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IS THE DODD-FRANK ACT DESTROYING
WHAT IS LEFT OF U.S. THRIFTS?

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IS THE DODD-FRANK ACT DESTROYING WHAT IS LEFT OF U.S. THRIFTS?

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Abstract: I examine data from 1992 to 2015 to assess the Dodd-Frank Act's impact on the performance of U.S. depository institutions, thrifts in particular. *Ceteris paribus*, the average FDIC-regulated institution experienced a decline in profitability as measured by pre-tax return on assets (ROA) following the Act's passage, but the decline was concentrated among commercial banks. Small thrifts increased pre-tax profitability, after controlling for other factors including weak economic growth. Depository institution loan quality improved after Dodd-Frank, less so for small thrifts but more so for large thrifts. Efficiency ratios, which regulatory costs affect, increased, more for thrifts than banks.

INTRODUCTION

Following the subprime mortgage crisis, Congress passed the Dodd-Frank Wall Street Reform and Consumer Protection Act, a sweeping set of regulatory changes intended to make the financial system less prone to crashes and to protect consumers from fraudulent financial institutions. Among the many provisions in the law, which President Barack Obama signed on July 21, 2010, was a set of reforms to the regulation of thrifts (savings and loans and savings banks) and their holding companies. Most notable among those was the elimination of their primary federal regulator, the Office of Thrift Supervision (OTS), an agency within the U.S. Treasury Department.

Many politicians, watchdog agencies and observers placed some of the blame for the subprime mortgage crisis on the OTS. Under OTS's supervision, Countrywide Bank, IndyMac Bank, and Washington Mutual Bank all encountered distress related to subprime mortgages before either going into receivership or entering into acquisitions arranged by regulators. Critics argued that the OTS had become more like a consultant than a supervisor, a magnet for risky commercial banks that went "regulator shopping" when their actions fell afoul of other supervisory agencies. As an example, an investigation by the Treasury Department's inspector general found that a senior OTS official allowed IndyMac to report in regulatory financial statements filed in March 2008 money that it received two months later -- in May 2008 (Applebaum and Nakashima, 2008a and 2008b; Treasury Department, 2010a and 2010b). The Dodd-Frank Act transferred the OTS's responsibilities to the Federal Deposit Insurance Corporation (FDIC), the Office of the Comptroller of the Currency (OCC), and the Federal Reserve. As the provider of deposit insurance to thrifts, the FDIC already performed some supervision of thrifts, but the OCC and the Fed historically regulated only commercial banks and bank holding companies.

In addition to the elimination of their separate regulator, thrifts saw some advantages that their charters had previously held over commercial banks shrink or disappear. For example, before Dodd-Frank, federally-chartered thrifts enjoyed more flexible branching powers than commercial banks. They could establish new branches in any state, subject only to approval by the OTS. Banks, on the other hand, could open new branches only if the laws of the host state expressly permitted it – a distinction that was still important in a handful of states. Under Dodd-Frank, banks are allowed to open new branches with only the approval of their regulator (Wall Street Reform and Consumer Protection Act of 2010; Comizio, Petrasic, and Lee, 2011). The Dodd-Frank Act also weakened what is known as "preemption" for federal thrifts and their subsidiaries. Previously, the OTS held exclusive authority to regulate lending, consumer protection, and other matters related to the operations of thrifts. Under Dodd-Frank, however, federal thrifts are subject to the same legal standard for preemption that applies to national banks, which are subject to state regulation whenever it does not directly conflict with federal regulation (Wall Street Reform and Consumer Protection Act of 2010; Donelson and Zaring, 2011; Smith, 2012).

Dodd-Frank did not alter the qualified thrift lender (QTL) test, which requires thrifts to hold at least 65 percent of their asset portfolios in "qualified thrift investments" such as housing loans, home-equity loans, small business loans, credit card loans, and mortgage-backed securities. In fact, the act imposed additional restrictions on thrifts and their holding companies if they do not pass the test. Nor did Dodd-Frank change other rules on lending that apply to federal thrifts, including limits on commercial loans, non-residential property loans, and consumer loans. These restrictions make it more difficult for thrifts to pursue

diversified lending strategies that may reduce their risk or increase their profits (Wall Street Reform and Consumer Protection Act of 2010; Comizio, Petrasic, and Lee, 2011).

Some thrift managers and owners appear to be chafing under the regulatory regime that resulted from Dodd-Frank as well as the preceding years of regulation and deregulation. With the support of the American Bankers Association, which lobbies on behalf of much of the thrift industry, bipartisan legislation was introduced in Congress in March 2015 to allow institutions chartered under the Home Owners' Loan Act (i.e. federal thrifts) to become "covered thrifts." Under this proposal, federal thrifts could obtain the lending powers and compliance responsibilities of national banks without changing their charters, a costly process that requires an application and review by the Office of the Comptroller of the Currency (OCC). The bill, introduced by Reps. Keith Rothfus (R-PA) and Jim Himes (D-CT), would allow covered thrifts to switch back to thrift rules under a process to be determined by the OCC. The Comptroller of the Currency, Thomas Curry, supports this legislation (American Bankers Association, 2015). Rothfus and Himes' bill, however, has not been voted upon by the House or Senate (United States Congress, 2015).

The movement to further alter thrift regulation comes at the same time that many bankers are also calling for the repeal of the Dodd-Frank Act -- or at least many of its provisions. The act imposed restrictions on both commercial banks and thrifts, large and small. These restrictions apply to a range of activities from securities investments to mortgage lending. The American Bankers Association in public statements argues that the act hits small depository institutions particularly hard, because the total cost of meeting some of those requirements are similar for both small and large institutions (American Bankers Association, 2012). In a survey, community bank executives reported that after Dodd-Frank they both added staff to deal with regulatory compliance and devoted more of existing staff time to regulatory compliance (Peirce, Robinson, and Stratman, 2014). New, or *de novo*, banks generally start small, and after the passage of the Dodd-Frank Act, the chartering of *de novo* depository institutions has nearly ground to a halt. Between 2011 and 2015, five new banks began reporting to the FDIC, which tracks all federally-insured banks. In the previous five year period, 465 new banks began reporting (FDIC, 2015). There is evidence, however, that at least some of this slowdown can be explained by FDIC policies separate from the Dodd-Frank Act and macroeconomic factors unrelated to regulation (McCord and Prescott, 2014; Adams and Gramlich, 2014).

In this paper I examine evidence from financial statements submitted to regulators by thrifts and banks over the past 25 years to assess whether the Dodd-Frank act is associated with a decline in performance for U.S. depository institutions as a group, and whether the act has disproportionately impacted thrifts specifically. Using fixed-effects regression analysis to control for other confounding factors, I find that the average U.S. depository institution has experienced a decrease pre-tax return on assets (ROA) during the period following the Dodd-Frank Act's passage. The decline, however, appears to be limited to banks, as the regression thrifts results indicate that thrifts increased their pre-tax profitability if factors such as economic growth, market concentration, and portfolio composition are considered. My analysis finds an improvement in loan quality among depository institutions in the Dodd-Frank era. The improvement is not as great for small and medium-sized thrifts, but the improvement is greater for large thrifts. This suggests that the OTS's supervisory weaknesses were limited to large thrifts. Finally, depository institution efficiency ratios, which include regulatory as well as other costs, have increased *ceteris paribus* in the Dodd-Frank period.

The increase has been more dramatic for thrifts than for banks, indicating that their new regulation, while less effective in preventing bad loans, is more costly.

RECENT TRENDS IN THE THRIFT INDUSTRY

The number of regulated depository institutions – both commercial banks and thrifts – has declined dramatically in the last 25 years. This can be attributed in part to the relaxation of regulations that prevented interstate branching, which allowed consolidation that previously would have run afoul of such rules. Several indicators provide evidence that bank charters have become somewhat, though not dramatically, more desirable than thrift charters in that time period. As Table 1 shows, in 1992, 82.3% of regulated depository institutions were commercial banks, and the remaining 17.7% were thrifts. By 2015, those numbers had changed 86.9% and 13.1%, respectively.

[Table 1 Here]

Figure 1 shows the aggregate pre-tax ROA for thrifts and commercial banks from 1992 through 2015. The figures provide an accurate picture of the industry as a whole but, unlike the regression estimates below, provide greater weight to the behavior of large institutions but also. I examine pre-tax ROA rather than post-tax ROA because tax laws introduce a number of complications that can affect a depository institution's post-tax income but are independent of its operating performance. In general, commercial banks generated 1.25 to 1.50 cents more return per dollar of assets over the time period. The notable exception is the subprime mortgage crisis period (roughly 2006 to 2011), when pre-tax ROA for both types of institutions fell, but commercial bank pre-tax profits actually dipped below those of thrifts for a short time in 2008. Following the crisis, banks regained their consistent profitability advantage. But since 2011 the margin between the two groups' pre-tax ROA has been slightly less than it was before the crisis, averaging 1.59 percentage points from 1992:Q4 through 2006:Q4 and 1.33 percentage points from 2011:Q1 through 2015:Q3.

[Figure 1 Here]

Although they have, on the whole, improved a bit relative banks in profitability since the passage of Dodd-Frank, thrifts have fallen behind in terms of one measure of risk: loans that are 90 or more days past due, also called non-performing loans (NPL). As Figure 2 shows, the greater value for aggregate NPL has alternated between thrifts and banks several times since 1992, with thrifts on the whole reporting greater NPL as a fraction of total assets since 2012, after Dodd-Frank passed and after the OTS closed. And while it is difficult to measure changes in regulatory costs, one way to assess the impact of Dodd-Frank is to examine commercial bank and thrift efficiency ratios over time (Figure 3). The efficiency ratio measures overhead expenses (including regulatory compliance costs) as a proportion of operating revenues. It is calculated by dividing noninterest expense less amortization of intangible assets by the sum of net interest income and noninterest income. A lower efficiency ratio is desirable, because it indicates overhead costs are smaller relative to operating income. As Figure 3 shows, banks held a consistent advantage in the efficiency ratio from 2001 to 2011, but thrifts held the advantage for a short time after, and since 2013 the two types of institutions have had remarkably similar efficiency ratios, near 62%. The

spike in thrifts' aggregate efficiency ratio in early 2011 comes from Hudson City Savings Bank which, at the time, was one of the country's largest thrifts. In the first quarter of 2011, Hudson City incurred \$1.9 billion in pre-payment penalties, which are classified as non-interest expense, to pay off long-term loans it had taken before the crisis when prevailing interest rates were much higher than they have been post-crisis (Hudson City Bancorp, 2011).

[Figure 2 Here]

The Dodd-Frank Act may not be the only explanation for the differences in the relative performance of thrifts and commercial banks from 2011 onward. In a study examining the decline in new commercial bank charters following the Dodd-Frank Act, Adams and Gramlich (2014) find that factors unrelated to regulation can explain 75-80% of that decline. Weak economic growth, which has prevailed throughout the post Dodd-Frank era, is typically associated with reduced demand for deposits and loans. In addition, a narrow spread between short-term and long-term interest rates discourages new banks, which do not have older, high-interest rate loans on their books, from entering the market. Other regulations that seek to reduce risk have restricted paths to greater profitability such as the increased capital and liquidity requirements imposed by the Basel agreements.

[Figure 3 Here]

THEORY AND ECONOMETRIC MODEL

The figures discussed above indicate that U.S. depository institution profitability as a whole has not returned to pre-crisis levels. Given the increased regulatory burden that the Dodd-Frank act appears to have placed on all such institutions, I test the hypothesis that, even after controlling for other factors, overall depository institution profitability declined during the Dodd-Frank era. And given the pre-tax ROA data presented above, I also test the hypothesis that, after controlling for other factors, the change in regulation associated with the Dodd-Frank Act led to reduced profitability for thrifts more than it did for banks. The act eliminated some advantages thrift charters held over bank charters while restricting thrifts to lending strategies that might be more profitable than those allowed by the QTL tests. Thrifts may have surpassed banks in profitability due to better conditions in the sectors in which they typically specialize.

I also hypothesize that the replacement of the primary federal thrift regulator, the OTS, and its replacement with other agencies led to stricter supervision that improved thrift loan quality. When thrifts came under the purview of the Fed, OCC, and FDIC, they became a small fraction of those agency's regulated groups, rather than the only group supervised by the OTS. In addition, there is one fewer competing regulatory agency for institutions to choose from. Stigler (1971) theorizes that regulation is designed and operated mainly for the benefit of firms in regulated industries, and that regulators want to remain in existence. As a result, regulators cater to the most powerful factions in the industries they regulate. If this theory holds, as a small subset among a new larger set of regulated entities, thrifts' ability to make higher-risk, higher-expected-return loans would be restricted by regulators more fearful of being caught allowing bad loans than losing an institution to a competitor.

Finally, I hypothesize that after controlling for other confounding factors, U.S. depository institutions' non-interest expenses, which include the costs of regulatory

compliance, increased after the passage of the Dodd-Frank Act. Further, the advantages that thrifts enjoyed from a separate specialized regulator disappeared, which will lead to greater costs of regulatory compliance. To summarize, the hypotheses are:

H1: All U.S. depository institutions became less profitable after the Dodd-Frank Act became law.

H2: Thrift profitability declined more than commercial bank profitability after the passage of the Dodd-Frank Act.

H3: Loan quality for all U.S. depository institutions improved after the Dodd-Frank Act.

H4: Thrift loan quality improved more than commercial bank loan quality after the passage of the Dodd-Frank Act.

H5: Efficiency worsened for all U.S. depository institutions increased after the Dodd-Frank Act.

H6: Thrifts' efficiency worsened more than that of commercial banks after the Dodd-Frank Act.

The evidence presented on pre-tax ROA and NPL in the “Recent Trends” section indicates that thrifts became more profitable relative to banks while loan quality decreased relative to banks after the enactment of Dodd-Frank. The narrowing of differences in efficiency ratios during the Dodd-Frank era do not make it clear that the regulatory burden has become heavier for thrifts than banks. The figures above, however, present only a univariate analysis that does not control for other factors that differ among commercial banks and thrifts that could affect profitability, risk, and operating efficiency. I therefore developed regression models to test for differential effects of the Dodd-Frank Act on thrift profitability, risk, and efficiency while controlling for other factors that also affect those variables. The model for profitability is as follows:

$$\begin{aligned}
 ROAPTX_{it} = & \beta_1 DF_t + \beta_2 THRIFT_{it} \times DF_t + \beta_3 THRIFT_{it} + \beta_4 LN_SIZE_{it} \\
 & + \sum_{j=5}^{11} \beta_j ASSET_TYPE_{it-1} + \sum_{k=12}^{13} \beta_k LIAB_TYPE_{it-1} \\
 & + \beta_{14} NPL_{it-1} + \beta_{15} EFF_{it} + \beta_{16} MUTUAL_{it} + \beta_{17} STATE_{it} \\
 & + \beta_{18} HHI_{mt} + \beta_{19} CO_UNEMP_{mt} + \beta_{20} CRISIS_t \\
 & + \beta_{21} RRE_{it-1} \times CRISIS_t + \varepsilon_{it}
 \end{aligned} \tag{1}$$

$ROAPTX_{it}$ is institution i 's pre-tax ROA in period t . Intercept terms do not appear in the models because I use fixed effects estimation (more on that below). The variables of interest are DF_t , $THRIFT_{it} \times DF_t$, and, to a lesser degree, $THRIFT_{it}$. DF_t is a binary variable equal to one in 2011-2015, the years in which depository institution profits should reflect the effects of the Dodd-Frank Act. A positive, significant coefficient will support H1. $THRIFT_{it} \times DF_t$ is an interaction of $THRIFT_{it}$ and DF_t , equal to one if the institution i is a thrift and the period t is after the passage of the Dodd-Frank Act, and zero otherwise. The coefficient on $DF \times THRIFT_{it}$ will measure the differential effect of the Dodd-Frank Act on thrift profitability. Because my hypothesis, H2, is that the Dodd-Frank Act has disproportionately hindered thrifts, I expect the sign on the $THRIFT \times DF_{it}$ coefficient to be negative. I also include the dummy variable $THRIFT_{it}$, as a regressor to test whether outside

the Dodd-Frank time period depository institutions with thrift charters are more or less profitable than those with bank charters, after controlling for other factors.

The model includes a set of control variables that previous authors (Berger *et al.* 2007; Hannan and Prager, 2009, for example) have found to be associated with greater or lesser profitability for U.S. depository institutions. These variables include a measure of the institution's size (LN_SIZE_{it}); a set of seven variables that measure the composition of institutions' asset portfolios ($ASSET_TYPE_{it-1}$); two variables measuring the composition of institutions' liabilities ($LIAB_TYPE_{it-1}$); variables representing asset quality (NPL_{it}), efficiency (EFF_{it}), corporate structure ($MUTUAL_{it}$), chartering authority ($STATE_{it}$), local market conditions (HHI_m and CO_UNEMP_m), and two variables that account for the extraordinary circumstances of the subprime mortgage crisis, when there was a general liquidity crunch as well as a crash in the residential real estate market ($CRISIS_{it}$ and $RRE_{it-1} \times CRISIS_{it}$). To avoid endogeneity from bidirectional causality, I used lagged values of the asset and liability composition variables and RRE in the crisis interaction.

I use the logarithm of real total assets (LN_SIZE_{it}) because the sample distribution of total assets is skewed right, and its relationships with the dependent variables are likely to be non-linear, with the effect decreasing as size increases (diminishing returns to scale). I converted nominal values of total assets to real values using the consumer price index (CPI) for June of the corresponding years. Asset portfolio composition variables include the ratios of the following (nominal) variables to the institution's (nominal) total assets: securities ($SECURITIES_{it}$), total loans ($LOANS_{it}$), commercial and industrial loans (CI_{it}), consumer loans ($CONSUMER_{it}$), commercial real estate loans (CRE_{it}), construction and land development loans (CLD_{it}), and residential real estate loans (RRE_{it}). The composition of liabilities is measured by the brokered deposits-to-total assets ratio ($BROKERED_{it}$) and the non-core funding-to-total assets ratio ($NONCORE_{it}$). Non-core funding is calculated as total liabilities minus insured deposits. The mix of assets has been found to be an important factor in bank profitability, but the quality of those assets is also important. To account for this, the model includes the ratio of non-performing loans to total assets (NPL_{it}). Differences in efficiency may affect profitability, independent of regulatory regime, so the efficiency ratio (EFF_{it}) is included, too. Corporate structure is measured with a binary variable ($MUTUAL_{it}$) that equals one if the institution is under mutual (rather than stock) ownership. State regulation may be lighter than federal regulation and enable greater profit, so I include a dummy variable ($STATE_{it}$) that equals one if the institution has a state charter and zero if it has a federal charter. To control for local economic influences, the model includes the Herfindahl-Hirschman Index for deposits (HHI_m) for the county m in which the bank has the greatest share of deposits. I expect bank profitability to be positively associated with local market concentration. The county unemployment rate (CO_UNEMP_m) proxies for local economic conditions. In markets that are struggling economically, the local unemployment rate should be higher and the institution's profits lower. The binary variable $CRISIS_t$ takes the value of one during the years of the subprime mortgage crisis (2007 through 2010). Finally, residential real estate lending may have been a profitable activity for institutions outside the crisis but, due to the general downturn in residential real estate, unprofitable during the crisis. The model therefore contains the interaction of the residential real estate lending to total assets ratio with the $CRISIS_t$ variable ($RRE \times CRISIS_{it}$).

To test H3 (thrift loan quality improved after the Dodd-Frank act) I estimate with fixed effects regression a similar model to Equation (1), but use NPL_{it} as the dependent variable. The set of independent variables is the same except that it excludes NPL_{it} . I expect

the sign on DF_{it} to be negative, under the assumption that regulation of depository institutions' lending on the whole was stricter after the passage of Dodd-Frank quality, I expect the sign on $DF \times THRIFT_{it}$ to be negative under H4, that thrifts have been more effectively regulated by the Fed, OCC, and FDIC than by the OTS. I also expect the sign on $THRIFT_{it}$ to be positive, consistent with lower thrift loan quality during the period when thrifts were under the supervision of the OTS. Equation 2 below presents the loan quality model.

$$\begin{aligned}
NPL_{it} = & \beta_1 DF_t + \beta_2 THRIFT_{it} \times DF_{it} + \beta_3 THRIFT_{it} + \beta_4 LN_SIZE_{it} \\
& + \sum_{j=5}^{11} \beta_j ASSET_TYPE_{it-1} + \sum_{k=12}^{13} \beta_k LIAB_TYPE_{it-1} \\
& + \beta_{14} EFF_{it} + \beta_{15} MUTUAL_{it} + \beta_{16} STATE_{it} + \beta_{17} HHI_{mt} \\
& + \beta_{18} CO_UNEMP_{mt} + \beta_{19} CRISIS_t \\
& + \beta_{20} RRE_{it-1} \times CRISIS_t + \varepsilon_{it}
\end{aligned} \tag{2}$$

To test hypotheses H5 and H6, related to the effect of the Dodd-Frank Act on non-interest expenses, I regressed EFF_{it} on the three variables of interest as well as most of the control variables in equation 2. Different assets and liabilities have different overhead costs. Local market concentration, ownership structure, and state supervision may all affect overhead costs, too. I exclude CO_UNEMP under the assumption that local economic conditions are not likely to have a net effect on depository institution efficiency.

$$\begin{aligned}
EFF_{it} = & \beta_1 DF_t + \beta_2 THRIFT_{it} \times DF_{it} + \beta_3 THRIFT_{it} + \beta_4 LN_SIZE_{it} \\
& + \sum_{j=5}^{11} \beta_j ASSET_TYPE_{it-1} + \sum_{k=12}^{13} \beta_k LIAB_TYPE_{it-1} \\
& + \beta_{14} NPL_{it} + \beta_{15} MUTUAL_{it} + \beta_{16} STATE_{it} + \beta_{17} HHI_{mt} \\
& + \beta_{18} CRISIS_t + \beta_{19} RRE_{it-1} \times CRISIS_t + \varepsilon_{it}
\end{aligned} \tag{3}$$

These models leave out some institution-specific variables that affect profitability such as management quality and expertise in niche lending markets or prevalence of fee-based activities. To address this issue, I estimated the models using the fixed-effects approach, which operates under the implicit assumption that those omitted variables do not vary over time for individual institutions. Because diagnostic tests provide evidence of the presence of heteroscedasticity and autocorrelation, I calculate standard errors using the heteroscedasticity- and autocorrelation-robust approach proposed by Arellano (1987). Goodness-of-fit and model suitability measures are modified as described in Wooldridge (2002) to account for the fixed-effects approach. Based on correlations and variance inflation factors (VIFs), I concluded that near-collinearity did not significantly affect the standard error calculations for the variables of interest. In addition, as described in more detail below I estimated the models on several subsets of the data to assess the robustness of the results. In some cases, coefficients on a few control variables were not significant. In those cases, I dropped the variables and re-estimated the models. The qualitative results for the variables of interest remained the same, and the loss of variables did not result in improved adjusted R^2 values.

DATA

Data from the FDIC's Web site were used to construct most of the variables in the regression model. The Statistics on Depository Institutions section provided the data on or the data used to calculate the pre-tax ROA, non-performing loan ratio, efficiency ratio, asset composition ratios, liability composition ratios, and total assets. The Summary of Deposits section provided data on institution type that allowed the classification of institutions as banks or thrifts. It also provided data on deposits and geographical location that enabled the calculation of HHIs. The FDIC releases Statistics on Depository Institutions data quarterly, but it releases Summary of Deposits data annually using data current as of June 30 of each year. I therefore used Statistics on Depository Institution data from the second quarter, which ends on June 30, of each year. CPI values are the 1982-84 chain-weighted base year CPI-U published by the Bureau of Economic Analysis, obtained from the St. Louis Fed's Federal Reserve Economic Database (FRED) Web site. Finally, the U.S. Bureau of Labor Statistics Web site was the source of unemployment data, which are annual averages. Data were drawn for the years 1994 through 2015, a 22-year period. Because the regression model uses lagged values of many of the independent variable, the model is estimated for profitability measures for 1995 through 2015, a 21-year period.

If an observation on an institution was missing any of the variables, I excluded it from the analysis. I removed observations in which institutions reported extreme values (below the first percentile and above the 99th percentile for the entire time period) of pre-tax ROA, NPL, EFF, ROE, or equity capital ratio from the data set. This reduces the influence of outliers and eliminates some nonsensical observations that appear in this large data set. After this Winsorization of the data, I removed observations on institutions with asset or liability ratios greater than one or less than zero, assuming they contained errors or reflected extraordinary circumstances. It was also necessary to drop institutions which appear in the data only once in order to perform fixed effects estimation, which requires at least two observations for each cross-sectional unit. Finally, I excluded branches of foreign institutions that appear in the FDIC data sets.

[Table 2 Here]

The resulting data set has 188,801 observations on 14,211 institutions. (The numbers of observations used to estimate the regression models is smaller due to the use of lagged independent variables.) Because thousands of institutions obtained charters, closed, failed, were acquired, or merged during the time period studied, the panel is not balanced. Tables 2, 3, and 4 present summary statistics for, respectively, all of the institutions in the sample, commercial banks only, and thrifts only. They include observations that survived the outlier and error detection process described above. The means are unweighted, while the ROA_{PTX}, NPL, and EFF data presented in Figures 1-3 are aggregate values, explaining apparent inconsistencies between the two. Institutions with thrift charters are about 15.2 % of the sample. Thrifts tend less towards holding securities and more towards lending than commercial banks. For thrifts, 21.2% and 66.4% of assets are in securities and loans, respectively, compared to 25.4% and 60.6% for banks. Thrift lending is dominated by residential real estate loans (RRE), which make up 45.8% of the average thrifts' total assets. None of the other lending categories comprise more than 10% of thrift's assets. The average commercial bank in the sample, on the other hand, has a more even distribution of lending,

with *RRE* also the leading type, but at only 16.6% of total assets and with commercial real estate lending (*CRE*) comprising 13.0% of total assets. Mutual ownership is much more common for thrifts than commercial banks (48.3% versus 0.1%). Such differences may help explain differences in profitability over time, independent of the regulatory regime.

[Table 3 Here]

[Table 4 Here]

REGRESSION RESULTS

Results of the regression model estimates are presented in Tables 5-7. In support of H1, tested by estimation of Equation (1) above, the Dodd-Frank Act is associated with lower pre-tax ROA (*ROAPTX*). The coefficient on the *DF* variable is negative and significant (-0.048, $t = -10.666$) when the model is estimated on all of the data (Table 5, column 1). *ROAPTX* is a percentage, so this can be interpreted as an estimated decrease in pre-tax ROA during the Dodd-Frank Era of 4.8 basis points, after controlling for other confounding factors. It may also be interpreted as an expected loss of 4.8 cents per hundred dollars of total assets. Thrift profitability, however, has not suffered as commercial banks have during the Dodd-Frank era. The coefficient on the *THRIFT*×*DF* term is positive and significant (0.091, $t = 10.407$). In fact, the sum of the coefficients (-0.048+0.091 = 0.043) indicates that thrifts, *ceteris paribus*, have improved profitability by 4.3 cents per hundred dollars since the Dodd-Frank Act became law.

[Table 5 Here]

Though thrifts' and banks' aggregate pre-tax profits are lower than they were before the act was passed (Figure 1), other factors, such as slow economic growth (average unemployment in the institutions' primary counties before 2011 was 5.4% and 6.8% after) also appear to be driving the decline in profitability during this time period. The coefficient on *CO_UNEMP* is similar in magnitude (-0.044, $t = -61.127$) to the coefficient on *DF*. Ownership structure also appears to play a more important role in profitability than the Dodd-Frank regulations. Thrifts are much more likely to be organized under mutual ownership than stock ownership (48.3% of the sample for thrifts versus 0.1% for commercial banks). As Figure 4 shows, mutual ownership is associated with lower profitability. With the exception of the subprime mortgage crisis period, thrifts that are mutually owned consistently earn lower profits than those that are owned by stockholders. In the regression, the coefficient on *MUTUAL*, significant at the 1% level, is -0.119, much larger than the coefficient on *DF*. The coefficient on *THRIFT* is not significantly different from zero, indicating that outside the Dodd-Frank era, thrifts didn't enjoy a pre-tax profitability advantage or disadvantage.

[Figure 4 Here]

I estimated the model on five subsets of the data to examine whether the results are robust to several other considerations. Because *HHI* and *CO_UNEMP* may not measure local competitive and economic conditions well for multi-market banks, I estimated the model on observations only on institutions with deposits in one county (Table 5, Column 2). The

results were qualitatively the same – a negative coefficient on DF (-0.071 , $t = -11.615$), a larger positive coefficient on $THRIFT \times DF$ (0.111 , $t = 9.048$), and a non-significant coefficient on $THRIFT$. The signs and significance on the other coefficients remained the same, too. A sub-set of the sample that included only institutions classified by the FDIC as community banks (column 3) also exhibits the same pattern. (The FDIC designates both banks and thrifts as “community banks” if they meet long list of criteria, including assets less than \$1 billion in 2015 dollars, loan-to-asset ratios above 33%, core deposit ratios above 50%, foreign assets below 10%, or less than 50% of assets in areas not commonly considered community-oriented such as credit card lending, trust management, and industrial loan companies (FDIC, 2012). I also created subsets of the institutions according to size, using real assets corresponding to \$1 billion in 2015 dollars as the upper limit for “small” institutions (column 4), \$1 billion to \$10 billion in 2015 dollars for “medium” institutions (column 5), and the rest classified as large institutions (column 6). The coefficients for small institutions show the same pattern as those for the entire sample. The coefficient for large and medium institutions, however, do not, with none of the coefficients on the three variables of interest (DF , $THRIFT \times DF$, and $THRIFT$) significant for medium banks, and $THRIFT$ being negative for large institutions. The insignificance of the $THRIFT \times DF$ coefficient on the medium and large institution sub-samples tells us that the improvement in thrift profitability has been concentrated among small, community-oriented thrifts. Although these thrifts may operate under stricter or less-understanding supervision now, given all the other factors that play a role in profitability, they are doing relatively well. Perhaps because their regulator no longer allows them to pursue high-risk, high-reward strategies, medium and large thrifts are not experiencing the same type of improvement.

I turn now to the results of the non-performing loan (NPL) model (Equation (2) above). For the entire sample, depository institutions on average held fewer defaulted loans on their books in the Dodd-Frank era than in other eras, after controlling for the composition of assets and liabilities, various institutional characteristics, and market conditions (Table 6, column 1). The coefficient on DF is negative and significant (-0.076 , $t = -29.731$), holding constant. The average institution in the Dodd-Frank era saw a 7.6-basis-point (7.6 cents for every hundred dollars of total assets) reduction in its percentage of bad loans, *ceteris paribus*.

[Table 6 Here]

Thrifts, however, exhibited greater non-performing loan ratios than commercial banks after the Dodd-Frank Act became law, consistent with the univariate data presented in Figure 2. The coefficient on $THRIFT \times DF$ (column 1) is positive and significant (0.018 , $t = 3.543$). For medium thrifts (column 5), the magnitude of the $THRIFT \times DF$ coefficient is greater than that of the DF coefficient. The finding indicates that, despite noteworthy failures of regulation of large thrifts, the OTS may have adequately supervised small and medium thrifts before it was eliminated. Bolstering this conclusion are the results from estimating the model for the subsample of large institutions only (column 6). For that subsample, the $THRIFT \times DF$ coefficient is negative and significant (-0.091 , $t = -2.514$), consistent with an improvement in loan quality for large thrifts during this period. For the subsamples of FDIC-classified community banks and small institutions, the coefficient on $THRIFT \times DF$ is positive and significant. For the subsample of institutions that operate in one county only (column 2), the coefficient is not significantly different from zero. With the exception of the subsample of large institutions, the coefficient on $THRIFT$ is not significantly different from

zero for any of the subsets, indicating that on average thrifts did not have greater proportions of non-performing loans over the period from 1992 until the crisis began in 2007. For large institutions (column 6), however, there is a positive and statistically significant thrift effect (0.107, $t = 2.119$). At 10.7 basis points, or 10.7 cents for every \$100 in assets, this is a greater magnitude than the Dodd-Frank era effect for the sample as a whole. This, too, is consistent with the narrative that the OTS less effectively regulated large thrifts than small and mid-sized thrifts.

[Table 7 Here]

Finally, I examine the results of the efficiency ratio (*EFF*) regression. Recall that a lower efficiency ratio is desirable, because it indicates overhead costs are smaller relative to operating income. My hypotheses (H5 and H6) are that efficiency decreased for all depository institutions after the Dodd-Frank Act, while thrifts' efficiency decreased more than those of commercial banks. Table 7, column 1 shows that, for the entire sample, the regression model supports both hypotheses. The coefficient on *DF* is positive and significant (9.446, $t = 94.447$) while the coefficient on *THRIFT*×*DF* is smaller, but still positive and significant (2.139, $t = 10.666$). For the average institution the sample, the Dodd-Frank period is associated with a 9.446 percentage point increase in non-interest expenses as a fraction of operating revenues (\$9.45 for every \$100). For the average thrift, the period is associated with 11.585 (9.446+2.139) percentage point increase (\$11.59 for every \$100). The coefficient on *THRIFT* is not significantly different from zero. Qualitatively, the results for the efficiency ratio regression hold for community bank, small, and medium subsamples (columns 2-4). For the subsample of medium institutions, which retains the positive and significant coefficient on *DF*, but the coefficient on *THRIFT*×*DF* is not significantly different from zero, while for the large subsample, the *THRIFT*×*DF* coefficient is negative and significant (-8.421 and $t = -4.333$). Efficiency ratios can include a variety of expenses in the numerator, some of which are not regulatory. The results, however, are consistent with greater regulatory costs, and those costs falling particularly heavily on smaller institutions. The magnitude of the change in efficiency ratio is far greater than the changes in pre-tax return on assets and non-performing loans. This implies that these changes in expenses, some of which are likely tied to regulation, are being offset by cost reductions in other areas.

CONCLUSIONS

In this paper I examine evidence from financial statements submitted to regulators by U.S. thrifts and banks over the past 25 years to assess whether the Dodd-Frank act is associated with a decline in performance for depository institutions as a group, and whether the act has had a disproportionate impact on thrifts specifically. Using fixed-effects regression analysis to control for other confounding factors, I find that pre-tax ROA has fallen for depository institutions on the whole, but the reduction has been borne by commercial banks while small thrifts have seen an improvement in profitability after controlling for other factors. The results of the analysis provide evidence that slow economic growth is playing a comparable role to that of other changes in the Dodd-Frank period. They also provide evidence that mutual ownership, rather than stock ownership, strongly contributes to the pattern over the last two decades of thrifts earning lower pre-tax profits than commercial banks.

With respect to depository institution risk, my analysis also indicates that the change in regulation of thrifts directed by the Dodd-Frank Act is associated with lower rates of default on loans made by most types of institutions, including large thrifts. For small thrifts, the effect is not as great as it is for the average institution. For medium thrifts, it appears there has been a small uptick in loan default after controlling for other confounding factors. For large thrifts, there was an increase in non-performing loans, but it was less than the increase for commercial banks. All of this suggests that, before it was shut down, the OTS adequately supervised small thrifts before it was shut down in the wake of its embarrassing performance with large thrifts.

My analysis also examines depository institution non-interest expense, as measured by the efficiency ratio, over the time period examined. After controlling for other possible confounding factors, the Dodd-Frank era has seen a significant increase in efficiency ratios of all depository institutions, with thrifts experiencing a larger increase. Non-interest expense may include a variety of charges, one of which is the cost of regulatory compliance. Though not conclusive, this result provides some evidence that the Dodd-Frank Act increased compliance costs for U.S. depository institutions, with the burden falling particularly heavily on thrifts.

Taken as a whole, the results suggest that, the Dodd-Frank era has produced higher regulator costs, lower profitability, but lower risk for U.S. depository institutions. Lower risk is going hand-in-hand with lower return, suggesting that policy makers' level of risk aversion should guild their assessments of the new law. The problem of relatively lax regulation of large thrifts seems to have been reined in. The evidence from this analysis is that the change in supervision of small thrifts has corresponded with an increase in both their risk and profitability relative to commercial banks. Much of the remaining difference between the two in pre-tax profitability can be attributed to the widespread mutual ownership of thrifts.

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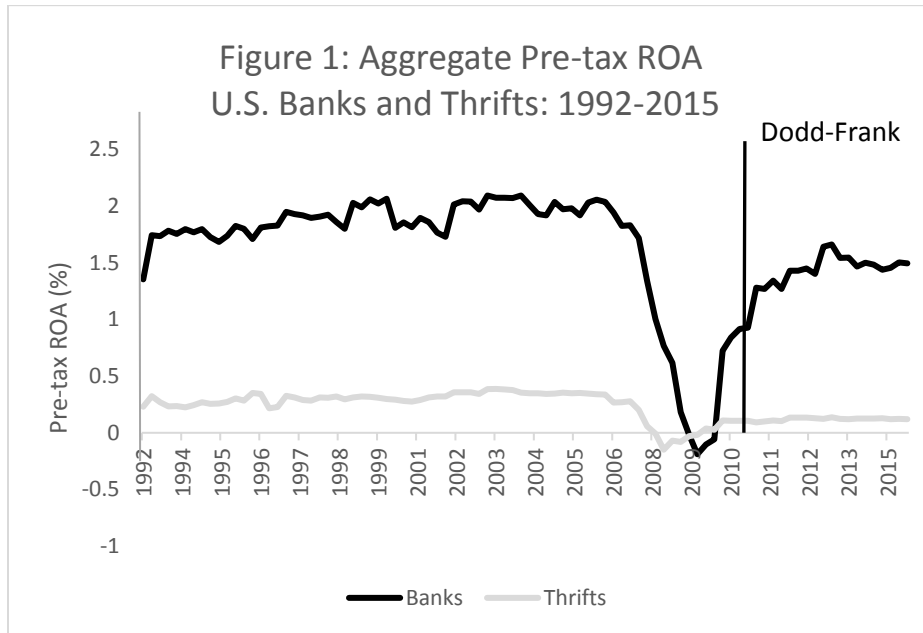
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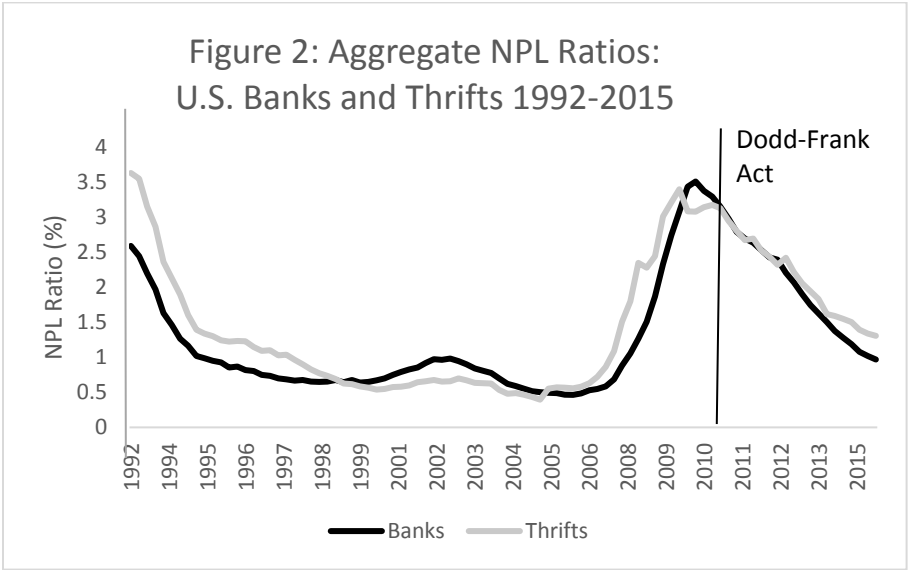
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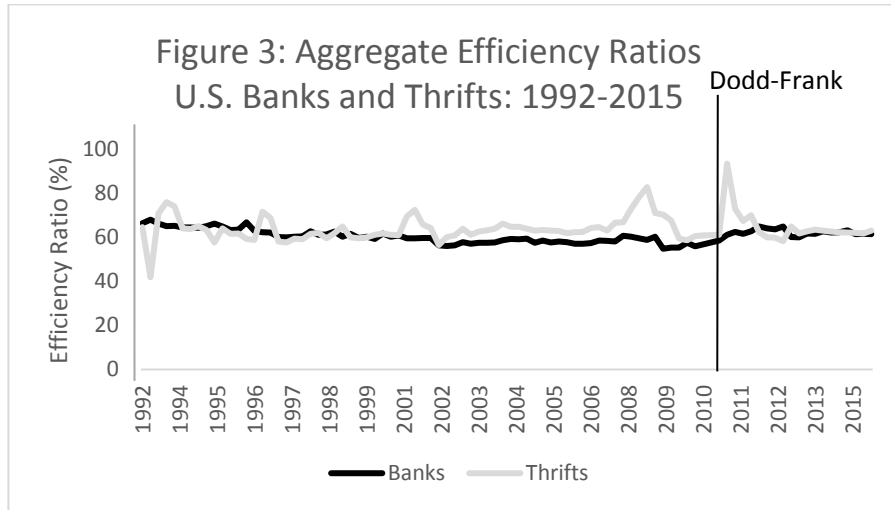
FIGURES AND TABLES



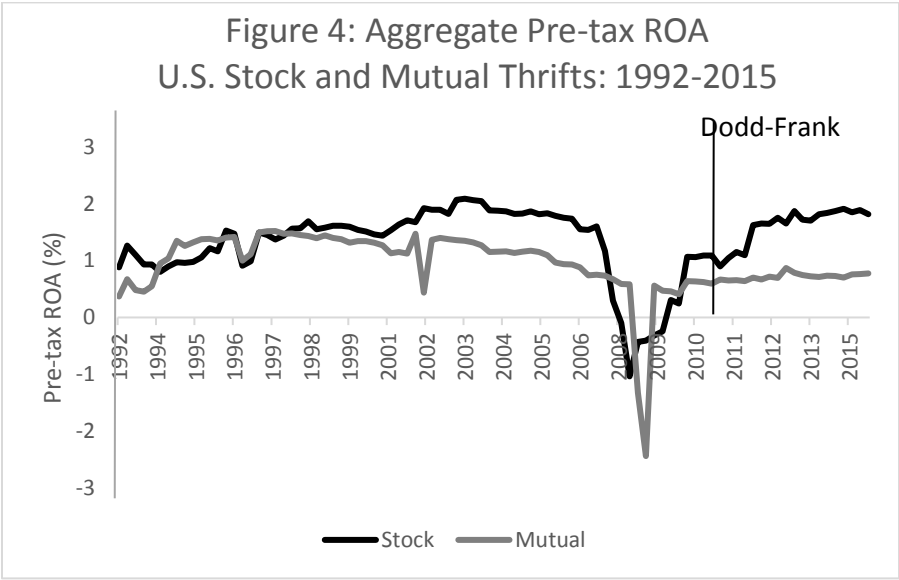
This chart shows the quarterly aggregate pre-tax return on equity (ROE) for U.S. banks and thrifts between 1992Q4: and 2015:Q3. The vertical line is placed at 2010:Q3, when the Dodd-Frank Act was signed into law.



This chart shows the quarterly aggregate ratio of non-performing loans to total assets (NPL) for U.S. banks and thrifts between 1992Q4: and 2015:Q3. The vertical line is placed at 2010:Q3, when the Dodd-Frank Act was signed into law.



This chart shows the quarterly aggregate efficiency ratios for U.S. banks and thrifts between 1992Q4: and 2015:Q3. The efficiency ratio is the non-interest expense less depreciation on intangible assets divided by the sum of non-interest expense and net interest margin. A lower efficiency ratio means the institution overhead expenses are a smaller fraction of operating revenues and, hence, a lower efficiency ratio is more desirable. A single observation on a thrift in 2008:Q4 was eliminated because it resulted in an efficiency ratio of more than 1700% for thrifts in that period. The vertical line is placed at 2010:Q3, when the Dodd-Frank Act was signed into law.



This chart shows the quarterly aggregate pre-tax return on equity (ROE) for U.S. thrifts, categorized as stock or mutual ownership, between 1992Q4: and 2015:Q3. The vertical line is placed at 2010:Q3, when the Dodd-Frank Act was signed into law.

Table 1: U.S. Commercial Bank and Thrift Comparison

<i>Category</i>	<i>Commercial Banks</i>	<i>Thrifts</i>
1992 Charters	11,463	2,472
1992 Percent of all DI Charters	82.3	17.7
2015 Charters	5,447	823
2015 Percent of all DI Charters	86.9	13.1
1992 Total Assets (\$billions)	3,431	1,066
1992 Percent of all DI Total Assets	76.3	23.7
2015 Total Assets (\$billions)	14,632	1,031
2015 Percent of all DI Total Assets	93.4	6.6

*This table shows changes over time in the number and charters and value of total assets of commercial bank and thrifts in the U.S. from 1992 to 2015. Data come from the FDIC's December 2015 *Statistics at a Glance*.

Table 2: Summary statistics on all institutions in the sample: 1992-2015

<i>Variable</i>	<i>Mean</i>	<i>Median</i>	<i>Std. Dev.</i>	<i>Minimum</i>	<i>Maximum</i>
<i>ROAPTX</i>	1.297	1.372	0.942	-5.066	4.564
<i>NPL</i>	0.163	0.026	0.304	0	2.087
<i>EFF</i>	67.483	65.400	17.368	25.216	197.847
<i>DF</i>	0.173	0	0.379	0	1
<i>THRIFT</i>	0.152	0	0.359	0	1
<i>THRIFTxDF</i>	0.024	0	0.152	0	1
<i>ASSETS</i>	521,808	56,123	9,567,187	570	844,672,512
<i>SECURITIES</i>	24.716	22.731	15.467	0	99.218
<i>LOANS</i>	61.527	63.331	15.586	0	99.027
<i>CI</i>	8.742	7.233	7.343	0	89.871
<i>CONSUMER</i>	6.090	4.324	6.935	0	99.947
<i>CRE</i>	12.252	9.752	10.332	0	85.710
<i>CLD</i>	4.019	1.884	5.916	0	81.681
<i>RRE</i>	21.061	17.165	16.074	0	96.976
<i>BROKERED</i>	1.562	0	5.172	0	91.265
<i>NON-CORE</i>	16.987	14.700	11.534	0	93.838
<i>MUTUAL</i>	0.074	0	0.262	0	1
<i>STATE</i>	0.704	1	0.457	0	1
<i>HHI</i>	2104	1754	1344	336	10,000
<i>UNEMP</i>	5.7	5.2	2.4	0.7	38.1
<i>YEAR</i>	2003.31	2003	6.29	1994	2015
<i>CRISIS</i>	0.204	0	0.403	0	1
<i>No. Obs.</i>	188,801				

The above table presents summary statistics on the data used in the analysis. Data presented here relate to both commercial banks and thrifts. Data sources and construction are described in more detail in the “Data” section in the main body of the text.

Table 3: Summary statistics on commercial banks: 1992-2015

<i>Variable</i>	<i>Mean</i>	<i>Median</i>	<i>Std. Dev.</i>	<i>Minimum</i>	<i>Maximum</i>
<i>ROAPTX</i>	1.350	1.435	0.948	-5.066	4.557
<i>NPL</i>	0.168	0.032	0.305	0	2.085
<i>EFF</i>	66.781	64.736	16.849	25.216	197.368
<i>DF</i>	0.177	0	0.381	0	1
<i>THRIFT</i>	0	0	0	0	0
<i>THRIFTxDF</i>	0	0	0	0	0
<i>ASSETS</i>	536,077	52,165	10,309,797	570	844,672,512
<i>SECURITIES</i>	25.351	23.425	15.191	0	98.490
<i>LOANS</i>	60.657	62.454	15.238	0	98.268
<i>CI</i>	9.843	8.210	7.262	0	89.871
<i>CONSUMER</i>	6.543	4.810	7.011	0	99.623
<i>CRE</i>	13.001	10.566	10.585	0	85.710
<i>CLD</i>	4.063	1.896	5.929	0	81.681
<i>RRE</i>	16.628	15.012	10.849	0	94.433
<i>BROKED</i>	1.630	0	5.206	0	90.942
<i>NON-CORE</i>	16.406	14.340	11.004	0	93.838
<i>MUTUAL</i>	0.001	0	0.027	0	1
<i>STATE</i>	0.750	1	0.433	0	1
<i>HHI</i>	2185	1813	1395	336	10,000
<i>UNEMP</i>	5.648	5.100	2.464	0.700	38.100
<i>YEAR</i>	2003.39	2003	6.299	1994	2015
<i>CRISIS</i>	0.206	0	0.404	0	1
<i>No. Obs.</i>	160,062				

The above table presents summary statistics on the data used in the analysis. Data presented here relate to commercial banks only, not thrifts. Data sources and construction are described in more detail in the “Data” section in the main body of the text.

Table 4: Summary statistics for thrifts in the sample: 1992-2015

<i>Label</i>	<i>Mean</i>	<i>Median</i>	<i>Std. Dev.</i>	<i>Minimum</i>	<i>Maximum</i>
<i>ROAPTX</i>	1.002	1.025	0.851	-4.990	4.564
<i>NPL</i>	0.136	0	0.292	0	2.087
<i>EFF</i>	71.394	69.709	19.559	25.368	197.847
<i>DF</i>	0.155	0	0.362	0	1
<i>THRIFT</i>	1	1	0	1	1
<i>THRIFTxDF</i>	0.155	0	0.362	0	1
<i>ASSETS</i>	442,339	89,343	3,051,849	803	173,880,169
<i>SECURITIES</i>	21.180	18.270	16.484	0	99.218
<i>LOANS</i>	66.373	68.995	16.583	0	99.027
<i>CI</i>	2.613	0.887	4.023	0	51.700
<i>CONSUMER</i>	3.567	1.473	5.892	0	99.947
<i>CRE</i>	8.076	5.927	7.529	0	58.556
<i>CLD</i>	3.769	1.834	5.832	0	73.583
<i>RRE</i>	45.753	46.379	17.966	0	96.976
<i>BROKERED</i>	1.187	0	4.963	0	91.265
<i>NON-CORE</i>	20.220	17.243	13.684	0.008	91.776
<i>MUTUAL</i>	0.483	0	0.500	0	1
<i>STATE</i>	0.444	0	0.497	0	1
<i>HHI</i>	1657.010	1469.060	894.467	335.811	8993.620
<i>UNEMP</i>	5.735	5.300	2.212	1.100	24.700
<i>YEAR</i>	2002.88	2002	6.213	1994	2015
<i>CRISIS</i>	0.194	0	0.395	0	1
<i>No. Obs.</i>	28,739				

The above table presents summary statistics on the data used in the analysis. Data presented here relate to thrifts only, not commercial banks. Data sources and construction are described in more detail in the “Data” section in the main body of the text.

Table 5: Pre-tax return on assets regression model results

	All (1)	One County (2)	Community (3)	Small (4)	Medium (5)	Large (6)
<i>DF</i>	-0.048*** (-10.666)	-0.071*** (-11.615)	-0.056*** (-12.389)	-0.051*** (-11.097)	0.030 (0.887)	-0.034 (-0.498)
<i>THRIFT</i> × <i>DF</i>	0.091*** (10.407)	0.111*** (9.048)	0.099*** (11.653)	0.091*** (10.307)	0.021 (0.431)	0.111 (0.920)
<i>THRIFT</i>	-0.013 (-0.800)	-0.030 (-1.089)	0.001 (0.084)	0.011 (0.644)	-0.068 (-0.782)	-0.305* (-1.828)
<i>LN_SIZE</i>	-0.153*** (-42.038)	-0.216*** (-31.785)	-0.151*** (-36.593)	-0.163*** (-38.945)	-0.218*** (-7.545)	-0.113*** (-2.821)
<i>SECURITIES</i>	0.000* (1.949)	0.002*** (5.569)	0.001*** (2.897)	0.001*** (2.733)	-0.003* (-1.795)	0.000 (-0.048)
<i>LOANS</i>	0.002*** (5.560)	0.002*** (4.979)	0.002*** (5.400)	0.002*** (5.875)	-0.003 (-1.050)	-0.007 (-1.330)
<i>CI</i>	-0.001** (-2.429)	-0.002*** (-3.991)	-0.001*** (-3.041)	-0.001*** (-3.013)	0.001 (0.283)	0.008 (1.204)
<i>CONSUMER</i>	-0.003*** (-7.703)	-0.002*** (-3.429)	-0.003*** (-6.793)	-0.004*** (-7.825)	-0.001 (-0.392)	0.010* (1.775)
<i>CRE</i>	0.001* (1.703)	0.001*** (2.682)	0.001* (1.777)	0.001* (1.866)	0.010*** (3.275)	-0.006 (-0.709)
<i>CLD</i>	-0.009*** (-20.844)	-0.006*** (-8.732)	-0.008*** (-18.511)	-0.008*** (-17.925)	-0.023*** (-7.154)	-0.035*** (-3.635)
<i>RRE</i>	0.000 (0.779)	0.000 (1.045)	0.000 (0.980)	0.000 (0.660)	0.005* (1.890)	0.004 (0.806)
<i>BROKERED</i>	-0.006*** (-16.075)	-0.004*** (-7.115)	-0.006*** (-14.413)	-0.005*** (-14.113)	-0.009*** (-4.699)	-0.008*** (-3.067)
<i>NON-CORE</i>	-0.003*** (-15.487)	-0.003*** (-12.509)	-0.004*** (-19.040)	-0.004*** (-18.500)	0.002** (2.072)	0.005*** (3.011)
<i>NPL</i>	-0.080*** (-18.298)	-0.067*** (-12.574)	-0.077*** (-18.314)	-0.078*** (-18.435)	-0.139*** (-3.102)	-0.131 (-1.638)
<i>EFF</i>	-0.045*** (-404.045)	-0.044*** (-298.381)	-0.045*** (-405.141)	-0.045*** (-406.912)	-0.043*** (-55.893)	-0.040*** (-26.686)
<i>MUTUAL</i>	-0.119*** (-9.683)	-0.147*** (-8.292)	-0.117*** (-9.907)	-0.116*** (-9.281)	-0.215*** (-3.277)	-0.070 (-0.158)
<i>STATE</i>	-0.006 (-0.681)	-0.032** (-2.385)	0.004 (0.496)	-0.001 (-0.118)	-0.072 (-1.561)	-0.276** (-2.324)
<i>HHI</i>	0.000 (1.306)	0.000* (1.924)	0.000*** (2.947)	0.000 (1.596)	0.000 (0.663)	0.000** (-2.342)
<i>CO_UNEMP</i>	-0.044*** (-61.127)	-0.031*** (-31.641)	-0.039*** (-55.478)	-0.040*** (-55.492)	-0.115*** (-25.113)	-0.096*** (-9.986)
<i>CRISIS</i>	-0.112*** (-21.988)	-0.095*** (-14.547)	-0.096*** (-19.120)	-0.096*** (-19.076)	-0.204*** (-5.783)	-0.373*** (-5.347)
<i>RRE</i> × <i>CRISIS</i>	0.002*** (10.240)	0.002*** (6.641)	0.002*** (11.957)	0.002*** (11.328)	0.000 (-0.407)	-0.002 (-0.751)
<i>Observations</i>	170,888	94,423	155,714	160,925	7,945	2,018

<i>Institutions</i>	14,211	10,811	12,769	13,628	1,338	305
<i>Adjusted R²</i>	0.757	0.783	0.772	0.771	0.658	0.620
<i>F-statistic</i>	38.565***	34.021***	43.019***	41.077***	12.657***	11.230***

*This table presents the results of a regression model that estimates the relationship between pre-tax return on assets (ROAPT_X) on three variables of interest and a set of control variables. The variables of interest, in bold-face, are **DF** (a binary variable that equals one if the observation is in 2011 or later), **THRIFT×DF** (an interaction term that equals one if the observation is on a thrift in 2011 or later), and **THRIFT** (a binary variable that equals one if the observation is on a thrift at any time). The control variables are described in the text.*

****, **, and *, denote significance at the 1%, 5%, and 10% levels, respectively. t-values are in parentheses.*

Table 6: Regressions results with non-performing loans as dependent variable

	All (1)	One County (2)	Community (3)	Small (4)	Medium (5)	Large (6)
<i>DF</i>	-0.076*** (-29.731)	-0.073*** (-18.842)	-0.075*** (-27.195)	-0.075*** (-27.536)	-0.025*** (-2.845)	0.083*** (4.122)
<i>THRIFT</i> × <i>DF</i>	0.018*** (3.543)	0.010 (1.231)	0.017*** (3.254)	0.013** (2.431)	0.035*** (2.863)	-0.091** (-2.514)
<i>THRIFT</i>	-0.003 (-0.276)	0.007 (0.402)	0.008 (0.790)	0.006 (0.597)	0.006 (0.254)	0.107** (2.119)
<i>LN_SIZE</i>	-0.004* (-1.696)	-0.013*** (-2.817)	-0.020*** (-7.791)	-0.019*** (-7.434)	0.026*** (3.461)	0.090*** (7.479)
<i>LOANS</i>	0.003*** (18.033)	0.003*** (13.457)	0.003*** (18.985)	0.003*** (18.200)	0.000 (-0.1456)	0.000 (-0.166)
<i>CI</i>	-0.001*** (-6.299)	-0.001*** (-3.435)	-0.002*** (-6.367)	-0.001*** (-6.085)	0.001* (1.712)	-0.001 (-0.447)
<i>CONSUMER</i>	0.003*** (11.733)	0.003*** (8.095)	0.002*** (7.790)	0.003*** (10.648)	0.005*** (5.647)	0.006*** (3.689)
<i>CRE</i>	-0.002*** (-10.922)	-0.002*** (-6.512)	-0.002*** (-10.613)	-0.002*** (-9.965)	0.000 (0.255)	0.005** (2.055)
<i>CLD</i>	-0.001*** (-3.808)	-0.001*** (-2.816)	-0.001*** (-3.254)	-0.001** (-2.456)	-0.001 (-0.917)	0.000 (0.002)
<i>RRE</i>	-0.002*** (-7.870)	-0.002*** (-5.146)	-0.002*** (-8.900)	-0.002*** (-8.157)	0.001 (1.454)	0.003* (1.883)
<i>BROKERED</i>	0.000* (1.859)	0.000 (0.439)	0.000 (1.328)	0.000 (1.266)	0.001* (1.720)	0.001 (0.618)
<i>NON-CORE</i>	0.000** (-2.156)	0.000** (-1.984)	0.000 (0.428)	0.000 (0.553)	-0.001*** (-4.886)	0.000 (0.351)
<i>EFF</i>	-0.001*** (-15.041)	-0.001*** (-12.090)	-0.001*** (-15.591)	-0.001*** (-15.793)	0.000 (-0.257)	0.000 (0.457)
<i>MUTUAL</i>	0.038*** (5.350)	0.044*** (3.870)	0.036*** (4.818)	0.037*** (4.911)	0.017 (0.981)	0.019 (0.144)
<i>STATE</i>	0.000 (-0.044)	-0.016* (-1.784)	0.001 (0.094)	0.003 (0.472)	0.030** (2.558)	-0.093*** (-2.613)
<i>HHI</i>	0.000** (2.570)	0.000 (-1.026)	0.000 (0.924)	0.000 (1.116)	0.000 (-1.158)	0.000*** (3.474)
<i>CO_UNEMP</i>	0.008*** (19.294)	0.008*** (12.353)	0.008*** (17.106)	0.008*** (17.538)	0.010*** (8.264)	0.034*** (11.768)
<i>CRISIS</i>	-0.029*** (-9.806)	-0.028*** (-6.704)	-0.031*** (-9.998)	-0.029*** (-9.497)	0.000 (0.043)	0.028 (1.305)
<i>RRE</i> × <i>CRISIS</i>	0.000 (1.497)	0.000 (1.640)	0.000 (1.605)	0.000 (1.110)	0.000 (0.137)	0.000 (0.541)
<i>Observations</i>	170,888	94,423	155,714	160,925	7,945	2,018
<i>Institutions</i>	14,211	10,811	12,769	13,628	1,338	305
<i>Adjusted R²</i>	0.294	0.307	0.290	0.291	0.473	0.586

F-statistic 6.018*** 5.040*** 6.059*** 5.868*** 6.445*** 9.929***

*This table presents the results of a regression model that estimates the relationship between the ratio of non-performing loan to total assets (NPL) on three variables of interest and a set of control variables. The variables of interest, in bold-face, are **DF** (a binary variable that equals one if the observation is in 2011 or later), **THRIFT×DF** (an interaction term that equals one if the observation is on a thrift in 2011 or later), and **THRIFT** (a binary variable that equals one if the observation is on a thrift at any time). The control variables are described in the text.*

****, **, and *, denote significance at the 1%, 5%, and 10% levels, respectively. *t*-values are in parentheses.*

Table 7: Regression results with efficiency ratio as dependent variable

	All (1)	One County (2)	Community (3)	Small (4)	Medium (5)	Large (6)
<i>DF</i>	9.446*** (94.447)	10.144*** (74.034)	9.804*** (94.164)	9.787*** (94.348)	8.213*** (15.505)	9.149*** (8.400)
<i>THRIFT</i> × <i>DF</i>	2.139*** (10.666)	2.927*** (10.269)	2.269*** (11.162)	2.290*** (10.914)	-0.534 (-0.692)	-8.421*** (-4.333)
<i>THRIFT</i>	-0.053 (-0.142)	-0.276 (-0.430)	-0.077 (-0.191)	0.565 (1.393)	1.854 (1.317)	-3.767 (-1.394)
<i>LN_SIZE</i>	-6.052*** (-73.238)	-10.997*** (-71.239)	-6.929*** (-71.212)	-7.185*** (-73.655)	-2.945*** (-6.347)	-1.932*** (-2.997)
<i>SECURITIES</i>	-0.324*** (-63.195)	-0.285*** (-44.234)	-0.333*** (-61.593)	-0.322*** (-61.107)	-0.282*** (-11.074)	-0.243*** (-4.873)
<i>LOANS</i>	-0.501*** (-63.450)	-0.455*** (-43.273)	-0.520*** (-63.179)	-0.505*** (-62.351)	-0.400*** (-9.305)	0.071 (0.828)
<i>CI</i>	0.091*** (9.874)	0.109*** (8.362)	0.088*** (9.167)	0.096*** (10.043)	0.072 (1.477)	-0.345*** (-3.297)
<i>CONSUMER</i>	0.012 (1.158)	0.007 (0.470)	-0.004 (-0.3512)	-0.006 (-0.567)	0.123** (2.406)	-0.479*** (-5.294)
<i>CRE</i>	0.158*** (18.562)	0.170*** (13.851)	0.180*** (20.396)	0.178*** (20.329)	0.102** (2.068)	-0.161 (-1.235)
<i>CLD</i>	0.215*** (20.836)	0.267*** (17.601)	0.244*** (22.572)	0.249*** (23.280)	-0.033 (-0.630)	-0.105 (-0.673)
<i>RRE</i>	0.128*** (16.354)	0.116*** (10.474)	0.123*** (15.167)	0.125*** (15.456)	0.178*** (4.367)	-0.305*** (-3.643)
<i>BROKERED</i>	-0.017** (-2.040)	-0.031*** (-2.662)	-0.023** (-2.460)	-0.016* (-1.752)	0.061* (1.960)	-0.076* (-1.726)
<i>NON-CORE</i>	0.115*** (26.436)	0.142*** (23.348)	0.147*** (31.060)	0.133*** (28.762)	0.009 (0.564)	0.079*** (2.702)
<i>NPL</i>	-0.211** (-2.098)	0.653*** (5.258)	0.894*** (8.862)	0.890*** (8.803)	3.120*** (4.338)	1.241 (0.972)
<i>MUTUAL</i>	-3.642*** (-12.847)	-4.300*** (-10.373)	-3.430*** (-12.069)	-3.801*** (-12.840)	-2.699** (-2.551)	-24.064*** (-3.371)
<i>STATE</i>	-1.512*** (-7.596)	-1.829*** (-5.790)	-0.965*** (-4.495)	-1.239*** (-5.865)	-1.882** (-2.526)	0.801 (0.417)
<i>HHI</i>	0.000*** (-3.738)	0.000 (-0.721)	0.000*** (-3.640)	0.000*** (-5.193)	0.000 (-0.082)	0.000 (-0.096)
<i>CRISIS</i>	4.759*** (41.046)	4.609*** (30.330)	4.725*** (39.451)	4.749*** (39.863)	4.632*** (8.177)	3.681*** (3.282)
<i>RRE</i> × <i>CRISIS</i>	0.096*** (23.734)	0.114*** (21.418)	0.101*** (24.336)	0.102*** (24.296)	0.028 (1.448)	-0.057* (-1.714)
<i>Observations</i>	170,888	94,423	155,714	160,925	7,945	2,018
<i>Institutions</i>	14,211	10,811	12,769	13,628	1,338	305
<i>Adjusted R²</i>	0.610	0.661	0.617	0.616	0.600	0.510
<i>F-statistic</i>	19.823***	18.784***	20.942***	20.047***	10.115***	7.564***

*This table presents the results of a regression model that estimates the relationship between institutions' efficiency ratio (EFF) on three variables of interest and a set of control variables. The variables of interest, in bold-face, are **DF** (a binary variable that equals one if the observation is in 2011 or later), **THRIFT×DF** (an interaction term that equals one if the observation is on a thrift in 2011 or later), and **THRIFT** (a binary variable that equals one if the observation is on a thrift at any time). The control variables are described in the text. ***, **, and *, denote significance at the 1%, 5%, and 10% levels, respectively. t-values are in parentheses.*