Fantasyland revisited? Bank construction and development lending and the financial crisis

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Abstract

The current study utilizes multivariate discriminant techniques to analyze the financial performance of commercial banks with total assets less than or equal to $10 billion. These banks are divided into two groups. In each group are approximately 1,500 banks. The first group contains banks with the highest concentrations of commercial construction and land development loans. These loans are among the riskiest assets currently held by commercial banks and are major contributors to the financial difficulties of almost 800 "problem" banks. The other group contains banks with the lowest concentrations of the same type loans. This group represents very conservative lenders. The model utilizes the CAMELS rating framework popularized by banking regulators and researchers. Included in the model are proxy variables for capital adequacy, asset quality, management, earnings, liquidity and sensitivity to market risk. Three periods are investigated: The End of the Boom (2006.4); Market Collapse (2008.4); and the Road to Recovery? (2010.1)—the latest available data. The discriminant model correctly classifies approximately 81-84% of cases in both the original and the validation groups.

Keywords: bank performance; CAMELS; commercial real estate lending; construction and land development loans; discriminant analysis; financial crisis

INTRODUCTION

> *"Fantasyland is dedicated to the young at heart and to those who believe that when you wish upon a star, your dreams come true."*
>
> - Walt Disney

Bankers may have taken Disney's Fantasyland description much too seriously. While Walt Disney and his associates certainly understood the fundamentals of both the real estate development and commercial construction business, perhaps as well as anyone, some bankers appear to have carried their construction and real estate development lending dreams to an extreme. The fantasy of endlessly rising real estate prices and unlimited commercial demand has been replaced by the harsh realities of the marketplace as record profits and stellar asset quality have been replaced by record losses, rapidly deteriorating loan quality, and for many, the real and immediate possibility of forced merger, or, worse yet, insolvency and liquidation. Dreams have eventually turned to nightmares for many bankers.

Elizabeth Warren, chairperson of the TARP Congressional Oversight Panel, predicted in a CNBC interview in late October, 2009 that half of all commercial mortgages in the U.S. would be underwater by the end of 2010. Federal Deposit Insurance Corporation (FDIC) chairperson Sheila Bair further predicted that commercial real estate loans would be the primary force behind bank failures. (Carty, 2010) Bank exposure to commercial real estate loans is at historic highs accounting for $1.3 trillion or roughly 18% of total loans and leases. Construction and land development loans account for almost $500 billion (Bair, 2010) .

Lawrence Yun, chief economist at the National Association of Realtors said "Commercial real estate almost always lags the economy. Because of the lingering impact from the deep recession over the past two years, vacancy rates will trend higher and many commercial property owners will need to make rent concessions". (Yun, 2010) Meaningful recovery in the commercial market is not expected until 2011.

Federal Reserve Chairman Ben Bernanke commented on commercial real estate lending by banks in a November 2009 speech at the Economic Club of New York. "Demand for commercial property has dropped as the economy has weakened, leading to significant declines in property values, increased vacancy rates, and falling rents. These poor fundamentals have caused a sharp deterioration in the credit quality of CRE loans on banks' books and of the loans that back commercial mortgage-backed securities (CMBS). Pressures may be particularly acute at smaller regional and community banks that entered the crisis with large concentrations of CRE loans…meanwhile the market for securitizations, backed by these loans remains all but closed". (Bernanke, 2009)

Exhibit 1 (Appendix) using FDIC data depicts the trend in the number of problem banks (rated 4 or 5 on the five point CAMELS rating scale) since 2002. There is a notable rise in problem banks since the end of 2008. While commercial real estate loans, particularly construction and land development loans, do not totally explain the rise in problem banks, it is clear that they are a significant contributor. The rise in failed institutions also appears to be highly correlated. Subsequent "autopsy studies" will eventually provide more definitive evidence on the relationships between commercial real estate lending, problem banks and subsequent bank failures.

Exhibit 2 (Appendix) also denotes the sharp increase in the total assets of troubled institutions which are now approaching a half trillion dollars. The number of failed banks in

2009 totaled 140 with an additional 118 failures already recorded by August 20, 2010. (Campbell & Sterngold, 2010). By comparison, 25 banks failed in 2008 and only three failed in 2007. (*FDIC Quarterly Banking Profile*, 2010) The growth in assets at risk in problem institutions poses special problems for the FDIC Bank Insurance Fund. The passage and signing of the Dodd Frank Wall Street Reform and Consumer Protection Bill in July, 2010 permanently raises the limit of deposit insurance to $250,000 and retroactively extends protection to a handful of failed institutions. http://www.fdic.gov/bank/individual/failed/dodd_frank_q_and_a.html

FDIC chairperson Sheila Bair in a *Forbes.com* interview in late July, 2010 said "We have already seen significant losses in construction and development loan portfolios—over $50 billion in net charge-offs the last eight quarters. These figures have figured prominently in many of the bank failures we have seen during the past two years….CRE concentrations tend to be higher at community banks (those with assets less than $1 billion) and mid-sized institutions (those with assets between $1 billion and $10 billion) than at larger institutions. We expect CRE to remain a challenging sector over the next couple of years." (Zendrian, 2010)

The large number of bank failures creates financial stress on the FDIC insurance fund and requires additional assessments on depository institutions. In some cases these are already troubled banks. Any additional deposit insurance contributions could tip some banks into insolvency.

In Fall 2010, over two years after the height of the Financial Crisis of 2008, the U.S. banking industry continues to suffer through the delayed effects of a massive global economic downturn. (The interested reader is referred to the *FDIC Quarterly Banking Profile* for 2010.3 at http://www2.fdic.gov/qbp/2010sep/qbp.pdf) While sub-prime lending may have triggered the crisis and credit default swaps extended the impact to institutions around the world, commercial real estate loans, particularly those made for construction and land development, are at the heart of banking industry problems. In the aftermath of the Banking and S&L Crisis in the late 1980's and early 1990's, bankers were repeatedly warned of the dangers of excessive concentration of lending in any one loan category. These are discussed in detail in the following background section. They were likewise cautioned of the need to establish proper loan loss allowances by increasing their provisions for loan losses and to provide adequate capital as a backstop against possible losses. These warnings were heeded by many bankers but ignored by many others.

The alluring assurances that rising real estate prices would prevent loan defaults led some bankers to further increase commercial land development and construction lending. A growing economy fueled demand for more commercial developments including office buildings, restaurants, hotels, apartments, condos and retail shops along with many others. When the commercial real estate bubble burst, banks found themselves holding large amounts of non-performing loans (90 days or more past due). As economic conditions deteriorated, increasing amounts of loans were charged off with losses recognized by banks against their capital accounts, seriously depleting their safety cushion and, in extreme cases, forcing insolvency.

While many banks avoided problems associated with sub-prime lending by originating loans for resale without recourse in the market, the securitization process is less well developed for commercial real estate lending due to the unique characteristics of these loans. The lack of homogeneity makes these loans more difficult to securitize. Bankers are therefore more inclined to hold them on their balance sheet where they can potentially create credit quality issues. Retention of these loans also requires that more capital be held. Moreover, depending on the structuring of these loans, interest rate risk may also increase.

This study examines the relative performance of banks that chose to have little, if any, exposure to commercial real estate construction and land development lending versus those that chose substantial or extreme exposure. Approximately 1,500 banks in each category are examined for three periods: End of the Boom (year-end 2006), is a period characterized by a peak in residential real estate prices followed by a sharp decline in home prices; Market Collapse (year-end 2008), described by some as a financial "meltdown" follows a series of financial crises including the failure of Lehman Brothers and the rescue of AIG; and Road to Recovery? (2010.1), is a period in which economists are uncertain if the economy is on a path of sustainable recovery or merely experiencing a temporary uptick preceding a further decline. The 2010.1 period contains the most current publicly available data.

Our model is developed based on the widely accepted CAMELS rating system used by Federal and state banking regulatory agencies as well as banking researchers. The CAMELS model is described in greater detail including references in the section on the model. Multivariate discriminant analysis is utilized to investigate the financial performance differences between banks with high versus low concentrations of commercial real estate construction and land development lending. This CAMELS model correctly predicts membership within each of these two groups with a high degree of accuracy-- between 81% and 84% across all three time periods. Additional results are presented that address specific parameters of the model. The model clearly indicates strong differences in operating performance between banks that chose substantial concentrations in commercial real estate construction and development loans and those that chose a conservative lending strategy supported by guidance from banking regulators based on previous banking crises.

BACKGROUND

The Financial Crisis of 2008 represented the convergence of economic and social forces in what has been described as the financial equivalent of a "Perfect Storm". Demand for home ownership was fueled by low interest rates, lax underwriting standards, social mandates to provide "affordable" housing and a securitization process that encouraged lenders to originate and place loans quickly. Technology assisted by lowering information costs to encourage economies of scale in lending. This in turn created many Internet based providers of mortgage credit such as LendingTree.com, Ditech.com and Internetmortgage.com..

Rating agencies such as Moody's, Standard & Poors and Fitch assisted by providing stellar ratings for questionable collateralized debt obligations and mortgage backed securities which permitted a wide distribution of investments based on home loans. Increasingly lax requirements by housing finance organizations such as Fannie Mae and Freddie Mac further contributed to growing housing demand. For additional discussion of the problems of credit rating agencies see both Acharya and Richardson, 2009 and Kolb, 2010.

The passage of the Financial Institutions Modernization Act (also known as the Gramm-Leach-Bliley Act) in November, 1999 repealed the Depression Era Glass-Steagall Act which for decades had separated commercial banking from investment banking, and allowed the creation of Large Complex Financial Institutions (LCFI) thus permitting cross ownership of banks and bank holding companies with investment banks and insurance companies, in many instances without additional direct supervision.

The preemption of state restrictions on bucket shops by the Commodity Futures Modernization Act of 2000 led to the creation of credit default swaps, insurance-like instruments (though without associated reserves) which further added to the marketability of questionable

mortgage backed investments. By maintaining interest rates at extremely low levels, the Federal Reserve may have encouraged additional mortgage lending. In the end, an asset bubble formed in the early 2000's and finally burst in 2006. The aftermath led to a succession of financial difficulties. (See Acharya and Richardson, 2009 for further discussion)

By 2008, Bear Stearns, Fannie Mae and Freddie Mac, Lehman Brothers, AIG and many other financial institutions faced forced mergers, conservatorship or even liquidation. The world economy stood on the brink of collapse by the Fall. For summaries of this difficult period, the interested reader is referred to (Acharya & Richardson, 2009); (Shiller, 2008); and (Kolb, 2010). Suggested videos include: the PBS *Frontline* episode, *Inside the Meltdown* (Kirk, 2009); the CBS *60 Minutes* segment on credit default swaps entitled *The Bet That Blew Up Wall Street* (Kroft, 2009); the PBS *Frontline* documentary on pre-crisis events including the Commodity Futures Trading Commission (CFTC), *The Warning (Kirk, The Warning*, 2009); and economic historian Niall Ferguson's International Emmy Award winning PBS documentary*, The Ascent of Money* (Ferguson, 2009)

Despite the developing world financial crisis, many commercial banks, particularly smaller community banks (defined as those with assets under $1 billion), were positioned to avoid many of these adverse effects. Those banks that actively originated residential mortgage loans for resale as securitized assets without recourse, were generally immune to excessive credit risk on their balance sheets. Moreover, securitization avoided interest rate risk as well as the need for additional capital. Unless these banks purchased mortgage backed securities in the secondary market, they were able to avoid extreme difficulties. These same banks still faced short term liquidity issues as markets seized up during the crisis. They also faced declining loan demand as the economy fell into a sharp recession. This adversely affected their earnings but generally not their viability. The securitization process including the originate and distribute process is described in detail in Acharya and Richardson, 2009.

The area of greatest concern for regulators became commercial real estate loans, especially construction loans and land acquisition and development loans. Unlike residential mortgage loans which must generally conform to established standards for resale, construction and land development loans are not generally as homogeneous and therefore are less likely candidates for resale as securitized assets. These loans therefore tend to stay on the bank's balance sheet. As the crisis in real estate deepened and the economy slowed, many of these loans began to be classified as past due, and subsequently non-performing. As construction companies faced cancellations, many of these loans became uncollectible and were subsequently written off. Land development loans faced a similar fate. These write-downs depleted bank capital and posed serious solvency threats. See Bair, 2010 for additional discussion) Exhibit 3 (Appendix) depicts the declining growth rates for commercial real estate loans including non-farm, non-residential properties, 1-4 family residential properties and, of course, construction and land development loans. The latter category which shows the sharpest declines is the primary focus of this paper.

Exhibit 4 (Appendix) shows noncurrent loan rates (loans 90 days or more past due) of real estate construction and development loans from the mid-1990's to present. For more than a decade from the mid-1990's until 2006 these loans experienced a steady decline in the percentage of noncurrent classifications to a level of about one half of one percent. Beginning in 2006 the trend reversed and began to increase sharply by 2007, reaching a level in excess of 16% by early 2010.

"THE PAST IS PROLOGUE": LESSONS FROM THE BANKING AND S&L CRISIS

Inscribed on the National Archives Building in Washington, D.C. is the prophetic phrase "The Past Is Prologue", words borrowed from William Shakespeare's *Hamlet* in the early 17th Century. Later 20th Century philosopher George Santayana expressed a similar concern when he said "Those who cannot remember the past are condemned to repeat it".

Unfortunately some bankers failed to learn the lessons of the Banking and S&L Crisis of the late 1980's and early 1990's despite repeated admonitions from banking regulators. In some ways the Financial Crisis of 2008 was distinctly different than the earlier crisis. The earlier crisis had origins in rapidly rising energy prices that led to concentrations of loans to energy related companies for oil exploration and distribution. (See the various "autopsy studies" discussed elsewhere in the paper). As discussed earlier, the 2008 crisis was precipitated by the bursting of asset bubbles related to subprime lending. As the crisis deepened and U.S. economy plummeted, the real estate crisis extended into commercial land development and construction lending. These loans are more difficult to securitize and are therefore more likely to remain on commercial bank balance sheets. Excessive concentrations of these types of loans further accentuates losses, depletes capital and threatens the financial viability of commercial banks. (See Bair, 2010)

Following the Banking and S&L Crisis, banks fundamentally changed their business models. Rather than originate loans with the intent to hold them on their balance sheets, banks utilized the securitization process to adopt an "originate and place" strategy. (See Acharya and Richardson for further discussion). By generating new loan prospects and performing the initial credit evaluation, banks were able to focus on origination fees as a primary source of revenue along with servicing fees for passing payments through to third party holders of the loans. Since loan margins are relatively low, banks compensated by increasing their loan volumes to generate additional revenues. During the Banking and S&L Crisis many savings and loan associations failed. S&Ls had historically been key lenders for residential mortgages. After the crisis, banks seized market share in residential mortgages previously claimed by savings and loan associations prior to their demise.. Banks also expanded their commercial real estate business as well. This was prompted in part by a decline in commercial and industrial lending to major corporations that turned to the developing commercial paper market to meet their short term credit requirements.

Federal banking regulators conducted multiple "autopsy" studies following the Banking and S&L Crisis. One study published by the Federal Deposit Insurance Corporation (FDIC) concluded relative to real estate lending: (FDIC.gov, 1999) "historically the commercial real estate industry had been cyclical, and that, combined with the banks aggressive lending, made it likely that lenders would eventually suffer financial losses when markets turned. When the bust did arrive in the late 1980s and continued into the early 1990s, the banking industry recorded heavy losses, many banks failed, and the bank insurance fund suffered accordingly."

In "Managing the Crisis: The FDIC and RTC Experience, 1980–1994" (FDIC, 1998) the FDIC noted that 1,617 federally insured banks with $302.6 billion in assets were closed or received FDIC financial assistance between 1980 and 1994; 1,295 savings and loan institutions with $621 billion in assets were closed by the FSLIC or the RTC, or received financial assistance. Some surviving banks used the opportunity to expand their market share.

The Office of the Comptroller of the Currency (OCC), the primary regulator of national banks, conducted a study of 171 national banks that failed between 1979 to 1987 that found: 81% of failed banks had no loan policy or did not adhere to their existing policy; 69% of banks

lacked adequate systems for compliance with internal policies, laws and regulations; and 59% had inadequate loan surveillance systems. (Office of the Comptroller of the Currency, 1988)

Reacting to the Banking and S&L Crisis Congress passed the FDIC Improvement Act of 1991 (FDICIA). FDICIA mandated the creation of residential real estate guidelines by Federal banking regulatory agencies. These were created in 1992 and revised again in 1999. These guidelines centered on high loan to value residential real estate loans. (Office of Thrift Supervision, 1999). In 2006, Federal banking regulators including the Federal Reserve, FDIC and OCC, concerned about excessive commercial real estate lending, created uniform inter-agency guidelines. (FDIC, 2006). These addressed sound risk management practices relative to banks with significant real estate concentrations. Concentration was considered to potentially constitute a risk if total loans for construction, development and other land exceed 100% of total risk-weighted capital or when total commercial real estate lending exceeds 300% of total risk-adjusted capital. (Federal Reserve Bank of San Francisco, 2007)

In March 2008 the FDIC distributed a Financial Institution Letter entitled Managing Commercial Real Estate Concentrations in a Challenging Environment. The timing of this guidance roughly corresponded with the financial difficulties presented by Bear Stearns. The document re-emphasized the importance of adequate capital and loan loss reserves for banks engaged in significant concentrations of real estate as well as robust credit risk management practices. (FDIC, 2008)

Although Federal banking regulators established guidance on commercial real estate lending, they did not always enforce them. A report in October, 2009 by the FDIC Office of Inspector General (OIG) found that the FDIC should have taken stronger supervisory actions against 20 of 23 banks with significant levels of commercial real estate loans that subsequently failed. (Vekshin, 2009) In a 2008 audit report based upon 2006 data from the six FDIC regions, the OIG found 1,626 banks (or 31% of FDIC supervised institutions) with a commercial real estate loan concentration. (FDIC's Consideration of Commercial Real Estate Concentration Risk in FDIC-Supervised Institutions, 2008) In June 2006 fifty nine percent of FDIC supervised institutions in the San Francisco FDIC region had commercial real estate loans to total capital ratios greater than 300%. This was followed by 50% in Atlanta, 30% in Chicago, 27% in New York, 24% in Dallas and 17% in Kansas City. This data, available to the banking regulators, is at the peak of housing prices at the approximate time that the residential real estate bubble burst.

Outgoing Comptroller of the Currency John C. Dugan observed in July 2010 that "As a result of the 1980's, we did see the risk building from increasing concentrations by community banks in commercial real estate loans, and we knew they were vulnerable. The regulatory community spent a great deal of time issuing significant guidance—over strong industry objections—to address these issues. I know that we at the OCC worked long and hard with our examiners and with community national banks to anticipate the issues that we thought could arise in the next real estate downturn. And I think these measures helped in a number of cases, either fending off failure or reducing the deposit insurance losses associated with failure. But honestly, it was just not enough. Too many banks, even those that were well run, simply could not withstand the types of losses generated by significant concentrations in residential construction and development lending, especially when funded by brokered deposits or other forms of higher cost borrowing." (Dugan, 2010)

METHODOLOGY

This study examines the financial performance of banks with high versus low concentrations of commercial construction and land development loans at year-end 2006 and 2008 and in the first quarter of 2010, the latest data currently available. Data were obtained through subscription to SNL Unlimited-Financial Services from SNL Corporation in Charlottesville, VA for almost 7,000 U.S. commercial banks with less than or equal to $10 billion in total assets that were established on or before January 1, 2000. The latter requirement eliminates the special complications of *de novo* or newly charted institutions. Both operating and defunct institutions were included to avoid "survivorship bias". (Brown, Goetzmann, Ibbotson, & Ross, 1992) Subsequent failed institutions are reflected as missing values.

These banks were sorted from high to low values based on the ratio of commercial construction and development loans to total loans for year-end 2009. Fifty six banks were removed from the study. These banks were largely trust operations or special purpose institutions for which commercial lending data were not applicable. From the remaining institutions, 1,500 banks with the highest and 1,500 banks with the lowest ratios of commercial construction and development loans to total loans were retained for further study. This "polar extremes" approach is discussed in greater detail in (Hair, Black, Babin, & Anderson, 2010). The banks outside the two groups of 1,500 were not analyzed further. It is possible that a future study could examine this "intermediate" group using either a three or four group multiple discriminant analysis

Data were subsequently imported into Excel 2007 using an SNL add-in and then exported to IBM SPSS Statistics 18.0 for further analysis. Any missing variables in the study were replaced with mean values.

DESCRIPTIVE STATISTICS

Table 1 (Appendix) contains descriptive statistics for variables used within the CAMELS model as well as other closely related performance measures. This permits the reader to assess the differences between the mean values of variables for banks with high concentrations of commercial real estate construction and land development loans versus banks with either no or low concentrations. Three periods are included: year-end 2006 which is at or near the point when the real estate asset bubble burst, year-end 2008 which is in close proximity to the near collapse of the financial markets and 2010.1, the most recent available period which may mark a period of financial recovery.

Construction and land development loans (CLDL2L) at year-end 2006 averaged over 23.5% of total loans for banks with the highest concentration of such loans while banks with the lowest concentrations averaged a mere 1.4%. By 2010.1, the levels had fallen to 18.8% and 0.55% respectively. Both groups were heavily involved with total real estate lending (both residential and commercial) in the most recent period (2010.1). The high concentration group had a ratio of total real estate to total loans of over 80.5% compared with slightly below 54.5% for the least concentrated group.

The loan to asset ratio (L2A) is a proxy for relative loan demand. Unlike the loan to deposit ratio, another frequently used demand measure, the loan to asset ratio is not adversely affected by reliance on non-deposit funding sources such as Federal Home Loan Bank advances. The loan to asset ratios for both high and low concentration banks are reflective of the overall decline in economic activity from 2006.4 forward as the economy was increasingly affected by the financial crisis.

Bank capital is measured by both the Tier 1 risk based capital ratio (T1RBC), a measure that has been increasingly used after adoption of the Basle Accord on risk based capital and by the equity capital to asset ratio (EC2A). High concentration banks generally hold less capital than low concentration banks. Additionally, capital ratios for high concentration banks declined between 2006.4 and 2010.1 while capital ratios for low concentration banks remained virtually unchanged as the U.S. economy weakened.

The liquidity ratio (LiqRat) which reflects the ability of banks to obtain cash quickly and without substantial loss of value, is substantially higher for low concentration banks than their high concentration counterparts. Both groups experienced a rise in the liquidity ratio in 2010.1. This may reflect simply a decline in loan demand due to deteriorating economic conditions rather than a strategic decision to hold more liquid assets.

Federal banking regulators have long admonished bankers about excessive reliance on brokered deposits that are obtained using a third party intermediary. These forms of "hot money" display marked volatility when a bank's financial condition deteriorates. Weaker rated banks are restricted or even forbidden to employ brokered deposits. Banks with low real estate concentrations have consistently held just over 2% of total deposits in brokered form. By contrast, high real estate concentration banks ranged from 5.58% brokered deposits in 2006.4 to a high of 8.69% in 2008.4 before reducing their dependence slightly.

Market sensitivity to risk or interest rate risk exposure is approximated by the one year gap ratio. This relates rate sensitive assets that mature or re-price within one year to rate sensitive liabilities that also mature or re-price during the same time interval. Both low and high concentration groups have had virtually identical gap ratios for both 2008.4 and 2010.1. For a discussion of special problems related to interest rate risk as banks move to lower concentrations of commercial real estate loans the reader is directed to a special Supervisory Insights issue by the FDIC. (FDIC.gov, 2010)

Return on average assets (measured by net income to average assets) and return on average equity (measured by net income to total equity capital) are two commonly used proxies for profitability. These measures are closely related since ROE is defined as ROA times the leverage multiplier (equal to 1/ (equity capital/total assets). For example, a bank with an ROA of 1% and a capital/asset ratio of 10% would have an ROE of 10%. If the capital/asset ratio fell to 5% while ROA remained at 1%, then ROE would rise to 20%. Banks with high concentrations of construction and land development loans saw their ROA plunge from 1.35% to -0.07% with ROE falling from 14.14% to -17.88%. While ROA and ROE declined, even in banks with low commercial real estate exposure, the results were still positive, in stark contrast to the high concentration banks.

Asset quality is measured by two primary ratios: non-performing loans to loans (NPL2L) and net charge-offs to Loans (NCO2L). The former captures loans that are 90 days or more past due; the latter measures loans that are deemed uncollectible and must be written off the bank's balance sheet with corresponding charges to bank capital. Non-performing loans rose from 0.62% at 2006.4 to 6.27% by 2010.1, a ten-fold increase for banks with high concentrations of construction and land development loans. By contrast, low concentration banks experienced a doubling of non-performing loans from 0.72% to 1.46% over the same period. It is interesting to note that the high concentration group actually had a slightly lower non-performing loan ratio in 2006.4 (0.62%) than the low concentration group (0.72%). This changed quickly, however, once real estate prices began their steep decline and the financial crisis ensued.

Charge-offs increased for both groups, though not as remarkably as with non-performing loans. The Federal Financial Institutions Examination Council (FFIEC), a group of Federal banking regulators including the FDIC, Federal Reserve, OCC, OTS and NCUA, issued a joint announcement on October 30, 2009 which said "This policy statement stresses that performing loans, including those that have been renewed or restructured on reasonable modified terms, made to creditworthy borrowers will not be subject to adverse classification solely because the value of underlying collateral declined." (FDIC.gov, 2009) This forbearance may partially explain the slowdown in the rate of charge-offs.

Dividends to net income (Div2NI) were virtually identical for both groups of banks in 2006.4 (62.26% vs. 62.21%). By 2010.1 dividends to net income were cut to 11.82% for high concentration banks and 45.63% for low concentration banks. Many banks eliminated dividends entirely, either as a result of board of director actions or through regulatory edict. The payment of a dividend that is not supported by underlying earnings is generally considered an "unsafe and unsound banking practice" that is not permitted by banking regulators. Such payment is a *de facto* partial liquidation of the bank.

The efficiency ratio is a measure of the use of overhead to support bank revenue generation. The numerator is overhead expense and the denominator is interest income plus non-interest or fee income. A lower number is generally considered more desirable than a higher number. While both groups saw this ratio rise over time, the high concentration group saw the efficiency ratio rise to a higher level. The fall in overhead expenses is generally slower than the fall in bank revenues which results in a rising efficiency ratio.

THE CAMELS MODEL, MULTIVARIATE DISCRIMINANT ANALYSIS AND THE RESULTS

The CAMELS rating system is used by Federal and state banking regulators as an overall indicator of the safety and soundness of commercial banks. For a general discussion of the CAMELS system see general bank management texts such as (Koch & MacDonald, 2010); (Rose & Hudgins, 2010); and (Gup & Kolari, 2005).

The CAMELS acronym stands for Capital Adequacy, Asset Quality, Management, Earnings, Liquidity, and Sensitivity to Market Risk. The scale ranges from 1 to 5 with 1 representing the highest rated and presumably best performing banks while 4 or 5 rated banks are in the worst financial position. Banks rated 4 or 5 are considered "problem banks" and are subject to intense regulatory scrutiny and limitations on their activities. Banks rated 5 are candidates for merger or liquidation. Regulatory CAMELS ratings may not be legally disclosed by either the regulators or the banks themselves although some private services provide estimated ratings that approximate the CAMELS variables.

Proxy variables are readily available for most of the CAMELS variables. The exception is the management factor which is a subjective assessment made by bank examiners who are privy to additional internal information about the bank and its operations. For this study, proxy variables are used for all component factors including management and are incorporated into Equation (1), a generalized linear discriminant model of the form:

$$Z_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n \tag{1}$$

Substituting the proxy variables results in the linear discriminant function in Equation (2):

$$Z_i = \alpha + \beta_1\ TREL2L + \beta_2\ L2A + \beta_3\ T1RBC + \beta_4\ LiqRat + \beta_5\ BrokeD2D + \beta_6\ 1Gap$$

$$+ \beta_7\ ROAA + \beta_8\ NPL2L + \beta_9\ Div2NI \qquad\qquad (2)$$

Where:

Z_i = Z score for the ith bank

α = constant

X_1 = TREL2L (Total Real Estate Loans to Loans) (Management proxy)

X_2 = L2A (Total Loan to Total Asset Ratio) (Management proxy)

X_3 = T1RBC (Tier 1 Risk Based Capital Ratio) (Capital proxy)

X_4 = LiqRat (Liquidity Ratio) (Liquidity proxy)

X_5 = BrokeD2D (Brokered Deposits to Deposits) (Management proxy)

X_6 = 1Gap (One Year Gap Ratio) (Market Risk Sensitivity proxy)

X_7 = ROAA (Return on Average Assets) (Earnings proxy)

X_8 = NPL2L (Non-performing Loans to Loans) (Asset Quality proxy)

X_9 = Div2NI (Dividends to Net Income) (Management proxy)

Multivariate discriminant analysis (MDA) is a widely used statistical technique that has been applied in financial literature to such diverse problems as bankruptcy prediction, credit scoring applications and IRS tax audits. As Sharma has noted, two-group MDA attempts to meet three objectives: 1) identify variables that discriminate "best between two groups; use the identified variables or factors to develop an equation or function for computing a new variable or index that will parsimoniously represent the differences between the two groups; and 3) use the identified variables or the computed index to develop a rule to classify future observations into one of the two groups. (Sharma, 1996) Hair et. al. conclude "Discriminant analysis is the appropriate statistical technique when the dependent variable is a categorical (nominal or nonmetric) variable and the independent variables are metric variables. (Hair, Black, Babin, & Anderson, 2010). (Logistical regression analysis was also performed using the same data with similar classification results.)

Tabachnick and Fidell note that discriminant analysis assumes multivariate normality in that scores on the predictors "are independently sampled from a population and that the sampling distribution of any linear combination of predictors is normally distributed. (Tabachnick & Fidell, 1996) They further observe that discriminant analysis is robust to failures of normality if violation is caused by skewness rather than outliers.

The variables used in equation (2) are listed in the order of relative importance based upon the structure matrix using year-end 2006 data (See Table 2 -- Appendix). The structure

matrix shows the Pearson correlations between the values of the discriminant function and the values of the variables. (Norusis, 2008) The ratio of real estate loans to total loans is the most important explanatory variable in all three periods. This is expected since over 50% of all loans made by each group in the study were real estate related. While all banks used in the study were heavily involved in aggregate real estate lending, there are very sharp differences between those that were heavily involved in commercial construction and land development lending and those that were not.

The loan to total asset ratio is the second most important variable in both 2006 and 2008. In 2010.1 the loan to total asset ratio fell to a fourth place ranking. The non-performing loan to loan ratio moved from an eighth place ranking out of nine variables in 2006 to the fourth rated variable in 2008 and the second rated variable in 2010.1. This may reflect the lagged response of commercial real estate lending to the overall economic downturn. Since non-performing loans are, by definition, more than 90 days past due, there is a built in time lag between an economic downturn and the reclassification of loans into the non-performing category. There is also an additional lag before non-performing loans become non-collectible as reflected by net loan charge-offs. The continued decline in credit quality as measured by the non-performing loan category is consistent with the rise in the number of problem banks and bank failures in the most recent periods.

The liquidity ratio measures the ability to turn short term assets into cash quickly and without substantial loss of value. As economic conditions deteriorated in 2008 during the financial crisis, banks found it difficult to obtain liquidity from traditional sources. Intervention through fiscal policy by the U.S. Treasury and Congress through use of TARP funds and government stimulus packages attempted to provide additional liquidity into the U.S. economy. The Federal Reserve System in concert with the Treasury used numerous non-traditional techniques to justify massive infusions of additional liquidity into the financial system in 2008 and beyond. These actions substantially expanded the Federal Reserve's balance sheet. http://www.federalreserve.gov/monetarypolicy/bst_recenttrends.htm

CAMELS MODEL CLASSIFICATION ACCURACY

CAMELS Models developed from Equation 2 are fitted using data for each of the three periods under investigation: 1) End of the Boom (2006.4); 2) Market Collapse (2008.4); and 3) Road to Recovery? (2010.1) A discriminant or Z score can be calculated for each bank in the study. In addition, a "critical Z score" also known as an "optimal cutting score" is calculated for each time period using the values for the group centroids as given in Table 3 (Appendix). For additional information on the optimal cutting score see the following endnote as well as (Hair, Black, Babin, & Anderson, 2010) [i]

Table 4 (Appendix) contains data on the classification accuracy of the CAMELS models for each of the three relevant time periods. A primary objective of this study is to develop a multivariate discriminant model using a CAMELS approach that is capable of correctly identifying banks that have high versus low concentrations of construction and land development loans. If the CAMELS variables correctly classify group membership with a high degree of accuracy on an *a priori* basis with only knowledge of the variables included in the model, it would suggest that there are significant differences in operating performance.

The results in Table 4 (Appendix) suggest that the CAMELS model produces stable results and a high degree of classification accuracy. The overall classification accuracy varies between around 81-84% across the three different time periods studied compared with a

proportional chance expectation of .5048 for 2006.4 and 2008.4 and a similar expectation of .5054 for 2010.1. (see endnote for a further discussion as well as (Hair, Black, Babin, & Anderson, 2010).[ii]

The values for Wilks' Lambda are presented in Table 5 (Appendix) along with Chi-square values and degrees of freedom. The relationships are statistically significant in all three periods investigated with $\rho = .000$.

SUMMARY AND CONCLUSIONS

This study finds evidence that statistically significant differences exist between banks with heavy concentrations in commercial real estate loans that focus on construction and land development and those that avoided excessive concentration in that loan category. This is consistent with the experience of banking regulators as they deal with increasingly large numbers of problem banks and, in many instances, bank failures. The conclusion of this study is quite simple and yet quite alarming. Some banks paid attention to regulatory warnings and are doing quite well. Those that did not may not survive. They may succumb to their own decisions. For them the recent signing into law of financial reform in the form of the Dodd Frank Wall Street Reform and Consumer Protection Act is perhaps too little, too late. They may not be around when the enabling regulations are written.

On numerous occasions since the Banking and S&L Crisis in the late 1980's and early 1990's, bankers have been warned by regulators that they should avoid excessive concentrations in a single asset category such as real estate and in particular subcategories such as commercial real estate lending that does not easily lend itself to risk transfer techniques through asset securitization. There were autopsy studies done and published, regulatory guidance provided and warnings issued. Still the lessons of the past went unlearned. Instead, many bankers used the opportunity of rising real estate prices combined with low interest rates to take on disproportionately large concentrations of commercial real estate loans, especially to land developers and construction companies.

Most bankers did not anticipate the financial tsunami presented by the Financial Crisis of 2008. Few individuals, including those in Congress and banking regulatory agencies as well as bankers and their boards of directors could imagine a crisis of such depth and breadth. Unfortunately, it is these unimaginable events that pose enormous systemic danger to financial institutions. The S&L Crisis two decades ago provided a glimpse of what might occur and provided advance warning of the consequences for commercial banks. Autopsy studies were conducted to investigate what went wrong and why. Directives were written providing bankers with guidance to avoid future crises.

Some bankers preferred to continue living in Fantasyland where prices only rise, deals are abundant, profits are plentiful, shareholders and directors are content and where all loans are paid back in full and on time. And, for a time, it appeared that such a world might actually exist…at least until 2006. Storm clouds gathered on the horizon and the forecast appeared to worsen. It wasn't until 2008 that reality set in. By that time, it was too late. Major institutions one after another succumbed to financial pressures as panic set in and financial markets froze. It was too late for bankers to extricate themselves from the trap they had created. As real estate prices plunged, commercial deals no longer made economic sense. As economic growth turned

negative, unemployment grew and with it came growing loan delinquencies. Bank examiners upon investigating loan records demanded that banks recognize their commercial real estate losses. The same loans that looked so solid a year or two before, now looked hopelessly uncollectible. With new loan volume declining, there was little hope of new infusions of capital as banks burned quickly through their existing capital as losses were absorbed.

It's a sad tale, but true. If only some bankers had pursued reality rather than fantasy….

APPENDIX

Exhibit 1

Number of FDIC-Insured "Problem" Institutions
2002-2010
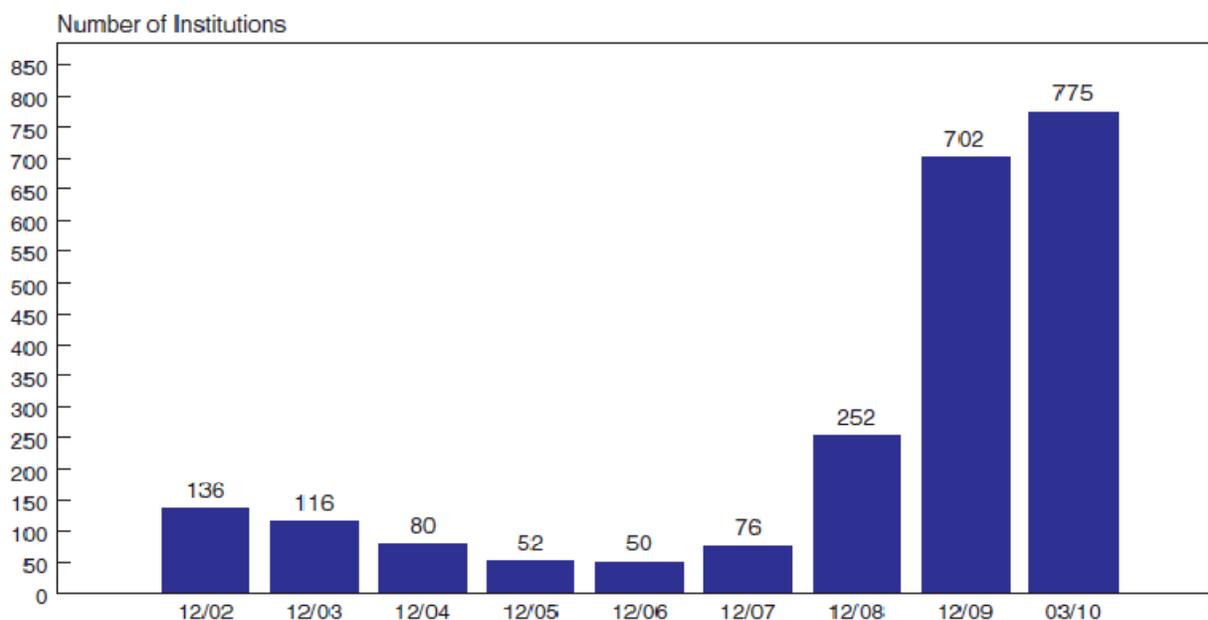
Source: FDIC Quarterly Banking Profile, 2010.1

Exhibit 2

Assets of FDIC-Insured "Problem" Institutions

2002-2010

$ Billions

Date	Value
12/02	$38.9
12/03	$29.9
12/04	$28.3
12/05	$6.6
12/06	$8.3
12/07	$22.2
12/08	$159.4
12/09	$402.8
03/10	$431.2
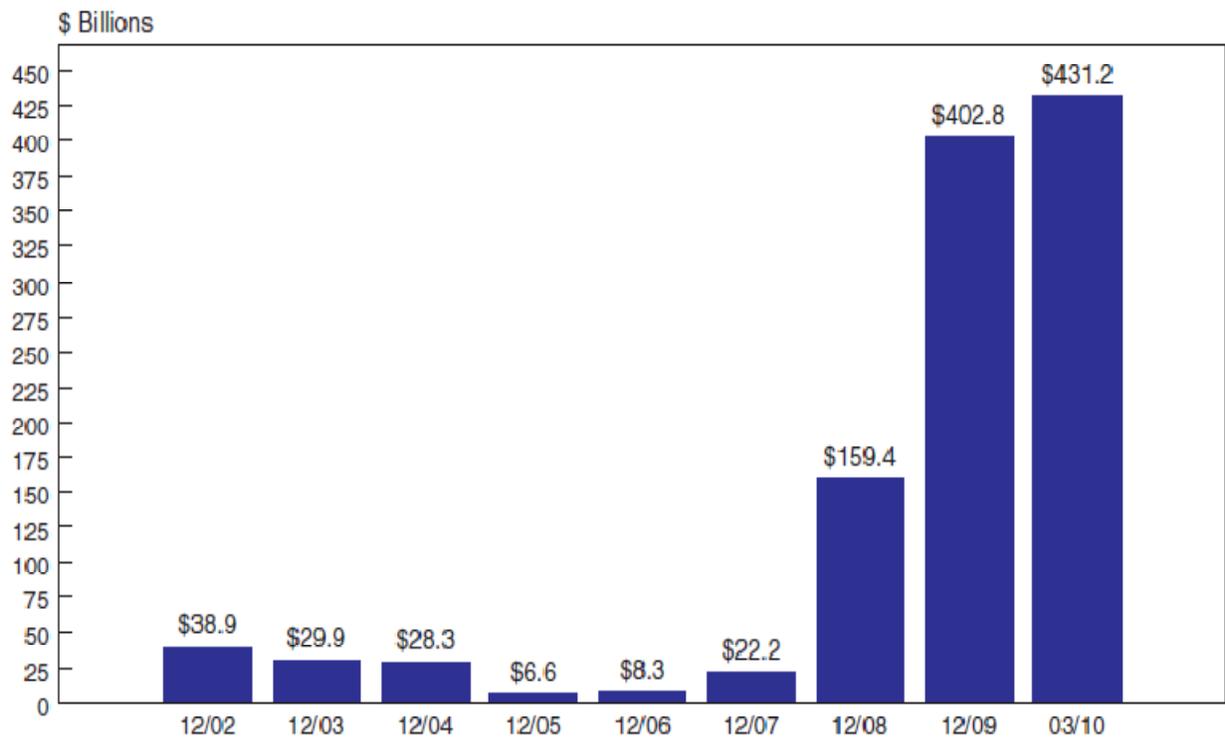
Source: FDIC Quarterly Banking Profile, 2010.1

Exhibit 3

Real Estate Loan Growth Rates*

2001-2010

Annual Growth Rate (%)

Construction and Land Development Loans
Nonfarm Nonresidential Loans
1-4 Family Residential Property Loans

1.23

-6.36

-26.24
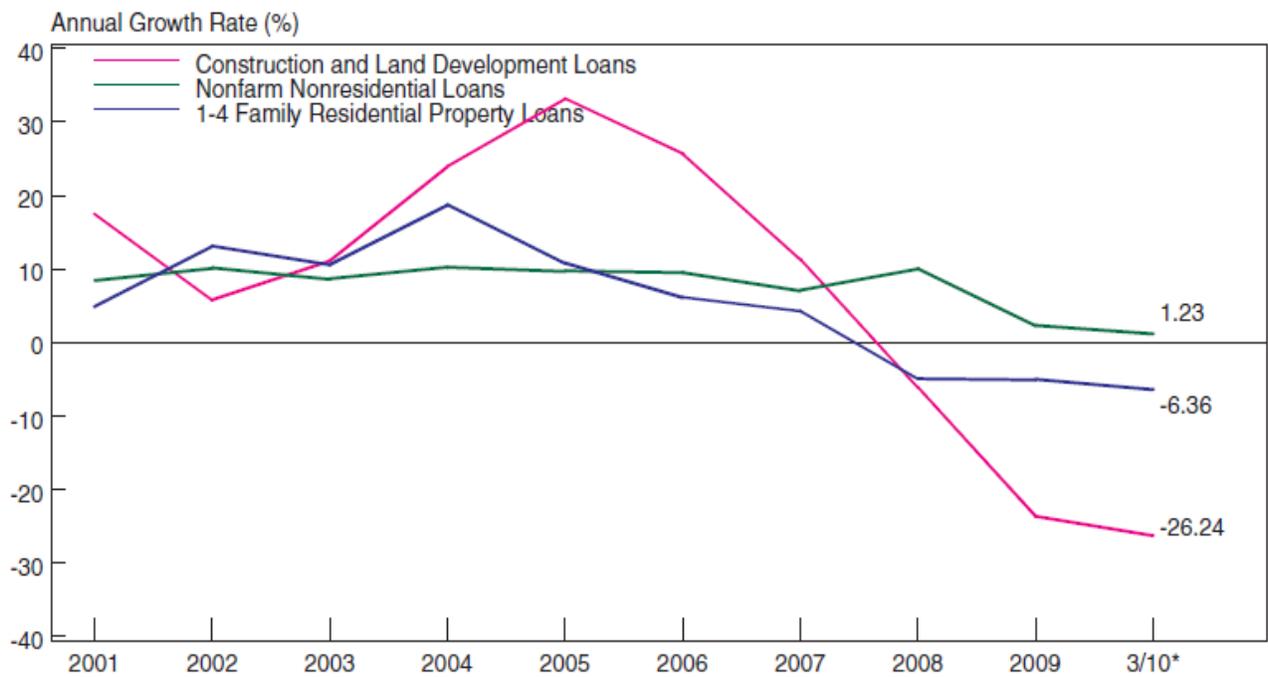
* Growth Rate for the most recent twelve-month period.

Source: FDIC, Quarterly Banking Profile 2010.1

Exhibit 4

Noncurrent Rate on Real Estate Construction and Development Loans
1996-2010
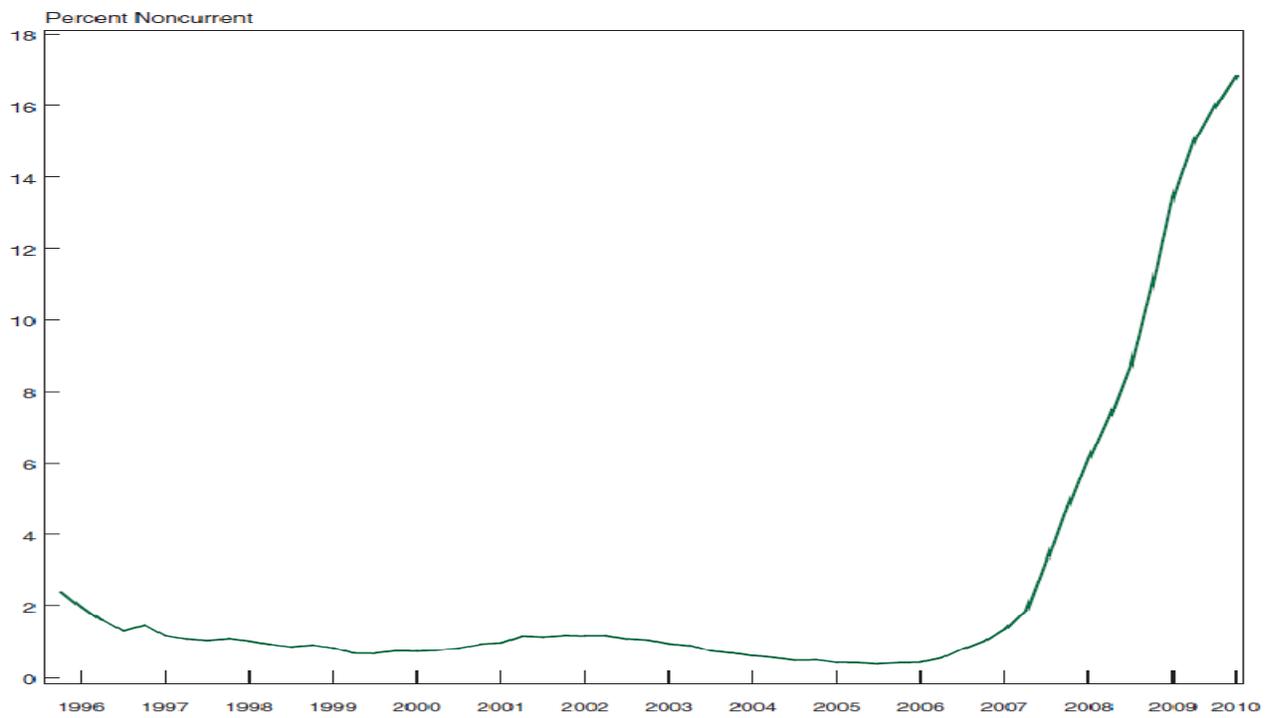
Source: FDIC, Quarterly Banking Profile 2010.1

Table 1

Descriptive Statistics

Variable	Code High =0 Low =1	*End of the Boom* 2006.4	*Market Collapse* 2008.4	*Road to Recovery?* 2010.1
Construction and Land Development Loans to Total Loans (CLDL2L)	High	23.55	23.51	18.80
	Low	1.41	0.98	0.55
Total Real Estate Loans to Loans (TREL2L)	High	76.97	79.31	80.58
	Low	52.09	53.29	54.41
Loan to Asset Ratio (L2A)	High	70.09	72.55	67.63
	Low	59.30	58.77	56.76
Tier 1 Risk Based Capital Ratio (T1RBC)	High	13.47	12.54	12.83
	Low	20.31	20.12	20.88
Equity Capital to Assets (EC2A)	High	10.07	9.70	9.34
	Low	12.27	12.13	12.17
Liquidity Ratio (LiqRat)	High	18.59	15.46	20.15
	Low	31.65	32.30	35.39
Brokered Deposits to Deposits (BrokeD2D)	High	5.58	8.69	6.41
	Low	2.10	2.20	2.04
One Year Gap Ratio (1Gap)	High	-17.60	-25.15	-28.90
	Low	-22.83	-26.86	-28.58
Return on Average Assets (ROAA)	High	1.35	0.19	-0.07
	Low	1.20	1.00	0.92
Return on Average Equity (ROAE)	High	14.14	1.42	-17.88
	Low	10.45	8.60	7.16
Non-performing Loans to Loans (NPL2L)	High	0.62	3.01	6.27
	Low	0.72	1.01	1.46
Net Charge-offs to Loans (NCO2L)	High	0.15	0.78	1.34
	Low	0.24	0.60	0.89
Dividends to Net Income (Div2NI)	High	62.26	91.00	11.82
	Low	62.21	58.17	45.63
Efficiency Ratio (ER)	High	60.79	70.45	79.31
	Low	62.87	69.29	73.64

Table 2

Structure Matrix and Variable Rankings

Variable	2006.4	Rank	2008.4	Rank	2010.1	Rank
Total Real Estate Loans to Loans (TREL2L)	.835	1	.807	1	.790	1
Loan to Asset Ratio (L2A)	.417	2	. 488	2	.377	4
Tier 1 Risk Based Capital Ratio (T1RBC)	-.288	3	-.243	7	-.194	7
Liquidity Ratio (LiqRat)	-.282	4	-.456	3	-.387	3
Brokered Deposits to Deposits (BrokeD2D)	.242	5	.347	5	.267	5
One Year Gap Ratio (1Gap)	.178	6	.055	8	-.010	9
Return on Average Assets (ROAA)	.069	7	-.268	6	-.236	6
Non-performing Loans to Loans (NPL2L)	-.031	8	.415	4	.550	2
Dividends to Net Income (Div2NI)	.000	9	.026	9	-.088	8

Table 3

Group Centroids and Calculated Critical Z Scores: 2006-2010

Group Code	2006.4 *End of the Boom*	2008.4 *Market Collapse*	2010.1 *Road to Recovery?*
High Concentration Construction and Land Development Loans (0)	.895	.989	1.029
Low Concentration	-.735	-.813	-.835

Construction and Land Development Loans (1)			
Critical Z scores (or optimal cutting scores)	**.160**	**.176**	**.194**

Table 4

Classification Accuracy

Original Data		High Concentration of Construction and Land Development Loans (0)	Low Concentration of Construction and Land Development Loans (1)
2006 (year-end) *End of the Boom*	High Concentration (0)	81.9%	18.1%
	Low Concentration (1)	19.5%	80.5%
Overall accuracy			81.2%
Cross Validation Data		High Concentration (0)	Low Concentration (1)
2006 (year-end)	High Concentration (0)	81.8%	18.2%
End of the Boom	Low Concentration (1)	19.6%	80.4%
Overall accuracy			81.1%
Original Data		High Concentration (0)	Low Concentration (1)
2008 (year-end)	High Concentration (0)	85.1%	14.9%
Market Collapse	Low Concentration (1)	17.3%	82.7%
Overall accuracy			83.9%
Cross Validation Data		High Concentration (0)	Low Concentration (1)
2008 (year-end)	High Concentration (0)	85.1%	14.9%
Market Collapse	Low Concentration (1)	17.4%	82.6%
Overall accuracy			83.8%
Original Data		High Concentration (0)	Low Concentration (1)
2010.1	High Concentration (0)	84.0%	16.0%
Road to Recovery?	Low Concentration (1)	15.3%	84.7%
Overall accuracy			84.4%
Cross Validation Data		High Concentration (0)	Low Concentration (1)
2010.1	High Concentration (0)	83.9%	16.1%

Road to Recovery?	Low Concentration (1)	15.5%	84.5%
Overall accuracy			84.2%

Table 5

Wilks' Lambda Statistics

Time Period	Wilks' Lambda (Λ)	Chi-square (χ^2)	Degrees of Freedom	Significance
2006.4 *End of the Boom*	**.603**	**1,350.9**	**9**	**.000**
2008.4 *Market Collapse*	**.554**	**1,580.0**	**9**	**.000**
2010.1 *Road to Recovery?*	**.538**	**1,643.3**	**9**	**.000**
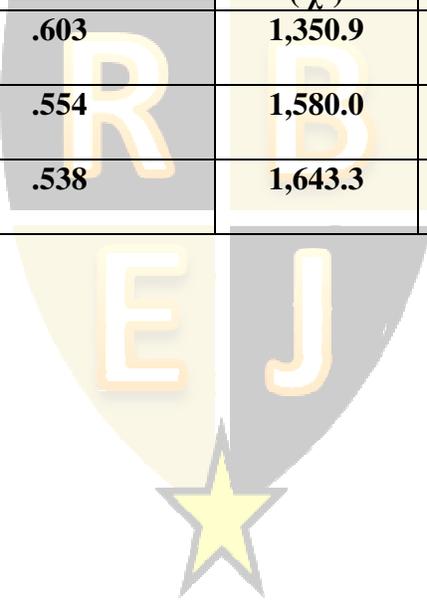
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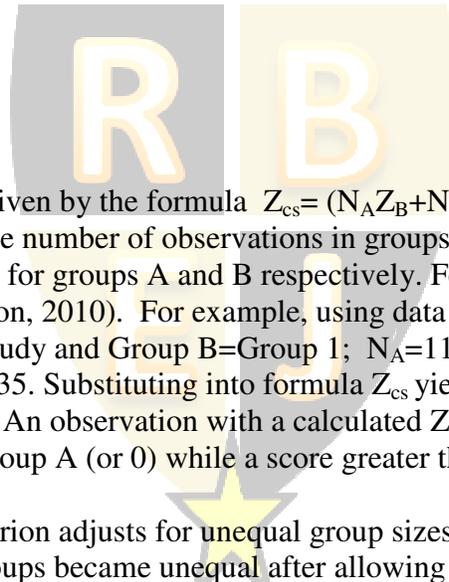
[i] The optimal cutting score is given by the formula $Z_{cs}= (N_A Z_B + N_B Z_A)/(N_A+N_B)$ where Z_{cs} is the cutting score, N_A and N_B are the number of observations in groups A and B respectively and Z_A and Z_B are the group centroids for groups A and B respectively. For additional information see (Hair, Black, Babin, & Anderson, 2010). For example, using data for 2010.1, Group A is equivalent to Group 0 in this study and Group B=Group 1; N_A=1190 and N_B=1466; Centroid Z_A=1.029 and Centroid Z_B=-.835. Substituting into formula Z_{cs} yields a critical Z score or optimal cutting score of .1938. An observation with a calculated Z score less than the critical Z score would be classified in Group A (or 0) while a score greater than the critical Z value would be classified in Group B (or 1).

[ii] The proportional chance criterion adjusts for unequal group sizes. Although the original groups were equivalent in size, the groups became unequal after allowing for defunct institutions and elimination of non-bank financial institutions such as trust companies that are not directly engaged in real estate lending.

The formula for the proportional chance criterion is: $Chance_{pro} = p^2 + (1-p)^2$. For example, using 2006.4 or 2008.4 data from the study yields: $(.451)^2 + (1-.451)^2 = .5048$. Using 2010.1 data generates a proportional chance value of .5054. Flipping a coin, of course, results in a value of .50. For additional discussion see (Hair, Black, Babin, & Anderson, 2010) p. 265.