Filene

REPORT

Factors Contributing to Credit Union Asset Growth, 1979–2016

Luis G. Dopico
Economist, Filene Research Institute

Acknowledgments

I would like to thank Hayagreeva "Huggy" Rao (Stanford University), William Jackson (University of Alabama), James A. Wilcox (University of California, Berkeley), and William Myers and Matt Traille (National Credit Union Administration, NCUA) for their valuable comments and insights about credit union asset growth. I would like to thank Stacy Furukawa (NCUA) for her generous sharing of large amounts of credit union data. I also would like to thank Andrew Downin, Stephanie Galligan, and George Hofheimer (Filene Research Institute) for their support and encouragement with this project and many others.

Filene thanks our generous supporters for making this important research possible.

Table of Contents

Foreword

by Hayagreeva Rao
Atholl McBean Professor of Organizational Behavior,
Graduate School of Business, Stanford University

It is with pleasure I invite you to read Luis Dopico's report, *Factors Contributing to Credit Union Asset Growth, 1979–2016*. It is the product of painstaking data collection, careful data analysis, and of course, an abiding commitment to the credit union community.

The report has breadth—it covers a wide time span—but it also has depth in operational detail. It is chock-full of riveting statistics and research findings—for example, a small increase in marketing expenses by 0.1% of assets increases growth by 0.79%.

The report is organized as a curated multicourse meal, but readers can equally treat each chapter as part of an elaborate buffet of research. Insight, of course, needs to be married with conversation. My hope is that this rich study by Luis sparks conversation and debate in your credit union about its game plan for growth.

Executive Summary

Overview

Employing NCUA credit union data collected since 1979, this report isolates key factors that drive asset growth in credit unions.

MEET THE AUTHOR

Luis G. Dopico
Economist,
Filene Research Institute

If you don't grow, you die.

—Theodore William Schultz, 1979 Nobel Prize for Economics recipient

Those words, or a variation on them, have been permanently ingrained in many of our minds as a mantra that the opposite of growth is not rest or stasis, but rather reduction and eventual systemic collapse. It's a phrase with relevance in the world of business as much as in the realms of biology and physiology.

For credit unions, which have seen their collective ranks diminish by nearly 30% in the last 10 years, this phrase elicits a particular sense of foreboding. With ever-increasing regulatory and operational costs, and amid an environment that requires scale for an individual institution to compete for market share, growth is imperative for credit union survival.

But what factors, competitive advantages, and specific investments of limited capital most reliably help credit unions grow? For many institutions, answering this question has been an enduring challenge.

What Is This Research About?

Leveraging data reported by credit unions to the National Credit Union Administration (NCUA) over the past three-and-a-half decades, Filene Economist Luis Dopico has isolated key drivers and factors that are positively correlated with higher rates of asset growth for credit unions. As the dynamics of growth vary based on the resources and scale of credit unions, the research identifies key factors within five separate asset ranges to provide relevance and context for credit unions of all sizes.

The research finds that in addition to higher return on assets (ROA), three key factors most strongly impact asset growth:

- Paying market-competitive rates on deposit products.
- Investments in marketing.
- Increasing product breadth among a core portfolio of deposit and loan offerings.

Perhaps counterintuitively, increasing the number of branch locations, expanding fields of membership, and adding ancillary products were found to be useful in impacting asset growth for only a limited set of credit union asset ranges.

The research concludes with observations and recommendations for how credit unions can most effectively approach asset growth and member service. Size may be important for growth, but it alone is not sufficient unless the benefits of size are passed on to members.

What Are the Credit Union Implications?

Understanding which factors most reliably drive asset growth will help credit union boards and managers make wise decisions around strategy, pricing, and expense allocation. Exploring which factors do not, on average, have reliable impacts may help prevent credit unions from implementing strategic decisions that may prove to be counterproductive to growth.

As credit unions build and execute strategies to support asset growth, they should consider that:

- **Estimated impacts vary somewhat predictably with economic cycles.** For example, the impact of higher deposit rates climbs significantly during times of changing interest rates.
- **Some impacts of growth have changed permanently.** Adding assets per member, as an example, now trumps simply adding new members to the credit union.
- **What works for smaller credit unions may not impact larger institutions, and vice versa.** While adding new branches may spur growth for a smaller credit union, larger shops might be better served by increasing their marketing expenses.

We all want our credit unions to be the survivors of a never-ending march toward consolidation. By understanding what factors lead to growth, credit unions stand a better chance of surviving and thriving.

Key Findings and Recommendations

Findings

The factors with the largest, most reliable impacts across asset sizes and time periods are:

- **Paying higher interest rates on deposits:** An increase of 1% increases growth by 1.12%.
- **ROA:** An increase of 1% increases growth by 0.87%.
- **An index of 12 key loans and deposits:** Adding 2 increases growth by 1.04% thereafter.
- **Marketing expenses:** A very small increase of 0.1% of assets increases growth by 0.79%.

Some estimated impacts vary somewhat predictably with economic cycles:

- The impacts from higher rates on deposits climb markedly during times of changing interest rates.
- The normally positive impacts of noninterest expenses turn negative during recessions.

Some estimated impacts may have changed permanently:

- The impacts of ROA tripled after passage of the Credit Union Member Access Act (CUMAA) in 1998 and the financial crisis in 2008.
- Adding members with few assets once helped; now, adding assets per member helps more.

Some factors had no measurable or very small impacts, after "holding constant" for other factors:

- Asset size, nonmember deposits, shifts in types of deposits, adding "non-key" products.

Some factors help growth for some asset size ranges, but not for others:

- Adding branches, expanding fields of membership (FOMs), changing CEOs, etc.

Some factors particularly help growth for very small credit unions, i.e., with assets of $1 million (M) to $10M:

- Secondary capital: An increase of 1% of assets increases growth by 0.66% thereafter.
- Switching to a multiple group FOM increases growth by 0.79% thereafter.

Some factors particularly help growth for smallish credit unions ($10M–$100M):

- Switching to a community charter increases growth by 1.12% thereafter.

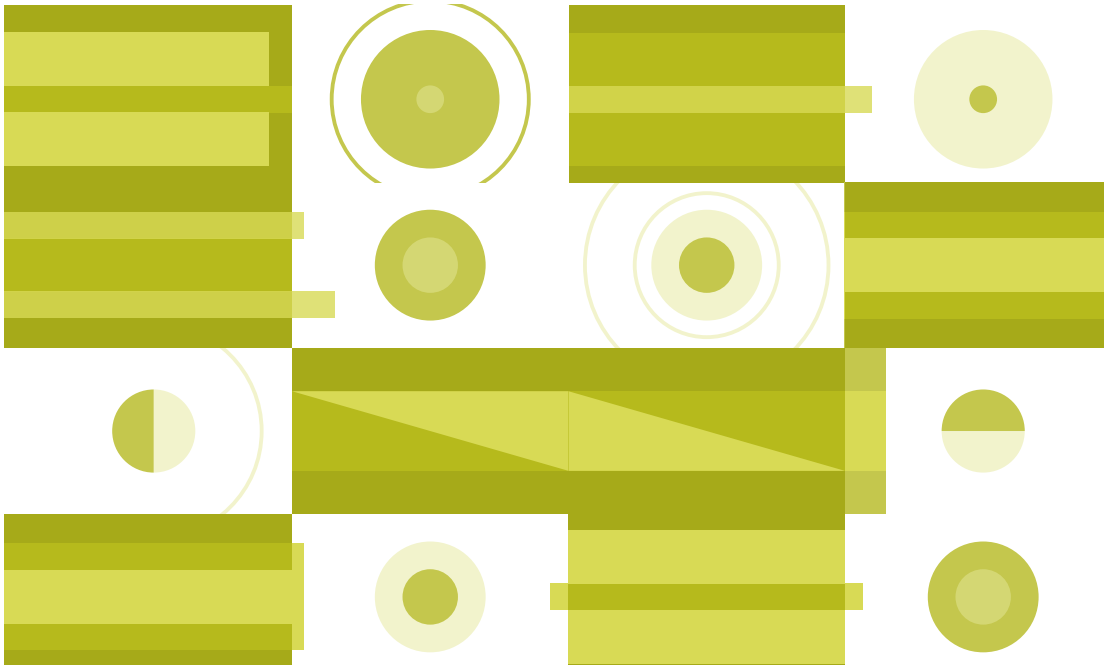
Recommendations

Based on a review and analysis of (1) the scholarly and professional literatures, (2) extensive data about credit union growth and its potential contribution factors, and (3) in-depth statistical analysis of about 100 potential factors, this report issues the following key recommendations regarding asset growth and member service by credit unions:

1. Credit unions should formally compare their interest rates on key types of loans and deposits against the interest rates available to their members at other financial providers.
2. Credit unions should include deposit benefits, loan benefits, and total member benefits among the key metrics that their managers track or target.
3. Credit unions should develop long-term strategic plans that specifically address the balance they seek to strike among deposit benefits, loan benefits, product breadth, other measures of member satisfaction, merger-adjusted asset growth, ROA, and net worth.
4. Credit unions should formally explore what additional financial products and services they could or should offer or add.
5. Credit unions should periodically review their mission as regards serving the credit needs of their whole actual membership, potential membership, and/or community.

6. Credit unions should develop and carry out marketing plans that are consistent with their strategic plans.
7. Credit unions should approach mergers with caution.
8. Policymakers and credit union leaders should continue to promote secondary, or supplemental, capital.

Factors Contributing to Credit Union Asset Growth, 1979–2016



CHAPTER 1

Introduction

Financial consumers form, join, and use credit unions, among other reasons, to have access to a broader range of financial services that they could not obtain elsewhere and/or to obtain those financial services at more attractive terms. These more attractive terms include higher acceptance rates for loan applications, lower interest rates on loans, higher interest rates on deposits,[1] and lower fees for other products. As cooperatively owned institutions, credit unions focus on sustainably providing their members with broad ranges of financial services at attractive terms (Smith, Cargill, and Meyer 1981; Rubin et al. 2013; Dopico 2016).

While this report focuses on credit unions' "inflation-adjusted and merger-adjusted[2] asset growth" (hereinafter growth), such growth should not, per se, be an ultimate, or direct, goal for credit unions. However, growth can be both a signal of success and

an intermediate, or indirect, goal. As shown below, credit unions that successfully provide members with attractive terms (particularly higher interest rates on deposits) also experience higher asset growth rates. Moreover, to remain relevant in the lives of financial consumers and in the US economy (i.e., to at least maintain market share), credit unions must increase their assets at least in line with some combination of the growth rates of overall economic production (gross domestic product, GDP), household wealth, and banks' assets (Dopico 2016).

Also, in recent decades smaller credit unions have experienced higher noninterest expenses per assets than their larger peers and rising "fixed costs" that larger credit unions find somewhat easier to cope with. These fixed costs include both (1) growing consumer demands for higher levels of service from financial providers (from checking accounts to debit and credit cards, online and mobile access, and increasingly complex technology-reliant services), as well as (2) growing regulatory burdens (GAO 2015). Thus, many credit unions hope that asset growth can help them achieve economies of scale—i.e., help defray the fixed costs of operation that consumers and regulators increasingly demand.[3]

Thus, this report explores (1) credit union asset growth, (2) the factors that contribute to that growth, and (3) the variation in asset growth and in its contributing factors across asset size ranges and time periods. We considered a very large number of factors (about 100), the longest period for which data for individual credit unions is readily available (1979–2016), and a large number of asset size ranges (five of them) to be able to explore the wide variety of experiences that individual credit unions encounter. Some factors, like product breadth, contribute more to growth for smaller credit unions than for larger ones. Other factors, like return on assets (ROA), have become more relevant over time. Yet others, like credit unions' interest rate advantages relative to banks, or noninterest expenses, become more or less relevant, somewhat predictably, at different points in the interest rate and business cycles. The remainder of this introduction summarizes the report, which proceeds as follows.

We considered a very large number of factors (about 100), the longest period for which data for individual credit unions is readily available (1979–2016), and a large number of asset size ranges (five of them) to be able to explore the wide variety of experiences that individual credit unions encounter.

In Chapter 2, we review data about credit union growth. Asset growth rates for credit unions have historically outpaced both economic growth and bank asset growth rates, ensuring a growing market share for credit unions and their growing relevance in the financial lives of American consumers and the US economy. After the very high growth

rates that are common for new entrants into an industry, as credit unions matured, their growth rates and their advantage relative to economic growth rates have shrunk. Annual growth rates have fallen, for instance, from 26% during the 1920s to 9.7% during the 1960s, 7.6% during the 1980s, and 4.4% during the last 10 years (2007–2016). Credit unions' growth advantages over economic growth have similarly fallen from 22% to 5.2%, 4.5%, and 3.0% during the same periods.

In Chapter 3, we review data about a lengthy list of potential factors that might contribute to growth. We review these data both for extended periods of time and across relevant asset size ranges. The structure of the credit union system has also changed massively over time, with the number of credit unions rising steadily from 1 in 1908 to 23,866 in 1969, and then shrinking steadily to 6,022 in 2016.[4] As the number of credit unions has shrunk, the distribution of credit unions across asset size ranges has also changed dramatically. In this report, we define credit unions as tiny (with under $1M in assets), very small ($1M–$10M), smallish ($10M–$100M), small (under $100M, or encompassing all the previous ranges), medium ($100M–$1 billion [B]), and large (over $1B), with all dollar values and boundaries adjusted for inflation, expressed in 2016 dollars. For instance, the number of tiny credit unions has fallen from 6,262 in 1979 to 297 in 2016. The number of very small credit unions has fallen from 8,264 to 1,361 during the same period.

The factors that we considered as potential contributors to growth include, among others:

1. Asset size.
2. Components of the income statement and related factors: loan and deposit interest rates of credit unions as compared with banks, noninterest expenses, noninterest income, delinquent loans, and ROA.
3. Components of noninterest expenses and related factors: employee compensation, adding employees, office occupancy expenses, adding branches, office operation expenses, and marketing expenses.
4. Components of the balance sheet and related factors: fractions of assets in various key loan and deposit types and in nonmember deposits, secondary capital,[5] and net worth.
5. Measures of credit unions' product breadth, across seven key loan types: credit cards, other unsecured loans, new car loans, used car loans, first mortgages, other real estate, and business loans; five key deposit types: regular shares (savings accounts), share drafts (checking accounts), money market shares (deposits), share certificates (certificates of deposit), and individual retirement accounts (IRAs); as well as across about 30 other products.

6. Field of membership (FOM) issues and related factors: Did credit unions focus on growth by reaching more members within their FOM? Did they focus on increasing assets per member? On expanding their FOM? Did they change FOMs from a single group to multiple groups, or to a community charter?
7. And yet other factors: Did credit unions change chief executive officers (CEOs)? How old was the credit union? Did credit unions merge?

Small credit unions, on average, have much higher noninterest expenses per assets[6] (3.64% during 1979–2016) than large credit unions (2.55%). With higher costs, small credit unions on average offer their members less attractive interest rates. Applying Smith, Cargill, and Meyer (1981), throughout this report we define "deposit benefits" as the extent to which interest rates for individual credit unions are higher than banks' average national rate for each key type of deposit. We similarly define "loan benefits" as the extent to which interest rates for individual credit unions are lower than banks' average national rate for each key type of loan. We define "total benefits" as the sum of deposit and loan benefits. During 1985–2016, total benefits have been consistently smaller among small credit unions (0.82%) than among large ones (1.48%). On average, offering less attractive interest rates on deposits, smaller credit unions have grown more slowly than larger ones. During 1979–2016 (inflation-adjusted and merger-adjusted) asset growth rates have averaged –2.1% among tiny credit unions, 2.1% among very small, 4.1% among smallish, 5.9% among medium, and 8.3% among large ones.

On average, offering less attractive interest rates on deposits, smaller credit unions have grown more slowly than larger ones.

In Chapter 4, we briefly present our statistical methodology, review the scholarly and professional literature on credit union asset growth, and present the variables in our core model. In this report, we use ordinary least squares (OLS) and fixed effects panel regression statistical techniques to assess what factors can be shown statistically to contribute to credit unions' growth both across asset size ranges and over time. The five independent variables in our core statistical mode are deposit benefits, ROA (return on assets, or net income per assets), an index of product breadth across 12 key loan and deposit types, delinquent loans, and asset size.

In Chapter 5, we present the results of our statistical models about what factors have contributed to credit union asset growth, across asset size ranges during 1979–2016. The factors that most reliably contribute to growth are deposit benefits, ROA, product breadth, and marketing expenses. Increasing deposit benefits by the large amount of 1% (but an amount smaller than one standard deviation for the variable) increases growth by 1.12%, which is about one-fourth of recent average growth. Increasing ROA by 1% (also less than

one standard deviation of ROA) increases growth by 0.87%. Adding two products (out of the 12 key loan and deposit products) increases growth by 1.04% subsequently. Increasing marketing expenses by 0.1% of assets (doubling the typical, and small, marketing budget) increases growth by 0.79%. While these estimated impacts were not identical across all asset size ranges and time periods, we found these core results to be remarkably similar across most asset size ranges and time periods.

We also concluded that deposit benefits and ROA are likely jointly necessary, but separately not sufficient, conditions for credit unions' sustained growth. Credit unions with higher interest rates on deposits likely attract more members and more of their funds. However, to maintain their net worth (capital) to asset ratios, credit unions cannot focus solely on deposit benefits. Credit unions experiencing larger asset inflows must set aside commensurately larger amounts of earnings. In other words, to simultaneously grow and maintain adequate capital to asset ratios requires a higher ROA. Conversely, credit unions cannot focus solely on higher ROAs at the expense of deposit benefits. By and large, consumers will take deposits to institutions that pay higher interest rates (and provide other quality services), without directly taking into account an institution's ROA.

To simultaneously grow and maintain adequate capital to asset ratios requires a higher ROA.

Our results about marketing expenses should likely push credit unions interested in faster asset growth to seriously consider the very high estimated impacts (the "bang per buck") of those expenses. Our results imply that allocating $1 worth of potential revenues toward lower interest rates on deposits would have an impact on growth (again 1.12%) similar to increasing marketing expenses by only $0.14. In other words, credit unions focused on growing could, on average, expect to obtain large positive impacts from small transfers in resources (e.g., 0.14% of assets) from deposit benefits to marketing efforts.

We also found the relationship among asset size, noninterest expenses, deposit benefits, and asset growth to be somewhat complex. We explored statistical models that simultaneously tested the impacts of asset size, noninterest expenses, and deposit benefits on growth. In such models, deposit benefits had the clearest, strongest impacts on growth. It is likely that credit unions with large deposit benefits may offer them because they had lower costs, and credit unions with lower costs tend to be larger. We interpret the weaker, less clear links between size and growth in multivariate models to imply the following. While asset size may be very important, asset size alone does not result in growth. Larger credit unions that have lower costs and pass those lower costs to their members in the form of attractive interest rates grow more quickly. However, larger credit unions that do not have low costs or do not pass them to their members would not grow as quickly. Size may be important,

but it is not enough. Deposit benefits may be linked to size, but if deposit benefits are not delivered, sustained growth is far less likely to take place. Adding more complexity to the picture, we also found that increasing noninterest expenses, carried out appropriately, can increase growth. For instance, increases in noninterest expenses might deliver growth if they relieve overstretched employees, operations (e.g., computers), or branches, allowing the credit union to deliver better service.

While asset size may be very important, asset size alone does not result in growth.

We also found that many estimated impacts could vary across both asset size ranges and time periods. For instance, increases in employee compensation (per assets) increased growth for credit unions smallish and above. Adding branches (per assets) increased growth, but only for very small and smallish credit unions. Adding secondary capital increased growth among very small credit unions. Similarly, changing CEOs lifted growth the most for very small credit unions, but did not have positive impacts on tiny, medium-size, and large credit unions. In an example of impacts that vary over time, the estimated impacts on growth due to noninterest expenses, and its components, are deeply affected by the business cycle, being positive during expansions but turning negative surrounding recessions.

There were also factors for which we find no evidence of contributions to growth. Providing broader offerings of key loans and deposits results in faster asset growth. However, we do not find similar results for about 30 other "non-key" products. Faster-growing credit unions are likely to be focused on delivering value to members. As such, we find faster-growing credit unions to deliver far broader ranges of many products that members likely do value. However, we find that adding non-key products does not increase credit union asset growth. For instance, slower-growing credit unions that add non-key products do not find that their asset growth rates climb when they add those products. Similarly, shifting sources of deposits or adding nonmember deposits did not result in faster asset growth.

Providing broader offerings of key loans and deposits results in faster asset growth.

Chapter 6 draws from the statistical findings, theory, and practices of credit unions, as examined in this report, to develop recommendations on how credit unions should address asset growth and, more generally, member service.

Chapter 7 again briefly summarizes the key findings from the report.

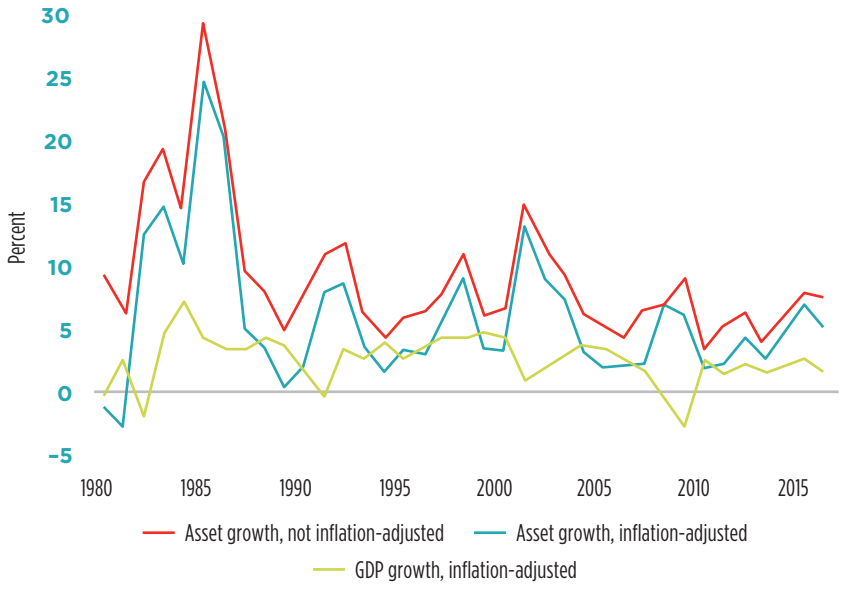
Asset Growth: Fewer Credit Unions, but a Growing Market Share

Figure 1 presents annual asset growth (the main variable we seek to explain throughout this report) and GDP growth, both adjusted for inflation, during 1980–2016.[7] The figure highlights that over extended periods, such as from 1980 to 2016, credit unions have consistently experienced higher growth rates (5.9%) than those for the US economy as a whole (2.6%) and for commercial banks (3.4%).[8]

The average asset growth rate for credit unions appears to respond to macroeconomic conditions and to changes in government monetary and regulatory policy. For instance, assets surged during the mid-1980s, following the lagged effects of the inflationary monetary policy of the late 1970s and, perhaps, due to the failures of thrift deposit insurers and differences in the timing of changes in the regulation and deregulation of deposit interest rates at credit unions vs. banks during the early 1980s. Credit unions also experienced (smaller) asset growth surges following the loosening of monetary policy implemented in response to the recessions of 1990–1991, 2001, and 2007–2009. Taking into

FIGURE 1

CREDIT UNION ASSET GROWTH AND GDP GROWTH (1980–2016)



Sources: NCUA (2017a) and BEA (2017).

account previous patterns in recent decades, the recent upsurge in credit unions' asset growth could similarly be a delayed result of the quantitative easing efforts of the Federal Reserve during 2008–2014.

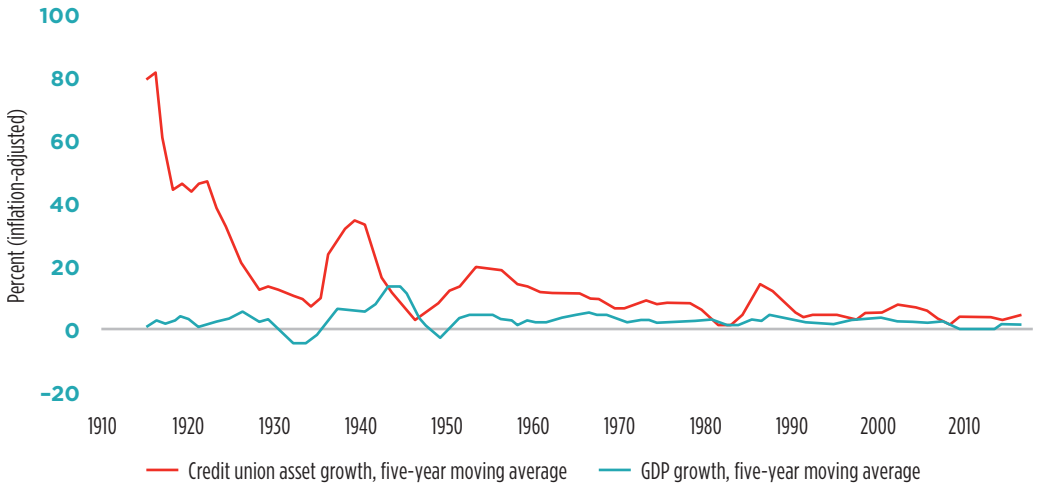
Our methodology (see Chapter 4) includes "annual dummy" variables that largely capture the overall impacts of nationwide economic conditions and of policy on credit union asset growth. However, since individual credit unions cannot control nationwide economic conditions or policy, this report does not focus on how aggregate credit union growth rates differ from year to year. Instead, this report largely focuses on the factors that may explain how the growth rates of individual credit unions differ from one another. In other words, our report focuses on the fraction of growth that individual credit unions may more readily control through changes in their operations, such as changing the gaps between the interest rates they offer and those of other depositories, changing the products and services they offer, and changing how they allocate their spending: more or less on marketing, on hiring employees, on building new branches, etc.

Figure 1 also shows that credit unions have been experiencing slowing asset growth rates: 7.6% during the 1980s, 5.2% during the 1990s, and 4.4% during the last 10 years (2007–2016). Thus, credit unions' growth advantages relative to both the US economy and banks have been shrinking. For instance, during these three periods, credit unions' growth advantage relative to GDP shrank from 4.4% to 2.0% and 3.0%. The reduction in credit unions' asset growth rates and in their advantage relative to both the economy and to banks since 1980 is likely related to even longer-term trends of reductions in credit unions' asset growth rates and to credit unions' growing market share. New entrants to a market often achieve very high growth rates during their early stages of development. Consider a new credit union that grows from $0 in assets to $1M, $2M, $3M, $4M, and $5M during its first years of operation. Computing that credit union's growth rate would yield values of infinity (comparing $1M and $0), 100% (comparing $2M and $1M), 50% (comparing $3M and $2M), 33% (comparing $4M and $3M), and 25% (comparing $5M and $4M). Even after seemingly extreme asset growth rates (ranging from infinity to 25%), the credit union would still be very small, with $5M in assets.

Thus, in Figure 2, we present again credit unions' asset growth and GDP growth, but for the extended period of 1915–2016.[9] The figure shows that the pattern of both (1) faster asset growth among credit unions and (2) a shrinking advantage for credit unions over GDP (and banks) during 1980–2016 clearly fits within a much longer pattern. Despite their slowing growth, as long as credit unions grow faster than GDP and faster than bank assets, their assets will continue their upward climb as a fraction either of GDP or bank assets. Figure 3 presents credit union assets per GDP and per assets in all depositories (i.e., including commercial banks and thrifts) during 1910–2016. Highlighting their long-term growth in

FIGURE 2

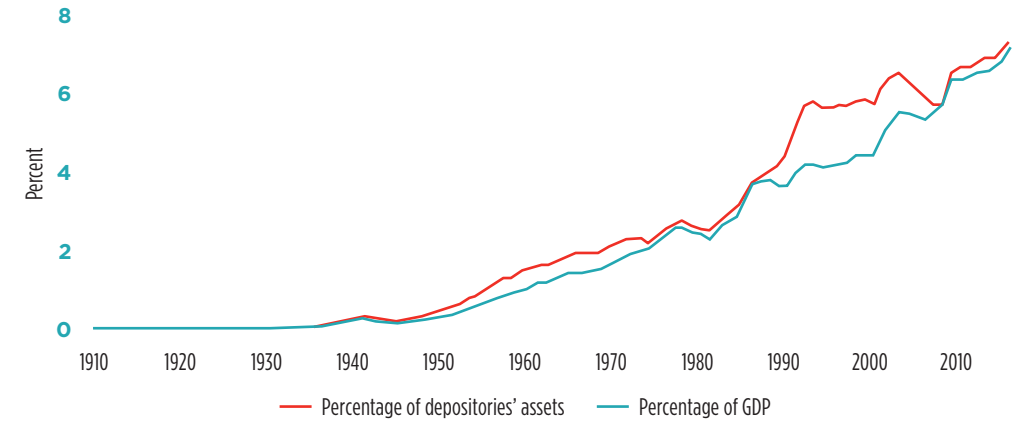
CREDIT UNION ASSET GROWTH AND GDP GROWTH (1915–2016)



Sources: BLS (1930 and 2017), BFCU (1969), BEA (2017), CUNA (2017), and author's calculations.

FIGURE 3

CREDIT UNION ASSETS PER DEPOSITORIES' ASSETS AND PER GDP (1910–2016)



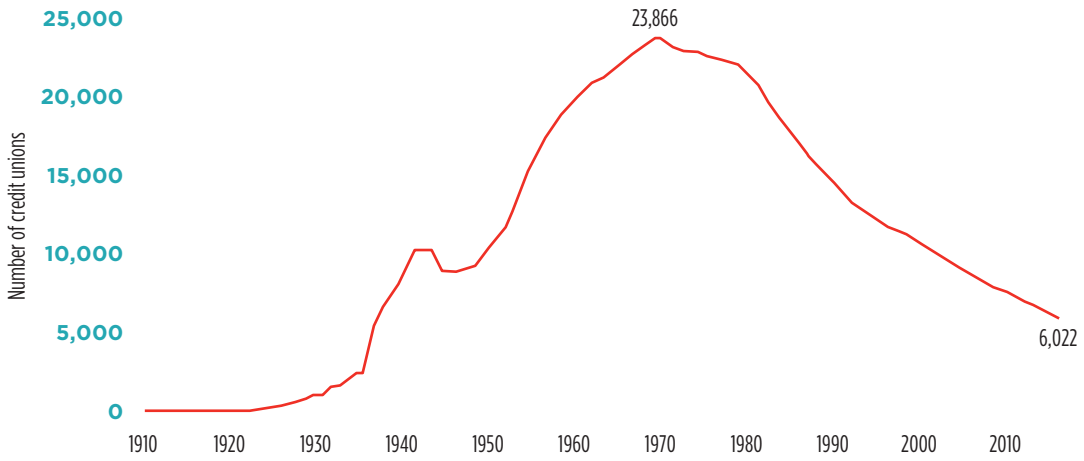
Sources: BLS (1930), BFCU (1969), Fed (1959), FHLBB (1988), CUNA (2017), FDIC (2017), BEA (2017), and author's calculations.

market shares, credit union assets per assets in all depositories first exceeded 1% in 1956, 2% in 1969, 5% in 1991, and reached 7.3% in 2016.

Despite the long-term success of the credit union system, the experiences of individual credit unions have varied widely. Figure 4 presents the number of credit unions (or charters) in the United States during 1910–2016. The figure clearly highlights two phases in the history of credit unions. Except for a brief interruption during World War II, the number of

FIGURE 4

NUMBER OF CREDIT UNIONS IN THE UNITED STATES (1910–2016)*



Sources: BLS (1930), BFCU (1969), and CUNA (2017).
*Including non-federally insured credit unions.

credit unions grew steadily during 1910–1969, peaking at 23,866 in 1969. Since then, the number of credit unions has fallen, also steadily, reaching 6,022 in 2016.[10]

The ongoing decline in the number of credit unions while their total assets grow is, of course, consistent with all of the following: (1) increasing amounts of assets per individual credit union, (2) a shift in assets from smaller to larger credit unions, and (3) pronounced declines in the number of smaller credit unions. To explore differences in credit unions across asset size ranges, we define credit unions as tiny (with under $1M in assets), very small ($1M–$10M), smallish ($10M–$100M), small (under $100M, or encompassing all the previous ranges), medium ($100M–$1B), and large (over $1B), with all boundaries adjusted for inflation, expressed in 2016 dollars. The $1M boundary is inspired by the NCUA's definition of small credit unions during 1981–2003. The $10M boundary is inspired by the NCUA's definition of small credit unions during 2003–2013 (see Dopico 2014). The $100M boundary is inspired by the NCUA's definition since 2015 (NCUA 2015).

Figure 5 presents the number of credit unions across[11] asset size ranges in 1979 and 2016 (panel A), along with their shares of the total (panel B). The large reduction in the number of credit unions (by 11,697, from 17,482 to 5,785) has been driven largely by the large reductions in the number of tiny credit unions (by 5,965, from 6,262 to 297) and of very small ones (by 6,903, from 8,264 to 1,361). In contrast, the numbers of medium and large credit unions have increased markedly, respectively, by 990 (from 289 to 1,279) and by 263 (from 3 to 272). Panels C and D present the even more dramatic shifts in the amounts of assets and market shares from smaller to larger credit unions. For instance, the fraction of

FIGURE 5

NUMBER OF CREDIT UNIONS, ASSETS, MARKET SHARES, AND GROWTH RATES, ACROSS ASSET SIZE RANGES (1979–2016)

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Small (<$100M) (5)	Medium ($100M–$1B) (6)	Large (>$1B) (7)
A. Number of credit unions							
1979	17,482	6,262	8,264	2,664	17,190	289	3
2016	5,785	297	1,361	2,575	4,233	1,279	272
B. Percentage of credit unions in each asset size range							
1979		36	47	15	98	1.7	0.02
2016		5.1	24	45	73	22	4.7
C. Assets in credit unions ($ billion, inflation-adjusted [r] and nominal [n])							
1979 (n)	54	0.9	9.2	24	34	18	1.5
1979 (r)	169	2.8	29	75	106	58	4.9
2016 (n, r)	1,293	0.1	6.7	97	104	395	793
D. Percentage of credit unions' assets in each asset size range							
1979		1.6	17	44	63	34	2.9
2016		0.01	0.5	7.5	8.1	31	61
E. Asset growth (merger-adjusted, but not inflation-adjusted)							
2016	7.4	–2.4	0.6	3.2	3.0	5.6	9.0
1979–2016	9.2	0.8	5.2	7.3	7.0	9.2	11.7
F. Asset growth (merger-adjusted and inflation-adjusted)							
2016	5.2	–4.4	–1.4	1.1	0.9	3.4	6.6
1979–2016	5.9	–2.1	2.1	4.1	3.8	5.9	8.3

Sources: NCUA (2017a) and BLS (2017).

Note: Since the extent to which non-federally insured credit unions (NFICUs) were included in call reports varied widely until 2006, in these long-term comparisons we focus on federally insured credit unions.

credit union assets in very small credit unions fell from a sizable 17% in 1979 to a very small 0.5% in 2015. The fraction across all small credit unions fell from 63% to 8% (column 5). The fraction in large credit unions rose from 3% to 61%.

Panels E and F present credit unions' asset growth rates, across asset size ranges during 1979–2016. We include data both in nominal terms (not inflation-adjusted, panel E) and in real terms (inflation-adjusted, panel F), but focus throughout the report on inflation-adjusted (i.e., real) asset growth. Smaller credit unions have sustainedly experienced lower asset growth rates than their larger peers, with averages for 1979–2016 ranging from tiny credit unions (at –2.1%) to very small (2.1%), smallish (4.1%), medium (5.9%), and large (8.3%).

A Review of Data about Factors Potentially Contributing to Credit Unions' Growth

This chapter presents data for many factors that could potentially contribute to credit union asset growth. They include:

1. Income statement–related items: interest rates for various products and their differences relative to the rates of banks, ROA and its components, number of employees and branches, marketing expenses, etc.
2. Balance sheet–related items: 12 key types of loans and deposits, nonmember deposits, secondary capital, and net worth.
3. Whether credit unions offer any of a long list of other "non-key" products.
4. Membership-related items: identifiers of credit unions as serving single groups, multiple groups, or having community charters; as well as the number of members and potential members (which we use to develop measures of credit unions' efforts to reach out within their field of membership or to expand it).
5. Yet other factors, such as the credit union's age.

In the following figures, we always present data for at least the most recent full year: 2016. However, while clearly representative of the most current conditions, 2016 may or may not be representative of long-term, and thus of future, conditions. Thus, for many factors, we also present averages for extended long-term periods (as long as 1979–2016) that may be more representative of the long-term conditions that credit unions may encounter in the future. In some cases, when credit unions are experiencing long-term trends that are likely to continue, we do not present long-term averages but present instead an earlier value to provide a sense of the ongoing long-term trend—presenting, for instance, values for 1979 and 2016.

Larger Credit Unions, on Average, Offer More Attractive Interest Rates

Figure 6 presents interest rates computed across all loans, across all deposits, and for 11 key types of loans and deposits, both in 2016 and for the longest period for which data were available, up to 1979–2016. Panel A presents interest income per loans, as an average

FIGURE 6

CREDIT UNION INTEREST RATES ON LOANS AND DEPOSITS, ACROSS ASSET SIZE RANGES (1979–2016)

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. All loans						
2016	4.35	7.93	6.42	5.27	4.50	4.17
1979–2016	8.53	10.51	9.59	9.00	8.49	8.15
B. Credit card loans						
2016	10.93	14.31	10.87	10.34	9.98	11.27
1992–2016	11.40	13.33	11.87	11.70	11.49	11.09
C. Other unsecured loans						
2016	11.30	11.54	11.72	10.96	10.51	11.81
1979–2016	13.10	12.85	13.23	13.14	13.02	13.09
D. New car loans						
2016	2.97	4.45	3.97	3.62	3.27	2.77
1986–2016	6.77	7.66	7.21	7.04	6.82	6.54
E. Used car loans						
2016	3.77	6.87	5.92	5.04	4.12	3.32
1989–2016	7.24	9.27	8.45	7.78	7.22	6.78
F. First mortgages						
2016	3.85	7.62	4.86	4.38	4.03	3.75
1982–2016	6.91	9.08	7.77	7.32	6.95	6.91
G. Other real estate loans						
2016	4.16	5.71	4.87	4.59	4.37	4.01
1986–2016	7.16	8.38	7.55	4.41	7.24	6.87
H. All deposits						
2016	0.52	0.55	0.37	0.34	0.42	0.60
1979–2016	3.86	3.13	3.55	3.70	3.88	4.12
I. Regular shares (savings accounts)						
2016	0.22	0.79	0.47	0.21	0.24	0.16
1979–2016	3.42	3.34	3.54	3.38	3.36	3.64
J. Share drafts (checking accounts)						
2016	0.16	0.03	0.08	0.08	0.15	0.18
1982–2016	2.17	1.26	1.61	2.02	2.22	2.30
K. Money market shares (deposits)						
2016	0.37	—	0.27	0.28	0.28	0.34
1979–2016	3.68	4.25	3.55	3.54	3.63	3.85

(CONTINUED)

FIGURE 6

CREDIT UNION INTEREST RATES ON LOANS AND DEPOSITS, ACROSS ASSET SIZE RANGES (1979–2016) *(CONTINUED)*

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
L. Share certificates (certificates of deposit)						
2016	1.08	0.83	1.15	0.78	0.90	1.19
1979–2016	4.92	4.28	4.73	4.82	4.95	4.97
M. Individual retirement accounts (IRAs)						
2016	0.90	0.90	0.70	0.77	0.77	0.97
1981–2016	4.71	4.11	4.60	4.63	4.61	4.89

Sources: NCUA (2017a) and BLS (2017).
Note: The call reports do not include interest rates for money market shares during 1984–1988. Dopico (2013) explores the variables included in call reports, and their changes, during 1979–1990.

that combines incomes from loans priced both in the most current year and for loans priced in earlier years (e.g., mortgages and auto loans). Panel H does the same for interest expense per deposits. The other panels are based on the interest rates reported by each credit union as most common at the end of each calendar year. The figure shows that smaller credit unions have long charged higher interest rates on loans and paid lower interest rates on deposits than larger credit unions, across nearly all asset size ranges, across nearly all loan and deposit types.

Smaller credit unions have long charged higher interest rates on loans and paid lower interest rates on deposits than larger credit unions, across nearly all asset size ranges, across nearly all loan and deposit types.

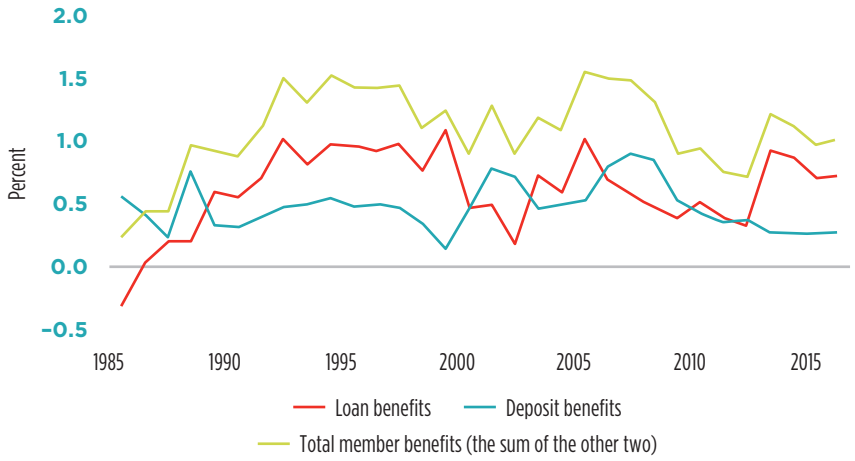
For instance, during 1979–2016, loan interest rates among large credit unions averaged 8.15%, substantially lower than among medium (8.49%) and smallish credit unions (9.00%), and much lower than among tiny credit unions (10.51%). These large differences remain, even after adjusting for differences in credit risk across asset size ranges, for instance, by removing provisions for loan losses (e.g., 7.49%, 7.92%, 8.44%, and 9.42%, respectively; panel H of Figure 8 below presents provisions). During the same extended period, average deposit interest rates among large credit unions (4.12%) were also higher than among medium (3.88%) and smallish credit unions (3.70%) and much higher than among tiny credit unions (3.13%).

These differences in interest rates across asset size ranges may, of course, be recast as measures of the benefits that credit unions provide to their members. Figure 7 presents

our annual estimates for (1) loan benefits, or how much lower interest rates for loans were at credit unions than at banks; (2) deposit benefits, or how much higher interest rates for deposits were at credit unions than at banks; and (3) total member benefits, or their sum, from 1985 to 2016. Following Smith, Cargill, and Meyer (1981),[12] we compute loan benefits for each year during the 1979–2016 period as the weighted average of the interest rates charged by banks (using their national average) minus those charged by individual credit unions across as many as six key loan types (credit cards, other unsecured loans, new cars, used cars, first mortgages, and other real estate loans).[13] We compute deposit benefits for each year during 1979–2016 as the weighted average of the interest rates paid by individual credit unions minus those paid by banks (using their national average) across as many as five key types of deposits (checking, saving, money market deposits, certificates of deposit, and IRAs).[14]

FIGURE 7

CREDIT UNION INTEREST RATE ADVANTAGES RELATIVE TO BANKS ON LOANS (LOAN BENEFITS), ON DEPOSITS (DEPOSIT BENEFITS), AND THEIR SUM (TOTAL MEMBER BENEFITS) (1985–2016)



Sources: NCUA (2017a and b), Census (2006), Bankrate.com (2008), and author's calculations.
Note: The value of total benefits, not shown above, averaged 0.82% during 1979–1984.

Figure 7 highlights that, despite some variation across years,[15] credit unions have sustainedly delivered higher interest rates on deposits than banks (averaging 0.48% more during 1985–2016) and lower interest rates on loans (averaging 0.62% less), yielding total members of 1.09% (during 1985–2016). Even during the current period of historically unprecedented very low interest rates, credit unions still deliver substantial deposit benefits (0.28% in 2016) and, particularly, loan benefits (0.74% in 2016), for a total member benefit of 1.02%.

Figure 8 presents data about total, loan, and deposit benefits as well as key components of credit unions' aggregate income statements, across asset size ranges during 1979–2016. Total member benefits (panel A) have sustainedly been larger for larger credit unions, ranging from 0.58% for tiny credit unions to 1.48% for large ones during 1985–2016. Furthermore, the differences have been increasing over time. For instance, in 2016, total member benefits ranged from −0.61% for tiny credit unions (implying rates that, absent adjustments for differences in credit risk, appear less attractive than at banks) to 1.20% for

FIGURE 8

CREDIT UNION TOTAL, LOAN, AND DEPOSIT BENEFITS AND KEY INCOME STATEMENT-RELATED FACTORS (INTEREST AND NONINTEREST INCOME AND EXPENSE, PROVISIONS FOR LOAN LOSSES, DELINQUENT LOANS, AND ROA) ACROSS ASSET SIZE RANGES (1979–2016)

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. Total member benefits (sum of loan and deposit benefits, %)						
2016	1.02	–0.61	–0.22	0.28	0.80	1.20
1985–2016	1.09	0.58	0.86	0.80	0.93	1.48
B. Loan benefits (interest rate advantage, or lower loan rates at credit unions than at banks, %)						
2016	0.74	–1.26	–0.59	0.12	0.61	0.85
1985–2016	0.62	–0.24	0.11	0.34	0.56	0.90
C. Deposit benefits (interest rate advantage, or higher deposit rates at credit unions than at banks, %)						
2016	0.28	0.66	0.37	0.16	0.18	0.35
1985–2016	0.48	0.82	0.75	0.45	0.37	0.59
D. Interest income (from both loans and investments, per assets, %)						
2016	3.29	3.79	3.65	3.31	3.35	3.26
1979–2016	7.08	7.60	7.58	7.25	7.03	6.80
E. Interest expense (from both deposits and borrowings, per assets, %)						
2016	0.51	0.44	0.32	0.30	0.39	0.60
1979–2016	3.51	2.66	3.14	3.34	3.55	3.77
F. Noninterest income (per assets, %)						
1979	0.10	0.26	0.16	0.10	0.06	0.06
2016	1.35	1.19	0.73	1.16	1.47	1.31
G. Noninterest expense (per assets, %)						
2016	3.00	4.33	3.67	3.55	3.50	2.67
1979–2016	3.15	4.39	3.87	3.58	3.20	2.55
H. Provisions for loan losses (per assets, %)						
2016	0.39	0.36	0.33	0.29	0.37	0.41
1979–2016	0.38	0.59	0.39	0.33	0.36	0.42
I. Delinquent loans (per assets, %)						
2016	0.56	1.74	0.95	0.61	0.57	0.54
1979–2016	0.94	3.21	1.69	1.09	0.76	0.60
J. Return on assets (ROA, net income per assets, %)						
2016	0.74	–0.14	0.05	0.33	0.55	0.90
1979–2016	0.87	0.44	0.67	0.73	0.83	0.90

Sources: NCUA (2017a and b), Census (2006), Bankrate.com (2008), and author's calculations.

large credit unions. Loan benefits (panel B) appear similarly related to size. Deposit benefits (panel C) have a less clear relationship with asset size, particularly as tiny and very small credit unions appear to be making an effort to retain their attractiveness through higher interest rates on regular shares (savings accounts).

Turning to the income statement, and unsurprisingly given the differences in interest rates, smaller credit unions have higher interest income than their larger peers (panel D). Despite smaller credit unions' efforts with regular shares, larger credit unions have higher interest expenses than their smaller peers (panel E), as they pay higher rates on the more sophisticated accounts that dominate their liabilities (e.g., share drafts, money market shares, and share certificates—see Figure 6 and Figure 18 below).

Despite smaller credit unions' efforts with regular shares, larger credit unions have higher interest expenses than their smaller peers.

Credit Unions' Noninterest Income Has Risen Markedly, but Net Interest Margins (NIM) Have Fallen More

Continuing with our overview of the income statement, panel F of Figure 8 explores noninterest income across asset size ranges during 1979–2016. During this period, noninterest income has risen markedly, from 0.10% to 1.35% of assets. Also, smaller credit unions used to have more noninterest income, ranging from, for instance, 0.26% for tiny credit unions to 0.06% for large ones in 1979. Today, the relationship between size and noninterest income is less clear, ranging from 0.73% for very small credit unions to 1.47% for medium ones. Neither tiny (1.19%) nor large credit unions (1.31%) fit into a picture of larger size resulting in more noninterest income.

Using only call report data, interpreting noninterest income and its evolution over time is particularly complex. Credit unions may experience increasing noninterest income for at least four reasons. First, credit unions may increase noninterest income by increasing fees on their existing products, i.e., by charging more. Second, members might simply be choosing to purchase more of their existing for-fee products, without prices having increased. Third, credit unions might be adding new for-fee products that consumers value and are willing to pay for (e.g., insurance and brokerage services). And, fourth, credit unions operate in an environment that is at least somewhat competitive and that may push them into a combination of the previous three options.

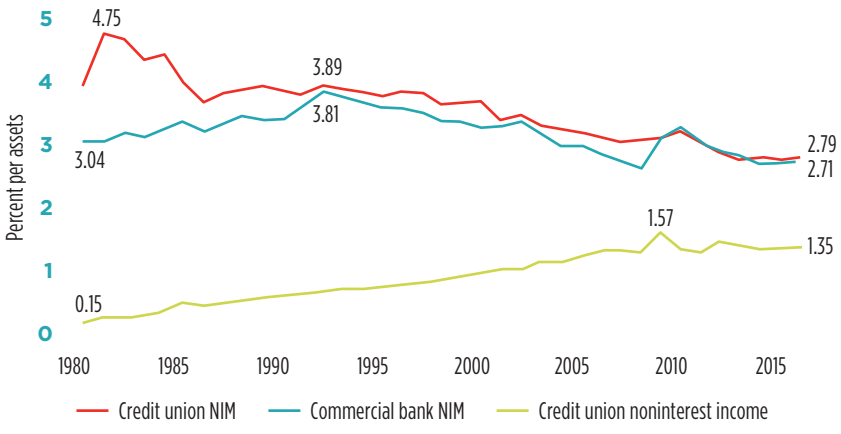
Many credit unions have, among others, the goal of providing non-loan, non-deposit products with more attractive pricing, i.e., lower fees than commercial banks (see Stango

and Zinman 2009). However, credit unions should not necessarily have as a goal providing services for no fees (and implicitly having zero noninterest income). Providing members with services for zero fees may result unduly in cross-subsidization across members. Essentially some members (who choose not to use services, or to use them less) would pay for (i.e., cross-subsidize) the services that other members use (or use more, and potentially abuse). To minimize the potential for cross-subsidization (and potential abuse) across members, credit unions could seek to price fees for services at cost so that users of services at least cover the costs of the services they consume.[16] Pricing services at cost would simultaneously (1) avoid the potential for cross-subsidization (and abuse), but (2) still likely result in more attractive pricing than at commercial banks.

As we stated above, credit unions also operate in at least a somewhat competitive environment that in recent decades has likely pushed many of them toward raising more noninterest income. To ensure that their rates are attractive, credit unions, by and large, price their loan and deposit offerings not only based on economy-wide interest rates, but particularly on commercial banks' interest rates. As economy-wide interest rates have fallen in recent decades, commercial banks have been experiencing an inexorable process of margin compression. In particular, commercial banks' net interest margin (NIM)—the difference between interest income and interest expense, per assets, %—has fallen by 1.10%, from 3.81% in 1992 to 2.71% in 2016 (see Figure 9). Since commercial banks are the larger and thus more dominant player in loan and deposit markets, their tightening margins inevitably have affected interest rates (i.e., the pricing of loans and deposits) among credit unions. Thus, during the same period, credit union NIMs also tightened by 1.10%, from 3.89% to 2.79%.[17] As credit unions increasingly find that competitive pressure from falling economy-wide and commercial bank interest rates pushes them to rely less and less on net interest income, many are turning to other sources of income to cover their expenses. Thus, margin compression during the last decades likely explains credit unions' increasing reliance on noninterest income. In fact, the increase in credit unions' noninterest income (by 1.25%, from 0.10% in 1979 to 1.35% in 2016) is roughly similar to the decrease in credit unions' NIM during the same period (by 1.31%, from 4.10% in 1979 to 2.79% in 2016).

FIGURE 9

COMMERCIAL BANK AND CREDIT UNION NIM AND CREDIT UNION NONINTEREST INCOME (1980–2016)



Sources: NCUA (2017a) and FDIC (2017).

Larger Credit Unions, on Average, Have Lower Noninterest Expenses

Next, panels G through J of Figure 8 highlight more deep differences in performance across asset size ranges during 1979–2016. For instance, large credit unions had far lower noninterest expenses (2.55%) than medium (3.20%), smallish (3.58%), very small (3.87%), and tiny credit unions (4.39%). The differences were similarly large for delinquent loans (0.60%, 0.76%, 1.09%, 1.69%, and 3.21%) and for ROA (0.90%, 0.83%, 0.73%, 0.67%, and 0.44%). Having lower noninterest expenses that are, on average, substantially lower means that larger credit unions, on average, can simultaneously (1) offer their members more attractive interest rates, (2) grow faster, (3) have higher ROAs, and thus (4) be able to set aside sufficient retained earnings to maintain stable capital ratios, despite faster asset growth (Dopico 2016).[18]

The Evidence for Size-Related Reductions in Costs among Credit Unions Is Complex

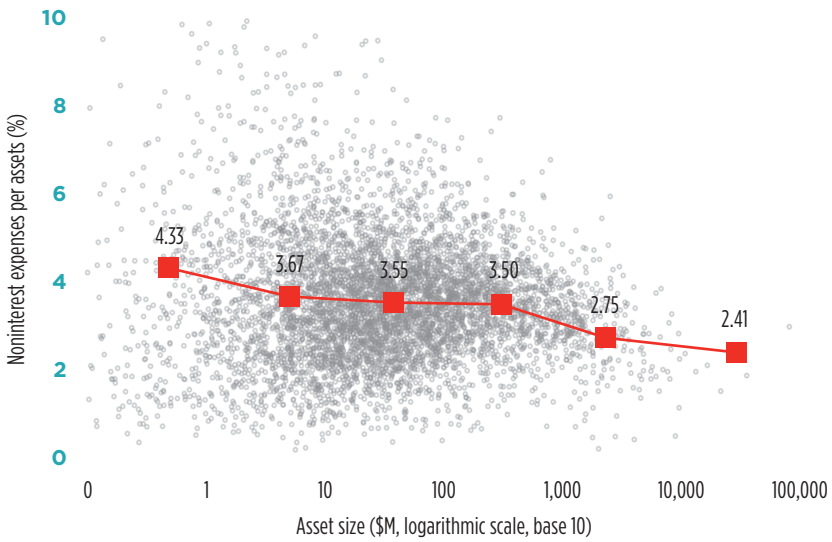
Given the large and ongoing differences in credit union performance across asset size ranges, many individual credit unions may look to scale, and mergers, as a key tool to manage their performance.[19] Individual credit unions might hope to benefit from economies of scale, spreading fixed costs over larger asset bases, either through organic growth (e.g., pushing for 10% growth instead of 5% per year) or through mergers. In particular, through mergers of equals, credit unions might hope to readily expand their assets by up to 100% within one year.[20] However, the evidence for size-related cost reductions among credit unions is complex. Differences in credit union costs across asset size ranges turn out to be pervasive, quite large when comparing very distant asset size ranges, but also surprisingly small when comparing "nearby" asset size ranges. Ultimately, using scale as a tool to manage credit union performance turns out to be very difficult.

To explore the elusive impacts of scale on individual credit unions, Figure 10 presents noninterest expenses (costs) per assets across asset size ranges and across individual credit unions in, for instance, 2016. The figure includes one dot presenting the combination of asset size and costs for each of 5,785 credit unions. Incontrovertible evidence for economies of scale (i.e., that larger size reliably reduced per unit costs) would involve credit unions being aligned along a relative narrow band running from the northwest of the figure to the southeast of the figure (i.e., with a downward or negative slope) and with relatively few observations in the southwest and northeast corners of the figure. However, the figure does not provide incontrovertible evidence for economies of scale. The "blob" of data points does not quite look like a downward-sloping narrow band.

Is there, then, evidence for economies of scale among credit unions? Is larger size associated with lower per unit costs? Figure 10 also includes averages for noninterest expenses per assets across asset size ranges.[21] These values are plotted using large squares and joined by a line. The squares and line do exhibit the downward slope associated with economies of scale. Replicating this procedure each year, with data for 1979–2016, produces remarkably similar results. These findings imply that, sustainedly across long periods of time, larger credit unions on average have lower costs than smaller ones. However, the size-related differences are not so clear-cut that all small credit unions have high costs. Many small credit unions do have low costs.

FIGURE 10

NONINTEREST EXPENSES PER ASSETS, ACROSS INDIVIDUAL CREDIT UNIONS AND ACROSS ASSET SIZE RANGES (2016)



Source: NCUA (2017a).

Note: This figure includes 5,785 dots, one per credit union. Darker areas indicate many individual credit unions. The squares and values indicate averages for tiny, very small, smallish, and medium credit unions. In keeping with the base 10 for the logarithmic scale, here we split our large asset range into two ranges, i.e., largish ($1B–$10B in assets) and very large credit unions (over $10B).

However, over time, the higher costs for large numbers of smaller credit unions (which drive their higher average) mean (1) that the majority of smaller credit unions perform less well, for instance, providing less attractive interest rates or narrower product offerings (see below), and grow more slowly, and (2) that the small credit unions that have low costs likely grow into larger asset size ranges. Of course, had the impacts of economies of scale been clear-cut and immediate, the number of small credit unions should have fallen to almost zero very quickly. Instead, the impacts of economies of scale are weak and have long-drawn-out effects. Thus, the number of smaller credit unions has continued to fall inexorably, but "relatively slowly" since the number of credit unions peaked in 1969.

The majority of smaller credit unions perform less well, for instance, providing less attractive interest rates or narrower product offerings, and grow more slowly; the small credit unions that have low costs likely grow into larger asset size ranges.

Data for Small Credit Unions Are Idiosyncratic

Moreover, data for small credit unions have long been notoriously idiosyncratic and difficult to interpret. The performance of many individual small credit unions is difficult to

assess based strictly on the information provided in their regulatory financial statements. Many small credit unions have very small professional, paid staffs (often one person, or even none, see Figure 12 below). The knowledge, experience, dedication, and initiative of these staff members can make all the difference between a successful and an unsuccessful credit union. The retirement of these staff members can pose unsurmountable challenges for the ongoing operation of credit unions as independent institutions. Moreover, the financial statements of small credit unions do not clearly reflect the extent to which they benefit from fully volunteer labor, from workers that willingly accept less than market wage rates, and/or in-kind contributions from either members or corporate sponsors (office space, office equipment, computer systems, payroll deductions, credit union employees paid by sponsors, etc.).

The knowledge, experience, dedication, and initiative of these staff members can make all the difference between a successful and an unsuccessful credit union.

The extent of unreported or underreported volunteer and corporate contributions to credit unions has at least two effects. First, the data for these small credit unions becomes much harder to interpret. A small credit union that has low reported noninterest expenses because of volunteer and corporate contributions may provide very good service to its members. Bearing lower costs itself, it may pass on the advantage to its members through lower interest rates on loans and higher interest rates on deposits. However, low reported noninterest expenses may not be indicative of actual efficiency. The true costs of the credit union are simply being absorbed by other parties.

As a second effect, the low reported noninterest expenses may be difficult to replicate or expand on. Volunteer and corporate contributions have played a key role in the history of credit unions (Moody and Fite 1984), and any future contributions would of course be welcome. However, the roles played by volunteers and sponsors appear to be dwindling over time (Thompson 2012). Few high-cost credit unions can hope to address their challenges by replicating the experience of credit unions that still have sizable volunteer and sponsor contributions.

Moreover, in general, low-cost institutions would be expected to provide better service to their members and attract new members, more deposits, and thus experience faster asset growth. However, small credit unions that have low reported noninterest expenses because of large volunteer or sponsor contributions cannot readily expand on their advantage. These small credit unions typically can count on the contributions that they have. Should good service draw in large amounts of new members and deposits, then volunteers and sponsors would typically not increase their contributions pro rata. Thus, the value of those

contributions would be diluted across the larger membership and deposit base. These credit unions would, then, have the unpalatable options of (1) incurring potentially high costs to serve their new members, (2) decreasing the level of service provided to new (and old) members, or simply (3) implementing policies that effectively prevent asset growth. A sample policy could include paying low interest rates on deposits (to deter new members and deposits), channeling benefits more toward low interest rates on loans, and/or accumulating large amounts of net worth.

To briefly highlight some of the extent of volunteer and sponsor contributions to credit unions and their historical evolution, Figure 11 presents the percentage of credit unions, across asset size ranges, with zero reported expenses for salaries and for office occupancy expenses in 1979 and 2016. The figure shows that, in 1979, smaller credit unions were far more likely than larger ones to receive substantial volunteer and sponsor contributions. For instance, 35% of tiny credit unions had zero recorded expenses in salaries, and thus relied exclusively on volunteers. Among smallish credit unions, only 1.3% had zero recorded expenses on salaries.

In 2016, smaller credit unions were still more likely than larger ones to receive substantial volunteer and sponsor contributions. However, as smaller credit unions have become less numerous, volunteer and sponsor contributions are becoming far less prevalent for credit

FIGURE 11

PERCENTAGE OF CREDIT UNIONS WITH LARGE VOLUNTEER AND/OR SPONSOR CONTRIBUTIONS* ACROSS ASSET SIZE RANGES (1979–2016)

1979			2016	
Percentage of credit unions with zero recorded expenses for:			Percentage of credit unions with zero recorded expenses for:	
employee compensation	office occupancy	Asset size range	employee compensation	office occupancy
34.6	71.7	Tiny ($0–$1M)	42.7	68.3
5.5	49.7	Very small ($1M–$10M)	3.6	34.9
1.3	18.8	Smallish ($10M–$100M)	0.3	6.6
0.3	5.7	Medium ($100M–$1B)	0.1	0.4
0.0	0.0	Large (≥$1B)	0.0	0.0
15.2	52.1	All credit unions	3.2	14.8
Percentage of all credit union assets			Percentage of all credit union assets	
1.5	16.6		0.06	0.53

Source: NCUA (2017a).

Note: Asset size range boundaries are expressed in 2016 dollars.

*Zero reported expenses for employee compensation and office occupancy,

unions as a whole. For instance, the percentage of all credit unions without any reported office occupancy expenses fell markedly from 52.1% in 1979 to 14.8% in 2016, highlighting the increasing difficulty for smaller credit unions to rely on expanding volunteer and sponsor contributions.

Using Scale as a Tool to Manage Costs Is Very Difficult

Despite the large differences in costs across very distant asset size ranges, differences in costs are surprisingly small when comparing "nearby" asset size ranges. Consider an average very smallish credit union (with $4.9M in assets and 3.67% in noninterest expenses in 2016) and an average smallish credit union ($38M and 3.55%). While the differences in noninterest expenses can be sizable across asset size ranges, these differences are computed over rather wide asset size ranges. The average smallish credit union is about eight times larger than the average very small one. A very small credit union attempting to use scale to manage its performance cannot reasonably plan to increase its size by eight times, either within one year or within many, either through organic growth or through mergers of equals.[22] Even in the extreme case of mergers of equals, the credit union's size would double. Such a merger might yield a small reduction in costs of, perhaps, one-fourth of the difference between the noninterest expenses of smallish and very small credit unions (0.02% = (3.67% – 3.55%)/4). Dopico and Wilcox (2010) report similarly small reductions in costs across all mergers, including mergers of equals, during the 1984–2009 period.

Despite the difficulties in interpreting noninterest expenses among small credit unions, Figure 10 ultimately shows (1) that credit union efforts to increase scale are unlikely to yield large impacts in the short term and (2) that there are very large differences in noninterest expenses among credit unions with very similar asset sizes. While not all initiatives (branch openings, new products, etc.) and/or cost control efforts will be successful, credit unions have a substantial degree of control over their noninterest income and expenses. Thus, credit unions may affect their noninterest expenses and ROA far more readily through cost control efforts and other initiatives than through efforts to alter their scale, either organically or through mergers.

Credit union efforts to increase scale are unlikely to yield large impacts in the short term.

A Brief Overview of the Components of Noninterest Expenses across Asset Size Ranges

Next, Figure 12 delves deeper into the components of noninterest expenses and several related factors. (For ease of reference, panel A simply presents noninterest expenses again, repeated from Figure 8.) Panel B shows that employee compensation (wages, benefits,

FIGURE 12

NONINTEREST EXPENSE COMPONENTS, AND RELATED FACTORS, ACROSS ASSET SIZE RANGES (1979–2016)

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. Noninterest expense (per assets, %)						
2016	3.00	4.33	3.67	3.55	3.50	2.67
1979–2016	3.15	4.39	3.87	3.58	3.20	2.55
B. Employee compensation (per assets, %)						
2016	1.52	1.93	1.96	1.70	1.78	1.37
1979–2016	1.53	1.69	1.90	1.70	1.58	1.28
C. Number of full-time employee equivalents (full-time + ½ part-time)						
1982	71,343	4,549	15,537	28,943	19,913	2,401
2016	277,355	218	3,119	29,239	105,795	138,984
D. Number of full-time employee equivalents per credit union						
1982	4.3	0.8	2.0	11	66	600
2016	48	0.7	2.3	11	83	423
E. Full-time employee equivalents per $1M in assets (inflation-adjusted, in 2016 dollars)						
1982	0.41	1.72	0.57	0.38	0.33	0.36
2016	0.21	1.56	0.46	0.30	0.27	0.18
F. Average compensation (salaries, benefits, etc.) per employee (inflation-adjusted, in 2016 dollars)						
1982	40,371	10,693	34,260	45,310	44,092	45,751
2016	70,979	12,379	42,054	56,750	66,575	78,066
G. Office occupancy expenses (per assets, %)						
2016	0.20	0.22	0.17	0.23	0.25	0.17
1979–2016	0.20	0.23	0.17	0.22	0.22	0.18
H. Number of offices (main office plus branches, all credit unions assigned at least one office)						
1980	25,051	7,119	11,369	4,331	2,127	99
2016	20,611	311	1,467	4,560	7,986	6,286
I. Number of offices per credit union						
1980	1.4	1.1	1.4	1.7	7.7	33
2016	3.6	1.0	1.1	1.8	21	23
J. Number of offices per $1M in assets (inflation-adjusted, in 2016 dollars)						
1980	0.15	2.46	0.41	0.06	0.04	0.02
2016	0.02	2.22	0.22	0.05	0.02	0.01
K. Office operation expenses (per assets, %)						
2016	0.56	1.24	0.81	0.70	0.71	0.66
1979–2016	0.63	0.86	0.70	0.70	0.67	0.55
L. Marketing (educational and promotional) expenses (per assets, %)						
2016	0.11	0.04	0.04	0.09	0.13	0.11
1979–2016	0.10	0.04	0.05	0.10	0.11	0.08

Sources: NCUA (2017a) and BLS (2017).

employment taxes, etc.) are a large fraction of noninterest expenses across all asset size ranges (averaging 49% of noninterest expenses = 1.53% of assets / 3.15% of assets during 1979–2016). Large credit unions bear substantially lower compensation costs (1.28%) than medium (1.58%), smallish (1.70%), very small (1.90%), or tiny ones (1.69%). Panels C and D present the obviously related total numbers of employees[23] and of employees per credit union. Unsurprisingly, large credit unions with more members and assets have more employees (averaging 423 per credit union in 2016) than medium (83), smallish (11), very small (2.3), and tiny ones (0.7).

However, even though tiny and very small credit unions average about only one employee per credit union, panel E also shows that larger credit unions operate with far fewer employees (0.18) per $1M in assets than medium (0.27), smallish (0.30), very small (0.44), and tiny ones (1.56). Smaller institutions that hire far more employees (per assets) and spend relatively little more in compensation (per assets, see panel B) as a result average annual compensation per employee that is substantially lower: tiny ($12,379), very small ($42,054), smallish ($56,750), medium ($66,757), and large ($78,066). While tiny credit unions still benefit from volunteer or donated labor far more than their larger peers (see Figure 11), the differences in compensation across asset size ranges likely mean that smaller credit unions must, on average, hire employees with fewer formal qualifications and less relevant financial experience than their larger peers.

Panel G of Figure 12 shows that office occupancy expenses (including costs of building branches, their depreciation, or rent for rented space) account for a far smaller fraction of noninterest expenses (averaging 6% = 0.20% of assets / 3.15% of assets during 1979–2016) than employee compensation (49%). Office occupancy expenses do not differ markedly across asset size ranges, ranging from 0.18% for large credit unions to 0.23% for tiny ones. Panels H through J present the total number of credit union offices (assuming at least one main office per credit union,[24] plus branches), the number of offices per credit union, and the number of offices per $1M in assets. Again, while larger credit unions have more members, assets, and branches, in total, they operate with smaller numbers of branches per assets, likely also resulting in offices that are larger, more convenient, and generally capable of delivering broader ranges of services to their members.

Panel K of Figure 12 shows that office operation expenses (computer equipment and software, furniture, printing, etc.) account for a larger fraction of noninterest expenses (20% = 0.63% / 3.15%) than office occupancy expenses (6%). In contrast to office occupancy expenses, office operation expenses, on average, rise markedly for smaller institutions, from large (0.55%) to medium (0.67%), smallish (0.70%), very small (0.70%), and tiny credit unions (0.86%).

Panel L of Figure 12 shows that reported marketing (i.e., educational and promotional) expenses account for a small fraction of noninterest expenses (3% = 0.11% / 3.15%). The amounts reported as marketing expenses in call reports, however, likely underrepresent the overall marketing efforts of many credit unions. For instance, the compensation received by employees engaged in marketing activities is included within employee compensation; the costs of computer time, etc. dedicated to marketing is similarly included within office operations expenses, etc. Regardless of their "true" size, reported marketing expenses account for relatively small fractions of expenses across all credit union asset size ranges (ranging from 0.04% for very small credit unions to 0.13% for medium ones). The small shares of expenses dedicated to marketing imply that, should marketing be effective in driving growth (as we explore in Chapter 5), then credit unions could somewhat easily greatly increase their marketing efforts. For instance, doubling them would not have large negative short-term impacts on ROA, and of course could have the potential for positive long-term impacts on both growth and ROA.

Credit Union Memberships and Fields of Membership Are Both Expanding and Shifting toward Larger Credit Unions

Figure 13 presents data about the number of members and related data about credit unions' growth policies and FOMs, across asset size ranges. Panel A shows that, during 1979–2016, the total number of credit union members has risen from 37M to 107M, or from 16% to 33% of the US population.[25] Despite the overall growth in members, and similar to the patterns for assets and for the number of credit unions, credit union memberships have shifted from smaller to larger institutions. The number of members in tiny credit unions plummeted from 1.8M to 70,025; in very small credit ones, members fell from 8.9M to 1.3M, and in smallish ones from 16M to 12M. In contrast, members in medium-size credit unions grew from 9.7M to 37M, and in large ones from 0.9M to 58M. (Panel B presents the number of members per credit union across asset size ranges.)

Panel C presents a window into credit unions policies toward growth. Many credit unions would prefer to simultaneously (1) increase their number of members, many of which would initially have small deposit balances, and (2) increase products and services and deposit balances, per member. In practice, however, credit unions may choose to emphasize one approach over the other or find that they are more successful at one of the two. Panel C simply presents the number of members per $1M in assets (the inverse, assets per member, is shown in panel D). Chapter 5 explores the impacts on asset growth of credit unions that experience changes in the ratio of members per assets. In particular, we seek to assess which of the two approaches—i.e., adding members (with initially low deposit balances) or adding assets per member—is more likely to increase asset growth rates.

FIGURE 13

MEMBERS, GROWTH POLICIES, AND FOMs, ACROSS ASSET SIZE RANGES (1979–2016)

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. Number of members (in millions)						
1979	37	1.8	8.9	16.0	9.7	0.9
2016	107	0.07	1.3	11.5	36.5	57.6
B. Members per credit union						
1979	2,115	282	1,078	6,002	32,589	294,388
2016	18,477	236	944	4,474	28,497	211,648
C. Members per $1M in assets (inflation-adjusted, expressed in 2016 dollars)						
1979	219	637	307	215	162	181
2016	83	500	191	118	92	73
D. Assets per member (inflation-adjusted, expressed in 2016 dollars)						
1979	4,576	1,570	3,258	4,659	6,157	5,516
2016	12,092	1,999	5,224	8,448	10,848	13,775
E. Excess potential members (potential minus actual members, divided by actual members, %)						
1979	96	309	125	85	49	95
2016	2,229	944	1,261	2,647	2,746	1,841
F. Actual members per potential members (%)						
1979	51	24	45	54	67	51
2016	4.3	9.6	7.3	3.6	3.8	4.2

Sources: NCUA (2017a) and BLS (2017).

While credit unions seeking new members are constrained to operate within predetermined fields of membership, credit unions may also seek to increase those FOMs.[26] Panel E presents credit unions' ratio of "excess potential members" (which we define as potential minus actual members) per actual members—i.e., how large is the number of nonmembers that credit unions could potentially turn into members, without a formal FOM expansion. For instance, a credit union with 1,200 potential members and 1,000 actual members would have 20% (= (1,200 – 1,000) / 1,000) excess potential members.

Panel E highlights that, since the early 1980s, credit unions, on average, have greatly expanded their FOMs. In 1979, the average credit union had 96 excess potential members per 100 actual members. In 2016, there were 2,229 excess potential members per 100 actual members. Conversely, this may be expressed (as in panel F) by stating that in 1979, for the average credit union, 51% of potential members were actually members; and that in 2016, only 4% of potential members were actually members. Since actual memberships have grown during this period, the declining "membership penetration rate" does not imply that

credit unions have become less effective at turning potential members into members, but rather that, on average, they have been effective at increasing their FOMs faster than their actual memberships.[27]

Since the early 1980s, credit unions, on average, have greatly expanded their FOMs.

Individual credit unions may increase their FOMs by adding select employee groups (SEGs). For instance, a credit union servicing one factory could add the employees of a closely related supplier to the factory that is too small to open its own credit union. A credit union servicing a university's employees could add the members of its alumni association. An employment-based credit union could adopt a community charter (i.e., a geographic FOM). The degree to which individual credit unions may have excess potential members (among which to expand their actual membership) varies greatly across types of FOM, and across states, since FOM rules vary across states. In Chapter 5, we explore the impact of expansions in FOM, as proxied by changes in our measure of excess potential members.

Figure 14 presents numbers of, and assets in, credit unions with single group (SG), multiple group (MG), and community charter (CC) fields of memberships, across asset size ranges during 1996–2016. The figure highlights the ongoing decrease in SGs (from 43% to 27%, see panel B), the small increase in MGs (from 39% to 44%, see panel D), and the large increase in CCs (from 7% to 30%, see panel F). SGs remain most common among smaller institutions, ranging from 83% for tiny ones to under 10% for medium and large credit unions. Despite growth in community charters, MGs are the most common FOM overall (44% of charters and 53% of credit union assets) and among large credit unions (71% and 58%). CCs are most common among medium credit unions (52% and 50%).

FIGURE 14

NUMBER OF, AND ASSETS IN, CREDIT UNIONS WITH SINGLE GROUP, MULTIPLE GROUP, AND COMMUNITY CHARTER FOMs, ACROSS ASSET SIZE RANGES (1996–2016)

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. Number of credit unions with single group (SG) FOMs						
1996 (FICUs)	4,925	1,052	2,556	1,151	154	11
2016 (FCUs only)	965	181	468	262	46	7
B. SGs (% of FICUs in 1996 and % of FCUs in 2016)						
1996	43	71	53	28	16	24
2016	27	83	51	16	6.6	5.8

(CONTINUED)

FIGURE 14

NUMBER OF, AND ASSETS IN, CREDIT UNIONS WITH SINGLE GROUP, MULTIPLE GROUP, AND COMMUNITY CHARTER FOMs, ACROSS ASSET SIZE RANGES (1996–2016) *(CONTINUED)*

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
C. Number of credit unions with multiple group (MG) FOMs						
1996 (FICUs)	4,394	213	1,464	2,098	589	30
2016 (FCUs only)	1,578	25	362	816	290	85
D. MGs (% of FICUs in 1996 and % of FCUs in 2016)						
1996	39	14	31	51	62	65
2016	44	11	39	50	41	71
E. Number of credit unions with community charters (CC, or geographic FOMs)						
1996 (FICUs)	742	55	175	407	105	0
2016 (FCUs only)	1,065	13	91	567	366	28
F. CCs (% of FICUs in 1996 and % of FCUs in 2016)						
1996	6.5	3.7	3.7	9.8	11	0
2016	30	5.9	9.9	34	52	23
G. Assets in SGs ($ billion, inflation-adjusted [r] and nominal [n])						
1996 (n)	75	0.35	6.8	22	26	21
1996 (r)	115	0.53	10	33	39	32
2016 (n, r)	133	0.080	2.1	7	13	111
H. Assets in SGs (% of assets in FICUs in 1996 and % of assets in FCUs in 2016)						
1996	23	71	49	24	16	33
2016	20	79	46	12	6.6	28
I. Assets in MGs ($ billion, inflation-adjusted [r] and nominal [n])						
1996 (n)	192	7.2	4.7	47	103	36
1996 (r)	292	11	7.1	72	157	55
2016 (n, r)	352	1.4	2.0	29	89	233
J. Assets in MGs (% of assets in FICUs in 1996 and % of assets in FCUs in 2016)						
1996	59	15	34	53	64	58
2016	53	14	43	48	44	58
K. Assets in CCs ($ billion, inflation-adjusted [r] and nominal [n])						
1996 (n)	26	1.6	0.6	9.8	16	0
1996 (r)	40	2.4	0.8	15	24	0
2016 (n, r)	185	0.007	0.5	24	101	59
L. Assets in CCs (% of assets in FICUs in 1996 and % of assets in FCUs in 2016)						
1996	8	3.2	4.0	11	10	0
2016	28	7.3	11	41	50	15

Sources: NCUA (2017a) and BLS (2017).

Note: Call reports include FOMs for both federal credit unions (FCUs) and state-chartered credit unions during 1996–2001, but provide FOMs only for FCUs during 2002–2016. Also, since call reports did not identify FOM types for all FICUs in 1996, our three FOM types do not add up to 100%.

Credit Union Offerings (Loan, Deposit, and Other Product Types) Are Broadening

Figure 15 presents the fraction of credit unions offering seven key types of loans (credit cards, other unsecured loans, new car loans, used car loans, first mortgages, other real estate loans, and business loans) and five key types of deposits (regular shares, share drafts, money market shares, share certificates, and IRAs) at the earliest date for which data were included in call reports (as early as 1979) and in 2016, as well as an index ranging from 0 to 12, with one unit representing an additional product.

Figure 15 highlights (1) sharp differences in the product breadth and sophistication of products offered across assets size ranges and (2) a shift toward greater product breadth, both within each asset size range and across all credit unions. For instance, in 2016, relatively few very small credit unions offer the "more sophisticated" loan products such as credit cards (18%), first mortgages (20%), or business loans (5%), focusing instead on "less sophisticated" other unsecured loans (100%), new car loans (95%), and used car loans (96%). In contrast, very large majorities of medium and large credit unions have long offered nearly all of those loan types. (Within this figure, the lowest fractions offered by medium credit unions, i.e., for business loans, were still quite high at 18% in 1986 and 81% in 2016.)

We found similar patterns among deposit types, with nearly all credit unions reporting regular shares. (The few cases where credit unions did not report offering regular shares are likely reporting errors.) Smaller credit unions (e.g., very small ones) were less likely to offer "more sophisticated" deposit products such as share drafts (45% in 2016), money market shares (9%), or IRAs (26%). In contrast, very large majorities of medium and large credit unions have long offered all of those deposit types.

FIGURE 15

PERCENTAGE OF CREDIT UNIONS OFFERING SEVERAL KEY TYPES OF LOANS AND DEPOSITS AND AN INDEX OF PRODUCT BREADTH, ACROSS ASSET SIZE RANGES (1979–2016)

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. Credit card loans						
1992	33	3	11	63	92	97
2016	60	1	18	71	89	93
B. Other unsecured loans						
1982	99	98	100	100	100	100
2016	100	99	100	100	100	100

(CONTINUED)

FIGURE 15

PERCENTAGE OF CREDIT UNIONS OFFERING SEVERAL KEY TYPES OF LOANS AND DEPOSITS AND AN INDEX OF PRODUCT BREADTH, ACROSS ASSET SIZE RANGES (1979–2016) *(CONTINUED)*

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
C. New car loans						
1982	81	58	91	98	98	100
2016	96	45	95	99	100	100
D. Used car loans						
1989	88	59	93	98	99	100
2016	97	61	96	100	100	100
E. First mortgages						
1979	20	5	20	50	75	67
2016	67	1	20	79	100	100
F. Other real estate loans						
1982	15	3	13	41	64	100
2016	70	2	27	83	99	100
G. Business loans						
1986	7	2	5	12	18	24
2016	38	1	5	32	81	96
H. Regular shares (savings accounts)						
1979	100	100	100	100	100	100
2016	100	100	100	100	100	100
I. Share drafts (checking accounts)						
1980	14	1	9	55	84	67
2016	79	3	45	94	100	99
J. Money market shares (deposits)						
1989	18	2	8	35	67	62
2016	50	0	9	53	89	95
K. Share certificates (certificates of deposit)						
1981	48	17	58	89	98	100
2016	80	12	54	91	99	99
L. IRAs						
1982	32	4	34	83	97	100
2016	68	2	26	79	98	99
M. Product breadth index 1 (number of the above products per credit union, from 0 to 12)						
1979	4.4	2.9	4.6	7.0	8.7	10.7
2016	9.0	3.3	5.9	9.8	11.5	11.8

Note: We assigned a credit union as offering a product if it reported either more than zero dollars for that loan or deposit, or if it reported a non-zero interest rate for that loan or deposit. To develop a consistent index back to 1979, we assigned credit unions offering a product at the earliest date for which there is data (e.g., business loans in 1986) as also offering that product in earlier years (i.e., 1979–1985).

As individual credit unions have added more products and as the structure of the credit union system has shifted toward larger institutions, the fraction of credit unions offering more sophisticated products has climbed steadily. Among loans, the fraction of credit unions offering credit cards climbed from 33% in 1992 to 60% in 2016. Those offering first mortgages climbed from 20% in 1979 to 67% in 2016. Those offering other real estate loans climbed from 15% in 1982 to 70% in 2016. And those offering business loans climbed from 7% in 1986 to 38% in 2016. Among deposits, the fraction of credit unions offering share drafts climbed from 14% in 1989 to 79% in 2016 and those offering IRAs climbed from 32% in 1982 to 68% in 2016.

Among loans, the fraction of credit unions offering credit cards climbed from 33% in 1992 to 60% in 2016.

Thus, our index of product breadth across key loan and deposit types (which we term "product breadth index 1") climbed from 4.4 in 1979 to 9.0 in 2016, a jump of more than four products (4.6). Much of this climb is due to there being more credit unions that are larger, since each asset size range experienced smaller increases in its index from, for instance, 2.9 to 3.3 among tiny credit unions (a jump of 0.4), from 4.6 to 5.9 among very small ones (a jump of 1.3), from 7.0 to 9.8 among smallish ones (a jump of 1.8), from 8.7 to 11.5 among medium ones (a jump of 2.8), and from 10.7 to 11.8 among large ones (a jump of 1.1).

Figure 16 presents the percentage of credit unions offering any of a long list of "non-key" products in 2016. Since these data have been included in call reports for only a relatively recent period of time, in this figure we only provide data for 2016. We combined these data into two separate product breadth indices (2 and 3) based on whether the data are reported since 2006 (index 2) or since 2009 (index 3, including also the products in index 2). We use product indices 1, 2, and 3 in our empirical chapter below to estimate the impacts on asset growth due to having broader product offerings and/or from adding more product offerings.

As in earlier figures, Figure 16 shows that larger credit unions have broader product offerings, particularly among more sophisticated offerings. For instance, only 1% of tiny credit unions offer ATM/debit card programs, while 100% of medium and large credit unions do so. Product breadth index 3 (ranging from 0 to 29) further highlights the stark differences across asset size ranges, from tiny credit unions (averaging only 1.1 non-key products out of 29) to very small (3.9), smallish (10.9), medium (16), and large ones (18.5).

Only 1% of tiny credit unions offer ATM/debit card programs, while 100% of medium and large credit unions do so.

FIGURE 16

PERCENTAGE OF CREDIT UNIONS OFFERING OTHER "NON-KEY" INDIVIDUAL PRODUCTS AND TWO INDICES OF PRODUCT BREADTH, ACROSS ASSET SIZE RANGES (2016)

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
1. Automated teller machines (ATM) or debit cards	77	1	38	93	100	100
2. Insurance, investment services	31	2	6	25	65	93
3. Brokered share certificates (CDs)	46	2	24	56	60	36
4. Debt cancellation	8	0	1	5	17	39
5. Overdraft protection	51	1	12	54	87	92
6. Overdraft line of credit	47	0	13	50	80	82
7. Brokered deposits	7	1	2	7	13	18
8. Product breadth index 2	2.7	0.1	1.0	2.9	4.2	4.6
9. Business share accounts	45	2	11	45	80	90
10. Heath share accounts (HSAs)	14	0	0	10	32	50
11. Individual development accounts (IDAs)	3	0	1	2	6	13
12. No cost drafts	75	2	40	89	97	97
13. Low minimum CDs	75	14	52	84	91	87
14. Financial counseling	36	17	15	33	57	81
15. Financial education	36	14	13	31	65	85
16. Financial literacy	22	8	4	15	46	74
17. First home loan	14	0	1	6	35	67
18. Bilingual services	22	5	6	19	39	62
19. No cost billing	60	0	12	71	95	99
20. Credit builder	25	8	10	25	39	44
21. Microbusiness loans	12	1	1	7	27	52
22. Microconsumer loans	17	5	6	16	28	43
23. Payday loans	10	2	9	11	11	17
24. Refund anticipation loans	2	0	1	2	3	3
25. Share-backed credit cards	39	0	6	44	64	69
26. Check cashing	57	8	31	66	75	73
27. International remittances	24	1	1	20	54	64
28. Low cost wires	69	6	40	83	85	78
29. Money orders	51	4	18	59	76	68
30. No cost ATMs	50	1	12	59	77	80
31. Product breadth index 3	10.2	1.1	3.9	10.9	16.0	18.5

Source: NCUA (2017a).

Credit Union Portfolios Have Long Been Shifting to Mortgages and Business Loans

Figure 17 and Figure 18 present, respectively, (1) loans and loan types and (2) deposits and deposit types (each per assets), across asset size ranges during 1979–2016. These figures are obviously related to Figure 15, but go beyond the fraction of credit unions offering a product to the fraction of assets invested in (or of deposits raised through) each product. In the empirical Chapter 5, we examine separately the possible impacts on growth (1) from offering and/or adding a product and (2) from changes in a credit union's portfolio once the product is offered.

FIGURE 17

LOANS AND LOAN TYPES PER ASSETS, ACROSS ASSET SIZE RANGES (1979–2016)

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. Net loans (per assets, %)						
2016	66	42	49	53	66	69
1979–2016	64	56	61	61	63	64
B. Credit card loans (per assets, %)						
1992	3.7	0.8	0.9	3.1	4.3	4.3
2016	4.1	0.2	1.0	2.4	3.0	4.8
C. Other unsecured loans (per assets, %)						
1992	8.0	20	14	8.9	7.1	7.0
2016	2.9	16	10	4.4	3.0	2.6
D. New car loans (per assets, %)						
1986	15	9.4	17	15	14	17
2016	9.0	7.9	11	7.0	8.2	14
E. Used car loans (per assets, %)						
1989	6.8	13	13	8.3	5.2	4.6
2016	14	14	18	15	17	13
F. First mortgages (per assets, %)						
1979	5.7	0.6	2.2	5.2	8.1	7.5
2016	27	0.2	2.8	14	24	31
G. Other real estate loans (per assets, %)						
1986	5.0	0.4	1.7	4.5	5.9	5.7
2016	6.0	0.3	2.1	5.2	6.3	5.9
H. Business loans (per assets, %)						
1986	0.6	0.3	0.3	0.6	0.6	1.2
2016	5.2	0.1	0.4	1.8	5.8	5.3

Sources: NCUA (2017a) and BLS (2017).

FIGURE 18

DEPOSIT AND DEPOSIT TYPES PER ASSETS, ACROSS ASSET SIZE RANGES (1979–2016)

Time period	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. Deposits (per assets, %)						
2016	85	79	85	87	87	83
1979–2016	88	83	86	88	88	86
B. Regular shares (savings accounts, per assets, %)						
2016	31	73	64	44	32	28
1980–2016	38	76	65	46	36	31
C. Share drafts (checking accounts, per assets, %)						
1980	3.7	0.7	0.9	3.5	5.2	5.7
2016	12	0.3	5.6	13	16	10
D. Money market shares (deposits, per assets, %)						
1989	7.4	0.1	1.4	5.8	8.7	11
2016	19	—	1.9	10.1	17	22
E. Share certificates (CDs, per assets, %)						
2016	15	3.7	9.7	13	15	16
1981–2016	20	2.8	11	18	21	21
F. IRAs (per assets, %)						
2016	6.0	0.5	2.2	5.6	5.8	6.2
1981–2016	8.6	0.6	3.8	7.9	8.7	11
G. Nonmember deposits (per assets, %)						
2016	0.7	1.2	0.9	0.7	0.7	0.7
1989–2016	0.2	1.3	0.5	0.3	0.2	0.2
H. Net worth (capital, per assets, %)						
1979	6.38	7.45	7.49	6.72	5.53	3.97
2016	10.90	19.72	15.05	11.90	10.95	10.71
I. Secondary capital (included within net worth, per assets, %)						
2016	0.014	0.025	0.040	0.011	0.040	0.001
1996–2016	0.007	0.034	0.026	0.013	0.013	0.001

Sources: NCUA (2017a) and BLS (2017).

Note: No tiny credit unions reported offering money market shares in 2016.

Figure 17 highlights not only the large differences in sophistication among the types of loans held, but also the large and growing disparity in the volume of loans held across asset sizes. In 2016, tiny credit unions lent substantially smaller fractions of their assets (42%) than very small (49%), smallish (53%), medium (66%), or large ones (69%). Regarding loan types and their degree of sophistication, tiny credit unions held far more of their assets as

other unsecured loans (16%) than other credit unions (with the overall mean being 2.9%). Similarly, very small credit unions held far fewer of their assets as first mortgages (2.8% vs. 27%) or as business loans (0.4% vs. 5.2%). Remarkable shifts in types of loans over time include those away from other unsecured loans (from 8.0% to 2.9%), from new car loans to used car loans (with the former falling from 15% to 9%, and the latter rising from 6.8% to 14%), and most significantly, the pronounced rise in first mortgage loans (from 5.7% in 1979 to 27% in 2016).[28]

Figure 18 similarly highlights the differences in sophistication among the types of deposits raised, across asset size ranges during 1979–2016. Medium and large credit unions have long relied far less on regular shares (accounting for 32% and 28% of assets in 2016) than tiny (73%) and very small ones (64%). Instead, medium and large credit unions rely far more on share drafts (16% and 10%), money market shares (17% and 22%), share certificates (both 21%), and IRAs (both 6%).

In contrast, public policy and efforts from the non-credit-union nonprofit sector are focusing some of the more sophisticated liabilities on low-income-designated (LID) and typically smaller credit unions. Thus, nonmember deposits and secondary capital (see panels G and I), largely restricted to LIDs, are concentrated more heavily among smaller asset size ranges. In particular, nonmember deposits (often from nonprofits and foundations) account for 1.2% of the assets of tiny credit unions and of very small (0.9%), smallish (0.7%), medium (0.7%), and large ones (0.7%). Computed across all credit unions, and even only among LIDs, secondary capital remains a very small source of funds for all but a small number of institutions.

Finally, panel H presents net worth (capital) per assets, highlighting both (1) generally rising capital ratios across all asset size ranges during 1979–2016 and (2) capital ratios in 2016 among tiny (19.72%) and very small credit unions (15.05%) that far exceed both regulatory minima (e.g., 7%) and the ratios of smallish (11.90%), medium (10.95%), and large ones (10.71%).

A Drought of New Credit Unions Is Resulting in Aging Credit Unions

Figure 19 presents numbers, and fractions, of credit unions by age (numbers of years since their founding) across asset size ranges during 1979–2016. In 1979, large numbers (and fractions) of credit unions were very young. About 20% (3,335) were less than 10 years old, another quarter were between 10 and 19 years old, and only one-quarter of institutions

FIGURE 19

NUMBER OF CREDIT UNIONS BY AGE, ACROSS ASSET SIZE RANGES (1979–2016)

Years since the credit union was founded	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. Number of credit unions founded within how many years (as of 1979)?						
0–5	2,011	1,568	401	34	8	
6–9	1,324	753	518	51	2	
10–19	4,214	1,814	2,055	330	15	
20–29	5,529	1,372	3,084	983	90	
30+	4,403	755	2,206	1,265	174	3
B. Percentage of credit unions founded within how many years (as of 1979)?						
0–5	12	25	4.9	1.3	2.8	
6–9	7.6	12	6.3	1.9	0.7	
10–19	24	29	25	12	5.2	
20–29	32	22	37	37	31	
30+	25	12	27	48	60	100
C. Number of credit unions founded within how many years (as of 2016)?						
0–5	13	4	7	1	1	
6–9	9	3	5		1	
10–19	35	12	14	8	1	
20–29	26	5	10	7	3	1
30+	5,658	273	1,323	2,527	1,263	271
D. Percentage of credit unions founded within how many years (as of 2016)?						
0–5	0.2	1.3	0.5	0.04	0.1	
6–9	0.2	1.0	0.4		0.1	
10–19	0.6	4.0	1.0	0.3	0.1	
20–29	0.5	1.7	0.7	0.3	0.2	0.4
30+	98.5	92.0	97.4	99.0	99.5	99.6
E. Average credit union age (number of years since founding)						
1979	22	16	24	31	34	45
2016	62	52	59	63	67	70

Sources: NCUA (2017a) and BLS (2017).

were more than 30 years old (see panels A and B). However, new credit union formation has dropped since then. The number of new credit unions formed has plummeted from about 10,000 during the 1960s to 5,938 during the 1970s, 881 during the 1980s, 110 during the 1990s, 72 during the first decade of the 2000s, and 18, thus far, during the 2010s (Dopico 2014).

The number of new credit unions formed has plummeted from about 10,000 during the 1960s to 5,938 during the 1970s, 881 during the 1980s, 110 during the 1990s, 72 during the first decade of the 2000s, and 18, thus far, during the 2010s.

As a result, by 2016, few credit unions are young; 98.5% are more than 30 years old (see panel D). The fraction of credit unions older than 30 is almost 100% for all but one asset size range: tiny credit unions, where the fraction is still very high at 92%. Dopico (2014) explores in more detail the shift in the credit union system from (1) growth by forming new credit unions to (2) growth through the expansion of FOMs. That report also explores the role of NCUA as a deposit insurer in raising the standards that new credit union organizers must now meet before receiving a charter. These higher standards seek to minimize the probability that new credit unions will fail and thus seek to limit costs on the deposit insurance fund. After almost four decades with plummeting levels of credit union formation, the average age of credit unions has climbed, concomitantly, by four decades (40 years) from 22 in 1979 to 62 in 2016 (see panel E).

CHAPTER 4

Methodology and Brief Literature Review

To carry out this study, we explored a wide variety of statistical techniques and model specifications to assess the impacts of many potential contributing factors (the independent variables) on inflation-adjusted, merger-adjusted asset growth (our dependent variable).[29] We estimated impacts (1) across all credit unions, (2) across several relevant asset size ranges, (3) for the longest periods for which the data were available, up to 1979–2016, and (4) across individual years.[30] After experimenting with a wide variety of model specifications (i.e., combinations of variables), we settled on a core statistical model using two separate statistical techniques: (1) ordinary least squares (OLS) regressions (within a panel framework that handled appropriately lagged annual observations for each individual credit union) and (2) fixed effects panel regressions. In the next three subsections, we delve deeper into these two statistical techniques, the brief scholarly and professional literature on credit union growth, and the variables included in our core model specification.

The Statistical Techniques in This Report: OLS and Fixed Effects Panel Regressions

A main shortcoming of using only OLS for our data would have been that OLS does not take into account that several annual observations might be for the same credit union across several years. Thus, throughout this report, we generally interpret OLS results as simply informative of the difference in growth across credit unions with higher vs. lower levels of an independent variable. For instance, we interpret the result of 0.89 (below in Figure 20, panel A, row 1, column 1) to mean that credit unions with deposit benefits that are 1% higher, on average, experience growth that is 0.89% higher. Conversely, credit unions with lower deposit benefits experience lower growth.

Panel regression techniques are commonly used for data where specific observations report in multiple instances over time (e.g., thousands of individual credit unions report data quarterly, or else semiannually or annually, since 1979). Panel regression techniques are widely used in applications both outside and inside the financial industry. For instance, Anderson, Crofton, and Rawe (2009) explore the impact of government policy (minimum wages) on school attendance across time, Maryland counties, and ethnic groups. Crofton and Parker (2012) explore the impact of government programs (online tourist promotion) on tourism-related outcomes across time and provinces in Atlantic Canada. Turning to finance, Jayaratne and Strahan (1996) explore the impact of government policy (branch regulation) on bank performance across time and US states. Wilcox (2011a) explores the interaction of small business lending in banks and credit unions across time and US states. Dopico and Wilcox (2013) explore the impact of mortgage lending on several measures of performance across time and individual credit unions. Dopico (2014) explores the impact of programs of the National Credit Union Administration's Office of Small Credit Union Initiatives (OSCUI), again, on several measures of performance across time and individual credit unions.

Fixed effects panel regressions (hereinafter, panel regressions) are the simplest and most intuitive of panel regression techniques, essentially creating one dummy variable per observation (i.e., each credit union) across time periods (i.e., years). Credit union–specific dummy variables take values of one (to identify each credit union) and zero (for all other credit unions). When the number of observations is extremely large, most applications of panel techniques (as here) dispense with using separate dummies per observations and instead, equivalently, remove the average value for each observation (computed across annual observations) from each annual observation.

Panel regression techniques are commonly understood to help address many common problems in statistical analysis, such as the possibility of omitted variables leading to model misspecification. In particular, panel techniques may help address biases resulting

from characteristics specific to one observation (a specific credit union). Panel techniques seek to "hold constant" (i.e., correct for statistical biases) for whatever characteristics are roughly constant over time for each individual credit union. For instance, they would hold constant for the fact that credit union A might be reliably smaller, more rural, state-chartered, more specialized in auto loans, etc., than credit union B, which might reliably be larger, more urban, federally chartered, more specialized in business loans, etc.

For both our OLS and panel regressions, we also included annual dummy variables[31] (hereinafter, annual dummies). Annual dummies hold constant for nationwide factors that individual credit unions cannot readily control and that might affect all credit unions roughly similarly in a given year, such as:

- The interest rate cycle (e.g., interest rates being higher in 2006 than in 2003).
- The business cycle (e.g., the unemployment rate being higher in 2009 than in 2016).
- Whatever nationwide legislative or regulatory impacts may take place over time—e.g., Congress enacting the Credit Union Member Access Act (CUMAA), also known as H.R. 1151, in 1998 (NCUA 1999).

Once we have controlled for nationwide factors through annual dummies, the other variables in our models focus on factors that individual credit unions may more readily control, such as how much the interest rates they offer differ from nationwide averages, whether they increase or reduce this or that type of expense, the products they offer or add, etc.

Throughout this report, we generally interpret results from panel regressions as informative of the impact of an increase in an independent variable on growth. Panel regressions abstract to a larger extent from the long-term differences across groups of credit unions (e.g., large vs. small ones) and focus more on the changes in conditions within each individual credit union. Thus, we interpret the result of 1.12 (in Figure 20, panel B, row 1, column 1) to mean that, on average, individual credit unions that increase their deposit benefits by 1% during one year will subsequently experience growth that is 1.12% higher, as long as they maintain the higher deposit benefits.

To understand the difference in our interpretation of OLS and panel results, consider the following example. A simplified OLS regression may show a coefficient of −0.08 between noninterest expense and growth, and a simplified panel regression may show a coefficient of +0.77 between the same two variables. The OLS result informs us that credit unions that have more interest expenses, on average, have lower growth. However, we also know (from the previous chapter) that smaller credit unions, on average, have larger noninterest expenses and deliver less attractive interest rates and narrower ranges of services. Thus,

it could simply be that, on average, smaller credit unions suffer from diseconomies of scale, i.e., they need higher noninterest expenses to deliver the same level of service or, alternatively, that with the same level of noninterest expenses, they can only deliver a lower level of service.

However, despite the differences in performance across asset size ranges, an individual credit union might still find that increasing noninterest expenses (e.g., hiring more or better qualified employees, adding more or better located branches or better electronic delivery systems, etc.) might improve the level of service, or product breadth, that it can offer its members and result in higher asset growth. Thus, the apparent contradiction between the OLS and panel results may be resolved. The OLS results point out, correctly, that higher-cost (typically smaller) credit unions on average have lower growth. In contrast, the panel results point out, also correctly, that individual credit unions that increase their noninterest expenses experience increases in their growth. For instance, lower-cost large credit unions that increase their noninterest expenses may experience faster growth. Similarly, higher-cost small credit unions that reduce their noninterest expenses may experience slower growth.

Consider next interpreting OLS and panel results applied to whether a credit union offers or adds a product. OLS results could show, for instance, that faster-growing credit unions are more likely to offer product A. It could be that being otherwise more efficient and dynamic, faster-growing credit unions can afford to be more member-centered and offer more services that are consistent with their mission. Other less efficient and slower-growing credit unions may find that they cannot afford to offer product A. However, product A could simply be associated with growth (and even be its effect), but not be a cause of (or contributing factor to) growth. While product A may be valued by consumers, it might not be one that drives asset growth. In that case, credit unions adding product A might find that their growth does not increase subsequently. In that case, while OLS results would show a positive and significant relationship between offering product A and growth, panel results would not show a positive and significant relationship between adding product A and growth. Thus, while we report both OLS and panel results, throughout this chapter, in general we tend to emphasize panel results as more relevant to future decision making by credit unions.

As we stated above, we used annual dummies to account for the potential impacts on growth due to factors such as the interest rate and business cycles and changes in legislation and regulation, which might affect all credit unions over time. Beyond that, we also sought to assess whether the results from our models (about the impacts on growth due to factors that credit unions may more readily control) were consistent over time. To do so, we performed our analyses removing, one at a time, the requirement that a single coefficient be estimated across all years for each variable. One may perform such analyses

by performing separate regressions with data for specific time periods, like decades (the 1980s, the 1990s, etc.) or even for individual years. Alternatively, one may perform these analyses permitting different coefficients to be estimated for different time periods, e.g., the bubble years, the years of the financial crisis, or the years of the recovery. Here, for many of our panel regressions, we simply permitted a separate coefficient to be estimated for each year, to allow the results to guide us in determining whether some impacts might exhibit long-term trends, be affected by various cycles (such as those in interest rates or in credit quality), or other factors such as changes in legislation.

We also experimented with using various time lags. We estimated the relationships between independent and dependent variables contemporaneously (i.e., without lags) and with only lags of one through four years. To address the possibility of statistical problems with model specification, autocorrelation, and heteroskedasticity, we generally focus on results from fixed effects panel regressions, use data lagged by one period, include a one-year lag of the dependent variable, and use robustness adjustments to address heteroskedasticity and autocorrelation (Hall and Cummins 2009). We also tested our results for data entered as levels and as first differences, and found the results to be broadly similar. We present results from regressions with data entered as levels, since their interpretation is more intuitive.

A Brief Review of the Literature on Credit Union Asset Growth

The scholarly and professional literature on credit union asset growth is relatively brief. Earlier authors address growth largely in a theoretical manner with only limited use of anecdotal evidence and industry-wide average data. Later authors examine average characteristics for subgroups of credit unions, computed using data for individual credit unions. Most recently, several authors have begun to apply sophisticated statistical techniques to the analysis of credit union growth. The variables included in studies of credit union growth are largely determined by the availability of data in credit union call reports and largely include interest rates, income statement components, balance sheet components, and information about a credit union's field of membership, charter type, and age.

For instance, Black and Dugger (1981) explore the role of macroeconomic conditions and regulatory change in explaining economy-wide credit union asset growth. They also explore how with credit union success (i.e., growth) credit unions have long been shifting from an all-volunteer model to professionally run institutions less and less able to rely on volunteer and sponsor contributions (see also Moody and Fite 1984 and Thompson 2012). Barron, West, and Hannan (1994) explore the roles of organizational age and size on organizational failure and growth. They identify old and small credit unions as more likely to fail, and young and small credit unions as having the fastest asset growth rates.

Hoel and Kelly (1999) compare the characteristics of 401 thriving (i.e., fast growth), 394 shrinking, and 800 other very small credit unions (which, in their study, had $1M–$5M in assets) from 1995 to 1997. Examining descriptive statistics across subgroups of credit unions, they identify high loan-to-shares, high product breadth, high noninterest expenses, high noninterest income, high deposit benefits, high ROA, low net charge-offs per loans, low delinquent loans, more employees per $1M in assets, more assets per member, and low capital per assets as factors contributing to faster asset growth among small credit unions.

Udell and Kelly (2004) explore credit unions' inflation-adjusted (real) asset growth across asset sizes from 1993 to 2001, focusing on the roles of asset size, growth in the number of members, and growth in assets per member. Examining descriptive statistics across subgroups of credit unions, they conclude that while asset size is important, it is not the sole determinant of growth. They concluded that growth in members was more predictive of asset growth than growth in assets per member.

Goddard and Wilson (2005) explore econometrically the relationships among credit unions' asset size, age, and asset growth rates from 1992 to 2001. They find that larger credit unions generally grow faster than smaller ones. They find the youngest credit unions grow particularly fast, but that the contribution of young age to asset growth dissipates after a few years. They also find that less restrictive FOMs aid asset growth.

Most recently, Stern, Swidler, and Hinkelmann (2009) verify econometrically that, after controlling for asset size and market-wide interest rates, credit unions' interest rates for individual deposit products (particularly for certificates of deposit) are key determinants of deposit growth rates. Further research on credit union asset growth includes, for instance, Kaushik and Lopez (1994), Leggett and Strand (2002), and Goddard, Wilson, and McKillop (2005).

Stern, Swidler, and Hinkelmann (2009) verify econometrically that, after controlling for asset size and market-wide interest rates, credit unions' interest rates for individual deposit products (particularly for certificates of deposit) are key determinants of deposit growth rates.

The Independent Variables in Our Core Statistical Model

To carry out this report, we reviewed the relevant literature, collected and processed the available data, and explored a wide variety of model specifications, i.e., combinations of independent (or control) variables. We found that our key results were generally robust across model specifications including more or fewer additional control variables. Since there are essentially countless possible combinations of factors, asset size ranges, and

time periods that one could consider, in this report we settled on a relatively simple core statistical model (i.e., a core set of factors) and use it as a basis from which to explore the impact of various changes to the core model, such as using one additional variable at a time, focusing on different asset size ranges, focusing on how impacts change over time, etc. This approach yields (1) models that are more parsimonious (i.e., simpler) and (2) results that are more easily or directly comparable across models. Taking into account theory and past empirical work (see the previous section of this chapter) and our preliminary exploration of data and results, our core statistical model, or core model specification, includes the following variables:

1. **Deposit benefits:** Following Smith, Cargill, and Meyer (1981), Hoel and Kelly (1999), and Stern, Swidler, and Hinkelmann (2009), we include deposit benefits as a key potential contributor to growth since credit union members are more likely to join credit unions and transfer more of their funds to institutions that offer more attractive (higher) interest rates on deposits.
2. **ROA (return on assets, or net income per assets):** Following Hoel and Kelly (1999), we include ROA as a key potential contributor to growth since credit unions must set aside earnings as net worth (capital) at a rate commensurate with their growth to maintain their capital to asset ratios. Credit unions cannot sustainably increase their assets at a rate higher than the rate at which they increase their capital (Dopico 2016).
3. **Product breadth index 1:** Following Hoel and Kelly (1999), we include this index as a potential key contributor to growth since credit union members are more likely to join credit unions and transfer more of their funds to credit unions that offer them a broader range of products and services.
4. **Delinquent loans (per assets):** Following Hoel and Kelly (1999), we include delinquent loans per assets as a control variable, since faster growth might be achieved at the expense of weakening credit standards.
5. **Logged real assets:** Following Barron, West, and Hannan (1994), Udell and Kelly (2004), Goddard and Wilson (2005), Wilcox (2008), and Stern, Swidler, and Hinkelmann (2009), we include logged,[32] inflation-adjusted (real) assets as a control variable, since larger credit unions have long been known, on average, to have (1) lower noninterest expenses, (2) higher deposit benefits, and (3) faster asset size growth.

We include delinquent loans per assets as a control variable, since faster growth might be achieved at the expense of weakening credit standards.

Other variables that we experimented with but ultimately did not include in our core model include total member benefits, loan benefits, and noninterest expense per assets.

What Factors Have Contributed to Credit Union Asset Growth? Statistical Results

In this chapter, we explore the relationships between many potential contributing factors and credit union asset growth during 1979–2016. In the figures throughout this chapter, most often we present numerical results for both (1) how growth differs across credit unions with higher vs. lower levels of a factor and (2) estimates of the impacts on growth due to changes in those factors. In each figure, we present these differences in the level of growth through OLS regressions, typically in a top panel labeled A. We present these impacts on growth through panel regressions, typically in a bottom panel labeled B. We generally focus on the impacts on growth, i.e., on the panel regressions in the bottom panels labeled B.

For many factors, particularly when differences and impacts point in the same direction, we do not discuss the differences in growth. Also, we first present results for each factor on an average basis, providing a single coefficient (or estimated impact) averaged across all asset size ranges and years (in column 1 of each of several figures). Next, we also present separate coefficients across individual asset size ranges (columns 2–6). For several of the most relevant factors, we also present graphically how the impacts (from panel regressions) might vary across individual years. To help keep the report as brief as possible, we do not present annual results for all factors.

Key Impacts on Growth: Our Core Statistical Model

Figure 20 presents abridged results for our core model of factors potentially contributing to credit unions' annual growth during 1979–2016, across several asset size ranges.[33] The figure clearly shows that credit unions with higher deposit benefits, ROA, and product breadth experience faster growth. Also, individual credit unions that increase those factors experienced increases in growth. Moreover, all these results were broadly consistent across asset size ranges. The R^2s[34] across asset size ranges are generally high, implying that our models explain rather large fractions (between 42% and 55%) of the variation in credit unions' asset growth rates, even using relatively small numbers of variables. The R^2s are smallest for the smallest asset size ranges (tiny and very small), consistent with the fact that data are most idiosyncratic for smaller credit unions (see above). The R^2s fall somewhat from smallish to larger asset sizes, likely because the larger ranges contain far fewer observations across which to perform the analyses.

Credit unions with higher deposit benefits, ROA, and product breadth experience faster growth.

Larger Deposit Benefits Increase Asset Growth

Following Hoel and Kelly (1999) and Stern, Swidler, and Hinkelmann (2009), Figure 20 shows that, during 1979–2016, credit unions that increased deposit benefits by 1% experienced growth rates that, on average, were 1.12% higher (see panel B, row 1,

FIGURE 20

A "CORE MODEL" OF FACTORS CONTRIBUTING TO GROWTH, ACROSS ASSET SIZE RANGES (1979–2016): DIFFERENCES IN AND IMPACTS ON GROWTH FROM DEPOSIT BENEFITS, ROA, PRODUCT BREADTH (INDEX 1), DELINQUENT LOANS, AND ASSET SIZE

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. How different are asset growth rates in credit unions with higher vs. lower levels of an independent variable? Results from OLS regressions						
1. Deposit benefits	0.89	0.74	0.98	1.03	0.94	1.16
2. ROA	0.97	0.48	1.20	1.68	2.29	2.44
3. Product breadth index 1	0.59	0.69	0.77	0.48	0.32	0.57
4. Delinquent loans	–0.25	–0.24	–0.29	–0.39	–0.56	–0.57
5. Logged real assets	–0.34	–3.61	–2.65	–1.63	–0.76	–0.45**
6. R^2	0.31	0.19	0.36	0.46	0.43	0.39
B. What is the impact of an increase in an independent variable on asset growth rates? Results from panel regressions						
1. Deposit benefits	1.12	1.03	1.29	1.33	1.30	1.63
2. ROA	0.87	0.36	0.98	1.47	1.99	1.82
3. Product breadth index 1	0.52	0.47	0.51	0.33	0.15*	
4. Delinquent loans	–0.24	–0.27	–0.26	–0.38	–0.75	–1.23
5. Logged real assets	–5.96	–13.67	–9.96	–7.83	–6.40	–6.32
6. R^2	0.43	0.42	0.49	0.55	0.52	0.49
Number of observations (= CUs × years)	349,402	62,666	148,411	109,460	25,961	2,904

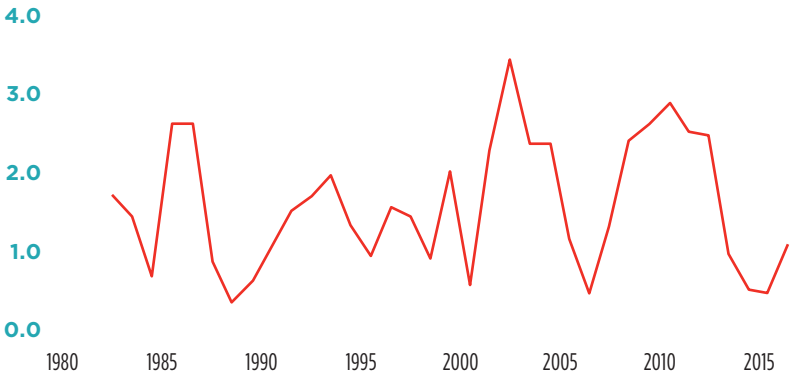
Notes: Rows 1–5 in each panel present abridged results for an OLS regression (in panel A) and for a panel regression (in panel B). Annual dummy variables for 1982–2016 were computed but are not shown here. All independent variables are lagged by one year. We also included one-year lags of growth as independent variables, also not shown (the coefficients for the one-year lags ranged between 0.08 and 0.31). The values in cells for rows 1–5 are coefficients indicating the relationship between changes in an independent variable and the dependent variable. To help keep our results as brief as possible, we do not provide numerical values for t-statistics or p-values. Since the large majority of coefficients were statistically significant at the 1% level (i.e., very reliable), we denote significance at the 1% level simply by including a value in a cell. We denote significance at the 5% level (i.e., reliable) by including two stars (**) following the coefficient. We denote significance at the 10% level (i.e., somewhat reliable) by including one star (*) following the coefficient. Cells left empty signify that the variable's impact was not significant at the 10% level. There is only one case each in this figure of significance at the 5% level, at the 10% level, and of insignificance. Throughout the figures reporting results from statistical models, we report at least two decimals for each coefficient (e.g., 0.20, 0.27, or 10.19), but at least two significant digits (two non-zero values), e.g., 0.0074 (there are no such cases in this figure). If the first non-zero value is followed by a zero, then we include that zero to indicate that the single digit was not affected by rounding, e.g., 0.0060 is entered as 0.0060, not as 0.006.

column 1). The impacts were broadly similar across asset size ranges, ranging between 1.03% and 1.57%. To place these impacts in perspective, a 1% change in deposit benefits falls somewhere in between the unweighted average (0.67%) of credit unions' deposit benefits and their standard deviation (1.16%) during 1985–2016. In other words, an increase in deposit benefits of 1% is a large increase, but one that would be reasonable for managers and analysts to consider. An impact of 1.12% amounts to 32% of credit unions' (unweighted) average growth (which was 3.5% during 1980–2016) and 9% of growth's standard deviation (which was 12.2%). In other words, the size of the estimated impact is also large, but reasonable.

Figure 21 presents estimated annual impacts of deposit benefits on growth during 1982–2016. These impacts have been consistently positive and statistically significant.[35] Averaging 1.12, these impacts have ranged somewhat widely between a minimum of 0.31 in 1988 and a maximum of 3.41 in 2002. Interpreting these annual patterns is somewhat complex. Impacts often become larger during times of changing interest rates and surrounding recessions (perhaps when there is likely more opportunity for gaps in interest rates between banks and credit unions), such as 1989–1993, 2001–2002, 2007–2010, and again, if incipiently, in 2016. Impacts often shrank during periods of either rising interest rates (2003–2006) or "stable" interest rates (1986–1988 and 1994–2000). Most recently, during the current period of historically unprecedented very low (and stable) interest rates (e.g., 2011–2015), many interest spreads were compressed throughout the economy and particularly both across banks vs. credit unions and among credit unions.

FIGURE 21

ESTIMATED ANNUAL IMPACTS OF DEPOSIT BENEFITS ON ASSET GROWTH (1982–2016)



While predicting short-term changes in interest rates is beyond the scope of this report, most analysts, observers, and/or forecasters, including the interest-rate-setting Federal Open Market Committee (FOMC 2017) and the Congressional Budget Office (CBO 2017), expect short-term interest rates to continue to increase over the next few years, even if likely at a slow pace and to a limited extent (topping at 2.8–3% within two to four years). As the current, historically atypical, extended period of very low interest rates comes to an end, it seems most likely that the long-term average impacts of deposit benefits would provide better guidance as to what credit unions may expect over the long term.

Larger ROAs Increase Asset Growth

Following Hoel and Kelly (1999), Figure 20 shows that the impacts on growth due to increasing net income (or ROA) by 1% of assets averaged 0.87% across all credit unions and ranged between 0.36% for tiny credit unions and 1.99% for medium credit unions (see panel B, row 2). Interpreting the impacts of ROA on growth, however, requires some caution. The direction of causality between deposit benefits and growth seems clear. More consumers will become members and members will deposit more of their savings in credit unions that pay more attractive (higher) interest rates on deposits. In contrast, higher ROA is likely more akin to a necessary condition for growth, rather than a sufficient condition. A credit union that attains high ROAs at the expense of offering unattractive (low) interest rates on deposits would be unlikely to maintain high growth. Thus, high ROAs are not sufficient to maintain fast growth.

Attractive interest rates on deposits are, likely, similarly necessary, but not sufficient, conditions for maintaining growth sustainably. Attractive interest rates on deposits will likely attract deposit inflows (and thus growth) in the short term. However, unaccompanied by sufficiently high ROA, combining attractive interest rates on deposits and growth would likely result in declining net worth (capital) per assets ratios. Should capital ratios fall excessively, actions required to lift capital ratios could involve temporarily offering less attractive rates on deposits, whether to raise ROA or to detract depositor inflows. Thus, maintaining sufficiently high ROAs is likely a necessary condition for sustainably maintaining high growth, explaining why our models find ROA to be a statistically significant contributor to growth. Also, our models find smaller impacts of ROA for smaller credit unions likely because smaller credit unions, on average, have much higher capital per asset ratios and thus are less likely to be "capital constrained." Having lower capital ratios, larger credit unions need to maintain higher ROAs to maintain a given growth rate.[36]

Attractive interest rates on deposits will likely attract deposit inflows (and thus growth) in the short term. However, unaccompanied by sufficiently high ROA, combining attractive interest rates on deposits and growth would likely result in declining net worth (capital) per assets ratios.

To place the impacts of ROA on growth in perspective, the means and standard deviations for deposit benefits and ROA are roughly comparable (unweighted means of 0.67% and 0.73%, and standard deviations of 1.16% and 1.26% during 1985–2016) and the impacts are roughly comparable (1.12% and 0.87%). Since both factors are jointly necessary but separately not sufficient conditions for sustainable growth, it is perhaps not surprising that

to maintain growth sustainably, credit unions would find similar impacts from allocating resources (1) toward paying attractive rates to depositors and (2) toward setting aside earnings to maintain their capital ratios.

FIGURE 22

ESTIMATED ANNUAL IMPACTS OF ROA ON ASSET GROWTH (1982–2016)

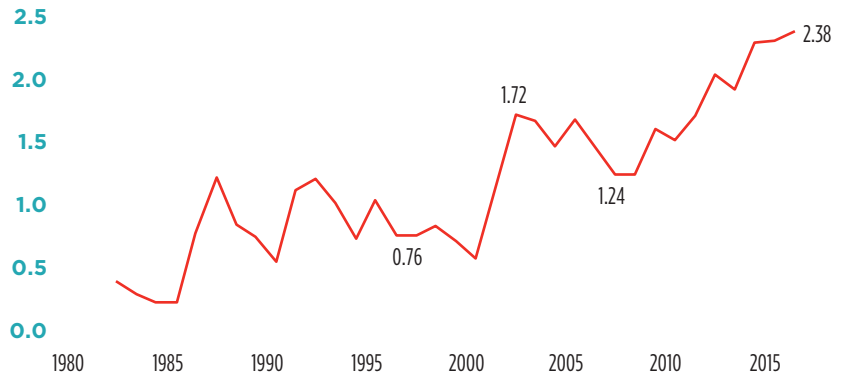


Figure 22 presents estimated annual impacts of ROA on growth during 1982–2016. These impacts have been consistently positive and statistically significant (always at the 1% level). Within this extended period, however, the estimated impacts of ROA on growth have been increasing. Changes in statutory capital requirements and in regulators' (and credit unions') outlook about the importance of capital likely play a key role in explaining the growing sizes of these estimated impacts. For instance, the impacts were noticeably lower, and perhaps without a clear long-term trend, before 1998. Then, the Credit Union Membership Access Act (CUMAA) profoundly changed credit unions' capital requirements (NCUA 1999). Before CUMAA, credit unions were required to set aside a fraction of their earnings, with no formal requirement that any capital per assets targets ever needed to be reached (Crofton, Dopico, and Wilcox 2015).

With CUMAA, credit unions are required instead to maintain capital per assets levels above several certain minima (e.g., 7% to be classified as "well capitalized"). The practical implication is that to maintain higher growth, credit unions must maintain higher ROAs. Thus, credit union ROAs predict growth rates more strongly than before. Unsurprisingly, the estimated impacts of ROA surged from 0.76 in 1997 (before CUMAA) to 1.72 in 2002 (shortly thereafter). More recently, the financial crisis may have further focused regulators (and credit unions) on the importance of capital in preventing failures, likely again increasing the required ROAs to attain growth. As a result, estimated impacts surged further from 1.24 in 2008 (as the crisis burst into public notice) to 2.38 in 2016.

Greater Loan and Deposit Product Breadth Increases Asset Growth

Following Hoel and Kelly (1999), Figure 20 shows that the impacts on growth due to increasing product breadth (as measured by our index 1) by one unit averaged 0.52% and ranged between 0.47% for tiny credit unions and 0.15% for medium credit unions (see panel B, row 3). The impacts were generally larger for smaller credit unions. Having narrower product offerings, smaller credit unions had more room for gains from adding

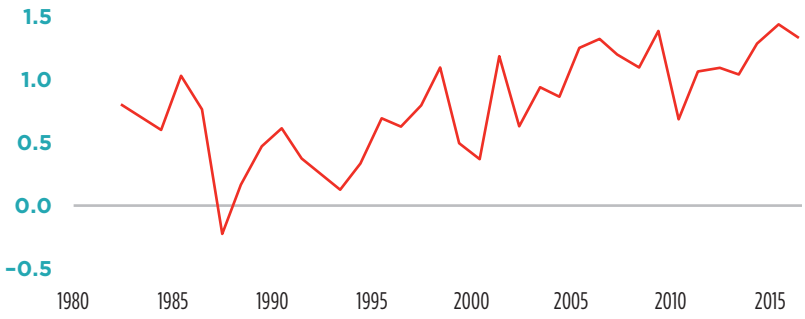
products. Having already very broad product ranges, we did not find any impacts for large credit unions.

To place the impacts of product breadth in perspective, an increase of two units in product breadth would be about one-third of the (unweighted) average (6.8) and about two-thirds of the standard deviation (3.1) for product breadth during 1979–2016. Thus, an increase of two units in product breadth would be a large, but reasonable, increase that credit unions could consider. Increasing product breadth by two units would result in increases in growth of 1.04% (= 2 * 0.52%). These estimates imply that credit unions could expect broadly similar, and large, impacts (1) from increasing their deposit benefits by 1%, (2) from increasing their ROA by 1%, or (3) from substantially expanding their product breadth (by at least two products, out of the 12 included in index 1).

Figure 23 presents estimated annual impacts of product breadth (index 1) on growth during 1982–2016. These impacts were positive and statistically significant (at the 1% level) in 34 out of 35 years. These results imply both (1) that broadening credit unions' offerings of key loans and deposits results in faster growth and (2) that the size of these impacts have not declined in recent years, even though the number of credit unions with narrower offerings continues to dwindle. Instead, the opposite trend appears to be taking place. As the number of credit unions with narrow offerings is dwindling, the growth reward for offering a broad selection of products (or the penalty for not doing so) is increasing.

FIGURE 23

ESTIMATED ANNUAL IMPACTS OF LOAN AND DEPOSIT PRODUCT BREADTH (INDEX 1) ON ASSET GROWTH (1982–2016)



Finally, Figure 24 explores impacts on growth in versions of our core model where we dropped product breadth index 1 as a variable, using instead each of its components one at a time, across asset size ranges during 1979–2016. (For ease of reference, row 1 in each panel presents again the results for the overall product breadth index 1 from Figure 20.) Again, we find that impacts are larger (and statistically significant more often) among smaller asset size ranges; that is for credit unions that have yet to add those products. Out of 12 products in index 1, we find positive impacts for six or seven products among tiny, very small, and smallish credit unions, but only for five among medium credit unions and three among large ones. Among the largest estimated impacts, we find that adding share drafts for tiny and very small credit unions increased asset growth subsequently by 1.7% and 1.6% annually.

FIGURE 24

DIFFERENCES IN AND IMPACTS ON GROWTH FROM KEY LOAN AND DEPOSIT PRODUCTS, ACROSS ASSET SIZE RANGES (1979–2016)

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. How different are asset growth rates in credit unions with higher vs. lower levels of an independent variable? Results from OLS regressions						
1. Product breadth index 1	0.59	0.69	0.77	0.48	0.32	0.57
2. Credit cards	0.78		0.72	0.71	0.56	
3. New car loans		0.26*				2.26
4. Used car loans	0.24	0.41**	0.78			2.59*
5. First mortgages	0.45		0.37	0.45		2.48**
6. Other real estate loans	0.74	0.95	0.88	0.77		
7. Business loans	0.76		0.85	0.62	0.48	0.59*
8. Share drafts	1.78	1.84	2.28	1.49	0.74*	
9. Money market shares	1.15		1.52	0.90	0.50	1.72
10. Share certificates	2.14	1.61	2.27	1.69	1.21	2.43
11. Individual retirement accounts (IRAs)	1.39	1.95	1.46	1.02		1.19
B. What is the impact of an increase in an independent variable on asset growth rates? Results from panel regressions						
1. Product breadth index 1	0.52	0.47	0.51	0.33	0.16*	
2. Credit cards	0.62			0.56	0.44*	
3. New car loans	–0.31**	0.94				4.45
4. Used car loans	–0.38	1.11		–0.78		2.41**
5. First mortgages	0.43					
6. Other real estate loans	0.42	1.07	0.36	0.38	—	
7. Business loans	1.03			0.17**	0.25*	
8. Share drafts	0.75	1.74**	1.65			—
9. Money market shares	1.39	0.99*	0.66	0.91	0.72	2.78**
10. Share certificates	1.32		1.55	0.89	0.68*	
11. Individual retirement accounts (IRAs)	1.60	1.36**	1.14	1.27		

Notes: Each cell provides the coefficient from a different regression in which that variable was added to the core models shown in Figure 20. Empty cells denote that the variable was not significant at the 10% level. One star (*) denotes significance at the 10% level (i.e., somewhat reliable results). Two stars (**) denote significance at the 5% level (i.e., reliable results). We denote significance at the 1% level (i.e., very reliable results) by coefficients unaccompanied by stars. Index 1 reproduces again the results for the index of loan and deposit breadth presented in Figure 20 within the core model. When testing each component of index 1, we dropped the index itself from the model. Statistical models were estimated over the following periods: first mortgages (1979–2016), share drafts (1980–2016), share certificates and IRAs (1981–2016), other unsecured loans, new car loans, and other real estate loans (1982–2016), business loans (1986–2016), used car loans and money market shares (1989–2016), and credit cards (1992–2016). We do not report results regarding adding unsecured loans and regular shares, since nearly all credit unions reported offering those products, and likely all actually did. We omit the estimated results for some products (which we designate with a "—") for medium and large credit unions since too few of them failed to offer the product to yield reliable estimates.

FIGURE 25

DIFFERENCES IN AND IMPACTS ON GROWTH FROM "NON-KEY" PRODUCTS (INDEX 2), ACROSS ASSET SIZE RANGES (2006–2016)

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. How different are asset growth rates in credit unions with higher vs. lower levels of an independent variable? Results from OLS regressions						
1. Product breadth index 2		–1.30**	0.12*	0.084**	0.093**	
2. ATM / debit programs	0.18*		0.56	0.40		
3. Insurance, investment services		–2.61				–1.15
4. Brokered CDs	–0.12**					
5. Debt cancellation						
6. Overdraft protection	0.15			0.34	0.32**	–0.87**
7. Overdraft line of credit						0.98
8. Brokered deposits						0.89*
B. What is the impact of an increase in an independent variable on asset growth rates? Results from panel regressions						
1. Product breadth index 2	0.12			–0.15		
2. ATM / debit programs			–0.43*	–0.74		
3. Insurance, investment services	0.23**	—				–1.73**
4. Brokered CDs	0.31					
5. Debt cancellation			–2.26**			
6. Overdraft protection	0.25**					
7. Overdraft line of credit				–0.63		
8. Brokered deposits						

Notes: Each cell provides the coefficient from a different regression in which that variable was added to the core models shown in Figure 20. Empty cells denote that the variable was not significant at the 10% level. One star (*) denotes significance at the 10% level (i.e., somewhat reliable results). Two stars (**) denote significance at the 5% level (i.e., reliable results). We denote significance at the 1% level (i.e., very reliable results) by coefficients unaccompanied by stars. We omit the estimated results for some products (which we designate with a "—") for tiny credit unions since too few of them offered the product to yield reliable estimates.

Next, Figure 25 through Figure 27 explore the impacts of offering or adding a long list of other "non-key" products. We estimate the impacts separately for two sets of products for 2006–2016 (index 2) and 2009–2016 (index 3) based on data availability. Focusing on results from panel regressions (panel B of Figure 25 and Figure 27), we find that adding very few of these products had positive impacts on credit union growth. In particular, none helped growth for tiny credit unions, only one for very small ones, and only four for smallish ones. We found more evidence of positive and significant impacts on growth for medium and large credit unions, respectively, for 11 and four products.

FIGURE 26

DIFFERENCES IN GROWTH FROM "NON-KEY" PRODUCTS (INDEX 3), RESULTS FROM OLS REGRESSIONS, ACROSS ASSET SIZE RANGES (2009–2016)

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
1. Product breadth index 3	0.041		0.15	0.11	0.12	0.14
2. Business share accounts	0.31		0.66**	0.45	0.51	0.61*
3. HSAs	0.37	—		0.32**	0.32	0.66**
4. IDAs	0.42**				0.48*	
5. No cost drafts			0.73	0.62		
6. Low minimum CDs			0.58	0.18*		
7. Financial counseling	0.33			0.31	0.48	
8. Financial education	0.32			0.35	0.61	0.73**
9. Financial literacy	0.43			0.41	0.66	0.54*
10. First home loan	0.46				0.63	0.73
11. Bilingual services			0.89**			0.66**
12. No cost billing			0.71	0.50	0.56	
13. Credit builder	0.49		0.68**	0.52	0.64	
14. Microbusiness loans	0.47			0.71	0.42	
15. Microconsumer loans	0.44		0.66*	0.42	0.52	
16. Payday loans	0.20*				0.36**	
17. Refund anticipation loans	0.94	—		1.30	0.65*	
18. Share-backed credit cards		—				
19. Check cashing	0.14**	—	0.58	0.42		
20. International remittances	0.29	—			0.42	
21. Low cost wires			0.69	0.27		
22. Money orders	0.15*		0.65	0.48		
23. No cost ATMs		—	0.67	0.38		

Notes: Each cell provides the coefficient from a different regression in which that variable was added to the core models shown in Figure 20. Empty cells denote that the variable was not significant at the 10% level. One star (*) denotes significance at the 10% level (i.e., somewhat reliable results). Two stars (**) denote significance at the 5% level (i.e., reliable results). We denote significance at the 1% level (i.e., very reliable results) by coefficients unaccompanied by stars. We omit the estimated results for some products (which we designate with a "—") for tiny credit unions since too few of them offered the product to yield reliable estimates.

There are at least two main possible explanations for the weak link between adding non-key products and asset growth. First, asset growth is not, and should not be, the only goal of credit unions. Fast asset growth is often a sign that members value a credit union. When members value a credit union, and particularly its interest rates on deposits, members will shift more of their business to the credit union, and its assets will grow faster. However, the credit union's objectives can be broader and can involve goals and programs that do

FIGURE 27

IMPACTS ON GROWTH FROM "NON-KEY" PRODUCTS (INDEX 3), RESULTS FROM PANEL REGRESSIONS, ACROSS ASSET SIZE RANGES (2009–2016)

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
1. Product breadth index 3	0.084				0.13	0.18*
2. Business share accounts	0.71			0.36*	0.81**	1.52**
3. HSAs	1.44				1.10	2.82
4. IDAs	1.07**					
5. No cost drafts			0.62*		–0.98	
6. Low minimum CDs					–0.66**	1.45*
7. Financial counseling	0.44**					
8. Financial education	0.38**				0.66**	
9. Financial literacy	0.93				0.58*	
10. First home loan	1.60				1.10	
11. Bilingual services	1.01				1.15	
12. No cost billing	0.28**					
13. Credit builder	1.03			0.73	0.80**	
14. Microbusiness loans	1.05			1.38		
15. Microconsumer loans	1.09			1.12	1.05**	
16. Payday loans						
17. Refund anticipation loans						
18. Share-backed credit cards	0.75				0.56*	
19. Check cashing						
20. International remittances	1.37				0.60	
21. Low cost wires						
22. Money orders						
23. No cost ATMs						

Notes: Each cell provides the coefficient from a different regression in which that variable was added to the core models shown in Figure 20. Empty cells denote that the variable was not significant at the 10% level. One star (*) denotes significance at the 10% level (i.e., somewhat reliable results). Two stars (**) denote significance at the 5% level (i.e., reliable results). We denote significance at the 1% level (i.e., very reliable results) by coefficients unaccompanied by stars.

not directly result in faster asset growth. Other goals include offering members attractively priced products and services other than deposits. Thus, offering members a broader range of products at attractive prices could (1) serve members well, but (2) not necessarily result in faster asset growth.

Asset growth is not, and should not be, credit unions' only goal.

Second, and somewhat similarly, it is possible that fast-growing credit unions, those that are otherwise dynamic institutions and that are successful at providing members with valued services, choose to add more services. Thus, some credit unions might add some of these additional services *because* they are fast-growing, rather than being fast-growing because they had added those services. Panel A in Figure 25 and Figure 26 highlight that faster-growing credit unions are more likely to offer more of these products. In particular, we find that faster-growing very small credit unions are more likely to offer 12 (out of 29) of these products than their slower-growing peers. We find similar results for smallish (18) and medium credit unions (15). We find fewer significant differences among tiny and large credit unions, likely since too few of the former offer any of the products and too few of the latter do not.

Credit Unions with More Delinquent Loans Do Not, Sustainably, Grow Faster

Government regulators and analysts commonly express concerns that, to achieve faster asset growth, some financial institutions may take more credit risk. Assessing credit risk from outside an institution is difficult, as measures such as delinquent loans, provisions for loan losses, and loan charge-offs are all imperfect measures of credit risk. They are all measures of negative outcomes from credit risk, but not direct measures of credit risk itself. During economic expansions, financial institutions may make loans that bear more credit risk, "betting" that those loans will work out. If the expansions continue, those bets may pay off, and increased credit risk may not result in actual negative outcomes. However, if expansions turn into recessions, credit unions bearing more credit risk will likely bear far larger increases in delinquent loans, in provisions for loan losses, and in charge-offs, than credit unions that bore less credit risk.

Despite the limitations of available measures of credit risk, we include delinquent loans in our core model as an imperfect but reasonable effort to control for the possibility that some credit unions may bear more credit risk to increase their growth rates. Like Hoel and Kelly (1999), our results do not find increases in delinquent loans to be associated with subsequent higher growth. Instead, we find that credit unions experiencing negative outcomes from credit risk (i.e., increases in loan delinquencies) experience lower asset growth, perhaps as higher loan delinquency rates signal both past errors in the loan portfolio mix and potential capital constraints. Figure 20 shows that increasing delinquent loans by 1% of assets reduced asset growth rates by 0.24% (see panel B, row 4). The impacts were much larger for larger credit unions, ranging from –0.27% for tiny credit unions to –1.27% for large ones. The larger impacts for larger credit unions likely have at least two explanations. First, larger credit unions maintain smaller capital ratios on average, so their growth must respond more readily to potential threats. Second, larger credit unions experience lower values for both the averages and standard deviations of

delinquent loans, so an increase (of the same percentage of assets) in loan delinquencies provides clearer signals of potential problems among larger credit unions than among their smaller peers.

Larger credit unions maintain smaller capital ratios on average, so their growth must respond more readily to potential threats.

Assessing the Impacts of Asset Size on Growth Is Complex

Figure 8 showed that larger credit unions typically have lower noninterest expenses, higher deposit benefits, and higher growth. We performed statistical modeling (not included in our figures) that buttress these likely chains of causation. On average, larger credit unions have lower noninterest expenses, i.e., they benefit from economies of scale. Having lower noninterest expenses, larger credit unions can afford to provide their members with more attractive (higher) interest rates on deposits. Offering more attractive interest rates, larger credit unions attract more members and more of their savings, and thus experience higher growth.

Following Goddard and Wilson (2005), a simplified OLS regression (including only a lag of growth and annual dummies as additional independent variables) can show that larger credit unions grow faster than smaller ones (with a coefficient of 0.49 between logged real assets and growth).[37] Similarly stripped-down regressions have similarly consistent results: Larger asset size is associated with lower noninterest expenses (with a coefficient of −0.027). Higher noninterest expenses are associated with lower deposit benefits (−0.12). Higher deposit benefits are associated with higher growth (0.80).

The very stages in this proposed chain of causation, however, hint that the links between asset size and growth are likely more indirect (Udell and Kelly 2004), and the links between, for instance, deposit benefits and growth are more direct (Stern, Swidler, and Hinkelmann 2009). To assess this hypothesis, we explored several statistical models including, for instance, regressions with growth as the dependent variable and as independent variables simultaneously logged real assets, noninterest expenses, and deposit benefits (as well as, as usual, lagged growth and annual dummies). An OLS version of this model yielded positive and significant coefficients of 0.84 for deposit benefits, 0.18 for noninterest expenses, and 0.48 for logged real assets. A panel version of these models yielded significant coefficients of 1.11 for deposit benefits, 0.34 for noninterest expenses, and −5.13 for logged real assets. (We discuss the positive coefficients for noninterest expenses below.)

How should we interpret the combination of a positive coefficient for deposit benefits and a negative coefficient for logged real assets in this panel regression, as well as in the core

models presented in Figure 20? We continue to interpret the positive coefficient between logged real assets and growth in stripped-down models and the predictable results in our "chain of causation" to validate (1) that larger size typically helps credit unions have lower noninterest expenses, (2) that those lower noninterest expenses typically help credit unions offer more attractive interest rates on deposits, and (3) that those more attractive interest rates result in faster growth.

However, our exploration also yields a somewhat complex picture. The absence of a positive coefficients for logged real assets in, for instance, Figure 20 implies that deposit benefits are, at least statistically, far clearer contributors to, or predictors of, growth than asset size. Thus, larger size may be instrumental in delivering faster growth, but larger size alone does not result in faster growth (see Udell and Kelly 2004). For instance, large credit unions that do not control their noninterest expenses or that do not pass their lower costs to members as deposit benefits will be less likely to experience faster growth. Expressed in terms of statistical modeling, once one has controlled for the impact of asset size on delivering deposit benefits, asset size does not make any other contributions to growth.

Larger size may be instrumental in delivering faster growth, but larger size alone does not result in faster growth.

Once we explored the likely more important, or direct, predictive role of deposit benefits, we settled on our core model that (1) focuses on deposit benefits and product breadth to both attract members and their funds and on the ROA required for growth to be sustainable, and (2) holds constant for delinquent loans and asset size. (Again, the core model includes a lag of growth and annual dummies.) We did not include noninterest expenses in our core model for several reasons. First, noninterest expenses seem to be one more element, even if a very important one, in the chain of causation from asset size to noninterest expenses to deposit benefits to growth. Thus, including both deposit benefits as a key predictor and asset size as a control variable seems sufficient for the core model.

Other Impacts on Growth Due to Income and Expense-Related Factors

Figure 28 presents additional potential contributors to credit union asset growth, focusing on factors more or less closely related to the income and expense statement: loan benefits; noninterest expenses and its components: employee compensation and the number of employees, office occupancy expenses and the number of branches, office operation expenses, marketing (or educational and promotional) expenses; and noninterest income.

FIGURE 28

DIFFERENCES IN AND IMPACTS ON GROWTH FROM OTHER FACTORS RELATED TO THE INCOME AND EXPENSE STATEMENT, ACROSS ASSET SIZE RANGES (1979–2016)

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. How different are asset growth rates in credit unions with higher vs. lower levels of an independent variable? Results from OLS regressions						
1. Loan benefits	–0.26	–0.24	–0.28		0.21	0.29*
2. Noninterest expenses	0.13		0.23	0.29	0.47	0.70
3. Employee compensation	–0.084	–0.24	0.11	0.44	0.86	1.26
4. Number of employees	0.35	0.34	1.12	4.14	5.50	8.16
5. Office occupancy expenses	–0.22**	–0.44	0.28**			
6. Number of offices (branches)	0.47	–0.50	2.49	11.71	26.76	50.62*
7. Office operation expenses	1.14	1.14	1.11	0.74	0.82	
8. Marketing expenses	5.65	3.93	7.44	7.20	5.82	8.51
9. Noninterest income	0.95	0.90	0.96	0.92	0.93	0.93
B. What is the impact of an increase in an independent variable on asset growth rates? Results from panel regressions						
1. Loan benefits	–0.15	–0.25	–0.27		0.18**	
2. Noninterest expenses	0.34		0.11**	0.47	0.78	1.06**
3. Employee compensation			–0.25	0.77	1.34	1.83
4. Number of employees	0.50	0.50	0.84	4.13	5.80	15.50
5. Office occupancy expenses		–0.48		–0.81		
6. Number of offices (branches)	0.23*		2.09	10.04		
7. Office operation expenses	0.35		0.68	0.34**		
8. Marketing expenses	7.86	2.74	9.20	9.77	7.78	12.50
9. Noninterest income	1.32	0.62	0.94	1.16	1.47	1.20

Notes: Each cell provides the coefficient from a different regression in which that variable was added to the core models shown in Figure 20. (The regressions for large components of ROA [noninterest expenses, employee compensation, office occupancy and operation expenses, and noninterest income] did not include ROA.) Empty cells denote that the variable was not significant at the 10% level. One star (*) denotes significance at the 10% level (i.e., somewhat reliable results). Two stars (**) denote significance at the 5% level (i.e., reliable results). We denote significance at the 1% level (i.e., very reliable results) by coefficients unaccompanied by stars. Most models were estimated with data for 1979–2016, except for branches (2003–2016). In our statistical models, loan benefits were entered as interest rates (i.e., rates being 1% lower than at banks). Noninterest expenses, employee compensation, office occupancy and operations expenses, marketing (educational and promotional) expenses, and noninterest income were entered per assets. The number of employees and offices were entered per $1M in assets.

Each cell in this figure presents the coefficient for each variable and asset size range for models largely akin to the core model that we introduced above, adding only that one additional variable per model, one at a time. We adjust the core model in a few cases. For instance, the models for large components of ROA (noninterest expenses, employee compensation, office occupancy expenses, office operation expenses, and noninterest income) did not include ROA, to ease the interpretation of the coefficients.

Larger Loan Benefits Increase Loan Growth, but Not Asset Growth

Thus far, this report has provided clear statistical evidence of a link between (1) credit unions paying more attractive (higher) interest rates on deposits and (2) faster asset size growth. However, the relationships among deposit interest rates (and benefits), loan interest rates (and benefits), and asset growth are complex. The focus of this report is on factors contributing to asset growth, but deposit benefits might be expected to affect deposit volumes more directly (Stern, Swidler, and Hinkelmann 2009), and loan benefits might be expected to affect loan volumes more directly.

The link between deposit benefits and asset growth is particularly strong, in large part because the link between deposit growth and asset growth is strong. By and large, credit union asset growth is, on an accounting or mechanical basis, driven mostly by deposit growth. Deposits are the main source of funds for credit unions. Most credit unions have few non-deposit liabilities, and, compared with deposit volumes, net worth volumes (and ratios) change relatively slowly.

In contrast, the link between loan growth and asset growth is much weaker. Credit unions hold large, and widely varying, amounts of non-loan assets. For instance, during 1979–2016, the loan-to-asset ratio for all credit unions averaged 64% and ranged between 81% in 1979 and 53% in 1992, and more recently from 69% in 2007 down to 58% in 2012 and back up to 67% in 2016. Individual credit unions may target their interest rates (and the differences between theirs and their competitors') to manage their loan growth, their deposit growth, and their loans to assets ratio. For instance, a credit union with a low loan-to-asset ratio might seek to increase it. To do so, the credit union could seek to increase its loan growth and reduce its asset (and deposit) growth. To do so, the credit union could offer more attractive loan rates, and less attractive deposit rates.[38,39] Conversely, a credit union with a high loan-to-asset ratio might, ultimately, move to offer less attractive loan rates, to reduce loan growth, and instead offer more attractive deposit rates, to increase deposit (and asset) growth.

Our results show that credit unions offering more attractive loan interest rates experience lower asset growth rates (Figure 28, panel B, row 1). In particular, offering loan interest rates that are 1% higher results in asset growth rates that are 0.15% lower. The discussion above likely helps to explain this result. Credit unions with low loan-to-asset ratios may be seeking to lift those ratios by simultaneously (1) lifting loans, through more attractive loan rates, and (2) restraining deposits (and assets), through less attractive deposit rates. Thus, our statistical techniques may simply be focusing on the indirect but observed link from low loan-to-asset ratios to both more attractive loan rates and lower asset growth rates. Further evidence for this possibility can be found by considering how this estimated impact

varies across asset size ranges. In particular, the negative impact is larger among smaller asset size ranges (tiny and very small), which have lower loan-to-asset ratios, and actually is positive among larger asset size ranges.

Larger Noninterest Expenses Increase Asset Growth

As we discussed above, larger credit unions, on average, have lower noninterest expenses, which allow them to offer their members more attractive interest rates, resulting in turn in higher asset growth rates. At first glance, this intuition would appear to link lower noninterest expenses and higher asset growth. And simple statistical analyses back that link. However, on closer examination, the link between noninterest expenses and asset growth is more complex. It is likely that simple statistical analyses simply point out that larger credit unions on average have lower noninterest expenses, higher deposit benefits, and higher asset growth rates, without exploring each possible link separately. In contrast, our methodology allows us to investigate separately the impacts of noninterest expenses, deposit benefits, and size on asset growth. In general, credit unions with higher noninterest expenses have lower deposit benefits, and thus have lower asset growth rates. However, the uses for which various credit unions use their noninterest expenses may differ widely.

In some cases, credit unions may bear noninterest expenses that do not directly benefit their members, e.g., a branch that is too big, employees whose efforts are being misallocated, regulatory costs that while required to operate, are not directly appreciated by members (Ferri and Kalmi 2014). In those cases, higher or increasing costs would be unlikely to be associated with higher or increasing asset growth. However, other credit unions may successfully increase noninterest expenses in manners that benefit, or at least do not hurt, average members. For instance, credit unions might incur one-time expenses to alleviate overstretched resources in manners that might yield better services and might actually increase asset growth. Extra spending on a new branch might relieve an overstretched older branch or might attract members from different neighborhoods. Similarly, hiring an additional employee might relieve overstretched employees and allow all employees to provide better service or the new employee to provide valued services that the credit union did not offer before.

Finally, some credit unions may incur additional expenses to offer new for-fee services that are valued by members (e.g., more safe deposit boxes, insurance and brokerage services, etc.). If the new services generate fees that match their associated noninterest expenses, then the higher reported noninterest expenses would not be associated with lower ROAs or detract from the credit union's ability to deliver attractive interest rates on loans and deposits. Instead, the extra noninterest expenses could be interpreted as successful

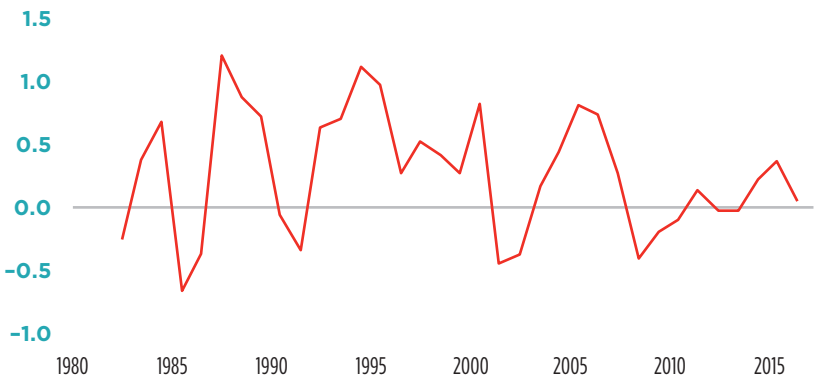
investments that resulted in services that were valuable to members. Receiving more valued services, members could bring more of their savings to the credit union, resulting in higher asset growth.

Like Hoel and Kelly (1999), Figure 28 shows that credit unions increasing their noninterest expenses experience higher asset growth rates (see panel B, row 2). In particular, increasing noninterest expenses by 1% of assets results in asset growth rates that are 0.34% higher. These results, however, vary widely across asset size ranges and over time. As row 2 shows, the impacts are larger (more positive) for larger credit unions, ranging from insignificant impacts for tiny credit unions to 0.11% for very small, 0.47% for smallish, 0.78% for medium, and 1.06% for large ones, implying that, on average, larger credit unions have more projects available that can result in higher asset growth.

Beyond the long-term or average impacts of increasing noninterest expenses across all credit unions or for specific asset size ranges, one may also explore those impacts over time. Figure 29 highlights that the impacts of many factors can vary widely over time and, particularly, that those impacts may depend on macroeconomic conditions. Since the mid-1980s (as credit union data becomes more reliable), we find that credit unions that increased noninterest expenses surrounding recessions (1990–1991, 2001–2002, and 2008–2009) on average experienced lower growth. In contrast, while the switchover from recessions to expansions is often not perfectly delineated, credit unions increasing noninterest expenses during expansions (1983–1984, 1987–1989, 1992–2000, and 2003–2007) on average experienced faster growth. However, the positive impacts of noninterest expenses have been particularly weaker during the recent, atypically slow economic recovery. In particular, we find positive and significant impacts, but small ones, for several years (2011 and 2014–2015) and a lack of significant impacts for several years (2010, 2012–2013, and 2016).

FIGURE 29

ESTIMATED ANNUAL IMPACTS OF NONINTEREST EXPENSES ON ASSET GROWTH (1982–2016)



Adding Employees (per Assets) Increases Asset Growth

Next, we delve deeper into the components of noninterest expenses. For instance, exploring the coefficients for "employee compensation per assets" (hereinafter compensation) serves to highlight (1) possible differences between OLS and panel models and (2) key differences across asset size ranges. The shift in signs in the OLS coefficients (Figure 28, panel A, row 3) from tiny credit unions (−0.24) to very small credit unions (0.11) indicates that faster-growing tiny credit unions on average have lower compensation expenses, while faster-growing very small credit unions on average have higher compensation expenses. This evidence, while correct, may not be used to conclude that to grow more quickly, tiny credit unions should spend less on compensation, or that very small credit unions should spend more on compensation.

Adding employees (per assets) increases asset growth.

Considering coefficients from fixed effects panel models (Figure 28, panel B, row 3), we find instead no statistical evidence that changing compensation among tiny credit unions affects their growth. Among very small credit unions, we find that increasing compensation actually decreases growth. The lack of statistical evidence among tiny credit unions is, at least in part, likely the result of the idiosyncratic data and characteristics of smaller credit unions, which have historically included, and continue to include, many institutions benefiting from a combination of volunteer and sponsor contributions. In that context, it is less likely that changes in growth might be readily traced back to changes in compensation.

Thus, while we find little evidence that increasing compensation results in faster growth for tiny and smaller credit unions, those impacts are statistically significant among smallish credit unions (with a coefficient of 0.77) and among larger credit unions. We interpret these impacts to imply, perhaps unsurprisingly, that adding labor resources can result in faster growth. Conversely, one could similarly interpret the results as implying that overstretched employees can only focus on day-to-day tasks and cannot focus on bringing in new members or providing them with an experience that results in faster growth. Thus, making employees less overstretched would result in faster growth.

Compensation, of course, combines (or multiplies) the number of employees and their average compensation per person. Increases in compensation may thus reflect (1) increases in the number of employees, (2) increases in compensation per person for current employees, and/or (3) changes in the composition of the labor force, from less skilled (or less formally trained) employees to more skilled (and typically better paid) ones. To begin to explore these factors, we also tested the relationship between the "number of employees per $1M of assets" (hereinafter, number of employees) and growth.

We test the relationship between employees per $1M of assets and growth instead of simply between the number of employees and the amount of assets since these last two variables would likely be correlated almost trivially. Instead, we are interested in exploring whether having very few employees per assets (i.e., overstretched employees) results in slower growth than having more employees per assets (i.e., their not being overstretched). Like Hoel and Kelly (1999), we find that adding one employee per $1M (i.e., making them less overstretched) results in asset growth that is 0.50% higher (Figure 28, panel B, row 5). Of course, finding (1) that compensation does not have positive, significant impacts on growth while (2) the number of employees does have positive, significant impacts likely implies that asset growth does not respond to how well compensated employees are, but does respond to how many employees there are.

Adding one employee per $1M (i.e., making them less overstretched) results in asset growth that is 0.50% higher.

Considering the impacts of the number of employees across asset size ranges, we find the estimated impacts to be much larger for larger credit unions, ranging from 0.50 for tiny credit unions to 15.50 for large credit unions. These differences across sizes are largely explained by the fact that changes in the number of workers in smaller credit unions are "lumpier." Smaller credit unions have smaller workforces, often of one, two, or very few employees. In those cases, adding an employee is a large decision not taken lightly or often. Adding a third worker to a two-worker credit union involves a one-time increase of 50% in its labor force. Thus, when smaller credit unions add workers, the impacts on growth are being measured with data involving occasional, large, discrete jumps. All the variation in growth rates is compared against only occasional changes in the number of employees. In contrast, among larger credit unions with larger workforces, their numbers of employees are being adjusted almost constantly in jumps that are far smaller on a percentage basis. Thus, the statistical models inevitably report weaker relationships between growth and changes in the number of employees among smaller institutions.

Expressed differently, the coefficients for larger credit unions are likely larger because the standard deviations for employees are smaller for larger asset size ranges. Adding one extra employee per $1M (or a very large increase in its labor force in percentage terms) might not happen all the time, but it is not unheard of among smaller credit unions. In contrast, larger credit unions almost never engage in very large increases in their number of employees per assets. Even in a merger of equals, even if doubling assets, the number of employees per assets might change only by a small amount, if at all. Thus, the relevant comparison of the impact of adding employees across smaller vs. larger credit unions likely should not be based on adding the same number of employees per assets, but should

instead take into account the standard deviations in employees per assets for each asset size range.

For instance, for tiny credit unions, the values for the average and standard deviation of employees per $1M in assets are 1.23 and 1.81. For large credit unions, they are 0.20 and 0.08. To place the coefficients for tiny and large in perspective, adding one employee per $1M (about the mean and half the standard deviation) would be a large but reasonable increase in employees for a tiny credit union. Our coefficient for tiny credit unions (0.50) implies that, upon adding that extra worker, asset growth would only become 0.5% higher (= 0.50 * 1). In contrast, the mean and standard deviation for large credit unions (again 0.20 and 0.08) show that large credit unions would be extremely unlikely ever to add one employee per $1M. A somehow proportionately similar increase in employees for a large credit union might involve adding only 0.1 employees per $1M (or about half their mean, and about their standard deviation—which of course would be equivalent to adding one employee per $10M). Our coefficient for large credit unions (15.50) implies that, upon adding that extra worker, asset growth would become 1.55% higher (= 15.50 * 0.1).[40]

Adding Branches (per Assets) Increases Asset Growth among Very Small and Smallish Credit Unions

Next, we explore the relationship between "office occupancy expenses per assets" (hereinafter, occupancy expenses), "the number of offices per $1M in assets" (hereinafter branches), and growth. We explore occupancy expenses and branches separately for several reasons. In particular, data for occupancy expenses are available since 1979, while data for branches are available consistently only since 2003. Our results show that increasing occupancy expenses has not reliably increased growth (Figure 28, panel B, row 5). Of course, since our models focus on occupancy expenses per assets, our findings do not imply that credit unions should not add branches as their assets increase. To prevent their branches from becoming overstretched, credit unions with more assets (and members) can afford (and may need) to increase their branch networks (or branch sizes) in line with asset and member growth. What our results imply is that past efforts by credit unions to "lead" growth through more spending on branches (or branch renovations) have not been successful in the past. Those expenses might even have diverted resources from uses preferred by members (such as more attractive interest rates or broader product offerings).

In contrast to occupancy expenses, our results (Figure 28, panel B, row 6) imply that increasing branches results in higher growth for very small and smallish credit unions, but not among tiny, medium, and large ones. The contrast in the results between occupancy expenses and branches can likely be explained by exploring closely the difference

between the two concepts. We may interpret occupancy expenses to represent the product of (1) number of locations available to members (i.e., offices) and (2) the cost per office (e.g., costs of construction, depreciation, or rent). Occupancy expenses may rise not only because credit unions add more offices, but also because they choose to spend more on those offices, whether in expansions or renovations.

Thus, finding positive impacts of branches on growth and negative impacts of occupancy expenses on growth likely implies that what promotes growth might be having a larger number of locations (even if spartan ones), instead of more spending on making existing locations more spacious or somehow lavish.

Like with employees, smaller credit unions have few offices per credit union (typically one) and adding a branch is, again, a large decision not taken lightly or often. For larger credit unions, adding branches may be far closer to a routine matter. Similar to the case of employees, statistical techniques faced with lumpier variation in branch data for smaller credit unions estimate, unsurprisingly, much smaller coefficients for branches for smaller credit unions. In this case, the coefficients range from 2.09 for very small credit unions to 10.04 for smallish ones.

To place the coefficients across asset size ranges in perspective, among very small credit unions an increase of one-fourth branch per $1M in assets (or one branch per $4M) would be large but reasonable (similar to the mean and standard deviations of branches per $1M in that asset size range of 0.33 and 0.24). Such an increase would result in asset growth being 0.52% higher (= 0.25 * 2.09). A proportionately similar increase for smallish credit unions would involve adding 0.04 branches per million (or one branch per $25M, which is also about the mean and standard deviation in that asset size range of 0.06 and 0.04). Such an increase in branching would result in asset growth being 0.40% higher (= 0.04 * 10.04).

Larger Office Operation Expenses Increase Asset Growth among Very Small and Smallish Credit Unions

Next, we explore the relationship between "office operation expenses per assets" (hereinafter, operation expenses) and growth. Our results imply that increasing operation expenses by 1% of assets increases growth by 0.68% among very small credit unions and by 0.34% among smallish ones, but not among tiny, medium, or large ones (see Figure 28, panel B, row 7). Positive, significant coefficients likely highlight that operations, on average, may have tended to be overstretched, such that additional expenditures (e.g., computer hardware and software updates and upgrades) could increase the quality of credit unions' services, attracting more members or more of their funds. In contrast, among larger credit unions, the absence of significant coefficients would likely imply that

those credit unions were closer to having optimized their operations, such that additional operation expenses would not appear to impact their growth.

Larger office operation expenses increase asset growth among very small and smallish credit unions.

Larger Marketing Expenses Greatly Increase Asset Growth

Next, we explore the relationship between "educational and promotional expenses per assets" (hereinafter marketing) and growth. Our results imply that increasing marketing has far larger impacts on growth than dedicating a credit union's resources to other areas (such as increasing deposit benefits, compensation, occupancy, or operation expenses). Our results imply that increasing marketing expenses by only 0.1% of assets, about its average (0.07%) and standard deviation (0.09), or roughly doubling them, results in growth rates that are higher by 0.79% (see Figure 28, panel B, row 8).

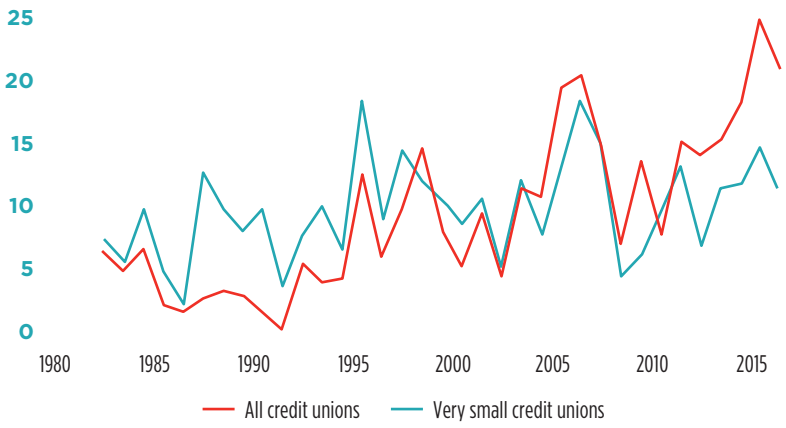
To increase asset growth by 0.79%, credit unions would have to increase deposit benefits by 0.71% (= 0.79 / 1.12), or increase ROA by 0.91% (= 0.79 / 0.87), or add 1.5 key loan and deposit products (= 0.79 / 0.52). Thus, a credit union focused on promoting its asset growth should likely consider seriously past credit unions' success in using marketing to promote asset growth. Moreover, the impacts of marketing on growth are largely consistent (positive and significant) across most asset size ranges. The impacts on growth from increasing marketing by 0.1% of assets are roughly similar across asset size ranges, from very small credit unions (0.92%) to large credit unions (1.25%), with only tiny credit unions having substantially smaller (but still significant) impacts (0.27%). While these results do not guarantee that future increases in marketing will be successful, or provide guidance as to how extra marketing budgets should be allocated, they nonetheless highlight that past credit union marketing efforts were successful in promoting asset growth.

Figure 30 presents estimated annual impacts of marketing on growth during 1982–2016 computed across all credit unions and among only very small credit unions. The figure highlights that, unlike (total) noninterest expenses' negative impacts surrounding recessions, marketing's impact has not been weakened during the post-crisis period. If anything, computed across all credit unions, the impacts of marketing appear to be in somewhat of an upward trend. This upward trend could perhaps be the result of increasingly professionalized marketing efforts among credit unions, particularly compared with the late 1980s. The uptick in marketing effectiveness in recent years could also be the result of new computer-based marketing techniques (websites, email, more effective marketing research, better targeted expenses, etc.) and emerging social media platforms.

Figure 30 also shows that the recent upward trend in the effectiveness of marketing across all credit unions is far weaker among very small credit unions. This difference across asset size ranges could perhaps be associated with very small credit unions not having the resources to employ whole departments (or even single employees) to marketing research and efforts. Thus, their marketing efforts may be more traditional and may be introducing more slowly the more recent, more effective computer-based and social media–based approaches to marketing. Despite the absence of an upward trend in the effectiveness of marketing among very small credit unions, our results point to marketing as a consistently very effective avenue for credit unions of all sizes to enhance their growth.

FIGURE 30

ESTIMATED ANNUAL IMPACTS OF MARKETING EXPENSES ON ASSET GROWTH (1982–2016)



Larger Noninterest Incomes Increase Asset Growth

Following Hoel and Kelly (1999), Figure 28 shows that increasing noninterest income by 1% of asset increases asset growth by 1.32% (see panel B, row 9). The impacts are fairly consistent across asset sizes (ranging between 0.62% and 1.47%) and across time periods since the early 1990s (not shown). As we stated above, interpreting credit unions' noninterest incomes is complex. Higher noninterest incomes could be consistent with credit unions charging higher fees for the same services. However, charging higher fees for the same services does not seem theoretically consistent with faster asset growth. More likely, higher noninterest incomes result from a combination of first, broader ranges of for-fee products that consumers value and, second, credit unions inevitably shifting their sources of revenue from falling interest income to noninterest income, as a response to margin compression as economy-wide and bank interest rates have fallen in recent decades. In this light, credit unions with rising noninterest incomes would simply be ones that are either (1) offering broader ranges of services or (2) generating the income needed to maintain their capital ratios, or (3) both.

Asset-Side Management Affects Growth More than Liability-Side Management

In this section, we explore the possible impacts on growth from changing asset and liability mixes. In general, we find larger impacts from increasing the loan-per-asset ratio and from changing credit unions' loan mixes than from changing their deposit mixes. While credit

unions' experience with secondary capital is, thus far, extremely limited, we find that very small credit unions using secondary capital grow more quickly.

Credit Unions with Rising Loans per Assets Grow More Quickly

Figure 31 explores the impacts on asset growth due to increasing several key types of loans (per assets), across asset size ranges during 1979–2016. As we discussed above, credit unions with low loan-per-asset ratios are likely to try to lift that ratio both by lifting their volume of loans and by slowing down their growth in deposits (and thus assets). Conversely, credit unions with high loan-per-asset ratios are likely to try to control that

FIGURE 31

DIFFERENCES IN AND IMPACTS ON GROWTH FROM SHIFTS IN ASSET AND LOAN PORTFOLIOS, ACROSS ASSET SIZE RANGES (1979–2016)

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. How different are asset growth rates in credit unions with higher vs. lower levels of an independent variable? Results from OLS regressions						
1. Loans	0.068	0.039	0.090	0.092	0.069	0.057
2. Credit cards	0.24			0.033	0.12	0.14
3. Other unsecured loans	0.049	0.034	0.056	0.061	0.076	0.099**
4. New car loans	0.025	–0.013**	0.036	0.058	0.046	0.032**
5. Used car loans	0.044	0.022	0.053	0.068	0.053	0.053
6. First mortgages	0.0041**		–0.025	0.015	0.017	0.019**
7. Other real estate loans	0.030		0.017**	0.037	0.030	
8. Business loans	0.030		0.032*	0.027**		0.017*
B. What is the impact of an increase in an independent variable on asset growth rates? Results from panel regressions						
1. Loans	0.13	0.080	0.15	0.13	0.11	0.069
2. Credit cards	0.020*			0.067	0.20	0.47
3. Other unsecured loans	0.067	0.037	0.066	0.13	0.19	
4. New car loans	0.040		0.062	0.10	0.085	0.062*
5. Used car loans	0.089	0.033	0.095	0.11	0.10	0.13
6. First mortgages	0.060			0.031	0.052	0.065
7. Other real estate loans	0.066		0.045	0.067	0.031	
8. Business loans	0.090			0.041*		0.091**

Notes: Each cell provides the coefficient from a different regression in which that variable was added to the core models shown in Figure 20. Empty cells denote that the variable was not significant at the 10% level. One star (*) denotes significance at the 10% level (i.e., somewhat reliable results). Two stars (**) denote significance at the 5% level (i.e., reliable results). We denote significance at the 1% level (i.e., very reliable results) by coefficients unaccompanied by stars. All variables are expressed per assets. Estimates were computed for each of the following products for the following dates: loans and first mortgages (1979–2016); new car loans, other real estate loans, and business loans (1986–2016); used car loans (1989–2016); and credit cards and other unsecured loans (1992–2016).

ratio both by slowing down their loan growth and by increasing their growth in deposits (and thus assets). Following Hoel and Kelly (1999), Figure 31 shows that increasing loans per assets by 1% increases asset growth by 0.13% (see panel B, row 1). These overall impacts are broadly similar across asset size ranges, ranging from 0.07 for large credit unions (with the smallest impact) to 0.15 for very small ones (with the largest impact). To place these impacts in perspective, increasing loans per assets by 10% for an average credit union would involve a large but reasonable increase (at about half of its standard deviation across credit unions) and would increase growth by 1.3%. Expressed differently, a credit union that increased its loans per assets from 60% to 70% could expect its growth rates to be 1.3% higher than it would have been otherwise.

Repeating the analysis across individual loan types, we find somewhat smaller estimated impacts from increasing individual loan types (ranging from 0.02 to 0.09) than from increasing all loans (again 0.13). We interpret this finding to imply that changing a credit union's asset mix from securities to loans is far more relevant to growth than changing its loan mix (from one type of loan to another type of loan).

Repeating the analysis across asset size ranges, we find impacts for the most loan types (all seven) among smallish credit unions. The fewest and smallest impacts are among smaller credit unions: four loan types among very small credit unions and two loan types among tiny ones. We also find fewer impacts among larger credit unions, but they are particularly large for some loan types. Six loan types are found to have impacts for medium credit unions, with particularly large impacts for credit cards (0.20) and other unsecured loans (0.19). Five loan types have impacts for large credit unions, with large impacts for credit cards (0.47). We find that adding business loans does not add to growth across most asset size ranges, with the exception of smallish and large credit unions (with impacts of 0.04 and 0.09).

Changing Deposit Structures Has Little Impact on Asset Growth

Figure 32 explores the impacts on asset growth due to credit unions changing their portfolios of deposits and liabilities, across asset size ranges during 1979–2016. By and large, our results show very limited impacts from changing credit unions' deposit structures from one to another key deposit type. In contrast, we find somewhat more interesting results for nonmember deposits, net worth, and secondary capital. Mimicking earlier differences between OLS and fixed effects panel results, we find limited evidence that faster-growing credit unions tend to have more nonmember deposits (among very small credit unions). However, we did not find that adding nonmember deposits would increase credit union asset growth.

Following Hoel and Kelly (1999), we also explore the role of net worth ratios in asset growth. Our OLS results show that faster-growing credit unions tend to have lower net

FIGURE 32

DIFFERENCE IN AND IMPACTS ON ASSET GROWTH FROM SHIFTS IN DEPOSITS AND LIABILITIES, ACROSS ASSET SIZE RANGES (1979–2016)

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. How different are growth in credit unions with higher vs. lower levels of an independent variable? Results from OLS regressions						
1. Regular shares	–0.0026**	0.0063*	0.0045**	0.0039**		
2. Share drafts	0.046	0.024*	0.047	0.069	0.082	0.046**
3. Money market shares	0.010		–0.027	–0.0048*	0.010**	0.026**
4. Share certificates	0.015		0.012		–0.011**	
5. IRAs	–0.051		–0.050	–0.042	–0.047	–0.079**
6. Nonmember deposits	0.031**		0.038**			
7. Net worth	–0.058	–0.11	–0.069	–0.050		
8. Secondary capital	0.53		0.68	0.68		—
B. What is the impact of an increase in an independent variable on asset growth? Results from "fixed effects" panel regressions						
1. Regular shares	–0.025	–0.015			0.014*	0.061**
2. Share drafts	0.030				0.035*	
3. Money market shares	0.073	0.088**	–0.024*	0.014**	0.020**	0.082
4. Share certificates	0.018		0.0080*	–0.013		–0.056*
5. IRAs	–0.093		–0.089	–0.044	–0.259**	
6. Nonmember deposits	–0.052**				–0.15*	
7. Net worth	0.063		0.090	0.17	0.36	0.68
8. Secondary capital			0.66		–0.48*	—

Notes: Each cell provides the coefficient from a different regression in which that variable was added to the core models shown in Figure 20. Empty cells denote that the variable was not significant at the 10% level. One star (*) denotes significance at the 10% level (i.e., somewhat reliable results). Two stars (**) denote significance at the 5% level (i.e., reliable results). We denote significance at the 1% level (i.e., very reliable results) by coefficients unaccompanied by stars. All variables are expressed per assets. Estimates were computed for each of the following products for the following dates: net worth (1979–2016), regular shares and share drafts (1980–2016), share certificates and IRAs (1981–2016), money market shares and nonmember deposits (1989–2015), and secondary capital (1996–2016). We estimated the models for nonmember deposits and secondary capital only among low-income-designated credit unions (LIDs). We omit the estimated results for some liability types (which we designate with a "—") for large credit unions since too few of them failed to use them to yield reliable estimates.

worth ratios than slower-growing ones. (Larger credit unions tend both to have lower net worth ratios and experience faster growth.) However, our panel results show that (except for tiny ones) individual credit unions that experience rising capital ratios subsequently grow more quickly. The precise chain of causation here is likely complex. Higher net worth, per se, is unlikely to result in faster growth. However, increases in net worth likely signal to credit unions that they may safely engage in policies that will result in faster growth. Credit unions whose net worth ratios are stagnant may be more reticent to experiment with policies that result in faster growth.

Similarly, we find that faster-growing very small and smallish credit unions are more likely to hold secondary capital than their slower-growing peers. However, we only find evidence that increasing secondary capital results in faster growth for very small credit unions. Again, a likely explanation is that credit unions that are already fast-growing, or dynamic, are more likely to experiment with secondary capital. However, our results imply that adding secondary capital significantly increases asset growth only for very small credit unions. Among those, adding secondary capital (by an amount equivalent to 1% of assets) results in asset growth rates that are 0.66% higher subsequently.

Many Other Managerial Choices Can Affect Asset Growth

In this section, we explore the roles of many other managerial choices that can affect asset growth. Among others, these factors include choices about fields of membership, mergers, and changing CEOs.

Adding Groups to the FOMs of Tiny and Very Small Credit Unions Adds to Growth; Converting to Community Charters Adds to Growth for Smallish Ones

Figure 33 explores impacts on, and differences in, growth associated with (1) several subsets of credit unions, namely, single group FOM vs. multiple group FOM vs. community charter, (2) managerial choices about how to pursue growth, and (3) the age of the credit unions (i.e., the number of years since their founding), across asset size ranges during 1979–2016.

Following Goddard and Wilson (2005), panel A shows that credit unions with more restrictive FOMs (i.e., single groups) grow more slowly than others (by a margin of –0.81%). In contrast, credit unions with multiple group FOMs grow faster than average (by 0.61%), and community charter credit unions grow fastest (by 0.89%). The differences vary somewhat across asset size ranges, but these differences are not clearly linked with size, being somewhat smaller for tiny credit unions and insignificant for large ones.

Credit unions with more restrictive FOMs (i.e., single groups) grow more slowly than others (by a margin of –0.81%). In contrast, credit unions with multiple group FOMs grow faster than average (by 0.61%), and community charter credit unions grow fastest (by 0.89%).

Like in many other cases throughout this report, panel B shows that changing FOM types does not necessarily deliver increases in growth that match exactly the differences in

FIGURE 33

DIFFERENCES IN AND/OR IMPACTS ON ASSET GROWTH FOR SEVERAL FOMs, MEMBER POLICIES, AND CREDIT UNION AGE, ACROSS ASSET SIZE RANGES (1979–2016)

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. How different are asset growth rates across several key subsets of credit unions (1996–2016)? Results from OLS regressions						
1. Single group FOM	–0.81	–0.59*	–1.08	–0.52	–0.50**	
2. Multiple group FOM	0.61	0.59*	0.88	0.31	0.40**	
3. Community FOM	0.89		1.55	0.91	0.39	
B. What is the impact on asset growth from changing subsets of credit unions (FOM, 1996–2016)? Results from panel regressions						
1. Single group FOM	–0.82	–2.28**	–1.04			
2. Multiple group FOM	0.70	2.42**	0.79**			
3. Community FOM	1.36			1.12		
C. What is the impact on asset growth from pursuing member growth within the FOM and from expanding FOM (1979–2016)? Results from panel regressions						
1. Members (per $1M in assets)	0.010	0.0037	0.011	0.011	0.011	0.056
2. Excess potential members (%)	0.0047		0.0027	0.0025	0.0019	
D. How different are asset growth rates across credit unions classified by age (in years, 1979–2016)? Results from OLS regressions						
1. 0–5	7.23	8.61	7.17	5.81	2.91*	
2. 6–9	3.20	2.87	3.65	4.09	2.72**	—
3. 10–19	1.11	0.34**	1.48	1.48	2.03	
4. 20–29	–0.32	–1.26	–0.24	0.21**	0.43*	
5. 30+	–1.60	–2.39	–1.57	–1.01	–1.14	
6. Age (in years)	–0.064	–0.13	–0.066	–0.034	–0.018	

Notes: Each cell provides the coefficient from a different regression in which that variable was added to the core models shown in Figure 20. Empty cells denote that the variable was not significant at the 10% level. One star (*) denotes significance at the 10% level (i.e., somewhat reliable results). Two stars (**) denote significance at the 5% level (i.e., reliable results). We denote significance at the 1% level (i.e., very reliable results) by coefficients unaccompanied by stars. Excess potential members are computed as (potential minus actual members) divided by actual members. For instance, a credit union with 1,200 potential members and 1,000 actual members would be reported as having 20% excess potential members. Since growth rates for new credit unions can be so large as to not be directly comparable with growth rates for older credit unions, we Winsorized annual growth rates capping them at a maximum of 50% and at a minimum of –25%. We omit the estimated results for some age groups (which we designate with a "—") for large credit unions since too few of them were in that group to yield reliable estimates.

growth observed across FOM types. We find large gains in growth for tiny credit unions that switch from single group to multiple group FOMs (by 2.42%) and large gains for very small ones (0.79%), but do not find any similar gains for larger asset size ranges. In contrast, we find gains from switching to community charters to be concentrated in the smallish asset size range (with gains of 1.12%), but not similar gains for tiny and very small credit unions.

Adding More Members, with Few Assets, Used to Result in More Asset Growth, but Focusing on More Assets per Member May Be Becoming More Effective

Credit unions may seek to increase their asset growth rates through many approaches. For instance, they may focus on increasing the number of members within their field of membership, even if such efforts involve opening accounts with small amounts of deposits, thus initially lowering average amounts of assets per member. Alternatively, credit unions may focus on deepening their relationships with existing members, increasing the number of products per member (loans, deposits, and yet others), and thus increasing assets per member. Of course, credit unions may also attempt to combine both approaches, simultaneously seeking new members and deepening existing relationships.

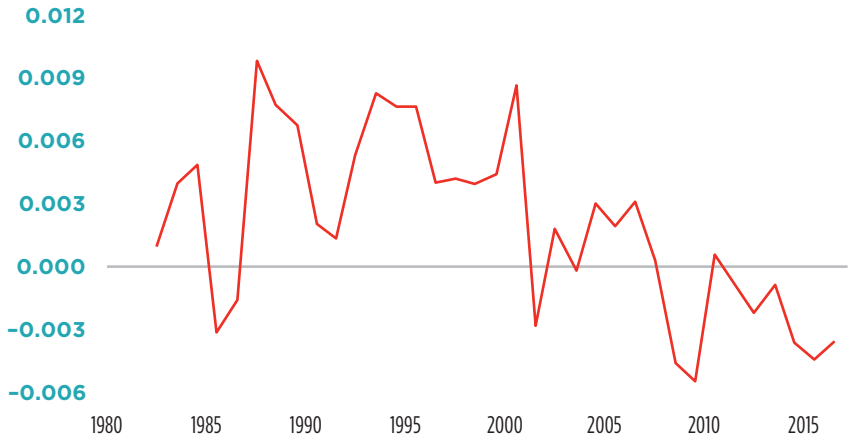
Adding more members, with few assets, used to result in more asset growth, but focusing on more assets per member may be becoming more effective.

Following Hoel and Kelly (1999) and Udell and Kelly (2004), we focus on "members per $1M in assets" to explore whether either of the two first approaches may be more successful in promoting growth. Our results (Figure 33, panel C, row 1) imply that, during 1979–2016, both on average and across all asset size ranges, focusing on increasing the number of members per assets was more effective in increasing growth than focusing on increasing assets per member. A large increase (e.g., 75) in the number of members per $1M, or about one-quarter of both the (unweighted) average across all credit unions and of their standard deviation, results in a large increase of subsequent growth of 0.75% (= 0.010 * 75).

Figure 34 presents estimated annual impacts of members per $1M in assets on growth during 1982–2016. This figure provides the only example in this report of a sharp change in the direction of impacts over time. (Other impacts have become stronger or weaker, or vary with interest rates and business cycles.) During 1982–2006, credit unions that increased their ratio of members per assets experienced significantly higher asset growth rates in 21 or 25 years (see Udell and Kelly 2004).

FIGURE 34

ESTIMATED ANNUAL IMPACTS OF THE NUMBER OF MEMBERS PER $1M ON ASSET GROWTH (1982–2016)



However, as the figure shows graphically, the sizes of the estimated impacts were, somewhat steadily, shrinking over time. Since then, the direction of the impact seems to have been reversed. By 2008–2016, credit unions that increased their ratio of assets per member (i.e., the inverse of members per assets) experienced significantly higher asset growth in six out of eight years. It is possible that this change in the effectiveness of a credit union's approach to growth may be related to the post-crisis environment. In that case, the long-term pattern of promoting member growth first might reassert itself as the crisis becomes a far more distant memory. However, (1) credit unions' growing market shares in assets and members (see Figure 3 and Figure 13) in recent decades, and (2) the fact that the effectiveness of increasing members per assets had long been weakening before the financial crisis, likely point to a permanent change in conditions. Hereinafter, credit unions may find that the policy of seeking more members with few deposits has become less effective at promoting growth. Seeking more deposits per member may remain the more effective approach for promoting growth.

Expanding Fields of Membership (FOMs) Increases Asset Growth

Credit unions may also seek to increase their memberships and asset growth rates by increasing the size of their FOM. To explore the impacts of FOM expansions, above we introduced a measure of "excess potential members" that we define as the number of (potential members minus actual members) divided by actual members. For instance, a credit union with 1,200 potential members and 1,000 actual members would have 20% excess potential members (= (1,200 – 1,000) / 1,000).

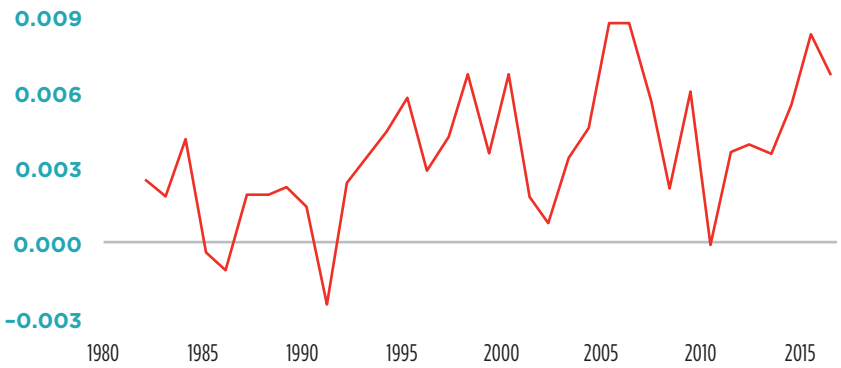
Figure 13 above shows that credit unions' FOMs have expanded markedly in recent decades. As many credit unions have added large numbers of select employee groups (SEGs) or adopted community charters, many credit unions have excess potential memberships (sometimes statewide ones) that far exceed their actual memberships. The average excess potential membership has expanded from 96% of actual members in 1979 to 2,229% in 2016 (or an actual membership of about 4% of the potential membership).

With already very large potential memberships, increasing a credit union's FOM by 100% of its actual members may amount to a small fraction of the average credit union's FOM (actually about 5–10% of current averages across asset size ranges). Thus, our findings imply that further, fairly large increases in FOMs (of 100% of actual members) result in fairly small increases in asset growth, ranging from 0.19% for medium credit unions to 0.27% for very small ones (Figure 33, panel C, row 2). We find no impacts for tiny and large credit unions.

Next, Figure 35 presents estimated annual impacts of excess potential members on growth during 1982–2016. The figure highlights that despite the large expansion in average FOMs,

FIGURE 35

ESTIMATED ANNUAL IMPACTS OF EXCESS POTENTIAL MEMBERS ON ASSET GROWTH (1982–2016)



and thus in the FOMs of many individual credit unions, the estimated impacts from expanding FOMs do not seem to be diminishing over time. The explanation for these sustained impacts is likely not that credit unions with large amounts of excess potential members would benefit from further FOM expansions. Instead, the explanation is likely that many individual credit unions still operate under fairly restrictive FOMs, and that they benefit substantially from expanding their more restrictive FOMs. For instance, in 2016, 862 credit unions (or one-seventh of them) had fewer than 50% excess potential members, i.e., their actual memberships exceeded two-thirds of their potential memberships.

Young Credit Unions Grow Faster

Following Barron, West, and Hannan (1994) and Goddard and Wilson (2005), panel D of Figure 33 presents differences in growth across credit unions classified by their age (i.e., the number of years since their founding), across asset size ranges during 1979–2016. The figure highlights that after controlling for the variables in our core model (e.g., the fact that new credit unions may have particularly narrow product offerings), age helps predict (even though it does not cause) growth rates. Very young (up to five years old) tiny credit unions grow 8.6% faster than other tiny credit unions (see row 1, column 2). The oldest tiny credit unions (more than 30 years old) grow 2.4% slower than other tiny credit unions. In contrast, age plays less of a role for larger credit unions (which are typically less likely to be young). Among medium credit unions, the gaps between the youngest (up to five years old) and the rest (2.9%) and between the oldest (more than 30 years old) and the rest (–1.1%) are much smaller than among tiny ones. Among large credit unions, we do not find any measurable differences to be associated with age.

Very young (up to five years old) tiny credit unions grow 8.6% faster than other tiny credit unions.

Mergers Add Assets, but the Sum Is Less than the Parts

Panel A of Figure 36 explores impacts of acquiring assets through mergers, across asset size ranges, during the longest possible period for which we have reliable merger data: 1983–2016. Measuring credit union asset growth is inevitably affected by mergers. As we have briefly alluded before, growth is often computed simply by comparing size at two periods. For instance, if credit union A has $100M in assets at time 1 and $110M at time 2 (e.g., one year later), then its growth rate would be 10% (= (110 – 100) / 100). However, if credit unions B and C with $100M and $10M at time 1 merge before time 2, computing growth rates must be handled with special caution. If the merged credit union B (or BC) has $110M in assets at time 2, what was its growth rate? Under the "standard" formula, the credit union would have had growth of 10% (= (110 – 100) / 100). However, the two credit unions together initially had $110M in assets and only have $110M one year later. To adjust for this issue, throughout this report, we have emphasized merger-adjusted growth, where the assets of (all) the parties before the merger are compared with the assets of the resulting credit union. In this example, the merger-adjusted growth rate would be 0% (= (110 – (100 + 10)) / (100 + 10)).

We estimate the impacts of the amount of assets in a credit union's merger target[41] (per the assets of the acquirer) on its asset growth using both the standard formula (which we

FIGURE 36

IMPACTS ON GROWTH DUE TO MERGERS (1983–2016) AND CHANGES IN CEO (1996–2016), ACROSS ASSET SIZE RANGES

	All credit unions (1)	Tiny (<$1M) (2)	Very small ($1M–$10M) (3)	Smallish ($10M–$100M) (4)	Medium ($100M–$1B) (5)	Large (>$1B) (6)
A. Impacts of acquired assets (1983–2016)						
1. On total growth	0.96		0.84	0.90	0.94	0.93
2. On merger-adjusted growth	–0.072		–0.11	–0.081	–0.064	–0.053
B. Impacts of a change in CEOs (1996–2016)						
3. Within 1 year			0.50			–0.76**
4. Within 2 years	0.24		0.53	0.22**		–0.60**
5. Within 3 years	0.25		0.45	0.23		
6. Within 4 years	0.24		0.44	0.22		
7. Within 5 years	0.20		0.43	0.16**		

Notes: Each cell provides the coefficient from a different regression in which that variable was added to the core models shown in Figure 20. Empty cells denote that the variable was not significant at the 10% level. One star (*) denotes significance at the 10% level (i.e., somewhat reliable results). Two stars (**) denote significance at the 5% level (i.e., reliable results). We denote significance at the 1% level (i.e., very reliable results) by coefficients unaccompanied by stars. All results in this figure are from OLS regressions, not from panel regressions. Results for panel A were broadly similar under both methods. The key independent variables in panel B took values of zero for most observations, eliminating the need to use panel regressions.

refer to as "total growth") and under the merger-adjusted formula (i.e., the one we use as the dependent variable throughout the rest of the report). Our results show that credit union mergers, of course, add assets to the acquiring (or surviving) credit unions, but also that "the sum can be less than the parts." The coefficient of 0.96 (for total growth across all credit unions, see row 1, column 1) implies that if credit union D with $100M in assets merged with credit union E with $10M in assets at time 1, its asset growth will be lower than that of other credit unions by a factor of 0.04 (or 1 – 0.96, or 4%) of the amount of assets it acquired in the merger. In our case, the merger would effectively add $9.6M in assets, instead of $10M to the credit union. If other credit unions were growing at 3% (or the equivalent of $3M for credit union D) during that year, then credit union D's total growth would not be $10M from the merger plus $3M (like everyone else), for a total of $13M. Instead, credit union D's total growth would only be $9.6M (= 0.96 * $10M) plus $3M, for a total of $12.6M. The most likely interpretation for this result is that dedicating resources to the merger somehow temporarily distracts managerial attention from other projects and efforts and thus results in lower growth rates.

This finding should not be interpreted to mean that mergers have either positive or negative effects. Mergers may have positive or negative effects on the separate memberships of the two merging credit unions (1) depending on their effectiveness in finding synergies and economies of scale that permit them to do more or less with the same resources and, consequently, (2) also depending on the short- and long-term impacts of mergers on interest rates and terms, product availability, convenience (branch locations and electronic access systems), etc. (see Dopico and Wilcox 2010). Thus, our statistical finding simply highlights that credit unions engaged in mergers add assets, as shown in jumps in assets, or growth, worth 0.96 (96%) of the assets of the target credit unions. However, after taking into account that credit unions involved in mergers on average grow more slowly than others, one may say that "the sum is less than the parts."

After taking into account that credit unions involved in mergers on average grow more slowly than others, one may say that "the sum is less than the parts."

The coefficient for the statistical model for merger-adjusted growth yields the same implication, i.e., that a credit union with $100M in assets merging with a credit union with $10M in assets will similarly experience merger-adjusted growth that is lower than it would have had, if it had not engaged in a merger. For instance, the coefficient of –0.07 (for merger-adjusted growth across all credit unions, see row 2, column 1) implies that if other credit unions were growing at 3%, this credit union would have merger-adjusted growth of 2.3% (= 3% – (0.07 * 10%), where 10% is obtained by dividing the assets in credit union D's target, $10M, by its initial assets of $100M.[42]

New CEOs Increase Asset Growth among Very Small and Smallish Credit Unions

Panel B of Figure 36 explores the impacts on asset growth due to changes in CEOs, across asset size ranges during 1996–2016. We estimated the impacts within one-through-five year windows and found positive, but small, impacts for very small and smallish credit unions. We find no evidence of positive impacts among tiny, medium, or large credit unions. The estimated impacts are largest for very small credit unions, with asset growth rates that are faster by about 0.50% for all windows one to five years into the future. Among smallish credit unions, we find smaller impacts, ranging from 0.16% to 0.23%, and no impacts within one year of a change in CEO. These results likely imply that new CEOs may have impacts on growth that are larger and take place earlier in smaller organizations, i.e., ones with fewer personnel where the corporate culture established by the previous CEO may be changed more quickly. Conversely, corporate culture, and asset growth, may change more slowly in larger institutions.

CHAPTER 6

Recommendations for Credit Unions Regarding Asset Growth and Member Service

In this chapter, we draw on the findings from our statistical analyses to develop a set of recommendations about how credit unions could manage their asset growth. Credit unions should bear in mind that asset growth per se should likely not be their ultimate goal. Instead, growth is often a signal of success, of members satisfied with their credit unions' service. Satisfied members, then, bring more of their savings to the credit union and/or tell friends and family to join the credit union. Larger asset sizes can, theoretically, help credit unions better manage their costs. In practice, however, individual credit unions can obtain far larger benefits from managerial efforts unrelated to size than from focusing on size and growth.

Individual credit unions can obtain far larger benefits from managerial efforts unrelated to size than from focusing on size and growth.

Examples of managerial efforts unrelated to size would include either successful cost control efforts or successful investments. The variation in performance across individual credit unions within an asset size range, and the changes in performance that many individual credit unions experience within a few years without particularly fast growth, both dwarf the average cost reductions than credit unions can expect if they double their size, or even if they increase their size by a factor of 5 or 10. Flowing from the statistical findings, theory, and practices of credit unions as examined in this report, our key recommendations regarding asset growth and member service are as follows:

1. **Credit unions should formally compare their interest rates on key types of loans and deposits against the interest rates available to their members at other financial providers.** In their comparisons, credit unions could use interest rates either from national bank averages or from local competitors. In turn, credit unions should compute measures of deposit benefits, loan benefits, and total member benefits, similar to the ones we discuss in this report. Individual credit unions focusing on memberships with higher credit risk profiles may need to adjust their computations.
2. **Credit unions should include deposit benefits, loan benefits, and total member benefits among the key metrics that their managers track or target.** Other key metrics that managers should track include, of course, ROA, net worth, merger-adjusted asset growth rates, and measures of product breadth and consumer satisfaction. Tracking measures of benefits and consumer satisfaction, along with other more traditional measures of financial performance, helps credit unions strike a proper balance of providing members value in a manner that is sustainable both in the short term and in the long term. Credit unions should both (1) track their individual performance over extended periods of time and (2) compare their performance against that of appropriately selected peer institutions. Credit unions that increase their focus on deposit benefits and product breadth will likely find that increases in sustainable asset growth follow naturally.
3. **Credit unions should develop long-term strategic plans that specifically address the balance they seek to strike among deposit benefits, loan benefits, product breadth, other measures of member satisfaction, merger-adjusted asset growth, ROA, and net worth.** Strategic plans should specifically address (1) possible cost control efforts, (2) planned investments (branches, new personnel, information technology, etc.), (3) possible efforts to broaden product offerings, (4) the extent to which the credit union's mission includes serving the credit needs of the whole membership, potential membership, and/or community, (5) marketing plans, and (6) plans about, or outlook toward, FOM expansions and/or mergers.[43]

4. **Credit unions should formally explore what additional financial products and services they could or should offer or add.** Deciding what financial products and services to offer, credit unions should take into account: (1) their financial capacity to add new products and services, (2) the actual demand for those products from within their membership, (3) whether the credit union can offer each new product at a price that is both competitive with other providers and financially sustainable for the credit union, and (4) the pace at which the credit union should experiment with new products within the next few years. Deciding what products to offer, credit unions must be aware that most non-key product additions are unlikely to increase their asset growth rate reliably.

Credit unions should formally explore what additional financial products and services they could or should offer or add.

5. **Credit unions should periodically review their mission as regards serving the credit needs of their whole actual membership, potential membership, and/or community.** This review could result in changes in loan approval procedures to lower barriers toward higher-risk borrowers that have limited access to borrowing elsewhere. If the credit union increases its focus on higher-risk borrowers, it should (1) ensure that its computation of loan benefits takes into account the higher interest rates that the new borrowers would face elsewhere, instead of simply using average interest rates in their market, and (2) price new loans adequately. Risk-based pricing should seek to ensure (a) that pools of higher-risk borrowers generate enough interest income to cover increased loan losses from within their pool, (b) that pools of lower-risk borrowers do not cross-subsidize higher-risk borrowers, and (c) that the long-term financial solidity of the credit union is not threatened.
6. **Credit unions should develop and carry out marketing plans that are consistent with their strategic plans.** If a credit union's strategic plan calls for an emphasis on asset growth, its marketing efforts should focus on activities that are more likely to result in faster asset growth. For instance, marketing efforts could focus more on attracting new members or on informing members of attractive interest rates or convenient features in the credit union's deposit accounts. Conversely, marketing efforts could focus less on promoting products and services that are less closely related to attracting new members or deposits.
7. **Credit unions should approach mergers with caution.** The scholarly and professional literature on mergers of financial institutions (and of credit unions in particular) have very mixed results. Many credit union mergers are successful and yield many winners. Members of credit union targets commonly experience large benefits from mergers, ranging from more attractive interest rates to broader

product offerings and more convenient service (e.g., branches and more up-to-date technology platforms). However, members of the larger partner in credit union mergers often experience very small impacts from mergers. Averaged across all mergers, net effects to the members of all partners in mergers (i.e., the larger acquirer and the smaller target) have small impacts on costs, and very often result in short-term declines in overall asset growth, as managerial attention is temporarily diverted toward the merger and away from other priorities. Credit union mergers likely benefit the members of often less dynamic target credit unions. By helping them, mergers benefit the cooperative credit union system as a whole. However, merger partners should be aware that mergers have, at best, mixed impacts on the members of the larger, acquirer credit unions.

8. **Policymakers and credit union leaders should continue to promote secondary capital,** and other forms of supplemental capital, through legislative and regulatory change, for low-income-designated credit unions, complex credit unions (under risk-based capital requirements), and all credit unions. Despite only incipient levels of use, secondary capital has already demonstrably increased growth rates among very small credit unions. While use of secondary capital remains very limited, further experimentation would likely continue to serve the public policy goals of (1) permitting credit unions to further increase their lending during recessions when other financial institutions restrict their lending and (2) reducing the probability of failure of better capitalized institutions.[44]

CHAPTER 7

Conclusion

Credit unions' asset growth rates have historically outpaced both economic growth and bank asset growth rates, ensuring a growing market share for credit unions and their growing relevance in the financial lives of American consumers and the US economy. After the very high growth rates that are common for new entrants into an industry, as credit unions have matured, their growth rates and their advantage relative to economic growth rates have shrunk. Credit union annual asset growth rates have fallen steadily during the last 100 years, from 26% during the 1920s to 9.7% during the 1960s, 7.6% during the 1980s, and 4.4% during 2007–2016. Despite a slowdown, credit unions' recent asset growth (again 4.4% during 2007–2016) has continued to exceed GDP growth (1.3%) and banks' asset

growth (4.2%). Along with their relatively faster growth, credit unions' share of assets in depositories (i.e., along with banks and thrifts) has grown steadily, passing 1% in 1956, 2% in 1969, 5% in 1991, and reaching 7.3% in 2016.

Despite a slowdown, credit unions' recent asset growth (4.4% during 2007–2016) has continued to exceed GDP growth (1.3%) and banks' asset growth (4.2%).

Since the introduction of deposit insurance, the credit union system has shifted from growing through new charters to accumulating more assets in fewer, larger credit unions. Thus, during 1979–2016, large credit unions (with over $1B in assets) consistently grew faster (at 8.3% annually) than small ones (under $100M) at 3.8%. Also, during 1979–2016, the number of tiny credit unions (with under $1M in assets) fell from 6,262 to 297, and that of very small credit unions ($1M to $10M) from 8,264 to 1,361. The number of medium credit unions ($100M to $1B) grew from 289 to 1,279; the number of large credit unions increased from 3 to 272, and their share of credit union assets from 3% to 61%.

Small credit unions, on average, have much higher noninterest expenses per assets (3.64% during 1979–2016) than large credit unions (2.55%). With higher costs, small credit unions on average offer their members less attractive interest rates. During 1985–2016, total benefits have been consistently smaller among small credit unions (0.82%) than among large ones (1.48%). Offering less attractive interest rates on deposits, smaller credit unions have grown more slowly than larger ones. During 1979–2016, inflation-adjusted and merger-adjusted asset growth rates have averaged –2.1% among tiny credit unions, 2.1% among very small, 4.1% among smallish, 5.9% among medium, and 8.3% among large ones.

We used ordinary least squares (OLS) and fixed effects panel regressions to explore which, among about 100 factors, contributed to credit union asset growth, across asset size ranges during 1979–2016. The factors with the largest, most reliable impacts across asset sizes and time periods are: paying higher interest rates on deposits (which we defined as deposit benefits), ROA, a product breadth index computed across 12 key loans and deposits, and marketing expenses. In particular:

- Increasing deposit benefits by 1% increases growth by 1.12%.
- Increasing ROA by 1% increases growth by 0.87%.
- Increasing product breadth by two units increases growth by 1.04% thereafter.
- Increasing marketing expenses by a very small amount (0.1% of assets) increases growth by 0.79%.

We find that our estimates of some impacts vary somewhat predictably with economic cycles. For instance, the impacts of deposit benefits become larger while interest rates are changing. And the normally positive impacts of noninterest expenses turn negative during recessions. We also find that our estimates of other impacts may have changed permanently throughout this period. For instance, the impacts of ROA tripled after Congress passed CUMAA in 1998 and after the financial crisis of 2008. Also, adding members with few assets once helped growth; now adding assets per member helps more.

Testing about 100 factors, we find that after controlling for some core factors, many others have no measurable or very small impacts on growth. For instance, the relationship between asset size, noninterest expenses, interest rates paid on deposits, and asset growth is somewhat complex. Larger size contributes to lower noninterest expenses, higher interest rates paid on deposits, and higher asset growth. However, large size alone does not ensure high growth. If large credit unions do not control their costs or do not pass their lower costs to members in the form of lower interest rates on deposits, then large size would not ensure fast growth. Other factors with little or no contribution to growth include nonmember deposits, shifting the composition of deposits, and adding "non-key" products.

We also find many factors that can help growth for some asset size ranges, but not for others. Examples included adding branches and employees, expanding FOMs, switching from a single group FOM to a community charter, changing CEOs, and many others. Very often what factors could help growth are linked with size, with some factors being effective for all but the smallest asset size ranges, others being effective for all but the largest asset size ranges. Yet others are effective only for a few, or a single, asset size range.

For instance, the following two factors are particularly helpful for very small credit unions (i.e., those with $1M–$10M in assets). Adding secondary capital worth 1% of assets increases growth by 0.66% thereafter. Switching to a multiple group FOM also increases growth by 0.70% thereafter.

Flowing from the statistical findings, theory, and practices of credit unions, as examined in this report, we present again an abridged version of our key recommendations on how credit unions could manage asset growth and, more generally, member service:

1. Credit unions should formally compare their interest rates on key types of loans and deposits against the interest rates available to their members at other financial providers.
2. Credit unions should include deposit benefits, loan benefits, and total member benefits among the key metrics that their managers track or target.

3. Credit unions should develop long-term strategic plans that specifically address the balance they seek to strike among deposit benefits, loan benefits, product breadth, other measures of member satisfaction, merger-adjusted asset growth, ROA, and net worth.
4. Credit unions should formally explore what additional financial products and services they could or should offer or add.
5. Credit unions should periodically review their mission as regards serving the credit needs of their whole actual membership, potential membership, and/or community.
6. Credit unions should develop and carry out marketing plans that are consistent with their strategic plans.
7. Credit unions should approach mergers with caution.
8. Policymakers and credit union leaders should continue to promote secondary, or supplemental, capital.

APPENDIX 1

Commonly Used Abbreviations and Terms

ATM: Automated teller machine

B: Billion

CD: Certificate of deposit, share certificate

CEO: Chief executive officer

CU: Credit union

CUMAA: Credit Union Membership Access Act of 1998

CUNA: Credit Union National Association

M: Million

FOM: Field of membership

HSA: Health savings account

IDA: Individual development account

Interest expense: Interest expense per assets

Interest income: Interest income per assets

IRA: Individual retirement account

NCUA: National Credit Union Administration

NIM: Net interest margin, interest income minus interest expense per assets

OLS: Ordinary least squares regression, a very common technique in statistical analysis

OSCUI: NCUA's Office of Small Credit Union Initiatives

SEG: Select employee group

Total member benefits: The sum of loan benefits and deposit benefits (see below)

Asset Size Ranges

All boundaries adjusted for inflation, expressed in 2016 dollars:

Tiny: $0–$1M

Very small: $1M–$10M

Smallish: $10M–$100M

Small: $0–$100M

Medium: $100M–$1B

Large: ≥ $1B

Other Subgroups of Credit Unions

CC: Community charter credit union

FCU: Federal credit union

FICU: Federally insured credit union

MG: Credit union with multiple groups in its FOM

LID: Low-income-designated credit union

NFICU: Non-federally insured credit union

SG: Credit union with a single group FOM

Key Variables Included in Statistical Models

Branches: Number of offices (main office plus branches) per $1M in assets.

Compensation: Employee compensation per assets.

Delinquent loans: Delinquent loans per assets.

Deposit benefits: The extent to which an individual credit union's interest rates on five key deposit types—regular shares (savings accounts), share drafts (checking accounts), money market shares (deposits), share certificates (certificates of deposit, CDs), and IRA accounts are higher than the national bank average, weighted by each credit union's deposit volumes, expressed as a %, like an interest rate.

Employees: Number of full-time equivalents (full-time employees plus one-half of part-time employees) per $1M in assets.

Excess potential members: Potential minus actual members, divided by actual members.

Growth: Merger-adjusted, inflation-adjusted asset growth.

Loan benefits: The extent to which an individual credit union's interest rates on six key loan types—credit cards, other unsecured loans, new and used auto loans, first mortgages, and real estate loans—are lower than the national bank average, weighted by each credit union's loan volumes, expressed as a %, like an interest rate.

Marketing: Educational and promotional expenses per assets.

Members: Number of members per $1M in assets.

Net worth: Net worth (capital) ratio, net worth per assets.

Noninterest income: Noninterest income per assets.

Noninterest expenses: Noninterest expenses per assets.

Occupancy expenses: Office occupancy expenses per assets.

Operation expenses: Office operation expenses per assets.

Product breadth index 1: Count of the number of the following 12 key loan and deposit products offered by a credit union in a given year: credit cards, other unsecured loans, new and used auto loans, first mortgages, real estate loans, business loans, regular shares (savings accounts), share drafts (checking accounts), money market shares (deposits), share certificates (certificates of deposit, CDs), and IRA accounts.

Product breadth index 2: See page 42.

Product breadth index 3: See page 42.

Provisions: Provisions for loan losses per assets.

ROA: Return on assets, net income per assets.

Endnotes

[1] Credit unions commonly refer to the analog of banks' deposits both as deposits and as shares. For simplicity, throughout this report, we refer to all credit unions' shares and deposits only as deposits.

[2] Throughout this report, we refer to most growth rates in inflation-adjusted, or real, terms. We compute merger-adjusted growth as follows. If credit union A with $50M in assets at time 1 merges with credit union B, also with $50M at time 1, and the resulting credit union A (or AB) has $110M in assets at time 2 (e.g., one year later), then the merger-adjusted growth rate would compare the total assets of the two credit unions before the merger and their assets afterward: 10% = (110 – (50 + 50)) / (50 + 50). In contrast, a standard (or total) asset growth rate might compare the assets of the surviving (or acquiring) credit union before the merger and the assets of the merged institution afterward: 120% = (110 – 50) / 50.

[3] Wilcox (2008) provides a review of the scholarly literature on credit union economies of scale and mergers.

[4] Throughout this report, we commonly use the term "credit union" to refer to natural person, federally insured credit unions (FICUs), excluding both corporate credit unions and non-federally insured credit unions (NFICUs). When referring to extended time periods that predate the launch of federal share insurance in 1970, like here, we include NFICUs both before and after 1970.

[5] Credit unions' secondary capital, and related concepts, are often referred to as alternative capital or supplemental capital. In this report, we use the term "secondary capital" since it is the most relevant term in long-term call report data.

[6] Throughout this report, we refer to many accounting terms as ratios per assets. For simplicity, we often omit the words "per assets" when referring to such ratios. For instance, we often state "noninterest expenses" instead of "noninterest expenses per assets."

[7] The figure also includes growth not adjusted for inflation. Except for the period of particularly higher inflation during the early 1980s, both asset growth series look broadly similar.

[8] For simplicity, in the figure we omit a line for commercial banks' asset growth rates. The ratio of commercial banks' assets to GDP has been roughly stable throughout the last 100 years, resulting in broadly similar growth rates for commercial banks and for GDP.

[9] To abstract from short-term fluctuations (which do not match neatly across both series), we present the series as five-year moving averages, thus focusing more on longer-term patterns. Since credit union assets start from essentially zero and initially exhibit the explosive growth rates that often take place in infant industries, we compute their five-year moving average not as a simple arithmetic average, but weighting the growth rates by annual assets, thus giving far less weight to the higher rates from initial years. For instance, growth rates fall from 1,204% in 1911 to 72% in 1915. The five-year arithmetic average for 1911–1915 would be 332%. The five-year weighted average for 1911–1915 included in the figure is 80%.

[10] In comparisons including data before 1979, we use the term "credit unions" to include both federally insured credit unions and non-federally insured credit unions.

[11] Since the extent to which NFICUs were included in call reports varied widely until 2006, in these long-term comparisons, we focus on federally insured credit unions, i.e., the term "all credit unions" here stands for all federally insured credit unions.

[12] Rubin et al. (2013) review the theoretical and empirical developments in the scholarly literature on credit unions' goals (e.g., maximizing member benefits) in recent decades.

[13] For 1979–1981, we include only the most common interest rate for loans at each credit union. Call reports then did not provide separate interest rates across loan types. We assume that the most common loan type is unsecured loans. For 1982–1985, we include only interest rates for first mortgages, weighted by their volume, and interest rates on unsecured loans, assuming that they account for all other loans. For 1986–2016, we add interest rates for new car loans. For 1989–2016, we add interest rates

for used car loans. For 1992–2016, we add interest rates for credit card loans. For 1998–2016, we add interest rates for other real estate loans.

14 For 1979–1980, we include only interest rates for regular shares (savings accounts). For 1981–1988, we include interest rates for regular shares and share certificates (certificates of deposit, CDs), each weighted by their volumes. For 1989–2016, we add interest rates for money market shares (deposits). For 1998–2016, we add interest rates for share drafts (checking accounts). For 2006–2016, we add interest rates for IRAs.

15 We do not include our results for 1979–1984 in Figure 7 since that period was extremely atypical. As a result of high inflation and high nominal interest rates economy-wide and caps on credit union interest rates that were set on a nominal, not real (or inflation-adjusted) basis, interest rates at credit unions became somewhat decoupled from those in the rest of the economy. Both their interest rates on loans and deposits became atypically lower, resulting in atypically large loan benefits (averaging 1.46% during 1979–1984), atypically small deposit benefits (–0.64%, with banks actually offering better rates), and, on balance, somewhat typical total benefits (0.82%).

16 Of course, credit unions face limits on how precisely they should determine the cost underlying the services received (and thus fees borne) by each member. In purposely extreme examples, neither credit union members nor the credit union's image would be helped if a credit union charged fees based on, for instance, the amount of time each member spent in a branch, including each member's imputed use of employees' time or of the branch's underlying rent or electricity.

17 Commercial bank and credit union NIMs are not directly comparable with one another as the portfolio mixes of the two institutions differ markedly. Commercial banks hold far larger fractions of their assets in business loans that, on average, pay lower interest rates, and credit unions historically held far larger fractions of their assets in unsecured loans and auto loans that, on average, pay higher interest rates. Similarly, evaluating credit unions' NIMs over time is complicated by the change in the mix in their loans away from higher-rate unsecured loans toward lower-rate mortgage loans. Thus, credit unions' NIMs fell even more during earlier periods, from 4.75% in 1981 to 3.89% in 1992, when banks' NIMs were actually rising.

[18] Doyle and Kelly (2005) explain that noninterest expenses per assets are simultaneously a key metric in managing credit unions, but also one whose interpretation is often complex.

[19] This and the next two sections largely mimic similar material included in Dopico (2016).

[20] Wilcox (2008) and Dopico and Wilcox (2009 and 2010) explore in depth credit union mergers and their relationship with noninterest expenses and asset growth.

[21] In this figure, large credit unions (over $1B in assets) are further subdivided into "largish" ($1B–$10B in assets) and very large credit unions (over $10B).

[22] Dopico and Wilcox (2010) show that in typical credit union mergers, where the target is much smaller than the acquirer, the target typically exhibits far worse performance than the acquirer (higher costs, more interest charged to borrowers, less interest paid to depositors), and after the merger, members of the target credit union experience large reductions in costs and in interest charged to borrowers, and increases in interest paid to depositors.

[23] For simplicity we refer to employees instead of "full-time equivalents." We define full-time equivalents as the number of full-time employees plus half of the number of part-time employees.

[24] For 2003–2011, call report data listed at least one office for every credit union. Beginning in 2012, the data include zeroes for credit unions that do not report a permanent place of business that is regularly open to the public. To ensure comparability with the data for 2003–2011, within this report we assign values of one for credit unions reporting zero offices during 2012–2016.

[25] Comparing the number of credit union members and the US population, to obtain a measure of market share or penetration and to assess its evolution over time, is complex. For instance, individuals may be members of more than one credit union. Moreover, some memberships may cover single individuals or pairs of individuals. Also, in recent decades, the ratio of minors (less likely to join a credit union) relative to the overall population has been falling.

[26] Burger and Dacin (1991) explore the early broadening of FOMs during the 1980s.

[27] Future work could analyze the evolution during 1979–2016 of excess potential members separately for single group, multiple group, and community charter credit unions, as well as for credit unions converting across any of these subsets.

[28] Dopico and Wilcox (2013) explore in depth the rise and impacts of mortgage lending among credit unions during the 1980–2011 period.

[29] We tested our results using all of (1) total growth, not adjusted for either mergers or inflation, (2) total growth, adjusted for inflation but not for mergers, (3) growth adjusted for mergers, but not for inflation, and (4) growth adjusted for mergers and inflation. We also tested results including corporate credit unions and NFICUs, and excluding both of those. We report results only for the last option (growth adjusted for both mergers and inflation, excluding corporates and NFICUs) since theoretically that dependent variable seems the most valid. However, results were broadly similar across all versions of the dependent variable.

[30] In models for nonmember deposits and secondary capital, which are largely restricted to low-income-designated credit unions (LIDs), we included only LIDs in our samples. In models about the impacts of assets acquired through mergers, we used as our dependent variable both merger-adjusted asset growth and total growth (i.e., not merger-adjusted).

[31] For instance, a 2009 annual dummy variable takes values of 1 for observations referring to the year 2009 and values of zero for observations referring to other years.

[32] Following Goddard and Wilson (2005), we use logged assets, instead of assets, as our control for size. It is unlikely that the impacts of one extra dollar are similar for a $1B institution as for a $1M institution, as using (unlogged) assets in our models would imply.

[33] All our regressions included one-year lags of the dependent variable and annual dummy variables. However, to keep our report as brief as possible, we do not present results for these additional variables.

34 The coefficient of determination (or R^2) is the proportion of the variance in the dependent variable that is predictable from the independent variable(s). It provides a measure of how well observed outcomes are replicated by the model.

35 The annual estimates were statistically significant at the 1% level for all years, except 2014, when the coefficient was significant at the 5% level, and 2015, when it was significant at the 10% level.

36 Dopico (2016) explores in detail, and provides examples, of the trade-offs between various levels of ROA, capital per asset ratios, and growth involved in assessing financially sustainable growth.

37 All relationships in this paragraph were estimated using data for all credit unions during 1979–2016 and were statistically significant at the 1% level.

38 While outside of the core of the scope of this report, similar statistical models showed that during 1982–2015: (1) increasing the attractiveness of loan interest rates by 1% increased loan growth by 0.15% and (2) increasing the attractiveness of deposit interest rates by 1% increased deposit growth by 1.04%.

39 Smith, Cargill, and Meyer (1981) and Rubin et al. (2013) analyze the conflicting interests within credit unions of (1) member-borrowers, who prefer lower interest rates on loans, reducing available income for member-savers, and (2) member-savers, who prefer higher interest rates on deposits, implicitly benefiting from higher interest rates charged on borrowers.

40 Thus, the impacts of adding a reasonable number of employees per assets (1 for tiny vs. 0.1 for large) are much larger for large credit unions (0.5 vs. 1.55), but are reasonable fractions of average observed growth rates in both cases.

41 In mergers, one credit union whose charter continues to exist is designated as the “continuing” or “surviving” credit union, and one credit union whose charter is discontinued is designated as the “merging” credit union. Most often, the larger credit union is the surviving credit union and the smaller credit union is the merging credit union. In some cases, credit unions retain the charter of the smaller credit union, particularly in “mergers of equals” where the two credit unions have comparable sizes. Credit unions

may retain the charter of the smaller credit union, for instance, if it has a more recognizable brand name or if its charter or field of membership is somehow more attractive. For instance, in the 2007 merger between Vista FCU (with $499M) and Partners FCU (serving Disneyland employees, and with assets worth $260M), Vista's charter was discontinued and Partners' charter was retained. Using the total growth formula, growth during 2007 for the continuing charter would have been 204%. Using the merger-adjusted formula, growth would have been 4%, independently of which charter was merging or surviving. For simplicity, here we refer to the larger credit union as the "acquirer" and to the smaller credit union as the "target."

42 Note that the coefficient for total growth (0.96) and the absolute value for the coefficient for merger-adjusted growth (–0.07) do not exactly add up to 1.00, as one might expect. Among others, one reason for this discrepancy is that the denominator in the computation of total growth rates does not include the assets of targets in mergers, while the denominator in the computation of merger-adjusted growth rates does include the assets of both acquirers and targets in mergers.

43 Below, we present some of these potential components of the strategic plan as separate report recommendations.

44 See Wilcox (2011a and b).

References

Anderson, William, Stephanie Crofton, and Emily Rawe. 2009. "Do Higher Real Minimum Wages Lead to More High School Dropouts? Evidence from Maryland across Races, 1993–2004." *American Journal of Economics and Sociology* 68 (2): 445–64.

Bankrate.com. 2008. "What's $29,000 Worth after 18 Years?" www.bankrate.com/finance/savings/what-s-29-000-worth-after-18-years.aspx.

Barron, David N., Elizabeth West, and Michael T. Hannan. 1994. "A Time to Grow and a Time to Die: Growth and Mortality of Credit Unions in New York City, 1914–1990." *American Journal of Sociology* 100 (2): 381–421.

BEA (Bureau of Economic Analysis). 2017. "Current-Dollar and 'Real' Gross Domestic Product." www.bea.gov/national/xls/gdplev.xls.

BFCU (Bureau of Federal Credit Unions). 1960–1969. *Annual Reports*. www.ncua.gov/Legal/RptsPlans/AnnRpts/Pages/annualrpt.aspx.

Black, Harold, and Robert H. Dugger. 1981. "Credit Union Structure, Growth, and Regulatory Problems." *Journal of Finance* 36 (2): 529–38.

BLS (Bureau of Labor Statistics). 1930. "Development of Credit Unions in Various States." *Monthly Labor Review* (February).

———. 2017. "Archived Consumer Price Index Supplemental Files: July 2017: Historical CPI-U." www.bls.gov/cpi/supplemental-files.htm.

Burger, Albert E., and Tina Dacin. 1991. *Field of Membership: An Evolving Concept*. Madison, WI: Filene Research Institute.

CBO (Congressional Budget Office). 2017. "The Budget and Economic Outlook: 2017 to 2027." www.cbo.gov/publication/52370.

Census (Bureau of the Census). 2006. *Historical Statistics of the United States: Millennial Edition Online*. hsus.cambridge.org/HSUSWeb/HSUSEntryServlet.

Crofton, Stephanie O., Luis G. Dopico, and James A. Wilcox. 2015. "A Century of Credit Union Capital: Before and After Share Insurance." Presented at the Annual Meeting of the Economic and Business History Society, La Crosse, WI (May 29).

Crofton, Stephanie O., and Richard D. Parker. 2012. "Do Twitter and Facebook Matter? Examining the Economic Impact of Social Media Marketing in Tourism Websites of Atlantic Canada." *Journal of Tourism Research and Hospitality* 1 (4): 1–9.

CUNA (Credit Union National Association). 2017. "Long Run Trends (1939–Present)." www.cuna.org/Research-And-Strategy/Credit-Union-Data-And-Statistics/Long-Run-Trends-(1939--Present)/.

Dopico, Luis G. 2013. *A Codebook for the NCUA Call Reports during 1979–1990*. Alexandria, VA: NCUA.

———. 2014. "Impact Analysis Study: Estimating the Impacts of the Activities of the Office of Small Credit Union Initiatives (OSCUI) on Small, New, Low-income, Rural, and Minority Credit Unions." NCUA-14-R-0002.

———. 2016. *Credit Unions: Financial Sustainability and Scale*. Madison, WI: Filene Research Institute.

Dopico, Luis G., and James A. Wilcox. 2009. *Characteristics of Credit Union Mergers: 1984–2008*. Madison, WI: Filene Research Institute.

———. 2010. *Impacts of Mergers on Credit Union Costs: 1984–2009*. Madison, WI: Filene Research Institute.

———. 2013. *Mortgages and Credit Union Performance: 1980–2011*. Madison, WI: Filene Research Institute.

Doyle, Joanne M., and William A. Kelly Jr. 2005. *Predicting and Managing a Credit Union's Expense Ratio*. Madison, WI: Filene Research Institute.

Ferri, Giovanni, and Panu Kalmi. 2014. *Only Up: Regulatory Burden and Its Effects on Credit Unions*. Madison, WI: Filene Research Institute.

FDIC (Federal Deposit Insurance Corporation). 2017. "Historical Statistics on Banking: Table CB05 (Interest Income) and Table CB06 (Interest Expense)." www.fdic.gov/bank/statistical.

Fed (Federal Reserve System). 1959. *All-Bank Statistics: U.S. 1896–1955*. Washington, DC: Federal Reserve Board.

FHLBB (Federal Home Loan Bank Board). 1988. *1987 Savings & Home Financing Source Book*. Washington, DC: FHLBB.

FOMC (Federal Open Market Committee of the Federal Reserve System). 2017. "Economic Projections of Federal Reserve Board Members and Federal Reserve Bank Presidents under Their Individual Assessments of Projected Appropriate Monetary Policy" (March). www.federalreserve.gov/monetarypolicy/files/fomcprojtabl20170315.pdf.

GAO (Government Accountability Office). 2015. "Dodd-Frank Regulations Impacts on Community Banks, Credit Unions, and Systemically Important Institutions." GAO-16-169. www.gao.gov/assets/680/674459.pdf.

Goddard, John, and John O. S. Wilson. 2005. "US Credit Unions: An Empirical Investigation of Size, Age, and Growth." *Annals of Public and Cooperative Economics* 76 (3): 375–406.

Goddard, John, John O. S. Wilson, and Donald G. McKillop. 2005. "Panel Unit Root Tests of the Size and Growth of Large US Credit Unions." *Managerial Finance* 31 (11): 36–49.

Hall, Bronwyn H., and Clint Cummins. 2009. *TSP 5.1 User's Guide*. Palo Alto, CA: TSP International.

Hoel, Robert F., and William A. Kelly Jr. 1999. *Why Many Small Credit Unions Are Thriving*. Madison, WI: Filene Research Institute.

Jayaratne, Jith, and Philip E. Strahan. 1996. "The Finance-Growth Nexus: Evidence from Bank Branch Deregulation." *Quarterly Journal of Economics* 111 (3): 639–70.

Kaushik, S., and R. H. Lopez. 1994. "The Structure and Growth of the Credit Union Industry in the United States." *American Journal of Economics and Sociology* 53 (2): 219–43.

Leggett, K. J., and R. W. Strand. 2002. "Membership Growth, Multiple Membership Groups, and Agency Control at Credit Unions." *Review of Financial Economics* 11: 37–46.

Moody, J. Carroll, and Gilbert C. Fite. 1984. *The Credit Union Movement: Origins and Development 1850 to 1980*. 2nd ed. Dubuque, IA: Kendall/Hunt.

NCUA (National Credit Union Administration). 1999. *1998 Annual Report*. www.ncua.gov/newsroom/Pages/publications/annual-reports.aspx.

———. 2015. "NCUA Board Doubles Small Credit Union Threshold to $100 Million." www.ncua.gov/About/Pages/board-actions/bulletins/2015/september/BAB20150917.aspx.

———. 2017a. "Call Report Quarterly Data." www.ncua.gov/analysis/Pages/call-report-data/quarterly-data.aspx.

———. 2017b. "Credit Union and Bank Rates." www.ncua.gov/analysis/Pages/industry/credit-union-bank-rates.aspx.

Rubin, Geoffrey M., George A. Overstreet Jr., Peter Beling, and Kanshukan Rajaratnam. 2013. "A Dynamic Theory of the Credit Union." *Annals of Operations Research* 205: 29–53.

Smith, Donald J., Thomas F. Cargill, and Robert A. Meyer. 1981. "Credit Unions: An Economic Theory of a Credit Union." *Journal of Finance* 36 (2): 519–28.

Stango, Victor, and Jonathan Zinman, 2009. *What People Pay: Deposit Account Fees at Banks and Credit Unions*. Madison, WI: Filene Research Institute.

Stern, Liliana V., Steve Swidler, and Christoph Hinkelmann. 2009. "Deposit Rate Sensitivity of Credit Union Shares." *Journal of Economics and Finance* 33: 259–72.

Thompson, Paul. 2012. *Development of the Modern US Credit Union Movement 1970–2010*. Morrisville, NC: Lulu. www.lulu.com.

Udell, Jon G., and William A. Kelly Jr. 2004. *Asset Growth at Credit Unions: Growth in Membership vs. Assets per Member.* Madison, WI: Filene Research Institute.

Wilcox, James A. 2008. *Credit Union Costs and Consolidations*. Madison, WI: Filene Research Institute.

——. 2011a. *The Increasing Importance of Credit Unions in Small Business Lending*. Washington, DC: Small Business Administration.

——. 2011b. *Reforming Credit Union Capital Requirements*. Washington, DC: K&L Gates.

List of Figures

About the Author

Luis G. Dopico

Economist, Filene Research Institute

Luis G. Dopico is an economist at the Filene Research Institute. His areas of expertise include credit unions, their historical and current call report data, and the statistical analysis of their performance. Over the years, he has researched crucial credit union topics including deposit insurance, capital requirements, costs, mergers, mutual conversions, credit union interest rates compared to bank interest rates, asset growth rates, credit cards, auto loans, mortgages, business loans, and government deposits. He has also looked deeply at important subsets including new, minority, small, and large credit unions.

Luis received his BA in economics and mathematics from the University of Southern Mississippi and his PhD in economics with specializations in statistical analysis and finance from Auburn University. His research has been published by Filene and in the *Journal of International Financial Markets, Institutions and Money*; the *International Review of Finance*; *Corporate Finance Review*; *Essays in Economic and Business History*; and the *Cooperative Business Journal*.

About Filene

Filene Research Institute is an independent, consumer finance think and do tank. We are dedicated to scientific and thoughtful analysis about issues affecting the future of credit unions, retail banking, and cooperative finance.

Deeply embedded in the credit union tradition is an ongoing search for better ways to understand and serve credit union members. Open inquiry, the free flow of ideas, and debate are essential parts of the true democratic process. Since 1989, through Filene, leading scholars and thinkers have analyzed managerial problems, public policy questions, and consumer needs for the benefit of the credit union system. We support research, innovation, and impact that enhance the well-being of consumers and assist credit unions and other financial cooperatives in adapting to rapidly changing economic, legal, and social environments.

We are governed by an administrative board comprised of influential executives. Our research priorities are determined by a national Research Council comprised of leaders and credit union CEOs.

We live by the famous words of our namesake, credit union and retail pioneer Edward A. Filene: "Progress is the constant replacing of the best there is with something still better." Together, Filene and our thousands of supporters seek progress for credit unions by challenging the status quo, thinking differently, looking outside, asking and answering tough questions, and collaborating with like-minded organizations.

Filene is a 501(c)(3) not-for-profit organization. Nearly 2,000 members make our research, innovation, and impact programs possible. Learn more at filene.org.

"Progress is the constant replacing of the best there is with something still better."

—Edward A. Filene

Filene

1010 E. Washington Ave.
Suite 306
Madison, WI 53703

p 608.661.3740
f 608.661.3933

Publication #443 (1/18)