The Increasing Brick-and-Mortar Efficiency of Community Banks

By Stefan Jacewitz

Over the last four decades, the number of community banks in the United States has steadily declined, from 15,000 in 1984 to less than 5,000 in 2021. Although community banks still account for more than 91 percent of all banks today, they hold a much smaller share of total industry assets: in particular, their asset share declined from 38 percent in 1984 to less than 12 percent in 2021.

This decline has raised questions about the continued viability of the community bank business model. Community banks play an outsized role in originating loans to small businesses, so a continued decline in their numbers and asset holdings could constrain entrepreneurs' access to credit—and, accordingly, constrain growth in the overall economy. Understanding the source of this decline is thus important for both regulators and policymakers.

One possible explanation for the declining number of community banks is that larger banks have outpaced them in terms of efficiency. Community banks, which have less than $300 million in assets on average, may be less able to benefit from the economies of scale enjoyed by larger banks. In particular, community banks may be less able to afford or adapt to new technologies (such as mobile banking) that make banking more efficient. Moreover, a string of landmark regulatory changes—including the Riegle-Neal Act of 1994, the Gramm-Leach-Bliley Act

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of 1999, and the Dodd-Frank Act of 2010—may have supported an efficiency advantage for large banks, either by removing restrictions on size and activities or by imposing a fixed regulatory burden that large banks can more easily absorb.

In this article, I examine how the efficiency of community banks has changed since the 2008 global financial crisis. I find that community banks have in fact seen substantial *improvements* in efficiency, partially attributable to a relative decline in their brick-and-mortar expenses. Moreover, community banks have been able to reduce their brick-and-mortar expenses relative to income, even as the average number of branches per bank has increased from about 5.5 in 2010 to about 6.5 in 2021. My results suggest that although business models, capital, and the size and quality of assets still matter to banks' overall efficiency, community banks have made and continue to make meaningful gains even as their numbers decline and the mode of banking shifts from being from being branch based to internet and mobile based.

The remainder of the article proceeds as follows. Section I discusses how community banks and efficiency ratios are defined. Section II describes the methodology and provides the key results from a regression analysis showing that community banks have increased their efficiency via a reduction in their brick-and-mortar expenses relative to their income.

I. Community Bank Efficiency

Loosely, a community bank is a "traditional" bank in that it makes loans, funds those loans by taking retail deposits, and operates primarily within a delimited community. Community banks often rely on local clientele, which allows them when making loan decisions to use "soft information" gathered about borrowers through relationships in addition to "hard information" such as credit scores or other financial data (Elyasiani and Goldberg 2004). Relying on relationships gives community banks a comparative advantage in lending to relatively opaque borrowers like small businesses. In fact, around 78 percent of small banks make almost all their commercial and industrial loans to small businesses, compared with less than 12 percent of large banks (FDIC 2018).

Importantly, there is no universally accepted definition of a community bank. A common definition is based on asset size, using a cut-off of $10 billion in consolidated assets. However, I follow the definition

used by the Federal Deposit Insurance Corporation (FDIC), which uses a more rigorous definition of a community bank based not only on asset size but also on loan portfolio composition, deposit composition, branches, geographic footprint, and other characteristics (FDIC 2012).[1]

Some of the characteristics of community banks may necessarily place them at an efficiency disadvantage relative to large commercial banks. For example, the smaller asset size may make them less able to invest in technological improvements. Indeed, Berger and DeYoung (2006) show that technological advancement led to geographical expansion in banks. Likewise, in examining internet banking (the precursor to mobile banking), DeYoung, Lane, and Nolle (2007) find that the adoption of this new technology was positively associated with community bank performance.

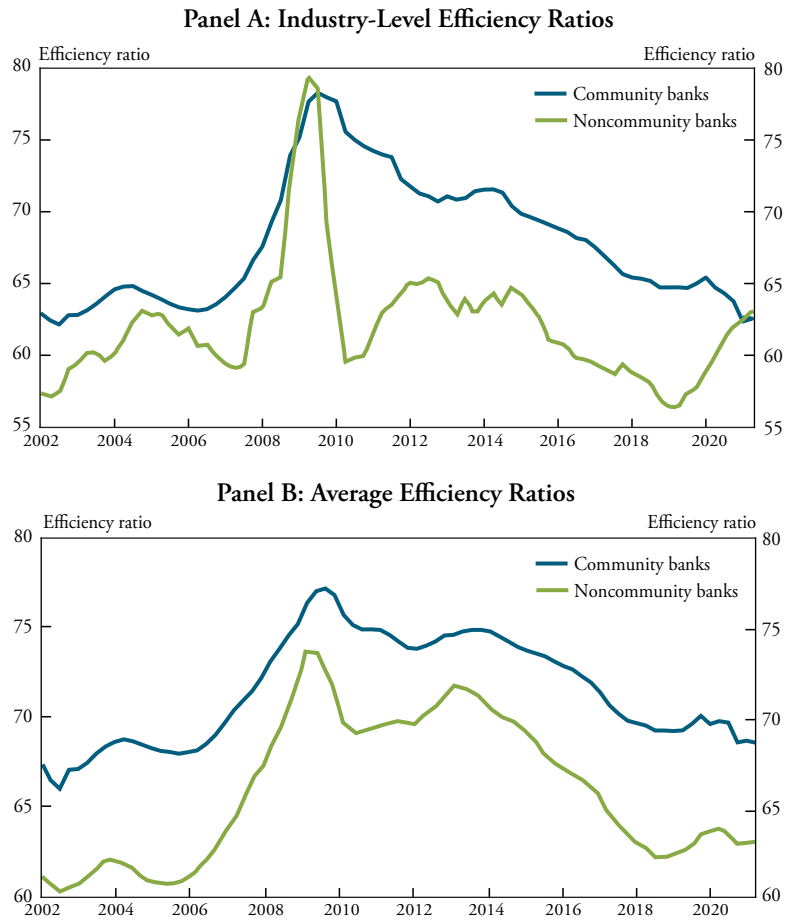
One common way to measure bank efficiency is through the "efficiency ratio," which represents a bank's spending on operations as a portion of its income.[2] Higher efficiency ratios imply that a bank is less efficient overall. Although there are many slightly different definitions of the efficiency ratio, most share the same basic conceptual framework. I follow the definition from the Federal Financial Institutions Examination Council's (FFIEC) Uniform Bank Performance Report and measure efficiency ratios as total overhead expenses as a percentage of net interest income plus noninterest income. As measured by this efficiency ratio, community banks tend to be less efficient than noncommunity banks. On a per-bank level, the average efficiency ratio for community banks is around 68 percent compared with 63 percent for noncommunity banks.

The current efficiency disadvantage for community banks is not new. Larger banks have a long history of being more efficient than smaller banks, at least as measured by the efficiency ratio. Panel A of Chart 1 shows aggregate efficiency ratios for community and noncommunity banks—that is, total expenses for each group of banks divided by total income for those same groups—while Panel B shows the average efficiency ratios for banks in the same groups.

Both the aggregate and average efficiency ratios for noncommunity banks are smaller than those for community banks, illustrating large banks' efficiency advantage over time. Moreover, both measures of efficiency ratios show that community banks have become steadily

Chart 1

Community and Noncommunity Bank Efficiency Ratios

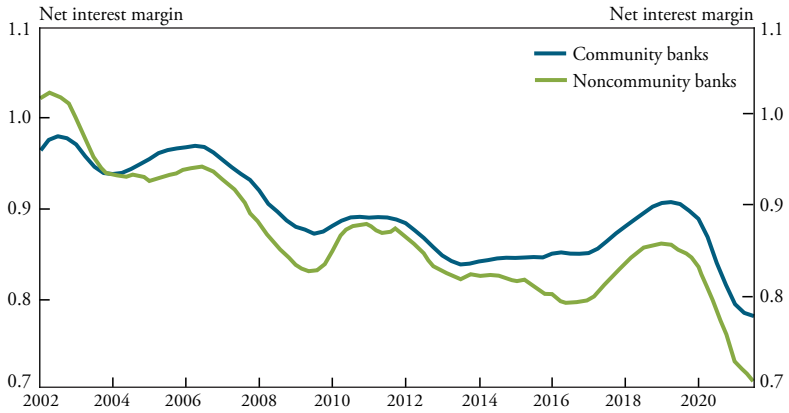


Note: Values are four-quarter moving averages.
Sources: FDIC, Federal Financial Institutions Examination Council (FFEIC), and author's calculations.

more efficient since 2010. However, the aggregate and average efficiency ratios for noncommunity banks (green lines) deviate in Panels A and B of Chart 1, reflecting that especially large banks can distort aggregate measures of efficiency. Given the heavily skewed distribution of assets in the industry toward a few very large banks, the aggregate efficiency ratio for noncommunity banks is strongly dependent on the largest banks. Therefore, for a more representative view of bank-level

Chart 2

Net Interest Margin as a Portion of Assets



Note: Values are four-quarter moving averages.
Sources: FDIC, FFEIC, and author's calculations.

efficiency, I focus on the average efficiency ratio rather than the aggregate in the subsequent analysis.

Although small banks have, on average, been generally less efficient than larger banks for decades, this disadvantage was partially offset by small banks' relatively higher interest income. For instance, Jacewitz and Kupiec (2012) find that community banks' efficiency ratios relative to larger banks is affected by community banks' advantage in net interest margins. Chart 2 shows that net interest margins, which measure banks' interest income less interest expenses, have been consistently higher at community banks since 2004. This is perhaps unsurprising, as smaller banks' loan rates tend to be higher relative to their deposit rates. This discrepancy between net interest margins at smaller and larger banks is often attributed to community banks' comparative advantage in acquiring soft information, enabling them to make loans that would have otherwise been overlooked by larger banks.

Nevertheless, community banks' persistently lower efficiency has been seen as a major factor contributing to long-run banking industry consolidation (see, for example, Hughes and others 1999, Amel and others 2004, and Kowalik and others 2015). The efficiency ratio is functionally used as a practitioner's version of "economies of scale." Theoretically, larger banks, being able to spread fixed costs across more assets, may exhibit economies of scale and thus report lower average costs compared with smaller banks. Because individual banks have little

influence on the federal funds rate and the national wholesale deposit market, most of the variable costs are found in banks' reported "noninterest expense." This logic, combined with observed lower efficiency, is often used as an explanation for why the number of small banks is decreasing. Moreover, it has been used as a motivating factor for mergers and acquisitions, further contributing to consolidation.

II. Quantitative Analysis of Community Bank Efficiency

Although asset size and efficiency are clearly linked, understanding what makes a bank efficient requires delving more deeply into what makes an individual bank unique. For example, community banks with riskier asset portfolios may be less efficient because they face larger monitoring or legal expenses, while community banks with less capital could be more efficient because raising capital to higher levels can be costly. On the other hand, Wall (1985) finds that more profitable small- and medium-size banks had lower interest and noninterest expenses, more transaction accounts, and higher capital. Other research has shown return on assets (ROA), net interest margins, and several other factors play an important role in a bank's efficiency. Hays, De Lurgio, and Gilbert (2009) test a classification model for predicting a community bank's efficiency and find that a bank's ROA, salaries, liquidity, equity, and charge-offs are significant predictors of efficiency. Dreschler, Savov, and Schnabl (2017) show that while there is significant variation in interest expenses (deposit rates) across community banks located in different counties, most of this variation is due to local competitive conditions. Most recently, following the emergence of the COVID-19 pandemic, Sengupta and Xue (2022) and others have shown that net interest margins, a major contributor to community banks' profitability, are now at historic lows for both small and larger banks.

To account for many of these alternatives, I perform a regression analysis that considers asset size, lending specialization, and ROA, among other characteristics. The analysis relies on Call Report data from the FFIEC. The distribution of efficiency ratios and other bank characteristics is generally "heavy tailed," in that extremely high and extremely low values are not rare. As a result, a few observations several orders of magnitude larger or smaller than the rest would tend

to dominate all other data. Therefore, for tractability, I drop observations with efficiency ratios, equity ratios, or ROAs below the first or above the 99th percentiles of the distribution from the analysis.

Table 1 provides summary statistics for selected key variables after this procedure. Even after removing extremely high and low values, the range of efficiency ratios for the full sample remains large, from 30 to 220 percent, with high variation. However, the average efficiency ratio of 71 percent is in line with expectations. The average efficiency ratio for community banks is also around 71 percent (as most banks are community banks), while the average for noncommunity banks is closer to 66 percent. Unsurprisingly, Table 1 shows that community banks have a smaller asset size and fewer branches than other banks. Furthermore, it shows that community banks tend to rely more on deposits as a source of funding. Otherwise, the bank characteristics are, on average, generally similar across community and noncommunity banks.

As noted in Section I, the efficiency ratio is defined as a bank's spending on operations as a portion of income. Using data from Call Reports, I decompose banks' overhead spending further into its constituent parts to examine finer, more targeted measures of efficiency. The major components of overhead spending are personnel expenses, such as the cost of salaries and benefits; premises expenses, such as the cost of branches and other buildings; and other expenses, including legal fees and goodwill impairment.[3]

Chart 3 shows how each of these components contributes to the total efficiency ratio over time. Salary expenses are the largest component of noninterest expenses, representing over half (around 58 percent) of the total efficiency ratio. Other expenses are the second-largest component, making up about one-third (around 30 percent) of the total efficiency ratio. Finally, premises expenses are the third-largest component, contributing just under 15 percent.

This decomposition allows me to calculate efficiency ratios for each component using expenses from the respective component in the numerator and net interest income plus noninterest income in the denominator. Thus, the "salary efficiency ratio" denotes a bank's spending on personnel per dollar of revenue, and so forth for the other component efficiency ratios.

Table 1

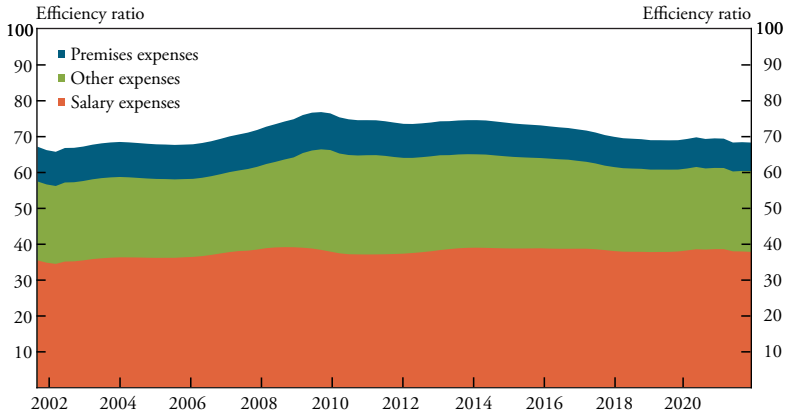
Summary Statistics for Efficiency and Major Related Factors

Independent variable	Dependent variable			
	Mean	Standard deviation	Minimum	Maximum
	(1)	(2)	(3)	(4)
Community banks				
Efficiency ratio	71.37	18.95	30.95	208.92
Total assets ($1,000)	291,529.17	532,215.99	2,157.00	9,984,414.00
Equity-to-assets	11.08	3.47	5.36	39.81
Deposits-to-assets	68.80	8.91	0.00	92.85
Return on assets	0.22	0.22	–1.45	0.98
Interest income	1.21	0.31	–12.92	16.29
Interest expense	0.31	0.23	–2.25	8.05
Noninterest income	0.18	0.33	–63.35	47.40
Noninterest expense	0.76	0.37	–63.05	48.24
Branches	6.23	7.98	1.00	169.00
Observations	478,827			
Noncommunity banks				
Efficiency ratio	65.61	19.92	30.96	208.90
Total assets	20,619,012.79	144,138,456.68	4,749.00	3,290,398,000.00
Equity-to-assets	11.21	4.35	5.37	39.82
Deposits-to-assets	62.08	16.46	0.00	94.26
Return on assets	0.23	0.24	–1.44	0.98
Interest income	1.21	0.51	–6.21	9.22
Interest expense	0.33	0.25	–2.76	3.21
Noninterest income	0.40	0.99	–21.50	48.77
Noninterest expense	0.84	0.95	–17.61	47.45
Branches	220.92	680.30	1.00	6,796.00
Observations	34,354			
All banks				
Efficiency ratio	70.98	19.07	30.95	208.92
Total assets	1,652,406.49	37,642,199.50	2,157.00	3,290,398,000.00
Equity-to-assets	11.09	3.53	5.36	39.82
Deposits-to-assets	68.35	9.75	0.00	94.26
Return on assets	0.22	0.23	–1.45	0.98
Interest income	1.21	0.32	–12.92	16.29
Interest expense	0.31	0.23	–2.76	8.05
Noninterest income	0.20	0.41	–63.35	48.77
Noninterest expense	0.77	0.43	–63.05	48.24
Office branches	20.60	184.17	1.00	6,796.00
Observations	513,181			

Sources: FDIC, FFIEC, and author's calculations.

Chart 3

Decomposition of Community Bank Efficiency Ratios



Note: Values are four-quarter moving averages.
Sources: FDIC, FFEIC, and author's calculations.

Although Panel A of Chart 4 shows that the salary efficiency ratio, the largest component of the overall efficiency ratio, has stayed relatively constant since 2009, Panel B shows that the average premises efficiency ratio has consistently fallen for both community and noncommunity banks. For community banks (blue line), the premises efficiency ratio fell from around 10 percent to around 8 percent. The general decline in premises expenses also follows a secular decline in the number of bank branches (dashed orange line in Panel B), from its most recent high of around 95,000 to its current level of around 70,000. Although the "other efficiency" ratio has also declined for both community and noncommunity banks (Panel C), I do not focus on this decline in the subsequent analysis due to the idiosyncratic nature of these expenses (for example, legal settlements and goodwill impairments). In sum, even though premises expenses are the smallest component of the overall efficiency ratio—representing less than 15 percent of noninterest expenses—improvements in premises efficiency have accounted for nearly 30 percent of the total gains in efficiency for community banks.

Much of community banks' steadily improving premises efficiency—and consequently overall efficiency—since 2009 can be attributed to a reduction in brick-and-mortar spending without an equivalent reduction in income. This steady reduction in brick-and-mortar

Chart 4

Expense Component Efficiency Ratios and Total Branches

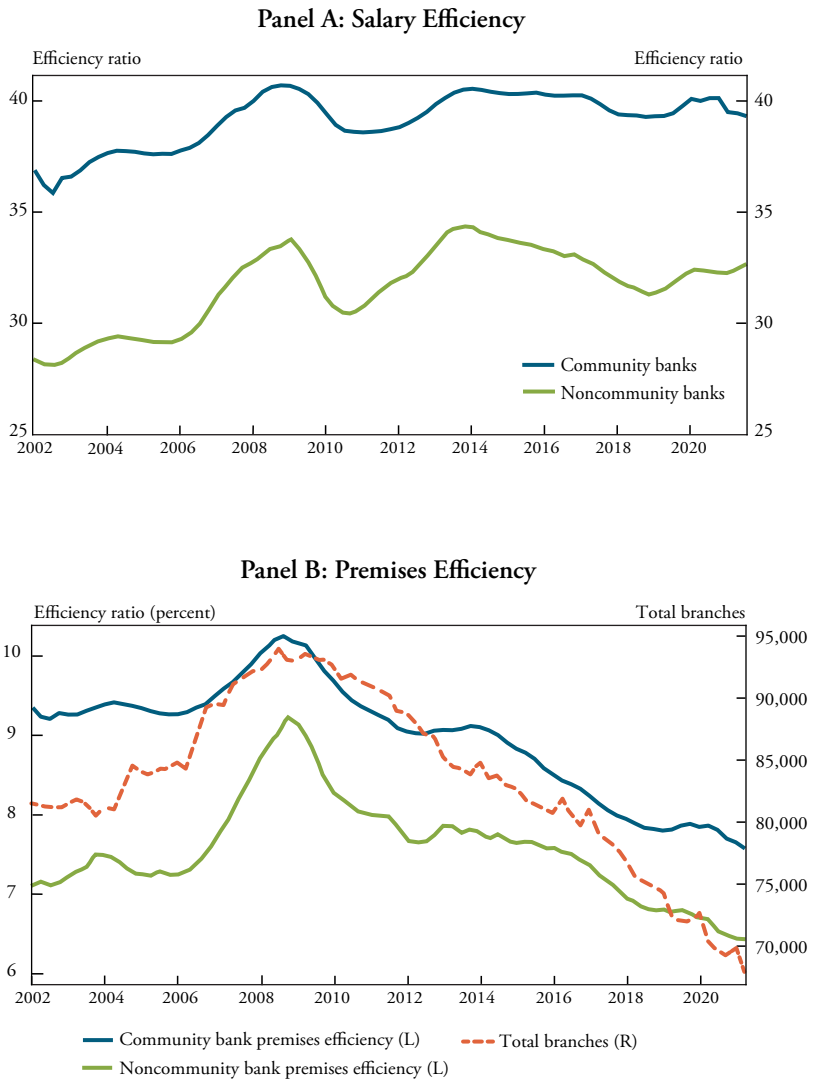
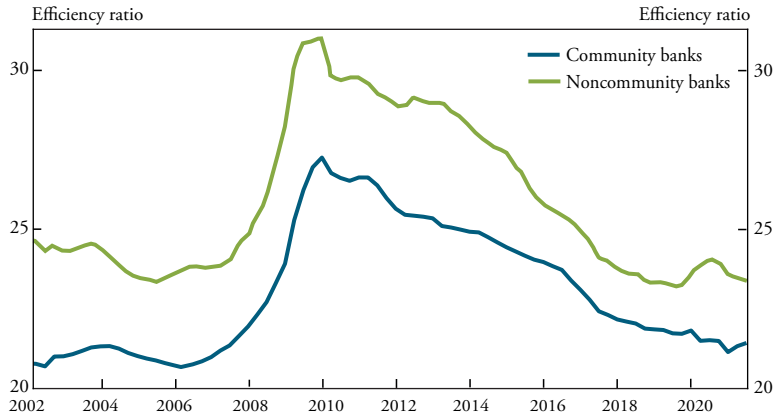


Chart 4 (continued)

Panel C: Other Expenses Efficiency



Notes: The value of the ratios are four-quarter moving averages. The value of the total number of branches is unmodified.
Sources: FDIC, FFEIC, and author's calculations.

spending has coincided with the widespread adoption of internet and mobile banking, suggesting that community banks (as well as noncommunity banks) have benefited from advances in internet and mobile banking, something we might have assumed they were less equipped to do. In fact, according to the Conference of State Banking Supervisors, community banks have nearly a 96 percent adoption rate for mobile banking (CSBS 2021).

Using Call Report data, I examine the relationship between community banks' core characteristics and efficiency ratios, as well as their component efficiency ratios, in Table 2.[4] The table provides the results of a statistical model relating the efficiency ratio and the component efficiency ratios to asset size as well as several other common bank characteristics that loosely follow regulatory CAMELS ratings (capital adequacy, asset quality, management, earnings, liquidity, and sensitivity). Positive coefficients indicate that higher values of that characteristic are associated with worse efficiency, and vice versa for negative coefficients. The table highlights that size, specialization (especially in agricultural lending), number of branches, and delinquency rate have the clearest relationships with efficiency at community banks.

Table 2

Estimated Relationships between Community Bank Characteristics and Bank Efficiency Ratios

Independent variable	Dependent variable			
	Efficiency ratio	Salary efficiency ratio	Premises efficiency ratio	Other expenses efficiency ratio
	(1)	(2)	(3)	(4)
log(assets)	−6.680*** (−27.50)	−2.436*** (−15.71)	−1.231*** (−19.64)	−2.990*** (−21.80)
Brokered-to-deposits	−0.0132 (−1.33)	−0.0189* (−1.81)	−0.00844 (−1.56)	0.0135 (1.49)
Listing-to-deposits	0.155*** (3.41)	0.0489** (2.57)	0.0186** (2.51)	0.0863*** (3.37)
CLD-to-assets	−0.343*** (−8.65)	−0.105*** (−4.10)	−0.0491*** (−5.10)	−0.186*** (−8.65)
Farm-to-assets	−0.650*** (−23.79)	−0.193*** (−12.30)	−0.0974*** (−15.04)	−0.364*** (−23.90)
SFR-to-assets	0.0686*** (5.64)	0.0430*** (5.39)	0.000648 (0.20)	0.0265*** (3.95)
CRE-to-assets	0.0514*** (2.92)	0.0306*** (2.85)	0.0261*** (5.85)	−0.00554 (−0.58)
CI-to-assets	−0.221*** (−8.52)	−0.0778*** (−4.82)	−0.0424*** (−6.83)	−0.105*** (−7.75)
Leverage ratio	−0.588*** (−9.68)	−0.146*** (−4.15)	−0.119*** (−8.11)	−0.321*** (−10.22)
Delinquent-to-assets	1.564*** (13.07)	0.159** (2.39)	0.176*** (7.17)	1.221*** (17.03)
ALLL-to-assets	−0.874* (−1.78)	−0.998*** (−3.23)	−0.362*** (−3.57)	0.608** (2.57)
log(branches)	3.298*** (12.84)	0.852*** (5.42)	1.289*** (19.95)	1.002*** (7.29)
Dividends-to-assets	−8.468*** (−10.73)	−4.086*** (−10.93)	−1.354*** (−11.70)	−3.024*** (−8.77)
Constant	159.1*** (58.72)	72.02*** (41.01)	23.78*** (32.69)	62.92*** (40.93)
Observations	17,7562	17,7562	17,7562	17,7562
Adjusted R^2	0.233	0.100	0.131	0.212

* Significant at the 10 percent level
** Significant at the 5 percent level
*** Significant at the 1 percent level

Notes: Table provides parameter estimates yielded from regressing efficiency ratios on the independent variables listed for community banks. Columns 1–4 provide the estimates for the corresponding efficiency ratio. Below each estimate are *t*-statistics in parentheses. All regressions include time fixed effects. Errors are clustered to allow for arbitrary patterns of correlation within bank observations.
Sources: FDIC, FFIEC, and author's calculations.

A bank's asset size, irrespective of whether it is a community bank, is still closely related to its efficiency. A community bank that is 1 percent larger, on average, has more than a 7 percentage point better (lower) overall efficiency ratio. However, the premises efficiency ratio is only one point lower, suggesting that asset size may matter less to efficiency gains from brick-and-mortar savings.

Capital is correlated with efficiency, but perhaps in a surprising way. Community banks with a higher leverage ratio, after accounting for the other common factors, are on average significantly more efficient than banks with lower capital. Dividend payments, as a fraction of assets, also have a statistically significant correlation with efficiency. Although paying additional dividends will, all else equal, decrease capital, community banks with more capital *and* community banks with higher dividends tend to be more efficient overall. One possible explanation is that due to regulatory oversight, larger dividend payments are approved only for banks that are otherwise especially well managed, safe, and sound. It is worth noting that higher dividends are most closely related to salary efficiency. This relationship aligns with a compensation decision faced by many family-owned community banks: should owners, who at the smallest banks are often also managers and part of the staff, be compensated via salary or cash dividends? If community banks compensate owners via dividends, they can reduce salaries by a commensurate amount, thereby reducing expenses and mechanically increasing efficiency.

A community bank's lending portfolio composition is also related to efficiency. Portfolios with a higher proportion of construction and land development (CLD), farm, and commercial and industrial (C&I) loans tend to be significantly more efficient. In contrast, community banks that are more concentrated in single family residential (SFR) and commercial real estate (CRE) loans tend to be less efficient. In conjunction, these two relationships may be a bit puzzling, as these two loan types are quite different from one another. SFR real estate credit tends to be heavily commoditized and trades on a national market, whereas CRE credit tends to be relatively heterogeneous and local. As one might expect, the total value of delinquencies as a fraction of assets is strongly associated with worse efficiency. However, once problem assets have been accounted for, community banks with higher allowances

for loan and lease losses (ALLL) as a fraction of assets are more efficient, on average. Thus, while more problem loans are clearly negative for a bank, appropriately provisioning for possible problem loans is actually correlated with more efficient banks.

Brokered and listing service deposits are both typically associated with a higher dependence on a type of internet-based deposits that tend to be more expensive and less stable. However, a higher use of brokered deposits is not significantly related to efficiency ratios, and listing service deposits are significantly related to worse efficiency, both in total efficiency and across all the individual subcomponents.

Finally, and consistent with the rise of mobile banking contributing to community banks' efficiency gains, more branches are significantly associated with worse efficiency. The relationship is strongest for premises efficiency, but also strong for overall, salary, and other efficiency. The estimate suggests that a 1 percent reduction in the number of branches is associated with a 3 percentage point better (lower) efficiency ratio.

Conclusion

Community banks play a central role in credit allocation to small businesses and small communities in the United States economy. However, the number of community banks has been steadily decreasing for decades. Although this decline has often been attributed to community banks' relative inefficiency compared with noncommunity banks, community banks have actually seen steadily improving efficiency since the end of the 2008 global financial crisis. I separate the standard efficiency ratio into its individual components and show that much of community banks' efficiency gains can be attributed to improvements in brick-and-mortar expenses. Although some improvement in average efficiency may be attributed to higher survival rates among relatively efficient banks, the mechanism for this progress has been disproportionately through premises efficiency. Coinciding with the rise of internet and mobile banking, community banks have been able to maintain profitability even while decreasing costs devoted to premises. When compared with the experience of larger banks, this suggests that community banks have benefited similarly from these technological developments. Although a bank's business model, asset size and quality, and capital still matter to efficiency, community banks have made and

continue to make meaningful and significant gains even as the mode of banking shifts from being branch based to mobile and internet based.

From a regulatory perspective, policy primarily predates internet and mobile banking and has therefore traditionally relied on the geographical distribution of branches in the approval of mergers and for Community Reinvestment Act assessments. However, the decreasing importance of a bank's branches for servicing the needs of the public has mirrored the rise of internet and mobile banking. The results here suggest that branch restrictions are likely now less costly to community banks, though given internet and mobile banking, community banks may also be less effective in ensuring adequate credit allocation to local communities.

As mobile banking is likely to continue growing, my results suggest that community banks will continue to reap benefits from gains in brick-and-mortar efficiencies, while still being able to maintain similar relative levels of net income. Any mobile-oriented investments made by community banks over the course of the COVID-19 pandemic may act to fortify or increase these efficiency gains. Indeed, Kutzbach and Pogach (2022) find that technological investments made before the pandemic expanded banks' reach to new borrowers. However, as the efficiency gains have been similar for noncommunity banks, it is unlikely that the gains experienced by community banks will materially affect current long-term trends in consolidation. The risk remains that technological advancements, as well as a continued transition away from physical locations, will further reduce community banks' traditional advantage in soft information acquisition, fundamentally cutting into the community bank business model.

Endnotes

[1]All results presented in subsequent sections are qualitatively identical to those from the same analysis using a cutoff of $10 billion in total assets, another commonly used alternative definition of a community bank.

[2]Throughout this paper, the term "efficiency" refers to the "efficiency ratio," and the two are used interchangeably.

[3]Berger and Mester (2003) point out that analyzing both the numerator and the denominator of the efficiency ratio is important to a full understanding of bank efficiencies. However, to keep the analysis as simple as possible, I focus on differences in the numerator (overhead expenses).

[4]These relationships represent correlations only and should not be interpreted as causal.

References

Amel, Dean, Colleen Barnes, Fabio Panetta, and Carmelo Salleo. 2004. "Consolidation and Efficiency in the Financial Sector: A Review of the International Evidence." *Journal of Banking & Finance*, vol. 28, no. 10, pp. 2493–2519. Available at https://doi.org/10.1016/j.jbankfin.2003.10.013

Berger, Allen N., and Robert DeYoung. 2006. "Technological Progress and the Geographic Expansion of the Banking Industry." *Journal of Money, Credit, and Banking*, vol. 38, no. 6, pp. 1483–1513. Available at https://doi.org/10.1353/mcb.2006.0077

Berger, Allen N., and Loretta J. Mester. 2003. "Explaining the Dramatic Changes in Performance of U.S. Banks: Technological Change, Deregulation, and Dynamic Changes in Competition." *Journal of Financial Intermediation*, vol. 12, no. 1, pp. 57–95. Available at https://doi.org/10.1016/S1042-9573(02)00006-2

CSBS (Conference of State Bank Supervisors). 2021. "CSBS 2021 National Survey of Community Banks." *Community Banking in the 21st Century*. Proceedings of the Ninth Annual Community Banking Research and Policy Conference, September 28–29.

DeYoung, Robert, William W. Lang, and Daniel L. Nolle. 2007. "How the Internet Affects Output and Performance at Community Banks." *Journal of Banking & Finance*, vol. 31, no. 4, pp. 1033–1069. Available at https://doi.org/10.1016/j.jbankfin.2006.10.003

Elyasiani, Elyas, and Lawrence G. Goldberg. 2004. "Relationship Lending: A Survey of the Literature." *Journal of Economics and Business*, vol. 56, no. 4, pp. 315–330. Available at https://doi.org/10.1016/j.jeconbus.2004.03.003

FDIC (Federal Deposit Insurance Corporation). 2018. *2018 FDIC Small Business Lending Survey.*

———. 2012. *FDIC Community Banking Study.* December.

Hays, Fred H., Stephen A. De Lurgio, and Arthur H. Grant. 2009. "Efficiency Ratios and Community Bank Performance." *Journal of Finance and Accountancy*, vol. 1, no. 1, pp. 1–15.

Hughes, Joseph P., William W. Lang, Loretta J. Mester, and Choon-Geol Moon. 1999. "The Dollars and Sense of Bank Consolidation." *Journal of Banking & Finance*, vol. 23, no. 2–4, pp. 291–324. Available at https://doi.org/10.1016/S0378-4266(98)00088-0

Jacewitz, Stefan, and Paul Kupiec. 2012. *Community Bank Efficiency and Economies of Scale*. Federal Deposit Insurance Corporation, December.

Kowalik, Michał, Troy Davig, Charles S. Morris, and Kristen Regehr. 2015. "Bank Consolidation and Merger Activity Following the Crisis." Federal Reserve Bank of Kansas City, *Economic Review*, vol. 100, no. 1, pp. 31–49.

Kutzbach, Mark, and Jonathan Pogach. 2022. "Bank Technology and the COVID-19 Pandemic." Federal Deposit Insurance Corporation, Center for Financial Research, working paper no. 2022-02, February.

Sengupta, Rajdeep, and Fei Xue. 2022. "Do Net Interest Margins for Small and Large Banks Vary Differently with Interest Rates?" Federal Reserve Bank of Kansas City, *Economic Review*, vol. 107, no. 1, pp. 45–64. Available at https://doi.org/10.18651/ER/v107n1SenguptaXue

Wall, Larry. 1985. "Why Are Some Banks More Profitable than Others?" *Journal of Bank Research*, vol. 15, pp. 240–256.