



Hu, C., Chen, Z., & Cao, T. (2026). Tangibility, Risk, Resilience, and Growth in U.S. Credit Unions: Evidence from Planned and Shock-Driven Non-Loan Assets. *Copernican Journal of Finance & Accounting*, 15(2), 69–87. <http://dx.doi.org/10.12775/CJFA.2026.008>

CHANGJIE HU*

Niagara University

ZHU CHEN**

Southwestern University of Finance and Economics

TING CAO***

MacEwan University

**TANGIBILITY, RISK, RESILIENCE,
AND GROWTH IN U.S. CREDIT UNIONS:
EVIDENCE FROM PLANNED AND SHOCK-DRIVEN NON-LOAN ASSETS**

Keywords: credit unions, tangibility, land and buildings, fixed assets, foreclosed assets, risk, growth.

J E L Classification: G21, G28, G32, G33.

Abstract: This study examines how tangible non-loan assets relate to risk, balance sheet resilience, and growth in U.S. credit unions. Using NCUA call report data, the anal-

Received: 21.01.2026; Accepted: 14.04.2026; Published: 21.09.2026.

* Contact information (corresponding author): chu@niagara.edu, Holzschuh College of Business Administration, Niagara University, New York, United States, phone: +1 9052947260; ORCID ID: <https://orcid.org/0000-0002-9853-2763>.

** Contact information: chenz@swufe.edu.cn, School of Accounting, Southwestern University of Finance and Economics, Sichuan, China, phone: +86 28 85458491; ORCID ID: <https://orcid.org/0009-0003-3961-400X>.

*** Contact information: caot9@macewan.ca, Department of Decision Sciences, MacEwan University, Alberta, Canada, phone: +1 7804975387; ORCID ID: <https://orcid.org/0000-0002-2241-7742>.

ysis measures total tangibility and decomposes it into planned tangibility, captured by premises and other fixed assets, and shock-driven tangibility, captured by foreclosed and repossessed assets obtained through workout and recovery. This decomposition separates slower moving operating investment from distress-related collateral holdings that become embedded on the non-loan side of the balance sheet. In fixed-effects panel regressions with lagged explanatory variables, controls, and high-dimensional fixed effects, higher tangibility is associated with thinner capital buffers and weaker economic solvency, alongside higher delinquency and net charge-offs, with materially stronger associations for the shock-driven component. These links intensify in crisis periods and vary with institutional scale and capital buffers, with the adverse associations generally stronger during stress periods and weaker at larger and better-capitalized credit unions. Moreover, planned tangibility is positively related to loan and member growth, but negatively related to asset growth, while shock-driven tangibility is strongly negative across growth outcomes. Overall, the evidence suggests that non-loan asset composition provides incremental information about both strategic capacity and distress dynamics and the trade-off between growth and resilience in a sector where retained earnings are central to resilience.

■■■ INTRODUCTION

Credit unions occupy a distinctive position in retail financial intermediation. As member-owned cooperatives, credit unions have objectives and operating logic that differ from shareholder-owned banks, shaping balance sheet choices, growth, risk management, and performance (Van Rijn, 2022). Capital formation is constrained, and without external equity like publicly traded banks, buffers rely on retained earnings, linking balance sheet composition to resilience for managers and supervisors (Bauer, 2008; Goddard, McKillop & Wilson, 2014).

Most empirical work emphasizes the loan-side balance sheet through portfolio composition, loan growth, and underwriting dynamics. This broader focus on balance sheet composition is consistent with evidence that expansion into business lending increases asset side risk in U.S. credit unions, suggesting that riskier balance sheet shifts can weaken subsequent resilience and growth capacity (Gomez-Biscarri, López-Espinosa & Mesa-Toro, 2021). Recent evidence on non-core lending in U.S. credit unions similarly links loan-side portfolio choices to credit risk and capital outcomes (Hu, Chen & Cao, 2026). Yet the non-loan side also matters, especially tangible non-loan assets that support service delivery and compliance capacity but may reduce liquidity. These assets can also arise from borrower distress through foreclosed and repossessed assets, with holding costs, valuation risk, and disposition frictions during stress (Beatty & Liao, 2014).

Our paper examines how tangible non-loan assets relate to risk, resilience, and growth in US credit unions. Using NCUA call report accounts, we decompose tangibility into planned tangibility and shock-driven tangibility. This split separates operating investment from distress related assets that rise through default resolution, improving interpretation relative to a single tangibility ratio. We relate these measures to three outcome sets used in monitoring. Resilience and buffers are captured by the net worth ratio and an economic solvency metric. Credit stress is captured by delinquent loans and net charge offs. Growth is captured by loan growth, asset growth, and member growth.

We contribute to the credit union literature in two ways. First, it highlights the non-loan side of the balance sheet as an underutilized source of information about resilience, credit stress, and growth. Second, it implements a transparent decomposition of tangibility that separates investment-related from distress-related tangibility. This complements the focus on loan composition by showing that tangible non-loan assets, especially foreclosed and repossessed assets, are systematically related to capital pressure, asset quality, and growth in the credit union sector.

LITERATURE REVIEW

Cooperative ownership reshapes incentives and governance. Member ownership dampens shareholder-driven risk incentives and supports relationship-oriented intermediation (Smith, Cargill & Meyer, 1981). Credit unions also face structural constraints that shape balance sheet choices. Limited access to external equity markets makes internal capital generation and retained earnings central to resilience, heightening the importance of how portfolio choices translate into asset quality and buffer pressure over the cycle (Wilcox, 2005; Bauer, 2008). Performance and risk vary across institutions, consistent with differences in strategy, scale, and organizational capacity (Goddard, McKillop & Wilson, 2008; McKillop & Wilson, 2011). Recent U.S. evidence also links credit union performance to asset and liability management choices, reinforcing the broader importance of balance sheet structure for resilience and strategic outcomes (El Fadil & Hessou, 2024).

For depository institutions, tangibility reflects operating infrastructure. Premises and other fixed assets support outreach, member service, and internal processing capacity, with service benefits alongside cost pressures and efficien-

cy trade-offs (Berger, Leusner & Mingo, 1997). Branch networks still aid convenience, deposit gathering, and relationship intermediation, but embed fixed costs and can reduce flexibility when conditions tighten (Hirtle, 2007). These rigidities matter for credit unions because resilience depends on retained earnings. Higher fixed-asset share can pressure capital ratios, and scale and footprint are linked to noninterest expense intensity, cost efficiency, and returns to scale (Wheelock & Wilson, 2013).

Tangibility also reflects realized credit stress. Defaults can shift collateral onto the balance sheet as foreclosed and repossessed assets held for sale, with material taxes, insurance, maintenance, and legal or administrative costs (Harding, Rosenblatt & Yao, 2012; Ramcharan, 2020). These assets arise through default and workout, linking loan-side distress to earnings, liquidity, and capital rebuilding, and may capture differences in loss-recognition and workout timing shaped by discretion in loss measurement and reporting regimes (Beatty & Liao, 2014; Bushman & Williams, 2015).

A complementary literature examines how institutions jointly adjust capital and risk after shocks. Because buffers and risk are co-determined, regulatory constraints and earnings capacity can move portfolio risk and capitalization together, so the same tangible asset position can have different implications depending on risk-bearing capacity (Shrieves & Dahl, 1992; Jacques & Nigro, 1997; Calem & Rob, 1999). In downturns, weaker cash flows and collateral values raise default and foreclosure activity while losses and weaker earnings compress buffers, and stressed balance sheets can worsen liquidation outcomes, tying shock-driven tangibility to earnings drag and slower capital rebuilding (Calem & Rob, 1999; Ramcharan, 2020). Scale can moderate these effects through operating capacity and resolution infrastructure, and weaker operational performance can precede problem-loan deterioration (Berger & DeYoung, 1997; Wheelock & Wilson, 2011).

This literature motivates a more explicit focus on tangible non-loan assets as a complement to loan composition in credit union research. Cooperative ownership and limited external equity make internal capital generation central to resilience, raising the importance of balance sheet structure for buffer dynamics and risk outcomes (Smith et al., 1981; Wilcox, 2005). Operating infrastructure can embed fixed costs and adjustment frictions, while foreclosed and repossessed assets arise from borrower distress and reflect resolution frictions and loss-recognition timing that link loan-side stress to non-loan assets (Bushman & Williams, 2012; Ramcharan, 2020). Building on these insights,

our approach decomposes tangibility into investment-related infrastructure and distress-related collateral holdings and examines how each relates to resilience, asset quality, and growth, including whether these links vary with institutional capacity and buffers when capital and risk adjust jointly (Jacques & Nigro, 1997; Calem & Rob, 1999).

DATA AND METHODOLOGY

Data Source and Sample Construction

A panel dataset is constructed from NCUA call report filings for U.S. credit unions. These filings provide detailed balance sheet and income statement accounts to construct asset-quality indicators and operating characteristics such as membership and branch count. The final sample includes 124,532 credit-union-year observations from 2005 to 2024 after excluding missing values. To limit the influence of extreme values from reporting irregularities, small denominators, or events such as mergers, all continuous variables are winsorized at the 1st and 99th percentiles. The main specifications used lagged tangibility measures and controls that help alleviate mechanical endogeneity between asset composition and performance.

Variable Construction

Tangibility is defined as fixed assets held on the balance sheet, including land and buildings, foreclosed and repossessed assets that are typically dominated by real estate and automobiles, and other fixed assets. We then decompose tangibility into planned, investment-driven tangibility and shock-driven tangibility that emerges from credit stress. Planned tangibility captures long-lived, operational investments recorded as land and buildings and other fixed assets. Shock-driven tangibility captures assets acquired through default resolution and collateral seizure, measured using foreclosed and repossessed assets. This decomposition separates business model and service delivery choices from realized distress and workout activity.

Our controls capture institutional characteristics that may covary with tangible investments and credit outcomes. We include the log of total assets and the log of membership for scale and member intensity, the log of age (years since

charter) for life cycle effects, and the log of branch count for service footprint and operational complexity. Return on assets controls for profitability, and operating expense intensity captures cost structure and internal capacity tied to fixed-asset choices and risk management. All controls are lagged except age.

Our outcome variables capture resilience, realized credit stress, and growth that may co-move with tangible asset intensity. Buffers are measured by the net worth ratio, and broader resilience is captured by a balance sheet-based solvency metric reflecting asset coverage of deposit-like funding after key non-equity claims.¹ Credit stress is measured by delinquent loans and net charge-offs, capturing emerging deterioration and realized losses. Growth in total loans, total assets, and membership captures expansion in lending, the balance sheet, and the member base. Variable constructions and account mappings are reported in Appendix table A.

Baseline Regression Specification

Our baseline specification includes total tangibility, a comprehensive set of lagged controls, and fixed effects:

$$Y_{i,t} = \alpha + \beta_1 \text{Tangibility}_{i,t-1} + \gamma X_{i,t-1} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (1)$$

where $Y_{i,t}$ is an outcome for credit union i in year t , $X_{i,t-1}$ is a vector of lagged controls, μ_i are credit union specific fixed effects, and λ_t are time-related fixed effects. Specifically, all regressions in the study include credit union, year, data-system, credit-union-type, and region fixed effects. Coefficients are therefore interpreted as within credit union associations over time, conditional on controls and common shocks, and are best viewed as robust conditional relationships that map tangible non-loan asset intensity into subsequent risk, resilience, and growth outcomes.² All standard errors are computed using robust variance estimators.

¹ Our solvency ratio follows the NCUA Financial Performance Report Ratio and Formula Guide and is built from a small set of balance-sheet items to measure the extent to which adjusted asset values cover member shares and deposits.

² Endogeneity cannot be fully ruled out even with rich fixed effects and lagged variables, so we avoid strong causal claims. We interpret the estimates as robust condition-

An alternative specification is also estimated that decomposes the base tangibility measure into planned and shock-driven tangibility. This extension helps clarify whether the baseline association is primarily driven by overall tangibility intensity or by differences in the composition between planned and shock-driven tangibility:

$$Y_{i,t} = \alpha + \beta_1 \text{Planned Tangibility}_{i,t-1} + \beta_2 \text{Shock Driven Tangibility}_{i,t-1} + \gamma X_{i,t-1} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (2)$$

Moderation and Extensions

The baseline framework is extended to assess heterogeneity and sharpen interpretation. First, tangibility is interacted with a crisis indicator to test whether associations strengthen during periods of heightened distress. Second, we examine moderation by institutional capacity by allowing tangibility effects to vary with member size. Third, we test buffer moderation by interacting tangibility with lagged net worth to assess whether better capitalized credit unions manage tangibility differently. Finally, we relate tangibility to subsequent growth in loans, assets, and members, and compare the total tangibility specification with the decomposed specification to distinguish investment-driven from stress-driven growth links.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1 reports descriptive statistics for the 124,532 observation sample. Total and planned tangibility have similar means and medians, consistent with planned tangibility accounting for most typical tangibility. Shock-driven tangibility is much smaller at the mean and median, but still shows a nontrivial upper tail. Outcomes display meaningful dispersion, with net worth and solvency varying across the distribution and delinquent loans and net charge-offs exhibiting wide ranges with a pronounced upper tail. Growth measures are

al associations, supported by stability across alternative specifications and robustness checks.

also dispersed, with loan, asset, and member growth spanning large negative and positive values, providing scope to assess how tangible non-loan assets relate to both resilience and expansion over time.

Table 1. Summary Statistics

Variables (N = 124,532)	Mean	S.D.	Min	Median	Max
Tangibility	0.02	0.02	0.00	0.01	0.08
Planned Tangibility	0.02	0.02	0.00	0.01	0.07
Shock-driven Tangibility	0.00	0.00	0.00	0.00	0.01
Net Worth	0.14	0.06	0.06	0.12	0.38
Delinquent Loans	0.01	0.01	0.00	0.00	0.09
Solvency	1.16	0.10	1.06	1.14	1.63
Net Charge-offs	0.07	0.11	-0.08	0.04	0.76
Loan Growth	0.38	1.56	-3.81	0.31	6.62
Asset Growth	0.40	1.01	-2.25	0.34	4.29
Member Growth	-0.00	0.83	-2.83	-0.03	4.30
Member Size	8.19	1.60	4.62	8.09	11.94
Size	16.99	2.01	11.66	16.99	21.40
Age	4.06	0.46	0.69	4.08	7.61
Branch Count	0.63	0.85	0.00	0.00	3.22
ROA	0.05	0.10	-0.47	0.05	0.33
Operating Expenses	0.45	0.17	0.11	0.43	1.11

Source: own elaboration.

Baseline Evidence from Total Tangibility

Table 2 reports baseline regressions linking lagged total tangibility to resilience and asset quality.³ Tangibility is negatively related to net worth and solvency and positively related to delinquent loans and net charge offs, connect-

³ For all our tables, coefficients with *, **, or *** indicate statistical significance at the 10%, 5%, or 1% levels, respectively.

ing higher on book tangibility to weaker buffers and greater realized credit stress. Conditional on controls and rich fixed effects, these estimates reflect within credit union variation over time rather than persistent cross institutional differences. The pattern is consistent with banking evidence on balance sheet constraints, capital buffers, and risk adjustment under shocks or limited external capital (Shrieves & Dahl, 1992; Calem & Rob, 1999; Berger & Bouwman, 2013), and with accounting research linking measured stress to credit loss recognition as problem assets materialize and are resolved (Beatty & Liao, 2014; Bushman & Williams, 2015).

Table 2. Tangibility, Capital Strength, and Asset Quality

N = 124,532	(1) Net Worth	(2) Solvency	(3) Delinquent Loans	(4) Net Charge-offs
Tangibility	-0.1167*** (0.008)	-0.1650*** (0.013)	0.0255*** (0.003)	0.3431*** (0.031)
Member Size	0.0096*** (0.001)	0.0117*** (0.001)	0.0005 (0.000)	0.0177*** (0.003)
Size	-0.0195*** (0.001)	-0.0301*** (0.001)	0.0026*** (0.000)	0.0281*** (0.003)
Age	0.0056*** (0.001)	0.0104*** (0.001)	-0.0008** (0.000)	-0.0021 (0.004)
Branch Count	-0.0019*** (0.000)	-0.0018*** (0.000)	-0.0004*** (0.000)	-0.0054*** (0.001)
ROA	0.0634*** (0.001)	0.0937*** (0.002)	-0.0014** (0.001)	-0.1081*** (0.007)
Operating Expenses	0.0163*** (0.002)	0.0267*** (0.003)	0.0061*** (0.001)	0.0512*** (0.008)
Constant	0.3591*** (0.012)	1.5259*** (0.020)	-0.0391*** (0.004)	-0.5637*** (0.042)
Adjusted R ²	0.88	0.88	0.53	0.30

Source: own elaboration.

Decomposing Planned and Shock-driven Tangibility

Table 3 replaces total tangibility with planned and shock-driven tangibility. Both components are negatively related to net worth and solvency and positively related to delinquent loans and net charge-offs, consistent with higher tangible non-loan asset intensity coinciding with thinner buffers and weaker asset quality. The key difference is magnitude. Shock-driven tangibility has much larger coefficients across all outcomes, which is intuitive because this item is usually small in normal times, so increases tend to signal a meaningful deterioration in credit conditions with more defaults, collateral seizure, and workout activity. Planned tangibility instead reflects slower-moving infrastructure choices that adjust gradually and are less tied to acute stress. Overall, the decomposition suggests the baseline associations are concentrated in the distress-related component, with the planned component showing a similar but more muted pattern.

Table 3. Planned vs. Shock-driven Tangibility

N = 124,532	(1) Net Worth	(2) Solvency	(3) Delinquent Loans	(4) Net Charge-offs
Planned Tangibility	-0.1095*** (0.009)	-0.1553*** (0.014)	0.0091*** (0.003)	0.1261*** (0.031)
Shock-driven Tangibility	-0.4028*** (0.046)	-0.4895*** (0.072)	0.4532*** (0.027)	6.6606*** (0.258)
Constant	0.3586*** (0.012)	1.5254*** (0.020)	-0.0386*** (0.004)	-0.5564*** (0.042)
CU- level Controls (table 2)	Yes	Yes	Yes	Yes
Adjusted R^2	0.88	0.88	0.53	0.30

Source: own elaboration.

Crisis Amplification

Banking research argues that balance sheet constraints bind more tightly in downturns, when earnings weaken, funding tightens, and credit losses broad-

en, strengthening the link between balance sheet composition, buffers, and realized stress (Peek & Rosengren, 1997; Foos, Norden & Weber, 2010). This view also aligns with evidence that the 2007 to 2009 financial crisis heightened the salience of risk management across credit institutions, making balance sheet exposures more consequential when stress regimes shift (Boda, 2017). Motivated by this view, table 4 tests crisis amplification by interacting planned and shock-driven tangibility with a financial crisis indicator.

Table 4. Tangibility during Crisis Periods

N = 124,532	(1) Net Worth	(2) Solvency	(3) Delinquent Loans	(4) Net Charge-offs
Planned Tangibility * Crisis	-0.0759*** (0.008)	-0.1294*** (0.012)	-0.0036 (0.003)	-0.0012 (0.033)
Shock-driven Tangibility * Crisis	-0.3481*** (0.092)	-0.5010*** (0.144)	0.1397** (0.057)	1.7911*** (0.539)
Planned Tangibility	-0.0809*** (0.009)	-0.1064*** (0.015)	0.0104*** (0.003)	0.1261*** (0.033)
Shock-driven Tangibility	-0.3362*** (0.049)	-0.3988*** (0.076)	0.4175*** (0.030)	6.2152*** (0.274)
Constant	0.3561*** (0.012)	1.5211*** (0.020)	-0.0386*** (0.004)	-0.5552*** (0.042)
CU- level Controls (table 2)	Yes	Yes	Yes	Yes
Adjusted R ²	0.88	0.88	0.53	0.30

Source: own elaboration.

The interaction terms show clear crisis amplification for shock-driven tangibility. In crisis years, its negative association with net worth and solvency becomes more pronounced, and its positive association with delinquency and net charge-offs also strengthens. This is intuitive because foreclosed and repossessed assets more directly reflect binding stress and active resolution when credit conditions deteriorate system wide, tightening their link to capital pressure and realized losses. Planned tangibility also becomes more negatively

related to net worth and solvency in crisis periods, consistent with operating rigidity being more costly when liquidity needs rise and internal capital generation weakens. In contrast, planned tangibility shows no significant crisis amplification for delinquency or net charge-offs, consistent with infrastructure choices being slower moving and not a direct marker of credit distress.

Member Size and Operational Capacity

Institutional capacity may moderate how tangibility maps into buffers and credit stress. Prior work shows that scale affects operating efficiency, monitoring capacity, and shock absorption, so the same balance sheet position can have different implications for large versus small intermediaries (Berger & Mester, 1997; Berger & Bouwman, 2013). Motivated by this view, table 5 interacts planned and shock-driven tangibility with member size to test for size-dependent associations.

The interaction terms suggest that scale moderates tangibility associations. For both planned and shock-driven tangibility, member size interactions are positive for net worth and solvency, implying that buffer effects become less negative at larger credit unions, consistent with greater earnings capacity, diversification, and infrastructure to manage tangible holdings. For credit stress, scale matters most for shock-driven tangibility. The size interaction is strongly positive for delinquency and net charge-offs, indicating that foreclosed and repossessed assets become an even sharper marker of realized stress at larger scale, either because large credit unions face broader stress and larger losses when these assets rise, or because they recognize and process foreclosures more systematically. Planned tangibility shows a weaker pattern for stress outcomes, with limited size dependence for delinquency but a positive interaction for net charge-offs, suggesting scale mainly strengthens its link to realized losses rather than early-stage deterioration.

Table 5. Tangibility and Size

N = 124,532	(1) Net Worth	(2) Solvency	(3) Delinquent Loans	(4) Net Charge-offs
Planned Tangibility * Member Size	0.0222***	0.0695***	0.0015	0.0857***
	(0.008)	(0.013)	(0.003)	(0.031)
Shock-driven Tangibility * Member Size	0.0258	0.1643**	0.1591***	1.2938***
	(0.040)	(0.066)	(0.024)	(0.226)
Planned Tangibility	-0.2964***	-0.7404***	-0.0040	-0.5999**
	(0.070)	(0.116)	(0.030)	(0.281)
Shock-driven Tangibility	-0.6248*	-1.8914***	-0.8928***	-4.3006**
	(0.364)	(0.598)	(0.214)	(2.035)
Member Size	0.0093***	0.0106***	0.0004	0.0156***
	(0.001)	(0.001)	(0.000)	(0.003)
Constant	0.3609***	1.5325***	-0.0383***	-0.5469***
	(0.012)	(0.020)	(0.004)	(0.042)
CU- level Controls (table 2)	Yes	Yes	Yes	Yes
Adjusted R^2	0.88	0.88	0.53	0.30

Source: own elaboration.

Capital Buffers

Table 6 tests whether capital strength moderates tangibility associations. Tangible non-loan assets can impose holding costs and reduce flexibility, but their implications for solvency pressure and credit stress should depend on the size of the capital cushion when stress materializes. We implement this by interacting planned and shock-driven tangibility with lagged net worth.

Table 6. Tangibility and Capital Buffers

N = 124,532	(1) Solvency	(2) Delinquent Loans	(3) Net Charge-offs
Planned Tangibility * Net Worth	-2.5895***	-0.2465***	-1.6699**
	(0.220)	(0.071)	(0.676)
Shock-driven Tangibility * Net Worth	-11.0208***	-1.4738**	-10.9522
	(1.760)	(0.739)	(6.942)
Planned Tangibility	0.2843***	0.0416***	0.3479***
	(0.026)	(0.009)	(0.086)
Shock-driven Tangibility	1.4560***	0.6268***	7.9589***
	(0.186)	(0.088)	(0.803)
Net Worth	1.3383***	0.0122***	0.0995***
	(0.009)	(0.003)	(0.025)
Constant	0.8313***	-0.0445***	-0.6052***
	(0.013)	(0.005)	(0.044)
CU- level Controls (table 2)	Yes	Yes	Yes
Adjusted R ²	0.95	0.53	0.30

Source: own elaboration.

The interaction terms are negative for both tangibility components in the solvency and delinquency regressions, with especially strong attenuation for shock-driven tangibility. This implies that adverse tangibility associations are most pronounced when net worth is low and become less severe as buffers strengthen. For net charge-offs, attenuation appears mainly through the planned tangibility interaction, while the shock-driven interaction is weaker, suggesting buffers dampen the link to measured resilience and delinquency more than they mute the connection between distress-related tangibility and realized losses. Overall, the results support a buffer-capacity interpretation. Better capitalized credit unions absorb the balance sheet consequences of tangible asset positions more effectively, so a given tangibility exposure is less tightly linked to weaker resilience, higher delinquency, and in part higher charge-offs at higher net worth.

Tangibility and Growth Trade-offs

Table 7 relates tangibility to loan, asset, and member growth and shows a clear contrast across components. Planned tangibility is positively related to loan growth and member growth, consistent with premises and fixed assets supporting service delivery, member acquisition, and lending. At the same time, planned tangibility is negatively related to asset growth, suggesting higher fixed-asset intensity can coincide with slower total asset expansion even when lending and membership rise, potentially reflecting tighter balance sheet constraints or a growth mix tilted toward loans and members rather than broad asset accumulation.

Table 7. Tangibility and Growth

N = 124,532	(1) Loan Growth		(2) Asset Growth		(3) Member Growth	
Tangibility	0.6476		-1.7607***		1.8696***	
	(0.496)		(0.294)		(0.276)	
Planned Tangibility		2.4392***		-0.6194**		2.2785***
		(0.518)		(0.307)		(0.290)
Shock-driven Tangibility		-55.0360***		-36.9212***		-10.8945***
		(3.037)		(1.889)		(1.831)
Constant	14.7614***	14.7004***	17.4645***	17.4240***	0.8160**	0.8036**
	(0.656)	(0.656)	(0.370)	(0.370)	(0.355)	(0.355)
CU-level Controls (table 2)	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.17	0.17	0.37	0.37	0.21	0.21

Source: own elaboration.

Shock-driven tangibility is strongly negative for loan, asset, and member growth, indicating that higher foreclosed and repossessed assets coincide with sharp slowdowns in expansion. This fits a distress and resource reallocation channel. Workout activity pulls liquidity and staff toward collections and disposition, charge-offs pressure retained earnings and regulatory ratios, and risk appetite tightens, reducing new lending and member acquisition. Overall,

the growth results match the risk and resilience evidence. Planned tangibility supports loan and member growth but coincides with weaker buffers, suggesting a growth versus resilience trade-off. Shock-driven tangibility aligns with thinner buffers, higher credit stress, and much lower growth, consistent with distress and resolution frictions crowding out expansion.

■■■ CONCLUSION

This paper examines how tangible non-loan assets relate to risk, resilience, and growth in U.S. credit unions. Higher total tangibility is associated with weaker resilience and higher credit stress. Shock-driven tangibility provides the clearest stress signal. It is tightly linked to delinquency and net charge-offs and is more strongly associated with buffer deterioration, consistent with a distress-state interpretation. Planned tangibility shows a more muted pattern and aligns with strategic expansion. Crisis periods amplify these associations, and capacity and capital buffers moderate effects. Larger credit unions offset some buffer pressure, but shock-driven tangibility remains a strong stress marker at scale, and higher net worth attenuates adverse associations. In growth regressions, planned tangibility aligns with stronger loan and member growth but weaker buffers, while shock-driven tangibility is strongly negative for loan, asset, and member growth. The findings have practical and policy implications for management and supervision. Separating planned from shock-driven tangibility helps diagnose whether rising tangible assets reflect operating investment or emerging distress that calls for workout capacity and capital planning. For monitoring, foreclosed and repossessed assets complement conventional asset-quality measures, especially in downturns when resolution and loss realization become central.

■■■ REFERENCES

- Bauer, K. (2008). Detecting abnormal credit union performance. *Journal of Banking & Finance*, 32(4), 573–586. <https://doi.org/10.1016/j.jbankfin.2007.04.022>.
- Beatty, A., & Liao, S. (2014). Financial accounting in the banking industry: A review of the empirical literature. *Journal of Accounting and Economics*, 58(2–3), 339–383. <https://doi.org/10.1016/j.jacceco.2014.08.009>.
- Berger, A.N., & Bouwman, C.H.S. (2013). How does capital affect bank performance during financial crises? *Journal of Financial Economics*, 109(1), 146–176. <https://doi.org/10.1016/j.jfineco.2013.02.008>.

- Berger, A.N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking & Finance*, 21(6), 849–870. [https://doi.org/10.1016/S0378-4266\(97\)00003-4](https://doi.org/10.1016/S0378-4266(97)00003-4).
- Berger, A.N., & Mester, L.J. (1997). Inside the black box: What explains differences in the efficiencies of financial institutions? *Journal of Banking & Finance*, 21(7), 895–947. [https://doi.org/10.1016/S0378-4266\(97\)00010-1](https://doi.org/10.1016/S0378-4266(97)00010-1).
- Berger, A.N., Leusner, J.H., & Mingo, J.J. (1997). The efficiency of bank branches. *Journal of Monetary Economics*, 40(1), 141–162. [https://doi.org/10.1016/S0304-3932\(97\)00035-4](https://doi.org/10.1016/S0304-3932(97)00035-4).
- Boda, M. (2017). The impact of the 2007–2009 financial crisis on risk management in credit institutions. *Copernican Journal of Finance & Accounting*, 5(2), 45–56. <https://doi.org/10.12775/CJFA.2016.014>.
- Bushman, R.M., & Williams, C.D. (2012). Accounting discretion, loan loss provisioning, and discipline of banks' risk-taking. *Journal of Accounting and Economics*, 54(1), 1–18. <https://doi.org/10.1016/j.jacceco.2012.04.002>.
- Bushman, R.M., & Williams, C.D. (2015). Delayed expected loss recognition and the risk profile of banks. *Journal of Accounting Research*, 53(3), 511–553. <https://doi.org/10.1111/1475-679X.12079>.
- Calem, P.S., & Rob, R. (1999). The impact of capital-based regulation on bank risk-taking: A dynamic model. *Journal of Financial Intermediation*, 8(4), 317–352. <https://doi.org/10.1006/JFIN.1999.0276>.
- El Fadil, J., & Hessou, H. (2024). Performance and assets and liabilities management in the US credit union. *Journal of Applied Finance & Banking*, 14(1), 97–121. <https://doi.org/10.47260/jafb/1416>.
- Foos, D., Norden, L., & Weber, M. (2010). Loan growth and riskiness of banks. *Journal of Banking & Finance*, 34(12), 2929–2940. <https://doi.org/10.1016/j.jbankfin.2010.06.007>.
- Goddard, J.A., McKillop, D., & Wilson, J.O.S. (2014). US credit unions: Survival, consolidation and growth. *Economic Inquiry*, 52(1), 304–319. <https://doi.org/10.1111/ecin.12032>.
- Goddard, J., McKillop, D., & Wilson, J.O. (2008). The diversification and financial performance of US credit unions. *Journal of Banking & Finance*, 32(9), 1836–1849. <https://doi.org/10.1016/j.jbankfin.2007.12.015>.
- Gomez-Biscarri, J., López-Espinosa, G., & Mesa-Toro, A. (2021). The risk implications of the business loan activity in credit unions. *Journal of Financial Stability*, 56, 100932. <https://doi.org/10.1016/j.jfs.2021.100932>.
- Harding, J.P., Rosenblatt, E., & Yao, V.W. (2012). The foreclosure discount: Myth or reality? *Journal of Urban Economics*, 71(2), 204–218. <https://doi.org/10.1016/j.jue.2011.09.005>.
- Hirtle, B.J. (2007). The impact of network size on bank branch performance. *Journal of Banking & Finance*, 31(12), 3782–3805. <https://doi.org/10.1016/j.jbankfin.2007.01.020>.

- Hu, C., Chen, Z., & Cao, T. (2026). Mission Drift or Strategic Expansion? Non-Core Lending, Risk, and Capital in US Credit Unions. *Risks*, 14(2), 32. <https://doi.org/10.3390/risks14020032>.
- Jacques, K., & Nigro, P. (1997). Risk-based capital, portfolio risk, and bank capital: A simultaneous equations approach. *Journal of Economics and Business*, 49(6), 533–547. [https://doi.org/10.1016/S0148-6195\(97\)00038-6](https://doi.org/10.1016/S0148-6195(97)00038-6).
- McKillop, D.G., & Wilson, J.O.S. (2011). Credit unions: A theoretical and empirical overview. *Financial Markets, Institutions & Instruments*, 20(3), 79–123. <https://doi.org/10.1111/j.1468-0416.2011.00166.x>.
- Peek, J., & Rosengren, E.S. (1997). The international transmission of financial shocks: The case of Japan. *American Economic Review*, 87(4), 495–505.
- Ramcharan, R. (2020). Banks' balance sheets and liquidation values: Evidence from real estate collateral. *The Review of Financial Studies*, 33(2), 504–535. <https://doi.org/10.1093/rfs/hhz056>.
- Shrieves, R.E., & Dahl, D. (1992). The relationship between risk and capital in commercial banks. *Journal of Banking & Finance*, 16(2), 439–457. [https://doi.org/10.1016/0378-4266\(92\)90024-T](https://doi.org/10.1016/0378-4266(92)90024-T).
- Smith, D.J., Cargill, T.F., & Meyer, R.A. (1981). An economic theory of a credit union. *The Journal of Finance*, 36(2), 519–528. <https://doi.org/10.1111/j.1540-6261.1981.tb00470.x>.
- Van Rijn, J. (2022). The cooperative identity at US credit unions. *Journal of Co-operative Organization and Management*, 10(1), 100152. <https://doi.org/10.1016/j.jcom.2021.100152>.
- Wheelock, D.C., & Wilson, P.W. (2011). Are credit unions too small? *Review of Economics and Statistics*, 93(4), 1343–1359. https://doi.org/10.1162/REST_a_00121.
- Wheelock, D.C., & Wilson, P.W. (2013). The evolution of cost-productivity and efficiency among US credit unions. *Journal of Banking & Finance*, 37(1), 75–88. <https://doi.org/10.1016/j.jbankfin.2012.08.003>.
- Wilcox, J.A. (2005). Economies of scale and continuing consolidation of credit unions. *Federal Reserve Bank of San Francisco Economic Letter*, 2005-29.

APPENDIX TABLE A. VARIABLE DEFINITIONS

Variables	Description
Tangibility	Total tangible non-loan asset intensity, defined as land and buildings (Acct_007) plus other fixed assets (Acct_008) and foreclosed and repossessed assets (Acct_798A), scaled by total assets (Acct_010).
Planned Tangibility	Investment-driven tangible asset intensity, defined as land and buildings (Acct_007) plus other fixed assets (Acct_008), scaled by total assets (Acct_010).
Shock-driven Tangibility	Stress-driven tangible asset intensity, defined as foreclosed and repossessed assets (Acct_798A), scaled by total assets (Acct_010).
Crisis	Crisis Indicator variable equal to 1 in designated stress years (2007 to 2009 and 2020 to 2023) and 0 otherwise.
Net Worth	Regulatory net worth ratio, computed as total net worth (Acct_997) scaled by total assets (Acct_010).
Delinquent Loans	Delinquent loans and leases, computed as Acct_041B divided by Acct_010.
Solvency	Balance-sheet-based solvency metric. In years prior to 2011: (Acct_010 – (Acct_860C – Acct_925) – Acct_825 – Acct_668 – Acct_820A) is divided by the total shares and deposits (Acct_018). In years including and after 2011: (Acct_010 – (Acct_860C – Acct_925A) – Acct_825 – Acct_668 – Acct_820A) is divided by Acct_018.
Net Charge-offs	Annualized net charge-off ratio, defined as charge offs minus recoveries (Acct_550 – Acct_551) divided by total loans and leases (Acct_025B).
Loan Growth	Annualized growth in total loans and leases defined as (Acct_025B – L1.Acct_025B) divided by L1.Acct_025B.
Asset Growth	Annualized growth in total assets, defined as (Acct_010 – L1.Acct_010) divided by L1.Acct_010.
Member Growth	Annualized growth in the number of members, defined as (Acct_083 – L1.Acct_083) divided by L1.Acct_083.
ROA	Annualized return on assets defined as net income (Acct_661A) divided by total assets (Acct_010).
Operating Expenses	Annualized operating expense ratio defined as total non-interest expense (Acct_671) divided by total assets (Acct_010). The NCUSIF stabilization expense (Acct_311) is added to the numerator in year 2010 and after.
Member Size	Natural log of the number of credit union members (Acct_083).
Size	Natural log of total assets (Acct_010).
Age	Natural log of the age of credit union (year – year_opened).
Branch Count	Natural log of the total number of branches (Acct_566).

* Acct_ items refer to NCUA Call Report accounts from the FS220 series. L1 denotes one period lag.