Does Bank Supervision have Side Effects? Evidence from CAMEL ratings

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Abstract

In this paper we test and measure the long-term impact of CAMEL downgrades (the composite index and its components) on loan growth. We do so by estimating loan growth equations at the state-level augmented by average CAMEL ratings for all banks in the state, as well as other control variables. We compare the impact of CAMEL downgrades over two different periods: 1985 to 1993 (a period during which the average CAMEL composite index was relatively high and rising, indicating higher failure potential) and 1994 to 2004 (a period during which the average CAMEL composite index was generally low and declining, indicating lower failure potential). We also compare the results for the entire sample with those obtained from the sub-sample of states with the worst banking conditions. The findings indicate that the impact of CAMEL downgrades on loan growth varies with existing banking conditions and with the component of CAMEL that gets downgraded.

Keywords: Loan growth equations, CAMEL downgrades, banking sector conditions.

JEL Classification Codes: E44, G21

I. Introduction

It is widely accepted that bank regulation and supervision exists to promote an efficient and competitive banking system; to prevent the occurrence of unnecessary financial disruptions caused by banking panics and failures; and to reduce depositor's risk exposure to episodes of financial distress. While these objectives benefit society, it is important to recognize that they are not costless. Indeed, many studies of bank regulation focus on the identification and estimation of these costs. The concern stems from the possibility that regulatory oversight can unintentionally impose costs that may be unduly burdensome, thereby becoming financial straightjackets for bank lending operations.

The purpose of this paper is to study in greater detail how bank supervision, through its evaluation process, impacts bank-lending operations. Regulatory oversight requires that all federally insured commercial banks be periodically evaluated through on-site examinations as well as off-site monitoring. The evaluation results in the assignment of a "CAMEL" rating based on the overall financial health of the institution.[1] A downgrade in this rating conveys the message that the bank's financial health has deteriorated, and thus management must take corrective action. Hence, "CAMEL" ratings downgrades, especially those to the 3, 4 or 5 level, would be associated with more conservative or restricted lending practices and potentially higher capital requirements at least in the short run. Thus, changes in "CAMEL" ratings can be useful for measuring the degree of bank regulatory oversight and its impact on bank lending operations.

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[1] "CAMELS" stands for: Capital, Asset quality, Management, Earnings, and Liquidity. These are the five categories supervisors use when examining banks until 1997. On January 1, 1997, a sixth rating component, sensitivity to market risk, was added. We do not use this component in this study since it was not available for the entire sample period. The ratings are assigned on a scale from 1 to 5, with 1 being the highest (healthiest possible condition) and 5 being the lowest (worst possible financial condition).

To measure the impact of regulatory oversight on bank lending, we estimate bank loan growth equations at the state-level augmented by the inclusion average CAMEL ratings for all banks in the state, as well as many other control variables. Although it is possible to estimate this equation at the aggregate (national) level, we choose to focus on the state level because of the important regional differences in the severity of economic fluctuations observed in the U.S in recent decades. These differences may be masked if the loan growth equations were estimated at the aggregate level. We could, alternatively, estimate this equation using bank-level data, since after all, the intuition that underlies our hypothesis applies to a single bank. Our interest, however, is macroeconomic in nature. We investigate whether a "systemic" downgrade has any implications for loan growth (at an aggregate level), and hence output. Although other papers have also investigated this issue, few, if any, concentrate on answering the question of "How much?" We test for the above-described relationship and quantify it using a cross-section time-series dataset that includes all 50 states plus the District of Columbia from the first quarter of 1985 to the third quarter of 2004.

We also do something novel in this paper—we examine whether different downgrades lead to different outcomes for loan growth. Specifically, we test how downgrades in each of the five CAMEL components affect aggregate loan growth. This is worth investigating since different downgrades may result in different policy responses from the bank's perspective. For example, a downgrade in the asset quality component of CAMEL probably reflects deterioration in the bank's weighted classified asset ratio. A bank that receives such downgrade will probably place more emphasis in monitoring past-due loans, insider loans, and perhaps reconsider its lending policies. A downgrade in

the management component of CAMEL, however, probably reflects a lack of compliance with applicable banking laws are regulations, or perhaps, from the perspective of the examiner, a general deterioration in safe and sound managerial practices. A severe enough downgrade in this component may results in the replacement of senior management. Although it is not clear which of these two downgrades will affect loan growth (if at all) the most, it is unlikely that they will affect it in the exact same way. This is clearly an empirical issue with policymaking implications, and thus, worthy of further investigation.

As indicated above, recent research in banking regulation finds that bank supervision has indeed had an adverse effect on bank lending. For example, Peek and Rosengren (1995) find that the sensational decline in the growth rate of bank lending in New England, which worsened the 1990-1991 recession, was partly attributable to credit contraction driven by the active enforcement of capital requirements, as institutions shrank their assets to meet the newly imposed requirements. Berger, Kyle, and Scalise (2001) use CAMEL ratings to examine the following three issues: (1) whether bank supervisors were particularly harsh during the 1989-92 credit crunch period, (2) whether they were more lenient in their evaluations in the 1993-98 recovery period, and (3) whether these changes in the aggressiveness of bank supervision had any effect on bank lending behavior. They find that indeed bank examiners had been tougher during the credit crunch period than during the 1993-98 period. However, they also find that these changes in the intensity of supervisory evaluations had a very small (though statistically significant) effect on bank lending practices.

In a related paper, Peek, Rosengren, and Tootell (2003) use the proportion of banks that have a CAMEL 5 rating (the worst rating) as an instrument for identifying loan supply shocks. They show that banks that receive this rating change their lending behavior dramatically. They go on to demonstrate that GDP growth forecast errors (the difference between actual GDP growth and its forecast) are correlated with this proxy for loan supply shocks.

This paper is closest in spirit to that of Berger, Kyle, and Scalise (2001), but it differs in many important respects. First, they look at bank-level data, while our unit of observation is aggregate bank lending at the state level. This is an important difference to highlight because it is possible that supervisory toughness may have a small effect in bank-lending operations at the bank level (as they find), but if enough banks in a state or region experience a supervisory downgrade, the aggregate consequences could be significant in a qualitative as well as quantitative sense. Also, as indicated above, we adopt the novel approach of examining the impact of CAMEL component downgrades on loan growth.

The results indicate that the impact of CAMEL downgrades on loan growth depends on several factors. First, the existing level of the composite CAMEL matters. Downgrades that occur when the banking sector has a relatively low average CAMEL rating do not appear to have a strong impact on lending growth. We test this by comparing the impact of CAMEL downgrades on loan growth over two different periods: 1985 to 1993 (a period during which the average CAMEL composite index was relatively high and rising) and 1994 to 2004 (a period during which the average CAMEL composite index was generally low and declining).

We confirm that the existing level of the composite CAMEL matters by comparing the results for the entire population with those obtained from a subset of states (consisting of the bottom 25^{th} percentile in terms of the average composite ratings). The results clearly show that the impact of CAMEL on loan growth is higher in the weaker sub-sample of states.

Second, we find that the effect of CAMEL on loan growth depends on the components. Thus, not all downgrades are the same. During the first period, for example, downgrades in the management component of CAMEL have an impact on loan growth that is nearly twice as high as the impact of the other components. During the second period, it is the capital and asset quality components that have the largest impact. We argue that this difference in the impact of components has to do with the implementation of FIDICIA after 1991, since it introduced risk-based deposit insurance pricing as well as incentives to keep banks well capitalized.

The rest of this paper is organized as follows. The following section describes the data underlying this study, and analyzes basic summary statistics. Section III describes in more detail the econometric test, and discusses the main results of the paper. Lastly, section IV concludes.

II. Data

The dataset is a balanced panel of variables measured at the state level for every state plus the District of Columbia, from the first quarter of 1985 to the third quarter of 2004. It includes: total bank lending, lending to asset ratio, revenue from loans and leases divided by total assets, non-current loans divided by total assets, and total equity capital

divided by assets, all obtained from the Call reports. We complemented this dataset by including state product income obtained from the Bureau of Economic Analysis website. In addition, we computed the weighted (by asset size) average CAMEL rating for all federally insured depository institutions in each state. Since this average is computed for each quarter, it will change from one quarter to the next if at least one bank in the state has an examination that results in a change in its CAMEL rating (either the composite or its components). The idea is, of course, to pick up the statewide consequences for bank lending from these changes in ratings.

Table 1 presents the average (computed over all four quarters in each year and for all states) of the variables described above, for each of the years considered in our sample period. Notice that this sample includes the so-called credit crunch period (from 1989 to 1992), as well as the boom period (1993 to 2000). Evident from the table is the rise in the average CAMEL rating (composite) peaking at 2.51 in 1991, gradually declining to approximately 1.7 after 2000. This trend is consistent with the notion that supervisory assessments significantly deteriorated during the credit crunch period, and eased quite dramatically during the boom years. Also consistent with expectations is the time series pattern observed for the log of loans and leases (computed in real terms)—there is a clear slowdown in bank lending between 1991 and 1993. The next four variables (loan to asset ratio, revenue from loans divided by assets, non-current loans to asset ratio, and the equity-asset ratio) depict different patterns over the 20-year sample period. While the loan to asset ratio remains roughly constant, revenue from loan and leases divided by assets generally declined. This can be at least partly attributable to the downward trend in interest rates during this period. The ratio of non-current loans to assets depicts a pattern

that is also generally consistent with expectations—relatively higher during the credit crunch period, gradually declining during the boom period. The table also indicates that the equity to asset ratio improved significantly, rising by almost 75 percent between 1985 and 2004. Lastly, the real state product income time series shows the two recessionary periods that occurred during the sample period: in 1990-1991 with no growth, and again, in 2001-2002 with virtually no growth either.

A central aspect of this paper is the estimation of the impact of the CAMEL components on loan growth. Hence, it is important to also examine the time series pattern of the components, relative to that of the composite index. Figure 1 presents these patterns over time. The pattern for the composite index mimics, as it should, the time series figures presented in Table 1—rapidly raising to a peak of 2.51 in early 1991, and gradually declining until 1997 after which it was relatively flat throughout the rest of the sample period. It should also be clear from the figure that although the composite and the components generally share the same trend over time—rising during the early 1990s and declining during the boom period, there is enough difference among them to warrant further investigation. First, there is a clear convergence of these series during the mid 1990s—the components and the composite are much further apart from each other during the beginning of the sample period, much closer together during the 1996 to 1998 period, and again, a slightly divergent during the last part of the period (2000 to 2004). These differences in patterns suggest that supervisory assessments emphasized different categories over time. For example, near the peak of the composite index (early 1991), the asset quality component was above all others, clearly implying that the bank's weighted classified asset ratio had significantly deteriorated during this period. By the mid 1990s,

however, this component was below all others, suggesting that the other components had deteriorated by a relatively larger margin. In the following section, we examine in more detail how each of the components affect bank loan growth.

II. Methodology and Results

To estimate and quantify the effect of CAMEL ratings on bank loan growth, we construct a parsimonious model of loan growth, and augment it by the inclusion of the ratings. The estimated model takes on the following form:

$$\Delta l_{i,t} = \alpha + \sum_{j=1}^{n_l} \beta_j \Delta l_{i,t-j} + \sum_{j=1}^{n_{camel}} \theta_j \Delta CAMEL_{i,t-j} + \sum_{j=1}^{n_{controls}} \gamma_j \Delta controls_{i,t-j} + \varepsilon_{i,t}$$

Where l stands for the log of loans in real terms in state i and time t, and Δ indicates change. The β's coefficients measure the effect of the lagged dependent variable, which is included to model the cyclical pattern of loan growth. Since we are using quarterly data, we include four lags (i.e. $n_l = 4$). The *CAMEL* variables included are the composite index and its five components. The finite distributed lag specification allows the CAMEL variable to affect loan growth with a lag. The sum of the θ coefficients measures the long-term impact of CAMEL on loan growth, a value of primary interest in this study. We allow up to six lags (i.e. $n_{camels} = 6$) of this variable, since bank examiners currently evaluate banks on average every 18 months.

The *controls* included are: (1) revenue from loan and leases divided by assets; (2) non-current loans to asset ratio; (3) equity to asset ratio; and (4) the log of real state product income. The first three control variables are included to capture the influence of balance sheet and income ratios on loan growth. For example, a general deterioration in

the asset quality of the balance sheet (captured by an increase in the non-current loans to asset ratio) may lead to a voluntary reduction in bank lending, as bankers may try to cope with the deterioration in the quality of assets by adopting a more restrictive in loan policy (see Berger and Udell, 1994, and Wagster, 1999). A change in revenue from loans may be a signal of a change in interest rates, which may result in adjustments to loan growth. Finally, a change in the equity to asset ratio may have implications for future loan growth as well. The fourth control variable, lagged changes in state income, is included to capture the influence of demand conditions on loan growth. To keep consistency with the lag structure imposed on the CAMEL variable, we selected $n_{control}$ to be six as well.

We estimate the model for two different time periods: (1) 1985-1993 and (2) 1994-2004. We do this for several reasons. First, we wanted to evaluate the possibility the credit crunch made a difference. As indicated earlier, previous research has argued that the most important reason behind the slowdown in bank lending during the 1989-91 period was the active enforcement of capital requirements (Peek and Rosengren, 1995). Second, it is possible that FIDICIA, which was passed in 1991, and implemented two years later, may have also influenced the effect of CAMEL on loan growth. Lastly, according to Berger, Kyle, and Scalise (2001) these two periods are very different from each other in terms of the aggressiveness of bank examiners—during the earlier period examiners were much tougher in their assessments than they were during the second period.

Our regressions are estimated using the Arellano and Bond (1991) GMM procedure, since we have a dynamic model with a lagged dependent variable on a panel dataset.

Tables 2 through 5 present the main results. Tables 2 and 3 present the regression results for the first period, while Tables 4 and 5 present the results for the second period. All tables report the long-term impact of CAMEL on loan growth (i.e. the sum of the θ coefficients) using all 6 lags. Although the control variables are included in all regressions, we do not report the coefficients.[2] According to the results in Table 2, a ten percent increase in the average composite CAMEL will reduce loan growth by nearly one half of one percent over a period of 18 months. This may not seem like a substantial amount, but given that the average annual loan growth rate during this period was nearly 2.5 percent, it implies that a ten percent increase (roughly equivalent to a one standard deviation shock) in the composite CAMEL can slow down the average loan growth rate by nearly 15 percent, a change large enough to have an visible effect on aggregate economic activity.

Table 2 also presents the results for the CAMEL components for the first period. The results reveal that the impact of CAMEL on loan growth varies with the component considered. Although they are all significant in a statistical sense, they differ in terms on the magnitude of the effect. In particular, the results show that the management component has the highest impact—about 25 percent higher than that of the composite effect. The capital, asset, and liquidity components of CAMEL have a slightly lower impact, while the earnings component has a similar effect on loan growth as that of the composite index. In relation to each other, the management component effect is nearly twice as high as that of capital, assets, and liquidity, and almost 50 percent higher than the impact of earnings. A statistical test for the difference in coefficients indicates that the

[2] With four control variables and 6 lags for each of them, we have a minimum of 24 coefficients, not counting those from the lagged dependent variable.

management coefficient is statistically different from the others at the 5 percent level or better with respect to the capital, assets, and liquidity, and at the 10 percent level with respect to earnings.[3] Hence, during the first period, downgrades in the management component of CAMEL appear to have been much more costly for loan growth than any of the other components. In some respect, this is not a surprising result. An effective bank examiner evaluates management over a broad number of criteria. If there is a perception of deterioration in safe and sound managerial practices, the examiner will most likely recommend that management take on corrective steps, before the deterioration in these practices ends up seriously affecting the financial health of the institution.

Table 3 presents results of the same regressions ran in Table 2, but for states in the bottom 25th percentile in terms of the average composite CAMEL rating (i.e. the 12 or 13 states with the highest average rating). The idea behind looking at this subset of states is twofold. First, we would like to examine the robustness of our results. In particular, it is important to determine that the result that management is the most important component in affecting loan growth is not driven by a particular set of states. The results in Table 3 confirm the robustness of the results—the management component continues to be the most important of them, with a coefficient close to 0.10. More generally, the ranking results in Table 3 are roughly the same as those in Table 2.

The second aspect worth highlighting is the increase in the magnitude of the effects. In particular, it is evident that the coefficients of the CAMEL components and the composite increased dramatically, some of them nearly doubling in size. This suggests that the effect of CAMEL on loan growth is dependent on the state's average composite CAMEL level, a result that squares nicely with straightforward intuition. For the typical

[3] The difference in coefficient test follows a t-distribution. The results described are for a one-tailed test.

bank, a downgrade from 1 to 2 will result in a less dramatic response than a downgrade from 2 to 3, or 3 to 4. Thus, as the statewide CAMEL composite deteriorates, the proportion of banks constraining loan growth increases as well, resulting in a larger impact on loan growth.

Table 4 presents the results for the second period. They are different from those obtained for the first period is several respects. First, although the CAMEL composite coefficient is larger than the one obtained for the first period in terms of magnitude, it is not estimated with the same precision—in terms of significance, it is just above the 10 percent cutoff level. Secondly, while the management component had the highest impact in the first period, it has virtually no effect on output in the second. In addition, the most important components in terms of magnitude and significance are the capital component with an effect of 0.08, and the assets component with an impact of over 0.10. Lastly, neither the earnings nor liquidity component had any significant effect on loan growth.

The overall weakening of the composite effect in the second period can be explained by the fact that during this period there were very few, if any, downgrades. By the end of the 1990s the vast majority of federally insured institutions had a composite rating of 1, and a few with 2. As we argued above, with most banks at this level, marginal changes in the composite index are likely to reflect cases of downgrades from 1 to 2, which tend to result in a modest bank response, and thus, have a limited impact on loan growth.

Although we do not have a solid explanation as to why the capital and assets components increased in magnitude and remain statistically significant during the second period, it is tempting to argue that FDICIA, the Federal Deposit Insurance Corporation

Improvement Act of 1991, has a something to do with it. This Act imposed risk-based deposit insurance pricing and stipulated a procedure for Prompt Corrective Action for banks and thrifts that are weakly capitalized. Hence, it is very likely that after FDICIA was implemented, bank examiners shifted their focus and concentrated their efforts in ensuring that institutions were not only well-capitalized, but that their asset quality improved as well. Moreover, with the implementation of FDICIA, banks arguably are likely to respond more significantly to a downgrade in the assets or capital component, than to a downgrade in any of the other three components.

The summary statistics in Table 1 lend some support for this view. Because FDICIA stipulates that the deposit insurance premium depends on the capitalization and the overall financial condition of the institution, banks have a strong incentive to stay well capitalized and have healthy balance sheet figures. Banks improved in both of these respects during the second period. As Table 1 indicates, the equity to asset ratio has been steadily increasing since 1990, and the non-current loan to asset ratio has been decreasing since 1991.

Table 5 presents the results of the regressions in Table 4, again for the states in the bottom 25^{th} percentile in terms of the average CAMEL composite rating. The results reveal a pattern similar to that obtained in Table 4. Once again, the capital and assets components have the highest impact on loan growth, while the other three have almost no statistically significant effect, with the exception of the earnings component. The consistency of the pattern between Tables 4 and 5 attests to the robustness of the results. In addition, just as in Table 3, the increase in the magnitude of the coefficients that are

significant suggests, as we argued earlier, that the effect of CAMEL on loan growth is dependent on the composite CAMEL level.

IV. Conclusion

This main objective of this paper is to measure and quantify the effect of bank supervision on bank lending behavior. Specifically, we estimate loan growth regressions and augment them by the inclusion of average CAMEL ratings (the composite index and its components), as well as several other control variables. We perform these regressions for two different time periods (1985 through 1993, and 1994 through 2004), and compare the impact across periods. We also compare the results for the entire sample with those obtained from the sub-sample of states with the worse banking conditions.

In our view, the most important lessons from this paper are two: First, CAMEL downgrades do matter, and their impact on loan growth tends to get larger as the overall health of the banking sector deteriorates. In terms of the magnitude, we find that if the average composite CAMEL rating for the banking sector is at least 2, a ten percent decline in the rating (roughly equivalent to a one standard deviation shock) can slow down the rate of loan growth by approximately 15 percent.

Second, not all downgrades are the same. That is, we find significant evidence suggesting that <u>how</u> the banking sector gets downgraded affects the impact of the downgrade on loan growth. We evaluate the impact of each of the different CAMEL components (Capital, Assets, Management, Earnings, and Liquidity), and find that their relative impact differs from each other and over the two time periods. In particular, we find that the management component has the largest impact on loan growth during the

first period, but virtually no effect during the second period. By contrast, while in the first period the capital and assets component had a statistically significant but limited impact on loan growth, it had a much stronger effect during the second period.

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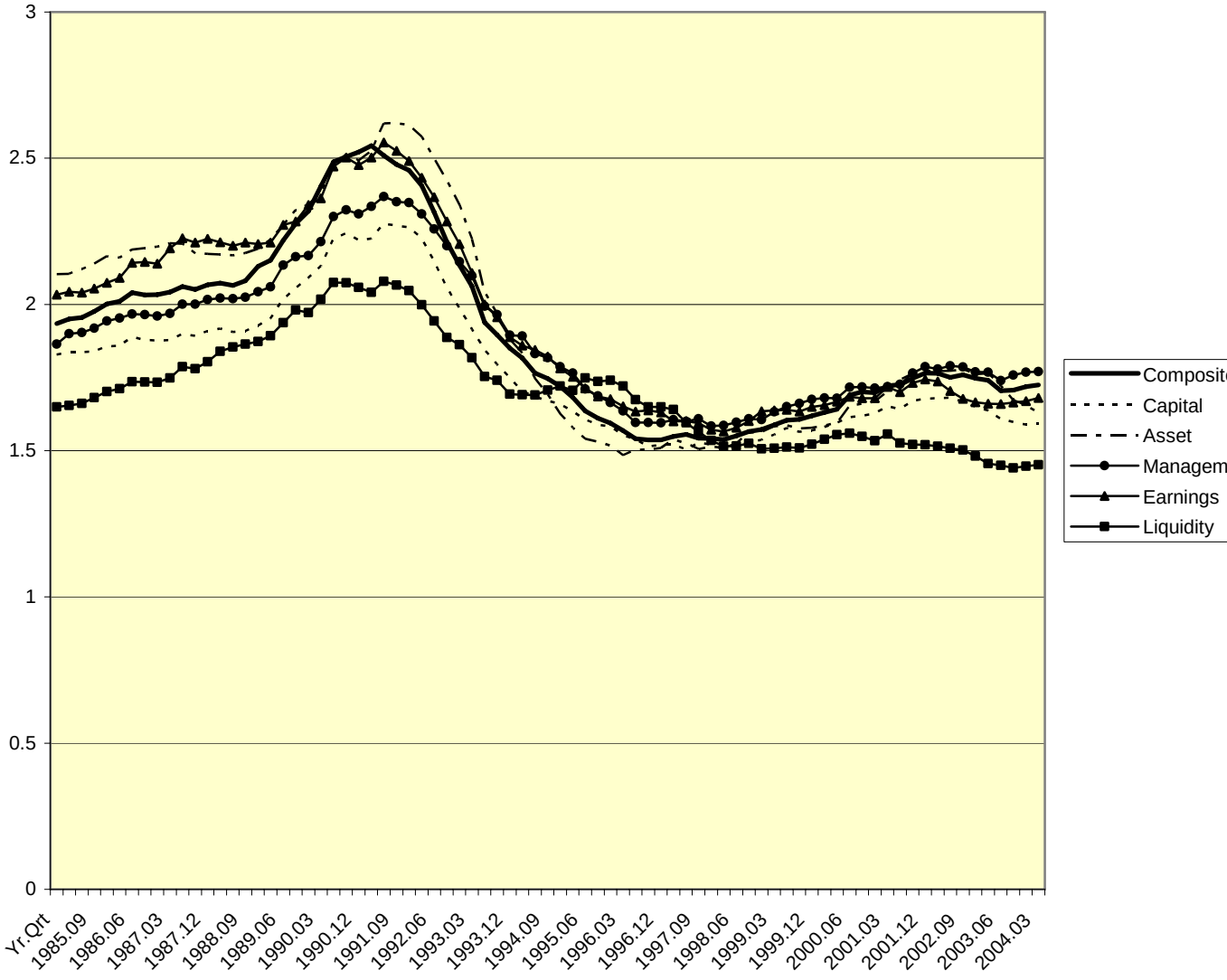
Figure 1

CAMEL Composite and Components Over Time



This chart presents the weighted average CAMEL composite and its components for all federally insured banks in the U.S.

Table 1
Summary Statistics

Year	*Log(loans and leases)*	*Average CAMEL rating*	*Loan and leases/ Assets*	*Revenue from loan and leases/ Assets*	*Non-current loans/ Assets*	*Equity/ Assets*	*Average Log(Real State Product Income)*
1985	12.218	1.954	0.609	0.073	0.016	6.063	5.920
1986	12.282	2.022	0.602	0.068	0.019	6.213	5.952
1987	12.297	2.047	0.599	0.062	0.022	6.215	5.967
1988	12.326	2.071	0.605	0.063	0.020	6.010	5.993
1989	12.301	2.194	0.610	0.070	0.017	6.644	6.026
1990	12.235	2.429	0.606	0.069	0.016	6.897	6.034
1991	12.171	2.513	0.597	0.064	0.018	7.237	6.034
1992	12.118	2.349	0.581	0.056	0.015	7.912	6.069
1993	12.116	2.007	0.584	0.050	0.010	8.532	6.082
1994	12.168	1.794	0.599	0.050	0.007	8.579	6.110
1995	12.249	1.662	0.625	0.057	0.006	8.823	6.132
1996	12.240	1.559	0.637	0.058	0.007	8.995	6.162
1997	12.182	1.546	0.641	0.059	0.007	9.397	6.194
1998	12.215	1.548	0.638	0.058	0.006	9.526	6.246
1999	12.246	1.593	0.641	0.056	0.006	9.331	6.269
2000	12.291	1.644	0.649	0.058	0.006	9.201	6.306
2001	12.294	1.711	0.639	0.057	0.007	9.660	6.324
2002	12.303	1.757	0.627	0.047	0.007	10.111	6.329
2003	12.339	1.738	0.625	0.042	0.006	10.193	6.341
2004	12.376	1.717	0.641	0.039	0.005	10.589	6.364

This table presents summary statistics for all states by year.

Table 2
Measuring the Impact of CAMELS on Loan Growth
First Period: 1985q1 to 1993q4

	Where x is:	***Where x is:***	***Where x is:***	***Where x is:***	***Where x is:***	***Where x is:***
	CAMELS Composite	CAMELS Capital	CAMELS Asset Quality	CAMELS Mgmt	CAMELS Earnings	CAMELS Liquidity
$\sum_{i=1}^{6} x_{t-i}$	-0.047[a]	-0.033[a]	-0.028[a]	-0.062[a]	-0.042[a]	-0.033[a]
	(0.012)	(0.014)	(0.012)	(0.014)	(0.010)	(0.012)
Controls Included?	YES	YES	YES	YES	YES	YES
Residual order 1 test	-31.89	-32.05	-31.94	-31.98	-32.20	-32.00
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Residual order 2 test	0.30	0.28	-0.17	-0.46	-0.31	0.02
p-value	[0.763]	[0.781]	[0.867]	[0.646]	[0.757]	[0.981]
No. Obs.	1479	1479	1479	1479	1479	1479

This table presents the impact of a CAMEL (composite index and its components) downgrade on aggregate loan growth. The "Controls included" are: (1) revenue from loan and leases divided by assets; (2) non-current loans to asset ratio; (3) equity to asset ratio; and (4) the log of real state product income. The statistic presented is the sum of the coefficients for the 6 lags included in each regression. Standard errors are included under the sum of the coefficients. An "a" indicates significance at the 5 percent level or better. A "b" indicates significance at the 10 percent level or better. The control variables included are: 4 lags of loan growth; 6 lags of bank financial indicators (non-current loans/total assets; income from loans and leases/total assets; equity/total assets); and 6 lags of state product income. The "residual order 1 test" and "residual order 2 test" are the Arellano-Bond tests that average autocovariance in residuals are of first or second order. The p-value of each test is included in brackets under each test. "No. Obs." is the number of observations.

Table 3
Measuring the Impact of CAMELS on Loan Growth
First Period: 1985q1 to 1993q4 (States in the bottom 25th percentile)

	Where x is:	***Where x is:***	***Where x is:***	***Where x is:***	***Where x is:***	***Where x is:***
	CAMELS Composite	CAMELS Capital	CAMELS Asset Quality	CAMELS Mgmt	CAMELS Earnings	CAMELS Liquidity
$\sum_{i=1}^{6} x_{t-i}$	-0.087[a]	-0.075[a]	-0.060[a]	-0.096[a]	-0.074[a]	-0.047[a]
	(0.025)	(0.030)	(0.024)	(0.029)	(0.022)	(0.022)
Controls Included?	YES	YES	YES	YES	YES	YES
Residual order 1 test	-15.81	-16.42	-16.21	-16.32	-16.25	-16.65
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Residual order 2 test	0.28	0.26	-0.68	0.11	0.02	-0.33
p-value	[0.777]	[0.798]	[0.495]	[0.913]	[0.986]	[0.741]
No. Obs.	377	377	377	377	377	377

This table presents the impact of a CAMEL (composite index and its components) downgrade on aggregate loan growth. The "Controls included" are: (1) revenue from loan and leases divided by assets; (2) non-current loans to asset ratio; (3) equity to asset ratio; and (4) the log of real state product income. The statistic presented is the sum of the coefficients for the 6 lags included in each regression. Standard errors are included under the sum of the coefficients. An "a" indicates significance at the 5 percent level or better. A "b" indicates significance at the 10 percent level or better. The control variables included are: 4 lags of loan growth; 6 lags of bank financial indicators (non-current loans/total assets; income from loans and leases/total assets; equity/total assets); and 6 lags of state product income. The "residual order 1 test" and "residual order 2 test" are the Arellano-Bond tests that average autocovariance in residuals are of first or second order. The p-value of each test is included in brackets under each test. "No. Obs." is the number of observations.

Table 4
Measuring the Impact of CAMELS on Loan Growth
Second Period: 1994q1 to 2004q3

	Where x is:	***Where x is:***	***Where x is:***	***Where x is:***	***Where x is:***	***Where x is:***
	CAMELS Composite	CAMELS Capital	CAMELS Asset Quality	CAMELS Mgmt	CAMELS Earnings	CAMELS Liquidity
$\sum_{i=1}^{6} x_{t-i}$	-0.076	-0.078[b]	-0.106[a]	-0.000	-0.001	-0.029
	(0.046)	(0.042)	(0.040)	(0.042)	(0.019)	(0.041)
Controls Included?	YES	YES	YES	YES	YES	YES
Residual order 1 test	-37.42	-37.31	-37.38	-37.40	-37.33	-37.44
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Residual order 2 test	0.73	1.10	0.74	1.40	1.28	0.43
p-value	[0.468]	[0.272]	[0.462]	[0.161]	[0.201]	[0.669]
No. Obs.	1836	1836	1836	1836	1836	1836

This table presents the impact of a CAMEL (composite index and its components) downgrade on aggregate loan growth. The "Controls included" are: (1) revenue from loan and leases divided by assets; (2) non-current loans to asset ratio; (3) equity to asset ratio; and (4) the log of real state product income. The statistic presented is the sum of the coefficients for the 6 lags included in each regression. Standard errors are included under the sum of the coefficients. An "a" indicates significance at the 5 percent level or better. A "b" indicates significance at the 10 percent level or better. The control variables included are: 4 lags of loan growth; 6 lags of bank financial indicators (non-current loans/total assets; income from loans and leases/total assets; equity/total assets); and 6 lags of state product income. The "residual order 1 test" and "residual order 2 test" are the Arellano-Bond tests that average autocovariance in residuals are of first or second order. The p-value of each test is included in brackets under each test. "No. Obs." is the number of observations.

Table 5
Measuring the Impact of CAMELS on Loan Growth
Second Period: 1994q1 to 2004q3 (States in the bottom 25th percentile)

	Where x is:	***Where x is:***	***Where x is:***	***Where x is:***	***Where x is:***	***Where x is:***
	CAMELS Composite	CAMELS Capital	CAMELS Asset Quality	CAMELS Mgmt	CAMELS Earnings	CAMELS Liquidity
$\sum_{i=1}^{6} x_{t-i}$	-0.145	-0.303[a]	-0.218[a]	-0.006	-0.162[a]	-0.077
	(0.094)	(0.069)	(0.074)	(0.095)	(0.054)	(0.055)
Controls Included?	YES	YES	YES	YES	YES	YES
Residual order 1 test	-18.97	-18.61	-18.85	-18.91	-18.81	-18.98
p-value	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Residual order 2 test	0.21	1.21	0.64	-0.18	1.09	-0.08
p-value	[0.831]	[0.228]	[0.525]	[0.861]	[0.276]	[0.936]
No. Obs.	432	432	432	432	432	432

This table presents the impact of a CAMEL (composite index and its components) downgrade on aggregate loan growth. The "Controls included" are: (1) revenue from loan and leases divided by assets; (2) non-current loans to asset ratio; (3) equity to asset ratio; and (4) the log of real state product income. The statistic presented is the sum of the coefficients for the 6 lags included in each regression. Standard errors are included under the sum of the coefficients. An "a" indicates significance at the 5 percent level or better. A "b" indicates significance at the 10 percent level or better. The control variables included are: 4 lags of loan growth; 6 lags of bank financial indicators (non-current loans/total assets; income from loans and leases/total assets; equity/total assets); and 6 lags of state product income. The "residual order 1 test" and "residual order 2 test" are the Arellano-Bond tests that average autocovariance in residuals are of first or second order. The p-value of each test is included in brackets under each test. "No. Obs." is the number of observations.