

FRBSF ECONOMIC LETTER

Number 2007-22, July 27, 2007

Regional Economic Conditions and Community Bank Performance

Community banks, by virtue of their size and emphasis on so-called relationship banking, typically have limited geographic scope in their activities. This would seem to imply that their financial performance would be tied closely to the financial condition of their customers and, thus, to the economic conditions in regional banking markets. Contrary to this expectation, the empirical evidence on the relationship between average community bank performance and regional economic conditions is at best mixed. Moreover, studies tend to find that information on regional economic conditions is of limited help in predicting the performance of individual banks.

In this *Economic Letter*, we argue that part of the explanation for this puzzle lies in the fact that looking at the *average* response of bank performance tends to mask the wide range of responses of *individual* banks' performances to regional economic shocks; we find evidence that individual bank responses run from significantly positive to significantly negative. At the same time, our analysis suggests that bank-specific factors are important drivers of the variation in the performance of community banks.

Previous looks at regional impacts on banks

Previous studies have found little evidence of a systematic relationship between community bank performance and regional economic conditions in regional divisions such as counties and metropolitan areas. Yeager (2004) uses three measures of performance—the ratio of nonperforming loans to total loans, net chargeoffs to total loans, and profitability—and finds little difference between community bank performance in counties experiencing large economic shocks (reflected in unemployment rates) and that in other counties. Using a different methodology, Emmons, Gilbert, and Yeager (2004) find that rates of return at community banks in the same region were not highly correlated in the late 1980s and early 1990s.

Other studies, such as Meyers and Yeager (2001) and Daly, Krainer, and Lopez (2003), examine the in-

fluences of a variety of measures of state-level economic conditions and find statistically significant effects on measures of bank performance. However, in the latter study, regional economic conditions in a state are not especially useful in predicting differences in the performance of individual banks in out-of-sample simulations.

A new look at the link

One common feature of most previous approaches is an assumption that the systematic responses of bank performance measures to a change in economic conditions are the same for all community banks. However, specialization among community banks could lead to variation in business strategies and portfolio composition, which could, in turn, lead to variation in the systematic responses of performance to regional economic conditions.

In our research (Furlong and Krainer 2007), we allow for such variations in the responses of individual banks to economic conditions. We study a large sample of community banks with total assets of \$1 million or less. The data are from the quarterly Reports of Condition filed by all domestically chartered banks from 1984 through 2004. We use return on assets (ROA)—that is, net income relative to assets—as our measure of performance.

Bank performance is assumed to depend on aggregate factors, state-level factors, and bank-specific factors. Drawing on a long tradition in finance, our proxy for the aggregate factors is the weighted-average ROA for community banks nationwide, because, at a given point in time, this measure will capture factors, such as changes in interest rates, that have systematic effects on community banks.

To derive the regional or state shocks, we assume that the banks in a state, as a group, are exposed to risks unique to that state. First we calculated the aggregate ROA for community banks in each state for each quarter. The part of a state's ROA not explained by national ROA in a quarter is defined to be the state's shock in that quarter. This approach sidesteps the difficult issue of identifying and

measuring the state-specific economic variables that drive state-level performance.

Examples of the time series for the state-specific components of ROA are shown in Figure 1 for three adjoining states—California, Oregon, and Arizona. The figure indicates that, even for community banks in states that share borders, state effects can differ substantially at any point in time. The pair-wise correlations for the state-specific components in these three states are all less than 0.2. (A value of 1.0 would mean perfect positive correlation and a value of -1.0 would mean perfect negative correlation.)

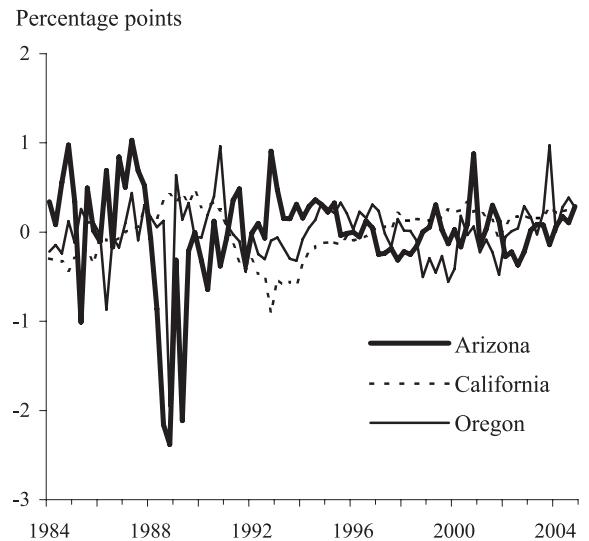
Differences in systematic responses of individual banks

With measures of the state shocks in hand, we can assess the systematic relationship (sensitivity) of the ROA of individual banks to national ROA and the state shocks using regression analysis. Individual bank regressions were run on the set of 5,255 community banks that are in our sample for the entire 20 years.

The degree of the systematic relationship can depend on the extent and type of specialization of a bank and the nature of the economic shocks. For example, a state's shocks might hit different economic sectors—commercial real estate, aerospace, information technology, subprime residential real estate loans—at different points in time. In that case, the performance of a community bank with a diversified loan portfolio might exhibit a high degree of systematic exposure to state shocks. In contrast, a highly specialized bank likely would exhibit a low degree of systematic exposure, even though the bank would be affected by economic conditions in its own sector of specialization.

The results from statistical analysis reveal considerable variation in the systematic responses of the performance of individual banks to factors affecting banks nationally and in their respective states. The solid line in Figure 2 plots the distribution of the estimated responses to changes in ROA at the national level. The coefficients generally are positive, with a median response of 0.6. That is, for a 1 percentage point change in national ROA, the median change in ROA for the sample banks would be 0.6 percentage points. The dashed line in Figure 2 plots the responses of the ROA of individual banks to state shocks, and the median value is approximately 0.4. Our analysis indicates that state

Figure 1
Estimated state components of ROA for community banks



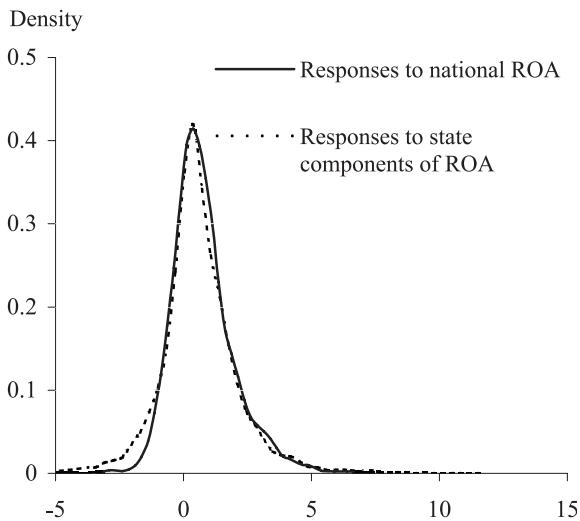
shocks had a systematic, statistically significant effect on the performance of half of the banks in the sample, with positive effects for 42% of the sample and negative effects for 8%. We would note that this combination of positive and negative effects would tend to lead to a finding of no significant effect in terms of the *average* response to state shocks.

Impact on the distribution of performance

The variation in responses to state shocks also could bias statistical analysis toward supporting a conclusion of no effect of regional shocks through changes in the variation in performance. That is, with quite different responses at the bank level, a state shock would tend to increase the spread in performance among community banks in a state, at least temporarily. In statistical analysis, an increase in spread (variance) would tend to reduce the precision of the estimated average response. The lower precision would tend to lead an analyst to accept the idea that the average effect was not different from zero.

As it turns out, state shocks do increase the variation in community bank performance within a given state market. For this stage of the analysis, we computed the variance of the distribution of ROA for each state for each quarter over the sample period. For the state shock we used the absolute value of the estimates discussed earlier, since both positive and negative shocks would be expected to widen the distribution of performance. The results show that the dispersion (variance) of individual

Figure 2
Distributions of responses of individual community banks' ROA to national and state components



bank performance within a state is positively and significantly related to the absolute value of the state shock.

Relative importance of economic shocks

The evidence so far indicates that regional shocks had statistically significant effects on the performance of about half the community banks in our sample. However, our analysis also shows that the systematic response to economic conditions still accounts for only a modest part of the overall variation in performance of individual banks. For example, allowing for different responses for each bank to national ROA could account for 4% or less of the actual variance in ROA for half of the banks. Allowing for individual responses to the state shocks improves the picture modestly, accounting for 13% or less of actual variance for half of the banks.

These results indicate that the bulk of the variation in the performance for a large number of community banks is idiosyncratic. The bank-specific effects could be related, in part, to the limited size and customer base, which may not be representative of the community at large. Credit underwriting and general business practices also can vary among banks and contribute to bank-specific risk. Finally, as suggested above, interaction between a bank's degree of specialization and the nature of the economic shocks can affect the systematic responses of performance and, thereby, bank-specific risk.

Conclusion

The connection between regional economic conditions and the performance of community banks is far from straightforward. From our analysis, regional economic shocks have had statistically significant effects on half of the community banks in the sample, with the magnitudes and even the direction of effects varying widely. Also, regional economic shocks tend to increase the variation in the performance of community banks. At the same time, the performance of most community banks still appears to be related in large part to bank-specific factors.

The analysis highlights the difficulty in generalizing about the implications of regional economic shocks for individual community banks. It suggests that a bank's performance will depend on the nature of the shocks and on the individual bank's business strategy. Even then, a bank's risk management and general business practices, as well as its customer base, may end up being more important than general economic conditions in accounting for the variability of its performance.

Fred Furlong
Group Vice President

John Krainer
Economist

References

[URLs accessed July 2007.]

- Daly, Mary C., John Krainer, and Jose A. Lopez. 2003. "Does Regional Economic Performance Affect Bank Conditions? New Analysis of an Old Question." FRB San Francisco working paper 2004-01. <http://www.frbsf.org/publications/economics/papers/2004/wp04-01bk.pdf>
- Emmons, William, Alton Gilbert, and Timothy Yeager. 2004. "Reducing the Risk at Small Community Banks: Is It Size or Geographic Diversification That Matters?" *Journal of Financial Services Research* 25(2-3) pp. 259-281.
- Furlong, Fred, and John Krainer. 2007. "Regional Economic Conditions and the Variability of Rates of Return in Commercial Banking." FRB San Francisco working paper (forthcoming).
- Meyers, Andrew, and Timothy Yeager. 2001. "Are Small Rural Banks Vulnerable to Local Economic Downturns?" *FRB St. Louis Review* 83(2) pp. 25-38. <http://research.stlouisfed.org/publications/review/01/03/0103am.pdf>
- Yeager, Timothy. 2004. "The Demise of Community Banks? Local Economic Shocks Are Not to Blame." *Journal of Banking and Finance* 28(9) pp. 2,135-2,153.

ECONOMIC RESEARCH
 FEDERAL RESERVE BANK
 OF SAN FRANCISCO

PRESORTED
 STANDARD MAIL
 U.S. POSTAGE
 PAID
 PERMIT NO. 752
 San Francisco, Calif.

P.O. Box 7702
 San Francisco, CA 94120
 Address Service Requested

Printed on recycled paper
 with soybean inks



Index to Recent Issues of *FRBSF Economic Letter*

DATE	NUMBER	TITLE	AUTHOR
1/5	07-01	Concentrations in Commercial Real Estate Lending	Lopez
1/19	07-02	Disentangling the Wealth Effect: Some International Evidence	Sierminska/Takhtamanova
1/26	07-03	Monetary Policy Inertia and Recent Fed Actions	Rudebusch
2/9	07-04	2006 Annual Pacific Basin Conference: Summary	Glick
3/2	07-05	Financial Innovations and the Real Economy: Conference...	Doms/Fernald/Lopez
3/9	07-06	Update on China: A Monetary Policymaker's Report	Yellen
3/16	07-07	Prospects for China's Corporate Bond Market	Hale
3/30	07-08	The U.S. Productivity Acceleration and the Current Account Deficit	Valderrama
4/6	07-09	Will Fast Productivity Growth Persist?	Fernald/Thippavong/Trehan
4/13	07-10	Do Monetary Aggregates Help Forecast Inflation?	Hale/Jordà
5/4	07-11	U.S. Supervisory Standards for Operational Risk Management	Lopez
5/25	07-12	Monetary Policy, Transparency, and Credibility: Conference Summary	Dennis/Williams
6/1	07-13	Anxious Workers	Valletta
6/8	07-14	House Prices and Subprime Mortgage Delinquencies	Doms/Furlong/Krainer
6/15	07-15	On Forecasting Future Monetary Policy	Kwan
6/22	07-16	Credit Unions, Conversions, and Capital	Wilcox
6/29	07-17	The Narrowing of the Male-Female Wage Gap	Doms/Lewis
7/6	07-18	The Costs and Value of New Medical Technologies: Symposium Summary	Valletta
7/13	07-19-20	The U.S. Economy and Monetary Policy	Yellen
7/20	07-21	What We Do and Don't Know about the Term Premium	Swanson

Opinions expressed in the *Economic Letter* do not necessarily reflect the views of the management of the Federal Reserve Bank of San Francisco or of the Board of Governors of the Federal Reserve System. This publication is edited by Judith Goff, with the assistance of Anita Todd. Permission to reprint portions of articles or whole articles must be obtained in writing. Permission to photocopy is unrestricted. Please send editorial comments and requests for subscriptions, back copies, address changes, and reprint permission to: Public Information Department, Federal Reserve Bank of San Francisco, P.O. Box 7702, San Francisco, CA 94120, phone (415) 974-2163, fax (415) 974-3341, e-mail sf.pubs@sf.frb.org. **The *Economic Letter* and other publications and information are available on our website, <http://www.frbsf.org>.**