The Effect of Bank Regulatory Capital Levels on Loan Types

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Abstract

This analysis tests whether regulatory capital levels, and whether capital measures are risk-weighted, affect the amount of Commerical and Industrial, Consumer, and Real-Estate loans which banks hold. First, we find evidence that higher Tier 1 Leverage Ratios, which are not risk-weighted, tend to increase Commerical and Industrial, Consumer, and Real-Estate loans. However, we find a higher Tier 1 Risk-Based Capital Ratio (which uses risk-weighted assets) tends to shift bank lending away from real-estate and consumer loans, and toward commercial and industrial loans. In sum, our results are evidence that the combination of higher capital requirements and risk-weighting assets shifts the supply of loans from real-estate and consumer and towards commercial and industrial loans. Our results have important implications for how regulation may affect loan portfolios and growth in various sections of the economy.

1 Introduction

This analysis investigates whether regulatory capital levels, and measures, affect the types of loans banks offer. Specifically, we test the effect of the Tier 1 Leverage Ratio and Tier 1 Risk-Based Capital Ratio on the amount of Commercial and Industrial, Consumer, and Real-Estate loans offered. Because the Tier 1 Leverage Ratio is not risk-weighted, and the Tier 1 Risk-Based Capital Ratio is, out differing capital ratios test for an effect of risk weighting assets in regulatory capital calculations on bank loan portfolios.

In the aftermath of the 2008 financial crisis banks were required to increase their regulatory capital levels. The intent of higher regulatory capital requirements is to provide these banks a greater capital cushion, thereby making them less likely to experience financial distress. Recent research, however, has found evidence that bank capital levels affect the amount and risk of loans which the bank offers. Dell'Ariccia, Laeven, and Suarez (2017) found evidence that risk-taking by banks is decreasing in short-term interest rates, and this relationship is more pronounced for banks with high capital levels.

Schwert (2018) found firms dependent on banks for financing tend to borrow from well-capitalized banks, and firms with access to the bond market borrow from banks with less capital. Since low-capitalized banks decrease lending more than high-capitalized bank in response to a financial crisis, this matching of firms and banks tends to lessen the effect of a financial crisis on the real economy—bank-dependent firms can still receive loans, and other firms shift to the bond market for financing. This also highlights, however, the link between capital levels and the type of loans banks make.

Noss and Toffano (2016) found that during period of economic growth, an increase in bank capital requirements is related to a reduction in lending. This reduction is greater for corporate lending compared with household. This is evidence of capital requirements affecting both the amount of loans, and the composition of the bank's loans.

Recent research has offered theroetical foundations, and empirical evidence, that requiring banks to increase their levels of regulatory capital causes their cost of capital to increase. Baker and Wurgler (2015) showed how higher bank capital requirements can increase bank cost of capital through the low-risk anomaly. In follow-on empirical work, Wallen (2017) found evidence that bank loan interest rates increase by approximately 5 basis points for each percentage point increase in bank capital.

Additionally, previous research has documented the additional computational requirements of measures which risk-weight assets. Haldane (2011) contrasted the number of calculations it takes a large bank to calculate its regulatory capital ratio under Basel I (a few) and Basel II (approximately 200 million). Research on capital requirements is particularly timely given proposed regulation which would set a required tier

1 leverage ratio of 9% for bank with less than $10 billion in assets (Section 201 of the Economic Growth Regulatory Relief and Consumer Protection Act of 2018).

Earlier research on the relationship between bank capital and overall lending found evidence that increased bank capital makes it easier to to raise uninsured debt, and thereby limits the effect of a drop in deposits on lending (Ashcraft (2006) ; Jayaratne and Morgan (2000) ; Kishan and Opiela (2000)). This effect is known as the "bank lending channel". Kim and Sohn (2017) also find evidence that higher bank capital has a positive effect on lending if large banks have a sufficient amount of liquid assets.

In this analysis we first confirm the link between levels of regulatory capital, and the quantity of bank credit. We then add to the understanding of this relationship by determining if capital levels have any effect on the type of bank credit offered. Lastly we add to this literature by investigating another implication of risk-weighting assets in regulatory capital measures—specifically that the risk weightings may affect the types of loans bank offer. These results are new to the literature, and has important implications concerning the role of banks in fostering economic growth.

Two Capital Ratios

In our analysis we use two separate capital ratios—the Tier 1 Leverage Ratio and the Tier 1 Risk-Based Capital Ratio. The difference between the two is the latter ratio uses risk-weighted assets instead of total assets in the denominator. Our analysis thus sheds light on the implications of the recent use of risk-weighted assets in bank oversight and regulation. Does risk-weighting assets shift banks from one form of loan to another?

This is particularly important question given the present reliance on credit ratings to weight assets by risk. Credit ratings have a tendency to be backward looking, and therefore assign disproportionately greater risk to the types of assets which have most recently done poorly (real estate for example).

2 Data

We use the comprehensive Reports of Condition and Income (Call Reports) banks must file. From the FDIC:

> Every national bank, state member bank, and insured nonmember bank is required by its primary federal regulator to file a Call Report as of the close of business on the last day of each calendar quarter (the report date).

As such, we are not limited to publicly traded banks. In fact, the vast majority of banks in the sample are small privately owned banks. The data are obtained through the Federal Financial Institutions Examination Council's (FFIEC) Central Data Repository (CDR) Public Data Distribution (PDD) website. The FFIEC is an interagency entity spanning the Governors of the Federal Reserve System (FRB), the Federal Deposit Insurance Corporation (FDIC), the National Credit Union Administration (NCUA), the Office of the Comptroller of the Currency (OCC), and the Consumer Financial Protection Bureau (CFPB). The FFIEC seeks to make recommendations that will improve the supervision of financial institutions, as well as suggest standards and reporting forms.

Code	Schedule	Variable
RCON2122	RC-C Part I	Total loans and leases, net of unearned income
RCON1766	RC-C Part I	Commercial and industrial loans
RCONB538	RC-C Part I	Credit Card Loans
RCONB539	RC-C Part I	Other Consumer Revolving Loans
RCON2011	RC-C Part I	Other Consumer Loans
RCONF158	RC-C Part I	One to Four Family Residential Mortgages
RCON1797	RC-C Part I	Revolving Open-end Loan, 1-4 Res.
RCON5367	RC-C Part I	First Lien Closed-end Loan, 1-4 Res.
RCON5368	RC-C Part I	Second Lien Closed-end Loan, 1-4 Res.
RCONF159	RC-C Part I	Other Construction Loans

Code	Schedule	Variable
RCON1420	RC-C Part I	Loans for Farmland
RCON1460	RC-C Part I	Multifamily Res. Loans
RCONF160	RC-C Part I	Owner-Occ. Nonfarm Nonres. Loans
RCONF161	RC-C Part I	Other Owner-Occ. Nonfarm Nonres. Loans
RIAD4340	RI	Net Income
RCON1606	RCN and RCN part I	Nonperforming Assets: 30-89 Days Overdue
RCON1607	RCN and RCN part I	Nonperforming Assets: 90+ Days Overdue
RCON1608	RCN and RCN part I	Nonperforming Assets: Nonaccrual
RCON2170	RC	Total Assets
RCON3210	RC	Total Equity
RCON2200	RC	Total Domestic Deposits
RCFA8274	RC-R Part I	Tier 1 Leverage Ratio
RCOA7206	RC-R Part I	Tier 1 Risk-Based Capital Ratio

Total consumer loans is the sum of RCONB538, RCONB539, and RCON2011 from Schedule RC-C Part I. Total real estate loans is the sum of RCONF158, RCON1797, RCON5367, RCON5368, RCONF159, RCON1420, RCON1460, RCONF160, and RCONF161 from Schedule RC-C Part I. Total Nonperforming Loans is the sum of RCON1606, RCON1607, and RCON1608 from Schedules RCN and the later renamed RCN Part I.

We have applied the following filters to the data set. We exclude observations where the Tier 1 Leverage Ratio or Tier 1 Risk-Based Capital Ratio is greater than 50%, or less than 0%. We have also excluded any observation where the percent change in the amount of a given loan type is greater than 200%. Table 2 summarized the filtered data set.

Table 2: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Per. Chng. Amt. Comm.	339,815	0.079	0.309	−0.995	−0.092	0.195	1.999
Comm. Loans / TA	339,815	0.093	0.068	0.00000	0.047	0.121	0.863
Per. Chng. Amt. Cons.	339,815	−0.045	0.339	−1.000	−0.155	0.072	1.997
Comm. Loans / TA	339,815	0.041	0.052	0.00000	0.005	0.058	1.135
Per. Chng. RE	339,815	0.119	0.294	−1.000	−0.023	0.157	2.000
RE Loans / TA	339,815	0.337	0.186	0.00000	0.190	0.473	4.606
T1 Leverage Rat.	339,815	0.102	0.031	0.001	0.082	0.112	0.497
T1 Risk-Based Cap. Rat.	339,815	0.153	0.062	0.001	0.111	0.174	0.500
Total Equity	339,815	0.105	0.032	−0.010	0.085	0.118	0.495
ROA	339,815	0.005	0.008	−0.296	0.002	0.009	0.295
Non-Perf. Assets	339,815	0.003	0.005	0.000	0.0002	0.003	0.171
Total Assets	339,815	442,021.100	1,931,462.000	2,298	65,639	307,772	163,066,000
Total Deposits	339,815	0.833	0.071	0.0001	0.802	0.882	0.993
De Novo Ind.	339,815	0.033	0.178	0	0	0	1
Post Crisis Ind	339,815	0.173	0.378	0	0	0	1
Fin. Crisis Ind	339,815	0.202	0.402	0	0	0	1

A notable feature of the data are the existence of many small banks, and a few very large institutions. The median bank has $136,415,000 in total assets whereas the mean bank has $442,021,100. This is over three times the number of assets. The largest bank has $931,462,000, or over 14 times the median bank.

As we would expect, capital ratios are more similar across banks. The median and mean Tier 1 Leverage ratios are 9.44% and 10.20% respectively. The median Tier 1 Risk-Based Capital ratio is 13.54%, and the mean is 15.3%.

3 Methods

We use a fixed-effects (bank fixed effects) panel data model with the following specification, which is based on Cole (2012):

$$\%\Delta Loans_{it} = \beta_0 + \beta_1 Orthogonalized\, Capital\ Ratio_{i(t-4)} + \beta_2 Total\ Equity_{i(t-4)} + \mathbf{\Gamma}(\mathbf{Controls})_{i(t-4)} + \mu_{it}$$

Where $\%\Delta Loans_{it}$ is the percent change in a particular loan type for firm i over the last year ending in quarter t. The loans types are Commercial and Industrial, Consumer, and Real-Estate.

Capital Ratio is one of the two capital ratios used in our analysis, the Tier 1 Leverage Ratio and the Risk-Based Capital Ratio. Each is orthogonalized with respect to Total Equity, that is each is the residual from the following equation: $Capital\ Ratio_{i(t-4)} = \alpha_0 + \alpha_1 Total\ Equity_{i(t-4)} + \eta_{it}$. As such, the orthogonalized capital ratio contains information in the ratio which is unrelated to the information contained in Total Equity.

Controls denotes a matrix of the following control variables: Return on Assets (*ROA*); Non-Performing Assets divided by Total Assets (*NPA*); natural log of Total Assets (*ln(TA)*); Total Deposits divided by Total Assets (*Deposits*); *Post Crisis* is an indicator for the years 2012–2015; *Fin Crisis* is an indicator for the years 2009-2011; *De Novo* denotes a bank which is less than 5 years old.

Note that the explanatory variables are lagged one year with respect to the percent change in loans. So our equation tests for the effect of the capital ratio in quarter t, with the percent change in loans over the following 4 quarters.

4 Results

We summarize the results below by capital ratio and loan type. We first show results for the full panel. We then estimate separate regressions for bank which exceed, and fall short of, the required capital thresholds.

4.1 Tier 1 Leverage Ratio

The estimated Tier 1 Leverage ratio coefficients in the following fixed-effects models are positive and significant effect across all three types of lending. Thus we find higher tier 1 leverage ratios tend to increase all types of lending over the following year, and this is robust to whether the bank is well or poorly capitalized.

4.1.1 Commercial and Industrial Loans

In the full-sample of banks, the coefficient on the orthogonalized tier 1 leverage ratio ranges from 1.497 to 1.551 and is a positive and significant across all regressions. This means for a 1% increase in the tier 1 leverage ratio which is *not* attributable to an increase in total equity, commercial and industrial loans increase by about 1.5% over the following year. The adjusted R-squared values of these regressions are fairly low at 0.074, so we are only explaining a modest amount of the variation in commercial and industrial loans.

The coefficients are somewhat lower, though again positive and significant, when estimating the model on the subset of well-capitalized banks. It ranges from 1.392 to 1.458. As we may expect, the effect of tier 1 capital on the change in commercial and industrial loans is greater when considering only poorly-capitalized banks. The coefficient ranges from 2.635 to 2.739 depending on the set of control variables. The relationsip is only significant at the 10% level, reflacting the fewer number of observations on poory-capitalized banks (2,134 bank/year observations).

Table 3: The Effect of the Tier 1 Leverage Ratio on Commercial and Industrial Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percent change in commerial and industrial loans in dollar amount. All variables are lagged one year relative to the dependent variable.

	Dependent variable:		
	Percent Change in Commercial and Industrial Loans		
	(1)	(2)	(3)
Com./Ind. Loans	2.335***	2.334***	2.332***
	(0.020)	(0.020)	(0.020)
T1LR	1.551***	1.497***	1.508***
	(0.085)	(0.085)	(0.085)
TE	2.533***	2.454***	2.462***
	(0.074)	(0.074)	(0.074)
ROA	0.137	−14.337***	−12.593***
	(0.115)	(1.056)	(1.064)
NPA	−10.695***	−10.718***	10.781***
	(0.162)	(0.162)	(1.721)
ln(TA)	−0.075***	−0.080***	−0.074***
	(0.002)	(0.002)	(0.002)
Deposits	0.084***	0.082***	0.080***
	(0.019)	(0.019)	(0.019)
Post Crisis	0.010***	0.010***	0.010***
	(0.002)	(0.002)	(0.002)
Fin Crisis	−0.049***	−0.049***	−0.047***
	(0.002)	(0.002)	(0.002)
De Novo	0.051***	0.048***	0.049***
	(0.005)	(0.005)	(0.005)
ln(TA) * ROA		1.197***	1.048***
		(0.087)	(0.088)
ln(TA) * NPA			−1.861***
			(0.148)
Observations	205,212	205,212	205,212
R^2	0.116	0.117	0.118
Adjusted R^2	0.073	0.074	0.074
F Statistic	2,572.869*** (df = 10; 195609)	2,358.526*** (df = 11; 195608)	2,176.839*** (df = 12; 195607)
Note:			*p<0.1; **p<0.05; ***p<0.01

4.1.2 Consumer Loans

Over all banks there is a positive and significant relationship between the level of Tier 1 Leverage Ratio and the percent change in Consumer Loans. The coefficient is approximately 2.8, implying a 1% higher Tier 1 Leverage Ratio will increase comsumer loans by 2.8% over the following year. Notably, the adjusted R-squared for these regressions is a little over 0.20. The level of a bank's Tier 1 Leverage ratio explains substantially more of the variation in Consumer realtive to Commercial and Industrial loans.

When considering only well-capitalized banks the relationship is slightly stronger with a significant coefficient of slightly over 3.07.For the subset of of poorly-capitalized banks, however, the coefficient on the Tier 1 Leverage Ratio drops to a range of 0.375 to 0.531. Moreover the coefficients are insignificant. This is evidence that the Tier 1 Leverage Ratio only affects the amount of Consumer Loans a bank offers when that bank is well-capitalized.

Table 4: The Effect of the Tier 1 Leverage Ratio on Consumer Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is total consumer loan amount outstanding as a percent of total assets. All variables are lagged one year relative to the dependent variable.

	Dependent variable:		
	Percent Change in Consumer Loans		
	(1)	(2)	(3)
Cons. Loans	-1.104^{***}	-1.103^{***}	-1.103^{***}
	(0.034)	(0.034)	(0.034)
T1LR	2.884^{***}	2.869^{***}	2.871^{***}
	(0.121)	(0.121)	(0.121)
TE	2.661^{***}	2.638^{***}	2.640^{***}
	(0.117)	(0.118)	(0.118)
ROA	0.229	-3.172^{**}	-2.234
	(0.174)	(1.548)	(1.559)
NPA	-2.889^{***}	-2.903^{***}	10.151^{***}
	(0.249)	(0.249)	(2.600)
ln(TA)	-0.081^{***}	-0.081^{***}	-0.078^{***}
	(0.003)	(0.003)	(0.003)
Deposits	-0.585^{***}	-0.586^{***}	-0.586^{***}
	(0.028)	(0.028)	(0.028)
Post Crisis	0.016^{***}	0.016^{***}	0.017^{***}
	(0.002)	(0.002)	(0.002)
Fin Crisis	-0.484^{***}	-0.484^{***}	-0.483^{***}
	(0.003)	(0.003)	(0.003)
De Novo	0.093^{***}	0.093^{***}	0.093^{***}
	(0.007)	(0.007)	(0.007)
ln(TA) * ROA		0.278^{**}	0.198
		(0.126)	(0.127)
ln(TA) * NPA			-1.127^{***}
			(0.223)
Observations	154,455	154,455	154,455
R^2	0.250	0.250	0.250
Adjusted R^2	0.201	0.201	0.202
F Statistic	$4{,}840.491^{***}$ (df = 10; 144992)	$4{,}401.008^{***}$ (df = 11; 144991)	$4{,}037.057^{***}$ (df = 12; 144990)
Note:			*p<0.1; **p<0.05; ***p<0.01

4.1.3 Real-Estate Loans

Over the full sample of banks, there is a positive and significant relationship between the Tier 1 Leverage Ratio and the percent change in real-estate loans (coefficient slightly over 2.90). The adjusted R-squared is 0.16. The coefficient is larger for the subset of well-capitalized banks relative to poorly capitalized banks (approximately 3.05 vs 1.40 respectively).

Table 5: The Effect of the Tier 1 Leverage Ratio on RE Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percentage change in the amount of real-estate loans outstanding. All variables are lagged one year relative to the dependent variable.

	Dependent variable:		
	Percent Change in real-estate Loans		
	(1)	(2)	(3)
Cons. Loans	-0.827^{***}	-0.825^{***}	-0.825^{***}
	(0.005)	(0.005)	(0.005)
T1LR	2.959^{***}	2.934^{***}	2.936^{***}
	(0.063)	(0.063)	(0.063)
TE	3.145^{***}	3.109^{***}	3.111^{***}
	(0.052)	(0.052)	(0.052)
ROA	-0.515^{***}	-7.497^{***}	-6.939^{***}
	(0.084)	(0.750)	(0.757)
NPA	-2.151^{***}	-2.164^{***}	5.072^{***}
	(0.119)	(0.119)	(1.278)
ln(TA)	0.050^{***}	0.048^{***}	0.050^{***}
	(0.002)	(0.002)	(0.002)
Deposits	-0.074^{***}	-0.075^{***}	-0.076^{***}
	(0.014)	(0.014)	(0.014)
Post Crisis	-0.018^{***}	-0.018^{***}	-0.018^{***}
	(0.001)	(0.001)	(0.001)
Fin Crisis	-0.015^{***}	-0.015^{***}	-0.015^{***}
	(0.001)	(0.001)	(0.001)
De Novo	0.037^{***}	0.035^{***}	0.036^{***}
	(0.003)	(0.003)	(0.003)
ln(TA) * ROA		0.577^{***}	0.529^{***}
		(0.062)	(0.062)
ln(TA) * NPA			-0.626^{***}
			(0.110)
Observations	208,321	208,321	208,321
R^2	0.199	0.200	0.200
Adjusted R^2	0.160	0.160	0.160
F Statistic	$4{,}944.844^{***}$ (df = 10; 198542)	$4{,}505.249^{***}$ (df = 11; 198541)	$4{,}133.159^{***}$ (df = 12; 198540)
Note:			*p<0.1; **p<0.05; ***p<0.01

4.2 Risk-Based Capital Ratio

Interestingly, a higher Tier 1 Risk-Based Capital Ratio tends to shift well-capitalized bank lending away from real-estate and consumer loans, and toward commercial and industrial loans over the following year. For poorly-capitalized banks, however, higher tier 1 risk based capital ratios tend to increase all types of lending. This is evidence of a dynamic relationship between the risk-weighted measure and lending which is not present in the non-risk weighted tier 1 leverage ratio.

4.2.1 Commercial and Industrial Loans

Over all banks the Tier 1 Risk-Based Capital Ratio has a positive and significant relationship with the subsequent percent change in Commercial and Industrial Loans. The coefficient is approximately 1.54, implying a 1 percentage point increase in the Tier 1 Risk-Based Capital Ratio will increase total Commercial and Industrial Loans by 1.54 percentage points over the following year. Similar to the Tier 1 Leverage Ratio regressions, the adjusted R-squared values are modest at approximately 0.083. Similar to the Tier 1 Leverage Ratio, the coefficient is positive and significant for both well, and poorly, capitalized banks.

Table 6: The Effect of the Tier 1 Risk-Based Ratio on Commercial and Industrial Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percent change in commerial and industrial loans in dollar amount. All variables are lagged one year relative to the dependent variable.

	Dependent variable:		
	Percent Change in Commercial and Industrial Loans		
	(1)	(2)	(3)
Com./Ind. Loans	2.503***	2.502***	2.499***
	(0.020)	(0.020)	(0.020)
T1RBCR	1.540***	1.532***	1.535***
	(0.032)	(0.032)	(0.032)
TE	2.680***	2.633***	2.637***
	(0.047)	(0.047)	(0.047)
ROA	0.285**	−14.115***	−12.348***
	(0.115)	(1.050)	(1.058)
NPA	−10.503***	−10.523***	11.317***
	(0.162)	(0.162)	(1.712)
ln(TA)	−0.069***	−0.073***	−0.068***
	(0.002)	(0.002)	(0.002)
Deposits	0.041**	0.039**	0.036*
	(0.019)	(0.019)	(0.019)
Post Crisis	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)
Fin Crisis	−0.044***	−0.043***	−0.042***
	(0.002)	(0.002)	(0.002)
De Novo	0.056***	0.053***	0.054***
	(0.005)	(0.005)	(0.005)
ln(TA) * ROA		1.191***	1.040***
		(0.086)	(0.087)
ln(TA) * NPA			−1.890***
			(0.148)
Observations	205,212	205,212	205,212
R^2	0.125	0.126	0.127
Adjusted R^2	0.082	0.083	0.084
F Statistic	2,800.909*** (df = 10; 195609)	2,566.069*** (df = 11; 195608)	2,367.880*** (df = 12; 195607)
Note:			*p<0.1; **p<0.05; ***p<0.01

4.2.2 Consumer Loans

Over all banks the Tier 1 Risk-Based Capital Ratio has a negative and significant relationship with the percent change in Consumer Loans. The coefficient is approximately -0.42, implying a 1 percentage point increase in the Tier 1 Risk-Based Capital Ratio will decrease total Commercial and Industrial Loans by 0.42

percentage points over the following year. The adjusted R-squared values are approximately 0.20.

Separating the sample into well, and poorly, capitalized bank shows the negative relationship is restricted to well-capitalized banks. The relationship is insignificantly different from zero for poorly capitalized banks.

Note the relationship between the Tier 1 Leverage Ratio and consumer loans was positive and significant, whereas it is negative and significant for the Tier 1 Risk-Based Capital Ratio. The change in sign is understandable given the higher risk weights on consumer loans relative to other types, such as commercial and industrial loans. This is evidence of the effect of risk-weighting imposed by regulators on banks loan portfolios.

Table 7: The Effect of the Tier 1 Risk-Based Ratio on Consumer Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is total consumer loan amount outstanding as a percent of total assets. All variables are lagged one year relative to the dependent variable.

	Dependent variable:		
	Percent Change in Consumer Loans		
	(1)	(2)	(3)
Cons. Loans	-1.153^{***}	-1.151^{***}	-1.151^{***}
	(0.034)	(0.034)	(0.034)
T1RBCR	-0.423^{***}	-0.426^{***}	-0.423^{***}
	(0.049)	(0.049)	(0.049)
TE	-0.183^{**}	-0.203^{***}	-0.200^{***}
	(0.074)	(0.074)	(0.074)
ROA	0.248	-5.337^{***}	-4.426^{***}
	(0.174)	(1.549)	(1.560)
NPA	-3.298^{***}	-3.319^{***}	9.370^{***}
	(0.250)	(0.250)	(2.605)
ln(TA)	-0.097^{***}	-0.098^{***}	-0.095^{***}
	(0.003)	(0.003)	(0.003)
Deposits	-0.598^{***}	-0.598^{***}	-0.598^{***}
	(0.028)	(0.028)	(0.028)
Post Crisis	0.015^{***}	0.015^{***}	0.015^{***}
	(0.002)	(0.002)	(0.002)
Fin Crisis	-0.491^{***}	-0.491^{***}	-0.490^{***}
	(0.003)	(0.003)	(0.003)
De Novo	0.118^{***}	0.116^{***}	0.117^{***}
	(0.007)	(0.007)	(0.007)
ln(TA) * ROA		0.456^{***}	0.378^{***}
		(0.126)	(0.127)
ln(TA) * NPA			-1.095^{***}
			(0.224)
Observations	154,455	154,455	154,455
R^2	0.248	0.248	0.248
Adjusted R^2	0.199	0.199	0.199
F Statistic	$4{,}775.077^{***}$ (df = 10; 144992)	$4{,}342.541^{***}$ (df = 11; 144991)	$3{,}983.288^{***}$ (df = 12; 144990)
Note:			*p<0.1; **p<0.05; ***p<0.01

4.2.3 Real-Estate Loans

Over all banks the Tier 1 Risk-Based Capital Ratio also has a negative and significant relationship with the percent change in Real Estate loans. The coefficient is approximately -0.35, implying a 1 percentage point increase in the Tier 1 Risk-Based Capital Ratio will decrease total Real Estate Loans by 0.35 percentage points over the following year. The adjusted R-squared values are approximately 0.15.

The relationship is negative and significant for well-capitalized banks (coefficient -0.38), though positive and significant (coefficient 1.1) for poorly-capitalized banks. Both are significant at the less than 1% level. So if a bank is well capitalized, and its Risk-Based Capital Ratio increases, then its loans will shift from real-estate toward commercial and industrial lending. However, if the Risk-Based Capital Ratio of a poorly capitalized bank increases, it will increase its real-estate loans.

The coefficient on the Tier 1 Leverage Ratio for well-capitalized banks was positive (approximately 3.05) and significant at the less than 1% level. The fact that risk-weighting assets again caused a change in sign is understandable given the higher risk weights on real-estate loans relative to commercial and industrial loans. This is further evidence of the effect of risk-weighting imposed by regulators on banks loan portfolios.

5 Conclusion

In this analysis we have estimated the effect of regulatory capital levels on types of bank lending. As measures of capital we used the non-risk weighted Tier 1 Leverage Ratio, and the risk-weighted Risk-Based Capital Ratio. Our results generally found significant relationships between regulatory capital levels and subsequent lending over the following year. The signs of these relationships, however, were contingent on the measure of capital, type of loan, and whether the banks was well or poorly capitalized.

When considering the non-risk-weighted Tier 1 Leverage Ratio, higher capital levels lead to greater percent changes in all types of loans over the following year. This is broadly true across both well and poorly capitalized banks.

The relationship is less uniform for the risk-weighted Risk-Based Capital Ratio. Across all banks, higher Risk-Based Capital Ratios shifts lending away from real-estate and consumer loans, and toward commercial and industrial loans. This result also holds when restricting the sample to well-capitalized banks. We do find evidence, however, that for the relatively small set of poorly-capitalized banks, a higher Risk-Based Capital Ratio leads to subsequently higher real-estate lending.

6 Appendix

Table 8: The Effect of the Tier 1 Risk-Based Ratio on RE Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percentage change in the amount of real-estate loans outstanding. All variables are lagged one year relative to the dependent variable.

	Dependent variable:		
	Percent Change in real-estate Loans		
	(1)	(2)	(3)
Cons. Loans	-0.845^{***}	-0.843^{***}	-0.843^{***}
	(0.005)	(0.005)	(0.005)
T1RBCR	-0.351^{***}	-0.353^{***}	-0.352^{***}
	(0.023)	(0.023)	(0.023)
TE	0.791^{***}	0.767^{***}	0.768^{***}
	(0.035)	(0.035)	(0.035)
ROA	-0.529^{***}	-9.056^{***}	-8.536^{***}
	(0.084)	(0.753)	(0.760)
NPA	-2.505^{***}	-2.519^{***}	4.223^{***}
	(0.120)	(0.120)	(1.284)
ln(TA)	0.041^{***}	0.038^{***}	0.039^{***}
	(0.002)	(0.002)	(0.002)
Deposits	-0.089^{***}	-0.091^{***}	-0.092^{***}
	(0.014)	(0.014)	(0.014)
Post Crisis	-0.019^{***}	-0.019^{***}	-0.019^{***}
	(0.001)	(0.001)	(0.001)
Fin Crisis	-0.021^{***}	-0.021^{***}	-0.020^{***}
	(0.001)	(0.001)	(0.001)
De Novo	0.055^{***}	0.053^{***}	0.053^{***}
	(0.003)	(0.003)	(0.003)
ln(TA) * ROA		0.705^{***}	0.660^{***}
		(0.062)	(0.062)
ln(TA) * NPA			-0.584^{***}
			(0.111)
Observations	208,321	208,321	208,321
R^2	0.192	0.192	0.192
Adjusted R^2	0.152	0.152	0.152
F Statistic	$4{,}703.629^{***}$ (df = 10; 198542)	$4{,}290.595^{***}$ (df = 11; 198541)	$3{,}935.894^{***}$ (df = 12; 198540)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 9: Well-Capitalized Banks: The Effect of the Tier 1 Leverage Ratio on Commercial and Industrial Loans. Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percent change in commerial and industrial loans in dollar amount. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio above 5 percent, and risk-based capital ratio above 10 percent.

	Dependent variable:		
	Percent Change in Commercial and Industrial Loans		
	(1)	(2)	(3)
Com./Ind. Loans	2.454***	2.454***	2.453***
	(0.022)	(0.022)	(0.022)
T1LR	1.458***	1.392***	1.400***
	(0.092)	(0.092)	(0.092)
TE	2.321***	2.226***	2.231***
	(0.080)	(0.080)	(0.080)
ROA	−0.679***	−15.523***	−14.131***
	(0.137)	(1.223)	(1.230)
NPA	−10.976***	−10.988***	8.989***
	(0.181)	(0.181)	(1.913)
ln(TA)	−0.072***	−0.077***	−0.072***
	(0.002)	(0.002)	(0.002)
Deposits	0.092***	0.090***	0.087***
	(0.021)	(0.021)	(0.021)
Post Crisis	0.011***	0.010***	0.011***
	(0.002)	(0.002)	(0.002)
Fin Crisis	−0.045***	−0.045***	−0.044***
	(0.002)	(0.002)	(0.002)
De Novo	0.047***	0.044***	0.045***
	(0.005)	(0.005)	(0.005)
ln(TA) * ROA		1.226***	1.108***
		(0.100)	(0.101)
ln(TA) * NPA			−1.737***
			(0.166)
Observations	187,350	187,350	187,350
R^2	0.107	0.108	0.108
Adjusted R^2	0.060	0.061	0.061
F Statistic	2,130.525*** (df = 10; 177977)	1,952.016*** (df = 11; 177976)	1,799.614*** (df = 12; 177975)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 10: Poorly-Capitalized Banks: The Effect of the Tier 1 Leverage Ratio on Commercial and Industrial Loans. Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percent change in commerial and industrial loans in dollar amount. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio below 5 percent, and risk-based capital ratio below 10 percent.

	Dependent variable:		
	Percent Change in Commercial and Industrial Loans		
	(1)	(2)	(3)
Com./Ind. Loans	5.102***	5.111***	5.109***
	(0.266)	(0.265)	(0.265)
T1LR	2.670*	2.635*	2.739*
	(1.473)	(1.472)	(1.472)
TE	3.073**	2.999*	3.131**
	(1.557)	(1.556)	(1.557)
ROA	0.233	−7.566*	−6.912
	(0.375)	(4.277)	(4.289)
NPA	−4.608***	−4.598***	20.896
	(0.944)	(0.943)	(13.741)
ln(TA)	−0.490***	−0.477***	−0.445***
	(0.055)	(0.056)	(0.058)
Deposits	0.199	0.197	0.226
	(0.315)	(0.315)	(0.315)
Post Crisis	0.012	0.012	0.011
	(0.022)	(0.022)	(0.022)
Fin Crisis	0.008	0.009	0.008
	(0.031)	(0.031)	(0.031)
De Novo	0.080	0.078	0.080
	(0.058)	(0.058)	(0.058)
ln(TA) * ROA		0.650*	0.591*
		(0.355)	(0.356)
ln(TA) * NPA			−2.161*
			(1.162)
Observations	2,134	2,134	2,134
R^2	0.243	0.245	0.246
Adjusted R^2	0.061	0.063	0.064
F Statistic	55.314*** (df = 10; 1719)	50.658*** (df = 11; 1718)	46.792*** (df = 12; 1717)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 11: Well Capitalized Banks: The Effect of the Tier 1 Leverage Ratio on Consumer Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is total consumer loan amount outstanding as a percent of total assets. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio above 5 percent, and risk-based capital ratio above 10 percent.

	Dependent variable:		
	Percent Change in Consumer Loans		
	(1)	(2)	(3)
Cons. Loans	-1.216^{***}	-1.214^{***}	-1.213^{***}
	(0.038)	(0.038)	(0.038)
T1LR	3.098^{***}	3.071^{***}	3.071^{***}
	(0.132)	(0.132)	(0.132)
TE	2.798^{***}	2.756^{***}	2.756^{***}
	(0.128)	(0.128)	(0.128)
ROA	-0.802^{***}	-6.059^{***}	-5.378^{***}
	(0.210)	(1.824)	(1.831)
NPA	-2.722^{***}	-2.736^{***}	9.778^{***}
	(0.278)	(0.278)	(2.929)
ln(TA)	-0.084^{***}	-0.086^{***}	-0.083^{***}
	(0.004)	(0.004)	(0.004)
Deposits	-0.504^{***}	-0.504^{***}	-0.506^{***}
	(0.030)	(0.030)	(0.030)
Post Crisis	0.017^{***}	0.016^{***}	0.017^{***}
	(0.003)	(0.003)	(0.003)
Fin Crisis	-0.499^{***}	-0.499^{***}	-0.498^{***}
	(0.003)	(0.003)	(0.003)
De Novo	0.084^{***}	0.082^{***}	0.083^{***}
	(0.008)	(0.008)	(0.008)
ln(TA) * ROA		0.428^{***}	0.369^{**}
		(0.148)	(0.148)
ln(TA) * NPA			-1.086^{***}
			(0.253)
Observations	138,970	138,970	138,970
R^2	0.253	0.253	0.254
Adjusted R^2	0.200	0.200	0.200
F Statistic	$4{,}403.009^{***}$ (df = 10; 129739)	$4{,}003.729^{***}$ (df = 11; 129738)	$3{,}672.112^{***}$ (df = 12; 129737)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 12: Poorly Capitalized Banks: The Effect of the Tier 1 Leverage Ratio on Consumer Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is total consumer loan amount outstanding as a percent of total assets. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio below 5 percent, and risk-based capital ratio below 10 percent.

	Dependent variable:		
	Percent Change in Consumer Loans		
	(1)	(2)	(3)
Cons. Loans	-5.030^{***}	-4.959^{***}	-4.940^{***}
	(1.030)	(1.032)	(1.032)
T1LR	0.403	0.531	0.375
	(2.511)	(2.514)	(2.515)
TE	1.836	1.977	1.815
	(2.809)	(2.812)	(2.813)
ROA	−0.676	6.853	5.443
	(0.586)	(7.053)	(7.110)
NPA	−0.887	−0.900	−36.250
	(1.573)	(1.573)	(23.415)
ln(TA)	0.017	0.008	−0.036
	(0.090)	(0.091)	(0.095)
Deposits	0.148	0.161	0.125
	(0.507)	(0.507)	(0.508)
Post Crisis	0.012	0.012	0.011
	(0.035)	(0.035)	(0.035)
Fin Crisis	-0.572^{***}	-0.575^{***}	-0.573^{***}
	(0.052)	(0.052)	(0.052)
De Novo	0.184	0.192	0.184
	(0.126)	(0.126)	(0.126)
ln(TA) * ROA		−0.624	−0.502
		(0.583)	(0.588)
ln(TA) * NPA			2.967
			(1.961)
Observations	1,548	1,548	1,548
R^2	0.398	0.399	0.400
Adjusted R^2	0.236	0.236	0.237
F Statistic	80.622^{***} (df = 10; 1218)	73.406^{***} (df = 11; 1217)	67.551^{***} (df = 12; 1216)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 13: Well Capitalized Banks: The Effect of the Tier 1 Leverage Ratio on RE Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percentage change in the amount of real-estate loans outstanding. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio above 5 percent, and risk-based capital ratio above 10 percent.

	Dependent variable:		
	Percent Change in real-estate Loans		
	(1)	(2)	(3)
Cons. Loans	-0.846^{***}	-0.844^{***}	-0.844^{***}
	(0.005)	(0.005)	(0.005)
T1LR	3.078^{***}	3.045^{***}	3.046^{***}
	(0.066)	(0.066)	(0.066)
TE	3.249^{***}	3.202^{***}	3.203^{***}
	(0.054)	(0.054)	(0.054)
ROA	-0.837^{***}	-8.797^{***}	-8.389^{***}
	(0.095)	(0.832)	(0.837)
NPA	-2.038^{***}	-2.047^{***}	4.045^{***}
	(0.127)	(0.127)	(1.362)
ln(TA)	0.056^{***}	0.053^{***}	0.054^{***}
	(0.002)	(0.002)	(0.002)
Deposits	-0.072^{***}	-0.073^{***}	-0.074^{***}
	(0.014)	(0.014)	(0.014)
Post Crisis	-0.016^{***}	-0.017^{***}	-0.017^{***}
	(0.001)	(0.001)	(0.001)
Fin Crisis	-0.015^{***}	-0.015^{***}	-0.015^{***}
	(0.001)	(0.001)	(0.001)
De Novo	0.034^{***}	0.033^{***}	0.033^{***}
	(0.003)	(0.003)	(0.003)
ln(TA) * ROA		0.657^{***}	0.622^{***}
		(0.068)	(0.069)
ln(TA) * NPA			-0.529^{***}
			(0.118)
Observations	190,909	190,909	190,909
R^2	0.191	0.192	0.192
Adjusted R^2	0.149	0.149	0.149
F Statistic	$4{,}291.244^{***}$ (df = 10; 181370)	$3{,}911.535^{***}$ (df = 11; 181369)	$3{,}587.634^{***}$ (df = 12; 181368)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 14: Poorly Capitalized Banks: The Effect of the Tier 1 Leverage Ratio on RE Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percentage change in the amount of real-estate loans outstanding. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio below 5 percent, and risk-based capital ratio below 10 percent.

	Dependent variable:		
	Percent Change in real-estate Loans		
	(1)	(2)	(3)
Cons. Loans	-0.969^{***}	-0.969^{***}	-0.968^{***}
	(0.031)	(0.031)	(0.031)
T1LR	1.384^{**}	1.394^{**}	1.432^{***}
	(0.551)	(0.551)	(0.551)
TE	1.985^{***}	2.002^{***}	2.048^{***}
	(0.560)	(0.561)	(0.561)
ROA	0.105	1.798	2.024
	(0.141)	(1.611)	(1.615)
NPA	0.169	0.168	8.968^{*}
	(0.356)	(0.356)	(5.152)
ln(TA)	-0.106^{***}	-0.109^{***}	-0.099^{***}
	(0.021)	(0.022)	(0.022)
Deposits	-0.036	-0.036	-0.027
	(0.117)	(0.117)	(0.117)
Post Crisis	0.017^{**}	0.017^{**}	0.017^{**}
	(0.008)	(0.008)	(0.008)
Fin Crisis	0.060^{***}	0.059^{***}	0.059^{***}
	(0.011)	(0.011)	(0.011)
De Novo	-0.085^{***}	-0.085^{***}	-0.084^{***}
	(0.021)	(0.021)	(0.021)
ln(TA) * ROA		-0.141	-0.161
		(0.134)	(0.134)
ln(TA) * NPA			-0.746^{*}
			(0.436)
Observations	2,176	2,176	2,176
R^2	0.431	0.431	0.432
Adjusted R^2	0.295	0.295	0.296
F Statistic	132.979^{***} (df = 10; 1755)	120.999^{***} (df = 11; 1754)	111.282^{***} (df = 12; 1753)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 15: Well Capitalized Banks: The Effect of the Tier 1 Risk-Based Ratio on Commercial and Industrial Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percent change in commerial and industrial loans in dollar amount. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio above 5 percent, and risk-based capital ratio above 10 percent.

	Dependent variable:		
	Percent Change in Commercial and Industrial Loans		
	(1)	(2)	(3)
Com./Ind. Loans	2.635***	2.634***	2.632***
	(0.022)	(0.022)	(0.022)
T1RBCR	1.550***	1.538***	1.540***
	(0.033)	(0.033)	(0.033)
TE	2.551***	2.496***	2.497***
	(0.051)	(0.051)	(0.051)
ROA	−0.492***	−14.765***	−13.361***
	(0.137)	(1.215)	(1.222)
NPA	−10.739***	−10.748***	9.466***
	(0.180)	(0.180)	(1.903)
ln(TA)	−0.064***	−0.069***	−0.064***
	(0.002)	(0.002)	(0.002)
Deposits	0.048**	0.047**	0.044**
	(0.021)	(0.021)	(0.021)
Post Crisis	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)
Fin Crisis	−0.039***	−0.039***	−0.038***
	(0.002)	(0.002)	(0.002)
De Novo	0.050***	0.047***	0.047***
	(0.005)	(0.005)	(0.005)
ln(TA) * ROA		1.179***	1.060***
		(0.100)	(0.100)
ln(TA) * NPA			−1.758***
			(0.165)
Observations	187,350	187,350	187,350
R^2	0.117	0.117	0.118
Adjusted R^2	0.070	0.071	0.071
F Statistic	2,349.383*** (df = 10; 177977)	2,150.178*** (df = 11; 177976)	1,981.739*** (df = 12; 177975)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 16: Poorly Capitalized Banks: The Effect of the Tier 1 Risk-Based Ratio on Commercial and Industrial Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percent change in commerial and industrial loans in dollar amount. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio below 5 percent, and risk-based capital ratio below 10 percent.

	Dependent variable:		
	Percent Change in Commercial and Industrial Loans		
	(1)	(2)	(3)
Com./Ind. Loans	5.062***	5.071***	5.069***
	(0.264)	(0.264)	(0.263)
T1RBCR	4.362***	4.313***	4.319***
	(0.807)	(0.807)	(0.807)
TE	5.063***	4.975***	5.014***
	(1.090)	(1.091)	(1.090)
ROA	0.151	−6.939	−6.303
	(0.370)	(4.248)	(4.259)
NPA	−4.117***	−4.113***	20.666
	(0.942)	(0.941)	(13.630)
ln(TA)	−0.470***	−0.458***	−0.427***
	(0.055)	(0.055)	(0.058)
Deposits	0.142	0.141	0.168
	(0.313)	(0.313)	(0.313)
Post Crisis	0.008	0.008	0.008
	(0.022)	(0.022)	(0.022)
Fin Crisis	0.010	0.011	0.009
	(0.031)	(0.031)	(0.031)
De Novo	0.091	0.089	0.091
	(0.057)	(0.057)	(0.057)
ln(TA) * ROA		0.591*	0.534
		(0.353)	(0.354)
ln(TA) * NPA			−2.100*
			(1.152)
Observations	2,134	2,134	2,134
R^2	0.255	0.256	0.257
Adjusted R^2	0.075	0.076	0.077
F Statistic	58.732*** (df = 10; 1719)	53.704*** (df = 11; 1718)	49.572*** (df = 12; 1717)
Note:			*p<0.1; **p<0.05; ***p<0.01

Table 17: Well Capitalized Banks: The Effect of the Tier 1 Risk-Based Ratio on Consumer Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is total consumer loan amount outstanding as a percent of total assets. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio above 5 percent, and risk-based capital ratio above 10 percent.

	Dependent variable:		
	Percent Change in Consumer Loans		
	(1)	(2)	(3)
Cons. Loans	-1.267^{***}	-1.264^{***}	-1.263^{***}
	(0.038)	(0.038)	(0.038)
T1RBCR	-0.391^{***}	-0.398^{***}	-0.396^{***}
	(0.051)	(0.051)	(0.051)
TE	-0.181^{**}	-0.219^{***}	-0.217^{***}
	(0.080)	(0.081)	(0.081)
ROA	-0.934^{***}	-9.570^{***}	-8.892^{***}
	(0.211)	(1.824)	(1.831)
NPA	-3.132^{***}	-3.153^{***}	9.252^{***}
	(0.279)	(0.279)	(2.935)
ln(TA)	-0.102^{***}	-0.105^{***}	-0.102^{***}
	(0.004)	(0.004)	(0.004)
Deposits	-0.527^{***}	-0.527^{***}	-0.528^{***}
	(0.030)	(0.030)	(0.030)
Post Crisis	0.014^{***}	0.014^{***}	0.014^{***}
	(0.003)	(0.003)	(0.003)
Fin Crisis	-0.507^{***}	-0.507^{***}	-0.506^{***}
	(0.003)	(0.003)	(0.003)
De Novo	0.108^{***}	0.106^{***}	0.106^{***}
	(0.008)	(0.008)	(0.008)
ln(TA) * ROA		0.703^{***}	0.645^{***}
		(0.148)	(0.148)
ln(TA) * NPA			-1.077^{***}
			(0.254)
Observations	138,970	138,970	138,970
R^2	0.251	0.251	0.251
Adjusted R^2	0.197	0.197	0.197
F Statistic	$4{,}336.940^{***}$ (df = 10; 129739)	$3{,}945.398^{***}$ (df = 11; 129738)	$3{,}618.592^{***}$ (df = 12; 129737)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 18: Poorly Capitalized Banks: The Effect of the Tier 1 Risk-Based Ratio on Consumer Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is total consumer loan amount outstanding as a percent of total assets. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio below 5 percent, and risk-based capital ratio below 10 percent

	Dependent variable:		
	Percent Change in Consumer Loans		
	(1)	(2)	(3)
Cons. Loans	-4.917^{***}	-4.839^{***}	-4.824^{***}
	(1.033)	(1.035)	(1.034)
T1RBCR	1.877	1.951	1.877
	(1.407)	(1.408)	(1.408)
TE	3.436^{*}	3.529^{*}	3.444^{*}
	(1.934)	(1.936)	(1.936)
ROA	−0.730	7.187	5.817
	(0.581)	(7.048)	(7.106)
NPA	−0.710	−0.718	−35.100
	(1.578)	(1.578)	(23.398)
ln(TA)	0.030	0.020	−0.022
	(0.090)	(0.091)	(0.095)
Deposits	0.144	0.157	0.123
	(0.507)	(0.507)	(0.507)
Post Crisis	0.010	0.010	0.009
	(0.035)	(0.035)	(0.035)
Fin Crisis	-0.575^{***}	-0.579^{***}	-0.577^{***}
	(0.052)	(0.052)	(0.052)
De Novo	0.194	0.203	0.194
	(0.126)	(0.126)	(0.126)
ln(TA) * ROA		−0.657	−0.538
		(0.583)	(0.588)
ln(TA) * NPA			2.885
			(1.959)
Observations	1,548	1,548	1,548
R^2	0.399	0.400	0.401
Adjusted R^2	0.237	0.237	0.238
F Statistic	80.914^{***} (df = 10; 1218)	73.690^{***} (df = 11; 1217)	67.794^{***} (df = 12; 1216)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 19: Well Capitalized Banks: The Effect of the Tier 1 Risk-Based Ratio on RE Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percentage change in the amount of real-estate loans outstanding. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio above 5 percent, and risk-based capital ratio above 10 percent.

	Dependent variable:		
	Percent Change in real-estate Loans		
	(1)	(2)	(3)
Cons. Loans	-0.869^{***}	-0.867^{***}	-0.867^{***}
	(0.006)	(0.006)	(0.006)
T1RBCR	-0.383^{***}	-0.389^{***}	-0.388^{***}
	(0.023)	(0.023)	(0.023)
TE	0.798^{***}	0.762^{***}	0.763^{***}
	(0.036)	(0.036)	(0.036)
ROA	-0.963^{***}	-11.219^{***}	-10.835^{***}
	(0.096)	(0.835)	(0.840)
NPA	-2.396^{***}	-2.406^{***}	3.329^{**}
	(0.128)	(0.128)	(1.369)
ln(TA)	0.046^{***}	0.042^{***}	0.044^{***}
	(0.002)	(0.002)	(0.002)
Deposits	-0.095^{***}	-0.096^{***}	-0.097^{***}
	(0.014)	(0.014)	(0.014)
Post Crisis	-0.017^{***}	-0.018^{***}	-0.018^{***}
	(0.001)	(0.001)	(0.001)
Fin Crisis	-0.021^{***}	-0.021^{***}	-0.021^{***}
	(0.001)	(0.001)	(0.001)
De Novo	0.052^{***}	0.050^{***}	0.050^{***}
	(0.003)	(0.003)	(0.003)
ln(TA) * ROA		0.847^{***}	0.814^{***}
		(0.069)	(0.069)
ln(TA) * NPA			-0.499^{***}
			(0.118)
Observations	190,909	190,909	190,909
R^2	0.183	0.183	0.184
Adjusted R^2	0.140	0.141	0.141
F Statistic	$4{,}056.319^{***}$ (df = 10; 181370)	$3{,}704.532^{***}$ (df = 11; 181369)	$3{,}397.609^{***}$ (df = 12; 181368)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 20: Poorly Capitalized Banks: The Effect of the Tier 1 Risk-Based Ratio on RE Loans: Results are from fixed-effects models with bank fixed effects, for the years 2001 through 2017. Data are quarterly. The dependent variable is the percentage change in the amount of real-estate loans outstanding. All variables are lagged one year relative to the dependent variable. This data set includes only banks with both a tier 1 leverage ratio below 5 percent, and risk-based capital ratio below 10 percent.

	Dependent variable:		
	Percent Change in real-estate Loans		
	(1)	(2)	(3)
Cons. Loans	-0.953^{***}	-0.952^{***}	-0.951^{***}
	(0.031)	(0.031)	(0.031)
T1RBCR	1.106^{***}	1.120^{***}	1.125^{***}
	(0.307)	(0.307)	(0.307)
TE	1.965^{***}	1.989^{***}	2.005^{***}
	(0.429)	(0.430)	(0.430)
ROA	0.111	1.966	2.182
	(0.140)	(1.608)	(1.613)
NPA	0.304	0.305	8.732^{*}
	(0.359)	(0.359)	(5.138)
ln(TA)	-0.106^{***}	-0.109^{***}	-0.099^{***}
	(0.021)	(0.022)	(0.022)
Deposits	-0.052	-0.052	-0.044
	(0.116)	(0.116)	(0.116)
Post Crisis	0.016^{*}	0.016^{**}	0.016^{**}
	(0.008)	(0.008)	(0.008)
Fin Crisis	0.060^{***}	0.059^{***}	0.059^{***}
	(0.011)	(0.011)	(0.011)
De Novo	-0.083^{***}	-0.082^{***}	-0.082^{***}
	(0.021)	(0.021)	(0.021)
ln(TA) * ROA		-0.155	-0.174
		(0.133)	(0.134)
ln(TA) * NPA			-0.715
			(0.435)
Observations	2,176	2,176	2,176
R^2	0.433	0.434	0.435
Adjusted R^2	0.298	0.298	0.298
F Statistic	134.151^{***} (df = 10; 1755)	122.101^{***} (df = 11; 1754)	112.260^{***} (df = 12; 1753)

Note: *p<0.1; **p<0.05; ***p<0.01

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