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What Do We Know about Regional Banks? An Exploratory Analysis

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This study tries to get a sense of the topography of the regional banking landscape. We focus on bank holding companies and banks with $10 billion to $50 billion in assets and look for factors that potentially explain regional bank health from 2008 to 2013. Our dataset is a combination of bank Call Report data and confidential supervisory data. Our analysis shows that regional banks are not a monolithic group, and different factors explain bank safety and soundness for different types of banks.

Keywords: Regional Banking Organizations; Banks and Banking; Supervisory Ratings

JEL codes: G21, G28, L25, R11

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I. Introduction

What is a regional bank? What factors have contributed to their health and success? At first glance, these questions seem straightforward. A regional bank is one that serves the region. Then how do we define *a region*? The Riegle Neal Act of 1994 ushered in an era of geographically unlimited banking which in turn muddied the concept of *a region*. Is a region a state or a group of contiguous states? Alternatively, is a region defined based on a bank's geographic lending activities and portfolio composition? Internet banking further confounds the concept of a region. Clearly, what constitutes *a region* remains unclear. We might be able to categorize a regional bank based on what it is "not." A regional bank is neither a community bank nor a systemically important bank. But, how do we define a regional bank based on what it is? As Gratton (2004) puts it, the midsize banking sector has been hard to define. This problem exists as there is a continuum of regional banks. From purely a size perspective, a regional bank could lie on the lower end of the size spectrum making it a super-sized community bank with a specific geographic focus. At the higher end of the size spectrum, a regional bank could have extensive market power, portfolio concentration, and could potentially consolidate and morph into a super-regional bank. Hence, given the ambiguity that comes with defining a regional bank, it becomes important for us to draw on history to see what exactly has shaped the definition on a regional bank.

Between the late 1980's and 1994, the U.S. banking system was a regional system. As Thomson and Seballos (1990) point out, from 1987 to 1989 more than 200 regional banks failed each year. Due to geographically limited banking, economic downturns that were regional in nature contributed to regional bank failures. However, with the passing of the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994, limits to geographic diversification of a bank's portfolio were removed. The strength of the regional economy was a weaker predictor

of a regional banks' performance. However, the housing bubble crash of 2008 showed tremendous amount of regional variation in its impact[1]. This in turn brought out performance differences across banks in different regions. There have been numerous studies that show that show that local economic conditions impact bank health[2].

As noted in the American Banker (April 1, 2013), a CEO observes, "[N]o one is talking about breaking us up." While regional banks are neither too big nor too small, and are not plagued by too-big-to-fail issues, they are not without vulnerabilities. Though regional banks are perhaps less subject to new regulatory requirements applied to the largest banks, it is important that regulators are not lulled into complacency on the health of these banks and their sensitivities to regional macroeconomic conditions. Regional bank health has a direct impact on the economy, primarily through the regional credit channel. Early studies by Samolyk (1992) and Hoskins (1991) show evidence of a regional credit channel. They develop a regional credit view and find that regional banking conditions can impact the local economy adversely. The results showed that regional banking-sector problems can impede economic activity in financially distressed regions. More recently, Morgan, Rime, and Strahan (2004) find that interstate branching has an impact on business cycles at the state level.At the same time, other studies have also shown that banking supervision can influence bank lending behavior and affect both macro level and regional level economic health. Berger, Kyle and Scalise (2001) use state level data and find that changes in supervisory stringency affect bank lending. Curry, Fissel and Ramirez (2008) find that supervisory ratings impact bank commercial and industrial (C&I) lending. Thus, the issue of regional bank health and their supervision is of consequence for the broader

[1] Refer to Balasubramanyan and Coulson (2013) on how house price declines impacted business starts in sand belt states and rust belt states.

[2] For these types of studies, refer to Avery and Gordy (1998) and Calomiris and Mason (2000).

economy. Assessing the role of regional banks is particularly important for the post financial crisis period (2008 to current).

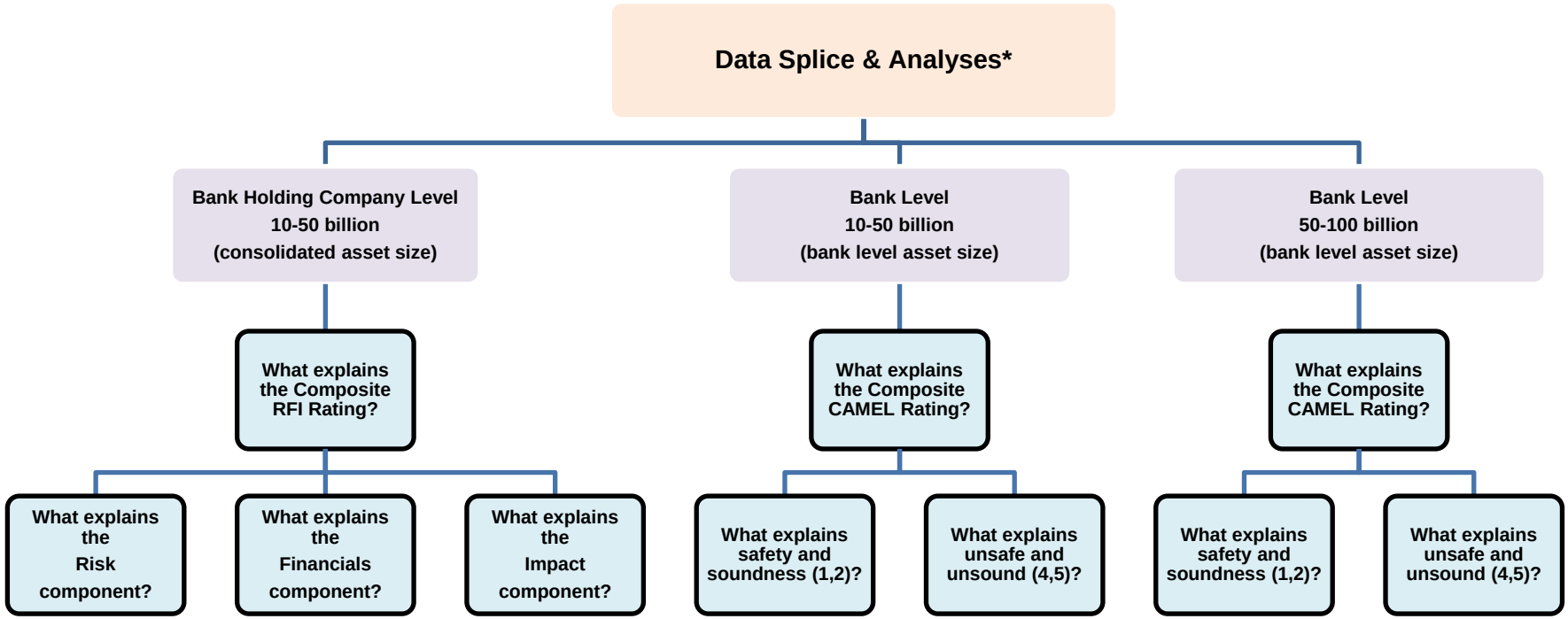
In this paper we use confidential supervisory data, which embeds valued examiner judgment to study what potentially explains regional bank health. Using surveillance[3] data and supervisory ratings, we examine the factors that explain the health of regional banks and bank holding companies between 2008 and 2013. Given that supervisory cycles do not coincide with Call Reporting cycles and that rating upgrades and downgrades take place at examiner discretion based on confidential examinations, we carry out various data splices and perform the analyses from various angles. We perform our analyses both at the Bank Holding Company level (BHC) as well as bank level. Our regional BHCs are in the 10 to 50 billion dollars consolidated asset category. The bank level asset size category is in the 10 to 50 billion dollars and 50 to 100 billion dollars (non-consolidated) range[4]. Figure 1 provides a schematic summary of the data splices and analyses.

This paper is organized as follows: Section 2 is a short section that states upfront the limits of this study and the context in which the reader should interpret the results and analyses. Section 3 describes the data and the dynamics of our regional bank panel. Section 4 describes the econometric methodology and specification of our models. Section 5 provides a detailed discussion of the results and Section 6 provides the conclusion and directions for future study.

[3] Recent Supervision and Regulation Statistical Assessment of Bank Risk Model (SR-SABR) data

[4] Our analysis is not performed at the consolidated bank holding level. The asset size definition is based on the bank level.

Figure 1: A schematic of the data splice and breakdown of the analyses performed to study the factors that explain regional bank health.



*We perform ten separate regression models to obtain answers to the questions above. Refer to the Methodology section for details.

II. Caveat Lector

This study is simply a starting-point-analysis to disaggregate some factors that potentially explain bank health from 2008 to 2013. Before readers delve into the paper, we would like for them to keep in mind the context of this study so as to avoid misinterpretation.

First, this study is not intended to be a "cheat sheet" for good ratings for regional banks. It is an exploratory analysis that attempts to tease out some factors that potentially explain regional bank health as measured by ratings for a very specific time period between 2008:Q1 to 2013:Q2. In any empirical study, it is important to emphasize that correlation is not causality.

Second, supervisory data is confidential and unique. Ratings embed supervisory judgment. One must keep in mind that there are various components to these ratings and the ratings follow from on-site examinations. Supervisory examinations are a highly nonlinear process. The scope of exams differs from bank to bank based on their complexity. The sub-areas and components of ratings can be upgraded or downgraded based on what examiners find during their exams. There are strict guidelines and supervisory letters that govern the examination process. However, the actual assignment of ratings requires judgment—which has both advantages an disadvantages. We do our best to capture these aspects in our econometric modeling. Also, given that the scope and cycle of supervisory exams do not coincide with Call Reporting and that ratings can be assigned by different regulatory agencies, we try to be as time-consistent as possible (as much as the data allow us to do so). We do so by employing the Supervision and Regulation Statistical Assessment of Bank Risk Model (SR-SABR) data. Ratings are up to date in this database with all ratings from various regulatory agencies being updated in a consistent manner.

Third, the systemic nature of the 2008 banking crisis channeled much attention towards the industry's largest banking organizations (SIFIs: Systemically Important Financial

Institutions). We do not know if regional banks are any different from the SIFI's (or any other group of banks for that matter). We do test econometrically and find that a regional bank in the 10 to 50 billion asset category is different from a regional bank in the 50 to 100 billion asset class.

Fourth, we make some assumptions on the size cutoff for regional banks. We define a regional bank to be within the 10 to 50 billion dollars (for BHCs) and 10 to 100 billion dollars (for banks) in this paper. This cutoff is predetermined (and perhaps arbitrary). By other criteria, a regional bank holding company could be potentially as large as 400 billion dollars in asset size. Hence, our limited size definition has to be kept in mind while interpreting the results.

Inevitably, this work may raise more questions than it answers. This study is meant to provide a broad level exploratory overview on regional banks. We combine publicly available and confidential supervisory data for our sample of regional banks. It is not meant to opine on why the results are what they are for these groups of banks. The findings are meant to sow the seeds for further exploration into specific risks and opportunities.

III. Data

Our regional bank sample can be broken down into three groups. The breakdown is as follows:

- Bank Holding Companies (BHCs) of consolidated asset size between 10 and 50 billion dollars
- U.S. commercial banks with asset size between 10 to 50 billion dollars
- U.S. commercial banks with asset size between 50 to 100 billion dollars

We construct a quarterly panel which spans from 2008:Q1 to 2013:Q2. We employ confidential supervisory data on RFI/C[5] and CAMELS[6] ratings. The RFI/C ratings are for BHCs while the CAMELS are used for the banks.

SR-SABR data is used by the surveillance examiners as part of their monitoring of emerging bank risks. Given that bank examination cycles and ratings reporting do not coincide with Call Report frequency; we use the RFI/C and CAMELS ratings from the surveillance database. It is updated frequently and is more likely to be representative of current quarters.

Our independent variables consist of bank balance sheet data, income statement data, state level unemployment, state level house price data and the spread between 30-year T-bonds and 90-day T-bills. Our bank and BHC balance sheet and income statement data are obtained from the FFIEC Call Reports. Our state level unemployment control data are obtained from the Bureau of Labor Statistics. State level house price index data are obtained from the Federal Housing Finance Agency. Data on yield spread are obtained from Haver Analytics. While constructing our dataset using data from a confidential supervisory database, we keep in mind some of the unique aspects associated with CAMEL ratings. We adopt some of the econometric

[5] The Federal Reserve Board adopted the Bank Holding Company RFIC rating system to replace the BOPEC system. The R represents Risk Management, the F represents Financial Condition and the I represents Impact of the parent subsidiary depository institution. The C component is the composite rating. The ratings are assigned based on a 1 to 5 scale. 1 indicates the highest rating and 5 indicates the lowest rating. Refer to SR04-18 for more details.

[6] The Federal Reserve Board adopts the Uniform Financial Institutions Rating System (UFIRS) commonly known as the CAMELS ratings system. The five components of the CAMELS rating are Capital Adequacy, Asset Quality, Management Administration, Earnings, Liquidity and Sensitivity to market risk. The rating scale ranges from 1 to 5, with a rating 1 being the strongest and a rating 5 being the weakest. Financial institutions with a rating 1 are considered to be sound in every aspect. Institutions with a rating 2 are considered to be fundamentally sound. Institutions with a rating 3 exhibit some degree of supervisory concern in one or more of the component areas. Financial institutions with a rating 4 generally exhibit unsafe and unsound practices or conditions and an institution rated 5 exhibits extremely unsafe and unsound practices and are deficient in performance. For more details on UFIRS, refer to: http://www.federalreserve.gov.boarddocs/press/general/1996/19961224

approaches outlined in Bassett, Lee and Spiller (2012) to deal with the uniqueness associated with confidential supervisory data[7].

Typically, studies employ a constant sample of banks that have observations for the entire sample period. This is to avoid the problems of accretion or attrition bias due to banks entering or leaving the sample (Refer to Curry, Fissel and Ramirez (2008)). However, in our study, the supervisory RFI/C for BHCs and CAMELS for banks is our dependent variable and our sample is an unbalanced panel. To ensure that our sample is adequate, we perform analyses on both balanced and unbalanced panels but report only results for the unbalanced panel as the results are not significantly different. For analytical purposes, we employ the unbalanced panel in order to maintain enough observations to ensure limited loss of degrees of freedom.

Due to the confidential nature of RFI/C and CAMELS ratings, we do not report the descriptive statistics for the dependent variable. Table 1 provides the descriptive statistics for an annual unbalanced panel of Bank Holding Companies between 10 to 50 billion in assets from 2008:Q1 to 2013:Q2. Table 2 provides summary statistics for a quarterly unbalanced panel of commercial banks between 10 and 100 billion in assets from 2008:Q1 to 2013:Q2.

IV. Methodology

A. Bank Holding Company (BHC) level analysis

In our first set of analysis, we estimate a random effects ordinal logit model[8]. Here we examine what factors explain a bank holding company's composite RFI/C rating where "C" is the composite rating. The sample for this analysis constitutes Bank Holding Companies (BHCs)

[7] Bassett, Lee and Spiller (2012) provide an excellent exposition of alternative statistical models that explain CAMEL ratings of banks from 1991 to 2011. They explain and show how these different models deal with the inherent limitations of confidential supervisory data. There are unique aspects of timing and frequency of supervisory data. Also, the private and confidential informational content of examination data need to be considered while constructing the econometric models.

[8] Refer to Berger et al. (2000).

of consolidated asset size between 10 and 50 billion dollars. The specification of our model is given as follows:

$$sixm\_RFI_{it} = lev_{it} + tcr_{it} + \sec c_{it} + cre_{it} + rre_{it} + consumer_{it} + cnindus_{it} + hotfund_{it} + roa_{it} + effiratio_{it} + ta_{it} + growthHPI_{it} + unemp_{t} + spread_{it} + \mu_{it} \quad (1)$$

where $sixm\_RFI_{it}$ is equals to 6 minus the composite RFI rating for bank i in period t. Bassett et al. (2012) takes this approach in transforming the Y_{it} variable so that higher values are associated with better conditions for the bank. The resulting coefficient interpretation is more intuitive with higher values associated with better supervisory ratings. The independent variables are as follows: lev_{it} is the Tier 1 leverage ratio. tcr_{it} measures the Tier 1 risk-based capital ratio. $secc_{it}$ measures the total securities as a percentage of total assets. cre_{it} measures commercial real estate loans as a percentage of total loans. rre_{it} measures residential real estate loans as a percentage of total loans. $consumer_{it}$ measures consumer loans as a percentage of total loans. $cnindus_{it}$ measures commercial and industrial loans as a percentage of total loans. $hotfund_{it}$ measures deposits above a $100000, brokered deposits and Fed Funds purchased. roa_{it} is the returns on assets. $effiratio_{it}$ is the expense ratio. It is obtained by dividing the non-interest expense by the sum of interest income and non-interest income. ta_{it} measures the log of total assets of the institution. $growthHPI_{it}$ measures the quarterly growth in state level house price index. $unemp_{t}$ captures quarterly state level unemployment based on the institution's state in which it is domiciled. $spread_{t}$ captures the quarterly spread between 30-year T-bonds and 90-day T-bills.

Table 3 reports the results and the odds ratios associated with the estimated coefficients.

In the next set of analysis, we regress each of the sub-components of the RFI ratings on the same set of independent variables. The following regressions are estimated:

$$sixm\_R_{it} = lev_{it} + tcr_{it} + \sec c_{it} + cre_{it} + rre_{it} + consumer_{it} + cnindus_{it} + hotfund_{it} + roa_{it} + effiratio_{it} + ta_{it} + growthHPI_{it} + unemp_t + spread_{it} + \mu_{it} \quad (2)$$

$$sixm\_F_{it} = lev_{it} + tcr_{it} + \sec c_{it} + cre_{it} + rre_{it} + consumer_{it} + cnindus_{it} + hotfund_{it} + roa_{it} + effiratio_{it} + ta_{it} + growthHPI_{it} + unemp_t + spread_{it} + \mu_{it} \quad (3)$$

$$sixm\_I_{it} = lev_{it} + tcr_{it} + \sec c_{it} + cre_{it} + rre_{it} + consumer_{it} + cnindus_{it} + hotfund_{it} + roa_{it} + effiratio_{it} + ta_{it} + growthHPI_{it} + unemp_t + spread_{it} + \mu_{it} \quad (4)$$

where $sixm\_R_{it}$, $sixm\_F_{it}$ *and* $sixm\_I_{it}$ is equals to 6 minus the sub-component rating for R (risk), F (financials) and I (impact) respectively for bank i in period t. The results and the receptive odds ratios are reported in Table 4.

B. U.S. commercial banks with asset size between 10 to 50 and 50 to 100 billion dollars.

In the second set of analysis, we estimate a random effects ordered logistic model of the following form[9]:

$$sixm\_camel_{it} = lev_{it} + tcr_{it} + \sec c_{it} + cre_{it} + rre_{it} + consumer_{it} + cnindus_{it} + hotfund_{it} + roa_{it} + effiratio_{it} + ta_{it} + growthHPI_{it} + unemp_t + spread_{it} + \mu_{it} \quad (5)$$

where $sixm\_camel_{it}$ is equal to 6 minus the composite CAMELS rating for bank i in period t. This model is estimated for banks in the 10 to 50 billion category, 50 to 100 billion size categories as well as a combined sample of banks in the 10 to 100 billion category. Table 5 provides the results for Model (5) and respective odds ratios.

[9] Refer to Bassett et al. (2012) and Jordan and Rosengren (2002).

In our third set of analysis, we want to specifically examine the drivers of bank safety and soundness as captured by composite CAMELS ratings 1 and 2. In Model (6), the dependent variable *soundbank12* takes the value of 1 if the CAMELS composite rating is a 1 or 2. All other composite rating values are assigned a 0. Table 6 provides the results for Model (6).

$$\begin{aligned} soundbank12_{it} &= lev_{it} + tcr_{it} + \sec c_{it} + cre_{it} + rre_{it} \\ &+ consumer_{it} + cnindus_{it} + hotfund_{it} + roa_{it} + effiratio_{it} + ta_{it} + growthHPI_{it} \\ &+ unemp_{t} + spread_{it} + \varepsilon_{it} \end{aligned} \quad (6)$$

As an antithesis, we also examine if the same factors help explain a bank's weakness (composite CAMELS rating 4 and 5). In Model (6), the dependent variable *unsafe_unsound* takes the value of 1 if the CAMEL composite rating is 4 or 5 while all other ratings take on a value of 0. Similarly, the same model is estimated for each of the three size categories. Table 7 provides the results for Model (7).

$$\begin{aligned} unsafe\_unsound_{it} &= lev_{it} + tcr_{it} + \sec c_{it} + cre_{it} + rre_{it} \\ &+ consumer_{it} + cnindus_{it} + hotfund_{it} + roa_{it} + effiratio_{it} + ta_{it} + growthHPI_{it} \\ &+ unemp_{t} + spread_{it} + \mu_{it} \end{aligned} \quad (7)$$

V. Results[10]

For convenience, we group the empirical results into results for the variables on the asset side, the liabilities side, management, and the regional and macroeconomic environment.

a. Asset and Loan Concentration at the BHC Level based on RFI ratings

For BHCs in the 10 to 50 billion consolidated asset size group, we find that and increase in commercial real estate loans reduces the likelihood of the bank holding company receiving better ratings. The BHC is 15 percent less likely to be rated well (Table 3). In the composite

[10] All analyses and results are based on a 1 standard deviation change in the independent variable. When we consider an increase or decrease in the independent variable, it implies a 1 standard deviation change from the mean. For the mean values of our variables, refer to Tables 1 and 2.

analysis, such a bank is more likely to receive a low rating and this likelihood increases by 19 percent for a one standard deviation increase in residential real estate holdings (Table 3). An increase in commercial and industrial loans reduces the likelihood of a BHC receiving better ratings by about 16 percent (Table 3).

The impact of commercial real estate (CRE) loans on sub-component ratings are as follows: (i) A one standard deviation increase in CRE loans reduce the BHC's likelihood of receiving higher risk management (R) ratings by 11 percent. (ii) A one standard deviation increase in CRE loans reduces the BHC's likelihood of receiving higher financial (F) ratings by 11 percent. (iii) A one standard deviation increase in CRE loans reduces the BHC's likelihood of receiving higher impact (I) ratings by 16 percent. (Refer to Table 4)

The impact of residential real estate (RRE) loans on sub-component ratings are as follows: (i) A one standard deviation increase in RRE loans reduces the BHC's likelihood of receiving higher risk management (R) ratings by 13 percent. (ii) A one standard deviation increase in RRE loans reduces the BHC's likelihood of receiving higher financial (F) ratings by 9 percent. (iii) A one standard deviation increase in RRE loans reduces the BHC's likelihood of receiving higher impact (I) ratings by 18 percent. (Refer to Table 4)

The impact of commercial and industrial (C&I) loans on sub-component ratings are as follows: (i) A one standard deviation increase in C&I loans reduces the BHC's likelihood of receiving higher risk management (R) ratings by 13 percent. (ii) C&I loans have no statistically significant impact on financial ratings. (iii) A one standard deviation increase in CRE loans reduces the BHC's likelihood of receiving higher impact (I) ratings by 23 percent. (Refer to Table 4). The impact of consumer loans is statistically significant only for impact (I) ratings. A one standard deviation increase in CRE loans reduces the BHC's likelihood of receiving higher impact (I) ratings by 15 percent. (Refer to Table 4).

b. Asset and Loan Concentration at the Bank Level based on CAMELS ratings

For banks in the 10 to 50 billion asset size group, we find that an increase in CRE loans reduces the likelihood of the bank being rated safe and sound by about 16 percent based on the binomial logit analysis (Refer to Table 6). In the ordered logit approach, we find that banks are likely to perform better with a decline in CRE loans. An increase in CRE loans reduces the likelihood of higher CAMEL ratings by about 4 percent (Refer to Table 5). An increase in residential real estate loans reduces the likelihood of being safe and sound by approximately 14 percent (Table 6). In the composite analysis, a bank is likely to receive a ratings downgrade and this likelihood increases by 6 percent for an increase residential real estate holdings. A rise in consumer loans reduces the likelihood of being safe and sound by about 3 percent (Table 5). For banks in the 50 to 100 billion group, an increase in commercial and industrial loans raises the likelihood of a bank being safe and sound by about 17 percent (Table 6).

c. Liability and Funding at the BHC Level based on RFI ratings

At the BHC level, we observe a positive relationship between the use of hot funds and better composite RFI ratings. However, this relationship is not statistically significant. We regress each of the RFI components on hot funds. We observe a sign reversal but the coefficients are not statistically significant (Table 3).

d. Liability and Funding at the Bank Level based on CAMELS ratings

At the bank level analysis, we see a more definitive relationship between ratings and hot funds. For the 10 to 50 billion group, an increase in hot funds increased the likelihood of being a sound bank by about 13 percent (Table 6). In the composite rating setting, the rise in hot fund holdings increases the likelihood of higher ratings by about 4 percent (Table 5). At first glance,

this may seem counterintuitive as hot funds are not characteristic of strong banks given that it is an unstable source of funding. However, the flip side is that hot funds are indicative of a bank that had lending opportunities that attracted the hot funds in the first place. This in fact is in line with previous work (Haubrich and Thomson, 1996). On average, the 10 to 50 billion group of banks was more likely to be rated safe and sound if they held higher than average concentrations of hot funds.

e. Management factors at the BHC Level based on RFI ratings

We find that BHCs that had higher returns on assets had higher impact (I) ratings. A one standard deviation in ROA resulted in an increase in likelihood of better impact ratings. This increase in likelihood is approximately 20 percent. At the sub-component rating level, an increase in the expense ratio (labeled efficiency ratio) reduces the likelihood of better component ratings. A one standard deviation increase in the expense ratio reduces the likelihood of better component ratings by approximately 5 percent (Table 4).

f. Management factors at the Bank Level based on CAMELS ratings

We find an obvious result, that is, banks that have higher returns on assets were more likely to be rated safe and sound. For the 10 to 50 billion group, and increase in ROA improved the likelihood of a safety and soundness rating by nearly 145 percent. For the 50 to 100 billion group, the likelihood of better composite CAMEL rating increased by approximately 33 percent (Table 5). For safe and sound banks in the 10 to 50 billion group, and increase in the expense ratio raised the likelihood of being rated a sound bank by approximately 149 percent. This does not imply that flagrant spending ensures safety and soundness. It is plausible that banks that spent successfully on quality management were more likely to be safe and sound (Table 6). An additional possibility is that these banks had a high fraction of non-interest income. (Gilbert, Mayer and Fuchs, 2013)

g. Regional Factors and Yield Curve at the BHC Level based on RFI ratings

Our analysis shows that BHCs are 36 percent less likely to have higher ratings with a one standard deviation increase in unemployment rate.

h. Regional Factors and Yield Curve at the Bank Level based on CAMELS ratings

Our analysis shows that banks in the 50 to 100 billion are approximately three times more likely to be rated safe and sound when treasury spread increases. This suggests that the larger regionals are more likely to position themselves to profit from the yield curve. When we employ the composite rating, the 10 to 50 billion banks also appear to be sensitive to the Treasury spreads. However, the effects are muted for the 10 to 50 billion group relative to the 50 to 100 billion group. A 10 to 50 billion regional bank is 74 percent more likely to have higher ratings while a 50 to 100 billion regional bank is 140 percent more likely to have higher ratings when Treasury spreads increase.

III. Conclusion and avenues for future research

The purpose of this exploratory study is to examine various factors that explain regional BHC as well as bank level performance as defined by RFI and CAMEL ratings respectively. The study is not intended to be a “cheat sheet” for good ratings, as correlation is not causality. Furthermore, there are some differences that make some results hard to interpret, particularly some divergences between results for banks and for bank holding companies. The work should be taken as a starting-point-analysis that attempts to tease out some potential factors that explain performance during and after the crisis period. The results serve to initiate conversations and further analyses on opportunities and risks for regional banks.

Moving forward, the following areas will be fruitful areas of research:

- How do supervisory ratings compare with market measures of bank performance?
- Under a more detailed breakdown, which types of loans performed well and under performed in in the 2008 to 2013 period?
- Statistically, how similar are regional banks, and to what extent do they statistically differ from non-regional banks?
- To what extent do governance factors help in explaining the health of regional banks?

As an exploratory analysis, we hope this work points the way towards more extensive and detailed research on regional banking organizations, which too often have been neglected.

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Table 1: Descriptive statistics for an annual unbalanced panel of Bank Holding Companies between 10 to 50 billion in assets from 2008:Q1 to 2013:Q1

Variable Description	**Short Name**	**Mean**	**Std. Dev.**	**Observations**
Tier 1 Leverage Ratio	lev	10.5	8.15	N = 268
Tier 1 Risk-Based Capital Ratio	tcr	14.75	9.86	N = 268
Total Securities as a % of Total Assets	secc	23.83	13.7	N = 294
Commercial Real Estate as a % of Total Loans	cre	35.23	17.94	N = 294
Residential Real Estate as a % of Total Loans	rre	30.76	20.18	N = 294
Consumer Loans as a % of Total Loans	consumer	6.69	9.99	N = 294
C & I Loans as a % of Total Loans	cnindus	19.22	13.73	N = 294
Deposits above a 100000, brokered deposits, Fed Funds Purchased as a % Total Assets	hotfund	21.04	23.29	N = 294
Returns on Assets	roa	0.67	1.48	N = 294
Expense Ratio	effiratio	0.52	0.15	N = 294
Log of Total Assets	ta	16.5	0.45	N = 294
Growth rate of House Price Index	growthHPI	-0.04	0.01	N = 294
Unemployment Rate	unemp	8.2	1.41	N = 294
Spread between 30-year T-bond and 90-day T-bill	spread	2.39	0.55	N = 294

Table 2: Descriptive statistics for a quarterly panel of commercial banks between 10 and 100 billion in assets from 2008:Q1 to 2013:Q1

Variable Description	Short Name	Mean	Std. Dev.	Observations
Tier 1 Leverage Ratio	lev	9.94	4.39	N = 2155
Tier 1 Risk-Based Capital Ratio	tcr	17.02	54.54	N = 2155
Total Securities as a % of Total Assets	secc	18.73	14.85	N = 2155
Commercial Real Estate as a % of Total Loans	cre	28.13	21.93	N = 2153
Residential Real Estate as a % of Total Loans	rre	27.85	24.47	N = 2153
Consumer Loans as a % of Total Loans	consumer	15.30	26.01	N = 2153
C & I Loans as a % of Total Loans	cnindus	19.23	15.21	N = 2153
Deposits above a 100000, brokered deposits, Fed Funds Purchased as a % Total Assets	hotfund	32.44	21.37	N = 2155
Returns on Assets	roa	0.56	1.71	N = 2153
Expense Ratio	effiratio	0.49	0.37	N = 2153
Log of Total Assets	ta	16.95	1.00	N = 2155
Growth rate of House Price Index	growthHPI	-0.01	0.02	N = 2155
Unemployment Rate	unemp	8.20	2.44	N = 2155
Spread between 30-year T-bond and 90-day T-bill	spread	2.52	0.68	N = 2155

Table 3: This table presents the results for Model (1) with an annual panel of Bank Holding Company (10-50 billion asset size category) level observations. The dependent variable *sixm_RFI* equals to 6 minus the composite RFI/C rating for Bank Holding Company *i* in period *t.* We estimate a random effects ordered logistic model. The robust standard errors are reported in the parentheses.

Explanatory Variable	**Short Name**	**Composite RFI/C, $50-100 Billion**	**Composite RFI/C, $50-100 Billion**
		sixm_RFI	**sixm_RFI**
			Odds Ratio
Tier 1 Leverage Ratio	lev	-0.12	0.88
		(0.12)	
Tier 1 Risk-Based Capital Ratio	tcr	0.05	1.05
		(0.07)	
Total Securities as a % of Total Loans	secc	0.09**	1.10
		(0.04)	
Commercial Real Estate as a % of Total Loans	cre	-0.17*	0.85
		(0.10)	
Residential Real Estate as a % of Total Loans	rre	-0.22**	0.81
		(0.10)	
Consumer Loans	consumer	-0.09	0.91
		(0.10)	
Commercial and Industrial Loans	cnindus	-0.18*	0.84
		(0.10)	
Hot Funds	hotfund	0.01	1.01
		(0.03)	
Return on Assets	roa	0.35*	1.43
		(0.21)	
Efficiency Ratio	effiratio	-0.04	0.96
		(0.029)	
Log of Total Assets	ta	-1.43	0.24
		(1.00)	
Growth Rate of House Price Index	growthHPI	-2.23	0.11
		(1.63)	
Unemployment Rate	unemp	-0.48*	0.62
		(0.26)	
Treasury Spread	spread	0.03	1.03
		(0.83)	
Number of Observations		268	
Log Likelihood		-163.43	
Number of Groups		47	

Table 4: This table presents the results for Model (2)-(4) with an annual panel of Bank Holding Company (10-50 billion dollars in assets) level observations. The dependent variable is *sixm_R, sixm_F, sixm_I* respectively. This dependent variable equals to 6 minus the R, F and I sub-component of the ratings respectively for Bank Holding Company *i* in period *t.* We estimate a random effects ordered logistic model. The robust standard errors are reported in the parentheses.

Explanatory Variable	Short Name	R component Rating, $10-50 Billion	F component Rating, $10-50 Billion	I component Rating, $10-50 Billion	R component Rating, $10-50 Billion	F component Rating, $10-50 Billion	I component Rating, $10-50 Billion
		sixm_R	sixm_F	sixm_I	sixm_R	sixm_F	sixm_I
					Odds Ratio	Odds Ratio	Odds Ratio
Tier 1 Leverage Ratio	lev	-0.08 (0.09)	-0.04 (0.07)	-0.24*** (0.08)	0.93	0.96	0.79
Tier 1 Risk-Based Capital Ratio	tcr	-0.09 (0.07)	-0.02 (0.04)	0.11* (0.06)	0.91	0.98	1.11
Total Securities as a % of Total Loans	secc	0.07*** (0.03)	0.07* (0.04)	0.06 (0.05)	1.07	1.07	1.06
Commercial Real Estate as a % of Total Loans	cre	-0.12** (0.05)	-0.06* (0.03)	-0.18*** (0.04)	0.89	0.94	0.84
Residential Real Estate as a % of Total Loans	rre	-0.14*** (0.05)	-0.10*** (0.04)	-0.20*** (0.06)	0.87	0.91	0.82
Consumer Loans	consumer	-0.02 (0.05)	0.04 (0.04)	-0.17*** (0.06)	0.98	1.04	0.85
Commercial and Industrial Loans	cnindus	-0.14** (0.06)	-0.07 (0.04)	-0.28*** (0.06)	0.87	0.94	0.76
Hot Funds	hotfund	-0.03 (0.03)	-0.02 (0.03)	-0.05 (0.04)	0.97	0.98	0.95
Return on Assets	roa	-0.04 (0.12)	0.06 (0.12)	0.25* (0.13)	0.96	1.06	1.28
Efficiency Ratio	effiratio	-0.05*** (0.015)	-0.05*** (0.019)	-0.043*** (0.016)	0.95	0.95	0.96
Log of Total Assets	ta	-1.61** (0.76)	-1.42** (0.70)	-0.99 (0.85)	0.20	0.24	0.37
Growth Rate of House Price Index	growthHPI	-1.83 (1.41)	0.84 (0.79)	-2.57* (1.43)	0.16	2.31	0.08
Unemployment Rate	unemp	-0.18 (0.20)	-0.32 (0.22)	-0.20 (0.32)	0.84	0.73	0.82
Treasury Spread	spread	0.17 (0.72)	-0.35 (0.67)	-0.02 (0.84)	1.19	0.70	0.98
Number of Observations		268	268	268			
Log Likelihood		-171.02	-217.46	-157.49			
Number of Groups		47	47	47			

Table 5: This table presents the results for Model (2) with a quarterly panel of bank level observations. The dependent variable *sixm_camel* equals to 6 minus the composite CAMELS rating for bank *i* in period *t.* We estimate a random effects ordered logistic model. The robust standard errors are reported in the parentheses.

Explanatory Variable	Short Name	Composite CAMEL, $10-50 Billion	Composite CAMEL, $50-100 Billion	Composite CAMEL, Full Sample	Composite CAMEL, $10-50 Billion	Composite CAMEL, $50-100 Billion	Composite CAMEL, Full Sample
		sixm_camel	sixm_camel	sixm_camel	sixm_camel	sixm_camel	sixm_camel
					Odds Ratio	Odds Ratio	Odds Ratio
Tier 1 Leverage Ratio	lev	-0.19***	-0.05	-0.14***	0.83	0.95	0.87
		(0.04)	(0.12)	(0.04)			
Tier 1 Risk-Based Capital Ratio	tcr	-0.01***	-0.31**	-0.01***	0.99	0.74	0.99
		(0.00)	(0.13)	(0.00)			
Total Securities as a % of Total Loans	secc	0.00	0.00	0.00	1.00	1.00	1.00
		(0.01)	(0.04)	(0.01)			
Commercial Real Estate as a % of Total Loans	cre	-0.04**	0.02	-0.03*	0.96	1.02	0.97
		(0.02)	(0.05)	(0.02)			
Residential Real Estate as a % of Total Loans	rre	-0.06***	-0.02	-0.03**	0.94	0.98	0.97
		(0.02)	(0.04)	(0.02)			
Consumer Loans	consumer	-0.03**	-0.01	-0.03***	0.97	0.99	0.97
		(0.02)	(0.03)	(0.01)			
Commercial and Industrial Loans	cnindus	-0.01	0.02	0.00	0.99	1.02	1.00
		(0.02)	(0.05)	(0.02)			
Hot Funds	hotfund	0.04***	0.02	0.04***	1.04	1.02	1.04
		(0.01)	(0.03)	(0.01)			
Return on Assets	roa	0.55***	0.28**	0.42***	1.73	1.33	1.53
		(0.07)	(0.14)	(0.06)			
Efficiency Ratio	effiratio	-0.08	0.64	0.06	0.92	1.91	1.06
		(0.28)	(0.71)	(0.25)			
Log of Total Assets	ta	-0.63**	-1.41	-0.79***	0.53	0.24	0.46
		(0.29)	(1.04)	(0.23)			
Growth Rate of House Price Index	growthHPI	1.61	0.77	2.28	5.03	2.15	9.77
		(4.85)	(4.32)	(3.12)			
Unemployment Rate	unemp	-0.50***	-0.69***	-0.59***	0.60	0.50	0.55
		(0.08)	(0.18)	(0.07)			
Treasury Spread	spread	0.55***	0.88**	0.71***	1.74	2.40	2.03
		(0.18)	(0.37)	(0.15)			
Number of Observations		1602	547	2149			
Log Likelihood		-762.13	-205.75	-995.02			
Number of Groups		104	37	133			

Table 6: This table presents the results for Model (6). The dependent variable *soundbank12* takes the value of 1 if the CAMELS composite rating is a 1 or 2. All other composite rating values are assigned a 0. We perform this analysis for each of the three categories based on size stratification by estimating a random effects binomial logit model for an unbalanced panel.

Explanatory Variable	Short Name	$10-50 Billion, Sound Banks	$50-100 Billion, Sound Banks	Full Sample, Sound Banks	$10-50 Billion, Sound Banks	$50-100 Billion, Sound Banks	Full Sample, Sound Banks
		soundbank12	soundbank12	soundbank12	soundbank12	soundbank12	soundbank12
					Odds Ratio	Odds Ratio	Odds Ratio
Tier 1 Leverage Ratio	lev	-0.23** (0.11)	-0.06 (0.19)	-0.17** (0.07)	0.79	0.95	0.84
Tier 1 Risk-Based Capital Ratio	tcr	-0.11*** (0.04)	-0.65*** (0.17)	-0.11*** (0.03)	0.89	0.52	0.90
Total Securities as a % of Total Loans	secc	0.03 (0.03)	0.02 (0.06)	0.00 (0.02)	1.03	1.02	0.99
Commercial Real Estate as a % of Total Loans	cre	-0.17** (0.07)	0.07 (0.06)	-0.07** (0.03)	0.84	1.07	0.93
Residential Real Estate as a % of Total Loans	rre	-0.15** (0.07)	-0.04 (0.05)	-0.03 (0.03)	0.86	0.97	0.97
Consumer Loans	consumer	-0.14 (0.09)	0.04 (0.04)	-0.07*** (0.02)	0.87	1.04	0.93
Commercial and Industrial Loans	cnindus	0.01 (0.09)	0.16** (0.08)	0.04 (0.04)	1.01	1.17	1.04
Hot Funds	hotfund	0.12*** (0.02)	0.01 (0.04)	0.08*** (0.02)	1.13	1.01	1.08
Return on Assets	roa	0.89*** (0.16)	0.36** (0.18)	0.50*** (0.10)	2.45	1.44	1.65
Efficiency Ratio	effiratio	0.91* (0.53)	1.01 (0.98)	0.71* (0.41)	2.49	2.75	2.03
Log of Total Assets	ta	0.52 (0.67)	-2.88* (1.47)	-1.06** (0.50)	1.69	0.06	0.35
Growth Rate of House Price Index	growthHPI	-0.11 (7.40)	0.00 (6.73)	3.85 (5.60)	0.90	1.00	47.20
Unemployment Rate	unemp	-0.11 (0.14)	-1.23*** (0.29)	-5.60*** (0.12)	0.89	0.29	0.56
Treasury Spread	spread	0.01 (0.30)	1.17** (0.51)	0.55** (0.25)	1.01	3.22	1.73
Number of Observations		1602	547	2149			
Log Likelihood		-320.96	-135.277	-484.297			
Number of Groups		104	37	133			

Table 7: This table presents the results for Model (7). The dependent variable *unsafe_unsound* takes the value of 1 if the CAMELS composite rating is a 4 or 5. All other composite rating values are assigned a 0. We perform this analysis for each of the size categories by estimating a random effects binomial logit model for an unbalanced panel. We are unable to perform the analysis for the 50 – 100 billion category as there are insufficient observations.

Explanatory Variable	Short Name	$10-50 Billion, Unsound Banks	Full Sample, Unsound Banks	$10-50 Billion, Unsound Banks	Full Sample, Unsound Banks
		unsound	unsound	unsound	unsound
				Odds Ratio	Odds Ratio
Tier 1 Leverage Ratio	lev	0.06 (0.21)	0.06 (0.22)	1.06	1.06
Tier 1 Risk-Based Capital Ratio	tcr	0.10 (0.08)	0.10 (0.06)	1.11	1.10
Total Securities as a % of Total Loans	secc	-0.07* (0.04)	-0.07* (0.04)	0.93	0.93
Commercial Real Estate as a % of Total Loans	cre	0.16 (0.17)	0.15 (0.14)	1.17	1.16
Residential Real Estate as a % of Total Loans	rre	0.07 (0.13)	0.06 (0.12)	1.07	1.06
Consumer Loans	consumer	0.03 (0.19)	0.03 (0.15)	1.03	1.03
Commercial and Industrial Loans	cnindus	0.11 (0.17)	0.10 (0.14)	1.11	1.10
Hot Funds	hotfund	-0.06 (0.06)	-0.06 (0.06)	0.94	0.94
Return on Assets	roa	-0.6*** (0.22)	-0.59*** (0.23)	0.55	0.55
Efficiency Ratio	effiratio	0.39 (0.67)	0.37 (0.64)	1.48	1.45
Log of Total Assets	ta	-8.32*** (2.1)	-8.26*** (2.11)	0.00	0.00
Growth Rate of House Price Index	growthHPI	2.82 (13.23)	2.64 (13.15)	16.73	13.97
Unemployment Rate	unemp	0.52* (0.3)	0.55** (0.27)	1.69	1.74
Treasury Spread	spread	-0.79 (0.62)	-0.83 (0.61)	0.45	0.43
Number of Observations		1602	2149		
Log Likelihood		-97.32	-97.45		
Number of Groups		104	133		