Finance and Economics Discussion Series
Divisions of Research & Statistics and Monetary Affairs
Federal Reserve Board, Washington, D.C.

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2012-59

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August 23, 2012

ABSTRACT

Bank lending to small firms in the U.S. fell substantially during the recent financial crisis and the ensuing recession. Because small firms account for a disproportionate share of new job creation, lending to these firms could have important implications for the pace of economic recovery. A number of factors may have contributed to the decline in small business lending over this period. This paper examines the extent to which changes in banks' supervisory ratings are associated with changes in the rate of growth of their lending to small businesses. Limiting our sample to small banks (those with total assets of $5 billion or less), we estimate the relationship between changes in supervisory CAMELS ratings and changes in small commercial and industrial (C&I) or small commercial real estate (CRE) loans to businesses, between 2007 and 2010. Controlling for other relevant factors, including several balance sheet measures of bank health, we find that small banks that experienced ratings downgrades during 2007-2010 exhibited significantly lower rates of growth in small C&I loans and small CRE loans outstanding compared with banks that maintained their ratings at healthy levels during the same period. We also find evidence suggesting that the slower growth in small business lending at downgraded banks is attributable primarily to aspects of the banks' financial health that were not fully reflected in balance sheet data, rather than to the ratings downgrades themselves or the supervisory process surrounding the downgrades.

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I. Introduction

Bank lending to small firms in the U.S. fell substantially during the recent financial crisis and subsequent recession. Small firms–especially new small firms–account for a disproportionate share of new job creation, and the formation and health of small firms directly affects consumption and other drivers of economic activity. Lending to these firms therefore has important implications for economic growth and for the strength of the current economic recovery.[1] A number of factors may have contributed to the recent decline in small business lending, including lower demand for credit by firms whose business declined during the recession; diminished credit quality or collateral quality of firms seeking credit; a general tightening of credit standards by banks; the deteriorating financial condition of some banks; and increased scrutiny of bank lending decisions by bank examiners.[2]

Concurrent with the decline in small business lending, a substantial proportion of banks experienced supervisory ratings downgrades. This paper examines the extent to which changes in banks' supervisory ratings are associated with changes in the rate of growth of their lending to small businesses, after controlling for a number of observable factors, including balance sheet measures of the banks' financial condition. We use bank-level data to estimate the relationship between changes in small commercial and industrial (C&I) or small commercial real estate (CRE) loans to businesses, on the one hand, and changes in supervisory CAMELS ratings, on the other hand, for three consecutive one-year periods beginning in June 2007 and ending in June 2010.[3] We limit our sample to small banks, defined as those with less than $5 billion in assets. Our focus on small banks is natural because small banks originate a disproportionate share of small business loans (nearly all loans originated by small banks are small); small and large banks face very different conditions in funding markets; and the small number of large banks limits the inference that can be drawn from an analysis of large institutions.[4]

Our paper makes two primary contributions to the literature. First, to our knowledge, it is the first comprehensive look at the relationship between CAMELS ratings changes and growth in

[1] Peek, et al. (2003) find strong support for a link between loan supply shocks and real GDP.
[2] For an overview of the types of concerns raised by observers regarding examiner scrutiny, see United States Government Accountability Office, "Banking Regulation: Enhanced Guidance on Commercial Real Estate Risks Needed" (May 2011).
[3] We define small loans as those with initial principal amounts of $1 million or less.
[4] More than 98 percent of the roughly 7,000 banks operating in the U.S. during our sample period meet our definition of a small bank. About 130 banks exceed the $5 billion asset threshold; these large banks vary considerably in size, from $5 billion to over $1 trillion.

small loans to businesses and total loans outstanding over the recent financial crisis. Second, it is the first paper on the relationship between supervisory ratings and loan growth to consider the effects of both CAMELS changes and levels, while controlling for bank financial variables likely to be correlated with ratings.

We find that, after controlling for a variety of factors, including balance sheet measures of a bank's financial condition, small banks that experienced ratings downgrades during the 2007 to 2010 period exhibited significantly lower rates of growth in small C&I loans and small CRE loans outstanding compared with banks that maintained their ratings at healthy levels during the same period. Small banks that maintained their ratings at levels indicating some degree of supervisory concern also exhibited lower rates of loan growth than did healthy banks. Although we do not identify the exact channel by which lending declines with downgrades, our findings suggest that the decline in lending is likely due to aspects of the banks' financial condition that are not reflected in balance sheet data, rather than the downgrades themselves.

II. The Effects of Bank Supervision on Loan Growth

Bank supervisors use the Uniform Financial Institution Rating System to assess the soundness of financial institutions and to identify those institutions that require special supervisory attention. Under this system, financial institutions are examined at least once every twelve months or once every eighteen months, depending on the bank's current condition.[5] Following these exams, banks are assigned numerical ratings for each of six components of their financial condition, as well as an overall composite rating. The six ratings components are capital adequacy (C), asset quality (A), management (M), earnings (E), liquidity (L), and sensitivity to market risk (S), and the ratings are commonly referred to as CAMELS. The numerical values for each component and for the composite CAMELS rating range from 1 through 5, with 1 being the best and 5 being the worst. When assigning a composite rating, some components may be given more weight than others, and the capital (C) and asset quality (A) components are usually weighted most heavily.[6] A composite rating of 1 or 2 indicates that a financial institution is judged to be sound. A composite rating of 3 indicates some degree of

[5] Most banks follow a twelve-month schedule; smaller banks in good financial condition may be on an eighteen-month schedule. For a more complete overview of the supervisory process see Berger et al. (2001) and Collier et al. (2003).
[6] Berger et al. (2001).

supervisory concern regarding the institution's condition. A rating of 4 or 5 indicates that the financial institution has been found to exhibit unsafe or unsound practices or condition. A bank with a composite rating of 5 faces a high probability of failure.

Institutions with composite ratings of 3 or worse are subject to increased supervisory attention and may face legal restrictions on their activities. The supervisory actions associated with poor CAMELS ratings may lead to a reduction in bank lending, beyond any such reduction that is directly attributable to the financial condition of the bank. For example, supervisors may impose explicit limitations on lending activity. Alternatively, increased supervisory attention may cause a bank voluntarily to cut back on its lending in order to shore up its balance sheet and improve its CAMELS rating in the future.

A large body of research has examined the ability of bank supervisors and bank supervisory ratings to predict bank distress and failure. Several papers focus explicitly on the relationship between balance sheet measures of banks' financial condition and monitoring models used by supervisors. These include Cole and Gunther (1998), Collier, Forbush, Nuxoll and O'Keefe (2003), Furlong and Williams (2006), Gilbert, Meyer, and Vaughan (1999, 2000 and 2002), Berger, Kyle and Scalise (2001), Krainer and Lopez (2009), Nuxoll, O'Keefe and Samolyk (2003), and Whalen (2010). A full discussion of this body of work is beyond the scope of our paper. It is worth noting, however, that balance-sheet measures of banks' financial condition do not include all of the elements that are incorporated into bank examiner ratings. Supervisors consider a broad array of factors that are not reflected on balance sheets. For example, supervisors review detailed information on the composition of banks' portfolios, their policies with respect to loss provisioning, their expected capital actions, their risk management and compliance processes, and so on. The management rating, in particular, reflects an evaluation of management quality that is not captured by balance sheet ratios, but that may be predictive of future problems. Thus, we would not expect that balance-sheet measures alone would perform as well as CAMELS ratings in predicting bank distress or failure.

More closely related to our work are a small number of papers that have examined the effects of bank supervision on bank lending behavior. Bizer (1993) regresses lending on lagged CAMELS ratings and some control variables; he finds that worse CAMELS ratings are associated with lower levels of lending. Peek and Rosengren (1995) examine specifically the effects of formal regulatory actions on small business loans in New England during the credit

crunch of the early 1990s. They find that small banks, which lend primarily to smaller firms, react to the imposition of formal regulatory actions by reducing their loans, including the types of loans that are most important for firms that are dependent on bank financing. Because Peek and Rosengren include indicators of the timing of direct regulatory action, they are able to identify credit supply effects separately from demand factors that could reduce lending.

Berger, Kyle and Scalise (2001) examine the effects of changes in supervisory assessments (both classified assets and CAMELS ratings) on the portion of banks' assets devoted to various types of loans (C&I, real estate, and installment loans) during the period from 1987 to 1998. They find that changes in classified assets are significantly related to changes in the composition of bank lending with the expected signs, but that the magnitudes of the effects are quite small. They find no consistent relationship between changes in CAMELS ratings and bank lending behavior.

Curry, Fissel and Ramirez (2008) examine the effect of CAMELS ratings on various categories of loan growth (commercial and industrial loans, consumer loans, and real estate loans) during two time periods: 1985 to 1993 and 1994 to 2004. They aggregate their data to the state level in order to investigate whether downgrades that affect a large share of a state's banking assets have a significant impact on the state's loan and output growth rates. They find a highly significant, negative relationship between the C&I loan growth rate and the weighted average CAMELS rating during the earlier period, but not during the later period. Results for consumer loans and real estate loans are mixed.

Ramirez, Curry and Fissel (2009) regress bank loan growth on the "unexpected" change in CAMELS ratings, banks' financial condition, and other control variables, for two time periods (1985-1993 and 1994-2005). Their measure of unexpected CAMELS changes is constructed as the change in the residual between their forecast of the CAMELS rating, using a model currently employed by bank examiners and regulators to identify banks whose financial condition has deteriorated since their last exam, and the actual CAMELS rating. They find this residual to be highly predictive of lending contractions. Because they do not include the actual CAMELS changes themselves in the regression, if the actual CAMELS change is correlated with the change in the residual (e.g., if the "expected" component of the change is correlated with the "unexpected" component), then the effect of the change in the residual may be overstated.

More recently, Bassett, Lee and Spiller (2012) use panel data from 1991-2011 to estimate the degree of variation in supervisory stringency over time and the effect of this variation on bank lending. They find that supervisory standards appear to show only a small degree of variation over time, but that even small increases in supervisory stringency are associated with noticeable reductions in total lending.

One challenge for researchers seeking to identify the effects of ratings downgrades on bank lending has been the relative infrequency of bank downgrades themselves, except during periods of unusual stress for the banking industry. The 1990-1994 period provided an interval during which a substantial number of banks and thrifts were downgraded, and much of the existing literature on ratings downgrades focuses on this period. The depth and breadth of the recent financial crisis once again brought the number of downgraded institutions to a level that allows for clearer identification of the effects of individual drivers on lending behavior. Geographic disparity in the timing and intensity of real estate value declines and various measures of economic distress over the course of the financial crisis and recession also provide opportunities for identification of specific factors affecting bank lending. Finally, the substantial fluctuations in loans originated and outstanding across banks and over time allow for more precise identification.

In this paper, we examine the relationship between supervisory downgrades and bank lending during the 2007 to 2010 period. In addition to focusing on this more recent time period, our paper differs from the previous research in two important ways. First, we focus on small loans to businesses rather than the broader loan categories considered in previous research. This distinction is noteworthy because the decline in small business lending during the financial crisis and the ensuing recession has been a significant policy concern. Although small businesses are now finding that lending conditions have eased somewhat relative to the peak of the crisis, credit remains very tight by historical standards for these firms.[7] Policymakers are concerned that the lack of access to credit may be constraining the ability of small businesses to grow and create new jobs, thereby hindering the economic recovery. Second, we use more granular measures of CAMELS ratings changes than have been used in previous research (e.g., distinguishing between a downgrade from 1 or 2 to 3 or worse and a downgrade from 3 to 4 or worse), allowing for differential effects on loan growth rates across various changes.

[7] See, for example, Dunkelberg and Wade (2011), "NFIB Small Business Economic Trends."

III. Loan Growth and Supervisory Ratings over the Financial Crisis

Charts 1, 2 and 3 show the movements in small C&I loans, small CRE loans and total bank loans, respectively, over the period 2001-2010. Each chart includes lines indicating the dollar values of loans outstanding for all banks, small banks (those with less than $5 billion in assets) and large banks (those with assets of $5 billion or more). The dollar value of small C&I loans outstanding at all banks, shown in Chart 1, is fairly stable from 2001 to 2004. It increases modestly from 2004 to 2006 and more sharply from 2006 to 2008, before declining by about eight percent between 2008 and 2010. Small C&I loans at large banks follow a very similar pattern through 2008, but level out in 2009 and 2010, while those at small banks show more modest increases through 2008 and then fall off rather sharply, declining by nearly seventeen percent between 2008 and 2010. Small CRE loans outstanding at all banks rise at a fairly steady rate between 2001 and 2008, are essentially unchanged between 2008 and 2009, and decline substantially from 2009 to 2010. Fairly similar patterns are observed for small CRE loans at large and small banks, though loans at small banks show less movement over time. Total loans outstanding at all banks rose without interruption from 2001 to 2009, and fell only slightly in 2010. Most of the growth in total loans outstanding over the decade is attributable to large banks.

Chart 4 shows the downward shift in the distribution of CAMELS ratings during the financial crisis, for both small and large banks. Between 2007 and 2010, the number of small banks with composite CAMELS ratings of 3 quadrupled, from just over 300 to more than1200, and the number of small banks rated 4 or 5 rose even more sharply, from about 50 to more than 750. Although the number of large banks falling into each rating category is much smaller, a similar shift in the distribution of ratings is observed for these institutions. By mid-2010, nearly thirty percent of banks had composite ratings of 3 or worse.

Table 1 shows changes in small banks' small loans to businesses and total loans outstanding, by CAMELS rating status. Over the June 2007 to June 2008 time period, growth rates for small C&I loans, small CRE loans and total loans outstanding were strongly positive for small banks that remained healthy throughout the year. Those that became troubled showed weakly positive growth in all three categories over the year. Small banks that were troubled at both the beginning and end of the 2007-08 period exhibited reductions in small C&I loans and

total loans outstanding, and a very modest increase in small CRE loans. During each of the two subsequent years, growth in small C&I loans was slightly negative for healthy small banks and strongly negative for small banks that became or remained troubled during the course of the year. Growth rates for small CRE and total loans at healthy banks remained positive from 2008 through 2010, while those for banks that became or remained troubled turned negative. The observed univariate relationship between lending growth rates and supervisory ratings, though perhaps unsurprising, does not necessarily represent a causal relationship, nor does it control for other factors that might influence the rate of growth in lending to small businesses. In the regression analysis that follows, we control for a number of these factors.

IV. Regression Analysis

The volume of small business lending undertaken by a bank at any point in time depends on a number of factors, including the growth potential and credit needs of small businesses in the local markets served by the bank, the creditworthiness of those small businesses and the value of assets that can be used as collateral, the bank's financial condition, and the stringency of regulators. Over time, changes in any of these factors may influence the rate of growth in small business lending. We consider the extent to which each of these factors is associated with the rate of growth in small loans to businesses and total loans for community banks, during the period from June 2007 to June 2010. We separate small loans to businesses into two categories – small C&I loans and small CRE loans – because cyclical patterns of loan growth can differ substantially between these loan types.[8]

We use OLS to estimate two alternative models. The first model relies on CAMELS ratings alone to capture the bank's financial condition. The second model includes several bank financial ratios in addition to the CAMELS variables. Each model is estimated for three different loan categories: small C&I loans, small CRE loans and total loans. For each loan category, the dependent variable is the percentage change in loans outstanding for the observed bank, over the one-year period ending on June 30 of year *t*, where *t* is 2008, 2009 or 2010. Data for the three years are pooled, and year dummies for 2008-09 and 2009-10 are included to allow for shifts in the overall loan growth rate from year to year. The right-hand-side variables are

[8] For the banks in our sample, the correlation between the rate of growth in small C&I loans and the rate of growth in small CRE loans is only 0.25.

intended to capture each of the factors mentioned above that might influence the volume of small business lending undertaken by a bank. Most of the variables that are indicative of the credit needs or creditworthiness of small businesses operating in a bank's local market area are measured at the state level, rather than at the local level, in order to mitigate endogeneity concerns. Table 2 provides definitions of the dependent and independent variables used in the regressions, and table 3 shows summary statistics for these variables for each sample year.

We cannot measure directly the credit needs of small businesses in a given local market; however, we expect that these needs will be positively related to demand for the small businesses' products or services, which are influenced by local economic conditions. We use three variables to capture local economic conditions – the beginning-of-period value of the Federal Reserve Bank of Philadelphia's monthly State Coincident Index (state index),[9] the percentage change in the state index over the previous year, and the average annual rate of population growth in the local market over the previous five years.[10] We expect the rate of growth in small loans to businesses to be positively related to each of these variables.

In underwriting loans to small businesses, particularly newer businesses that have not yet established a track record, banks tend to base their lending decisions in part on the credit quality of the business owners. We use the percentage change in the delinquency rate on consumer loans over the previous year to measure the change in consumer credit quality for the state(s) in which the bank operates. We expect to find a negative relationship between the change in the delinquency rate in a state and the change in outstanding small loans to businesses held by banks operating in that state. Small business owners often take out mortgages on their homes to finance their businesses or use their homes as collateral for their business loans.[11] For this reason, changes in home values can affect the willingness of banks to lend to small businesses. We include the percentage change in the state-level housing price index (HPI) over the previous year to capture changes in the value of residential real estate held by small business owners. We expect the estimated coefficient on this variable to be positive.

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[9] The State Coincident Index combines four state-level indicators (nonfarm payroll employment, average hours worked in manufacturing, the unemployment rate, and wage and salary disbursements deflated by the consumer price index) to summarize current economic conditions in a single statistic. Higher values of the index indicate better economic conditions.

[10] Unlike the other geographically-based variables included in our models, population growth is measured at the local market level because it is not likely to be influenced by loan growth rates at banks serving the area.

[11] See Dennis (2010), *Small Business Credit in a Deep Recession*.

We include a variable that measures the bank's rate of growth in total loans outstanding during a three-year period preceding the recent recession (June 2004 to June 2007). A high rate of loan growth during this earlier period could indicate that the bank has a propensity to expand its loan portfolio at a rapid rate, in which case we would expect a positive coefficient on this variable. Alternatively, a high historical loan growth rate could indicate that the bank expanded too rapidly during the earlier period, requiring it to pursue a more modest rate of growth over the 2007 to 2010 period, in which case we would expect a negative coefficient.

We include a multibank holding company (MBHC) indicator to allow for the possibility that banks that are subsidiaries of multibank holding companies differ from independent banks with regard to growth in small business lending, with no expectation regarding the direction of any such difference.[12] We also include a measure of bank size (the natural log of total assets) and the portfolio concentrations of small C&I and small CRE loans as of the beginning of the one-year period in our equations. The size variable allows for the possibility that the rate of growth in small loans to businesses varies with bank size, though we do not have a prior on the sign of this relationship. The portfolio concentration measures allow for the possibility that banks may seek to diversify against excessive concentration in any one type of lending. As such, the sign on the small C&I (CRE) loan concentration variable is expected to be negative in the equation explaining the rate of growth in small C&I (CRE) loans.

We include two primary-regulator indicators to allow for the possibility that differences in stringency across regulatory agencies may affect loan growth rates. These variables identify banks whose primary regulator is the Office of the Comptroller of the Currency (OCC) or the Federal Deposit Insurance Corporation (FDIC), respectively.[13] We have no prior regarding the signs on the coefficients for these variables.

The right-hand-side variables of particular interest to us are the six supervisory-rating indicators that reflect the bank's composite CAMELS ratings as of the beginning and end of the one-year period. CAMELS ratings reflect the bank supervisor's assessment of an institution's financial condition and practices. As such, a change in the CAMELS rating may be attributable to a change in the bank's financial condition or practices, a change in the supervisor's rating standards, or both. The supervisory-ratings indicators are defined as follows: The first of these

[12] Ashcraft (2008) finds that banks affiliated with MBHCs fare better during times of financial distress than do independent banks of similar size and strength.

[13] The excluded category is banks whose primary regulator is the Federal Reserve Board.

variables (CAMELS 12→345) equals 1 if the bank had a composite CAMELS rating of 1 or 2 at the beginning of the one-year period under consideration and a rating of 3, 4 or 5 at the end of the period, and zero otherwise. Similarly, the other CAMELS transition indicator variables are as follows: CAMELS 3→12 indicates a bank with a rating of 3 at the beginning of the period and a rating of 1 or 2 at the end of the period; CAMELS 3→3 indicates a bank with a rating of 3 at both the beginning and end of the period; CAMELS 3→45 indicates a bank that began with a rating of 3 and transitioned to a rating of 4 or 5 by the end of the period; CAMELS 45→123 indicates a bank with a beginning-of-period rating of 4 or 5 and an end-of-period rating of 1, 2 or 3; and CAMELS 45 →45 indicates that the bank's rating was 4 or 5 throughout the period. The omitted indicator is for banks that had ratings of 1 or 2 at both the beginning and the end of the period.

The estimated coefficient on each of the supervisory-rating indicators measures the extent to which, all else equal, average loan growth at institutions in that category differs from loan growth at institutions in the omitted category. For example, the estimated coefficient on CAMELS 12→345 in the equation explaining the growth in small C&I loans measures the average difference in the small C&I loan growth rate, over a one-year period, between banks that were downgraded from a composite rating of 1 or 2 at the beginning of the period to a rating of 3 or worse at the end of the period and banks that were rated 1 or 2 at both points in time. The expected coefficient signs are negative for the downgrade indicators (CAMELS 12→345 and CAMELS 3→45) and for the indicators of ratings that remained at levels below 2 (CAMELS 3→3 and CAMELS 45→45). We have no prior on the expected signs for the coefficients on the upgrade indicators (CAMELS 3→12 and CAMELS 45→123); although upgraded firms would be expected to exhibit higher rates of loan growth than firms that had similar initial ratings and were not upgraded, it is not clear how their loan growth would compare with that of firms that were financially sound throughout the period.[14]

In the second model, we also include four measures of a bank's financial condition as of the beginning of the one-year period. These measures, which are constructed from bank balance sheet data, capture information that is related to particular components of the CAMELS ratings.

[14] We also estimate versions of our models (not reported) in which we include interaction terms between the primary-regulator indicators and the supervisory-rating indicators, and versions in which we control for the financial condition of other banks operating in the observed bank's local market(s). These additional variables generally are not statistically significant and their inclusion does not alter the results in any meaningful way.

The ratio of equity capital to total assets is a measure of capital adequacy; the ratio of problem loans to total assets and the ratio of other real estate owned (OREO) to total assets are indicative of asset quality; and the ratio of non-core liabilities to total assets is a measure of liquidity.[15,16] These variables have been shown, in previous studies, to be predictive of bank performance.[17, 18]

We expect the estimated coefficients to be positive for the capital-asset ratio and negative for the problem-loan and the other-real-estate-owned ratio. The ratio of non-core liabilities to assets is entered into the equation by itself and interacted with year dummies for the second and third years of our study period (June 2008 to June 2009 and June 2009 to June 2010), to allow for a flexible relationship between non-core liabilities and bank lending over the course of the financial crisis and recovery. In particular, a bank's use of non-core funds could allow it to expand lending more rapidly during periods of strong economic growth; however, reliance on non-core funds could constrain lending during periods of financial distress if these funds become more difficult or expensive to obtain.[19] If this relationship holds, we would expect a positive coefficient on the non-core liabilities ratio itself, and expect negative coefficients on its interactions with the year dummies. We are particularly interested in assessing the effect of the inclusion of these variables on the explanatory power of the supervisory ratings variables.

V. Sample and Variable Construction

The sample is composed of a repeated cross-section of commercial banks that were in operation in the U.S. at both the beginning and end of any of the one-year periods commencing on June 30 of 2007, 2008 or 2009.[20] We restrict the regression sample to small banks, defined as those with less than $5 billion in assets, and banks that were in existence prior to June 2004. The former restriction eliminates from the sample large, geographically diversified banks, which may

[15] Problem loans are the sum of loans past due 30 through 89 days but still accruing, loans past due 90 days or more but still accruing, and nonaccrual loans.
[16] Non-core liabilities are the sum of total time deposits of $100,000 or more, foreign office deposits, insured brokered deposits less than $100,000, securities sold under repurchase agreements, federal funds purchased, and other borrowed money.
[17] See, for example, Collier et al. (2003), Gilbert et al. (2000), Nuxoll et al. (2003), and Gozzi et al. (2010).
[18] As a robustness check, we re-estimate each equation including a fifth measure of bank financial condition – return-on-assets (ROA) over the preceding one-year period. This variable corresponds to the earnings (E) component of the CAMELS rating and its expected coefficient sign is positive.
[19] Focusing on large, syndicated loans, Ivashina and Scharfstein (2010) find that banks that relied more heavily on deposits as a source of funds reduced their lending less than other banks during the 2008 financial crisis.
[20] Banks were included in the sample if they filed a Summary of Deposits report in any of the years 2007, 2008, and 2009 and a CALL report in June of any two consecutive years from 2007 through 2010.

behave differently than small banks with regard to small business lending.[21] The latter restriction eliminates newly chartered banks, whose loan growth patterns tend to differ sharply from those of established banks. Finally, we exclude banks whose growth rates for any of the loan types considered are outliers (in the top one percent or bottom one percent of the distribution). The final sample includes between 6000 and 7000 banks each year.

Financial variables are constructed from each bank's June 30 Reports of Condition and Income (CALL Reports). These include small C&I loans outstanding, small CRE loans outstanding, total loans outstanding, loan performance and liquidity measures, historical loan growth rates and banks' portfolio shares in each lending category.[22] CAMELS ratings variables are constructed from the Federal Reserve Board's confidential supervisory data collected from state and federal bank regulatory agencies.

Banks were assigned to states and local banking markets (MSAs or rural counties) based on the locations of their branches, as reported in the FDIC's annual Summary of Deposits. For banks whose branch networks span more than one state, the state-level measures (state index, percentage change in state index, percentage change in consumer loan delinquency rate, and percentage change in HPI) reflect a deposit-weighted average of the values of those variables in each of the states in which the bank operates.[23] The change in market population is the only local market-level variable included in our analysis. It is computed as the five-year average of the deposit-weighted average of the annual percent change in population for the markets in which the observed bank operates, as reported by the BEA.[24]

[21] As a robustness check, we re-estimate our models using several alternative definitions of a small bank. These alternative definitions include (i) banks with total assets less than $1 billion; (ii) banks with total assets less than $10 billion; and (iii) banks that are either independent institutions with total assets less than $5 billion or subsidiaries of organizations with total organizational banking assets less than $5 billion. The results (not reported) do not differ in any meaningful way across the various definitions.

[22] Small loans are defined as those with initial principal amounts of less than $1 million. We do not include small loans to farms in our small C&I or CRE loan measures.

[23] The weights for each state are the share of the bank's deposits that are held in offices in that state.

[24] For example, an observation for June 30, 2009 is computed from annual population growth rates over the period December 31, 2003, to December 31, 2008. Weights reflect the share of a bank's deposits held in a given market.

VI. Results

Table 4 contains the results of estimating our two models for each dependent variable.

Small C&I Loans. We begin by considering the version of the small C&I loan growth equation that excludes the financial ratios (the leftmost column). The coefficients on several of the CAMELS variables are highly significant in the expected direction. Other things equal, a bank that experiences a downgrade in its composite CAMELS rating from 1 or 2 to 3 or worse during a one-year period exhibits a rate of growth in small C&I loans over that same period that is, on average, about 6.3 percentage points lower than the rate of growth for a bank with a composite rating of 1 or 2 at both the beginning and end of the period. A roughly similar (5.2 percentage points lower) small C&I loan growth differential is observed for banks that have composite CAMELS ratings of 3 at both the beginning and end of a one-year period. Banks that begin a one-year period with a rating of 3 and end with a rating of 4 or 5 or have ratings of 4 or 5 at both the beginning and end of the period exhibit substantially larger small C&I loan growth rate differentials (-12.2 and -11.8 percentage points, respectively) relative to the base case. The estimated coefficient on the variable indicating that the bank's primary-regulator is the OCC is negative, while the coefficient on the FDIC indicator is positive, but both are statistically insignificant.

The estimated coefficient on one of the three variables intended to capture loan demand (percent change in the state index) is significantly different from zero with the expected positive sign, while the coefficients on the level of the state index and the population growth rate are insignificant. The results suggest that a one percentage point increase in the previous year's rate of growth in the state index is associated with a 0.31 percentage point increase in the rate of growth of small C&I loans.

The two variables intended to capture state-level borrower credit quality yield mixed results. The estimated coefficient on the percent change in the consumer loan delinquency rate is statistically significant with the expected negative sign, indicating that a one percentage point increase in the growth rate of the consumer loan delinquency rate for residents of the state(s) in which a bank operates is associated with a 0.31 percentage point decrease in the growth rate of small C&I loans. The estimated coefficient on the percent change in the state-level housing price index over the previous year is also negative, contrary to expectations, and statistically significant.

The historical loan growth variable has a positive, significant coefficient, suggesting some persistence over time in a bank's rate of loan growth. The rate of growth in small C&I loans is significantly lower for banks that are subsidiaries of multibank holding companies than for independent banks; it is also strongly negatively related to bank size. The rate of growth in small C&I loans does not appear to be related to the beginning-of-period portfolio concentration of small CRE loans, but is strongly negatively related to the beginning-of-period portfolio concentration of small C&I loans.

Adding the variables measuring the bank's financial condition to the model (results reported in the second column of table 4) changes the estimated coefficients of the CAMELS variables, but has no meaningful effect on any of the other coefficients.[25] The coefficients on the capital-asset ratio, the problem-loan ratio and the OREO ratio are all statistically significant with the expected signs. The coefficient on the capital-asset ratio implies that a one point increase in capital as a percentage of total assets is associated with a 0.32 percentage point increase in the rate of growth in small C&I loans. The estimated coefficient values of -0.96 on the problem-loan ratio and -1.01 on the OREO ratio indicate that a one point increase in either problem loans or OREO as a percentage of total loans is associated with about a one percentage point decline in the rate of growth in small C&I loans.

The estimated coefficient on the ratio of non-core liabilities to assets is positive and highly significant. The coefficients on the interactions between the non-core liabilities ratio and the year dummies for 2008-09 and 2009-10 are both negative and statistically significant. The magnitude of the negative coefficient on the latter interaction term is roughly the same as the magnitude of the positive coefficient on the non-core liabilities ratio itself, while the magnitude of the coefficient on the former interaction term is roughly half that size. Thus, it appears that over the 2007 to 2008 period, increased reliance on non-core liabilities is associated with substantially higher rates of growth in small C&I loans; however, this relationship diminishes in 2008-2009 and disappears in 2009-10.[26] These findings are consistent with non-core liabilities providing expanded potential for loan growth during the boom period, when loan demand was

[25] Adding a fifth measure of the bank's financial condition, ROA (which corresponds to the earnings component of the CAMELS ratings), does not alter the results from those reported here. ROA is excluded from the model because of concerns about endogeneity.

[26] This is generally consistent with the results reported in Gozzi and Goetz (2010). They found that a higher ratio of non-core liabilities to total assets was positively related to the growth in C&I loans at small banks before the failure of Lehman Brothers in the fall of 2008, but that this positive relationship was significantly attenuated following Lehman's failure.

high and liquidity was readily available, but exerting a constraining effect on loan growth when liquidity dried up during the financial crisis.

The estimated coefficients on most of the CAMELS variables are smaller in magnitude relative to those in the first model, but all of the CAMELS coefficients that are significantly different from zero in the first model retain their statistical significance in the second. Thus, even when we control for observable measures of the bank's financial condition, CAMELS ratings have value in explaining the rate of growth in small C&I loans. Banks experiencing downgrades of their CAMELS ratings, as well as those with ratings that remain at 3 or remain at 4 or 5 during the course of a year, exhibit significantly lower rates of growth in small C&I loans compared with banks that have CAMELS ratings of 1 or 2 throughout the year. This effect could be due to examiner information about the bank's health that is not reflected in balance sheet measures (for example, practices, policies, or features of the bank's portfolio that are expected to cause poor future performance), or, alternatively, to supervisory actions concurrent with the downgrade that directly affect the bank's lending or bank responses to the downgrade that indirectly affect its lending

Small CRE Loans. We turn next to the small CRE loan growth model, beginning with the version that excludes the financial ratios (the third column of table 4). Once again, the estimated coefficients on several of the CAMELS variables are significant with the expected sign. A CAMELS downgrade from 1 or 2 to 3 or worse is associated with a 3.3 percentage point decline in small CRE loan growth, and a downgrade from 3 to 4 or 5 is associated with a 8.0 percentage point decline in small CRE loan growth, relative to the base case of a CAMELS rating of 1 or 2 throughout the period. Banks that start and end the period with a composite CAMELS rating of 3 and banks that start and end the period with ratings of 4 or 5 also have significantly lower small CRE loan growth rates than do base-case banks, with the differentials being -2.4 and -8.7, respectively. The rate of growth in small CRE loans does not appear to vary with the identity of the bank's primary regulator.

Among the variables intended to capture the demand for loans, the beginning of period level of the state index is not significantly related to the rate of growth in small CRE loans, and the previous year's rate of change in the state index is marginally significant with the unexpected sign. However, the average rate of population growth over the past five years is strongly positively related to growth in small CRE loans, consistent with expectations. There is no

evidence of a relationship between the rate of growth in small CRE loans and either of the two borrower credit quality variables (consumer loan delinquency and home price growth).

Banks that are subsidiaries of multibank holding companies do not appear to behave differently from independent banks with respect to the rate of growth in small CRE loans, but the loan growth rate decreases with an increase in bank size. The estimated coefficient on historical loan growth is positive in this equation, as it is in the small C&I loan equation, and statistically significant, again suggesting some persistence over time in loan growth rates.

Beginning of period portfolio concentrations of both small C&I loans and small CRE loans are highly significantly related to the rate of growth in small CRE loans during the period. The estimated coefficient on the C&I loan concentration variable is positive, while that on the small CRE loan concentration variable is negative. These findings are consistent with the view that banks tend to avoid excessive concentration of their portfolios, at the margin, in one type of loan.

Adding the bank-financial-ratio variables to the CRE loan growth equation (the fourth column of table 4) reduces the magnitudes of the estimated coefficients on most of the CAMELS variables, but has no meaningful effect on any of the other estimated coefficients. The coefficients on all of the financial ratios have the expected signs, and all except the OREO ratio are significantly different from zero. As in the C&I loan growth equation, the estimated coefficient on non-core liabilities itself is significant and positive, and the estimated coefficients on its interactions with the year dummies are negative. For small CRE loans, the positive relationship between non-core liabilities and loan growth weakened, but did not disappear, over the course of the financial crisis. Three of the four CAMELS variables that were statistically significant in the CRE loan growth equation that excluded bank financial ratios remain significant, with slight declines in their coefficients.[27] Thus, the supervisory rating variables continue to play a role in explaining changes in small CRE loans over time, even when we control for the bank's financial condition.

Total Loans. The rightmost columns show the regressions for the rate of growth in total loans outstanding. In the model that excludes the financial ratios (column 5), the coefficients on all six of the CAMELS variables are negative and highly significant. The estimated coefficient

[27] One of the CAMELS variables (CAMELS 3→3), which was marginally significant in the previous model, becomes insignificant.

on the OCC-as-primary-regulator indicator variable is negative and statistically significant, suggesting that, other things equal, OCC-regulated banks have a lower rate of growth in total loans outstanding than do banks whose primary regulator is the Federal Reserve Board. The coefficient on the FDIC indicator is not significantly different from zero.

The estimated coefficients on all three variables proxying for the demand for loans (state index, % change in state index, and population growth) are statistically significant with the expected positive sign. The estimated coefficients on the measures of borrower quality (consumer loan delinquency growth and home price growth) are also statistically significant, but only the former has the expected sign. Banks that are subsidiaries of multibank holding companies have a significantly lower rate of growth in total loans outstanding than do independent banks. The coefficient on bank size is not statistically significant in the total loan growth equation, whereas it was negative and highly significant in the equations for both types of small loans to businesses. The historical rate of loan growth has a positive significant coefficient, as it does in the equations for small C&I and small CRE loan growth. The rate of growth in total loans is positively related to the beginning-of-period concentrations in both small C&I and small CRE loans.

Adding the financial ratios to the total loan growth equation (the rightmost column of table 4) reduces the magnitudes of the estimated coefficients on the CAMELS variables, but does not affect the coefficients on most of the other variables. The estimated coefficients on all of the financial ratios in the total loan growth equation have the expected signs and are highly significant.

Summary of Results. We find that the rates of growth in small loans to businesses and total loans outstanding over the period 2007-2010 were substantially lower for banks whose composite CAMELS ratings were downgraded or remained poor. Banks that were upgraded from 3 to 1 or 2, or from 4 or 5 to 3 or better, experienced no significant difference in growth rates for small loans to businesses compared with those that remained at 1 or 2; however, they did show significantly lower rates of growth in total loans outstanding relative to the control group. These results are consistent with Bizer's (1993) finding that worse CAMELS ratings are associated with lower levels of lending and Peek and Rosengren's (1995) finding that small banks react to the imposition of formal regulatory actions by reducing their lending, but

inconsistent with Berger, Kyle and Scalise's (2001) finding of no consistent relationship between changes in CAMELS ratings and bank lending behavior.

The economic significance of our findings on the effects of downgrades is illustrated in table 5, which shows the loan growth predicted by the models for each one-year period and loan type, broken out by CAMELS transition. For example, between June 2008 and June 2009, banks that maintained composite CAMELS ratings of 1 or 2 exhibited an average decline in small C&I loans of 2.6 percent, while banks whose composite CAMELS ratings deteriorated from 1 or 2 to 3 or worse exhibited an average decline of 7.3 percent.

The models control for a large set of other factors that reflect bank financial condition and strategic orientation, borrower financial condition and collateral quality, loan demand more generally, and the identity of the bank's primary regulator. Therefore, the observed relationship between CAMELS downgrades and loan growth rates cannot be attributed to correlation between these factors and the downgrades. However, the models are not able to determine the extent to which the observed relationship is due to (i) aspects of a bank's financial health that affect both its supervisory rating and its lending behavior, but are not reflected in balance sheet data, versus (ii) effects of CAMELS ratings themselves on bank lending, whether due to explicit requirements imposed by regulators when downgrades take place or voluntary actions taken by the bank.

We shed some light on this question by re-estimating our models, taking into account the precise timing of CAMELS changes within a given one-year period. Specifically, for each bank that experienced a particular rating change during a sample year (e.g., a downgrade from 1 or 2 to 3 or worse), we determine the fraction of the year for which the rating change was in effect. We then add to the model a variable that interacts that fraction (zero for banks that did not experience that rating change) with the rating change indicator. Assuming that the timing of bank exams is exogenous, we would expect the coefficient on this interaction variable to be significant only if the observed relationship between loan growth and ratings changes is due to the ratings changes themselves, rather than due to underlying factors that affect both lending behavior and supervisory ratings.

Results from the augmented regressions are presented in table 6. Among the four interaction variables added to each equation, one is significant with the expected sign in the CRE loan growth regression, and two are marginally significant (one with the unexpected sign) in the

C&I loan growth regression. Two of the four interaction variables are significant in the total loan growth equation, but only one of them has the expected sign. Overall, these results do not provide compelling evidence that the precise timing of ratings changes matters. Thus, the observed relationship between CAMELS ratings changes and loan growth is likely primarily due, not to the ratings changes themselves, but rather, to aspects of the banks' financial health that affect both the supervisory ratings and lending behavior, but are not reflected in balance sheet data.

VII. Conclusion

We examine the extent to which changes in CAMELS ratings of small banks over the course of the recent financial crisis are associated with changes in the growth rates of these banks' small C&I, small CRE, and total loans. In our regressions we control for several bank financial ratios, banks' loan concentrations, and other bank characteristics, as well as local economic conditions, and the identity of a bank's primary regulator. We find a strong, statistically significant relationship between CAMELS ratings changes and the rates of growth in bank lending in general, and lending to small businesses in particular, even after controlling for commonly-used balance-sheet measures of bank financial condition. This finding likely reflects information about an institution's financial condition that is known to supervisors at the time of the downgrade but not fully reflected in balance sheet measures. We find no specific evidence that the supervisory process surrounding the ratings themselves directly influences bank lending behavior. Nonetheless, given the important role that banks play in the extension of credit to businesses, further work is needed to address the many questions that remain regarding the potential real economic effects of supervisory policies.

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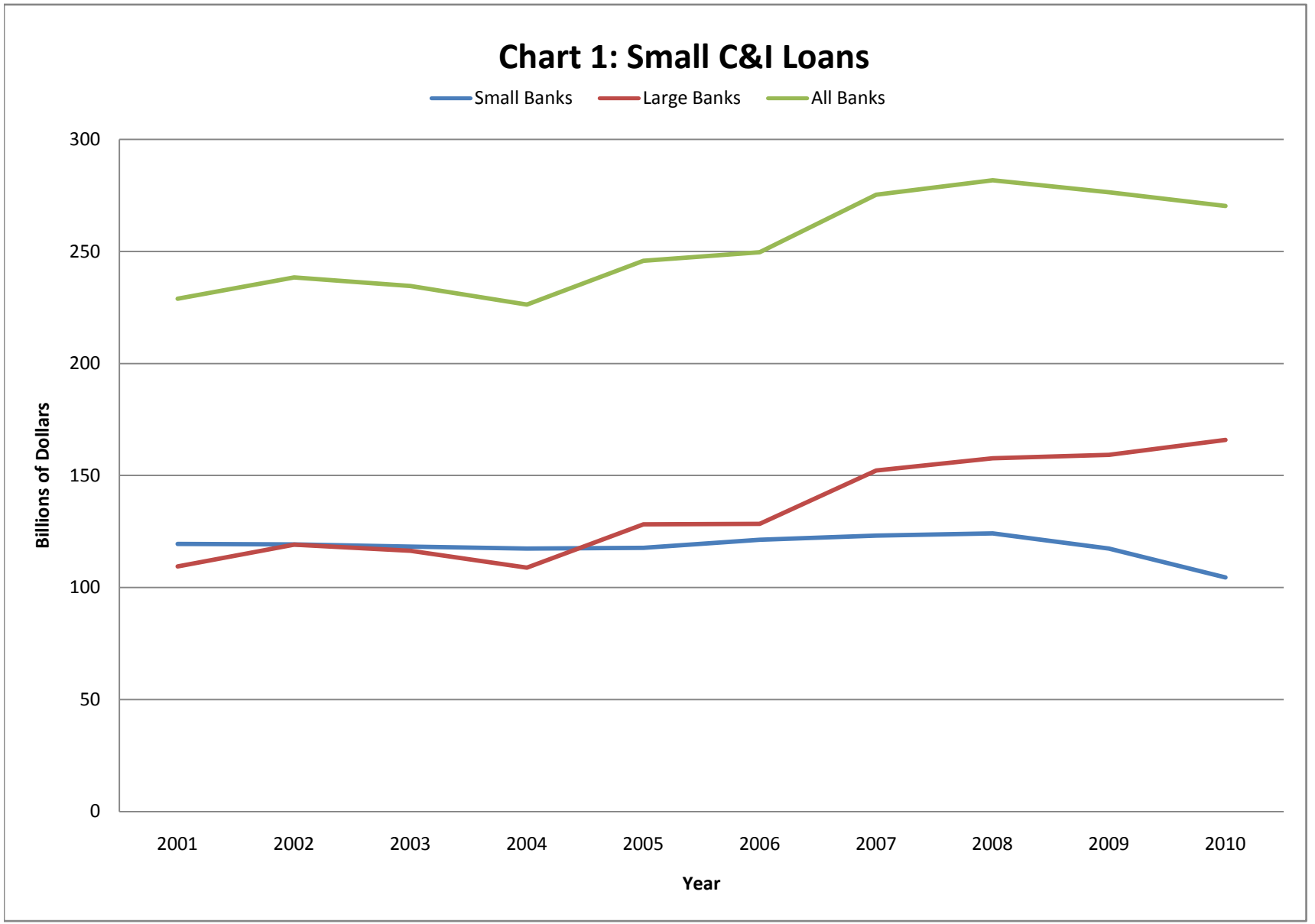
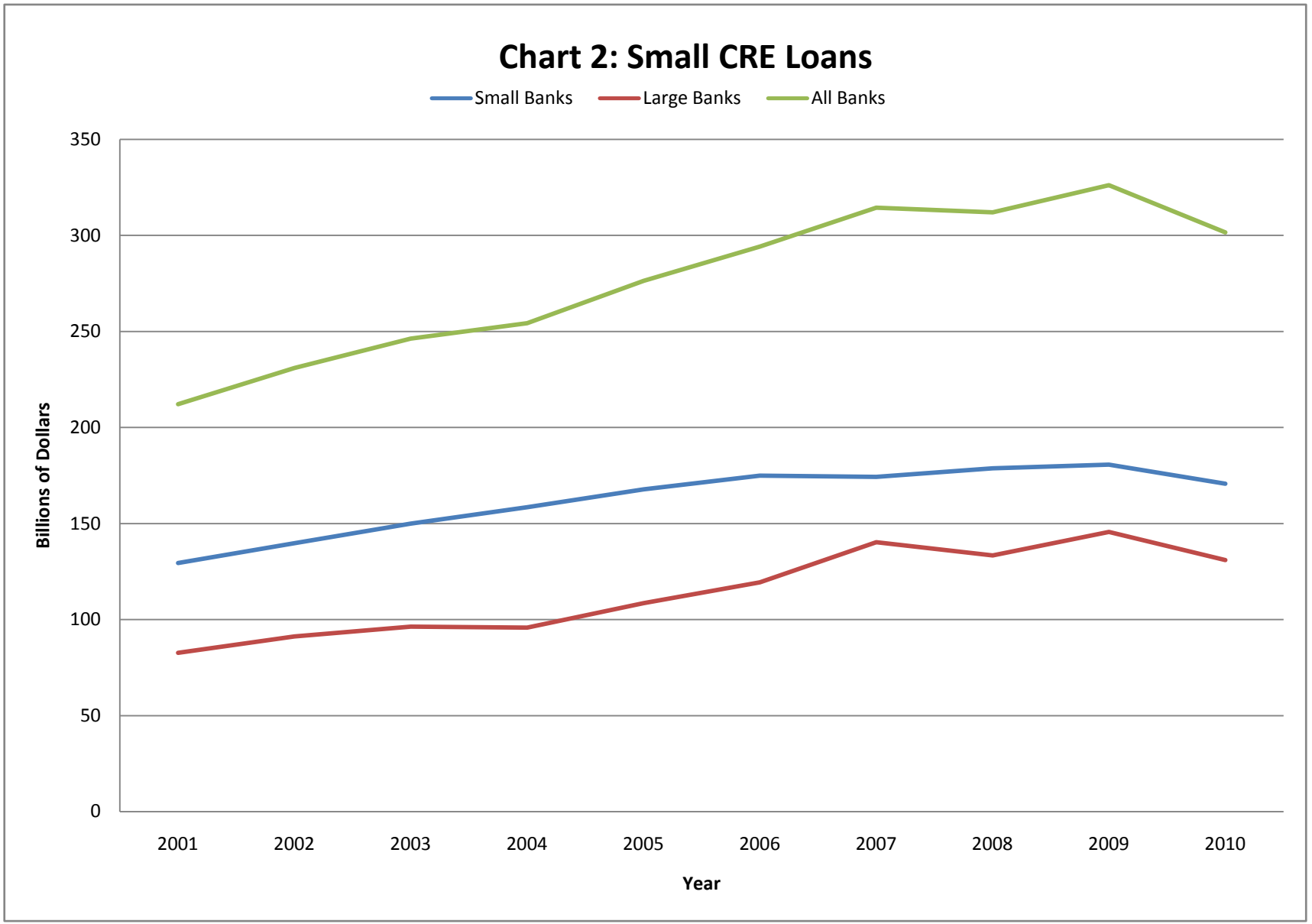
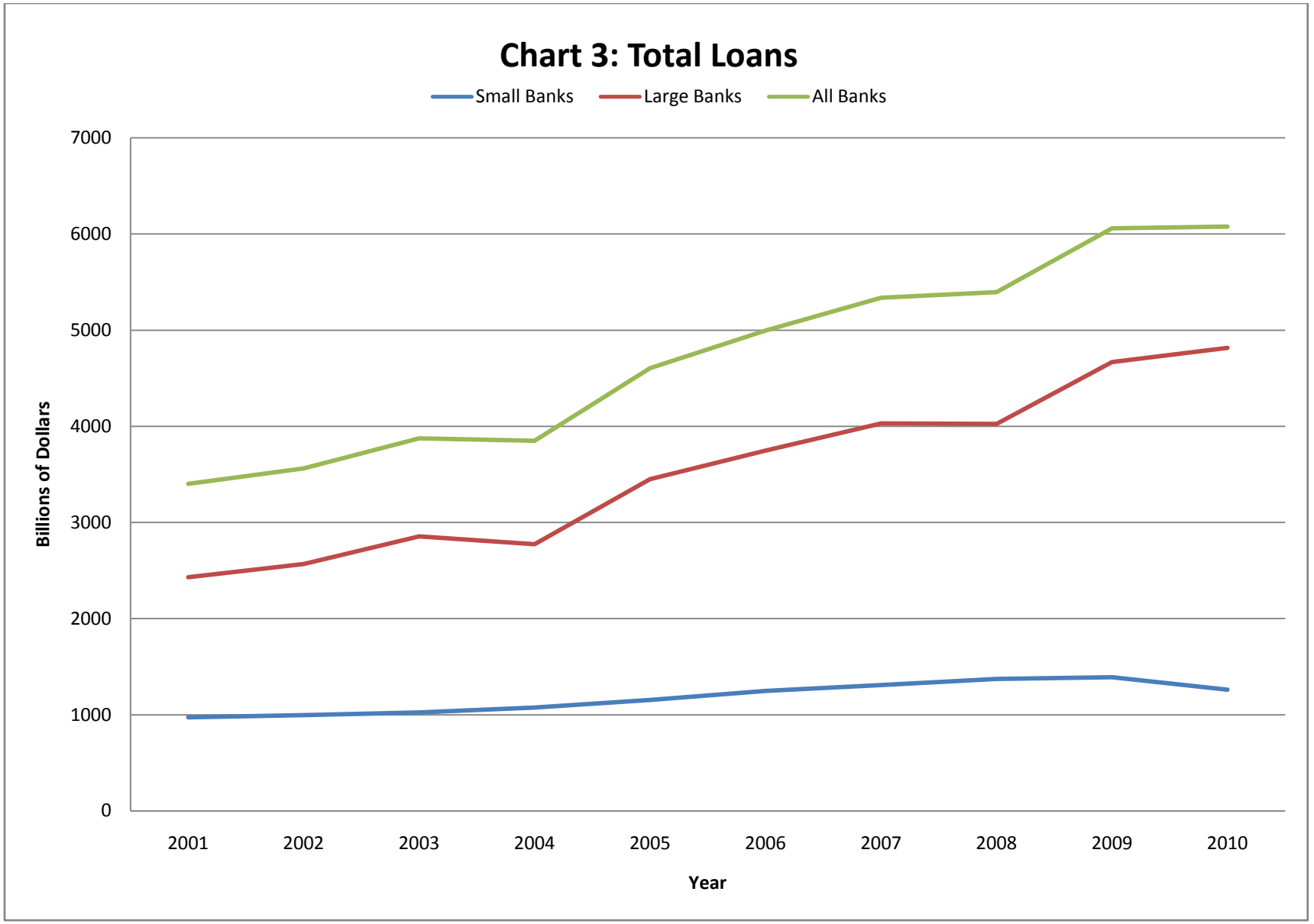


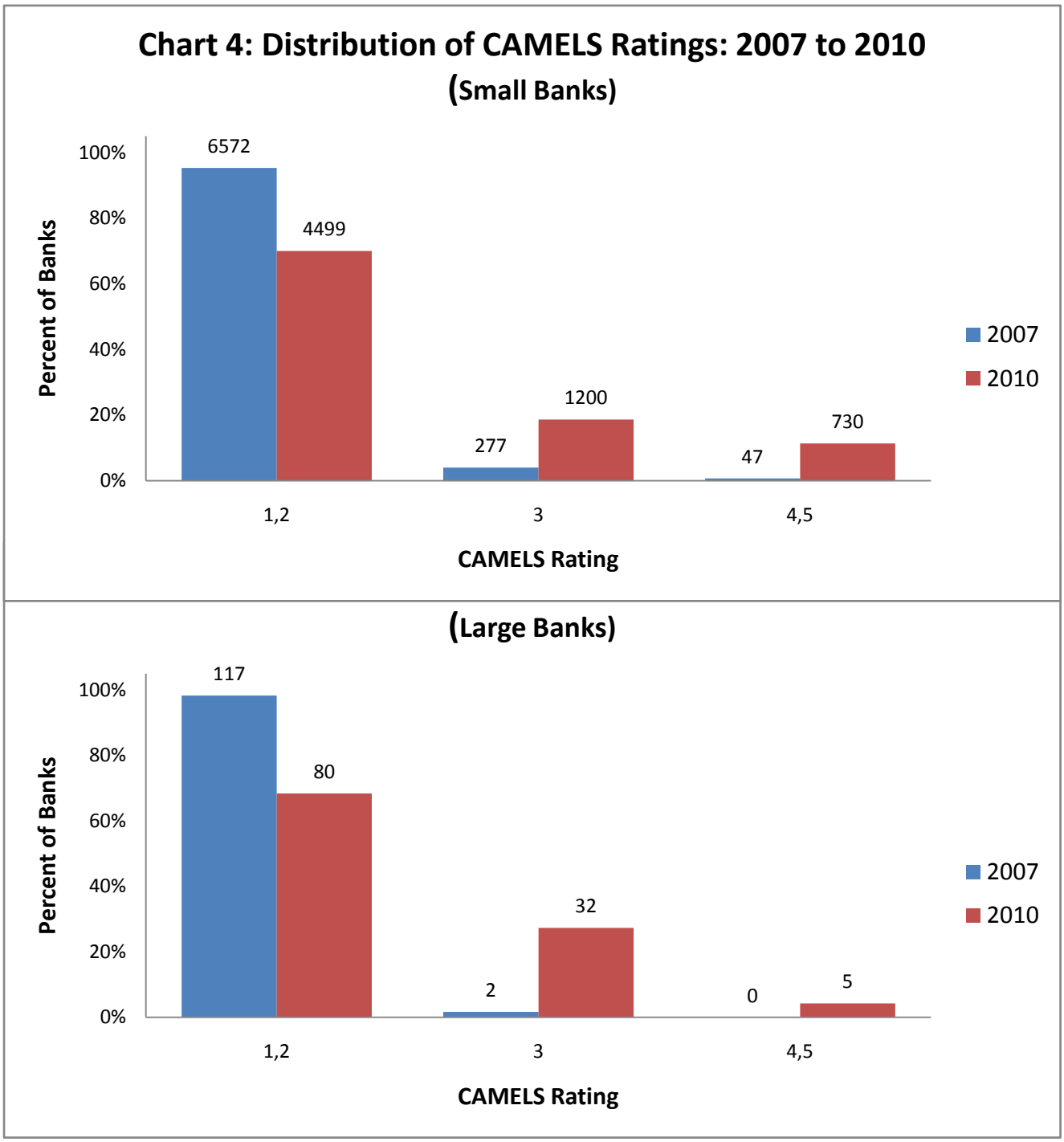
Note: Small C&I loans are commercial and industrial loans with original amounts of $1 million or less.
Small banks are banks with total assets less than $5 billion; large banks are banks with total assets greater than or equal to $5 billion.



Note: Small CRE loans are loans secured by nonfarm, nonresidential properites with original amounts of $1 million or less.
Small banks are banks with total assets less than $5 billion; large banks are banks with total assets greater than or equal to $5 billion.



Note: Small banks are banks with total assets less than $5 billion; large banks are banks with total assets greater than or equal to $5 billion.



Note: Small banks are banks with total assets less than $5 billion

Large banks are banks with total assets greater than or equal to $5 billion.

CAMELS ratings are as of June 30 of the respective year.

Table 1: Median Loan Growth Rates by CAMELS Rating and Year

	%Δ Small C&I	%Δ Small CRE	%Δ Total Loans
		2007 - 08	
All Banks	4.2	4.4	6.7
Banks that:			
Remain healthy	4.5	4.9	7.0
Become troubled	0.5	0.6	1.7
Remain troubled	-4.0	-0.4	-0.6
		2008 - 09	
All Banks	-2.7	3.3	3.7
Banks that:			
Remain healthy	-1.7	4.1	4.7
Become troubled	-7.2	0.4	-1.5
Remain troubled	-8.6	-0.9	-4.5
		2009 - 10	
All Banks	-4.9	-0.2	0.2
Banks that:			
Remain healthy	-2.0	1.2	2.4
Become troubled	-10.0	-1.4	-4.4
Remain troubled	-13.8	-5.3	-8.6

Note: For banks with total assets less than $5 billion.

Healthy banks are those with a composite rating of either 1 or 2.

Troubled banks are those with a composite rating of either 3, 4, or 5.

Table 2: Variable Definitions

%Δ Small C&I	Percent change in commercial and industrial loans with original amounts less than $1 million
%Δ Small CRE	Percent change in commercial real estate loans with original amounts less than $1 million
%Δ Total Loans	Percent change in total loans and leases net of unearned income
CAMELS 12→345	Indicator equal to one if the observed bank was rated 1 or 2 at the beginning of the period and 3, 4, or 5 at the end of the period; zero otherwise
CAMELS 3→12	Indicator equal to one if the observed bank was rated 3 at the beginning of the period and 1 or 2 at the end of the period; zero otherwise
CAMELS 3→3	Indicator equal to one if the observed bank was rated 3 at the beginning of the period and 3 at the end of the period; zero otherwise
CAMELS 3→45	Indicator equal to one if the observed bank was rated 3 at the beginning of the period and 4 or 5 at the end of the period; zero otherwise
CAMELS 45→123	Indicator equal to one if the observed bank was rated 4 or 5 at the beginning of the period and 1, 2 or 3 at the end of the period; zero otherwise
CAMELS 45→45	Indicator equal to one if the observed bank was rated 4 or 5 at the beginning of the period and 4 or 5 at the end of the period; zero otherwise
State Index	Federal Reserve Bank of Philadelphia's State Coincidence Index (deposit-weighted average for multi-state banks)
%Δ State Index	Percent change in Federal Reserve Bank of Philadelphia's State Coincidence Index (deposit-weighted average for multi-state banks)
%Δ Market Population	Five-year average of percent change in the market population (deposit-weighted average for multi-state banks)
%Δ State Delinquency	Percent change in a state's consumer loan delinquency rate over the previous year; delinquency rate is defined as the share of borrowers who are 60 or more days past due on one or more of their credit obligations during the past 12 months (deposit-weighted average for multi-state banks)
%Δ State HPI	Percent change in a state's housing price index over the previous year (deposit-weighted average for multi-state banks)
Historical Loan Growth	Average annual percent change in the observed bank's total loans outstanding between June 30, 2004 and June 30, 2007

MBHC Subsidiary	Indicator equal to one if the observed bank is a subsidiary of a multi-bank holding company; zero otherwise
Log Assets	Natural logarithm of total assets
Small C&I Concentration	Ratio of commercial and industrial loans with original amounts less than $1 million to total loans
Small CRE Concentration	Ratio of commercial real estate loans with original amounts less than $1 million to total loans
OCC	Indicator equal to one if the observed bank's primary regulator is the OCC; zero otherwise
FDIC	Indicator equal to one if the observed bank's primary regulator is the FDIC; zero otherwise
Capital/Assets	Ratio of total equity capital to total assets x 100
Problem Loans/Assets	Ratio of total problem loans[1] to total assets x 100
NonCore/Assets	Ratio of non-core liabilities[2] to total assets x 100
OREO/Assets	Ratio of other real estate owned to total assets x 100
Yr 08-09	Indicator equal to one if the dependent variable is the change from June 30,2008 to June 30, 2009 and zero otherwise
Yr 09-10	Indicator equal to one if the dependent variable is the change from June 30,2009 to June 30, 2010 and zero otherwise
NonCore/Assets * Yr 08-09	Interaction term between NonCore/Assets and the 2008-2009 Indicator
NonCore/Assets * Yr 09-10	Interaction term between NonCore/Assets and the 2009-2010 Indicator
Share of Yr	The fraction of the one year period that a bank has had its end of year CAMELS rating (only calculated if a change in rating has occurred during the one-year period)

[1] Total Problem Loans are the sum of loans past due 30 through 89 days but still accruing, loans past due between 90 and 180 days but still accruing, and nonaccrual loans past due.

[2] Non-core liabilities are the sum of total time deposits of $100,000 or more, foreign office deposits, insured brokered deposits less than $100,000, securities sold under repurchase agreements, federal funds purchased, and other borrowed money.

Note: Unless otherwise indicated, growth rates are computed from June of the previous year to June of the current year. For multi-state banks, state-level variables are weighted according to the share of the bank's deposits held in branches in that state.

Table 3: Summary Statistics, By Year

	2007 to 2008			2008 to 2009			2009 to 2010		
	Mean	Median	Std. Dev	Mean	Median	Std. Dev	Mean	Median	Std. Dev
%Δ Small C&I	8.69	4.17	31.70	1.71	-2.69	30.92	-1.73	-4.87	26.74
%Δ Small CRE	12.31	4.39	40.63	10.05	3.31	35.41	4.80	-0.19	31.17
%Δ Total Loans	9.74	6.69	15.81	5.43	3.72	13.29	0.90	0.23	11.33
CAMELS 12→345	0.06	0.00	0.24	0.12	0.00	0.33	0.15	0.00	0.35
CAMELS 3→12	0.02	0.00	0.15	0.02	0.00	0.14	0.02	0.00	0.14
CAMELS 3→3	0.03	0.00	0.17	0.05	0.00	0.21	0.08	0.00	0.27
CAMELS 3→45	0.01	0.00	0.07	0.02	0.00	0.13	0.03	0.00	0.18
CAMELS 45→123	0.00	0.00	0.05	0.00	0.00	0.07	0.01	0.00	0.08
CAMELS 45→45	0.00	0.00	0.06	0.01	0.00	0.10	0.03	0.00	0.18
State Index	155.28	151.70	13.34	155.64	151.44	13.17	145.51	142.50	12.85
%Δ State Index	0.61	0.60	1.76	-6.07	-5.90	2.73	-0.68	-0.70	1.42
%Δ Market Population	0.54	0.46	1.10	0.56	0.49	1.07	0.53	0.50	1.00
%Δ State Delinquency	3.30	3.15	4.09	6.60	6.33	4.23	1.31	0.02	5.14
%Δ State HPI	3.17	2.93	2.74	-1.18	-0.18	4.83	-2.38	-1.20	3.89
Historical Loan Growth	8.67	2.86	101.29	8.49	2.81	102.27	8.43	2.74	104.40
MBHC Subsidiary	0.20	0.00	0.40	0.18	0.00	0.39	0.17	0.00	0.38
Log Assets	11.80	11.73	1.12	11.87	11.79	1.16	12.08	11.86	1.98
Small C&I Concentration	0.12	0.11	0.08	0.12	0.10	0.08	0.11	0.10	0.07
Small CRE Concentration	0.15	0.14	0.10	0.15	0.14	0.09	0.15	0.14	0.09
OCC	0.22	0.00	0.42	0.21	0.00	0.41	0.21	0.00	0.41
FDIC	0.66	1.00	0.48	0.66	1.00	0.47	0.66	1.00	0.47
Capital/Assets	11.08	9.84	5.64	10.91	9.76	5.45	10.73	9.78	5.20
Problem Loans/Assets	1.46	1.08	1.44	1.96	1.46	1.90	2.66	2.00	2.51
OREO/Asset	0.15	0.00	0.36	0.28	0.04	0.59	0.57	0.19	1.01
NonCore/Assets	0.23	0.21	0.11	0.25	0.23	0.12	0.25	0.24	0.12

Note: Sample includes banks with total assets less than $5 billion that were in existence prior to June 2004.

Table 4: Regression Results

	%Δ Small C&I		%Δ Small CRE		%Δ Total Loans	
CAMELS 12→345	-6.292***	-4.653***	-3.336***	-2.898***	-6.541***	-4.866***
	[-8.70]	[-5.85]	[-4.09]	[-3.27]	[-19.66]	[-13.89]
CAMELS 3→12	-1.513	-0.685	0.130	0.328	-2.435***	-1.581*
	[-0.76]	[-0.35]	[0.05]	[0.13]	[-2.69]	[-1.81]
CAMELS 3→3	-5.194***	-2.647**	-2.397*	-1.539	-7.033***	-4.367***
	[-4.44]	[-2.16]	[-1.83]	[-1.14]	[-14.48]	[-8.82]
CAMELS 3→45	-12.154***	-7.268***	-7.989***	-6.383***	-14.133***	-9.053***
	[-7.89]	[-4.28]	[-4.62]	[-3.38]	[-25.13]	[-14.23]
CAMELS 45→123	-0.226	3.097	1.320	2.824	-7.678***	-4.015*
	[-0.03]	[0.42]	[0.18]	[0.38]	[-3.60]	[-1.91]
CAMELS 45→45	-11.778***	-3.894*	-8.743***	-5.965**	-15.318***	-7.102***
	[-6.26]	[-1.77]	[-4.42]	[-2.52]	[-18.98]	[-7.21]
State Index	0.022	0.010	0.002	-0.003	0.026***	0.015
	[1.08]	[0.53]	[0.09]	[-0.16]	[2.77]	[1.62]
%Δ State Index	0.309***	0.374***	-0.246*	-0.192	0.191***	0.247***
	[2.78]	[3.36]	[-1.90]	[-1.49]	[3.95]	[5.19]
%Δ Market Population	-0.401	-0.504**	1.739***	1.581***	0.773***	0.633***
	[-1.60]	[-2.00]	[5.51]	[4.95]	[6.97]	[5.92]
%Δ State Delinquency	-0.308***	-0.236***	0.005	0.022	-0.155***	-0.081**
	[-3.64]	[-2.81]	[0.05]	[0.23]	[-4.19]	[-2.26]
%Δ State HPI	-0.333***	-0.288***	-0.057	-0.049	-0.106**	-0.058
	[-3.31]	[-2.87]	[-0.51]	[-0.44]	[-2.36]	[-1.34]
Historical Loan Growth	0.009***	0.008***	0.003***	0.002*	0.007***	0.005***
	[2.92]	[2.67]	[2.70]	[1.95]	[3.52]	[3.02]
MBHC Subsidiary	-1.370**	-1.517**	-0.665	-0.724	-0.578**	-0.765***
	[-2.27]	[-2.51]	[-0.95]	[-1.03]	[-2.17]	[-2.90]
Log Assets	-1.475***	-1.490***	-1.255***	-1.332***	0.017	-0.039
	[-7.45]	[-7.00]	[-7.08]	[-7.16]	[0.23]	[-0.54]
Small C&I Concentration	-52.155***	-52.379***	32.793***	32.870***	8.706***	8.584***
	[-15.58]	[-15.70]	[6.71]	[6.73]	[5.89]	[5.92]
Small CRE Concentration	0.526	2.389	-77.374***	-76.322***	3.665***	5.683***
	[0.19]	[0.85]	[-24.62]	[-24.30]	[3.15]	[4.99]
OCC	-0.957	-0.828	-1.359	-1.277	-1.087***	-0.908***
	[-1.26]	[-1.09]	[-1.51]	[-1.42]	[-3.34]	[-2.85]
FDIC	1.107	1.405**	-0.693	-0.636	-0.001	0.370
	[1.64]	[2.08]	[-0.88]	[-0.80]	[-0.00]	[1.33]
Capital/Assets		0.324***		0.274***		0.267***
		[3.62]		[2.65]		[5.74]
Problem Loans/Assets		-0.963***		-0.508***		-1.069***
		[-6.12]		[-2.97]		[-16.86]
OREO/Assets		-1.007**		-0.010		-1.150***
		[-2.54]		[-0.02]		[-8.18]
NonCore/Assets		23.548***		23.180***		21.109***
		[5.65]		[4.70]		[11.40]
NonCore/Assets * Yr 08-09		-12.104**		-16.758***		-8.536***
		[-2.18]		[-2.76]		[-3.64]
NonCore/Assets * Yr 09-10		-23.868***		-14.419**		-16.077***
		[-4.58]		[-2.40]		[-6.95]
Yr 08-09	-4.777***	-1.439	-3.671***	0.589	-1.902***	0.617
	[-5.08]	[-0.92]	[-3.26]	[0.33]	[-4.66]	[0.95]
Yr 09-10	-10.407***	-3.696**	-5.837***	-2.200	-6.687***	-1.661***
	[-11.44]	[-2.48]	[-5.55]	[-1.26]	[-16.62]	[-2.60]
Constant	30.984***	24.657***	34.605***	28.665***	4.495**	-0.059
	[7.62]	[5.62]	[8.02]	[6.09]	[2.52]	[-0.03]
Observations	17500	17494	17390	17384	17537	17531
R-squared	0.05	0.06	0.05	0.06	0.14	0.17

Robust t-statistics in brackets:*** p<0.01, ** p<0.05, * p<0.1

Table 5: Predicted Loan Growth from Empirical Model Including Financial Ratios

CAMELS	%Δ Small C&I Loans			%Δ Small CRE Loans			%Δ Total Loans		
Transition	2007 - 08	2008 - 09	2009 - 10	2007 - 08	2008 - 09	2009 - 10	2007 - 08	2008 - 09	2009 - 10
1,2 -> 1,2	9.7	-2.6	-5.3	12.4	4.8	0.5	10.2	1.5	-2.2
1,2 -> 3,4,5	5.1	-7.3	-10.0	9.5	1.9	-2.4	5.3	-3.4	-7.1
3 -> 1,2	9.1	-3.3	-6.0	12.7	5.2	0.8	8.6	-0.1	-3.8
3 -> 3	7.1	-5.3	-8.0	10.8	3.3	-1.1	5.8	-2.9	-6.6
3 -> 4,5	2.5	-9.9	-12.6	6.0	-1.6	-5.9	1.2	-7.6	-11.3
4,5 -> 1,2,3	12.8	0.5	-2.2	15.2	7.7	3.3	6.2	-2.5	-6.2
4,5 -> 4,5	5.8	-6.5	-9.2	6.4	-1.1	-5.5	3.1	-5.6	-9.3

Note: The prediction vector consists of the corresponding values for CAMELS transition and year indicator variables.
Other continuous variables are set to their mean value and other indicator variables are set to their median value.

Table 6: Regression Results with CAMELS Duration Interaction

	%Δ Small C&I	%Δ Small CRE	%Δ Total Loans
CAMELS 12→345	-3.079**	-2.186	-3.213***
	[-2.56]	[-1.49]	[-5.69]
CAMELS 3→12	-2.010	-8.304**	-3.536**
	[-0.54]	[-2.16]	[-2.36]
CAMELS 3→3	-2.714**	-1.562	-4.426***
	[-2.21]	[-1.16]	[-8.93]
CAMELS 3→45	-4.683	-8.692***	-10.628***
	[-1.64]	[-3.06]	[-10.31]
CAMELS 45→123	24.157	2.741	-7.732**
	[1.41]	[0.21]	[-2.08]
CAMELS 45→45	-4.084*	-6.012**	-7.254***
	[-1.85]	[-2.53]	[-7.34]
CAMELS 12→345 * Share of Yr	-3.588*	-1.616	-3.762***
	[-1.68]	[-0.62]	[-3.88]
CAMELS 3→12 * Share of Yr	2.667	17.671**	3.956
	[0.38]	[1.96]	[1.50]
CAMELS 3→45 * Share of Yr	-6.496	5.453	3.525*
	[-1.26]	[0.87]	[1.67]
CAMELS 45→123 * Share of Yr	-45.002*	0.144	7.795
	[-1.65]	[0.01]	[1.16]
Historical Loan Growth	0.008***	0.002**	0.005***
	[2.66]	[1.98]	[3.03]
MBHC Subsidiary	-1.510**	-0.719	-0.767***
	[-2.50]	[-1.02]	[-2.91]
Log Assets	-1.494***	-1.333***	-0.040
	[-7.03]	[-7.17]	[-0.56]
Small C&I Concentration	-52.384***	32.946***	8.566***
	[-15.71]	[6.74]	[5.91]
Small CRE Concentration	2.280	-76.298***	5.677***
	[0.81]	[-24.29]	[4.98]
OCC	-0.861	-1.260	-0.911***
	[-1.13]	[-1.40]	[-2.85]
FDIC	1.393**	-0.625	0.375
	[2.06]	[-0.79]	[1.35]
Capital/Assets	0.320***	0.274***	0.265***
	[3.58]	[2.65]	[5.70]
Problem Loans/Assets	-0.948***	-0.501***	-1.056***
	[-6.01]	[-2.92]	[-16.68]
OREO/Assets	-0.977**	-0.013	-1.132***
	[-2.45]	[-0.03]	[-8.04]
NonCore/Assets	23.227***	23.059***	21.029***
	[5.58]	[4.68]	[11.35]
NonCore/Assets * Yr 08-09	-12.010**	-16.536***	-8.493***
	[-2.16]	[-2.72]	[-3.62]
NonCore/Assets * Yr 09-10	-23.394***	-14.214**	-15.807***
	[-4.49]	[-2.36]	[-6.83]
Yr 08-09	-1.440	0.554	0.628
	[-0.92]	[0.31]	[0.97]
Yr 09-10	-3.755**	-2.238	-1.687***
	[-2.52]	[-1.28]	[-2.64]
Constant	24.766***	28.811***	-0.046
	[5.65]	[6.12]	[-0.03]
Observations	17494	17384	17531
R-squared	0.06	0.06	0.18

Robust t-statistics in brackets: *** p<0.01, ** p<0.05, * p<0.1

Note: State and market variables are included in this regression, but the coefficients are not shown