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Beta convergence and sigma convergence of key financial ratios post the Great Recession: community banks vs. non-community banks

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Abstract

This study investigates whether there is a convergence in key U.S. bank financial ratios for the period of 2010-2017, the immediate aftermath of the Great Recession. It reveals both beta and sigma convergences and suggests a progression of bank profitability, capital sufficiency, and liquidity towards a common level and a reduction of cross-sectional dispersion over time. This research also examines the convergence speed of two bank groups, community banks and non-community banks, given their drastically different business models, geographical coverage, and size. The test results show that community banks in general adjust at a slower speed than non-community banks.

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1. Introduction and motivation

The Great Recession wreaked havoc on the banking sector and posed many challenges and threats to the industry. The destruction prompted banks to adopt significant changes to various aspects of operation and resort to tools at their disposal to fight for their very existence. This study investigates if low-performing banks catch up with high-performing banks following the global financial meltdown by examining U.S. bank convergence, or lack thereof, in key financial ratios over the period of 2010-2017 with a particular focus on community banks (CBs)—small state-chartered banks operating in less populated, underserved neighbourhoods and vicinities where competition is less fierce, and non-community banks (Non-CBs)—large commercial banks enjoying economies of scale and wide, national and regional coverages.

Deviating from sizeable Non-CBs' practice of relying on computerized scoring metrics for centralized, uniform decision making, CBs adopt a business model of relationship building within communities by providing customized and personalized services, which allows them to capitalize on soft information gathered in the process for business and household lending. Given community banks' pivotal role to the livelihood of small businesses and hence local economies, it is important to look into their recovery from the crisis relative to their large-size counterparts. The topic's significance rings true especially in light of documented steady decline in the number of CBs and scholarly inquiries into their viability due to their cost disadvantages in service offerings, slow adoption of technology, and disproportionate financial burden for regulatory compliance, notably the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank) enacted by Congress in January 2010 (Dahl, Meyer, & Neely, 2016; DeYoung & Duffy, 2002; DeYoung, Hunter, & Udell, 2004a and 2004b; Gilbert & Wheelock, 2013; Lux & Greene, 2015). The research subject is critical because it deals with the issue of sustained economic growth, which hinges on business and consumer's ability to gain convenient and cost-effective access to well-functioning financial institutions for their banking needs.

Given the above illustration, the goal of the paper is to examine bank performance convergence in profitability, capital adequacy, and liquidity over the period of 2010-2017, the post-Great Recession era, and the convergence speed of community banks relative to non-community banks. Fayman, Chen, and Mayes (2022b), using data from 2009 to 2017 to investigate six categories of financial ratios, reveal that these two subgroups of banks emerged and evolved from the global financial crisis significantly differently from each other, notably with CBs upholding higher levels of liquidity and relying more heavily on core deposits while demonstrating lower levels of capital than Non-CBs. Given the demonstrated unique characteristics of CBs and Non-CBs and their drastic different business models and geographical coverages, it makes sense to dissect the banking sector and analyze the two subsamples.

We focus on a sample period of 2010-2017, similar to the period covered by Fayman et al. (2022b) with the removal of 2009 because the recession, according to the U.S. National Bureau of Economic Research, did not end until June 2009. The choice is also motivated by regulatory compliance requirements enacted during the period in the hope of preventing a repeat of the financial, systemic catastrophe, reining in bank aggressive risk-taking behavior preceding the crisis, and promoting financial stability. The notable regulations enacted during the sample period include Dodd-Frank of 2010, Basel II.5 (i.e., the market capital risk rule) of 2012, and

Basel III of 2013. (See Getter (2014) for detailed coverage of the two Basel provisions.) These regulations touch mainly on capital requirements and liquidity adequacy, both of which are highlighted by Fayman et al. (2022b) as differentiating factors between CBs and Non-CBs and are included in this study, along with the profitability ratio category.

While the collapse of the housing market in 2007 and its ensuing adverse impact on mortgage delinquencies served as the catalyst for the Great Recession, Brunnermeier (2009, p. 98) names financial institutions' obsessive usage of leverage and excessive mismatch in asset-liability maturities, among several others, as amplifiers to the full-blown liquidity risk. As a result, banks with inadequate levels of capital had to resort to unloading assets at a fire-sale price to stay afloat and saw their profits plummet into the red. This manifests too the importance of adequate capital, which is highly linked to earnings, and liquidity. As a result, this study focuses on the examination of key financial ratios that gauge bank profitability, capital adequacy, and liquidity.

To the best of our knowledge, this research represents the only empirical study with a focus on U.S. bank convergence in profitability, capital adequacy, and liquidity post the Great Recession through the lens of community banks and non-community banks. A lot of empirical research examining beta and sigma convergences since the introduction of the concept by Barro and Sala-i-Martin (1992) has been conducted. However, the bulk of the work focuses on the convergence of economic data series such as GDP (Dey & Neogi, 2015), house prices (Cook, 2012), income (Sala-i-Martin, 1996; Parikh & Shibata, 2004; Young, Higgins, & Levy, 2008), and rent and yield (Srivatsa & Lee, 2012). Moreover, recent studies investigating convergence in the banking industry mainly address efficiency in Europe, notably the Eurozone (Andrieș & Căpraru, 2014; Carvallo & Kasman, 2017; Casu & Girardone, 2010; Kösedağ, Denizel, & Özdemir, 2011; Mamatzakis, Staikouras, & Koutsomanoli-Filippaki, 2008; Matousek et al., 2015; Weill, 2009), a single performance measure such as return on assets (Bulut, Kaya, & Kocak, 2015) or return on equity (Goddard, Liu, & Molyneux, 2013), or some profitability metrics, e.g., before-tax profit and return on assets (Yap, Law, & Abdul-Ghani, 2020) and return on assets, return on equity, and market-to-book ratio (Lamers, Present, & Vander Vennet, 2022). While Olson and Zoubi (2017) look into bank beta and sigma convergences with multiple financial ratios, they place their emphasis on the profitability ratio category, notably return on assets, with sample data consisting of banks located in the Middle East, North African, and Southeast Asia region for the comparison between commercial banks and Islamic banks. Kirimhan, Nazlioğlu, and Payne (2022) show that stress-tested U.S. banks experience beta convergence in profitability, risk-taking behavior, and systemic risk contributions. However, since only large-size financial institutions are subject to stress testing, the study's conclusion cannot be readily generalized to small-size ones. Given the aforementioned, this study makes significant contributions by enriching banking literature.

Given the dramatic adverse impact the Great Depression exerted on the U.S. banking sector, the study focuses on the convergence or lack thereof of key financial ratios in its two subgroups, community banks and non-community banks, in the aftermath of the global financial crisis. Empirical results documenting convergence will lend support to effective financial integration and competitive landscape of the sector and manifest the ability and speed of recovery from the crisis by U.S. banks.

Whether U.S. bank financial performance converges post the Great Recession or not is a priori ambiguous. On one hand, banks might not converge given their individual characteristics that could cause them to behave and react differently in response to the destruction of the global financial meltdown. This particularly rings true in light of the distinct business model adopted by CBs in comparison to Non-CBs. On the other hand, banks should converge since both types of banks are government regulated and supervised, all bank deposits are FDIC insured up to $250,000 per account, and every bank is periodically examine and assigned CAMELS ratings on a scale from 1 (the best) to 5 (the worst), gauging the bank's financial condition in six categories, capital adequacy, asset quality, management capability, earnings, liquidity, and sensitivity to market risk. Above all, banks have to compete with one another for business and to perform for survival and prosperity regardless of their classification, CBs or Non-CBs, their operation model, customer-centric relationship building or centralized, uniform decision making, or their size, large or small. Given the illustrated ambiguity, we turn to empirical analysis to explore the financial performance of U.S. banks post the Great Recession.

Beta convergence and sigma convergence documented in this study support the notion that all banks converge toward respective common values for all examined financial ratios, albeit with CBs adjusting at a slower rate than Non-CBs for majority of the ratios. The empirical findings are in line with Olson and Zoubi (2017) in the sense that banks converge no matter what their business model, classification, or size is. They conducted beta and sigma convergence tests on Islamic and commercial banks in the Middle East, Africa, and Southeast Asia region in recent years and all 21 financial variables examined displayed beta convergence and sigma convergence in the after-crisis period for both types of banks with Islamic banks adjusting at a slower rate than commercial banks for seven of the variables. Their empirical evidence shows that convergence occurred during the period despite the clear difference in business models between the two types of banks documented by Beck, Demirgüç-Kunt, and Merrouche (2013). The latter research shows that Islamic banks lean more heavily on fee-based business, count proportionately more on non-deposit funding, and have higher loan-to-deposit ratios than conventional banks.

The rest of the paper is organized as follows. Section 2 describes data and some preliminary results. Section 3 presents methodology. Section 4 reports empirical results. Section 5 concludes this study.

2. Data

We compile data for this study from the Statistics on Depository Institutions (SDI) data located on the website of the Federal Deposit Insurance Corporation (FDIC)[1]. Eight yearly financial ratios, return on equity, net interest margin, net profit margin, capital ratio, loans to assets, cash to assets, liquidity ratio, and deposits to liabilities, are constructed from year end of 2009 through year end of 2017. The first three ratios measure bank profitability although net interest margin also reflects bank efficiency. Capital ratio indicates bank stability. The last four ratios capture

[1] https://www5.fdic.gov/sdi/main.asp?formname=customddownload

bank liquidity. These represent key bank financial ratios since no banks can survive, let alone prosper, without sufficient profitability, efficiency, stability, and liquidity.

Following Beck, Demirgüç-Kunt, and Merrouche (2013) and Fayman, Chen, and Mayes (2022a and 2022b), this study adopts three time-varying bank characteristics, bank size proxied by the log of total assets, non-loan earnings assets to total assets, and fixed assets as a percentage of total assets, as control variables. The adoption intends to account for the respective impact of economies of scale, the non-lending business of banks, and the opportunity costs of non-earning assets. Table 1 lists the eleven derived ratios and their definitions. The entire sample is then divided into two sub-groups: community banks (CBs) and non-community banks (Non-CBs). A notion (cb) flagged by the FDIC, which carries a value of one if a bank is considered to be a community bank and zero otherwise, is used for the sample grouping. Table 2 shows the composition of CBs and Non-CBs for each study year. Tables 3a and 3b present descriptive statistics over the sample period, Q4 2010−Q4 2017, for community banks and non-community banks, respectively.

TABLE 1: Summary of variables included in the paper

Panel A: Profitability	
Return on equity (ROE)	Net Income/total equity capital (%)
Net interest margin	(Interest income-Interest expense)/earning assets (%)
Net profit margin	Net income/(non-interest income + interest income) (%)
Panel B: Capital	
Capital ratio	Total equity capital/total assets (%)
Panel C: Liquidity	
Loans to assets	Total loans/total assets (%)
Cash to assets	(Cash + balances due from institutions)/total assets (%)
Liquidity ratio	(Cash +securities)/total assets (%)
Deposits to liabilities	Total deposits/total liabilities (%)
Panel D: Control Variables	
ln(total assets)	Natural log of total assets
Non-loan earnings assets	Non-loan earnings assets/total assets (%)
Fixed assets	Fixed assets/total assets (%)

Table 4 contains the t-test results for the mean difference across the eight key financial ratios and the three control variables between CBs and Non-CBs. Based on the reported p values, these two bank groups behaved and performed significantly differently from each other over the sample period post the Great Recession. While CBs have lower profitability in terms of return on equity and net profit margin, their significantly higher average net interest margin suggests that they are more operationally efficient, generating proportionately more interest income and/or incurring proportionally less interest expense from running its earning assets than Non-CBs. Based on their significantly lower average capital ratio, CBs as a whole do not enjoy the same stability as non-CBs. As to liquidity, CBs, on average, book relatively more loans out of their assets and rely more heavily on deposits, the cheapest source for their funding need, than Non-CBs. In contrast, CBs have significantly lower average levels of cash and liquidity than Non-CBs. Characteristically, CBs, relative to Non-CBs, are significantly smaller based on total assets, possess less non-loan earnings assets, but hold proportionately more assets in fixed assets.

TABLE 2: The number of banks in each sample year

Year	Community Banks	Non-Community Banks	% Community Banks
2010	7007	646	91.56%
2011	6794	559	92.40%
2012	6535	545	92.30%
2013	6300	509	92.52%
2014	6029	477	92.67%
2015	5727	453	92.67%
2016	5453	458	92.25%
2017	5221	448	92.10%

TABLE 3a: Descriptive statistics of key bank ratios and control variables – Community Banks

Ratio	Mean	Minimum	Maximum	Standard deviation
Panel A: Profitability				
Return on equity (ROE)	0.0510	-14.3834	10.6603	0.2855
Net interest margin	0.0366	0.0127	0.0609	0.0068
Net profit margin	0.1394	-8.3333	3.3754	0.2743
Panel B: Capital				
Capital ratio	0.1088	-0.0067	0.2317	0.0292
Panel C: Liquidity				
Loans to assets	0.6191	0.1494	0.9735	0.1528
Cash to assets	0.0614	0.0000	0.3099	0.0640
Liquidity ratio	0.2859	0.0000	0.7552	0.1519
Deposits to liabilities	0.9511	0.7532	1.0015	0.0526
Panel D: Control variables				
ln(total assets)	12.0577	8.1083	17.5795	1.0874
Non-loan earnings assets	0.3003	0.0000	0.7750	0.1540
Fixed assets	0.0218	0.0000	0.0886	0.0162

TABLE 3b: Descriptive statistics of key bank ratios and control variables – Non-Community Banks

Ratio	Mean	Minimum	Maximum	Standard deviation
Panel A: Profitability				
Return on equity (ROE)	0.0710	-3.6283	1.7502	0.2363
Net interest margin	0.0350	-0.0778	0.1986	0.0202
Net profit margin	0.1667	-15.9309	12.0853	0.6069
Panel B: Capital				
Capital ratio	0.1303	-0.0045	0.7255	0.0820
Panel C: Liquidity				
Loans to assets	0.5615	0.0000	0.9873	0.2535
Cash to assets	0.0658	0.0000	0.5005	0.0881
Liquidity ratio	0.2944	0.0000	0.9671	0.2127
Deposits to liabilities	0.8881	0.2500	1.0000	0.1120
Panel D: Control variables				
ln(total assets)	14.4639	5.3327	21.4844	2.2828
Non-loan earnings assets	0.3288	0.0000	0.9993	0.2360
Fixed assets	0.0152	0.0000	0.0793	0.0147

TABLE 4: Mean difference in ratios

Ratio	CBs vs. Non-CBs
Panel A: Profitability	
Return on equity (ROE)	-0.2000 (0.0000)
Net interest margin	0.0016 (0.0000)
Net profit margin	-0.0272 (0.0000)
Panel B: Capital	
Capital ratio	-0.0215 (0.0000)
Panel C: Liquidity	
Loans to assets	0.0576 (0.0000)
Cash to assets	-0.0043 (0.0030)
Liquidity ratio	-0.0085 (0.0157)
Deposits to liabilities	0.0630 (0.0000)
Panel D: Control Variables	
ln(total assets)	-2.4062 (0.0000)
Non-loan earnings assets	-0.0284 (0.0000)
Fixed assets	0.0066 (0.0000)

Note: Numbers reported inside parentheses are p values.

3. Methodology

This section briefly covers the two convergence tests to be performed in this study, beta convergence and sigma convergence. To account for both the time-series pattern of convergence and cross-sectional variation of U.S. banks, we apply the specifications of convergence tests to panel data.

3.1 Beta convergence

Following procedures proposed by Barro and Sala-i-Martin (1992) and adopted by Olson and Zoubi (2017), we implement the test through the estimation of the equation below.

$$\ln\left(\frac{y_{it}}{y_{it-1}}\right) = \beta \ln(y_{it-1}) + \beta_{cb} \ln(y_{it-1})\, Xcb + \varepsilon_{it} \quad (1)$$

where ln performs the log function of the associated variable; y_{it} represents the value of any given financial ratio for bank i in year t; cb denotes a dummy variable that takes on the value

of one for community banks and zero otherwise, $\ln(y_{it-1})$ Xcb captures the interaction term of log function of a given financial ratio for bank i in year t-1 and the dummy variable; β and β_{cb} capture the estimated coefficients for the financial ratio and the interaction term; ε_{it} stands for the error term[2]. Note that the beta coefficients, β and β_{cb}, are actually derived from performing fixed-effect panel regressions on the three explanatory variables, $\ln(y_{it-1})$, cb, and $\ln(y_{it-1})\,Xcb$, and the three control variables, ln(total assets), non-loan earnings assets, and fixed assets. A negative beta supports the notion that the financial ratio under consideration converges towards some common value over time. The absolute value of beta reflects adjustment speed. In Equation (1), β and β_{cb} measure the rate of adjustment for Non-CBs and the differential rate of adjustment for CBs relative to Non-CBs, respectively.

3.2 Sigma convergence

Sala-i-Martin (1996) shows that "β-convergence is a necessary but not a sufficient condition for σ convergence" (p. 1330), a notion further demonstrated by Young, Higgins, and Levy (2008). Thus, sigma convergence, which checks if the cross-sectional variation in a given variable lessens over time, represents a more stringent condition than beta convergence. Based on Parikh and Shibata (2004), Weill (2009), Casu and Girardone (2010), and Olson and Zoubi (2017), we estimate the following equation for the examination of sigma convergence.

$$\ln\left(\frac{W_{it}}{W_{it-1}}\right) = \sigma \ln(W_{it-1}) + \sigma_{cb} \ln(W_{it-1})\,Xcb + e_{it} \qquad (2)$$

where $W_{it} = \ln(y_{it}) - (1/n)\sum_{i=1}^{n} \ln(y_{it})$, i.e., the difference between $\ln(y_{it})$ and the cross-sectional mean of $\ln(y_{it})$ for each year, and e_{it}, the error term. As with beta convergence, sigma convergence requires σ to be negative. Note that the sigma coefficients, σ and σ_{cb}, are actually obtained from running fixed-effect panel regressions on the three explanatory variables, $\ln(W_{it-1})$, cb, and $\ln(W_{it-1})\,Xcb$, and the three control variables, ln(total assets), non-loan earnings assets, and fixed assets. Once again, σ and σ_{cb} in Equation (2) capture the adjustment rate for Non-CBs and the incremental adjustment of speed for CBs relative to Non-CBs, respectively.

4. Empirical Results

This section presents empirical results generated from the two convergence tests.

Table 5 covers beta convergence test results. The table shows that all of the beta coefficients (β) are statistically significantly negative at the 1% significance level. This supports that all Non-CBs are converging toward some common value over time for each ratio. The β_{cb} coefficients, which measure the differential convergence speed of CBs relative to Non-CBs, are statistically significantly negative for three of the eight ratios, capital ratio, loans to assets, and liquidity ratio, signifying CBs with a faster speed of adjustment than non-CBs for these three cases. For another three ratios, profit margin, cash to assets, and deposits to liabilities, the coefficients are statistically significantly positive, illustrating a slower adjustment rate for CBs than Non-CBs. Nevertheless, the small magnitude of the CB differentials, albeit positive and

[2] For financial ratios that may take on negative values, e.g., ROE, net interest margin, and net profit margin, we perform the log function on the sum of one plus the respective ratio.

significant, substantiates convergence toward some overall mean for these ratios. The remaining two ratios, both in the category of profitability, ROE and net interest margin, exhibit no significance, indicating that they converge over time at the same respective rate for the two bank subgroups. In general, all key financial ratios of community banks converge over time toward respective averages despite at a statistically slower speed than their national counterparts for three of the ratios.

4.1 Beta convergence

TABLE 5: Beta convergence of financial ratios (2010-2017)

$$\ln\left(\frac{y_{it}}{y_{it-1}}\right) = \beta \ln(y_{it-1}) + \beta_{cb} \ln(y_{it-1})\, Xcb + \varepsilon_{it}$$

Ratio	β	β_{cb}
Panel A: Profitability		
ROE	-0.8980 (.000)	-0.0134 (0.334)
Net interest margin	-0.6749 (0.000)	0.0020 (0.807)
Net profit margin	-0.9068 (0.000)	0.0479 (0.001)
Panel B: Capital		
Capital Ratio	-0.4990 (0.000)	-0.0305 (0.009)
Panel C: Liquidity		
Loans to assets	-0.6162 (0.000)	-0.2529 (0.000)
Cash to assets	-0.8039 (0.000)	0.0619 (0.000)
Liquidity Ratio	-0.7082 (0.000)	-0.0539 (0.000)
Deposits to liabilities	-0.6558 (0.000)	0.0658 (0.000)

Notes: The two sets of reported beta coefficients are derived from performing fixed-effect panel regressions on the three explanatory variables, $\ln(y_{it-1})$, cb, and $\ln(y_{it-1})\, Xcb$, and the three control variables, ln(total assets), non-loan earnings assets, and fixed assets. The notation cb denotes a dummy variable that takes on the value of one for community banks and zero otherwise. Numbers reported inside parentheses are p values. While fixed-effect and random-effect models yield similar results, the Hausman test rejects the random-effect model at the 1% level for all independent variables. β indicates convergence in levels for Non-CBs while β_{cb} represents the differential adjustment rate for CBs relative to Non-CBs. To focus on the examination of convergence, the rest of the panel regression coefficients are not reported.

4.2 Sigma convergence

Table 6 presents test results associated with sigma convergence. As noted before, sigma convergence is more powerful and stringent than beta convergence, given that the latter is a

necessary but not a sufficient condition for the former. The test results shown in Table 6 resemble those in Table 5 with several notable differences.

TABLE 6: Sigma convergence of financial ratios (2010-2017)

$$\ln\left(\frac{W_{it}}{W_{it-1}}\right) = \sigma \ln(W_{it-1}) + \sigma_{cb} \ln(W_{it-1})\, Xcb + e_{it}$$

Ratio	σ	σ_{cb}
Panel A: Profitability		
ROE	-0.9284 (.000)	0.0027 (0.848)
Net interest margin	-0.6901 (0.000)	-0.0011 (0.894)
Net profit margin	-1.0796 (0.000)	0.0995 (0.000)
Panel B: Capital		
Capital Ratio	-0.5842 (0.000)	-0.0248 (0.075)
Panel C: Liquidity		
Loans to assets	-0.6667 (0.000)	-0.0167 (0.112)
Cash to assets	-0.8535 (0.000)	-0.0423 (0.044)
Liquidity Ratio	-0.9062 (0.000)	0.0751 (0.000)
Deposits to liabilities	-0.7935 (0.000)	0.1964 (0.000)

Notes: The two sets of reported sigma coefficients are obtained from running fixed-effect panel regressions on the three explanatory variables, $\ln(W_{it-1})$, cb, and $\ln(W_{it-1})\, Xcb$, and the three control variables, ln(total assets), non-loan earnings assets, and fixed assets. The notation cb denotes a dummy variable that takes on the value of one for community banks and zero otherwise. Numbers reported inside parentheses are p values. While fixed-effect and random-effect models yield similar results, the Hausman test rejects the random-effect model at the 1% level for all independent variables. σ indicates convergence in levels for Non-CBs while σ_{cb} represents the differential adjustment rate for CBs relative to Non-CBs. To focus on the examination of convergence, the rest of the panel regression coefficients are not reported.

First, the coefficients for Non-CBs, σ reported in the table, are higher than their beta counterparts, β, listed in Table 5 for all eight ratios. This suggests that the cross-sectional dispersion among Non-CBs for these key financial ratios that address profitability, capital adequacy, and liquidity converges at a faster speed than that at which Non-CBs move the ratios over time toward their respective common overall means. Second, in contrast to the β_{cb} coefficients for capital ratio and loans to assets, both of which are statistically significant at the 1% significance level, the σ_{cb} coefficients for the two ratios, are not statistically significant. This implies that while the group of CBs for the two variables is converging at a speed different

from that experienced by the group of Non-CBs toward the respective common overall means over time, both groups converge at the same rate when it comes to closing in on the cross-sectional dispersion over time. Third, the significant β_{cb} and σ_{cb} coefficients observed in Tables 5 and 6 for cash to assets and liquidity ratios see their respective signs reversed, indicating that the differential adjustment rate of CBs relative to Non-CBs for the two ratios between beta convergence and sigma convergence is not in sync with each other. For cash to assets, beta convergence of CBs trails that of Non-CBs while the opposite holds when it comes to sigma convergence. On the other hand, beta convergence of CBs for liquidity ratio outpaces that of Non-CBs while the observation flips when the focus moves to sigma convergence. Nevertheless, sigma convergence is observed across all banks, with CBs showing an adjustment rate either the same as or slower than that of Non-CBs for all variables except for cash to total assets with a statistically significantly faster speed than Non-CBs at the 5% significance level.

5. Conclusion

Beta and sigma convergences documented in the study for the U.S. banking industry indicate that the performance laggards are evolving and catching up with the performance leaders by adjusting at a faster rate. The empirical evidence further shows that both CBs and Non-CBs converge, albeit with the former trailing the latter in adjustment speed for most examined financial ratios. The test results also indicate that CBs have emerged well post the Great Recession, despite their limited geographical coverage and disadvantageous scale deficiency, and demonstrates that their relationship-building business model holds up well in their competition against Non-CBs. Admittedly, the study is subject to the survival bias given the steady decline in the number of both CBs and Non-CBs shown in Table 2 over the sample period. As a result, the evidenced convergence could be a reflection of the fact that only banks who stayed competitive, recovered from the crisis, and strived to conform to the common industry norm for their financial ratios survived the crisis. Nevertheless, the findings are encouraging because CBs provide more convenient and cost-effective means to small businesses and consumers for their financial needs than otherwise and thus their stability and success are crucial to the vitality and prosperity of the local community they serve and, in aggregate, the general economy of the country. Furthermore, bank convergence in these key financial ratios suggests that the banking sector is competitive and makes it easier to envision the future state of the industry for business operation, strategic planning, policy formulation, and regulation making.

Barely over a decade after the world emerged from the global financial tsunami, COVID-19 pandemic, officially declared by the World Health Organization (WHO) on March 11, 2020, threw the world order into chaos, triggered worldwide lockdowns, prompted a precipitous drop in the global economy, propelled skyrocketing unemployment, and disrupted supply chain of goods. As a result, the U.S. saw forceful government interventions to sustain the economy. They went much further this round than the last round during the Great Recession. The government has come to the rescue of not only Wall Street as it did in the previous crisis but also Main Street by rolling out the Main Street Lending Program and issuing multiple rounds of stimulus checks to qualified households and individuals. The aggressive fiscal policies adopted by the Congress and Administration and monetary policies launched by the Federal Reserve, along with lingering adverse impacts from COVID-19 and geopolitical risks, including the ongoing war in Ukraine, have set off

historically high inflation and have forced the Fed's hand to hike interest rates drastically, including three consecutive 75-basis-point rate increases in June, July, and September of 2022. Given the different origins and nature of the two financial crises, distinct government counteractions, and contrasting post-crisis inflation levels and rate environments, a further investigation of bank convergence post the pandemic serves as a worthwhile future research avenue.

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