10 present findings from a probit specification. There does not appear to be any evidence at conventional significance levels that the proportion of loans secured by real estate among the largest banks affects the probability of a failure. As can be seen from Table 11, the same holds true after the Riegel-Neal Act.

We proceed to look at whether real estate loans are correlated with the average number of failures. The analysis begins using simple OLS in Tables 12 and 13. Here, the evidence is stronger. In the first three columns of Table 12, the results correspond to the period prior to the financial crisis. Notably, if the largest institutions hold a greater proportion of real estate loans, there is an increase in the number of failures. Moreover, the coefficient estimate increases as one moves down the size distribution of the banking sector. As an example,

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[4]Authors' calculations for Total Assets Interest Earning, All Loans and Leases, Gross, Secured by Real Estate, All Commercial Banks (Quarterly, Not Seasonally Adjusted, Variable Code LSREACBEP) divided by Total Assets, All Commercial Banks (Quarterly, Seasonally Adjusted, Variable Code: TLAACBM027SBOG).

a one-percentage point increase in the proportion of loans secured by real estate by the ten largest banks causes the number of failures in a quarter to increase by around 8 banks on average. By comparison, the number falls to just above 6 banks when looking at the proportion held by the three largest institutions. As in the case of the overall concentration ratios, the analysis moves to a Poisson specification in the next three columns of Table 12. Findings are consistent with the results from OLS.

However, there is some evidence that real estate holdings of the largest banks promoted the stability of the banking system through reducing the number of failures since restrictions on inter-state banking were eliminated in 1994. Please see the first three columns using OLS in Table 13. While the coefficient estimate for the three firm ratio is only statistically significant beyond the 20% level, the ten firm ratio is highly significant – beyond the 1% level, indicating that a one-percentage point increase in real estate loans causes the average number of failures to decrease by 2 banks in each quarter.

We next consider results from the Poisson regressions. Though the coefficient estimate for the three firm holdings is only significant at the 11% level, the other estimates are significant beyond the 1% level. Hence, one might conclude that real estate holdings by the largest banks promoted the stability of the banking system in recent years. Since the point estimates from the Poisson specification are not easy to interpret, Table 14 presents the predicted number of failures across different real estate holdings. If the percentage of real estate holdings lies between 15% and 25%, there would be an average of 25 failures per quarter if one focuses on the period since 1994. By comparison, if the holdings increase to between 25% and 35% – which includes the average amount of real estate lending for the overall commercial banking system – the expected number of failures falls down to nearly two per quarter. Results from a Tobit specification largely mirror the OLS results and are omitted.

The analysis of the real estate component of the largest institutions' balance sheets concludes by looking at the size of failures in Tables 15 and 16. To begin, we can look at the results from OLS prior to the crisis. The average percentage of assets of failed institutions is only around 0.2% over the whole sample. The results for the period omitting the crisis suggest that a one-percentage point increase in the holdings of real estate loans by the largest banks would cause the magnitude of failures to increase by around .03% depending on the concentration measure.

The evidence since 1994 is very weak – only the coefficient estimate for the ten firm ratio approaches conventional levels and it is significant beyond the 11% level. Yet, the point estimate is strong, indicating that a one-percentage point increase would be associated with a decrease in magnitude of failures by .13%. In the Tobit specification, the coefficient estimate for real estate holdings by the ten largest firms is significant at the 10% level and indicates a one-percentage point increase in the ratio would lower the size of failures by .14%.

We offer a brief summary of our results for the proportion of loans secured by real estate among the largest banks. As previously mentioned, there has been much concern that real estate lending by the largest institutions in recent years

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exposes the banking system to fragility. However, the evidence does not seem to bear such concerns out. First, the probability of a bank failure is independent of the relative amount of real estate lending by the largest banks in either time period. In fact, the only period where real estate lending is associated with increased fragility occurs is the period *excluding the financial crisis* where there were some years in which restrictions on inter-state banking were in place – limiting the ability of banks to geographically diversify. Moreover, the impact appears to be weaker at the highest degrees of concentration. That is, the relationship between the number of failures, size of failures, and the proportion of assets allocated to loans secured by real estate is weaker as one considers higher banking concentration measures.

On top of such evidence – in the period since 1994 which includes the recent crisis – if anything, the banking system appears to be more stable if the largest banks allocate more of their resources to real estate lending. For example, the five and ten firm real estate loan ratios are negatively correlated and statistically significant when looking at the number of failures. Analogous to the period excluding the crisis, the correlation is stronger at lower degrees of concentration. Further, there is mild evidence that real estate lending is negatively related to the size of failures since restrictions on inter-state banking were eliminated.

4.2 Commercial and Industrial Loans

We move to another important category of bank lending activity, commercial and industrial loans (RCFD1600). On average, commercial and industrial loans make up around 14% of the largest institutions' balance sheets during the full sample period. By comparison, the average amount in the commercial banking system stands a little higher at nearly 16%. Table 17 presents the analysis prior to the financial crisis. Based upon OLS, the evidence does not indicate the C&I loans affect the probability of a failure in the banking system. The probit specification does not show any significant relationship to concentration either. Moreover, there does not appear to be any evidence since 1994 in Table 18.

The analysis turns to the number of failures using OLS in the first three columns of Table 19. In contrast to the analysis looking at the probability of a failure, the evidence for the number of failures is much stronger. Notably, the ratio for the three and five largest firms is negative and statistically significant beyond the 10% level. The coefficient estimate for the 10 largest firms is significant at the 15% level. The results generally indicate that a one-percentage point increase in C&I lending would cause the number of failures to fall by around one and a half each quarter. The next three columns show the results using the Poisson regression model. The coefficient estimate for all three ratios is negative and statistically significant beyond the 1% level. By comparison, Table 20 shows that the estimates are not significant at conventional levels since 1994, regardless of OLS or the Poisson specifications.

The evidence for C&I loans concludes by looking at the magnitude of failures in Tables 21 and 22. There is evidence using OLS prior to 2008 that C&I lending by the three and five largest firms is negatively correlated with the size of failures

but none of the concentration measures are significant in the Tobit specification prior to the crisis. The evidence since 1994 in Table 22 is not suggestive of any relationship at conventional levels. Moving to the Tobit specifications, the C&I components do not appear to be related to the size of failures.

To wrap up the information on C&I lending by the largest banks, generally, C&I lending does not appear to be related to the fragility of the banking system. The only period where there is a relationship excludes the crisis – an increase in C&I lending is negatively correlated and significant for the number of failures. There does not appear to be a clear relationship between *any* measure of fragility and the degree of concentration since restrictions on inter-state banking were eliminated.

4.3   Loans to Individuals

The next component of lending activity to be discussed is the fraction of loans to individuals.[5] This component represents between 7 and 8% of assets among the largest firms while it averages near 10% across the overall commercial banking system between 1984 and 2010. To begin, there is no significant evidence that the fraction of consumer loans is correlated with the probability of a failure across either sample period.

However, there are findings regarding the number of failures. Notably, an increase in the amount of loans to individuals is positively correlated and significant beyond the 5% level according to all three ratios prior to the financial crisis in Table 23. The results generally indicate that a one-percentage point increase in consumer loans would lead to somewhere between 5.4 and 7.6 additional failures. Thus, as in the case of real estate lending by the largest institutions, lending to consumers appears to put the banking system at risk – from the perspective of the number of failures in the first sample period where there were some restrictions on inter-state banking. Since 1994, there does not appear to be a relationship. Results using the Poisson regression model line up with the evidence using OLS.

We move on to consider the size of failures. Please see Tables 25 and 26. The first three columns in Table 25 show the results for OLS prior to the crisis. The fraction of consumer loans is statistically significant and positively correlated with the magnitude of failures. This is true regardless of the degree of concentration. Notably, a one-percentage point increase in this form of lending would cause the size of failures to increase by more than around .03%. However, only the three-firm is statistically significant in the Tobit specification. Since 1994, the evidence is different – the coefficient estimate for the 5-firm measure is negative and significant at the 15% level while the estimate is stronger and statistically significant beyond the 5% level for the 10-firm measure. According to the 10-firm ratio, a one-percentage point increase would cause the size of failures to fall by nearly .3%.

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[5]In the early part of the sample, this variable is RCFD1975. Towards the end, it is RCFDB538+RCFDB539+RCFD2011.

Thus, there is mild evidence that loans to consumers have contributed to stress in the banking system – notably, a relationship only appears to exist in the sample timeframe where restrictions on interstate banking were in place for some time – loans to consumers are positively correlated with the number of failures in the period excluding the crisis. There is only weak evidence for the size of failures. In the first subsample, one of the ratios is positively correlated with failure size while in the second subsample, one of the ratios is negatively correlated.

4.4   Fed Funds and Reverse Repos

The final component of lending activity to be studied is the amount of lending by the largest firms to other financial institutions. Over the full sample, this form of lending represents around 2.5% of assets on the largest banks' balance sheets while it is about 3.5% for the aggregate banking system.[6] Using OLS, as observed in Table 28, the coefficient estimates only approach statistically significant effects on the probability of a failure in the period since 1994. Though the coefficient estimates are negative for all three firm ratios, the coefficient estimate for the three firm ratio is only significant at the 12% level and the estimates for the five and ten-firm ratios are significant at the 11% level. Yet, all of the estimates are significant at conventional levels according to the probit specification since restrictions on interstate banking were eliminated.

Moving to the number of failures prior to the crisis, there is not any significant evidence of a correlation prior to the financial crisis. This occurs regardless of the estimation method. The same holds true since Riegel-Neal was in place. Moreover, it does not appear that lending to other financial institutions affects the number of failures – hence, the results are omitted. In addition, lending to other institutions does not appear to be correlated with the relative size of failures. As there does not appear to any compelling support for the number and size of failures, such results are omitted.

We briefly summarize the results for loans to other intermediaries. In particular, there are weak indications that lending to other institutions promotes the stability of the banking system – since restrictions on inter-state banking have been eliminated, an increase in federal funds lending and reverse repos by the largest banks is negatively correlated with the probability of a failure. In addition, the coefficient estimates increase in absolute value at higher degrees of concentration, indicating lending plays a stronger role in reducing the probability of a bank failure as one moves up the size distribution.

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[6] Call Report Variable Code, RCFD1350.

4.5 Treasuries

We turn to looking at the implications of holdings of Treasuries in Table 29 which represents around 1% of assets held by the largest banks.[7] Prior to the financial crisis, only the holdings of Treasuries by the three largest firms are significantly correlated with the probability of a failure according to a LPM. In the probit specifications in Table 29 and 30, an increase in the holdings by both the three and five largest firms impacts the probability of a failure regardless of the sample timeframe.

Tables 31 and 32 show the results for the number of failures. Again, regardless of the sample period, holdings of Treasuries are positively correlated with fragility in the banking system. For example, omitting the financial crisis, a one-percentage point increase in the holdings of Treasuries by the 10 largest firms would cause the number of failures to rise to nearly 19. By comparison, the estimates since 1994 are weaker, indicating that the same increase would be about one-half. The Poisson results in both tables mirror the results from OLS.

Next, we look at the magnitude of banking distress. According to OLS, holdings of Treasuries are not significantly correlated with the size of failures in either sample period. Hence, the results are omitted. However, this does not emerge when one accounts for the censored nature of the dependent variable. There is moderate evidence that holdings of Treasuries make the banking system more fragile – the coefficient estimates for the three and five-firm ratios are positive and statistically significant beyond the 5% level if one omits the financial crisis in Table 33. There is no significant evidence since 1994.

Thus, there is strong support that Treasury holdings by the largest institutions impact the degree of fragility of the banking system. In particular, in the period prior to the recent crisis, *every* measure of banking distress is positively correlated with the proportion of the largest banks' balance sheets allocated to Treasuries. Since 1994, both the probability and number of failures are positively correlated with the proportion of Treasury holdings but no such relationship is observed for the size of failures.

4.6 Cash

The final asset to be considered is cash (RCFD0010). Over the full sample, this represents about 8.5% of assets on the largest firms' balance sheets but just over 6% of assets in the overall commercial banking system. Such behavior reflects the findings observed by Ghossoub and Reed (2015) which indicates that banks in concentrated banking systems hold more liquid assets. In terms of the implications for the probability of a bank failure, Table 34 presents the results prior to the financial crisis. According to the LPM, the five and ten-firm ratios are highly statistically significant and show that a one-percentage point increase in such holdings would increase the probability of a failure by around 0.08%. Mirroring the observations from OLS, the five and ten-firm ratios are

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[7]Please see Call Report Code RCFD1287.

significantly correlated with the probability of a failure prior to the financial crisis through the probit regressions. Moreover, in contrast to the LPM, the five and ten-firm ratios are also positively correlated with the probability of a failure since 1994. (Please see Table 35)

We proceed to study how cash holdings by the largest firms affect the number of failures. Please see Tables 36 and 37. In both time periods, there is strong evidence indicating that an increase in holdings of cash is correlated with the number of failures. However, the coefficient estimates are weaker since 1994 than in the longer sample period.

How do cash balances affect the magnitude of distress in the banking system? According to the Tobit specifications in Tables 38 and 39, there is only ample evidence that cash balances are positively correlated with the size of failures. While the five and ten firm ratios are significant in the years prior to the crisis, the coefficient estimates for all three ratios are positive and statistically significant at conventional levels since 1994.

Interestingly, the evidence regarding cash balances is even more striking than the relationship between Treasuries and fragility – the proportion of assets allocated to cash is positively correlated with every measure of distress in the banking system – regardless of the time period studied.

4.7   Summary of the Evidence on Lending and Fragility

At this stage, we offer a brief summary of the evidence on how the actions of the largest institutions affect the stability of the banking system. This evidence is summarized in Tables 40 and 41. Regardless of the timeframe, findings generally do not support the claim that increased concentration of the banking system contributes to fragility. In particular, claims that eliminating geographical restrictions would lead to institutions which become 'Too Big to Fail,' excessively lend and put the banking system at risk do not appear to have much merit. In fact, in every category of lending studied, it seems that the largest institutions have a smaller fraction of loans on their balance sheets than the overall banking system.

However, real estate lending and consumer lending appear to be areas where banking concentration can be associated with instability – but this only occurs from 1984-2007, a period where restrictions on inter-state banking were in place for some time and also includes the Savings and Loan Crisis. It is quite possible that limitations on the ability of the largest institutions to geographically diversify across different markets in the United States aggravated risks in the banking system.

Insights from the period in which restrictions on inter-state banking were eliminated are particularly interesting. In every category of loans studied, there is weak evidence that the banking system is *more* stable if the largest firms lend more. In particular, the role of real estate lending is entirely different since the Riegel-Neal Act – real estate lending appears to favorably influence a number of different measures of stress.

What also stands out is that when banks withhold resources from the financial system – by holding more Treasuries and cash on their balance sheets – the banking system is less stable, regardless of the time period considered. In particular, the evidence for cash balances is the strongest, affecting *every* measure of stress in both sample periods. Such observations seem to be particularly important in the shift towards greater macroprudential regulation.

5 Why do the actions of the largest banks affect the stability of the overall banking system?

Why does concentration affect the stability of the banking system? How do the actions of the largest institutions affect market returns? The preceding evidence shows that increasing concentration generally promotes the stability of the overall banking system. In particular, we previously showed that measures of concentration were negatively related to *every* measure of fragility since restrictions on inter-state banking were eliminated. We have also observed that the composition of the largest banks' balance sheets can have important consequences. The next question is *why?* In order to attempt to answer this question, we look at how changes in concentration and behavior among the largest banks affect the return on assets in the commercial banking system.

To begin, please see Table 42 which studies how the return on assets generally responds to increases in banking concentration. Notably, regardless of the sample period, higher degrees of concentration are generally positively correlated and statistically significant for the return on assets (ROA). Thus, it appears that concentration promotes ROA.

We next look at how the various types of lending impact ROA. To begin, please see Table 43 which specifically focuses on the coefficient estimates for the different measures of asset composition. For example, the first three rows present the coefficient estimates for the proportion of real estate loans. It was previously pointed out that mortgage lending was positively correlated with the number of failures and the size of failures from 1984-2007 but there was weak evidence that real estate lending promoted stability since 1994. To try to understand these observations, we turn to the effects of real estate lending for ROA. Notably, the evidence for ROA is also consistent with these findings – all three measures of real estate lending are negatively correlated with ROA in the first sample period but the coefficient estimate for the ten firm ratio is positive and statistically significant beyond the 1% level since the Riegel-Neal Act.

In contrast to the results for real estate lending, the results for C&I lending and ROA do not line up with the evidence on fragility – C&I lending by the largest banks promoted stability from 1984-2007, but no such relationship emerges since 1994. By comparison, there is weak evidence in Table 43 that C&I lending is negatively correlated with ROA in the early sample while all three measures are negatively related to ROA since restrictions on inter-state banking

were eliminated. This might indicate that it is more difficult to diversify C&I loans than real estate lending.

Moving on to consumer loans, in the years prior to the financial crisis, such activity by the largest banks does not appear to be correlated with ROA. However, since 1994, as the largest banks allocate a larger portion of their balance sheets to consumer loans, the ROA increases. Turning to lending to other financial institutions, the table shows that increased lending to other institutions lowers the ROA in the banking system. In short, the correlations between loans to individuals and ROA do not match up with the evidence on fragility.

We next move to liquid assets. In particular, we previously showed that greater holdings of Treasuries were strongly correlated with measures of distress regardless of the sample period. This is especially true for cash balances where the proportion of assets held as cash was positively correlated with every measure of stress in both sample periods. Notably, Table 44 begins with the results for Treasuries and shows that holdings of Treasuries are negatively correlated with ROA and highly significant in either timeframe. Moreover, the results for cash balances are even stronger than Treasuries. Thus, the relationships observed between holdings of liquid assets and market returns are very much consistent with the evidence for failures – holdings of liquid assets lower returns and are also correlated with stress in the banking system.

In sum, we have seven different measures of concentration – either in terms of total assets or the composition of assets held by the largest banks – the coefficient estimates for four out of the seven ratios and ROA line up with the evidence on banking fragility. Thus, most of the evidence indicates that concentration, ROA, and fragility behave in systematic ways.

6   Conclusions

Since the recent financial crisis, there has been increased attention to the implications of banking concentration in the United States and other advanced countries. In particular, some have warned that increased concentration poses substantial risks to the commercial banking system. In this paper, we examine how concentration among the largest banks in the United States has affected the stability of the banking system from the mid 1980s through the end of the crisis.

Our results do not support arguments that concentration in the banking system contributes to fragility. Over both sample periods considered – one which excludes the crisis and the other where the crisis is included and there are no restrictions on inter-state banking – higher concentration ratios (as measured by total assets) are negatively correlated with the probability of a failure, the number of failures, and the size of failures.

Moreover, it appears that restrictions on inter-state banking fundamentally alter how the actions of the largest institutions affect the stability of the banking system. From 1984 - 2007, higher amounts of real estate lending and loans to individuals contribute to stress in the banking sector. However, since 1994, there

is weak evidence that the banking system is *more* stable if the largest firms lend more. In particular, the role of real estate lending is entirely different since the Riegel-Neal Act – real estate lending appears to favorably influence a number of different measures of stress.

Finally, it is especially important to point out that the banking system is less stable when banks allocate more resources to liquid assets and thereby withhold resources from the financial system. This is generally true regardless of the time period considered, but every measure of distress – the probability of a failure, the number of failures, and the relative size of failures – tends to be higher when banks hold more Treasuries and cash balances.

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3 Firm % Total Assets

5 Firm % Total Assets

10 Firm % Total Assets
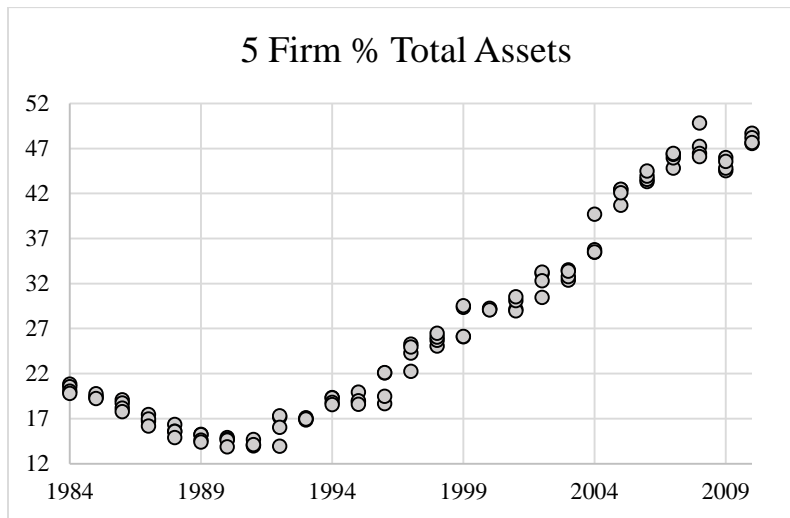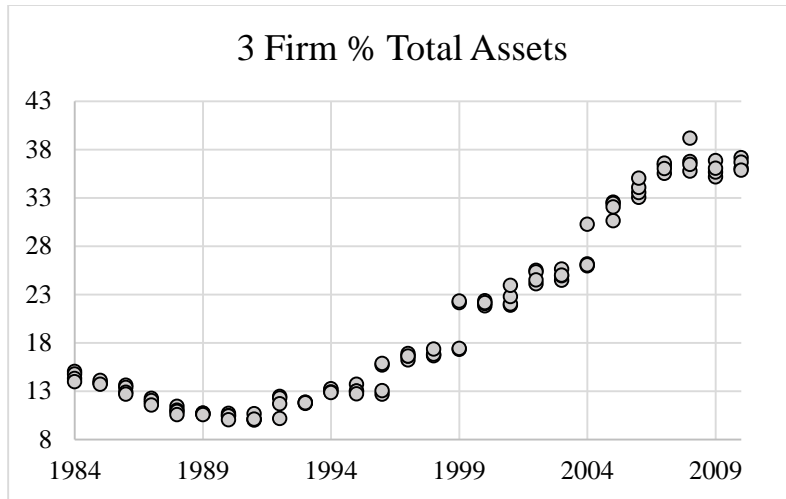
Figure 1: Bank Concentration Ratios
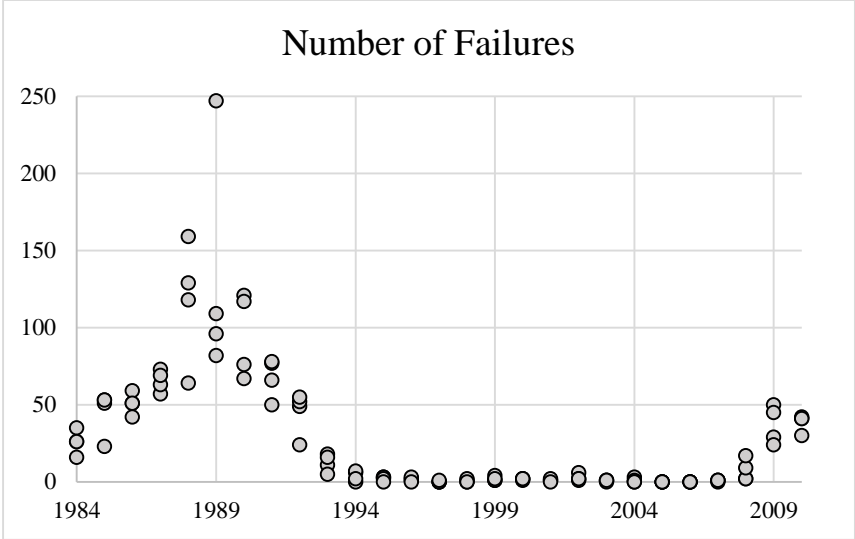
Figure 2: Number of Failures
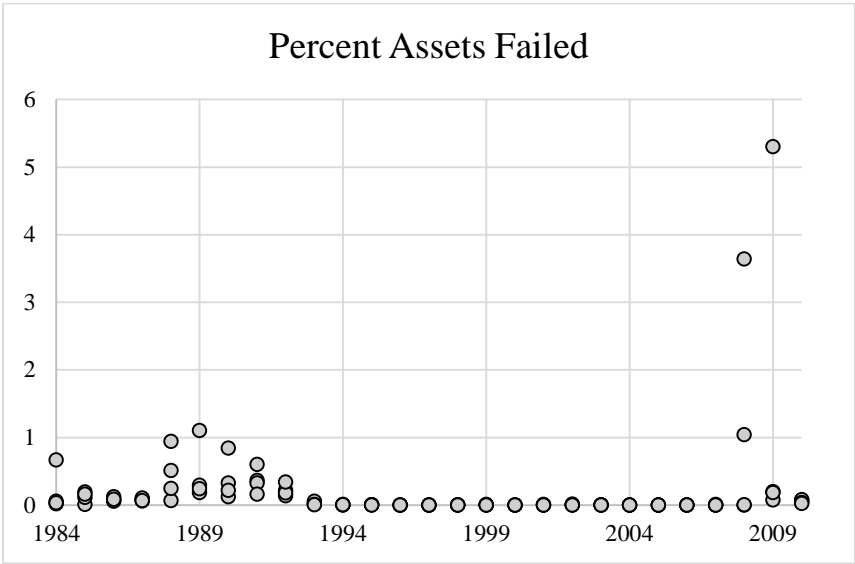
Figure 3: Relative Size of Failures

Table 1: Summary Statistics for Variables

Variable	Observations	Mean	Std. Deviation	Min	Max
Fail	108	.806	.398	0	1
Number of Failures	108	28.1	41.3	0	247
Percentage Assets Failures	108	.186%	.639	0%	5.30%
Δ GDP	108	5.41%	2.43	-3.2%	12.4%
Number of Banks	108	9,957.0	2568.0	6,478	14,400
Total Assets of Commercial Banks	108	$5.65 Trillion	$3.04*10^9$	$2.03 Trillion	$12.2 Trillion
Δ Housing Prices	108	3.96%	3.99	-7.04%	11.9%
3-Firm Concentration Ratio	108	20.2%	9.39	10.0%	39.2%
5-Firm Concentration Ratio	108	27.3%	11.5	13.9%	49.8%
10-Firm Concentration Ratio	108	35.9%	12.0	21.2%	60.0%
3-Firm Real Estate Loan Ratio	108	.191	.036	.125	.270
5-Firm Real Estate Loan Ratio	108	.186	.047	.101	.274
10-Firm Real Estate Loan Ratio	108	.193	.048	.094	.279
3-Firm C&I Loan Ratio	108	.143	.115	0	.341
5-Firm C&I Loan Ratio	108	.137	.112	0	.339
10-Firm C&I Loan Ratio	108	.137	.112	0	.339
3-Firm Consumer Loans Ratio	108	.080	.013	.055	.109

5-Firm Consumer Loans Ratio	108	.070	.011	.050	.092
10-Firm Consumer Loans Ratio	108	.070	.012	.048	.096
3-Firm Federal Funds and Reverse Repos Ratio	108	.024	.021	0	.071
5-Firm Federal Funds and Reverse Repos Ratio	108	.025	.024	0	.100
10-Firm Federal Funds and Reverse Repos Ratio	108	.028	.025	0	.084
3-Firm Treasuries Ratio	108	.010	.009	0	.033
5-Firm Treasuries Ratio	108	.010	.007	0	.026
10-Firm Treasuries Ratio	108	.010	.008	0	.025
3-Firm Cash Ratio	108	.083	.031	.042	.147
5-Firm Cash Ratio	108	.084	.035	.040	.150
10-Firm Cash Ratio	108	.085	.034	.041	.148
ROA	108	.965%	.400	-.37%	1.41%

Table 2: Partial Correlations

	Fail	N-Failures	Failure Size	Δ GDP	Δ DW	N-Banks	TACB	Δ HP	5-Firm CR	ROA
Fail	1.00									
N-Failures	0.337	1.00								
Failure Size	.144	.238	1.00							
Δ GDP	-.081	.178	-.334	1.00						
Δ DW	.088	-.083	.389	-.301	1.00					
N-Banks	.328	.598	-.027	.539	-.199	1.00				
TACB	-.215	-.383	.204	-.611	.343	-.876	1.00			
Δ HP	-.335	-.064	-.384	.568	-.418	.194	-.408	1.00		
5-Firm CR	-.283	-.461	.114	-.466	.306	-.844	.966	-.266	1.00	
ROA	-.406	-.367	-.367	.264	-.256	-.385	.001	.532	.088	1.00

Table 3: Probability of a Bank Failure Prior to Financial Crisis of 2008

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.053** (.025)	-.047* (.024)	-.055** (.022)	-.311** (.149)	-.268* (.149)	-.354** (.160)
Δ DW	$6.33*10^{-4*}$ $(3.21*10^{-4})$	$6.48*10^{-4**}$ $(3.19*10^{-4})$	$6.05*10^{-4*}$ $(3.32*10^{-4})$	$3.51*10^{-3}$ $(2.17*10^{-3})$	$3.53*10^{-3}$ $(2.19*10^{-3})$	$3.60*10^{-3}$ $(2.25*10^{-3})$
3-Firm Total Asset (TA) Ratio	$2.94*10^{-3}$ $(1.86*10^{-2})$			$4.41*10^{-3}$ $(9.84*10^{-2})$		
5-Firm TA Ratio		$-8.76*10^{-3}$ $(1.39*10^{-2})$			$-6.95*10^{-2}$ $(8.86*10^{-2})$	
10-Firm TA Ratio			$6.78*10^{-3}$ $(1.12*10^{-2})$			.101 .100
Number of Banks	$3.02*10^{-5}$ $(4.55*10^{-5})$	$3.66*10^{-5}$ $(4.34*10^{-5})$	$3.01*10^{-5}$ $(4.29*10^{-5})$	$4.35*10^{-4**}$ $(1.90*10^{-4})$	$4.39*10^{-4**}$ $(1.77*10^{-4})$	$5.65*10^{-4**}$ $(2.26*10^{-4})$
Total Assets	$-7.78*10^{-11}$ $(9.41*10^{-11})$	$-2.65*10^{-11}$ $(8.72*10^{-11})$	$-9.60*10^{-11}$ $(7.60*10^{-11})$	$-1.07*10^{-10}$ $(4.16*10^{-10})$	$2.05*10^{-10}$ $(4.22*10^{-10})$	$-4.71*10^{-10}$ $(4.27*10^{-10})$
Δ Housing Prices	-.021 (.019)	-.017 (.019)	-.025 (.021)	-.014 (.075)	-.002 (.074)	-.043 (.084)
Constant	1.22 (.746)	1.11 (.697)	1.16* (.650)	-1.02 (2.52)	-1.12 (.231)	-3.36 (3.16)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.316	0.318	0.318			
Pseudo R2				0.336	0.340	0.344

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 4: Probability of a Bank Failure since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.018 (.028)	.005 (.031)	-.009 (.030)	-.295 (.192)	-.176 (.181)	-.204 (.175)
Δ DW	$3.70*10^{-6}$ ($5.62*10^{-6}$)	$5.13*10^{-6}$ ($5.74*10^{-6}$)	$5.44*10^{-6}$ ($6.28*10^{-6}$)	$4.31*10^{-3}$ ($3.58*10^{-3}$)	$3.77*10^{-3}$ ($3.19*10^{-3}$)	$3.09*10^{-3}$ ($2.51*10^{-3}$)
3-Firm Total Asset (TA) Ratio	$-3.09*10^{-2}$ ($3.03*10^{-2}$)			$-.208^{*}$ .116		
5-Firm TA Ratio		$-5.44*10^{-2*}$ ($3.19*10^{-2}$)			$-.285^{**}$ .139	
10-Firm TA Ratio			$-3.46*10^{-2}$ ($2.67*10^{-2}$)			-.211 .133
Number of Banks	$-4.20*10^{-4**}$ ($1.61*10^{-4}$)	$-4.67*10^{-4***}$ ($1.60*10^{-4}$)	$-5.36*10^{-4***}$ ($1.98*10^{-4}$)	$-1.30*10^{-3**}$ ($5.38*10^{-4}$)	$-1.52*10^{-3***}$ ($5.67*10^{-4}$)	$-1.98*10^{-3***}$ ($7.27*10^{-4}$)
Total Assets	$-1.15*10^{-10}$ ($1.10*10^{-10}$)	$-1.87*10^{-11}$ ($1.31*10^{-10}$)	$-1.26*10^{-10}$ ($8.88*10^{-11}$)	$3.64*10^{-11}$ ($4.50*10^{-10}$)	$3.86*10^{-10}$ ($5.56*10^{-10}$)	$-8.80*10^{-11}$ ($4.18*10^{-10}$)
Δ Housing Prices	$-.062^{***}$ (.020)	$-.059^{***}$ (.019)	$-.063^{***}$ (.018)	$-.180^{**}$ (.086)	$-.177^{**}$ (.086)	$-.179^{**}$ (.084)
Constant	6.09^{***} (1.85)	6.69^{***} (1.87)	7.77^{***} (2.41)	18.4^{***} (6.21)	21.4^{***} (6.69)	28.2^{***} (9.46)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.309	0.328	0.312			
Pseudo R2				0.327	0.347	0.326

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 5: Number of Failures Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Poisson	5 Firm Poisson	10 Firm Poisson
Δ GDP	1.68 (2.58)	4.01 (2.67)	-.166 (2.78)	.140*** (.046)	.123*** (.045)	-.017 (.071)
Δ DW	.022 (.031)	.027 (.026)	.041 (.033)	$-6.40*10^{-5}$ $(4.24*10^{-4})$	$3.35*10^{-4}$ $(4.33*10^{-4})$	$1.44*10^{-3**}$ $(5.99*10^{-4})$
3-Firm Total Asset (TA) Ratio	-10.61*** (2.61)			-.496*** (.039)		
5-Firm TA Ratio		-9.97*** (2.03)			-.356*** (.027)	
10-Firm TA Ratio			-6.05*** (1.38)			-.301*** (.029)
Number of Banks	.025*** (.003)	.021*** (.002)	.019*** (.002)	$1.26*10^{-3***}$ $(1.15*10^{-4})$	$1.07*10^{-3***}$ $(9.72*10^{-5})$	$1.07*10^{-3***}$ $(1.20*10^{-4})$
Total Assets	$4.74*10^{-8***}$ $(1.08*10^{-8})$	$4.97*10^{-8***}$ $(9.38*10^{-9})$	$3.16*10^{-8***}$ $(6.28*10^{-9})$	$2.09*10^{-9***}$ $(2.20*10^{-10})$	$1.73*10^{-9***}$ $(1.80*10^{-10})$	$1.57*10^{-9***}$ $(1.94*10^{-10})$
Δ Housing Prices	3.94*** (1.19)	4.73*** (1.16)	5.39*** (1.39)	-.018 (.031)	.018 (.030)	.122** (.058)
Constant	-297.5*** (49.2)	-235.9*** (32.1)	-145.7*** (27.2)	-13.2*** (1.81)	-9.66*** (1.52)	-7.44*** (1.89)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.633	0.690	0.603			
Pseudo R2				0.856	0.866	0.817

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 6: Number of Failures since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Poisson	5 Firm Poisson	10 Firm Poisson
Δ GDP	-.397 (.748)	.211 (.817)	.104 (.730)	.046 (.034)	.155*** (.032)	.121*** (.030)
Δ DW	$-1.12*10^{-3***}$ $(2.38*10^{-4})$	$-1.10*10^{-3***}$ $(2.42*10^{-4})$	$-1.02*10^{-3***}$ $(2.32*10^{-4})$	$-6.76*10^{-5***}$ $(1.43*10^{-5})$	$-6.40*10^{-5***}$ $(1.39*10^{-5})$	$-5.37*10^{-5***}$ $(1.51*10^{-5})$
3-Firm Total Asset (TA) Ratio	-1.94*** (.546)			-.300*** .055		
5-Firm TA Ratio		-1.86*** (.586)			-.319*** .056	
10-Firm TA Ratio			-2.02*** (.504)			-.272*** .046
Number of Banks	$-3.10*10^{-3}$ $(2.24*10^{-3})$	$-4.00*10^{-3*}$ $(2.39*10^{-3})$	$-9.75*10^{-3***}$ $(3.36*10^{-3})$	$-1.01*10^{-3}$ $(6.32*10^{-4})$	$-1.46*10^{-3**}$ $(7.16*10^{-4})$	$-1.93*10^{-3**}$ $(7.95*10^{-4})$
Total Assets	$6.90*10^{-9***}$ $(1.83*10^{-9})$	$7.48*10^{-9***}$ $(2.08*10^{-9})$	$5.82*10^{-9***}$ $(1.35*10^{-9})$	$5.75*10^{-10**}$ $(2.27*10^{-10})$	$6.33*10^{-10***}$ $(2.13*10^{-10})$	$3.03*10^{-10}$ $(2.10*10^{-10})$
Δ Housing Prices	-1.13*** (.340)	-1.24*** (.347)	-1.22*** (.313)	-.286*** (.034)	-.331*** (.041)	-.312*** (.037)
Constant	36.6 (25.4)	50.8* (27.5)	133.9*** (42.1)	12.8* (7.32)	18.9** (8.42)	26.1*** (9.58)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.768	0.760	0.776			
Pseudo R2				0.774	0.781	0.780

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 7: Number of Failures using Tobit Specification

	3 Firm Prior to Crisis	5 Firm Prior to Crisis	10 Firm Prior to Crisis	3 Firm Since 1994	5 Firm Since 1994	10 Firm Since 1994
Δ GDP	.400 (2.45)	2.87 (3.00)	-1.82 (2.47)	-.446 (.543)	.594 (.598)	.129 (.574)
Δ DW	.046 (.034)	.052* (.031)	.067* (.036)	-1.14×10^{-3}*** (2.39×10^{-4})	-1.10×10^{-3}*** (2.30×10^{-4})	-1.03×10^{-3}*** (2.39×10^{-4})
3-Firm Total Asset (TA) Ratio	-11.0*** (1.91)			-2.43*** (.578)		
5-Firm TA Ratio		-10.6*** (1.40)			-2.91*** (.601)	
10-Firm TA Ratio			-6.20*** (1.28)			-2.40*** (.544)
Number of Banks	.025*** (3.54×10^{-3})	.022*** (3.04×10^{-3})	.020*** (3.04×10^{-3})	-.011*** (3.26×10^{-3})	-.014*** (3.47×10^{-3})	-.018*** (3.94×10^{-3})
Total Assets	4.61×10^{-8}*** (8.54×10^{-9})	4.98×10^{-8}*** (7.20×10^{-9})	2.96×10^{-8}*** (6.96×10^{-9})	4.30×10^{-9}*** (2.33×10^{-9})	6.17×10^{-9}* (2.23×10^{-9})	2.96×10^{-9} (1.98×10^{-9})
Δ Housing Prices	3.63** (1.65)	4.67*** (1.52)	5.30*** (1.89)	-2.37*** (.475)	-2.67*** (.467)	-2.39*** (.466)
Constant	-283.2*** (55.7)	-226.0*** (46.9)	-133.6*** (51.5)	131.8*** (39.1)	177.7*** (42.1)	239.5*** (49.5)
Number of Obs.	96	96	96	68	68	68
Prob > F						
Prob > Chi2	0.00	0.00	0.00	0.00	0.00	0.00
R-Squared						
Pseudo R2	0.112	0.130	0.103	0.223	0.234	0.226

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 8: Relative Size of Failures Prior to Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	.019 (.018)	.029 (.018)	.012 (.019)	.011 (.015)	.022 (.015)	.002 (.015)
Δ DW	$1.03*10^{-4}$ $(2.33*10^{-4})$	$1.26*10^{-4}$ $(2.18*10^{-4})$	$1.78*10^{-4}$ $(2.51*10^{-4})$	$2.46*10^{-4}$ $(2.07*10^{-4})$	$2.71*10^{-4}$ $(1.98*10^{-4})$	$3.22*10^{-4}$ $(2.15*10^{-4})$
3-Firm Total Asset (TA) Ratio	-.042*** .015			-.043*** .012		
5-Firm TA Ratio		-.041*** .012			-.044*** .009	
10-Firm TA Ratio			-.024** .009	$8.12*10^{-5***}$ $(2.18*10^{-5})$		-.023*** .008
Number of Banks	$8.05*10^{-5***}$ $(1.76*10^{-5})$	$6.76*10^{-5***}$ $(1.29*10^{-5})$	$5.67*10^{-5***}$ $(1.13*10^{-5})$		$6.98*10^{-5***}$ $(1.95*10^{-5})$	$5.84*10^{-5***}$ $(2.05*10^{-5})$
Total Assets	$1.81*10^{-10***}$ $(5.93*10^{-11})$	$1.99*10^{-10***}$ $(5.45*10^{-11})$	$1.18*10^{-10***}$ $(3.90*10^{-11})$	$1.65*10^{-10***}$ $(5.31*10^{-11})$	$1.92*10^{-10***}$ $(4.66*10^{-11})$	$9.69*10^{-11**}$ $(4.24*10^{-11})$
Δ Housing Prices	.007 (.008)	.011 (.008)	.013 (.010)	.003 (.010)	.008 (.010)	.009 (.012)
Constant	-.986*** (.242)	-.758*** (.177)	-.387** (.172)	-.855** (.345)	-.653** (.302)	-.277 (.311)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.363	0.418	0.342			
Pseudo R2				1.58	1.84	1.46

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 9: Relative Size of Failures since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	-.122 (.082)	-.090 (.066)	-.107 (.072)	-.139** (.059)	-.077 (.067)	-.118* (.064)
Δ DW	$5.64*10^{-5}$ $(5.14*10^{-5})$	$5.77*10^{-5}$ $(5.08*10^{-5})$	$5.93*10^{-5}$ $(5.23*10^{-5})$	$5.98*10^{-5}$** $(2.62*10^{-5})$	$6.29*10^{-5}$** $(2.59*10^{-5})$	$6.31*10^{-5}$** $(2.68*10^{-5})$
3-Firm Total Asset (TA) Ratio	-.082 (.065)			-.124* (.064)		
5-Firm TA Ratio		-.091 (.072)			-.165** (.066)	
10-Firm TA Ratio			-.071 (.069)			-.103* (.061)
Number of Banks	$2.26*10^{-4}$ $(1.81*10^{-4})$	$1.72*10^{-4}$ $(1.54*10^{-4})$	$1.32*10^{-6}$ $(1.68*10^{-4})$	$-2.43*10^{-4}$ $(3.28*10^{-4})$	$-4.03*10^{-4}$ $(3.48*10^{-4})$	$-5.41*10^{-4}$ $(4.10*10^{-4})$
Total Assets	$3.82*10^{-10}$ $(2.89*10^{-10})$	$4.51*10^{-10}$ $(3.39*10^{-10})$	$3.04*10^{-10}$ $(2.53*10^{-10})$	$2.56*10^{-10}$ $(2.38*10^{-10})$	$4.32*10^{-10}$* $(2.58*10^{-10})$	$1.43*10^{-10}$ $(2.10*10^{-10})$
Δ Housing Prices	.038 (.032)	.036 (.031)	.032 (.030)	-.033 (.047)	-.038 (.046)	-.039 (.046)
Constant	-1.87 (1.69)	-1.07 (1.38)	1.48 (2.62)	4.08 (3.91)	6.25 (4.19)	8.55 (5.17)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.392	0.396	0.387			
Pseudo R2				0.236	0.252	0.231

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 10: Real Estate Lending by Largest Banks and Probability of a Failure in Years Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.049[*] (.018)	-.052[**] (.023)	-.051[**] (.023)	-.288[*] (.155)	-.317[**] (.157)	-.289[*] (.157)
Δ DW	$6.84*10^{-4*}$ $(3.94*10^{-4})$	$6.62*10^{-4*}$ $(3.39*10^{-4})$	$6.60*10^{-4*}$ $(3.35*10^{-4})$	$3.50*10^{-3}$ $(2.35*10^{-3})$	$3.64*10^{-3}$ $(2.48*10^{-3})$	$3.64*10^{-3}$ $(2.43*10^{-3})$
3-Firm Real Estate (RE) Loan Ratio	0.867 (1.23)			8.98 (8.41)		
5-Firm Real Estate (RE) Loan Ratio		0.423 (1.40)			6.33 (9.77)	
10-Firm Real Estate (RE) Loan Ratio			0.487 (1.18)			9.30 12.22
Number of Banks	$2.50*10^{-5}$ $(3.78*10^{-5})$	$3.02*10^{-5}$ $(3.89*10^{-5})$	$3.07*10^{-5***}$ $(4.05*10^{-5})$	$4.95*10^{-5}$ $(3.33*10^{-5})$	$3.81*10^{-4}$ $(2.43*10^{-4})$	$3.81*10^{-4}$ $(2.33*10^{-4})$
Total Assets	$-7.58*10^{-11*}$ $(4.21*10^{-11})$	$-7.46*10^{-11}$ $(5.45*10^{-11})$	$-7.56*10^{-11}$ $(5.19*10^{-11})$	$-2.16*10^{-10}$ $(1.97*10^{-10})$	$-2.31*10^{-10}$ $(2.68*10^{-10})$	$-2.87*10^{-10}$ $(2.98*10^{-10})$
Δ Housing Prices	-.014 (.019)	-0.018 (.019)	-.019 (.018)	.017 (.085)	-.011 (.080)	-.019 (.080)
Constant	1.10[***] (.555)	1.16[**] (.547)	1.14 (.691)	-1.16 (2.33)	-.841 (2.21)	-1.31 (2.30)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.320	0.317	0.317			
Pseudo R2				0.348	0.340	0.342

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 11: Real Estate Lending by Largest Banks and Probability of a Failure since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.028 (.028)	-.027 (.035)	-.024 (.028)	-.246 (.185)	-.281 (.193)	-.260 (.192)
Δ DW	$7.69*10^{-6}$ $(5.87*10^{-6})$	$3.64*10^{-6}$ $(7.47*10^{-6})$	$2.55*10^{-6}$ $(5.60*10^{-6})$	$2.18*10^{-3}$ $(2.54*10^{-3})$	$2.71*10^{-3}$ $(2.87*10^{-3})$	$2.87*10^{-3}$ $(3.05*10^{-3})$
3-Firm Real Estate (RE) Loan Ratio	4.68 (3.17)			13.77 (12.14)		
5-Firm Real Estate (RE) Loan Ratio		1.09 (5.63)			7.87 (14.43)	
10-Firm Real Estate (RE) Loan Ratio			-.022 (4.80)			-4.58 (16.41)
Number of Banks	$-4.98*10^{-5***}$ $(1.38*10^{-4})$	$-4.12*10^{-4**}$ $(1.63*10^{-4})$	$-3.97*10^{-4**}$ $(1.57*10^{-4})$	$-1.58*10^{-3**}$ $(6.78*10^{-4})$	$-1.34*10^{-3**}$ $(6.23*10^{-4})$	$-1.18*10^{-3**}$ $(5.94*10^{-4})$
Total Assets	$-2.85*10^{-10***}$ $(6.55*10^{-11})$	$-2.36*10^{-10*}$ $(1.34*10^{-10})$	$-2.10*10^{-10*}$ $(1.10*10^{-10})$	$-8.90*10^{-10**}$ $(3.61*10^{-10})$	$-8.29*10^{-10*}$ $(4.49*10^{-10})$	$-5.40*10^{-10}$ $(4.33*10^{-10})$
Δ Housing Prices	-.065*** (.018)	-.071*** (.017)	-.070*** (.022)	-.216** (.085)	-.240*** (.088)	-.215** (.098)
Constant	6.39** (1.60)	5.98** (1.79)	5.87*** (1.81)	19.5*** (5.92)	18.4*** (6.09)	17.3*** (6.09)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.322	0.299	0.299			
Pseudo R2				0.317	0.305	0.302

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 12: Real Estate Lending by Largest Banks and Number of Failures Prior to the Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Poisson	5 Firm Poisson	10 Firm Poisson
Δ GDP	-.154 (2.12)	-2.02 (2.04)	1.12 (2.27)	.016 (.051)	-.044 (.062)	.084* (.049)
Δ DW	$4.85*10^{-2}$ $(3.40*10^{-2})$	$5.62*10^{-2}$ $(3.96*10^{-2})$	$5.56*10^{-2}$ $(3.58*10^{-2})$	$1.58*10^{-3**}$ $(6.45*10^{-4})$	$2.08*10^{-3*}$ $(1.07*10^{-3})$	$1.65*10^{-3**}$ $(6.68*10^{-3})$
3-Firm Real Estate (RE) Loan Ratio	616.5*** (121.9)			24.1*** (2.36)		
5-Firm Real Estate (RE) Loan Ratio		666.5*** (110.0)			26.8*** (3.54)	
10-Firm Real Estate (RE) Loan Ratio			834.5*** (142.6)			35.5*** (3.02)
Number of Banks	.012*** $(1.64*10^{-3})$	.013*** $(1.42*10^{-3})$	0.014*** $(1.36*10^{-3})$	$5.21*10^{-4***}$ $(1.09*10^{-4})$	$4.41*10^{-4***}$ $(1.38*10^{-4})$	$4.66*10^{-4***}$ $(1.25*10^{-4})$
Total Assets	$-2.25*10^{-9}$ $(2.19*10^{-9})$	$-8.79*10^{-9***}$ $(2.98*10^{-9})$	$-1.17*10^{-8***}$ $(3.35*10^{-9})$	$-3.34*10^{-10**}$ $(1.51*10^{-10})$	$-7.34*10^{-10***}$ $(2.06*10^{-10})$	$-9.88*10^{-10***}$ $(2.13*10^{-10})$
Δ Housing Prices	5.21*** (1.21)	3.37*** (1.03)	2.94*** (1.00)	.179*** (.054)	0.135** (.059)	.206*** (.051)
Constant	-217.3*** (26.4)	-185.4*** (21.9)	-230.4*** (26.9)	-7.30*** (1.87)	-3.86* (2.11)	-6.21*** (1.93)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.654	0.601	0.657			
Pseudo R2				0.837	0.775	0.855

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 13: Real Estate Lending by Largest Banks and Number of Failures since Riegel-Neal Act

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Poisson	5 Firm Poisson	10 Firm Poisson
Δ GDP	-.735 (.770)	-.692 (.891)	-.673 (.727)	$9.04*10^{-3}$ $(4.95*10^{-2})$	$4.27*10^{-2}$ $(4.85*10^{-2})$	$-8.29*10^{-3}$ $(4.15*10^{-2})$
Δ DW	$-1.26*10^{-3***}$ $(2.85*10^{-4})$	$-1.22*10^{-3***}$ $(2.89*10^{-4})$	$-1.32*10^{-3***}$ $(2.74*10^{-4})$	$-1.12*10^{-4***}$ $(3.53*10^{-5})$	$-1.23*10^{-4***}$ $(3.49*10^{-5})$	$-1.18*10^{-4***}$ $(2.86*10^{-5})$
3-Firm Real Estate (RE) Loan Ratio	-60.9 (45.2)			-16.0 (9.83)		
5-Firm Real Estate (RE) Loan Ratio		-31.4 (69.9)			-24.2^{***} (9.36)	
10-Firm Real Estate (RE) Loan Ratio			-208.8^{***} (72.5)			-27.6^{***} (7.40)
Number of Banks	$-3.04*10^{-4}$ $(2.04*10^{-3})$	$-1.19*10^{-3}$ $(2.04*10^{-3})$	$-2.07*10^{-4}$ $(1.90*10^{-3})$	$1.15*10^{-4}$ $(6.32*10^{-4})$	$-1.42*10^{-4}$ $(5.84*10^{-4})$	$-3.39*10^{-4}$ $(5.70*10^{-4})$
Total Assets	$1.90*10^{-9*}$ $(1.13*10^{-9})$	$1.66*10^{-9*}$ $(1.90*10^{-9})$	$4.97*10^{-9***}$ $(1.50*10^{-9})$	$2.74*10^{-10}$ $(3.22*10^{-10})$	$4.39*10^{-10}$ $(3.07*10^{-10})$	$3.50*10^{-10}$ $(2.49*10^{-10})$
Δ Housing Prices	-1.67^{***} (.368)	-1.57^{***} (.350)	-1.03^{**} (.398)	$-.276^{***}$ (.045)	$-.274^{***}$ (.049)	$-.237^{***}$ (.047)
Constant	16.0 (22.6)	19.5 (23.3)	23.3 (21.9)	1.50 (7.09)	4.11 (6.85)	7.46 (6.71)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.718	0.713	0.749			
Pseudo R2				0.724	0.731	0.750

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 14. Predicted Number of Failures Across Different Levels of Real Estate Lending since
1994

Five Firm RE Ratio	Predicted Number of Failures and Standard Error
0.10	285.0 (439.7)
0.15	84.8 (91.2)
0.20	25.2* (15.4)
0.25	7.51*** (1.22)
0.30	2.23*** (0.768)
Observations	68

Table 15: Real Estate Lending and Size of Failures Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	.013 (.017)	$4.59*10^{-3}$ (.017)	0.020 (.016)	$5.36*10^{-3}$ (.014)	$-4.32*10^{-3}$ (.015)	.012 (.014)
Δ DW	$2.26*10^{-4}$ ($2.41*10^{-4}$)	$2.50*10^{-4}$ ($2.66*10^{-4}$)	$2.67*10^{-4}$ ($2.46*10^{-4}$)	$3.77*10^{-4*}$ ($2.00*10^{-4}$)	$3.94*10^{-4*}$ ($2.15*10^{-4}$)	$4.28*10^{-4**}$ ($1.99*10^{-4}$)
3-Firm RE Loan (RE) Ratio	2.78^{***} (.786)			2.99^{***} (.619)		
5-Firm RE Ratio		2.83^{***} (.784)			2.92^{***} (.848)	
10-Firm RE Ratio			3.95^{***} (.923)			4.20^{***} (.824)
Number of Banks	$2.46*10^{-5**}$ ($1.07*10^{-5}$)	$3.35*10^{-5***}$ ($9.54*10^{-6}$)	$3.37*10^{-5***}$ ($8.55*10^{-6}$)	$2.64*10^{-5}$ ($1.94*10^{-5}$)	$3.53*10^{-5*}$ ($2.04*10^{-5}$)	$3.52*10^{-5*}$ ($1.88*10^{-5}$)
Total Assets	$-1.90*10^{-11}$ ($1.45*10^{-11}$)	$-4.50*10^{-11**}$ ($2.07*10^{-11}$)	$-6.54*10^{-11***}$ ($2.21*10^{-11}$)	$-3.60*10^{-11}$ ($2.26*10^{-11}$)	$-6.38*10^{-11**}$ ($2.83*10^{-11}$)	$-8.62*10^{-11***}$ ($2.67*10^{-11}$)
Δ Housing Prices	$.015^{*}$ ($8.47*10^{-3}$)	$5.80*10^{-3}$ ($6.97*10^{-3}$)	$4.85*10^{-3}$ ($6.39*10^{-3}$)	.012 (.010)	$2.14*10^{-3}$ (.010)	$2.34*10^{-3}$ ($9.20*10^{-3}$)
Constant	$-.702^{***}$ (.154)	$-.552^{***}$ (.137)	$-.777^{***}$ (.157)	$-.652^{**}$ (.299)	$-.459$ (.312)	$-.715^{**}$ (.298)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.416	0.355	0.436			
Pseudo R2				1.84	1.55	1.90

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 16: Real Estate Lending and Size of Failures since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	-.137 (.093)	-.130 (.089)	-.131 (.090)	-.165[***] (.060)	-.152[**] (.066)	-.157[***] (.058)
Δ DW	$5.11*10^{-5}$ $(5.39*10^{-5})$	$5.06*10^{-5}$ $(5.39*10^{-5})$	$4.58*10^{-5}$ $(5.05*10^{-5})$	$5.55*10^{-5}$[**] $(2.75*10^{-5})$	$5.04*10^{-5}$[*] $(2.79*10^{-5})$	$4.63*10^{-5}$[*] $(2.63*10^{-5})$
3-Firm RE Loan (RE) Ratio	-2.07 (3.07)			1.91 (6.38)		
5-Firm RE Ratio		-2.81 (4.09)			-3.33 (8.56)	
10-Firm RE Ratio			-12.7 (7.77)			-14.1[*] (8.46)
Number of Banks	$3.33*10^{-4}$ $(2.72*10^{-4})$	$3.27*10^{-4}$ $(2.61*10^{-4})$	$3.74*10^{-4}$ $(2.59*10^{-4})$	$-1.62*10^{-4}$ $(3.57*10^{-4})$	$-7.52*10^{-5}$ $(3.42*10^{-4})$	$3.14*10^{-6}$ $(3.19*10^{-4})$
Total Assets	$1.63*10^{-10}$ $(1.41*10^{-10})$	$1.96*10^{-10}$ $(1.81*10^{-10})$	$3.75*10^{-10}$ $(2.40*10^{-10})$	$-1.36*10^{-10}$ $(1.92*10^{-10})$	$-2.89*10^{-11}$ $(2.51*10^{-10})$	$1.82*10^{-10}$ $(2.26*10^{-10})$
Δ Housing Prices	.016 (.018)	.020 (.021)	.053 (.036)	-.059 (.046)	-.058 (.046)	-.014 (.051)
Constant	-2.67 (2.30)	-2.73 (2.33)	-2.41 (1.96)	3.03 (3.97)	2.50 (3.94)	2.52 (3.73)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.368	0.368	0.400			
Pseudo R2				0.214	0.214	0.230

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 17: C&I Lending and Probability of a Failure Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.045* (.027)	-.051** (.025)	-.054** (.026)	-.297 (.197)	-.341* (.201)	-.356* (.201)
Δ DW	$6.36*10^{-4**}$ $(3.18*10^{-4})$	$6.35*10^{-4*}$ $(3.20*10^{-4})$	$6.36*10^{-4*}$ $(3.22*10^{-4})$	$3.53*10^{-3}$ $(2.16*10^{-3})$	$3.51*10^{-3}$ $(2.22*10^{-3})$	$3.46*10^{-3}$ $(2.20*10^{-3})$
3-Firm CI Loan (CI) Ratio	-.508 (1.19)			-.558 (4.58)		
5-Firm CI Ratio		-.0840 (1.08)			1.41 (4.53)	
10-Firm CI Ratio			.140 (1.09)			2.10 (4.41)
Number of Banks	$3.35*10^{-5}$ $(4.20*10^{-5})$	$3.30*10^{-5}$ $(4.25*10^{-5})$	$3.13*10^{-5}$ $(4.27*10^{-5})$	$4.30*10^{-4**}$ $(1.98*10^{-4})$	$4.48*10^{-4**}$ $(2.03*10^{-4})$	$4.49*10^{-4**}$ $(2.02*10^{-4})$
Total Assets	$-8.36*10^{-11}$ $(6.03*10^{-11})$	$-6.85*10^{-11}$ $(5.76*10^{-11})$	$-6.20*10^{-11}$ $(5.68*10^{-11})$	$-1.13*10^{-10}$ $(2.49*10^{-10})$	$-3.88*10^{-11}$ $(2.37*10^{-10})$	$-1.63*10^{-11}$ $(2.30*10^{-10})$
Δ Housing Prices	-.024 (.019)	-.0201 (.018)	-.019 (.018)	-.020 (.092)	$-1.93*10^{-5}$ (.090)	$5.00*10^{-3}$ (.087)
Constant	1.31* (.686)	1.19* (.678)	1.16* (.670)	-.843 (3.01)	-1.50 (2.95)	-1.65 (2.86)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.318	0.316	0.316			
Pseudo R2				0.336	0.337	0.338

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 18: C&I Lending and Probability of a Failure since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.017 (.0307)	-.021 (.0313)	-.022 (.0311)	-.236 (.223)	-.275 (.226)	-.278 (.227)
Δ DW	$2.28*10^{-6}$ $(5.58*10^{-6})$	$2.46*10^{-6}$ $(5.49*10^{-6})$	$2.50*10^{-6}$ $(5.45*10^{-6})$	$2.69*10^{-3}$ $(2.40*10^{-3})$	$2.76*10^{-3}$ $(2.47*10^{-3})$	$2.74*10^{-3}$ $(2.45*10^{-3})$
3-Firm CI Loan Ratio	-.534 (1.11)			-.750 (4.48)		
5-Firm CI Loan Ratio		-.228 (1.12)			.884 (4.54)	
10-Firm CI Loan Ratio			-.155 (1.09)			1.00 (4.47)
Number of Banks	$-4.00*10^{-4**}$ $(1.55*10^{-4})$	$-3.99*10^{-4**}$ $(1.55*10^{-4})$	$-3.99*10^{-4**}$ $(1.55*10^{-4})$	$-1.24*10^{-3**}$ $(5.53*10^{-4})$	$-1.20*10^{-3**}$ $(5.59*10^{-4})$	$-1.19*10^{-3**}$ $(5.66*10^{-4})$
Total Assets	$-2.28*10^{-10***}$ $(7.54*10^{-11})$	$-2.18*10^{-10***}$ $(7.80*10^{-11})$	$-2.15*10^{-10***}$ $(7.79*10^{-11})$	$-6.69*10^{-10**}$ $(3.40*10^{-10})$	$-5.99*10^{-10*}$ $(3.38*10^{-10})$	$-5.93*10^{-10*}$ $(3.38*10^{-10})$
Δ Housing Prices	-.076*** (.021)	-.072*** (.022)	-.072*** (.022)	-.239** (.103)	-.217** (.101)	-.216** (.100)
Constant	6.06*** (1.79)	5.95*** (1.83)	5.93*** (1.83)	17.8*** (6.85)	16.9*** (6.87)	16.8*** (6.92)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.301	0.299	0.299			
Pseudo R2				0.302	0.302	0.302

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 19: C&I Lending and Number of Failures Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Poisson	5 Firm Poisson	10 Firm Poisson
Δ GDP	-.337 (3.57)	.0219 (3.52)	-.786 (3.48)	$7.47*10^{-2}$ $(8.72*10^{-2})$	$3.15*10^{-2}$ $(7.09*10^{-2})$	$5.72*10^{-2}$ $(8.48*10^{-2})$
Δ DW	$1.41*10^{-2}$ $(4.41*10^{-2})$	$1.36*10^{-2}$ $(4.34*10^{-2})$	$1.38*10^{-2}$ $(4.41*10^{-2})$	$3.33*10^{-4}$ $(9.83*10^{-4})$	$5.83*10^{-4}$ $(1.03*10^{-3})$	$1.18*10^{-4}$ $(1.01*10^{-3})$
3-Firm CI Loan Ratio	-131.9^{*} (73.4)			-26.5^{***} (5.78)		
5-Firm CI Loan Ratio		-178.9^{**} (86.7)			-33.5^{***} (5.48)	
10-Firm CI Loan Ratio			-114.4 (79.1)			-29.9^{***} (7.81)
Number of Banks	$1.71*10^{-2***}$ $(1.88*10^{-3})$	$1.80*10^{-2***}$ $(2.05*10^{-3})$	$1.77*10^{-2***}$ $(2.04*10^{-3})$	$7.58*10^{-4***}$ $(2.26*10^{-4})$	$1.26*10^{-3***}$ $(2.28*10^{-4})$	$1.22*10^{-3***}$ $(2.78*10^{-4})$
Total Assets	$1.81*10^{-10}$ $(3.29*10^{-9})$	$-6.04*10^{-10}$ $(3.21*10^{-9})$	$1.49*10^{-9}$ $(3.05*10^{-9})$	$-1.14*10^{-9***}$ $(4.29*10^{-10})$	$-9.22*10^{-10***}$ $(2.46*10^{-10})$	$-7.17*10^{-10***}$ $(2.25*10^{-10})$
Δ Housing Prices	.100 (1.13)	-.051 (1.14)	.397 (1.10)	$-.211^{***}$ (.075)	$-.323^{***}$ (.066)	$-.308^{***}$ (.087)
Constant	-125.6^{***} (31.4)	-126.6^{***} (29.7)	-141.2^{***} (29.1)	4.55 (3.90)	-.270 (2.61)	-1.40 (2.48)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.484	0.495	0.481			
Pseudo R2				0.664	0.730	0.661

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 20: C&I Lending and Number of Failures Since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Poisson	5 Firm Poisson	10 Firm Poisson
Δ GDP	-1.08 (.928)	-1.06 (.906)	-1.07 (.916)	$2.75*10^{-3}$ $(5.39*10^{-2})$	$3.98*10^{-3}$ $(5.41*10^{-2})$	$4.48*10^{-3}$ $(5.44*10^{-2})$
Δ DW	$-1.18*10^{-3***}$ $(2.82*10^{-4})$	$-1.18*10^{-3***}$ $(2.81*10^{-4})$	$-1.18*10^{-3***}$ $(2.82*10^{-4})$	$-9.18*10^{-5***}$ $(3.06*10^{-5})$	$-9.25*10^{-5***}$ $(3.08*10^{-5})$	$-9.28*10^{-5***}$ $(3.09*10^{-5})$
3-Firm CI Loan Ratio	21.61 (14.5)			4.68 (4.23)		
5-Firm CI Loan Ratio		22.0 (14.1)			4.80 (4.25)	
10-Firm CI Loan Ratio			22.4 (14.2)			4.88 (4.11)
Number of Banks	$-1.51*10^{-3}$ $(2.03*10^{-3})$	$-1.47*10^{-3}$ $(2.03*10^{-3})$	$-1.38*10^{-3}$ $(2.05*10^{-3})$	$-2.99*10^{-4}$ $(6.45*10^{-4})$	$-2.78*10^{-4}$ $(6.42*10^{-4})$	$-2.61*10^{-4}$ $(6.45*10^{-4})$
Total Assets	$1.66*10^{-9}$ $(1.12*10^{-9})$	$1.64*10^{-9}$ $(1.10*10^{-9})$	$1.66*10^{-9}$ $(1.11*10^{-9})$	$1.55*10^{-10}$ $(3.40*10^{-10})$	$1.53*10^{-10}$ $(3.39*10^{-10})$	$1.58*10^{-10}$ $(3.40*10^{-10})$
Δ Housing Prices	-1.34^{***} (.485)	-1.35^{***} (.469)	-1.35^{***} (.471)	$-.233^{***}$ (.056)	$-.235^{***}$ (.055)	$-.235^{***}$ (.054)
Constant	15.2 (24.2)	15.1 (24.1)	14.3 (24.3)	2.34 (7.96)	2.20 (7.96)	2.03 (8.03)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.718	0.718	0.718			
Pseudo R2				0.722	0.722	0.722

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 21: C&I Lending and Size of Failures Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	.014 (.022)	.014 (.022)	.011 (.022)	$4.73*10^{-3}$ $(1.75*10^{-2})$	$3.50*10^{-3}$ $(1.69*10^{-2})$	$-6.86*10^{-4}$ $(1.72*10^{-2})$
Δ DW	$7.11*10^{-5}$ $(2.65*10^{-4})$	$6.88*10^{-5}$ $(2.64*10^{-4})$	$6.96*10^{-5}$ $(2.67*10^{-4})$	$2.22*10^{-4}$ $(2.22*10^{-4})$	$2.20*10^{-4}$ $(2.21*10^{-4})$	$2.20*10^{-4}$ $(2.23*10^{-4})$
3-Firm CI Loan Ratio	-.702[*] (.419)			-.845 (.567)		
5-Firm CI Loan Ratio		-.807[*] (.449)			-.872 (.561)	
10-Firm CI Loan Ratio			-.535 (.436)			-.529 (.572)
Number of Banks	$4.99*10^{-5}$[***] $(1.14*10^{-5})$	$5.38*10^{-5}$[***] $(1.16*10^{-5})$	$5.28*10^{-5}$[***] $(1.14*10^{-5})$	$5.01*10^{-5}$[**] $(2.13*10^{-5})$	$5.41*10^{-5}$[**] $(2.15*10^{-5})$	$5.28*10^{-5}$[**] $(2.18*10^{-5})$
Total Assets	$-1.18*10^{-11}$ $(2.07*10^{-11})$	$-1.17*10^{-11}$ $(1.92*10^{-11})$	$-2.76*10^{-12}$ $(1.91*10^{-11})$	$-3.92*10^{-11}$ $(3.20*10^{-11})$	$-3.60*10^{-11}$ $(3.02*10^{-11})$	$-2.49*10^{-11}$ $(3.00*10^{-11})$
Δ Housing Prices	$-9.19*10^{-3}$ $(6.62*10^{-3})$	$-9.04*10^{-3}$ $(6.52*10^{-3})$	$-7.14*10^{-3}$ $(6.43*10^{-3})$	-.017 (.011)	-.017 (.011)	-.014 (.011)
Constant	-.262 (.180)	-.294[*] (.169)	-.357[**] (.166)	-.051 (.360)	-.107 (.344)	-.185 (.343)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.266	0.271	0.259			
Pseudo R2				1.28	1.28	1.23

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 22: C&I Lending and Size of Failures since 1994

	3 Firm Standard	5 Firm Standard	10 Firm Standard	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	-.177 (.122)	-.173 (.119)	-.175 (.120)	-.192*** (.065)	-.192*** (.064)	-.194*** (.064)
Δ DW	$5.49*10^{-5}$ $(5.11*10^{-5})$	$5.47*10^{-5}$ $(5.11*10^{-5})$	$5.45*10^{-5}$ $(5.12*10^{-5})$	$5.50*10^{-5**}$ $(2.64*10^{-5})$	$5.50*10^{-5**}$ $(2.63*10^{-5})$	$5.48*10^{-5**}$ $(2.63*10^{-5})$
3-Firm CI Loan Ratio	2.88 (2.15)			2.28 (2.112)		
5-Firm CI Loan Ratio		2.86 (2.10)			2.49 (2.16)	
10-Firm CI Loan Ratio			2.892 (2.14)			2.58 (2.14)
Number of Banks	$3.03*10^{-4}$ $(2.24*10^{-4})$	$3.09*10^{-4}$ $(2.29*10^{-4})$	$3.19*10^{-4}$ $(2.37*10^{-4})$	$-7.95*10^{-5}$ $(3.19*10^{-4})$	$-7.11*10^{-5}$ $(3.19*10^{-4})$	$-5.98*10^{-5}$ $(3.19*10^{-4})$
Total Assets	$2.29*10^{-10}$ $(1.68*10^{-10})$	$2.23*10^{-10}$ $(1.63*10^{-10})$	$2.26*10^{-10}$ $(1.66*10^{-10})$	$-1.01*10^{-11}$ $(1.76*10^{-10})$	$-6.26*10^{-12}$ $(1.75*10^{-10})$	$-1.31*10^{-12}$ $(1.75*10^{-10})$
Δ Housing Prices	.053 (.042)	.050 (.039)	.050 (.039)	-.027 (.054)	-.026 (.053)	-.025 (.052)
Constant	-3.45 (2.60)	-3.44 (2.60)	-3.54 (2.67)	1.65 (3.91)	1.54 (3.91)	1.42 (3.92)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.393	0.391	0.392			
Pseudo R2				0.220	0.221	0.222

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 23: Consumer Loans and Number of Failures Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Poisson	5 Firm Poisson	10 Firm Poisson
Δ GDP	-1.24 (2.54)	-1.41 (2.55)	-1.33 (2.57)	.075 (.084)	.088 (.065)	.107 (.084)
Δ DW	.030 (.043)	.026 (.046)	.022 (.045)	$1.82*10^{-3*}$ $(9.81*10^{-4})$	$1.56*10^{-3}$ $(1.09*10^{-3})$	$1.00*10^{-3}$ $(1.34*10^{-3})$
3-Firm Consumer Loan (CL) Ratio	762.9^{***} (200.2)			96.4^{***} (16.4)		
5-Firm CL Ratio		544.0^{***} (197.7)			91.73^{***} (15.77)	
10-Firm CL Ratio			606.0^{**} (261.7)			97.9^{***} (19.1)
Number of Banks	$1.65*10^{-2***}$ $(1.75*10^{-3})$	$1.62*10^{-2***}$ $(1.86*10^{-3})$	$1.46*10^{-2***}$ $(2.28*10^{-3})$	$4.36*10^{-4**}$ $(2.11*10^{-4})$	$2.81*10^{-4}$ $(2.42*10^{-4})$	$2.18*10^{-4}$ $(2.03*10^{-4})$
Total Assets	$4.68*10^{-9***}$ $(1.74*10^{-9})$	$3.33*10^{-9*}$ $(1.94*10^{-9})$	$8.01*10^{-10}$ $(2.82*10^{-9})$	$-5.67*10^{-10}$ $(3.54*10^{-9})$	$-7.76*10^{-10**}$ $(3.60*10^{-10})$	$-7.81*10^{-10**}$ $(3.07*10^{-10})$
Δ Housing Prices	1.01 (.958)	1.18 (.951)	1.22 (.974)	$.217^{*}$ (.107)	$.185^{**}$ (.08990)	.010 (.080)
Constant	-223.7^{***} (28.7)	-189.7^{***} (23.7)	-165.3^{***} (25.5)	-9.29^{***} (2.79)	-4.80 (3.93)	-3.40 (2.81)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.512	0.485	0.480			
Pseudo R2				0.740	0.653	0.622

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 24: Consumer Loans and Number of Failures Since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Poisson	5 Firm Poisson	10 Firm Poisson
Δ GDP	-.793 (.771)	-.793 (.772)	-.663 (.703)	.019 (.053)	.024 (.060)	.035 (.088)
Δ DW	$-1.19*10^{-3***}$ $(2.81*10^{-4})$	$-1.19*10^{-3***}$ $(2.83*10^{-4})$	$-1.20*10^{-3***}$ $(2.81*10^{-4})$	$-8.87*10^{-5***}$ $(2.94*10^{-5})$	$-9.59*10^{-5***}$ $(3.28*10^{-5})$	$-1.01*10^{-4***}$ $(3.58*10^{-5})$
3-Firm Consumer Loan (CL) Ratio	-9.57 (54.8)			-25.8 (19.3)		
5-Firm CL Ratio		-1.95 (58.1)			-19.1 (19.5)	
10-Firm CL Ratio			-75.8 (92.5)			-7.95 (15.3)
Number of Banks	$-1.57*10^{-3}$ $(2.01*10^{-3})$	$-1.61*10^{-3}$ $(2.15*10^{-3})$	$-1.20*10^{-3}$ $(2.08*10^{-3})$	$-2.35*10^{-4}$ $(6.35*10^{-4})$	$-2.31*10^{-4}$ $(6.27*10^{-4})$	$-2.56*10^{-4}$ $(5.99*10^{-4})$
Total Assets	$9.44*10^{-10}$ $(9.99*10^{-10})$	$9.33*10^{-10}$ $(1.10*10^{-9})$	$1.44*10^{-9}$ $(1.08*10^{-9})$	$-5.75*10^{-12}$ $(2.71*10^{-10})$	$5.43*10^{-11}$ $(2.82*10^{-10})$	$6.19*10^{-11}$ $(2.67*10^{-10})$
Δ Housing Prices	-1.58^{***} (.405)	-1.60^{***} (.416)	-1.53^{***} (.411)	$-.245^{***}$ (.049)	$-.253^{***}$ (.050)	$-.259^{***}$ (.050)
Constant	22.9 (22.2)	22.7 (23.1)	20.2 (22.7)	5.29 (7.52)	4.24 (7.26)	3.64 (7.18)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.712	0.712	0.715			
Pseudo R2				0.724	0.721	0.719

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 25: Consumer Loans and Size of Failures Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	$8.79*10^{-3}$ ($1.70*10^{-2}$)	$8.47*10^{-3}$ ($1.68*10^{-2}$)	$8.26*10^{-3}$ ($1.72*10^{-2}$)	$-4.24*10^{-4}$ ($1.54*10^{-2}$)	$-1.55*10^{-3}$ ($1.60*10^{-2}$)	$-3.54*10^{-3}$ ($1.67*10^{-2}$)
Δ DW	$1.53*10^{-4}$ ($2.69*10^{-4}$)	$1.40*10^{-4}$ ($2.78*10^{-4}$)	$1.11*10^{-4}$ ($2.75*10^{-4}$)	$3.30*10^{-4}$ ($2.23*10^{-4}$)	$3.02*10^{-4}$ ($2.30*10^{-4}$)	$2.55*10^{-4}$ ($2.30*10^{-4}$)
3-Firm Consumer Loan Ratio	3.88*** (1.21)			4.51** (1.86)		
5-Firm Consumer Loan Ratio		3.10** (1.21)			3.36 (2.33)	
10-Firm Consumer Loan Ratio			3.76** (1.350)			2.32 (3.45)
Number of Banks	$4.72*10^{-5***}$ ($1.06*10^{-5}$)	$4.50*10^{-5***}$ ($1.11*10^{-5}$)	$3.76*10^{-5***}$ ($1.35*10^{-5}$)	$4.66*10^{-5**}$ ($2.09*10^{-5}$)	$4.50*10^{-5**}$ ($2.14*10^{-5}$)	$4.01*10^{-5}$ ($2.48*10^{-5}$)
Total Assets	$1.21*10^{-11}$ ($1.02*10^{-11}$)	$4.39*10^{-12}$ ($1.16*10^{-11}$)	$-7.28*10^{-12}$ ($1.65*10^{-11}$)	$-1.01*10^{-11}$ ($2.45*10^{-11}$)	$-1.80*10^{-11}$ ($2.56*10^{-11}$)	$-2.47*10^{-11}$ ($3.37*10^{-11}$)
Δ Housing Prices	$-4.31*10^{-3}$ ($6.20*10^{-3}$)	$-3.41*10^{-3}$ ($6.19*10^{-3}$)	$-3.24*10^{-3}$ ($6.35*10^{-3}$)	$-8.57*10^{-3}$ ($1.01*10^{-2}$)	$-8.70*10^{-3}$ ($1.04*10^{-2}$)	$-9.75*10^{-3}$ ($1.06*10^{-2}$)
Constant	-.769*** (.149)	-.615*** (.128)	-.471*** (.143)	-.666*** (.360)	-.473 (.357)	-.297 (.333)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.297	0.270	0.259			
Pseudo R2				1.38	1.27	1.22

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 26: Consumer Loans and Size of Failures Since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	-.139 (.095)	-.140 (.095)	-.091 (.074)	-.163*** (.060)	-.163*** (.059)	-.107* (.059)
Δ DW	$5.51*10^{-5}$ $(5.23*10^{-5})$	$5.43*10^{-5}$ $(5.11*10^{-5})$	$5.08*10^{-5}$ $(4.18*10^{-5})$	$5.42*10^{-5**}$ $(2.69*10^{-5})$	$5.41*10^{-5**}$ $(2.66*10^{-5})$	$5.07*10^{-5**}$ $(2.48*10^{-5})$
3-Firm Consumer Loan Ratio	-4.96 (4.39)			-2.02 (9.83)		
5-Firm Consumer Loan Ratio		-10.4 (7.16)			-7.38 (11.3)	
10-Firm Consumer Loan Ratio			-27.9** (12.9)			-30.1*** (10.8)
Number of Banks	$3.14*10^{-4}$ $(2.38*10^{-4})$	$3.65*10^{-4}$ $(2.63*10^{-4})$	$4.42*10^{-4}$ $(2.71*10^{-4})$	$-1.05*10^{-4}$ $(3.30*10^{-4})$	$-5.61*10^{-5}$ $(3.34*10^{-4})$	$9.29*10^{-5}$ $(3.04*10^{-4})$
Total Assets	$1.41*10^{-10}$ $(1.09*10^{-10})$	$1.82*10^{-10}$ $(1.31*10^{-10})$	$3.22*10^{-10*}$ $(1.78*10^{-10})$	$-9.89*10^{-11}$ $(1.61*10^{-10})$	$-6.39*10^{-11}$ $(1.69*10^{-10})$	$1.28*10^{-10}$ $(1.64*10^{-10})$
Δ Housing Prices	.028 (.025)	.036 (.029)	.045 (.028)	-.055 (.051)	-.046 (.050)	-.025 (.043)
Constant	-2.39 (2.05)	-2.78 (2.19)	-3.37 (2.29)	2.78 (3.86)	2.47 (3.86)	1.21 (3.57)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.371	0.379	0.450			
Pseudo R2				0.213	0.216	0.258

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 27: Federal Funds/Reverse Repos and the Probability of a Failure Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.055** (.022)	-.054** (.022)	-.052** (.022)	-.315** (.132)	-.310** (.135)	-.29** (.133)
Δ DW	$7.09*10^{-4**}$ $(3.25*10^{-4})$	$7.52*10^{-4**}$ $(3.12*10^{-4})$	$6.98*10^{-4**}$ $(3.15*10^{-4})$	$3.79*10^{-3*}$ $(2.05*10^{-3})$	$4.36*10^{-3**}$ $(2.13*10^{-3})$	$3.79*10^{-3*}$ $(1.98*10^{-3})$
3-Firm FFRR Ratio	-2.26 (2.75)			-10.6 (9.73)		
5-Firm FFRR Ratio		-2.81 (2.65)			-12.9 (8.83)	
10-Firm FFRR Ratio			-2.39 (2.51)			-10.4 (8.71)
Number of Banks	$2.12*10^{-5}$ $(3.91*10^{-5})$	$8.45*10^{-6}$ $(3.86*10^{-5})$	$7.71*10^{-6}$ $(4.05*10^{-5})$	$3.35*10^{-4*}$ $(1.76*10^{-4})$	$2.61*10^{-4}$ $(1.81*10^{-4})$	$2.695*10^{-4}$ $(1.94*10^{-4})$
Total Assets	$-8.99*10^{-11*}$ $(5.22*10^{-11})$	$-1.03*10^{-10*}$ $(5.27*10^{-11})$	$-1.02*10^{-10*}$ $(5.48*10^{-11})$	$-2.32*10^{-10}$ $(1.92*10^{-10})$	$-3.10*10^{-10}$ $(1.99*10^{-10})$	$-2.84*10^{-10}$ $(2.08*10^{-10})$
Δ Housing Prices	-.017 (.018)	-.017 (.018)	-.019 (.017)	-.019 (.071)	-.025 (.072)	-.032 (.073)
Constant	1.47*** (.635)	1.69*** (.633)	1.68** (.677)	1.03 (2.65)	2.29 (2.77)	1.93 (2.97)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.324	0.333	0.327			
Pseudo R2				0.347	0.360	0.350

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 28: Federal Funds/Reverse Repos and Probability of a Failure Since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.025 (.026)	-.021 (.027)	-.020 (.027)	-.328** (.161)	-.318* (.172)	-.259 (.160)
Δ DW	$3.46*10^{-6}$ $(5.84*10^{-6})$	$3.74*10^{-6}$ $(5.95*10^{-6})$	$3.30*10^{-6}$ $(6.05*10^{-6})$	$3.08*10^{-3}$ $(2.25*10^{-3})$	$4.54*10^{-3}$ $(2.81*10^{-3})$	$2.94*10^{-3}$ $(2.05*10^{-3})$
3-Firm FFRR Ratio	-5.22 (3.30)			-26.4* (14.9)		
5-Firm FFRR Ratio		-5.03 (3.06)			-25.2** (12.4)	
10-Firm FFRR Ratio			-4.67 (2.86)			-22.3* (12.6)
Number of Banks	$-5.24*10^{-4***}$ $(1.53*10^{-4})$	$-5.47*10^{-4***}$ $(1.55*10^{-4})$	$5.36*10^{-4***}$ $(1.53*10^{-4})$	$-2.14*10^{-3***}$ $(7.97*10^{-4})$	$-2.35*10^{-3***}$ $(8.00*10^{-4})$	$-2.14*10^{-4***}$ $(7.97*10^{-4})$
Total Assets	$-2.99*10^{-10***}$ $(7.49*10^{-11})$	$-3.12*10^{-10***}$ $(7.66*10^{-11})$	$-3.10*10^{-10***}$ $(7.60*10^{-11})$	$-1.23*10^{-9***}$ $(4.36*10^{-10})$	$-1.34*10^{-9***}$ $(4.33*10^{-10})$	$-1.28*10^{-9***}$ $(4.59*10^{-10})$
Δ Housing Prices	-.083*** (.018)	-.085*** (.018)	-.086*** (.019)	-.307*** (.086)	-.334*** (.088)	-.332*** (.094)
Constant	7.71*** (1.81)	8.00*** (1.84)	7.89*** (1.81)	30.5*** (10.3)	33.2*** (10.3)	31.2*** (10.6)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.332	0.347	0.337			
Pseudo R2				0.354	0.38	0.358

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 29: Treasury Holdings and Probability of a Failure Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.062***	-.061**	-.051**	-.570**	-.541**	-.295*
	(.023)	(.024)	(.022)	(.225)	(.212)	(.159)
Δ DW	$6.02*10^{-4*}$	$6.31*10^{-4*}$	$6.23*10^{-4*}$	$3.04*10^{-3}$	$3.45*10^{-3}$	$3.52*10^{-3}$
	$(3.24*10^{-4})$	$(3.22*10^{-4})$	$(3.22*10^{-4})$	$(2.29*10^{-3})$	$(2.31*10^{-3})$	$(2.21*10^{-3})$
3-Firm T-Ratio	9.11**			89.5***		
	(4.55)			(33.0)		
5-Firm T-Ratio		10.26			109.8**	
		(6.50)			(49.6)	
10-Firm T-Ratio			-3.71			-12.0
			(5.99)			(37.3)
Number of Banks	$8.67*10^{-5*}$	$8.66*10^{-5}$	$1.37*10^{-5}$	$1.28*10^{-3**}$	$1.24*10^{-3}$	$3.80*10^{-4}$
	$(5.08*10^{-5})$	$(5.77*10^{-5})$	$(5.35*10^{-5})$	$(5.18*10^{-4})$	$(5.31*10^{-4})$	$(2.94*10^{-4})$
Total Assets	$-2.08*10^{-11}$	$-1.81*10^{-11}$	$-8.34*10^{-11}$	$4.60*10^{-10}$	$4.92*10^{-10}$	$-1.45*10^{-10}$
	$(5.61*10^{-11})$	$(6.12*10^{-11})$	$(5.72*10^{-11})$	$(3.04*10^{-10})$	$(3.41*10^{-10})$	$(2.47*10^{-10})$
Δ Housing Prices	-.018	-.014	-.024	.044	.061	-.022
	(.017)	(.018)	(.018)	(.085)	(.085)	(.082)
Constant	.343	.295	1.50***	-11.8**	-12.1*	-.116
	(.828)	(.951)	(.870)	(5.94)	(6.49)	(4.18)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 30: Treasury Holdings and Probability of a Failure Since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.045 (.037)	-.055 (.040)	-.027 (.036)	-.537** (.274)	-.674** (.288)	-.353 (.221)
Δ DW	$6.62*10^{-6}$ $(7.07*10^{-6})$	$9.11*10^{-6}$ $(8.04*10^{-6})$	$3.57*10^{-6}$ $(8.29*10^{-6})$	$3.04*10^{-3}$ $(2.31*10^{-3})$	$3.80*10^{-3}$ $(2.74*10^{-3})$	$3.20*10^{-3}$ $(2.50*10^{-3})$
3-Firm T-Ratio	8.81 (7.79)			76.8** (38.3)		
5-Firm T-Ratio		17.6 (12.2)			151.4** (69.8)	
10-Firm T-Ratio			2.32 (12.0)			47.4 (45.9)
Number of Banks	$-2.64*10^{-4}$ $(2.16*10^{-4})$	$-2.34*10^{-4}$ $(2.13*10^{-4})$	$-3.87*10^{-4**}$ $(17.1*10^{-4})$	$-5.65*10^{-5}$ $(9.18*10^{-4})$	$1.11*10^{-4}$ $(8.54*10^{-4})$	$-1.02*10^{-3}$ $(6.22*10^{-4})$
Total Assets	$-1.46*10^{-10}$ $(9.92*10^{-11})$	$-1.18*10^{-10}$ $(1.04*10^{-10})$	$-2.03*10^{-10**}$ $(8.41*10^{-11})$	$-6.68*10^{-11}$ $(4.32*10^{-10})$	$1.41*10^{-10}$ $(4.53*10^{-10})$	$-4.82*10^{-10}$ $(3.17*10^{-10})$
Δ Housing Prices	-.053** (.026)	-.044 (.029)	-.067** (.026)	-.087 (.115)	-.037 (.116)	-.170 (.106)
Constant	4.23 (2.56)	3.70 (2.59)	5.71*** (2.07)	3.62 (10.5)	14.3* (7.48)	.483 (10.2)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.309	0.323	0.299			
Pseudo R2				0.341	0.380	0.312

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 31: Treasury Holdings and Number of Failures Prior to Financial Crisis

	3-Firm OLS	5-Firm OLS	10-Firm OLS	3-Firm Poisson	5-Firm Poisson	10-Firm Poisson
Δ GDP	-3.97*	-4.42**	-3.53	-.091	-.074	-.084
	(2.32)	(1.99)	(2.25)	(.063)	(.054)	(.066)
Δ DW	$7.80*10^{-3}$	$1.27*10^{-2}$	$2.03*10^{-2}$	$-5.64*10^{-5}$	$-4.03*10^{-4}$	$9.02*10^{-5}$
	$(4.03*10^{-3})$	$(3.54*10^{-2})$	$(3.94*10^{-2})$	$(1.13*10^{-3})$	$(9.02*10^{-3})$	$(1.02*10^{-3})$
3-Firm T-Ratio	1672.5***			78.8***		
	(527.6)			(24.5)		
5-Firm T-Ratio		2727.8***			111.9***	
		(828.6)			(31.0)	
10-Firm T-Ratio			1859.2**			89.1***
			(778.6)			(30.4)
Number of Banks	.027***	.031***	.026***	$7.33*10^{-4***}$	$9.81*10^{-4***}$	$1.01*10^{-3***}$
	$(3.72*10^{-2})$	$(4.67*10^{-3})$	$(4.23*10^{-3})$	$(2.07*10^{-4})$	$(2.65*10^{-4})$	$(2.79*10^{-4})$
Total Assets	$1.30*10^{-8***}$	$1.75*10^{-8***}$	$1.35*10^{-8***}$	$-1.03*10^{-10}$	$2.01*10^{-10}$	$3.45*10^{-10}$
	$(2.86*10^{-9})$	$(3.92*10^{-9})$	$(3.62*10^{-9})$	$(2.45*10^{-10})$	$(2.88*10^{-10})$	$(3.00*10^{-10})$
Δ Housing Prices	1.50*	2.67***	2.90**	-.030	$2.23*10^{-3}$	.013
	(.907)	(.907)	(1.17)	(.060)	(.051)	(.063)
Constant	-312.5***	-394.2***	-321.0***	-5.03	-9.72**	-10.4**
	(54.2)	(75.1)	(69.7)	(3.46)	(4.56)	(4.85)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	.524	.559	.516			
Pseudo R2				.636	.682	.642

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 32: Treasury Holdings and Number of Failures Prior Since 1994

	3-Firm OLS	5-Firm OLS	10-Firm OLS	3-Firm Poisson	5-Firm Poisson	10-Firm Poisson
Δ GDP	-2.35***	-2.43***	-2.14***	-.127***	-.139***	-.117***
	(.895)	(.855)	(.745)	(.034)	(.033)	(.044)
Δ DW	$-8.87*10^{-4***}$	$-8.44*10^{-4***}$	$-7.63*10^{-4***}$	$-4.20*10^{-5***}$	$-3.71*10^{-5***}$	$-3.78*10^{-5**}$
	$(2.26*10^{-4})$	$(2.18*10^{-4})$	$(2.02*10^{-4})$	$(1.06*10^{-5})$	$(1.06*10^{-5})$	$(1.51*10^{-5})$
3-Firm T-Ratio	663.0***			87.6***		
	(173.8)			(14.6)		
5-Firm T-Ratio		939.7***			119.9***	
		(215.4)			(18.6)	
10-Firm T-Ratio			990.0***			97.4***
			(203.7)			(17.3)
Number of Banks	$8.37*10^{-3***}$	$7.07*10^{-3**}$	$2.47*10^{-3}$	$1.08*10^{-3*}$	$9.03*10^{-4*}$	$3.10*10^{-4*}$
	$(3.13*10^{-3})$	$(2.76*10^{-3})$	$(2.47*10^{-3})$	$(5.63*10^{-4})$	$(5.49*10^{-4})$	$(5.37*10^{-4})$
Total Assets	$5.75*10^{-9***}$	$5.82*10^{-9***}$	$4.08*10^{-9***}$	$6.04*10^{-10***}$	$5.99*10^{-10***}$	$3.34*10^{-10}$
	$(1.45*10^{-9})$	$(1.37*10^{-9})$	$(1.77*10^{-9})$	$(2.26*10^{-10})$	$(2.24*10^{-10})$	$(2.17*10^{-10})$
Δ Housing Prices	-.313	-.212	-.350	-.141***	-.130***	-.148***
	(.454)	(.430)	(.3783)	(.030)	(.029)	(.038)
Constant	-100.4***	-92.6***	-43.6	-12.7*	-11.5*	-4.37
	(36.4)	(33.2)	(28.1)	(6.55)	(6.44)	(6.15)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	.798	.810	.822			
Pseudo R2				.778	.781	.772

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 33: Treasury Holdings and Size of Failures Prior to Financial Crisis

	3-Firm Tobit	5-Firm Tobit	10-Firm Tobit
Δ GDP	-.013	-.015	-.010
	(.016)	(.016)	(.016)
Δ DW	$1.94*10^{-4}$	$2.11*10^{-4}$	$2.34*10^{-4}$
	$(2.21*10^{-4})$	$(2.18*10^{-4})$	$(2.23*10^{-4})$
3-Firm T-Ratio	6.28^{*}		
	(3.46)		
5-Firm T-Ratio		10.1^{**}	
		(4.33)	
10-Firm T-Ratio			4.58
			(4.25)
Number of Banks	$8.59*10^{-5***}$	$1.02*10^{-4***}$	$7.22*10^{-5***}$
	$(2.95*10^{-5})$	$(3.12*10^{-5})$	$(3.06*10^{-5})$
Total Assets	$2.15*10^{-11}$	$3.86*10^{-11}$	$1.29*10^{-11}$
	$(2.99*10^{-11})$	$(3.18*10^{-11})$	$(3.23*10^{-11})$
Δ Housing Prices	-.010	$-5.08*10^{-3}$	$-6.05*10^{-3}$
	(.010)	(.011)	(.011)
Constant	$-.845^{*}$	-1.16^{**}	-.683
	(.454)	(.499)	(.504)
Number of Obs.	96	96	96
Prob > F			
Prob > Chi2	0.00	0.00	0.00
Pseudo R2	1.31	1.37	1.24

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 34: Cash Balances and Probability of a Failure Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.056**	-.055**	-.061***	-.336**	-.336*	-.338*
	(.022)	(.022)	(.023)	(.165)	(.200)	(.194)
Δ DW	$6.24*10^{-4**}$	$6.07*10^{-4*}$	$5.44*10^{-4*}$	$3.38*10^{-3}$	$4.14*10^{-3}$	$3.24*10^{-3}$
	$(3.15*10^{-4})$	$(3.19*10^{-4})$	$(3.25*10^{-4})$	$(2.26*10^{-3})$	$(3.02*10^{-3})$	$(2.49*10^{-3})$
3-Firm Cash Ratio	5.03			20.4		
	(2.98)			(19.7)		
5-Firm Cash Ratio		7.49***			55.4**	
		(2.61)			(25.5)	
10-Firm Cash Ratio			8.93***			55.8**
			(3.36)			(25.8)
Number of Banks	$-3.43*10^{-5}$	$-8.35*10^{-5}$	$-9.63*10^{-5}$	$2.19*10^{-4}$	$-2.23*10^{-4}$	$-2.11*10^{-4*}$
	$(7.45*10^{-5})$	$(5.62*10^{-5})$	$(6.31*10^{-5})$	$(3.14*10^{-4})$	$(3.43*10^{-4})$	$(3.31*10^{-4})$
Total Assets	$-7.11*10^{-11}$	$-7.70*10^{-11}$	$-7.06*10^{-11}$	$-8.77*10^{-11}$	$-1.15*10^{-10}$	$-7.34*10^{-11}$
	$(5.02*10^{-11})$	$(4.87*10^{-11})$	$(4.90*10^{-11})$	$(1.61*10^{-10})$	$(1.70*10^{-10})$	$(1.69*10^{-10})$
Δ Housing Prices	-.027	-.034*	-.037**	-.022	-.053	-.056
	(.019)	(.017)	(.018)	(.078)	(.086)	(.086)
Constant	1.54**	1.89***	1.92***	1.87	-.237	1.87
	(.768)	(.675)	(.706)	(3.03)	(2.75)	(3.03)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.328	0.350	0.352			
Pseudo R2				0.345	0.382	0.378

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 35: Cash Balances and Probability of a Failure Since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Probit	5 Firm Probit	10 Firm Probit
Δ GDP	-.025 (.032)	-.017 (.030)	-.017 (.030)	-.266 (.185)	-.283 (.224)	-.268 (.213)
Δ DW	$2.09*10^{-6}$ $(7.71*10^{-6})$	$5.06*10^{-6}$ $(7.93*10^{-6})$	$4.73*10^{-6}$ $(7.22*10^{-6})$	$2.81*10^{-3}$ $(2.35*10^{-3})$	$4.00*10^{-3}$ $(3.07*10^{-3})$	$3.23*10^{-3}$ $(2.36*10^{-3})$
3-Firm Cash Ratio	-.431 (4.42)			12.2 (18.0)		
5-Firm Cash Ratio		2.84 (5.34)			47.4^* (28.7)	
10-Firm Cash Ratio			2.79 (4.68)			50.1^* (26.1)
Number of Banks	$-3.96*10^{-4**}$ $(1.58*10^{-4})$	$-4.02*10^{-4***}$ $(1.55*10^{-4})$	$-4.05*10^{-4***}$ $(1.54*10^{-4})$	$-1.21*10^{-3**}$ $(5.18*10^{-4})$	$-1.28*10^{-3***}$ $(5.01*10^{-4})$	$-1.36*10^{-3***}$ $(4.90*10^{-4})$
Total Assets	$-2.11*10^{-10***}$ $(6.95*10^{-11})$	$-2.04*10^{-10***}$ $(7.08*10^{-10})$	$-2.06*10^{-10***}$ $(6.97*10^{-11})$	$-5.98*10^{-10**}$ $(2.48*10^{-10})$	$-5.20*10^{-10**}$ $(5.56*10^{-10})$	$-5.19*10^{-10**}$ $(2.57*10^{-10})$
Δ Housing Prices	$-.071^{***}$ (.017)	$-.065^{***}$ (.020)	$-.064^{***}$ (.020)	$-.202^{**}$ (.083)	$-.160^*$ (.096)	$-.158^*$ (.093)
Constant						
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.299	0.301	0.302			
Pseudo R2				0.305	0.331	0.335

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 36: Cash Balances and Number of Failures Prior to the Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Poisson	5 Firm Poisson	10 Firm Poisson
Δ GDP	-2.60 (2.80)	-2.93 (2.74)	-3.65 (2.74)	-.150** (.071)	-.250*** (.053)	-.293*** (.056)
Δ DW	$1.28*10^{-2}$ $(4.40*10^{-2})$	$7.33*10^{-3}$ $(3.38*10^{-2})$	$-1.69*10^{-3}$ $(3.49*10^{-2})$	$9.52*10^{-4}$ $(1.36*10^{-3})$	$9.96*10^{-4}$ $(7.14*10^{-4})$	$4.28*10^{-4}$ $(7.09*10^{-4})$
3-Firm Cash Ratio	434.7 (296.6)			25.7** (11.7)		
5-Firm Cash Ratio		1722.9*** (507.1)			65.4*** (7.54)	
10-Firm Cash Ratio			1515.3*** (569.2)			76.6*** (12.0)
Number of Banks	.011*** $(3.97*10^{-3})$	$-9.90*10^{-3}$ $(7.92*10^{-3})$	$-5.07*10^{-3}$ $(8.26*10^{-3})$	$2.32*10^{-5}$ $(2.22*10^{-4})$	$-5.09*10^{-4***}$ $(1.31*10^{-4})$	$-6.06*10^{-4***}$ $(2.03*10^{-4})$
Total Assets	$4.31*10^{-9***}$ $(1.65*10^{-9})$	$2.21*10^{-9}$ $(2.14*10^{-9})$	$3.95*10^{-9**}$ $(1.92*10^{-9})$	$-3.77*10^{-10**}$ $(1.58*10^{-10})$	$-4.98*10^{-10***}$ $(1.21*10^{-10})$	$-4.16*10^{-10***}$ $(1.35*10^{-10})$
Δ Housing Prices	.480 (1.09)	-2.03 (1.35)	-1.71 (1.39)	-.149*** (.055)	-.352*** (.042)	-.416*** (.056)
Constant	-128.0*** (28.9)	5.10 (53.3)	-32.9 (52.0)	3.51 (2.35)	7.26*** (1.57)	7.61*** (2.07)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.480	0.566	0.566			
Pseudo R2				0.576	0.793	0.733

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 37: Cash Balances and Number of Failures Since 1994

	3-Firm OLS	5-Firm OLS	10-Firm OLS	3-Firm Poisson	5-Firm Poisson	10-Firm Poisson
Δ GDP	.208	.447	.423	.136***	.108***	.098***
	(.578)	(.578)	(.523)	(.046)	(.041)	(.033)
Δ DW	-7.42×10^{-4}***	-7.10×10^{-4}***	-7.99×10^{-4}**	-4.59×10^{-5}***	-4.70×10^{-5}***	-7.34×10^{-5}***
	(2.23×10^{-4})	(2.25×10^{-4})	(3.10×10^{-4})	(1.06×10^{-5})	(9.37×10^{-6})	(1.15×10^{-5})
3-Firm Cash Ratio	413.4***			42.7***		
	(78.1)			(6.71)		
5-Firm Cash Ratio		549.0***			52.5***	
		(88.6)			(7.25)	
10-Firm Cash Ratio			507.0***			56.1***
			(73.9)			(8.04)
Number of Banks	-2.63×10^{-3}	-2.50×10^{-3}	-3.12×10^{-3}**	-1.60×10^{-4}	-1.03×10^{-4}	-1.82×10^{-4}
	(1.82×10^{-3})	(1.53×10^{-3})	(1.46×10^{-3})	(4.61×10^{-4})	(4.04×10^{-4})	(3.72×10^{-4})
Total Assets	1.51×10^{-9}**	2.06×10^{-9}***	1.75×10^{-9}***	1.51×10^{-10}	1.93×10^{-10}	1.71×10^{-10}
	(8.11×10^{-10})	(7.49×10^{-10})	(6.57×10^{-10})	(2.04×10^{-10})	(1.86×10^{-10})	(1.70×10^{-10})
Δ Housing Prices	-.797***	-.713***	-.628***	-.158***	-.142***	-.105***
	(.284)	(.260)	(.261)	(.029)	(.028)	(.035)
Constant	-7.23	-20.7	-11.3	-2.19	-3.30	-2.83
	(20.1)	(18.6)	(16.6)	(5.72)	(5.06)	(4.71)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	.834	.859	.859			
Pseudo R2				.778	.785	.790

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 38: Cash Balances and Size of Failures Prior to Financial Crisis

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	$3.17*10^{-3}$ $(1.77*10^{-2})$	$1.21*10^{-3}$ $(1.90*10^{-2})$	$-9.49*10^{-4}$ $(1.82*10^{-2})$	$-9.24*10^{-3}$ $(1.58*10^{-2})$	$-1.27*10^{-2}$ $(1.43*10^{-2})$	$-1.74*10^{-2}$ $(1.52*10^{-2})$
Δ DW	$6.95*10^{-5}$ $(2.73*10^{-4})$	$4.73*10^{-5}$ $(2.78*10^{-4})$	$2.02*10^{-5}$ $(2.37*10^{-4})$	$2.15*10^{-4}$ $(2.24*10^{-4})$	$1.76*10^{-4}$ $(2.04*10^{-4})$	$1.28*10^{-4}$ $(2.14*10^{-4})$
3-Firm Cash Ratio	.271 (1.86)			2.00 (2.42)		
5-Firm Cash Ratio		5.99^{**} (3.04)			9.05^{***} (2.05)	
10-Firm Cash Ratio			4.85 (3.32)			8.49^{***} (2.53)
Number of Banks	$4.48*10^{-5*}$ $(2.53*10^{-5})$	$4.44*10^{-5}$ $(4.80*10^{-5})$	$-2.16*10^{-5}$ $(4.91*10^{-5})$	$2.12*10^{-5}$ $(3.94*10^{-5})$	$-9.56*10^{-5**}$ $(3.83*10^{-5})$	$-7.67*10^{-5*}$ $(4.27*10^{-5})$
Total Assets	$1.22*10^{-11}$ $(1.03*10^{-11})$	$3.64*10^{-12}$ $(1.28*10^{-11})$	$9.92*10^{-12}$ $(1.14*10^{-11})$	$-1.31*10^{-11}$ $(2.54*10^{-11})$	$-3.06*10^{-11}$ $(2.39*10^{-11})$	$-2.04*10^{-11}$ $(2.44*10^{-11})$
Δ Housing Prices	$-4.18*10^{-3}$ $(6.44*10^{-3})$	$-.015^{**}$ $(7.44*10^{-3})$	$-.013^{*}$ $(7.44*10^{-3})$	$-.015$ $(1.17*10^{-2})$	$-.035^{***}$ $(1.17*10^{-2})$	$-.033^{***}$ $(1.27*10^{-2})$
Constant	$-.420^{**}$ (.168)	.131 (.319)	$-.036$ (.303)	$-.105$ (.388)	$.710^{*}$ (.387)	.534 (.405)
Number of Obs.	96	96	96	96	96	96
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.250	0.339	0.294			
Pseudo R2				1.23	1.79	1.56

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 39: Cash Balances and Size of Failures Since 1994

	3 Firm OLS	5 Firm OLS	10 Firm OLS	3 Firm Tobit	5 Firm Tobit	10 Firm Tobit
Δ GDP	$-8.90*10^{-2}$ $(7.04*10^{-2})$	$-8.62*10^{-2}$ $(7.20*10^{-2})$	$-7.88*10^{-2}$ $(7.05*10^{-2})$	$-.111^{*}$ $(6.02*10^{-2})$	$-.104^{*}$ $(6.07*10^{-2})$	$-9.66*10^{-2}$ $(5.88*10^{-2})$
Δ DW	$7.57*10^{-5*}$ $(4.38*10^{-5})$	$7.38*10^{-5*}$ $(4.39*10^{-5})$	$7.28*10^{-5*}$ $(2.71*10^{-5})$	$7.76*10^{-5***}$ $(2.24*10^{-5})$	$7.83*10^{-5***}$ $(2.70*10^{-5})$	$7.74*10^{-5***}$ $(2.58*10^{-5})$
3-Firm Cash Ratio	20.5^{*} (11.1)			20.6^{**} (8.56)		
5-Firm Cash Ratio		23.2^{*} (12.0)			26.1^{**} (10.4)	
10-Firm Cash Ratio			25.0^{**} (10.3)			27.7^{**} (9.13)
Number of Banks	$2.39*10^{-5}$ $(1.85*10^{-4})$	$2.52*10^{-5}$ $(2.00*10^{-4})$	$2.15*10^{-5}$ $(1.90*10^{-4})$	$-1.40*10^{-4}$ $(3.05*10^{-4})$	$-1.26*10^{-4}$ $(3.04*10^{-4})$	$-1.48*10^{-4}$ $(2.96*10^{-5})$
Total Assets	$1.59*10^{-10}$ $(1.08*10^{-10})$	$1.78*10^{-10}$ $(1.17*10^{-10})$	$1.71*10^{-10}$ $(1.08*10^{-10})$	$-5.83*10^{-11}$ $(1.49*10^{-10})$	$-3.24*10^{-11}$ $(1.50*10^{-10})$	$-2.93*10^{-11}$ $(1.45*10^{-10})$
Δ Housing Prices	$.058$ $(.037)$	$.055$ $(.035)$	$.066$ $(.034)$	$-.011$ $(4.57*10^{-2})$	$-.8.81*10^{-3}$ $(4.61*10^{-2})$	$-7.32*10^{-2}$ $(4.50*10^{-2})$
Constant	-3.93 (2.52)	-4.28 (2.67)	-4.12^{*} (2.39)	$-.924$ (3.68)	$.310$ (3.72)	$.262$ (3.57)
Number of Obs.	68	68	68	68	68	68
Prob > F	0.00	0.00	0.00			
Prob > Chi2				0.00	0.00	0.00
R-Squared	0.441	0.432	0.459			
Pseudo R2				.248	.251	.267

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 40: Concentration and Fragility Prior to the Recent Financial Crisis

	Total Assets	Real Estate	C&I	Consumers	Federal Funds and Reverse Repos	Treasuries	Cash
Probability of a Failure	0	0	0	0	0	++	++
Number of Failures	―――	+++	――	+++	0	+++	+++
Relative Size of Failures	―――	+++	0	+	0	++	++

Notes: The number of signs reflects the number of coefficient estimates recorded as statistically different from zero beyond the 10% level in either the Probit (probability of a failure), Poisson (number of failures), or Tobit (relative size of failures) specifications in previous regression tables.

Table 41: Concentration and Fragility Since Restrictions on Inter-State Banking Eliminated

	Total Assets	Real Estate	C&I	Consumers	Federal Funds and Reverse Repos	Treasuries	Cash
Probability of a Failure	――	0	0	0	―――	++	++
Number of Failures	―――	――	0	0	0	+++	+++
Relative Size of Failures	―――	–	0	–	0	0	+++

Notes: The number of signs reflects the number of coefficient estimates recorded as statistically different from zero beyond the 10% level in either the Probit (probability of a failure), Poisson (number of failures), or Tobit (relative size of failures) specifications in previous regression tables.

Table 42: Concentration and Return on Assets

	3-Firm Prior to Crisis	5-Firm Prior to Crisis	10-Firm Prior to Crisis	3-Firm Since 1994	5-Firm Since 1994	10-Firm Since 1994
Δ GDP	.029**	.043***	.035***	.046**	.035***	.038***
	(.014)	(.015)	(.013)	$(8.50*10^{-3})$	$(9.69*10^{-3})$	$(8.94*10^{-3})$
Δ DW	$-1.21*10^{-4}$	$-1.13*10^{-4}$	$-1.69*10^{-4}$	$-2.91*10^{-6}$	$-3.14*10^{-6}$	$-4.43*10^{-6}$
	$(1.45*10^{-4})$	$(1.65*10^{-4})$	$(1.51*10^{-4})$	$(3.72*10^{-6})$	$(3.75*10^{-6})$	$(3.84*10^{-6})$
3-Firm TA Ratio	.030***			.038***		
	$(7.92*10^{-3})$			$(9.25*10^{-3})$		
5-Firm TA Ratio		$-2.68*10^{-11}$			.035***	
		$(2.79*10^{-11})$			(.011)	
10-Firm TA Ratio			.016***			.035***
			$(5.20*10^{-3})$			$(1.14*10^{-2})$
Number of Banks	$-2.14*10^{-4***}$	$-1.90*10^{-4***}$	$-1.96*10^{-4***}$	$-9.53*10^{-5***}$	$-7.98*10^{-5***}$	$1.79*10^{-5}$
	$(2.15*10^{-5})$	$(2.09*10^{-5})$	$(1.98*10^{-5})$	$(3.77*10^{-5})$	$(4.38*10^{-5})$	$(6.00*10^{-5})$
Total Assets	$-1.91*10^{-10***}$	$-7.05*10^{-11***}$	$-1.41*10^{-10***}$	$-2.01*10^{-10***}$	$-2.06*10^{-10***}$	$-1.69*10^{-10***}$
	$(3.40*10^{-11})$	$(1.23*10^{-11})$	$(2.38*10^{-11})$	$(2.94*10^{-11})$	$(3.42*10^{-11})$	$(3.07*10^{-11})$
Δ Housing Prices	-.011	$-3.94*10^{-3}$	$-1.46*10^{-2*}$	.023***	.025***	.025***
	$(8.36*10^{-3})$	$(8.13*10^{-3})$	$(8.59*10^{-3})$	$(5.56*10^{-3})$	$(5.26*10^{-3})$	$(5.86*10^{-3})$
Constant	3.58***	3.18***	3.16***	2.12***	1.87***	.446
	(.267)	(.251)	(.239)	(.455)	(.540)	(.801)
Number of Obs.	96	96	96	68	68	68
Prob > F	0.00	0.00	0.00	0.00	0.00	0.00
R-Squared	.784	.764	.777	.905	.899	.902

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 43: Bank Lending Variables and Return on Assets

	Prior to Crisis	Since 1994
I. Real Estate Ratio		
A. 3-Firm	-1.03**	.932
	(.482)	(1.36)
B. 5-Firm	-1.71***	-.197
	(.567)	(1.62)
C. 10-Firm	-1.85***	5.21***
	(.622)	(1.41)
II. C&I Loan Ratio		
A. 3-Firm	-.345	-1.28***
	(.344)	(.245)
B. 5-Firm	-.364	-1.31***
	(.307)	(.249)
C. 10-Firm	-.658**	-1.33***
	(.304)	(.253)
III. Loans to Individuals		
A. 3-Firm	.645	2.80**
	(1.32)	(1.36)
B. 5-Firm	.120	4.21***
	(1.56)	(1.45)
C. 10-Firm	1.41	7.35***
	(1.89)	(1.80)
IV. Federal Funds/Reverse Repos		
A. 3-Firm	-1.66**	-2.37***
	(.791)	(.638)
B. 5-Firm	-1.34**	-1.83***
	(.603)	(.527)
C. 10-Firm	-2.16***	-2.16***
	(.439)	(.439)

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.

Table 44: Other Asset Holdings and Return on Assets

	Prior to Crisis	Since 1994
I. Treasury Ratio		
A. 3-Firm	-6.98***	-13.1***
	(1.91)	(2.76)
B. 5-Firm	-7.19***	-18.1***
	(2.77)	(3.33)
C. 10-Firm	-1.25	-17.0***
	(3.23)	(3.27)
II. Cash Ratio		
A. 3-Firm	-4.81**	-6.68***
	(2.25)	(1.24)
B. 5-Firm	-4.38**	-8.08***
	(1.83)	(1.56)
C. 10-Firm	-4.55**	-7.88***
	(2.21)	(1.57)

Notes: Heteroskedasticity-consistent standard errors are reported in parentheses below each coefficient estimate. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level.