Can the Federal Reserve Effectively Target Main Street? Evidence from the 1970s Recession

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Abstract

Modern central bankers confront a challenge of providing economic stimulus even when the policy rate is constrained by a lower bound. This challenge has led to substantial innovation by policymakers and a proliferation of new policy tools. In this paper, I offer evidence on the efficacy of a new tool known as funding for lending, which provides banks with subsidized funding to make additional loans. I focus on a historical episode from the United States in which the Federal Reserve provided banks with steeply subsidized loans to promote the expansion of credit within their local communities. I show that the cheap funding succeeded in generating more lending by countering banks' excessive liquidity preference. The additional credit benefited the real economy. Local areas enjoyed higher rates of small business formation and more rapid employment growth. Finally, I show that the cost of the subsidy provided by the government was more than offset by the additional payroll taxes paid out of higher wages and salaries. These results suggest that funding for lending programs deserve consideration for the modern central banker's toolkit and demonstrate that certain unconventional tools can offer monetary policymakers the means to pursue more targeted objectives.

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1 Introduction

Providing economic stimulus when the policy rate is constrained by the effective lower bound is a principal challenge for modern central bankers. To meet this challenge and protect the relevance of monetary policy, policymakers have experimented with new tools to speed economic recoveries and limit the damage from deeper and longer downturns (Bernanke, 2020). The most widely adopted alternative policy tools include quantitative easing (QE) and forward guidance, and a large literature now exists to evaluate the efficacy of these policies. However, central banks continue to innovate beyond QE and forward guidance, possibly due to some combination of declining marginal benefits, increasing costs and risks, the inability of unconventional policy to fully overcome the limitations introduced by the effective lower bound (Bernanke, 2020), and the desire to pursue more nuanced objectives. Even before the COVID-19 crisis, central banks adopted policies including negative rates, yield curve control, funding for lending, and non-sovereign QE. Although policymakers report little regret in employing these novel policy tools (Blinder et al., 2017), whether or not they become part of the standard toolkit will ultimately depend on their efficacy.

In this paper, I offer evidence on the ability of a funding for lending (FFL) facility to boost credit supply and promote growth in the real economy. FFL programs offer subsidized loans to banks on the condition that banks increase their lending, particularly to bank-dependent borrowers that lack access to capital markets and likely face cash and credit constraints. Therefore, FFL can help support an economic recovery even outside of a crisis or financial panic. Such programs can be particularly attractive to policymakers if they judge that the social benefits of additional lending and a more rapid recovery exceed the private benefits banks enjoy from the additional loans (English and Liang, 2020). The social benefits of easier credit are likely to be substantial, particularly during steep downturns when small firms could fail and cut employment *en masse* (Brunnermeier and Krishnamurthy, 2020; Hanson et al., 2020). FFL programs with sufficient subsidies can also be beneficial if banks become too risk averse to pursue many profitable lending opportunities, or if bank funding costs are abnormally high. The subsidy offered to banks is then justified because it helps banks internalize the positive externalities from looser credit, compensates banks for the additional risk, and counteracts high funding costs.[1]

Lowering the hurdle rate for new loans with a FFL program can transmit additional stimulus through the banking sector even if the main policy rate is pinned at an inefficiently high level because of an effective lower bound on nominal rate. Not only can subsidized lending be offered at increasingly negative rates to help circumvent the lower bound on the policy rate, but the ability to adjust the subsidy at will offers policymakers an effective tool even if a low and flat term structure of rates limits the gains from additional QE and forward guidance. However, the potential benefits of FFL can be negated if unattractive terms restrain total borrowing from the facility, if banks channel credit to nonviable firms, or if banks simply make loans that they would have originated even without subsidized funding.

To evaluate the efficacy of FFL programs, I appeal to a historical episode in which the Federal Reserve (Fed) provided highly subsidized funding to banks so that they could expand lending within their local communities. Specifically, I examine the launch of the Seasonal Credit Facility (SCF), which was introduced as a discount window program in 1973 and continues to this day. The SCF is meant to provide funding to banks that lack reliable access to national capital and money markets and that witness pronounced seasonality in deposits and loans. Many of the institutions that meet these criteria are small banks in agricultural areas. These banks witness robust loan demand during the planting and growing seasons. In contrast, rapid deposit growth materializes in the fall and winter when farmers sell their crops and pay off their loans. The inevitable deposit runoffs in the spring and

[1]Policymakers may also wish to design a program that alleviates bank balance sheet constraints. In this case, structuring a lending program that works through purchasing loan participations—as in the case of the Federal Reserve's Main Street Lending Program (MSLP) initiated in 2020—may be the most effective option. However, FFL programs can also ease banks' balance sheet constraints by providing sufficient compensation for the balance sheet growth, and by boosting expected capital through a higher flow of retained earnings. In addition, the limited success of the MSLP suggests that a loan participation structure may be difficult to implement in practice.

summer restrain banks' willingness to invest in long-term illiquid assets when they receive deposit windfalls. Instead, banks subject to strong seasonal patterns carry an inefficiently large share of assets in the form of liquid securities throughout the year. The SCF helps banks meet funding needs during periods of peak loan demand so that they can reduce liquidity buffers to support more loans. As the Fed explained when rolling out the SCF, the explicit goal of the facility was to enhance the ability of member banks to expand credit within their communities.

The circumstances and details surrounding the implementation of the SCF reveal that the lending facility was a *de facto* FFL program. First, SCF credit from the Fed was available to banks outside of a lender of last resort (LOLR) context. Second, SCF credit was offered at the ordinary discount rate, which was often set below prevailing short-term interest rates before 2003. The discount rate could at times become substantially unmoored from market rates, partly due to a view that increasing the relatively high-profile discount rate would attract unwanted attention and criticism. This disconnect was especially pronounced when the SCF was introduced, which led to a steep subsidy. Over the first 18 months of the program, the subsidy averaged 2.75 percentage points, with a maximum of nearly 5 percentage points. Third, banks were forbidden from using the funds to increase lending to other banks or out-of-market areas, and local Reserve Banks monitored SCF borrowers to ensure compliance with this rule. Fourth, because the terms of SCF advances generally made larger banks ineligible, any additional lending supported by the facility was almost certainly directed to the bank-dependent firms and households that compose the bulk of small bank customers.

Another appealing feature of the historical setting is that it offers a compelling strategy to draw causal inference despite the endogentiy of banks' borrowing decisions. When the SCF was introduced, only Fed member institutions enjoyed the seasonal borrowing privilege. As a result, central bank funding was open to only a subset of institutions operating within a given area. Eligible and ineligible banks faced similar local demand conditions, so a divergence in lending activity after the introduction of the SCF points to a causal effect of the facility. Furthermore, the variation in total SCF draws across geographic areas correlates with the prevalence of eligible institutions. This correlation opens up an instrument for seasonal credit funding, which allows for causal estimates of cheap central bank funding on local economic activity. Isolating the geographic area that reaps the benefit of SCF loans is relatively straightforward because severe branching restrictions at the time resulted in tightly defined loan market areas for most banks. The identification strategy requires a distribution of Fed member banks in rural counties that is as good randomly assigned with respect to local growth prospects in the 1970s. Although all nationally chartered banks must be members of the Fed, state-chartered banks may choose to join. Thus, a selection concern may arise if banks' membership choice was driven by actual or expected local growth rates. I offer evidence that the membership decision is neither endogenous to 1970s growth rates nor driven by the SCF itself. For example, there is little transition into Fed membership in the years before and quarters after the introduction of the SCF, and in fact the overwhelming majority of banks established their membership status many decades earlier. In addition, the state member banks that selected into Fed membership did not draw on the SCF at higher rates than nationally chartered banks. I also observe a similar balance sheet composition between member and nonmember banks, and I show that the two groups displayed comparable seasonal loan swings.

I find that subsidized funding from the central bank boosted loan growth and supported real economic activity. Banks that drew on the SCF reduced their liquid asset buffers and increased lending. The increase in loans was split between non-agricultural and agricultural businesses. The shift in asset composition also increased interest income, because the interest earned on the additional loans exceeded the interest lost from the sale of liquid assets. Communities with banks that took up more SCF loans witnessed faster employment growth, particularly among sole proprietorships. Consistent with that evidence, the additional credit from the central bank helped support an increase in small business establishments. The new establishments were concentrated in industries that were well represented in rural counties, had lower startup costs, and were more dependent on credit from small banks. By contrast, prevalent industries with high regulatory, staffing, and capital hurdles witnessed no net change. In sum, these results are consistent with the notion that credit constraints could restrain productivity growth, in which case a FFL program can boost the supply potential of the economy (Churm et al., 2012).

This paper contributes most directly to the nascent literature on the efficacy of the most nonstandard unconventional policy measures introduced since the global financial crisis. While a large and expanding literature examines the effects of QE, forward guidance, and negative policy rates, far less evidence has been brought to bear on FFL programs. The dearth of FFL studies reflects the limited examples of such programs. The studies that exist focus on either the BoE's funding for lending scheme (Churm et al., 2018) or the ECB's targeted longer-term refinancing operations (TLTROs) (Benetton and Fantino, 2018; Afonso and Sousa-Leite, 2019; Jasova et al., 2020; Laine, 2021), although TLTROs did not embed an explicit subsidy component until March 2020. Consequently, the most comparable analysis using the experience with TLTROs is (Da Silva et al., 2021). As explained in Churm et al. (2018) and Andrade et al. (2019), all of these studies confront a difficult identification challenge stemming from the endogeneity of bank participation. Addressing this challenge by using the restricted eligibility is a key feature of the present study. The focus on the real effects of the FFL program represents another contribution to the existing literature. Churm et al. (2018) conducts a time series analysis in which a measure of bank funding costs is used to indirectly estimate the macroeconomic benefit of the BoE's FFL program, but other studies focus on financial effects. As explained in Gros et al. (2016), gauging the real effects of FFL programs may be particularly important because banks can originate loans that make them eligible for cheaper funding but serve no real economic purpose. Lastly, I offer the only study of an FFL program within the United States, which also entails a rare analysis of Fed lending outside of a crisis or lender of last resort (LOLR) context.

The present study also contributes to the literature on central bank policy objectives (Yellen, 2009; Woodford, 2014) by demonstrating the scope for the monetary policy toolkit to make progress towards more targeted objectives. Most monetary policy tools are characterized as blunt instruments that are best suited to ease or tighten overall financial conditions. However, central banks have recently been at the forefront of debates and policy making aimed toward such varied goals as promoting green energy, mitigating distributional equality, and offering support to specific nonfinancial sectors and geographic areas. Targeting these and other objectives requires policy tools that can be employed with more finesse than traditional policy tools, which may suffer from imprecision. In the present setting, targeted borrowers were identified according to a stated geographic preference because banks drawing subsidized credit were expected to boost lending to their local communities. However, other FFL programs could tie eligibility to a requirement that additional lending be directed towards a particular demographic, industry, or firm type.

One potential drawback to the research design presented here is that the lessons may lack generalizability. The external validity of studies examining historical episodes is always a question, but some key aspects of the facility and setting are similar to modern considerations and enhance the overall relevance. First, the Fed provided funding at an attractive subsidy, and bank participation was robust. Robust participation is central to the success of a program that is intended to support a wide array of nonfinancial companies without ready access to capital markets (English and Liang, 2020). Second, the SCF is aimed at eliminating the financial friction introduced by an excessive liquidity preference among banks. Banks placing too high a premium on liquidity is a typical affliction that policymakers confront when designing monetary policies to counter significant downturns. Third, by coincidence, the Fed introduced the SCF just before the 1973–1975 recession. Policymakers are most likely to consider FFL programs when facing a flagging economy. Because the effects of additional credit can change over the course of the business cycle, it is helpful that the results in this paper apply to subsidized funding granted during a recession. Fourth, although the SCF only targeted small banks, large institutions typically enjoy access to liquid capital markets that the Fed can exert more influence over using other tools. FFL is typically aimed at bank-dependent firms that often maintain relationships with smaller financial institutions that cannot raise funding as readily as large banks. Finally, as outlined above, several features of the SCF's implementation support the internal validity of the research design. Insofar as internal validity is a *prerequisite* for external validity (Carlson and Morrison, 2009; Campbell and Stanley, 2015), these features also advance the external validity of the results.

2 Institutional Background: Discount Window Lending, the Seasonal Credit Facility, and Bank Access

2.1 The Discount Window and Preexisting Credit Programs

The discount window is the primary lending facility maintained by the Fed. In the years following the establishment of the Fed, discount window lending was the principal tool of monetary policy. By the Great Depression, discount window lending started to wane because of the discovery of open market operations and the emergence of the federal funds market. In general, the prevailing view over subsequent years was that banks should tap the private market to satisfy funding needs in normal times. Over time, discount loans were extended for two main reasons. First, banks that faced an unexpected shortage of reserves could approach the discount window for a short-term loan that could be used to make payments or meet minimum reserve requirements. Second, the discount window eased the upward pressure on the federal funds rate that could arise when reserves supplied via open market operations fell short of anticipated demand (Clouse, 1994; Madigan and Nelson, 2002).

In the early 1970s, the Fed extended loans to its member banks through two discount window programs. The "adjustment credit" program was by far the most common of the two programs. Adjustment credit loans were ordinary discount window loans granted to requesting institutions to meet temporary liquidity needs. Banks initiated loan requests by telephoning their district Reserve Bank, which would ensure that the bank posted adequate collateral and had an appropriate reason to request a discount window loan. To grant the loan, the Reserve Bank would have to make a determination that the borrower exhausted reasonably available alternative sources of funds. While a temporary and unexpected funding shortfall was a valid reason to borrow, loans would be disallowed for foreseeable increases in loans or securities and for replacing the anticipated runoff of private funds (Clouse, 1994). The "extended credit" program was intended to meet the needs of banks facing extended periods of illiquidity under exceptional circumstances.[2] The terms of extended credit loans were strict, and the Fed made almost no loans through the extended credit program during the years covered in this study.[3]

Adjustment credit loans were offered at the discount rate, which was usually set below overnight market interest rates. Reserve Banks set the discount rates for member banks in their district, subject to approval by the Board of Governors. This practice did not result in meaningful variation across districts in the early-to-mid 1970s. In fact, differences in discount rates charged by Reserve Banks were almost always no more than 25 basis points for no more than a few days.

Below-market rates on discount window loans led to an administrative burden for the Reserve Banks. To prevent an uncontrolled expansion of reserves, discount window credit was rationed via rules that prohibited banks from borrowing too frequently, forbade arbitrage of the spread between the federal funds rate and discount rate, and required banks to exhaust other sources of funding. Administrative rationing of discount window credit therefore required discount officers to review every prospective borrower's funding situation and monitor borrowing institutions' federal funds sold position. The judgments necessary to

[2]In 2003, the adjustment and extended credit programs were replaced by the primary and secondary credit facilities.

[3]In the decades before 1980, the extended credit facility saw nontrivial use only once when over a billion dollars was provided to aid in the wind-down of the mafia-linked (?!) Franklin National Bank. This bank does not appear in the sample used in the main analysis.

grant discount window loans could be subjective, complicating efforts to achieve consistency across the 12 Reserve Banks (Madigan and Nelson, 2002).

2.2 The Design of the Seasonal Credit Facility

The Fed announced its intention to offer a seasonal borrowing privilege through the discount window on November 22, 1972. As with the preexisting discount window lending programs, the new Seasonal Credit Facility (SCF) was available only to banks that were members of the Federal Reserve System. The SCF was intended to assist institutions that operated in areas with pronounced seasonality in loan demand and deposits. Such seasonal patterns typically resulted from the local economic importance of a single seasonally sensitive industry such as agriculture.[4] Banks with seasonal deposit flows would often carry a large share of liquid assets to guard against the correlated deposit outflows and sudden credit needs of their customers during other times of the year. For example, agricultural banks witnessed rapid deposit growth following the harvest season, but these funds were not used to support loan growth. Instead, banks held large shares of liquid assets in anticipation of deposit runoffs and increased demand for short-term loans through the growing season. The Fed specifically cited such asset and liability management issues as a cause of banks' inability to provide adequate banking services to their communities. Prior to the introduction of the SCF, discount window credit was not available to help banks address predictable liquidity pressures.

By offering seasonal credit on attractive terms, the Fed hoped to target the frictions that led banks to hold inefficiently large liquidity buffers so that these banks could extend more loans to their local communities (Clouse, 1994). As stated in the circular requesting public comment on the facility, "the seasonal borrowing privilege now proposed is meant to enhance the ability of member banks to serve the credit needs of their communities and areas." In

[4]Meaningful seasonal fluctuations in deposits and loans were not unique to agricultural banks. Among other things, seasonal patterns could also be caused by construction, college, tourism, and municipal financing.

a review of the potential benefits of offering seasonal credit, the Fed explicitly identified the ability of such funds to aid in rural banks' provision of credit to boost the "developmental capital" available to their communities. Because seasonal credit was intended to help banks expand credit within their local communities, banks were disallowed from drawing funds to make loans outside of their normal market areas or to purchase loans from other institutions. Similarly, banks were not permitted to use the funds to increase their liquid asset holdings. The rationale underpinning the SCF thus mirrored that of a funding-for-lending program.

In contrast to other discount window programs, the SCF did not require banks to exhaust market sources of funding to receive a loan. Instead, banks were simply expected to submit historical data on loans and deposits to demonstrate persistent seasonal fluctuations. A seasonal credit line was available to a bank in the amount that the bank's decline in available funds (deposits minus loans) exceeded a "deductible" that the bank had to meet out of its own resources.[5] The Fed also required that the seasonal funding strains lasted for *at least* two months. Unlike other Reserve Bank credit programs at the time, SCF lending was not designed to cover short-term needs. If a bank met these criteria, the Fed stated a willingness to extend credit for the maximum allowable time of 90 days and to issue a new loan in the event that a member bank's seasonal needs persisted for more than 90 days. In this way, lending through the SCF provided a means for the Fed to offer credit to banks outside of a LOLR context.

The SCF favored smaller banks for several reasons. First, more economically diverse metropolitan areas are less likely to generate pronounced seasonal fluctuations. Banks in rural areas are thus more likely to satisfy the eligibility requirements, and rural banks tend to be smaller than urban banks. A Fed report on the needs for seasonal credit assistance emphasized the unique needs and challenges confronted by banks in smaller towns and communities, which operated at a more limited scale. Second, the deductible that banks were required to meet with their own resources could be quite substantial for larger banks,

[5] The deductible changed over the years, but was initially set at 5% of a bank's average total deposits in the preceding calendar year.

and the seasonal component of their business would have to be very large to secure SCF funding. In later years, the percentage deductible increased with bank size. Third, smaller institutions lacked the capacity to smooth seasonality in their deposit base with wholesale funding from large-denomination CDs and the Eurodollar or federal funds markets.

2.2.1 Borrowing at the Seasonal Credit Facility

As shown in Figure 1, borrowing from the SCF commenced immediately upon the facility's introduction. Because banks were required to go through a review process with their Reserve Banks before receiving funds via the SCF, the rapid take-up indicates that eligible banks began preparing for access in advance of the facility's launch in April of 1973. The participation also indicates that the credit program was offered on favorable terms and correctly identified a funding need for certain institutions.

The SCF's interest rate was an important factor influencing bank participation in the facility. As demonstrated in Figure 2, the effective subsidy as measured by the difference between the federal funds rate and the discount rate was already over 1 percentage point during the SCF comment period in early 1973. In fact, the multiple-month maturity of SCF loans implies that the true subsidy was somewhat higher than reported in Figure 2. During peak seasonal credit needs later in the year, the subsidy was over 3 percentage points. For the first 18 months of the program, the subsidy averaged 2.75 percentage points, with a maximum of nearly 5 percentage points near the peak borrowing period in 1974. The relatively modest take-up in 1975 and 1976 in part reflects the low or nonexistent effective subsidy in these years, when the federal funds rate fell more rapidly than Reserve Banks' discount rates.

The geographic distribution of SCF credit was disperse in its first two years, as shown in Figure 3. Although banks in popular vacation areas in New England and Southern Florida drew heavily on the facility, rural counties with a large agricultural presence benefited the most from the subsidized lending. Figure 4 demonstrates the relevance of SCF credit to rural counties. Compared with urban counties, the maximum SCF draw by banks in a county as a share of county-wide deposits was nearly twice as high across all rural counties. A more restrictive definition of rural counties increases the gap further. While the terms of the Fed's Regulation A virtually ensured that the SCF was not a substitute for ordinary adjustment credit discount window borrowing, an analysis in Appendix A confirms that banks' SCF borrowing did not simply replace non-SCF loans.

2.3 Discount Window Access and Federal Reserve Membership

Before the Monetary Control Act was passed in 1980, ordinary access to discount window credit was limited to banks that were members of the Federal Reserve System. Banks with national charters were required to become members, while state-chartered banks could choose to become members. In the years immediately following the creation of the Fed, few state banks opted into membership. Though many state bank executives held a general distaste for federalization, state banks were also put off by the extra clerical expense, red tape, and additional requirements associated with membership, such as the requirement to accept checks at par (Krueger, 1933). After several years, changes to the Federal Reserve Act made membership more desirable and a patriotic desire to assist the government in financing World War I sparked an increase in membership (Krueger, 1933).[6] Anderson et al. (2018) document that larger state banks with a respondent banking network were among the first to join the Fed, followed by banks that were attracted by the potential for the discount window to limit liquidity risk resulting from runs and fluctuations in loan demand. Member institutions were subject to minimum capital requirements, although state-level requirements were usually similar in rural areas. As a result of these factors, membership rates among state banks rose for a few years before leveling off off by the mid-1920s with around 8% of state banks eventually joining (Anderson et al., 2018).

[6] As detailed in Anderson et al. (2018), amendments to the Federal Reserve Act were aimed at assuaging fears related to regulation and oversight, as well as relaxing rules related to branching, issuing loans against improved real estate, and permissible directors. The changes also permitted the withdrawal from membership.

Membership transitions were relatively few in the decades before the introduction of the SCF, due in part to a combination of economic and financial development, the reduction in depositor run risk following the creation of the FDIC, and regulatory communication from the Fed emphasizing the limited and short-term nature of discount window credit. Of the limited membership transitions that did occur during this period, most banks gave up their membership, which allowed them to avoid the effective tax imposed by zero-interest reserve requirements.[7] While limited reporting in the National Information Center database prevents an exhaustive analysis before 1959, I find that 97% of banks did not change their membership status at all between 1959 and 1970, and only 0.7% of banks transitioned *into* Fed membership. The average time since membership transition for these banks was five years. The low rate of transition into membership continued in the quarters following the introduction of the SCF.

Most banks' membership decision was made many decades prior to the 1970s, and the majority of banks' membership status was determined by the nature of their charter (Board, 1930). Not only was the charter decision often unrelated to the Fed, but most of the banks in the sample were formed before the creation of the Fed.[8] As of 1970, the median bank in the sample was over 60 years old, and three-quarters of banks were at least 40 years old.

Despite the temporal separation between banks' membership decision and the introduction of the SCF, a selection concern may arise if the state-chartered banks that opted into membership did so for reasons that also led them to draw more heavily on the SCF. Though there was a clear shift in focus towards macro stabilization by the 1950s, a key role of the Fed in its early years was to facilitate seasonal swings caused by agricultural flows (Miron, 1986). This role may have caused banks to select membership if they were subject to pronounced

[7] Although regulatory regimes could differ between state and nationally chartered banks, FDIC insurance subjected all covered banks to nationally applicable standards.

[8] As reported in Board (1930), national banks commonly selected their charter because of the prestige and goodwill connoted by the national label in the banks' communities. State charters were frequently chosen because of permissible fiduciary and trust powers and the ability to lend against real estate, which were addressed through future amendments to the Federal Reserve Act and in some cases even deferred to the applicable state powers.

seasonality and attracted by discount window access (Anderson et al., 2018). Despite the significant changes in discount window philosophy and operation in the intervening decades, these historical factors could influence SCF borrowers in the 1970s. However, it does not appear that state membership rates were driven by the same type of seasonal needs addressed by the SCF. For instance, membership rates among state-chartered banks were high in states such as New York and New Jersey that were most seasonally affected by relationships with country banks. State-chartered membership rates in agricultural states were far lower, and the statewide correlation between the state bank membership share and SCF borrowing as a share of total deposits is 0.04 ($p = 0.77$). In addition, if the membership decision was driven by the same factors that led banks to borrow from the SCF, state-chartered members should exhibit the highest incidence of borrowing. However, national banks were a bit *more* likely to draw on the SCF compared with state member banks (7.8% versus 6.0%). Evidently, State banks did not opt into membership for reasons that also led to high SCF usage.

3 The Financial Effects of Seasonal Credit

In this section, I focus on evaluating whether observed financial outcomes are consistent with the rationale behind the SCF. The goal of the SCF was to expand the lending capacity of banks that maintained inefficiently high liquidity buffers because of steep seasonal liquidity pressures and correlated deposit flows. If the additional bank loans reached credit constrained households and businesses, seasonal communities could enjoy more rapid growth.

Table 1 reports summary statistics for the analytic sample of banks in rural areas, which received the overwhelming majority of SCF loans. As explained in Section 2, discount window loans were ordinarily available to Federal Reserve member banks only. Nonmember banks that operated in the same areas as member banks may be used to form a counterfactual, so it is useful to split the sample accordingly.

Although nonmember banks were smaller than member banks on average, the two groups of banks held a similar amount of total assets because nonmembers were more numerous. While member banks are about 65% larger than nonmembers on average, this difference is far smaller than the roughly 400% differential observed in urban areas.[9] The size differential likely stems from the historical size requirement for Fed membership. Members and nonmembers held a similar share of assets in loans, and the composition of the banks' loan portfolios was very similar. The funding structure was also similar across membership status, with each group deriving about 90% of funding from deposits. Interest income was about the same, but the slightly smaller liquid asset portfolio share among member banks—possibly reflecting the liquidity insurance offered by the discount window—made a smaller contribution to return on assets. At the bottom of Table 1, I report the average of member banks' maximum SCF draw between 1973 and 1974 as a share of 1972 deposits. Conditional on using the SCF, banks averaged a peak SCF draw of about 5% of deposits.

Table 2 reveals that membership status is not easily determined based on observable characteristics. The pseudo R^2 from a logit regression of membership status on the 11 characteristics in Table 1 is only 7.5%. Only two of these characteristics—the capital and interest income ratios—achieve statistical significance. While there is evidence that state banks that opted into membership were observably different from nonmember institutions at the time of the membership decision (Anderson et al., 2018), membership status in the 1970s was evidently not easy to predict based simply on balance sheet characteristics.[10]

Members and nonmembers were also similar in their exposure to seasonal swings. Figure 5 displays the regular seasonal patterns in banks' loan portfolio shares using the semiannual Call Reports for banks operating in communities with seasonal patterns sufficient to

[9]The average bank size for both groups in these metropolitan areas is an order of magnitude larger than that of rural banks reported in Table 1.

[10]The current analysis is not strictly comparable with that of Anderson et al. (2018). The sample in the present paper includes many nationally chartered banks which were automatically placed into Fed membership, and is not limited to New York state only. In supplemental analysis, I find that observable differences between members and nonmembers in urban areas are much more pronounced.

qualify for the SCF. Specifically, I plot the β_js from the following regression:

$$\left(\frac{Loans_{bt}}{Assets_{bt}}\right) = \gamma_b + \phi_{ZIP3} \cdot t + \sum_j \beta_j \cdot \mathbb{1}_j(t) + \varepsilon_{bt} \quad (1)$$

where $j \in \{1, ..., T\}$, and the interaction of a time trend with 3-digit ZIP location dummies accounts for any drift in each area's average portfolio shares. The timing of the Call Reports does not generally line up with the seasonal lending peaks and troughs, but there is a clear pattern of increasing loan issuance through the growing season and pay-downs following the harvest.

In sum, rural banks are quite similar regardless of membership status. Although a high degree of similarity between the groups of banks is not necessarily required by the difference-in-differences identification strategy used below, such similarity may increase the plausibility of the parallel trends assumption.

Figure 5 also suggests an effect of the SCF on credit provision, because the loan-to-asset ratio for member banks moves up relative to nonmember institutions after the introduction of the lending facility. To more formally examine the financial effects of the SCF, I estimate the following two-way fixed effects regression with two groups of banks:

$$Y_{bt} = \gamma_b + \phi_{ZIP3,t} + \sum_j \beta_j \left[\mathbb{1}_j(t) \times \mathbb{1}_{SCF}(b)\right] + \varepsilon_{bt} \quad (2)$$

where Y_{bt} is either the bank-quarter liquid asset share or loan share of total assets, and $\mathbb{1}_{SCF}(b)$ is an indicator function that identifies banks that drew on the SCF by the end of 1974. Because the decision to request seasonal credit may be endogenous to lending opportunities, equation (2) may offer more of a descriptive rather than causal interpretation. Nevertheless, the ZIP-time fixed effects help control for local economic and credit demand conditions that might otherwise give rise to endogeneity concerns.

As shown in Figure 6, the response of SCF borrowers accords with the theory behind the facility. Following the introduction of the facility, SCF borrowers reduced their liquid asset holdings in favor of higher loan shares relative to other banks. The relative increase in loan-to-asset ratios reached more than 4 percentage points in 1974 after deviating by less than one percentage point in the three and a half years before the SCF's introduction. Because SCF credit is extended only after a consultation with and review by a Reserve Bank, the noticeable divergence of lending and liquidity positions so soon after the comment period suggests that institutions anticipated their eventual use of the facility. This interpretation aligns with the evidence presented in Section 2.2.1 that member banks were in communication with their Reserve Banks throughout the comment period.

To facilitate the interpretation of the financial effects, Table 3 reports the average post-implementation effects for banks that tapped the SCF from an estimation of:

$$Y_{bt} = \gamma_b + \phi_{ZIP3,t} + \beta\big[Post_t \times \mathbb{1}_{SCF}(b)\big] + \varepsilon_{bt}. \quad (3)$$

The loan-to-asset ratio for drawing banks increased by about 3 percentage points. The nearly exactly offsetting estimate for the liquid asset share indicates that the additional lending cannot be attributed to interference with banks that did not draw on the SCF. Liquid assets including Treasuries and agency debt are either allowed to mature or sold using brokers into national markets. If SCF borrowers simply cannibalized loans from nearby banks, the simultaneous reduction in credit by SCF non-borrowers would result in a much larger estimate for loan shares relative to the decline in liquid asset shares. While it could also be the case that SCF non-borrowers' liquidity ratios rose mechanically because of a passive decrease in size as SCF borrowers poached loans, this does not appear to be the case. In unreported results, I find that using the natural logarithm of total assets as the outcome variable yields a coefficient estimate of -0.01 ($p = 0.17$). This pattern of results suggests the absence of interference across banks and therefore supports the validity of the stable unit treatment value assumption.[11]

[11]If loans were simply switching between banks operating in the same area, this would likely limit the real effects of the SCF. An assessment of the real effects of the SCF is taken up later in the paper.

The increase in the loan-to-asset ratio resulted in loan growth that was about 6 percentage points higher, as seen in the third column of panel A. An increase in loan growth that is twice the size of the increase in the loan-to-asset ratio follows from the average loan-to-asset share of about 50% (Table 1) with no meaningful difference in asset growth.

Decomposing the increase in the loan share of assets in panels B and C of Table 3 reveals that commercial and industrial, commercial real estate, and agricultural loan shares all increased by about 10% compared with the member bank averages reported in Table 1.[12] The final column in panel C shows that the substitution from liquid assets to loans boosted banks' interest income margins by about 11 basis points on average.

To further address the endogenous decision to borrow from the SCF, I proceed with two additional exercises. First, I estimate intent-to-treat effects with the specification:

$$Y_{bt} = \gamma_b + \phi_{ZIP3,t} + \beta\big[Post_t \times \mathbb{1}_{Mem50}(b)\big] + \varepsilon_{bt} \tag{4}$$

where $\mathbb{1}_{Mem50}(b)$ is an indicator function that identifies banks that the Fed expected to be the most likely beneficiaries of the SCF. Specifically, the initial SCF proposal included an explanation that the terms of the facility would be particularly attractive to member institutions with less than \$50 million in total assets, and a maximum seasonal funding swing that exceeded 5% of deposits. The results in Table 4 broadly confirm those reported in Table 3, although there is now some evidence of an increase in residential real estate loans in place of the commercial real estate lending increase observed earlier. The parameter estimates in Table 4 will be attenuated somewhat because the indicator function includes member banks that would never draw on the SCF.

As a second exercise to address the endogenous borrowing decision, I estimate an instrumented difference-in-differences (DiD-IV) system of equations using 2SLS. In this system, the targeted member bank dummy instruments for the seasonal credit borrower dummy,

[12] Using SCF funds to support additional loans to other financial institutions was prohibited, and the accounts of drawing banks were monitored by the Fed. Consistent with this rule, I achieve a precisely estimated zero (not shown) when I use loans to financial institutions as the outcome variable.

both of which are interacted with a post-SCF time indicator:

$$Post_t \times \mathbb{1}_{SCF}(b) = \gamma_b + \phi_{ZIP3,t} + \mu\big[Post_t \times \mathbb{1}_{Mem50}(b)\big] + \eta_{bt} \tag{5}$$

$$Y_{bt} = \gamma_b + \phi_{ZIP3,t} + \beta\big[\widehat{Post_t \times \mathbb{1}_{SCF}}(b)\big] + \varepsilon_{bt}. \tag{6}$$

For this exercise, I collapse the time dimension for each bank to a single observation before and after the implementation of the SCF as in Bertrand et al. (2004). While the results and conclusions are nearly identical without collapsing, the two-period DID-IV with a binary instrument and treatment corresponds to a special case of DiD-IV in which the β coefficient identifies a local average treatment effect as in Imbens and Angrist (1994) so long as familiar difference-in-differences and instrumental variable assumptions are met (de Chaisemartin, 2010; Hudson et al., 2017). The results in Table 5 reveal qualitatively similar results to those obtained above. According to the 2SLS results, however, SCF loans from the Fed helped boost residential real estate loans in addition to C&I and agricultural loans. Because sole proprietorships entangle the personal and business financial positions of the owner, it is possible that residential real estate loans helped support small business activity.[13] As I show in the next section, areas exposed to more SCF funding witnessed higher proprietorship growth.

The preceding analysis supports the original theory rationalizing the SCF. Geographic areas reliant on highly seasonal industries produce large swings in liquidity demands on banks that could lead to inefficient liquidity hoarding. These areas also feature highly correlated depositor behavior that can contribute to banks' precautionary liquidity holdings (Diamond and Dybvig, 1983). The SCF helped eligible banks draw down their liquidity buffers in favor of additional credit that would not have otherwise been issued. The benefits of offering lending facilities so that banks do not need to hold liquidity buffers to safeguard against all contingencies has been a motivating principle in central banking at least since Bagehot

[13]Estimating DiD-IV regressions using all time periods also yields a statistically significant increase in consumer loans of about 1 percentage point ($p = 0.019$).

(1873). The SCF was similarly motivated, with the goal of supporting economic activity by fostering easier credit conditions. Whether such growth materialized following the expansion of credit identified above is an empirical question that I address in the following section.

4 The Real Effects of Seasonal Credit

4.1 Data and Empirical Methods

To measure the economic effects of the seasonal credit facility on local communities, I focus on county-level outcomes for a few reasons. First, regulators frequently use county boundaries to demark banking markets for rural areas. Second, branching restrictions in the mid-1970s were often tied to the county or city of a bank's headquarters. Such stringent branching restrictions at that time increase the likelihood that a bank's lending activity was directed within its home county. In fact, many of the Midwestern states that received the bulk of SCF loans were unit banking states that prohibited branching entirely (Amel, 1993).[14] Third, data availability constraints preclude a finer geographic unit of observation.

Table 6 reports summary statistics for rural counties as of December 1972, just prior to the introduction of the SCF. The sample includes only rural counties in the contiguous U.S., excluding counties in the few states that never witnessed SCF draws. Employment and population totals are reported annually by the BEA. To gauge the real effects of subsidized Fed lending, I focus on both proprietors' employment and total employment. Proprietorships are the most common form of business organization in the U.S. by a wide margin, not least because they require no formal registration with states, are easy to start, and face few of the operational hurdles associated with other business types such as corporations or LLCs. Because proprietorships entwine individuals' personal legal and financial conditions with

[14] About 65 percent of states tied branching restrictions to the local county or municipality of a bank's headquarters. Over 71 percent of states had finer than state-wide branching restrictions. Midwestern states with unit banking included Colorado, Illinois, Iowa, Kansas, Nebraska, North Dakota, Montana, Minnesota, Missouri, Oklahoma, Texas, and Wyoming. Indiana and Wisconsin tied branching restrictions to a bank's home county.

that of their business, proprietors are often dependent on different forms of credit from small banks. This dependence was particularly pronounced during the early 1970s, because little credit was extended via credit cards and nonbanks.[15]

Establishment counts from the County Business Patterns (CBP) data published by the Census Bureau are reported in the middle of Table 6. The selected industries reported in the table correspond to the most prevalent business types in rural counties, and businesses in these industries account for about 90% of all county establishments on average. The ubiquity of building material/hardware stores, bars and restaurants, and miscellaneous retail shops in rural counties ensure that many individuals possess industry-specific knowledge, connections, and experience, which can lower staffing and startup hurdles. Many of the building materials establishments—the most common establishments in rural counties by far—supply materials for housing and building construction. Miscellaneous retail stores include book stores, used merchandise purveyors, jewelry stores, hobby shops, and tobacco stores. The disparate business types that compose the miscellaneous retail industry operate an above-average share of small establishments. By contrast, I can also conduct falsification or "placebo outcome" tests by examining certain industries that are unlikely to be affected by small bank loans because of high regulatory and capital requirements associated with starting such businesses. For this purpose, I focus on gas stations, banks, and lodging services, all of which are among the most prevalent establishment types in rural counties. The items at the bottom of Table 6 report the average number of banks in each county, along with both the average proportion of those banks that are Fed members and the share of assets controlled by member banks. Appendix B describes some special considerations regarding the CBP establishment data.

[15] One notable exception is thrift institutions, which were far fewer in number than commercial banks, but accounted for a meaningful share of residential mortgage credit outstanding. At this time, thrifts were largely prohibited from extending all but residential real estate loans.

The structural relationship of interest uncovers the effect of SCF loan intensity on employment and establishment growth:

$$ln(Y_{ct}) = \gamma_c + \phi_t + \lambda \boldsymbol{X}_{ct} + \beta \big[Post_t \times \frac{SCF_c}{Deposits_c}\big] + \varepsilon_{ct} \tag{7}$$

where Y_{ct} is the total employment or establishment count in county c in year t, γ_c are county fixed effects, ϕ_t are year fixed effects, $\boldsymbol{X}_{ct}$ is a vector of county characteristics, and $\frac{SCF_c}{Deposits_c}$ sums each county's bank-level maximum draw on the SCF during the recession and divides this amount by total county deposits just prior to the introduction of the SCF. An OLS estimate of β will be biased if $\frac{SCF_c}{Deposits_c}$ is not orthogonal to ε_{ct}. The SCF borrowing decision is likely to be endogenous because banks may face higher credit demand in faster-growing counties. If banks' lending opportunities are unobservably different across counties, the orthogonality assumption is likely violated.

To identify the effect of SCF funding on local economic outcomes, I extract exogenous variation in the intensity of Fed borrowing by using the within-county presence of Fed member banks as an instrument for SCF funding during the recession. As seen in Figure 7, member bank presence in a county is positively related to the county-wide SCF borrowing intensity. Thus, I supplement equation (7) with the first-stage regression:

$$Post_t \times \frac{SCF_c}{Deposits_c} = \gamma_c + \phi_t + \kappa \boldsymbol{X}_{ct} + \delta \big[Post_t \times MemberAssetShare_c\big] + \eta_{ct}, \tag{8}$$

where $MemberAssetShare_c$ is the proportion of total bank assets in the county that are managed by Fed members, measured just before the introduction of the SCF.[16] While variation in treatment intensity may help strengthen the case for a causal interpretation, continuous treatments define more treatment effect parameters than binary treatments (Callaway et al.,

[16]The empirical strategy outlined above is methodologically similar to Nguyen (2019), while the use of membership status to identify the effects of Fed policy has been previously used by Park and Van Horn (2015) and Carlin and Mann (2020). As demonstrated in a previous draft of this study, all of the results are robust to using the share of banks in a county that are Fed members in place of Fed member asset shares.

2021). However, Callaway et al. (2021) show that δ can be interpreted as a familiar average causal response in the style of Angrist and Imbens (1995) under a parallel trends assumption whereby the evolution of potential outcomes would be similar for counties in the absence of treatment *and* across treatment doses.[17]

A key identifying assumption is that county-level distribution of Fed member banks is as good as randomly assigned with respect to local growth prospects, conditional on the controls. Several factors support the validity of this assumption. First, as discussed in Section 2.3, many banks' membership status was established decades before the time period in question, there were few membership transitions before or during the sample period, and membership rates among state-chartered institutions is not geographically correlated with the degree of SCF borrowing. This indicates that the membership choice would be unrelated to any consideration for a lending facility akin to the SCF. Not only was the request for comment on the seasonal borrowing privilege announced without advance warning in late 1972, but the facility was fundamentally different from other discount window and lender-of-last-resort programs, as detailed in Section 2. The proposed terms of the facility also differed somewhat from those outlined in the Fed's 1968 reappraisal of discount window credit, which discussed the design of a potential seasonal borrowing program. Second, county-level fixed effects control for any unobserved heterogeneity at the county level that remained constant over time and happens to be correlated with both the historical membership mix and the local economic performance in the 1970s.[18] Finally, as shown in Figure 8, Fed membership rates display a wide degree of geographic variation.

Channels through which Fed membership status could affect economic outcomes outside of SCF borrowing are few. It is particularly unlikely that the outcome variables are

[17]A traditional parallel trends assumption is still sufficient to recover standard ATT-type parameters and I recover such a parameter in Appendix A. Also in Appendix A, I conduct an exercise similar to that of Cengiz et al. (2019) to show that treatment effects are not much correlated with observed member bank asset shares, which suggests homogeneity of treatment dose/response functions across counties with different membership shares.

[18]Using an instrument for counties' economic performance in the 1970s recession, I demonstrate in subsection 4.3 that the effect did not materially differ by growth prospects.

directly affected by Fed membership. Nevertheless, institutions did face differences based on membership status, even when comparing state-chartered members to state-chartered nonmembers. For example, member institutions enjoyed access to the Fed's payment services, but this access was constant through time and it is unlikely to explain differences in economic performance in any case. Member institutions were also subject to zero-interest reserve requirements, but these requirements scarcely changed following the announcement of the SCF. Reserve requirements on demand deposits did not change by more than 0.5 percentage points and the reserve requirement on savings deposits did not change at all.

One potential concern with equation (9) is that the administration of the discount window through the District Federal Reserve Banks described in Section 2 means that the mapping from membership shares to SCF borrowing can vary systematically across Fed districts over time. If a Reserve Bank is more or less assiduous in its communications with member institutions, this could affect the likelihood that its members draw on the SCF, all else equal. To account for this potential variation across districts, I replace the simple year fixed effects (ϕ_t) in equations (7) and (9) with finer district-year fixed effects ($\phi_{FRS,t}$). These district-specific time dummies not only help explain more of the variation in county-level SCF borrowing, but they also serve as better controls for year-to-year changes in regional economic conditions.

Another potential concern regarding the equations above is the possibility of a bad control problem stemming from the county-level controls $\boldsymbol{X}_{ct}$. To avoid this issue, I measure the controls as of 1972 Q4 and interact them with a $Post_t$ dummy. This method helps ensure robustness to cross-sectional differences across counties that may be correlated both with membership shares and with economic outcomes in the post-treatment period. However, the preferred specifications exclude the county controls entirely.

In the following analysis, I highlight the reduced form for two reasons. First, member banks that did not draw on the SCF may still be affected by the establishment of a seasonal borrowing privilege if those banks viewed the SCF as an effective backstop against liquidity risks. Second, the coefficient estimate is easier to interpret as the effect of moving from a local area where no Fed members supply credit to an area where businesses rely exclusively on Fed members for their credit needs. Alternatively, the coefficients of the reduced form estimates can be divided by 3 to achieve the approximate effect of a one standard deviation change in the member asset share across counties, which roughly translates to one additional member bank on average. To confirm the findings from the reduced form estimates, I additionally report the results from the DiD-IV described in equation (7). Appendix A includes a more thorough discussion of the treatment effect parameters identified under different parallel trends assumptions, and additionally computes ATT-type parameters to demonstrate the robustness of the conclusions from the main analysis.

4.2 The Economic Effects of Seasonal Credit

I first show that SCF funding had a positive effect on local employment outcomes in Table 7. Although the principal focus of this analysis is on the qualitative lessons for FFL programs, it is useful to verify that the results are economically significant. In fact, relative to counties with no Fed member banks and thus no SCF loans, counties with only Fed member banks witnessed total employment growth that was about 1.5 percentage points higher in the years following the introduction of the SCF on average. For reference, I present the time pattern of the total employment effect in Figure 9. To facilitate the interpretation of the parallel trends assumption, Figure 9 compares the counties in the highest membership share tercile against those in the lowest tercile. The two groups of counties exhibited nearly identical employment growth in the years before the announcement of the SCF. After the provision of subsidized credit through the recession, however, more exposed counties enjoyed gradually increasing employment growth for a few years before leveling off. Evidently, the additional loans were directed to productive uses and banks did not draw on the SCF merely to lend to nonviable business during the recession.

The middle columns of Table 7 reveal that proprietors' employment expanded at an even more rapid rate in counties that were more likely to receive SCF credit. To verify that the increase in economic activity spurred by the post-SCF credit expansion was not driven solely by the agricultural sector, the rightmost columns show similar effects for proprietors' employment within non-farm businesses.

An increase in proprietors' employment implies an increase in business formation within counties that were more exposed to SCF loans. The first two columns of Tables 8-10 show that the SCF promoted net establishment growth among building materials and hardware stores, bars and restaurants, and retail shops. The middle and final columns demonstrate that the growth in total establishments within these industries was driven by the smallest establishments. Establishments with few employees are more reliant on loans from the small banks targeted by the SCF. Conversely, larger establishments are less likely to be unincorporated proprietorships and are more likely to have access to internal financing and to have relationships with larger banks. The null results and smaller point estimates for larger establishments also suggest that the effects among small businesses reflect the flow of small business credit and are not simply an artifact of an unrelated improvement in economic conditions in counties with high member bank presence.

In total, the results in Tables 8-10 are consistent with expected patterns if the SCF had its intended effect of promoting real activity by boosting credit supply to the customers of small banks. The relatively modest increase in places of business in operation implied by the average effects reported in these tables accords with the total credit provided via the SCF, which was not immense. Because the CBP data include only nonfarm establishments, employment growth may be a better gauge of the real effects of the lending facility.

As an additional exercise to help rule out the possibility that stronger establishment growth among SCF-intensive counties reflects a shortcoming in the identification strategy, Table 11 presents several falsifications tests. In these tests, I report the results for three well represented industries within rural counties that should be less responsive to changes in credit provision by smaller banks because of heavy regulations and steep initial capital requirements. In contrast to the earlier results, establishments in these industries show no clear response to the introduction of the SCF. As with the firm size results, the distributional patterns across industries help rule out the possibility that the stronger performance is driven by some unobserved factor correlated with both the predetermined county-level membership shares and economic activity in the mid-1970s.

In Appendix A I show that all of these results hold for a sample of only the most rural counties. Further, I compute an ATT parameter for each outcome by retaining only counties with the lowest and highest member bank asset shares and assigning a binary treatment status to each group. Appendix A also reports the results from the DID_{M} first introduced in de Chaisemartin and D'Haultfœuille (2020), which computes treatment effects that are robust to heterogeneous effects and permits continuous measures of treatment (de Chaisemartin and D'Haultfœuille, 2021). All permutations of the main results reveal similarly robust effects of the SCF on real activity at the county level.

4.3 The Cyclical Asymmetry of the Effects of Seasonal Credit

An important question regarding the efficacy of any monetary policy tool is whether the tool's potency depends on the state of the economy. This question is particularly salient for unconventional policy tools introduced during recent recessions because central banks maintained their reliance on these tools well into the subsequent recoveries. Recent literature highlights the state-dependence of monetary stabilization (Jordà et al., 2020) as well as the concern that certain unconventional policies may be ineffective after non-financial shocks (Karadi and Nakov, 2020).

The foregoing evidence regarding the efficacy of a FFL program may only apply to weak economic environments because the introduction of the SCF was followed by a long recession and slow recovery. Conditioning on the dependent variable could invalidate inference based on a naive sub-sample analysis that simply divides counties by growth rates, which I have already shown depend upon SCF take-up.

To assess the efficacy of FFL programs across the economic cycle, I sort counties using an instrument for their post-1973 growth prospects. OAPEC's oil embargo in October of 1973 triggered a dramatic rise in the price of oil that choked off a robust expansion and helped tip the economy into a recession that lasted nearly 18 months. However, counties with a petroleum extraction industry stood to benefit from higher oil prices. As shown in Table 12, these counties witnessed much stronger employment and income growth compared with counties that had no oil extraction industry.

In Table 13, I show the reduced form estimates (for brevity) of the key outcome variables when including an interaction of a petroleum production dummy ($Petro_c$) with the key regressor. All specifications additionally include a $Post_t \times Petro_c$ interaction term. In general, the coefficient estimate on the triple interaction term is a noisy zero, indicating that the economic benefits of the SCF did not vary systematically across different growth environments. The point estimates alone mostly indicate that, if anything, the SCF had somewhat stronger effects in counties experiencing growth booms.

4.4 The Net Effect on Consolidated Government Finances

Potential financial losses associated with unconventional policies can result in a reluctance to pursue programs that would otherwise benefit the economy. For example, the possibility of losses was cited by policymakers as a potential cost of QE (Bernanke, 2012). Although economic benefits such as those identified above should be the key determining factor in the decision to adopt a policy, the potential for financial losses may weigh on policymakers who also consider risks to the central bank's independence and reputation. For the SCF, the subsidy offered by the Fed relative to market rates may be viewed as a cost of the facility, even if the loans are extended through the issuance of unremunerated reserves.

For this reason, I evaluate the narrow fiscal implications of the SCF to test whether a successful FFL program can generate tax revenues that surpass the "costs" of the subsidy. In Table 14, I report the results from equation (7) as well as its reduced form. To more easily compare tax revenues against the dollar cost of the subsidy offered by the Fed, dependent variables are expressed in levels.

Panels A and B reveal that the SCF boosted total wage and salary employment, with an associated increase in total wages and salaries within the counties. Focusing on the second specification, both the reduced form and the 2SLS results point to an average salary per additional job of about $17,500. Dividing the coefficient estimates for contributions to social insurance programs by that for total wages and salaries shows that about 14% was passed on in the form of payroll taxes. This figure conforms with the total payroll taxes of 11.7% at the time, plus the average state and federal unemployment insurance taxes of about 2.5%. A full accounting of phaseouts and lower rates for certain types of workers would yield a more precise number, but it is clear that the estimates in Table 14 are consistent with prevailing tax rates and average salaries of the time.

The total cost of the subsidy (calculated using the values from Figures 1 and 2) point to a total subsidy of about $5 million between the introduction of the SCF and the end of the recession in 1975. The value of the contributions to government social insurance funds implied by the final coefficient estimate in panel B of Table 14 suggests that the jobs created by the SCF in the average affected county resulted in about $1 million per year in payroll taxes. Even in the event of bank defaults, the additional economic activity supported by the SCF-fueled credit expansion would more than offset the subsidy provided by the Fed.

5 Policy Implications and Discussion

Directing monetary support to business poses a substantial challenge for central banks, which may not be able to legally or practically offer either direct grants or loan guarantees. This challenge is multiplied when the goal is to direct credit towards small and medium sized businesses, because these firms lack access to financial markets and will not benefit from LOLR backstop facilities that can ensure credit continues to flow through capital markets. One option, which the Fed employed during the COVID-19 crisis, is to purchase loan participations from banks if the loans meet certain criteria. Another possible option is to subsidize bank loans through a FFL program. Both options necessitate a reliance on financial institutions as a practical matter, because central banks do not have the capacity to make credit decisions on a large scale basis, particularly for more opaque small business.

FFL programs can ensure that monetary stimulus transmits through the banking sector even if the main policy rate remains at its effective lower bound. In contrast to the effects of negative policy rates on banks' assets, negative rates on loans from the central bank should *improve* the health of the banking sector and thus promote credit growth. Besides opening up additional policy space at the lower bound, FFL also allows the central bank to incur contingent losses during severe downturns. When adverse shocks generate real economic losses that must be borne regardless of financial market conditions—for example, as in the COVID-19 crisis (Hanson et al., 2020)—FFL facilities offer the central bank the ability to shoulder a share of those losses by setting the lending rate well below the rate paid on reserves.

To be successful, a FFL program should be offered on terms that are sufficient to induce meaningful participation by banks. The main factor involved in banks' decision to request subsidized credit from the central bank is the size of the subsidy. For this reason, FFL programs can be particularly successful in offsetting abnormally high bank funding costs (English and Liang, 2020). However, sufficient compensation via funding subsidies can also work to overcome banks' balance sheet constraints and excessive risk aversion. Because banks originate the loans and keep them on their balance sheets, FFL programs face fewer complications related to asymmetric information and adverse selection. Consequently, FFL programs do not necessarily require that borrowers meet a litany of eligibility criteria, which in turn increases the likelihood of broad participation and benefits to a variety of small businesses.[19]

As with other programs that encourage lending to small businesses, FFL programs should result in loans that would not have otherwise been originated. Because of the unobserved counterfactual, assessing the extent of additional lending spurred by an FFL facility can pose a challenge to policymakers, absent some randomization embedded in the design of the facility. The results above deliver an encouraging message. SCF-eligible banks boosted credit relative to ineligible banks operating in the same communities, and an increase in SCF funding corresponded to better economic outcomes. The results also offer no evidence to support the concern that highly subsidized credit might be directed towards unproductive loans that serve to temporarily prop up nonviable businesses.

Ensuring that banks direct the additional lending towards institutions or areas that the central bank wishes to support can be a key consideration for an FFL program. If sufficiently attractive FFL terms are conditioned on lending to particular types of businesses or locations, banks will almost certainly devise a method to certify compliance with the requirements. Some types of targets, including specific geographic areas or demographic characteristics of business owners may be easier to verify than other targets, such as businesses most affected by a pandemic, but a certification protocol is still feasible. In terms of the SCF, policymakers hoped to target credit-starved businesses and individuals in areas subject to large seasonality. I find that the SCF was successfully able to target these areas, and credit was directed towards non-agricultural industries including restaurants and bars.

The ability to fine-tune the targets of a FFL program presents policymakers with a policy tool that is far less blunt than both conventional tools and more common unconventional tools. As mentioned above, FFL programs may be used to target particular geographic areas, demographic groups, or industries. Although efforts to promote distributional equality

[19] Another example of FFL program's relative flexibility is the fact that they may be structured through the central bank's existing discount window authority, which are subject to established regulations that may be flexibly adjusted. In contrast, loan participation programs such as the Fed's MSLP may be subject to additional constraints imposed by its emergency (Section 13(3)) lending classification.

may be best addressed through targeted fiscal policies, central banks can introduce some measure of specificity in their objectives through careful design of a FFL program.

Some of the most vociferous criticisms of FFL programs concern the quasi-fiscal component of the stimulus. Ensuring a separation between fiscal and monetary policy can be an integral aspect of central bank independence, so these concerns should not be minimized. However, considerations surrounding credit allocation and fiscal encroachment are not completely foreign to other unconventional policies. Even simple interest rate adjustments can disproportionately affect rate-sensitive industries. Purchases of mortgage-backed debt have long been criticized by policymakers that disfavor the credit-allocation effects of such purchases. Purchasing corporate debt involves taking credit risk in addition to the interest rate risk introduced with all QE programs, and such purchases can generate backlash if they are seen to favor some firms or industries. In fact, many central bank policies may favor larger and safer borrowers over smaller borrowers insofar as the former can access capital markets that benefit most from LOLR backstop facilities, direct purchases, and portfolio balance effects. Borrowers that depend on bank credit can be cut off from the support and stimulus offered by monetary actions if credit spreads at banks remain high and credit provision low, even as benchmark rates are depressed by QE, forward guidance, and other measures. Even with limited ability to further adjust the level or path of the main policy rate, an FFL program can ensure that monetary stimulus continues to transmit to needy borrowers through the banking system.

Efforts to improve the flow of credit to small, bank-dependent businesses can help ensure that unconventional policies are not predominantly benefiting borrowers with access to securities markets. There is a pervasive view that QE and other central bank policies are primarily directed at large corporations and large financial institutions on Wall Street. FFL programs and other facilities that target small- and medium-sized businesses can help countervail that perception because they improve credit access for bank-dependent firms with productive investment opportunities.

6 Conclusion

As modern central banks face the effective lower bound with more regularity, it is increasingly important to assess new policy tools that may help manage downturns and foster robust recoveries. Some unconventional tools—such as QE and forward guidance—saw widespread adoption during the global financial crisis, and many central banks actively employed such policies throughout the decade-long recovery that followed. A large literature sprung up to evaluate the effficacy of these tools, but far more work remains to understand the potency and transmission channels of less tested unconventional tools.

In this paper, I evaluate the success of a de facto funding-for-lending program wherein the Fed offered some banks subsidized funding with the goal of promoting credit growth within the banks' local communities. I find that eligible banks increased their credit supply to small businesses after receiving the cheap central bank funding. The additional credit supported employment growth, entrepreneurship, and net business creation across a variety of sectors. The economic benefits of the credit materialized across a broad set of communities, and was not limited to areas with the best growth environment.

In sum, the foregoing analysis suggests that funding-for-lending programs warrant serious consideration for inclusion in the modern central banker's toolkit. Not only can these programs flexibly target "Main Street" businesses that may benefit less directly from other unconventional policies, but they can be creatively adapted to aid in an effort to attain other targeted objectives.

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Appendix

Appendix A   Supplemental Analysis and Robustness

In this Appendix, I present supplemental analysis to that reported in the main text.

Appendix A.1   Discount Window Substitution

Figure A1 shows that banks borrowing from the SCF did not merely substitute out of other discount window credit supplied by the Fed. Banks drawing on the SCF did not differ materially in their adjustment credit borrowing either before or after the introduction of the SCF. Besides the nearly universal null estimates reported in Figure A1, the point estimates also reveal negligible effects. For context, the maximum difference of about 0.1% of assets compares with the 5% average draw among SCF borrowers reported in Table 1.

Appendix A.2   Ultra-Rural County Subsample

Table A1 reports the key results for a sample of ultra-rural counties only. Table A1 excludes certain ancillary results for the sake of brevity, but all patterns and conclusions from the main results hold for this subsample. For example, larger establishments exhibit much less sensitivity to SCF exposure and none of the coefficient estimates are statistically different from zero. Similarly, establishment growth in placebo industries demonstrates no response to SCF exposure.

Appendix A.3   Randomization Inference

In Figure A2, I depict p-values for the main reduced form results from Tables 7-11 and Table 14 computed via randomization inference. Each point represents a p-value for a coefficient estimate reported in the main tables, with the cluster robust derived p-value on the horizontal axis and the corresponding p-value obtained via randomization inference on the vertical axis. I resample from the actual realizations of member asset share 1,000 times. In most instances, the randomization inference p-value lies below the 45-degree line, suggesting tighter confidence intervals. Sampling membership asset shares from a random uniform distribution yields nearly the same results, though I do not present these results for brevity and because of the strong restriction that this sampling procedure imposes on the rerandomization process. All but one of the points in the second panel corresponds to the null results from the falsification/placebo outcome tests of large establishment growth or growth of total establishments within high-barrier industries. None of the randomized inference p-values in the second panel are less than 0.05. The lone null result for a non-falsification test (the second specification for total bar and restaurant establishment growth in Table 9) achieves a p-value of 0.087 using randomization inference.

Appendix A.4 Within-County Evaluation of Financial Effects

In Table A2, I report estimates of the financial effects using exposed counties as the geographic unit of interest. The exercise in Table A2 corresponds to that carried out at the ZIP3-level in Table 4. The results are similar across both tables, though the county-level estimates reported here are generally larger in absolute value. However, the ZIP3 geographic unit is more appropriate for this exercise, which expresses a comparison between treated and untreated units within a given area at each point in time. The ZIP3 level of analysis is sufficiently large to ensure that most areas include a number of untreated banks, yet small enough to capture a similar lending environment (see, for example, Figure 5). In contrast, about 23% of exposed counties do not host a single nonmember institution, and 21% of counties host only a single nonmember institution.

Appendix A.5 Variation in Treatment Intensity, Treatment Effect Heterogeneity, and Computing Average Treatment Effects

As Callaway et al. (2021) discuss at length, continuous measures of treatment can identify multiple treatment effect parameters, including the average treatment effects and average causal responses (Angrist and Imbens, 1995), which are not distinct concepts for a binary treatment. The main text invokes a “strong” parallel trends assumption whereby the evolution of potential outcomes is similar even for counties with different treatment intensities. Under a traditional parallel trends assumption and heterogenous treatment dose/response functions across counties, the TWFE estimation method in the main text can mix together the average causal responses with the average treatment effects for counties treated with different exposure to the SCF (i.e. membership shares). However, the average treatment effect on the treated (ATT) counties with similar member bank asset shares is nonparametrically identified under a traditional parallel trends assumption on untreated potential outcomes. In Table A3 I compute the ATT by retaining only those counties with member bank asset shares in the highest (avg. $MemberAssetShare_c = 86\%$) and lowest (avg. $MemberAssetShare_c = 0\%$) terciles, assigning a binary treatment/control treatment indicator to the respective groups, and estimating:

$$ln(Y_{ct}) = \gamma_c + \phi_{FRS,t} + \beta\big[Post_t \times Treat_c\big] + \kappa\big[Post_t \times \boldsymbol{X}_c\big] + \varepsilon_{ct}. \quad (9)$$

The results reported in Table A3 confirm the positive effects of local SCF credit exposure on real economic activity. Although the interpretation of this causal parameter differs from the parameter described in the main text, the primary goal of this study is to establish generalizable lessons about the relationship between targeted central bank credit and real outcomes. Retrieving precise elasticities or average causal responses is less important in this setting because such estimates would not likely generalize, and the precise estimates could not be used to form the basis of policy. Instead the main purpose of the analysis is to evaluate whether the mechanisms crucial to the success of FFL programs are operational in the United States. On this score, both the average causal responses identified under appropriate assumptions in the main text and the ATTs computed here support the rationale underlying FFL.

To assess treatment effect heterogeneity across SCF exposure, I carry out an exercise similar to Cengiz et al. (2019). Specifically, Figure A3 reports the estimate of the causal response parameter (β) from reduced form regressions of employment (panel a) and building material establishments (panel b) for different bins of $MemberAssetShare_c$. The evidence presented in Figure A3 suggests that the causal response of employment declines slightly in member bank asset shares, but that the causal response of establishment growth is essentially uncorrelated with member asset shares.

Finally, Table A4 reports the main results using the DID_M estimator proposed by de Chaisemartin and D'Haultfœuille (2018) and de Chaisemartin and D'Haultfœuille (2020), which accommodate non-binary treatments in unstaggered designs by comparing groups switching treatment between periods to a control group whose treatment does not change, *but with the same treatment as the switching groups in the pre-treatment period.* In the context of the SCF, counties without Fed member institutions compose the control groups, and the control group can be expanded to include the relatively few counties with low member asset shares. As described in de Chaisemartin and D'Haultfœuille (2021), these estimators can be used with a multivalued treatments even when treatment adoption is not staggered. Under a parallel trends assumption, the DID_M is an unbiased and consistent estimate of the average treatment effect among switchers.[20] To ease computational burden for this exercise, I collapse each county's data into pre- and post-SCF averages.

Consistent with the conclusions from the approaches above, Table A4 reports statistically significant and positive effects of subsidized Fed credit access on local outcomes.

Appendix B Data Appendix

In this Appendix I describe data sources, variable definitions, and miscellaneous considerations relevant to the data used in the main analysis in order to promote replication. Table B1 lists key bank-level variables with their item numbers from the Call Reports (FR 105 and FR 107, cross-listed as FFIEC 010 and 011). Bank borrowing at the discount window is reported daily and derived from the Fed's Transmission of Edited Deposits System, form FR 414a. For each bank, item number 2867 reports seasonal credit borrowing, item 2865 reports total borrowings from Federal Reserve Banks, and item 2200 provides total deposits. The sample includes commercial banks only. The analysis makes no adjustment for mergers to no practical effect: only about a dozen banks were involved in mergers during the

[20] All of these estimators can be computed by the did_multiplegt Stata package, available from the SSC repository.

sample period. Whenever a bank's location is missing in the NIC database, I used the 1975 Summary of Deposits data to identify the bank's zip code.

County-level variables aside from establishment counts were sourced from the BEA Regional Economic Accounts database. Rural counties are identified according to the Rural-Urban continuum codes produced by the USDA's Economic Research Service using the 1975 vintage. In particular, the definitions produced in "Social and Economic Characteristics of the Population in Metro and Nonmetro Counties: 1970," by Hines, Brown, and Zimmer (Agricultural Economic Report No. 262). Rural counties exclude those in metropolitan (SMSA) areas, and urbanized SMSA-adjacent counties, most of which transitioned to SMSA counties by the time of the release of the next vintage. I define ultra-rural counties as those with a population of less than 2,500 or counties with fewer than 20,000 inhabitants that are not adjacent to SMSAs.

Establishment counts are reported by the U.S. Census via the County Business Patterns (CBP) data. I favor establishment count data (over, e.g. employment data) in the CBP, because establishment/reporting unit counts are not considered disclosure information and are thus never suppressed. Data suppression in the CBP data can be prevalent among ultra-rural counties where other CBP series may be concealed for confidentiality reasons. The CBP data collection and reporting underwent a change in 1974, which generated two issues pertinent to the analysis in Section 4. First, the Building Materials and Hardware Stores (SIC 5200) industry was subject to administrative shuffling so that certain sub-SICs were excluded as of 1974 (5220, 5240, 5252) while others were included (5260, 5270). To harmonize the parent 5200 SIC, I exclude all of the constituent sub-SICs that transitioned as a result of the reclassification. This change is made to little effect. By way of example, the average establishment count for this industry in rural counties reported in Table 6 is only 1.2 units (1%) higher using the unadjusted CBP data. Second, prior to 1974, CBP data were tabulated in terms of reporting units rather than establishments. For manufacturing companies, each individual location of a company is counted as a separate reporting unit. Consequently, reporting units are the same as the establishments reported as of 1974. For nonmanufacturing industries, multi-location employers are counted once in each county for each industry in which they operate, and multi-location employers in a given county may control more establishments in a given county compared to pre-1974 reporting units. It is unclear whether this poses an issue for the main analysis, because most firms operate only one establishment. Among multi-location firms, there is some chance that the establishments are in separate counties. The focus on rural counties also likely demotes the relevance of the reporting change because of the lower overall economic activity. However, if (small) multi-location employers are distributed across counties in a manner that is correlated with bank membership rates, the resulting increase in reporting units may incorrectly be attributed to the incidence of Fed membership (and by extension, the rate of takeup at the SCF). It is unclear why multi-location employers would not be randomly distributed with respect to membership shares, and the inclusion of county-level fixed effects offer some measure of control for unobserved factors that influence the rates of both. Nevertheless, I perform a test that can help identify whether counties with high membership shares also host more multi-location employers. Specifically, I regress the 1973-1974 change in reporting units on a second-order polynomial of the consistently reported employment total from the BEA and save the residuals. Counties with disproportionately high rates of multi-location employers will thus have positive residuals, and vice versa. The correlation of residuals from this regression with county-level membership shares is only 0.0155 ($p = .53$) and 0.0181 ($p = 0.46$) for member asset-shares. This exercise supports the notion that multi-location employers are distributed randomly with respect to Fed membership rates.

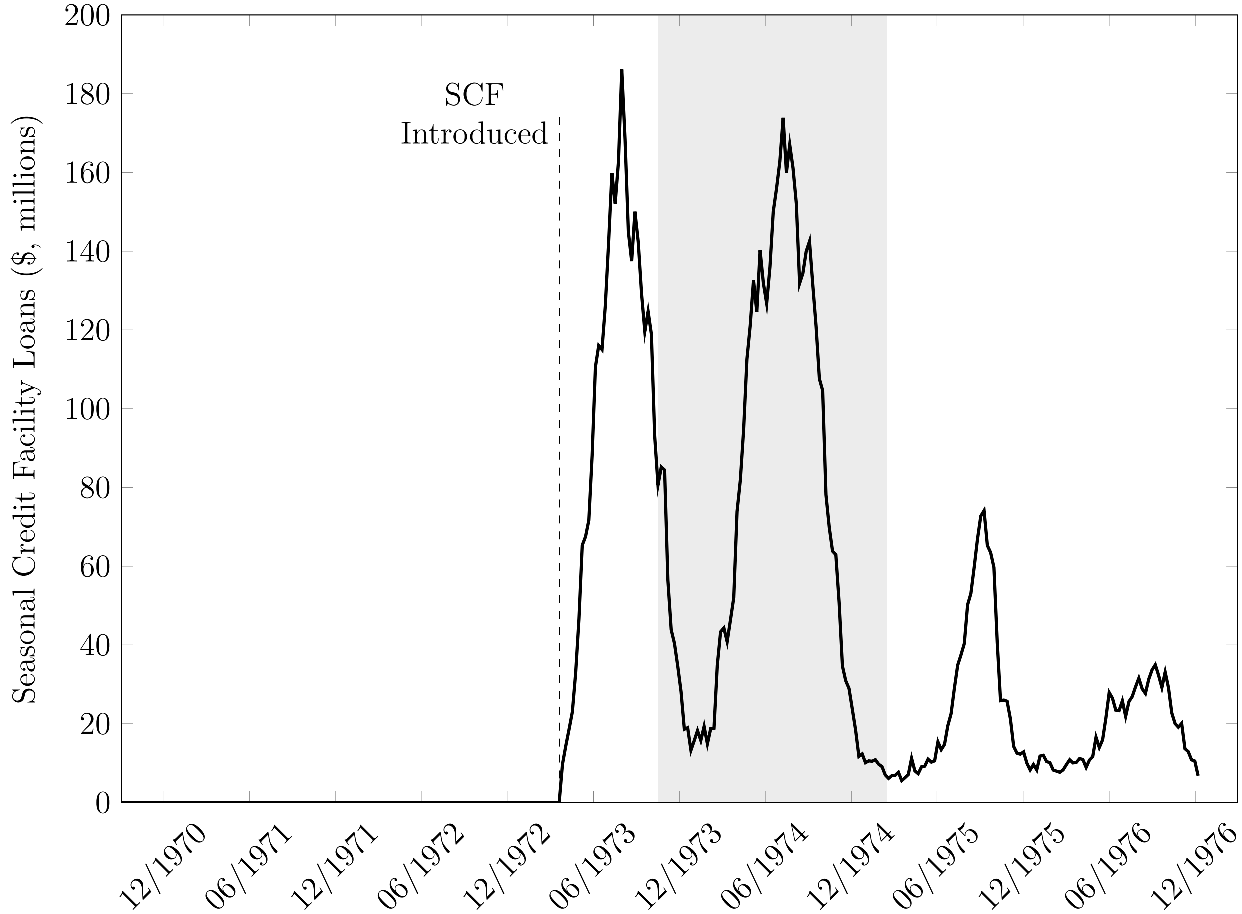


Figure 1: **Total Seasonal Credit Facility Lending.**
Notes: This figure plots the weekly volume of discount window loans granted to member banks as part of the Seasonal Credit Facility.
Source: Board of Governors of the Federal Reserve System (Transmission of Edited Deposits System, form FR 414a).

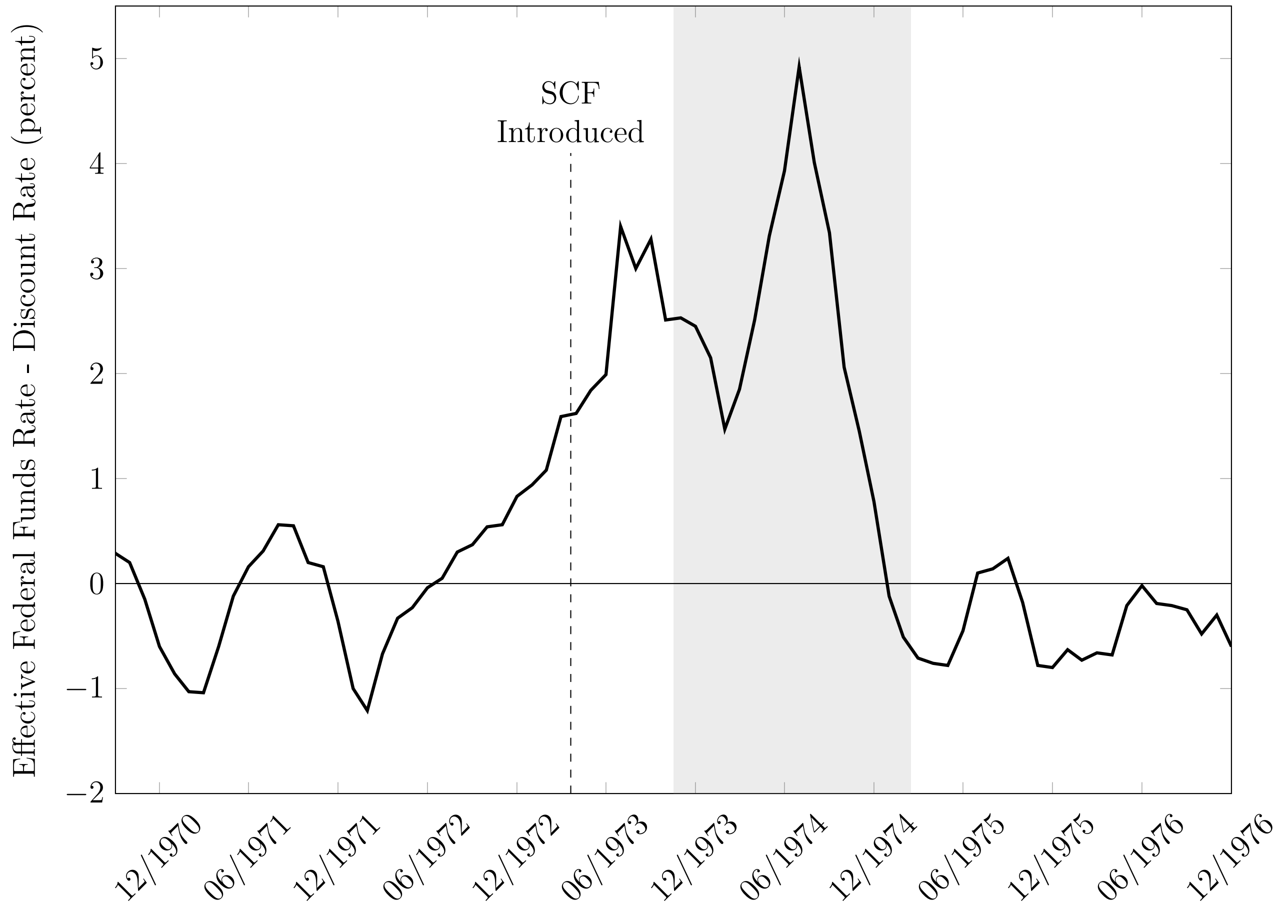


Figure 2: **Subsidy offered through the Seasonal Credit Facility.**
Notes: This figure plots the effective subsidy offered to banks that borrowed from the Seasonal Credit Facility for each month. The subsidy is defined as the effective federal funds rate (averaged over days within each month) minus the adjustment credit (discount) rate established by the Federal Reserve Bank of New York.
Source: Annual Statistical Digest; Board of Governors of the Federal Reserve System (H.15).

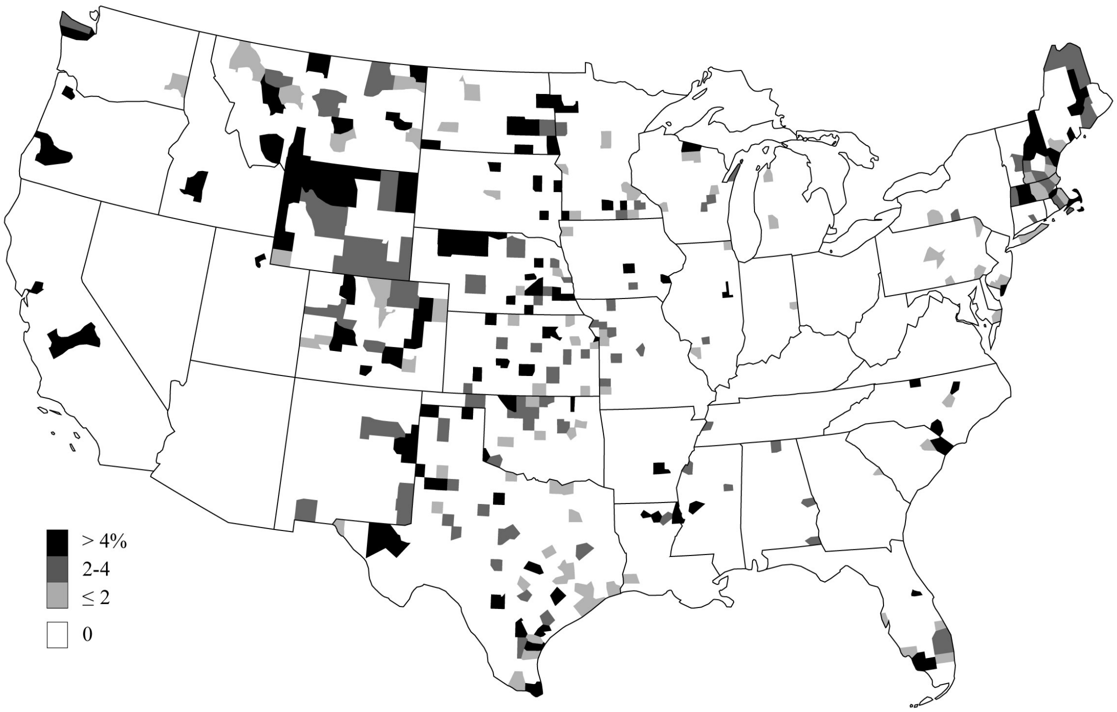


Figure 3: **Seasonal Credit Facility loans by county as a percentage of total county-wide deposits**.

Notes: This figure depicts the peak county-level discount window borrowing between 1973 and 1974, expressed as a percentage of total county-wide deposits. Counties are binned according to the values shown in the legend. County-level borrowing is computed by summing the maximum borrowing across banks within each county and year, and dividing by the beginning-of-year deposits.

Source: Board of Governors of the Federal Reserve System (Transmission of Edited Deposits System, form FR 414a), (form FR-105); National Information Center

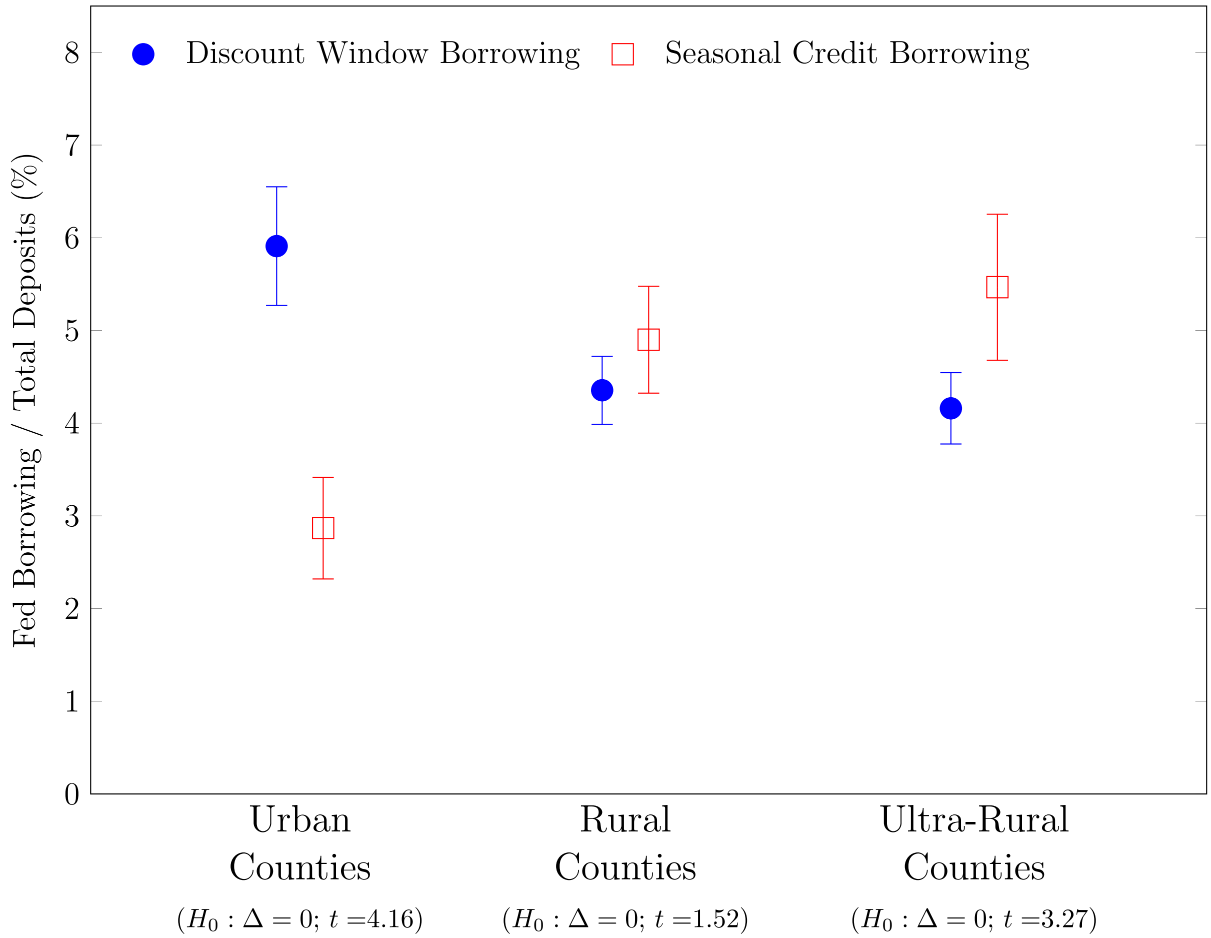


Figure 4: **Discount Window Borrowing Relative to Total Deposits.**
Notes: This figure plots peak county-level discount window borrowing between 1973 and 1974, expressed as a percentage of total county-level deposits. Solid blue circles represent Adjustment Credit borrowing, and open squares represent borrowing from the Seasonal Credit Facility. County-level borrowing is computed by summing the maximum borrowing across banks within each county and year, and dividing by the beginning-of-year deposits. A t test of the equality of means between Adjustment Credit and Seasonal Credit borrowing intensity is reported in parentheses beneath each county grouping. Rural counties are defined as non-MSA counties with a total urban population of fewer than 20,000 people unless the county is not adjacent to an MSA. Ultra-rural counties are those with a total urban population of fewer than 2,500 people or counties with a total urban population of fewer than 20,000 that are not adjacent to an MSA.
Source: Board of Governors of the Federal Reserve System (Transmission of Edited Deposits System, form FR 414a); United States Department of Agriculture.

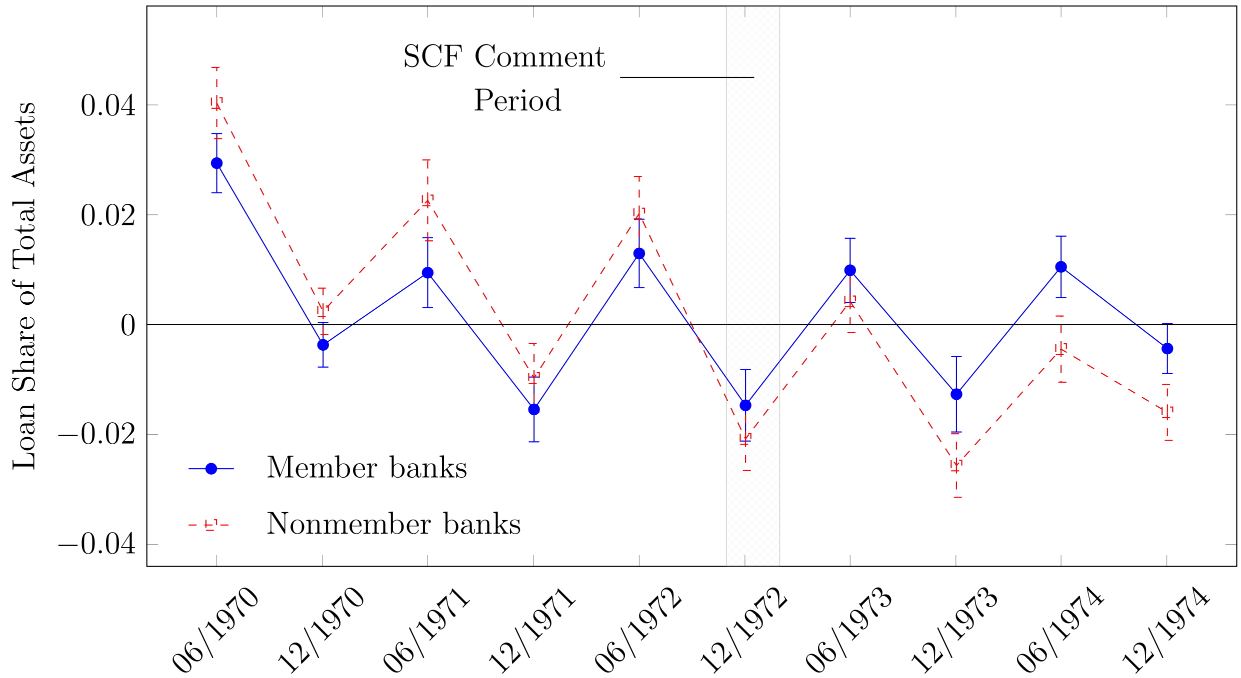


Figure 5: **Seasonality of Banks' Loan Portfolios**.
Notes: This figure plots the β_j coefficients from an estimation of the following specification for zip codes with sufficient seasonality to justify SCF loans:

$$\left(\frac{Loans_{bt}}{Assets_{bt}}\right) = \gamma_b + \phi_{ZIP3} \cdot t + \sum_j \beta_j \cdot \mathbb{1}_t(j) + \varepsilon_{bt}.$$

Source: Board of Governors of the Federal Reserve System (Transmission of Edited Deposits System, form FR 414a); National Information Center.

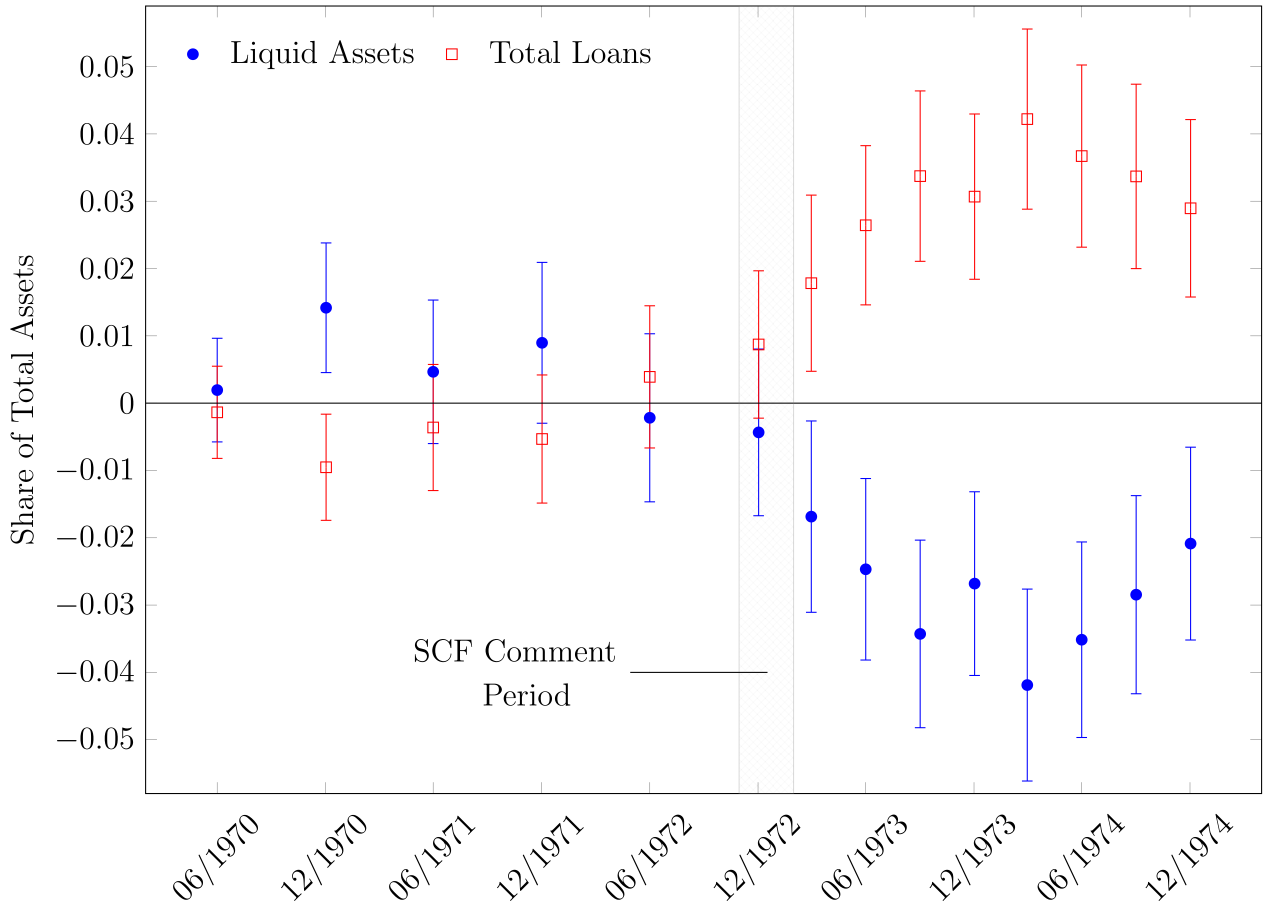
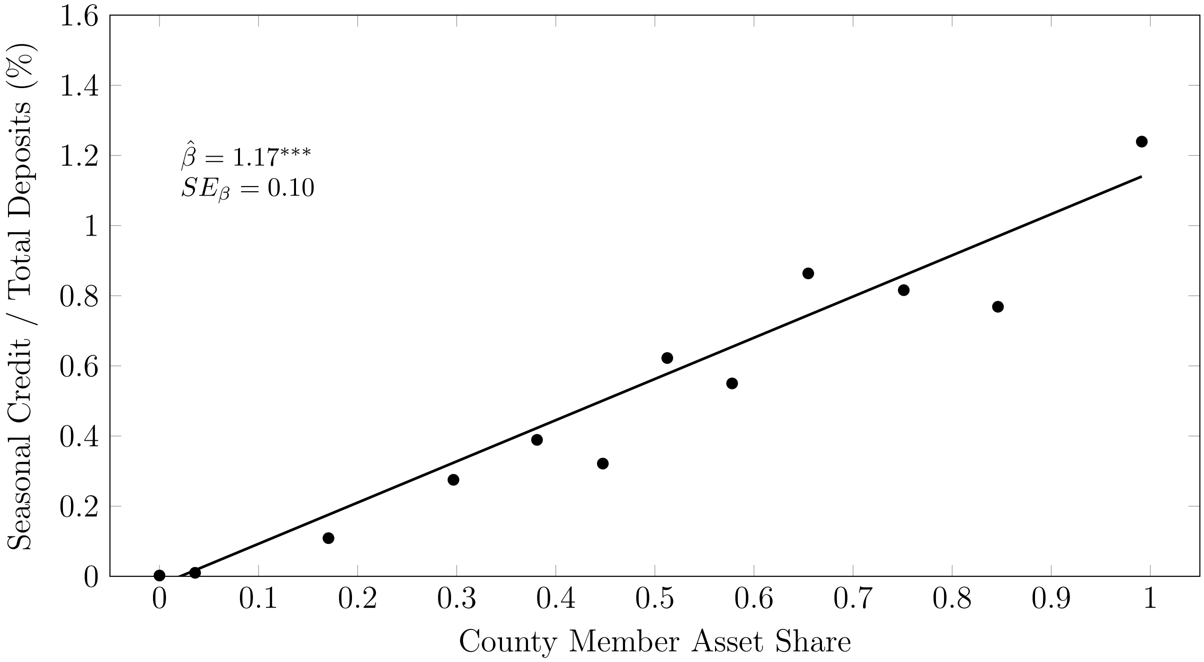


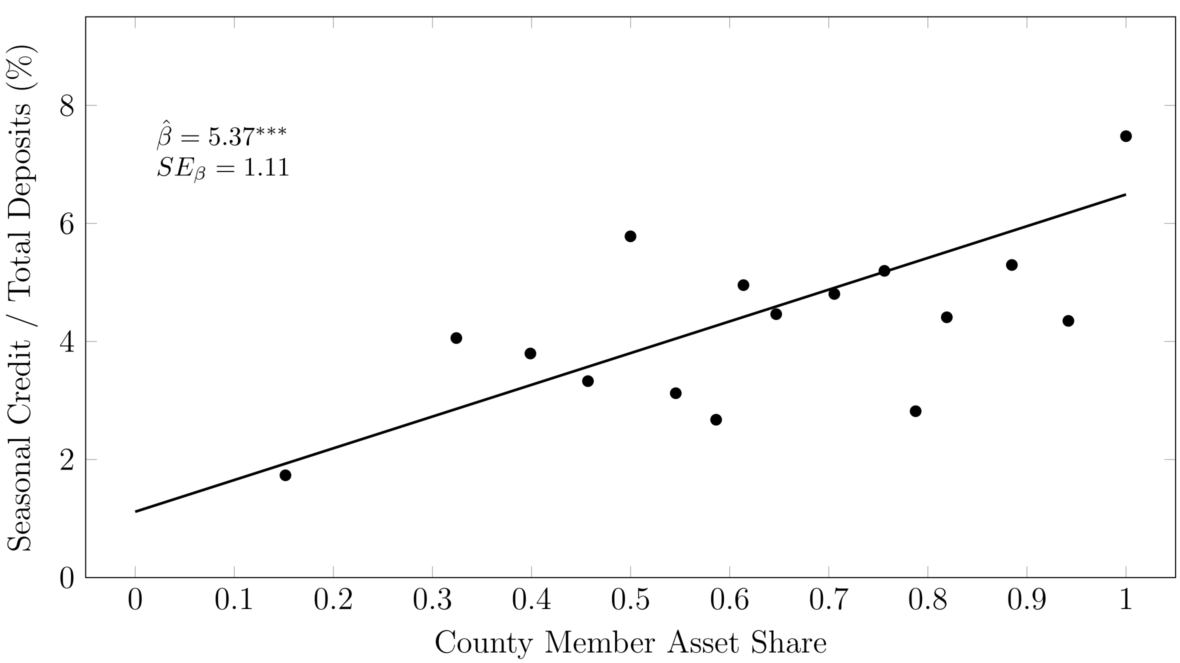
Figure 6: **Bank Balance Sheet Allocation Over Time**.
Notes: This figure plots the β_j parameters from an estimation of the following specification for zip codes with sufficient seasonality to justify SCF loans:

$$Y_{bt} = \gamma_b + \phi_{ZIP3,t} + \sum_j \beta_j \left[\mathbb{1}_j(t) \times \mathbb{1}_{SCF}(b) \right] + \varepsilon_{bt}.$$

Y_{bt} is either the bank-quarter liquid asset share of assets (solid blue dots) or loan share of assets (open red squares). 95% confidence intervals accompany each point estimate.
Source: Board of Governors of the Federal Reserve System (form FR-105); National Information Center.



(a) All rural counties

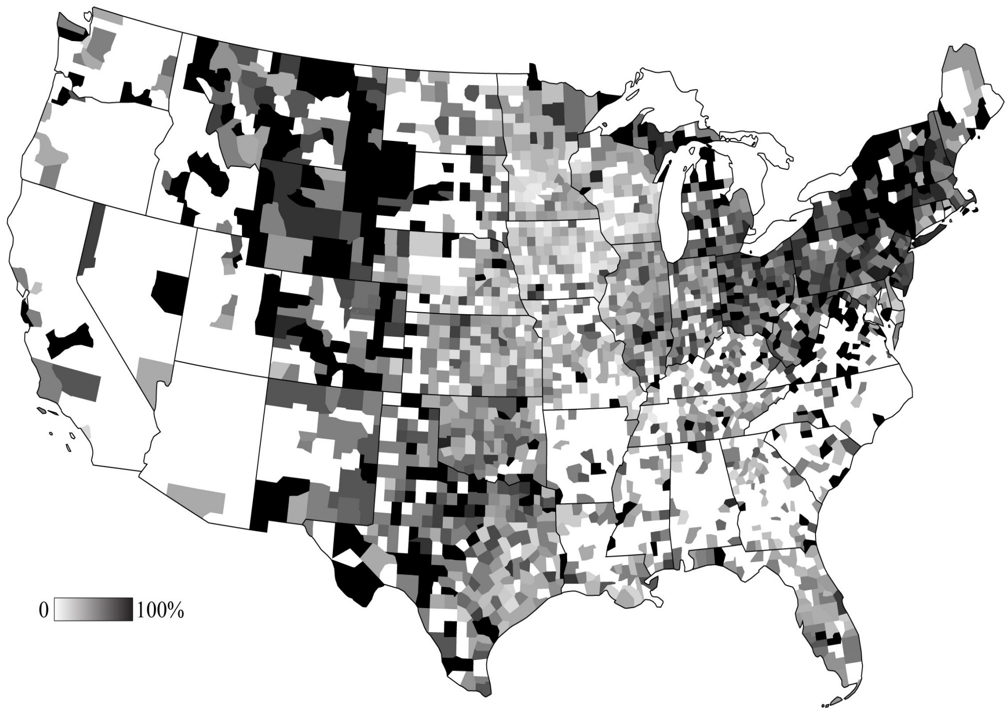


(b) Rural counties with Seasonal Credit > 0

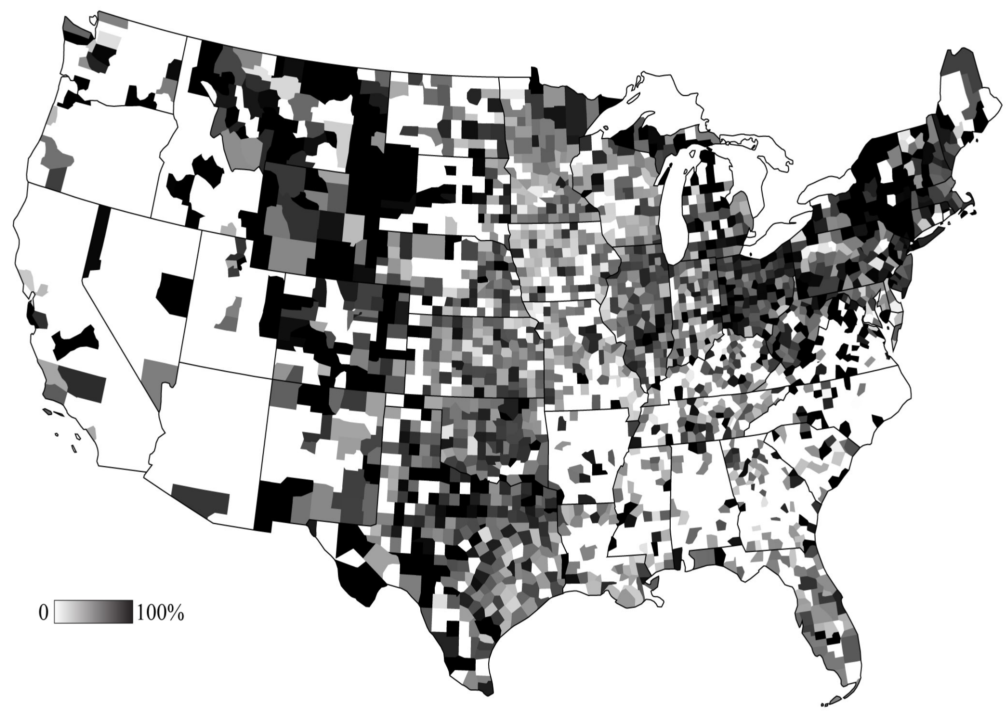
Figure 7: **The Relationship Between Seasonal Credit Use and Asset Share of Fed Member Banks.**

Notes: This figure shows the relationship between county-level SCF borrowing and the share of assets held by Federal Reserve member banks in each county using a binned scatter plot. Each point represents an average across counties within each bin. Panel (a) includes all rural counties, and Panel (b) includes only the subset of counties that received at least one SCF loan. County-level borrowing is computed by summing the maximum borrowing across banks within each county between 1973 and 1974, and dividing by the beginning-of-period deposits.

Source: Board of Governors of the Federal Reserve System (Transmission of Edited Deposits System, form FR 414a); National Information Center.

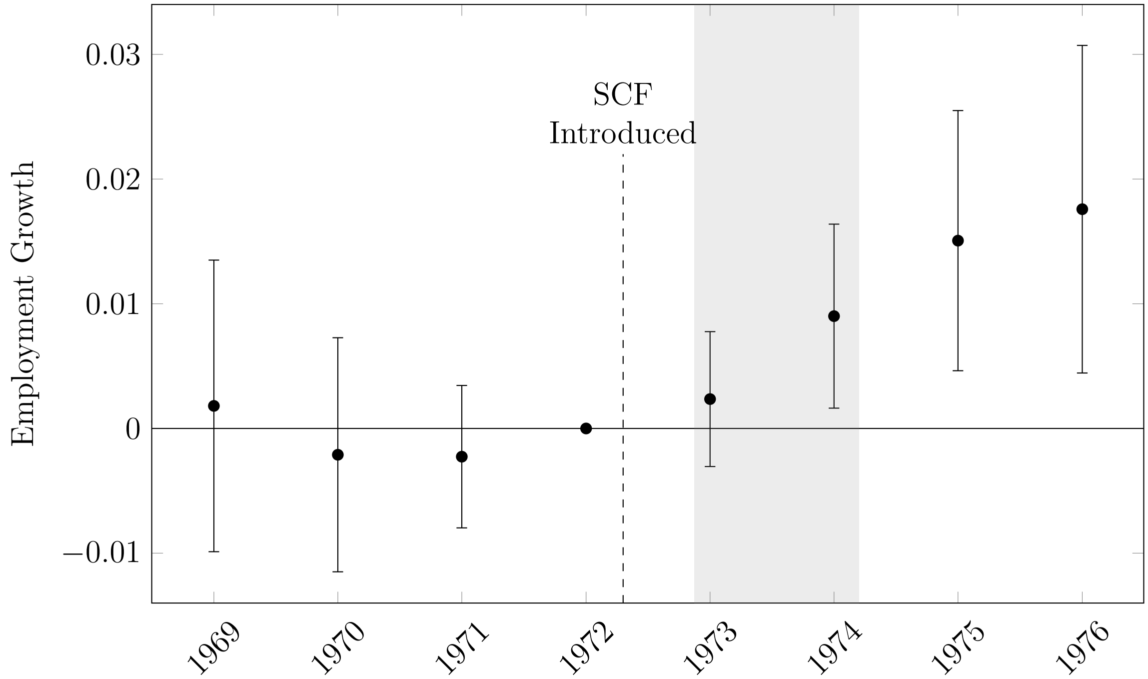


(a) Share of member banks in each county

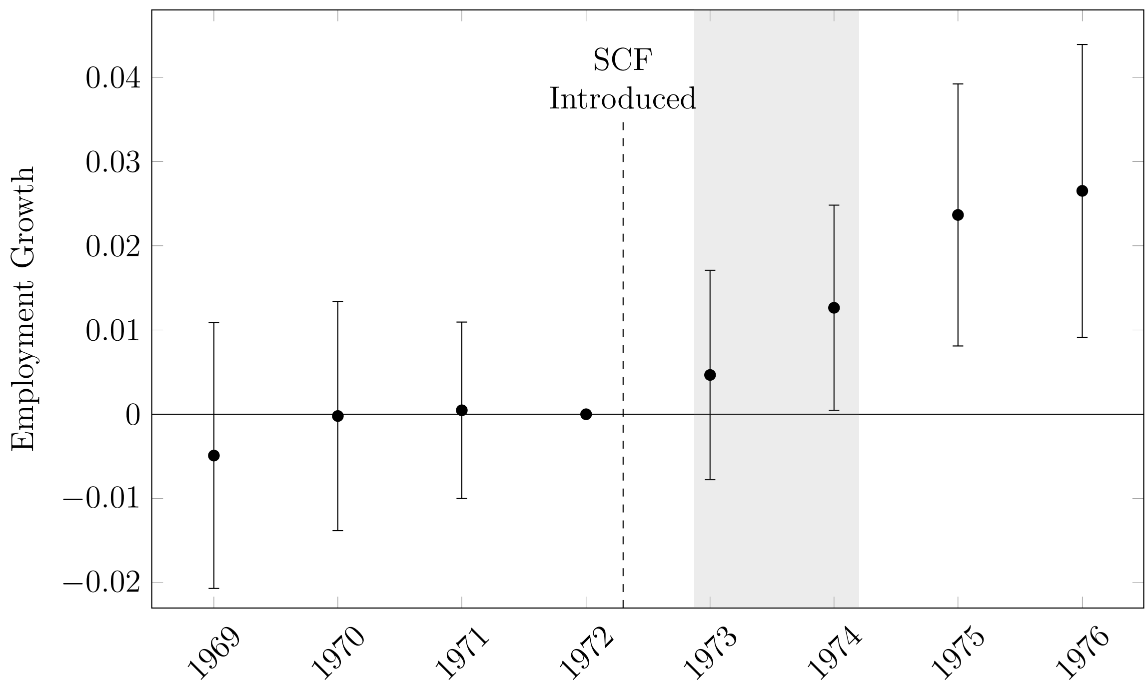


(b) Share of member bank assets in each county

Figure 8: **Federal Reserve membership shares by county**.
Notes: This figure depicts the percent of commercial banks in each county that are members of the Federal Reserve System as of 1973 Q1 in panel (a). Panel (b) depicts the percent of bank assets in each county that are controlled by member banks. Counties with no commercial banks are coded as zero.
Source: National Information Center.



(a) Total employment



(b) Nonfarm proprietors' employment

Figure 9: **Employment Growth Effects Over Time**.
Notes: This figure plots the β_j parameters from an estimation of the following county-level regression:

$$ln(employment_{ct}) = \gamma_c + \phi_{FRS,t} + \sum_j \beta_j \left[\mathbb{1}_j(t) \times TopMemberShareTercile_c\right] + \varepsilon_{ct}.$$

for both total employment (panel a) and nonfarm proprietors' employment (panel b).
Source: Board of Governors of the Federal Reserve System (Transmission of Edited Deposits System, form FR 414a); BEA Regional Economic Accounts database; National Information Center.

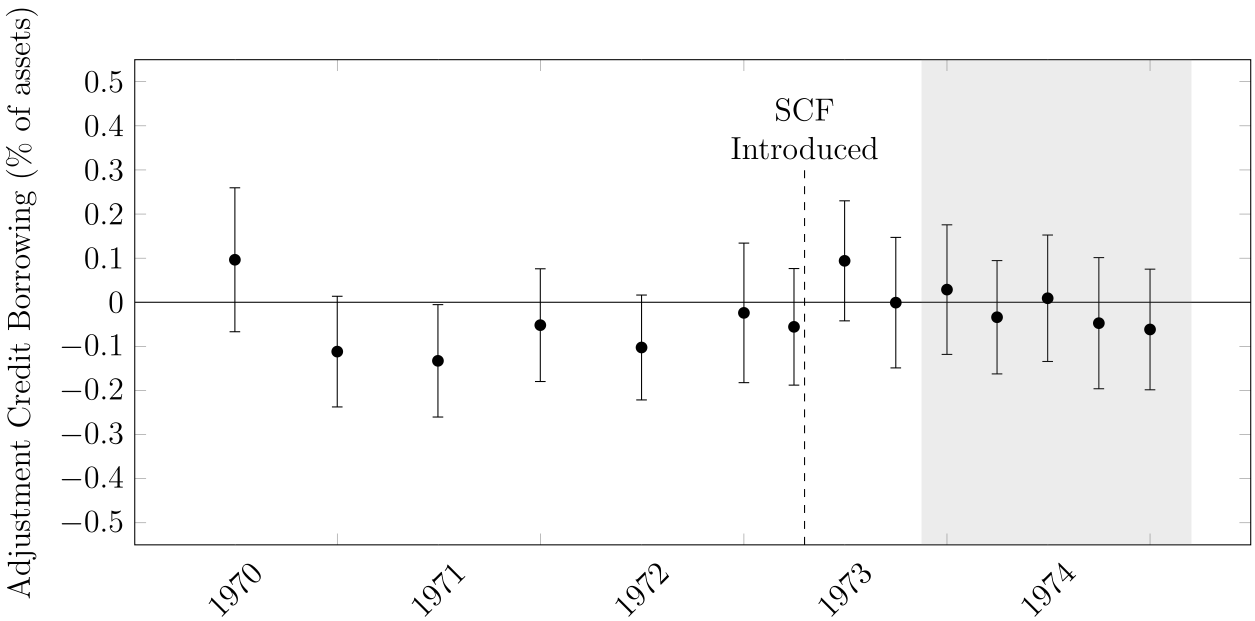
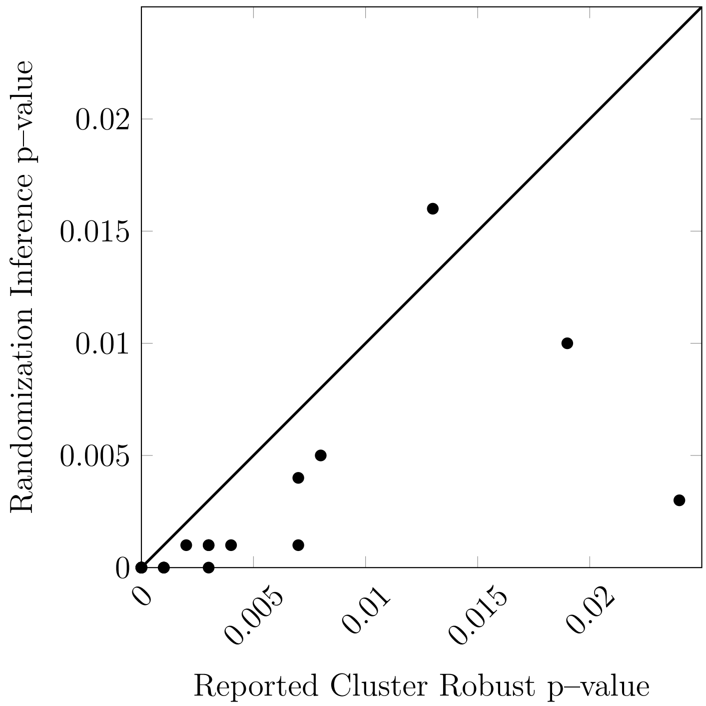


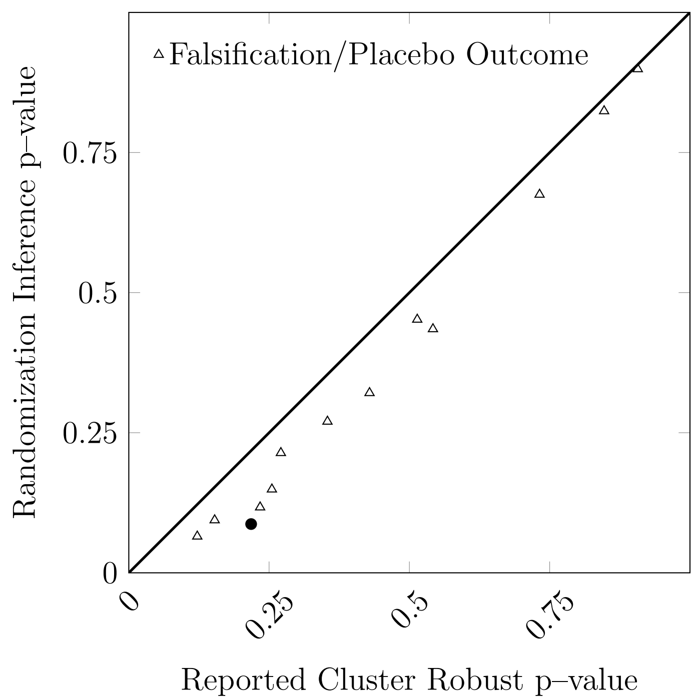
Figure A1: **Adjustment Credit Borrowing Over Time**.
Notes: This figure plots the β_j parameters from an estimation of the following specification for zip codes with sufficient seasonality to justify SCF loans:

$$\left(\frac{AdjustmentCreditLoans_{bt}}{Assets_{bt}}\right) = \gamma_b + \phi_{ZIP3,t} + \sum_j \beta_j \left[\mathbb{1}_j(t) \times \mathbb{1}_{SCF}(b)\right] + \varepsilon_{bt}.$$

Source: Board of Governors of the Federal Reserve System (Transmission of Edited Deposits System, form FR 414a); National Information Center.

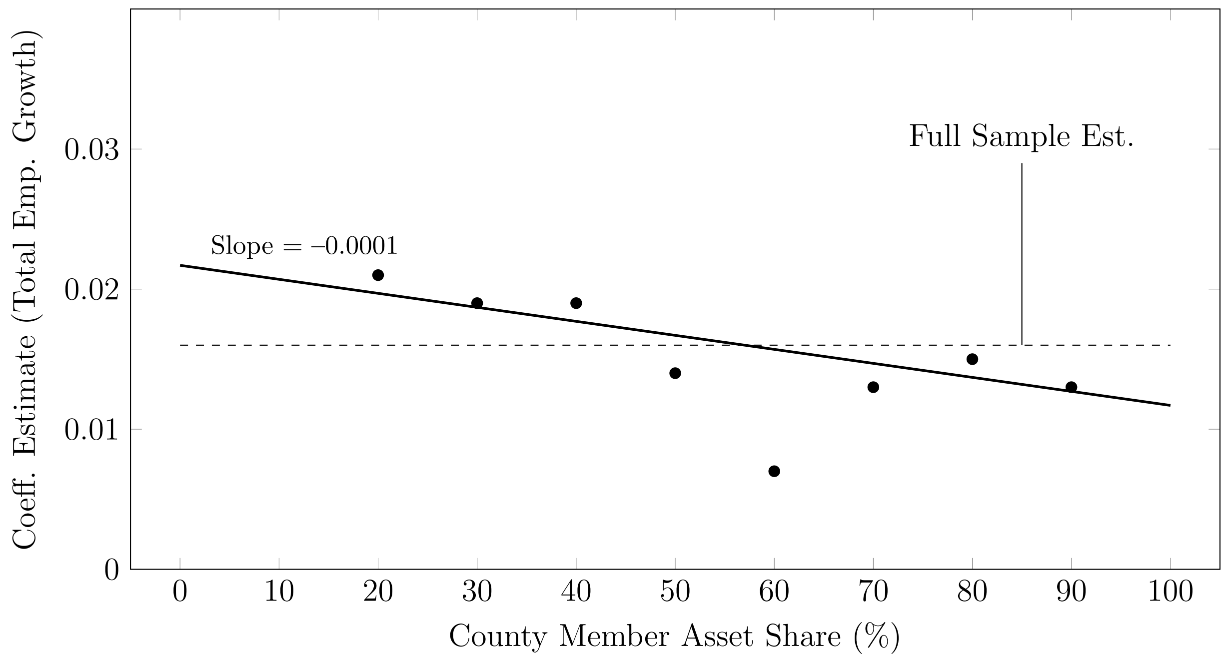


(a) Original $p \leq 0.10$

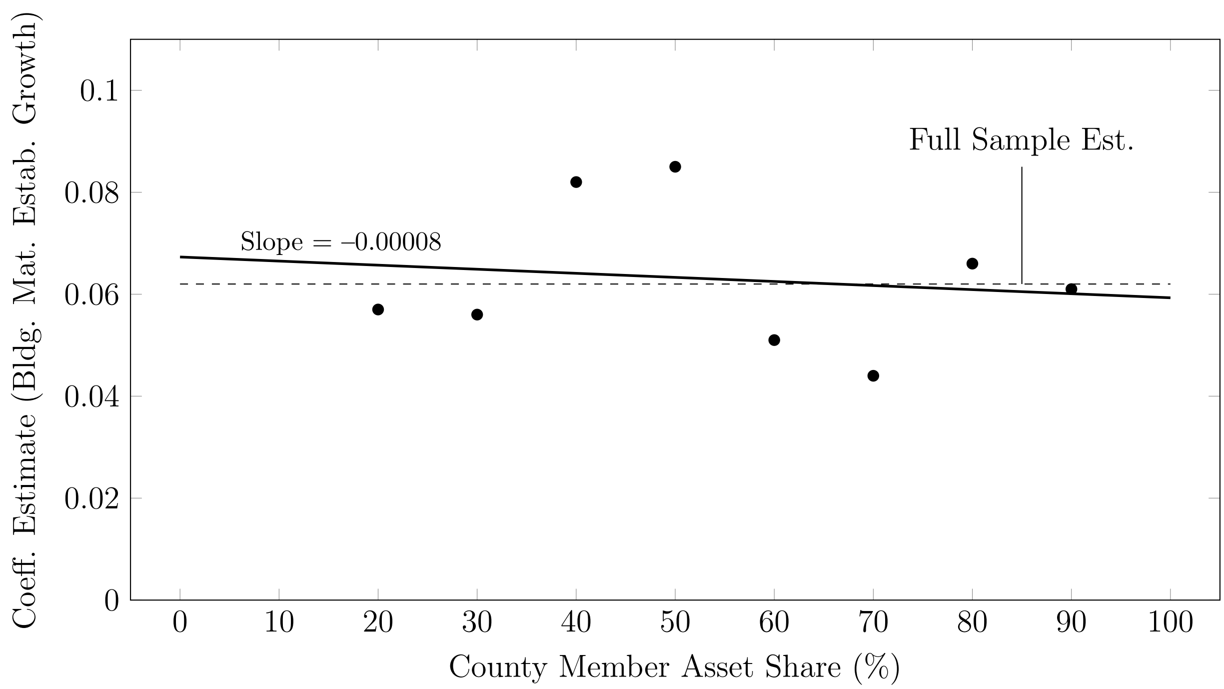


(b) Original $p > 0.10$

Figure A2: **Randomization Inference.**
Notes: This figure shows the relationship between p-values reported in the main reduced form results (Tables 7-11 and Table 14) on the horizontal axis and p-values obtained via randomization inference on the vertical axis, with resampling from actual realizations of the member asset share for each county. Points expressed as triangles correspond to falsification tests of growth among large establishments or growth of total establishments within high-barrier industries.



(a) Dependent Variable: ln(Employment)



(b) Dependent Variable: ln(Small Building Material and Hardware Stores)

Figure A3: **Heterogeneity in the Reduced Form Estimate Across the Member Asset Share Distribution.**
Notes: This figure reports the average causal responses for subsamples of counties based on their member asset shares. Each point estimate indicated by a solid circle is computed using a sample of counties with member asset shares within +/- 10 percentage points of value reported on the horizontal axis. Panel (a) uses the natural logarithm of total employment as the dependent variable, and panel (b) reports the results using the natural logarithm of small building material establishments as the dependent variable. The dashed horizontal line corresponds to the point estimate using the full sample reported in Tables 7 and 8. The solid line fits the average causal responses. The bandwidth for the first point (county member asset share of 20%) doubles the subsample bandwidth given the limited observations at the bottom of the distribution.

Table 1: Rural Commercial Bank Summary Statistics (Dec. 1972)

	Nonmembers	Members
Assets ($mil)	8.7	14.7
	(27.3)	(15.0)
$\frac{\text{Liq. Assets}}{\text{Assets}}$	0.43	0.40
	(0.15)	(0.14)
$\frac{\text{Loans}}{\text{Assets}}$	0.46	0.47
	(0.13)	(0.12)
$\frac{\text{C\&I Loans}}{\text{Assets}}$	0.08	0.09
	(0.06)	(0.06)
$\frac{\text{CRE Loans}}{\text{Assets}}$	0.02	0.02
	(0.03)	(0.03)
$\frac{\text{Cons. Loans}}{\text{Assets}}$	0.09	0.11
	(0.06)	(0.07)
$\frac{\text{RRE Loans}}{\text{Assets}}$	0.05	0.05
	(0.05)	(0.06)
$\frac{\text{Ag Loans}}{\text{Assets}}$	0.22	0.18
	(0.13)	(0.13)
$\frac{\text{Deposits}}{\text{Assets}}$	0.90	0.90
	(0.04)	(0.03)
$\frac{\text{Equity}}{\text{Assets}}$	0.08	0.08
	(0.03)	(0.03)
$\frac{\text{Int. Income}}{\text{Assets}}(\%)$	5.20	5.07
	(0.73)	(0.69)
$\frac{max\{SCF\}}{Deposits}$	–	0.01
		(0.03)
$\frac{max\{SCF\}}{Deposits}\Big\vert \mathbb{1}_{SCF}(b)$	–	0.05
		(0.03)
N	1,583	1,061

Notes: This table reports descriptive for rural commercial banks operating in areas with sufficient seasonal variation in loans and deposits to qualify for the SCF. Average values for each variable are reported as of 1972 Q4, with the standard deviation in parentheses. The indicator function $\mathbb{1}_{SCF}(b)$ takes a value of one for all banks that drew on the SCF at any point in its first two years. The maximum number of observations for each group is reported in the final line of the table.

Table 2: Membership Prediction Based on Observable Characteristics

	Coeff. Estimate
Assets ($mil)	39.4
$\frac{\text{Liq. Assets}}{\text{Assets}}$	–2.30*
$\frac{\text{Loans}}{\text{Assets}}$	–2.96
$\frac{\text{C\&I Loans}}{\text{Assets}}$	0.48
$\frac{\text{CRE Loans}}{\text{Assets}}$	–4.04
$\frac{\text{Cons. Loans}}{\text{Assets}}$	3.19
$\frac{\text{RRE Loans}}{\text{Assets}}$	2.26
$\frac{\text{Ag Loans}}{\text{Assets}}$	0.97
$\frac{\text{Deposits}}{\text{Assets}}$	–4.25
$\frac{\text{Equity}}{\text{Assets}}$	-12.29**
$\frac{\text{Int. Income}}{\text{Assets}}(\%)$	-0.47***
Pseudo R^2	0.075
N	2,635

Notes: This table reports results from a logit regression of rural banks' membership status on balance sheet and income characteristics as of 1972 Q4. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table 3: Balance sheet and income changes for banks that borrowed from the Seasonal Credit Facility (OLS estimates)

Panel A			
	$\frac{\text{Liq. Assets}}{\text{Assets}}$	$\frac{\text{Loans}}{\text{Assets}}$	ln(Loans)
$Post_t \times \mathbb{1}_{SCF}(b)$	-0.031***	0.032***	0.060***
	(0.004)	(0.004)	(0.014)
Adj. R^2	0.83	0.81	0.97
N	39,602	39,602	39,599
Panel B			
	$\frac{\text{C\&I Loans}}{\text{Assets}}$	$\frac{\text{CRE Loans}}{\text{Assets}}$	$\frac{\text{Cons. Loans}}{\text{Assets}}$
$Post_t \times \mathbb{1}_{SCF}(b)$	0.009***	0.003**	0.002
	(0.002)	(0.001)	(0.002)
Adj. R^2	0.79	0.85	0.88
N	29,022	29,022	29,022
Panel C			
	$\frac{\text{RRE Loans}}{\text{Assets}}$	$\frac{\text{Ag Loans}}{\text{Assets}}$	$\frac{\text{Int. Income}}{\text{Assets}}$(%)
$Post_t \times \mathbb{1}_{SCF}(b)$	0.000	0.017***	0.111***
	(0.002)	(0.003)	(0.031)
Adj. R^2	0.92	0.91	0.66
N	29,022	29,022	15,762
Bank FEs	✓	✓	✓
ZIP3×Time FEs	✓	✓	✓

Notes: This table reports difference-in-differences estimates from regressions of the indicated dependent variables on the interaction term, $Post_t \times \mathbb{1}_{SCF}(b)$, which equals one for post-treatment (1973 Q2 and later) observations of banks that ever drew on the SCF, bank fixed effects, and ZIP3-time fixed effects:

$$Y_{bt} = \gamma_b + \phi_{ZIP3,t} + \beta\big[Post_t \times \mathbb{1}_{SCF}(b)\big] + \varepsilon_{bt}.$$

Standard errors (in parentheses) are clustered at the bank level. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table 4: Balance sheet and income changes for member banks that the Federal Reserve identified as likely beneficiaries (Intent-to-treat/Reduced form estimates)

Panel A			
	$\frac{\text{Liq. Assets}}{\text{Assets}}$	$\frac{\text{Loans}}{\text{Assets}}$	ln(Loans)
$Post_t \times \mathbb{1}_{SCF}(b)$	-0.017***	0.018***	0.025**
	(0.004)	(0.004)	(0.012)
Adj. R^2	0.83	0.81	0.97
N	39,602	39,602	39,599
Panel B			
	$\frac{\text{C\&I Loans}}{\text{Assets}}$	$\frac{\text{CRE Loans}}{\text{Assets}}$	$\frac{\text{Cons. Loans}}{\text{Assets}}$
$Post_t \times \mathbb{1}_{SCF}(b)$	0.005***	0.000	0.002
	(0.002)	(0.001)	(0.002)
Adj. R^2	0.79	0.85	0.88
N	29,022	29,022	29,022
Panel C			
	$\frac{\text{RRE Loans}}{\text{Assets}}$	$\frac{\text{Ag Loans}}{\text{Assets}}$	$\frac{\text{Int. Income}}{\text{Assets}}(\%)$
$Post_t \times \mathbb{1}_{SCF}(b)$	0.002*	0.011***	0.159***
	(0.002)	(0.002)	(0.027)
Adj. R^2	0.92	0.91	0.66
N	29,022	29,022	15,762
Bank FEs	✓	✓	✓
ZIP3×Time FEs	✓	✓	✓

Notes: This table reports difference-in-differences estimates from regressions of the indicated dependent variables on the interaction term, $Post_t \times \mathbb{1}_{Mem50}(b)$, which equals one for post-treatment (1973 Q2 and later) observations of banks that the Federal Reserve identified as the most likely to benefit from the SCF given the terms at the time, bank fixed effects, and ZIP3-time fixed effects:

$$Y_{bt} = \gamma_b + \phi_{ZIP3,t} + \beta\big[Post_t \times \mathbb{1}_{Mem50}(b)\big] + \varepsilon_{bt}.$$

Standard errors (in parentheses) are clustered at the bank level. Statistical significance: $^{***}\ p \leq 0.01,^{**}\ p \leq 0.05,^{*}\ p \leq 0.10$.

Table 5: Balance sheet and income changes for member banks that the borrowed from the Seasonal Credit Facility (2SLS DID-IV estimates)

Panel A			
	$\frac{\text{Liq. Assets}}{\text{Assets}}$	$\frac{\text{Loans}}{\text{Assets}}$	ln(Loans)
$\widehat{Post_t \times \mathbb{1}_{SCF}(b)}$	-0.081***	0.084***	0.114**
	(0.019)	(0.019)	(0.057)
1st Stage F	82.7	82.7	82.7
AR Wald (p)	0.000	0.000	0.040
N	5,284	5,284	5,284
Panel B			
	$\frac{\text{C\&I Loans}}{\text{Assets}}$	$\frac{\text{CRE Loans}}{\text{Assets}}$	$\frac{\text{Cons. Loans}}{\text{Assets}}$
$\widehat{Post_t \times \mathbb{1}_{SCF}(b)}$	0.023***	0.001	0.011
	(0.009)	(0.004)	(0.008)
1st Stage F	82.3	82.3	82.3
AR Wald (p)	0.006	0.881	0.180
N	5,272	5,272	5,272
Panel C			
	$\frac{\text{RRE Loans}}{\text{Assets}}$	$\frac{\text{Ag Loans}}{\text{Assets}}$	$\frac{\text{Int. Income}}{\text{Assets}}(\%)$
$\widehat{Post_t \times \mathbb{1}_{SCF}(b)}$	0.012**	0.054***	0.785***
	(0.006)	(0.013)	(0.164)
1st Stage F	82.3	82.3	82.2
AR Wald (p)	0.040	0.000	0.000
N	5,272	5,272	5,248
Bank FEs	✓	✓	✓
ZIP3×Time FEs	✓	✓	✓

Notes: This table reports difference-in-differences estimates from DID-IV regressions of the indicated dependent variables on the instrumented interaction term, $\widehat{Post_t \times \mathbb{1}_{SCF}(b)}$, which equals one for post-treatment (1973 Q2 and later) observations of banks that ever drew on the SCF, bank fixed effects, and ZIP3-time fixed effects:

$$Y_{bt} = \gamma_b + \phi_{ZIP3,t} + \beta\big[\widehat{Post_t \times \mathbb{1}_{SCF}(b)}\big] + \varepsilon_{bt}.$$

The Kleibergen-Paap (2006) first stage F-stat, the p-value of the Anderson-Rubin (1949) weak-instrument robust inference test of the statistical significance of the endogenous regressor in the structural equation, and the number of observations are reported for each specification. Standard errors (in parentheses) are clustered at the bank level. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table 6: Rural County Summary Statistics (Dec. 1972)

	Mean	Std. Dev.
N	1,631	–
Employment and Population		
Total Employment	7,863	(7,395)
Proprietors' Employment	2,002	(1,287)
Nonfarm Proprietors' Employment	1,139	(888)
Population	18,792	(16,044)
Establishment Counts		
Building Materials	120.3	(96.0)
Bars and Restaurants	20.7	(21.6)
Misc. Retail	18.4	(18.3)
Gas Stations	27.4	(24.1)
Banks	23.5	(28.7)
Hotels & Lodging	78.3	(81.9)
Commercial Bank Presence (Mar. 1973)		
Banks	3.7	(2.6)
Fed membership share	0.37	(0.34)
Fed membership asset share	0.42	(0.37)

Notes: This table reports descriptive statistics for rural counties as of 1972 Q4, except for bank membership variables, which are reported as of 1973 Q1, just before the implementation of the Seasonal Credit Facility.
Sources: Bureau of Economic Analysis; Census Bureau; National Information Center.

Table 7: Employment outcomes for counties exposed to the Seasonal Credit Facility

Panel A: Reduced Form Estimates

	ln(Employment) (1)	ln(Employment) (2)	ln(Proprietors' Employment) (1)	ln(Proprietors' Employment) (2)	ln(Non-farm Prop. Employment) (1)	ln(Non-farm Prop. Employment) (2)
$Post_t \times MemAssetShare_c$	0.016***	0.014**	0.025***	0.018***	0.026***	0.018**
	(0.006)	(0.006)	(0.007)	(0.006)	(0.008)	(0.007)
Adj. R^2	0.99	0.99	0.99	0.99	0.99	0.99
N	11,417	11,417	11,417	11,417	11,417	11,417
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Panel B: 2SLS Estimates

	ln(Employment) (1)	ln(Employment) (2)	ln(Proprietors' Employment) (1)	ln(Proprietors' Employment) (2)	ln(Non-farm Prop. Employment) (1)	ln(Non-farm Prop. Employment) (2)
$\widehat{Post_t \times \frac{SCF_c}{Deposits_c}}$	1.130**	0.979**	1.843***	1.282***	1.846***	1.276**
	(0.445)	(0.46)	(0.513)	(0.466)	(0.583)	(0.578)
1st Stage F	61.9	47.1	61.9	47.1	61.9	47.1
AR Wald (p)	0.008	0.020	0.000	0.003	0.001	0.014
N	11,382	11,382	11,382	11,382	11,382	11,382
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameter from an estimation of the following regression:

$$ln(Y_{ct}) = \gamma_c + \phi_{FRS,t} + \beta\big[Post_t \times MemAssetShare_c\big] + \kappa\big[Post_t \times \boldsymbol{X}_c\big] + \varepsilon_{ct}$$

in panel A, where Y_{ct} corresponds to employment totals within each county as indicated. In panel B, $Post_t \times MemAssetShare_c$ is used to instrument for county-wide seasonal credit borrowing as a share of total deposits, $Post_t \times \frac{SCF_c}{Deposits_c}$. Standard errors (in parentheses) are clustered at the county level. The Kleibergen-Paap (2006) first stage F-stat, the p-value of the Anderson-Rubin (1949) weak-instrument robust inference test of the statistical significance of the endogenous regressor in the structural equation, and the number of observations are reported for each 2SLS specification. Statistical significance: $^{***}\ p \leq 0.01,^{**}\ p \leq 0.05,^{*}\ p \leq 0.10$.

Table 8: Building materials and hardware establishment growth for counties exposed to the Seasonal Credit Facility

Panel A: Reduced Form Estimates

	ln(Building Material and Hardware Stores)					
	All		≤4 employees		>20 employees	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.049***	0.035**	0.062***	0.046***	0.049	0.031
	(0.015)	(0.015)	(0.016)	(0.015)	(0.032)	(0.033)
Adj. R^2	0.97	0.98	0.96	0.96	0.91	0.91
N	11,222	11,222	11,222	11,222	9,200	9,200
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Panel B: 2SLS Estimates

	ln(Building Material and Hardware Stores)					
	All		≤4 employees		>20 employees	
	(1)	(2)	(1)	(2)	(1)	(2)
$\widehat{Post_t \times \frac{SCF_c}{Deposits_c}}$	3.520***	2.473**	4.457***	3.287***	3.529	2.279
	(1.177)	(1.145)	(1.219)	(1.182)	(2.370)	(2.493)
1st Stage F	61.8	47.3	61.8	47.3	54.9	50.2
AR Wald (p)	0.001	0.023	0.000	0.006	0.129	0.357
N	11,187	11,187	11,187	11,187	9,172	9,172
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameter from an estimation of the following regression:

$$ln(Y_{ct}) = \gamma_c + \phi_{FRS,t} + \beta\big[Post_t \times MemAssetShare_c\big] + \kappa\big[Post_t \times \boldsymbol{X}_c\big] + \varepsilon_{ct}$$

in panel A, where Y_{ct} corresponds to establishment counts within each county as indicated. In panel B, $Post_t \times MemAssetShare_c$ is used to instrument for county-wide seasonal credit borrowing as a share of total deposits, $Post_t \times \frac{SCF_c}{Deposits_c}$. Standard errors (in parentheses) are clustered at the county level. The Kleibergen-Paap (2006) first stage F-stat, the p-value of the Anderson-Rubin (1949) weak-instrument robust inference test of the statistical significance of the endogenous regressor in the structural equation, and the number of observations are reported for each 2SLS specification. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table 9: Bar and restaurant establishment growth for counties exposed to the Seasonal Credit Facility

Panel A: Reduced Form Estimates

	ln(Bar and Restaurant Establishments)					
	All		≤4 employees		>20 employees	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.060***	0.028	0.115***	0.085***	0.063	0.027
	(0.022)	(0.023)	(0.029)	(0.029)	(0.044)	(0.045)
Adj. R^2	0.95	0.95	0.86	0.86	0.80	0.80
N	9,604	9,604	9,556	9,556	6,161	6,161
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Panel B: 2SLS Estimates

	ln(Bar and Restaurant Establishments)					
	All		≤4 employees		>20 employees	
	(1)	(2)	(1)	(2)	(1)	(2)
$\widehat{Post_t \times \frac{SCF_c}{Deposits_c}}$	4.119***	1.910	7.853***	5.714***	4.167	1.861
	(1.567)	(1.518)	(2.165)	(2.028)	(2.867)	(2.775)
1st Stage F	53.4	49.3	53.3	49.2	39.8	40.0
AR Wald (p)	0.006	0.207	0.000	0.003	0.129	0.496
N	9,574	9,574	9,526	9,526	6,147	6,147
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameter from an estimation of the following regression:

$$ln(Y_{ct}) = \gamma_c + \phi_{FRS,t} + \beta\big[Post_t \times MemAssetShare_c\big] + \kappa\big[Post_t \times \boldsymbol{X}_c\big] + \varepsilon_{ct}$$

in panel A, where Y_{ct} corresponds to establishment counts within each county as indicated. In panel B, $Post_t \times MemAssetShare_c$ is used to instrument for county-wide seasonal credit borrowing as a share of total deposits, $Post_t \times \frac{SCF_c}{Deposits_c}$. Standard errors (in parentheses) are clustered at the county level. The Kleibergen-Paap (2006) first stage F-stat, the p-value of the Anderson-Rubin (1949) weak-instrument robust inference test of the statistical significance of the endogenous regressor in the structural equation, and the number of observations are reported for each 2SLS specification. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table 10: Miscellaneous retail establishment outcomes for counties exposed to the Seasonal Credit Facility

Panel A: Reduced Form Estimates

	ln(Misc. Retail Establishments)					
	All		≤4 employees		>20 employees	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.155***	0.099***	0.133***	0.085***	0.068	0.042
	(0.029)	(0.028)	(0.030)	(0.030)	(0.062)	(0.064)
Adj. R^2	0.94	0.94	0.89	0.89	0.61	0.61
N	9,413	9,413	9,372	9,372	3,186	3,186
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Panel B: 2SLS Estimates

	ln(Misc. Retail Establishments)					
	All		≤4 employees		>20 employees	
	(1)	(2)	(1)	(2)	(1)	(2)
$\widehat{Post_t \times \frac{SCF_c}{Deposits_c}}$	11.814***	7.582***	10.100***	6.488***	4.945	3.379
	(2.759)	(2.321)	(2.667)	(2.398)	(4.503)	(5.016)
1st Stage F	43.6	43.3	43.6	43.3	24.3	21.2
AR Wald (p)	0.000	0.000	0.000	0.004	0.259	0.490
N	9,382	9,382	9,342	9,342	3,175	3,175
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameter from an estimation of the following regression:

$$ln(Y_{ct}) = \gamma_c + \phi_{FRS,t} + \beta\big[Post_t \times MemAssetShare_c\big] + \kappa\big[Post_t \times \boldsymbol{X}_c\big] + \varepsilon_{ct}$$

in panel A, where Y_{ct} corresponds to establishment counts within each county as indicated. In panel B, $Post_t \times MemAssetShare_c$ is used to instrument for county-wide seasonal credit borrowing as a share of total deposits, $Post_t \times \frac{SCF_c}{Deposits_c}$. Standard errors (in parentheses) are clustered at the county level. The Kleibergen-Paap (2006) first stage F-stat, the p-value of the Anderson-Rubin (1949) weak-instrument robust inference test of the statistical significance of the endogenous regressor in the structural equation, and the number of observations are reported for each 2SLS specification. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table 11: High-barrier-industry establishment growth for counties exposed to the Seasonal Credit Facility

Panel A: Reduced Form Estimates

	Lodging		Banking		Gas Stations	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.022	0.016	0.002	–0.007	0.022	0.003
	(0.020)	(0.020)	(0.021)	(0.021)	(0.018)	(0.018)
Adj. R^2	0.97	0.97	0.96	0.96	0.96	0.96
N	11,198	11,198	11,221	11,221	10,268	10,268
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Panel B: 2SLS Estimates

	Lodging		Banking		Gas Stations	
	(1)	(2)	(1)	(2)	(1)	(2)
$\widehat{Post_t \times \frac{SCF_c}{Deposits_c}}$	1.568	1.102	0.173	–0.507	1.658	0.227
	(1.412)	(1.454)	(1.467)	(1.496)	(1.408)	(1.351)
1st Stage F	61.9	47.5	61.8	47.4	54.7	49.8
AR Wald (p)	0.259	0.442	0.906	0.734	0.235	0.867
N	11,163	11,163	11,186	11,186	10,237	10,237
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameter from an estimation of the following regression:

$$ln(Y_{ct}) = \gamma_c + \phi_{FRS,t} + \beta\big[Post_t \times MemAssetShare_c\big] + \kappa\big[Post_t \times \boldsymbol{X}_c\big] + \varepsilon_{ct}$$

in panel A, where Y_{ct} corresponds to the establishment counts within each county for the indicated industries. In panel B, $Post_t \times MemAssetShare_c$ is used to instrument for county-wide seasonal credit borrowing as a share of total deposits, $Post_t \times \frac{SCF_c}{Deposits_c}$. Standard errors (in parentheses) are clustered at the county level. The Kleibergen-Paap (2006) first stage F-stat, the p-value of the Anderson-Rubin (1949) weak-instrument robust inference test of the statistical significance of the endogenous regressor in the structural equation, and the number of observations are reported for each 2SLS specification. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table 12: Rural County Summary Statistics (Dec. 1972)

	No Petro Industry	Petro Industry	Difference
Employment Growth (%, 1973–1974)	1.74	2.64	0.90***
Income Growth (%, 1973–1974)	4.82	8.87	4.05***
Employment Growth (%, 1973–1975)	1.33	3.49	2.16***
Income Growth (%, 1973–1975)	15.7	21.8	6.08***

Notes: This table reports average employment and income growth rates for rural counties separated based on the presence of a petroleum industry. Statistical significance: *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.10$.

Table 13: Employment and establishment growth for counties exposed to the Seasonal Credit Facility and the petroleum industry

Reduced Form Estimates						
	ln(Employment)		ln(Proprietors' Employment)		ln(Non-farm Prop. Employment)	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.017***	0.016**	0.025***	0.019***	0.025**	0.019**
	(0.006)	(0.006)	(0.007)	(0.006)	(0.008)	(0.008)
$Post_t \times MemAssetShare_c \times Petro_c$	–0.005	–0.007	0.016	0.007	0.021	0.010
	(0.016)	(0.015)	(0.017)	(0.016)	(0.019)	(0.018)
Adj. R^2	0.99	0.99	0.99	0.99	0.99	0.99
N	11,417	11,417	11,417	11,417	11,417	11,417
			ln(Small Establishments)			
	Building Materials		Bars & Restaurants		Misc. Retail	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.064***	0.050***	0.119***	0.092***	0.139***	0.100***
	(0.017)	(0.016)	(0.031)	(0.031)	(0.033)	(0.032)
$Post_t \times MemAssetShare_c \times Petro_c$	0.034	0.000	0.082	0.041	0.077	–0.028
	(0.033)	(0.032)	(0.074)	(0.076)	(0.069)	(0.063)
Adj. R^2	0.96	0.96	0.86	0.86	0.89	0.89
N	11,222	11,222	9,556	9,556	9,372	9,372
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameters from an estimation of the following regression:

$$ln(Y_{ct}) = \gamma_c + \phi_{FRS,t} + \beta_0 \left[Post_t \times MemAssetShare_c\right] + \beta_1 \left[Post_t \times MemAssetShare_c \times Petro_c\right] + \kappa \left[Post_t \times \boldsymbol{X}_c\right] + \varepsilon_{ct}$$

where Y_{ct} corresponds to the dependent variables as indicated. $Petro_c$ denotes a dummy variable that takes a value of one for counties with a petroleum industry. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table 14: Employment, wages, and contributions to government social insurance programs for counties exposed to the Seasonal Credit Facility

Panel A: Reduced Form Estimates

	Wage & Salary Employment		Total Wages & Salaries ($000s)		Contrib. to Gov. Social Insurance ($000s)	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	364***	135***	8,882***	2,378***	1,432***	331***
	(57.4)	(50.3)	(1,120)	(706)	(180)	(108)
Adj. R^2	0.99	0.99	0.96	0.97	0.92	0.96
N	11,417	11,417	11,417	11,417	11,417	11,417
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Panel B: 2SLS Estimates ($\times 10^{-3}$)

	Wage & Salary Employment		Total Wages & Salaries ($000s)		Contrib. to Gov. Social Insurance ($000s)	
	(1)	(2)	(1)	(2)	(1)	(2)
$\widehat{Post_t \times \frac{SCF_c}{Deposits_c}}$	26.7***	9.7**	649.6***	170.9***	104.5***	23.5**
	(5.3)	(3.9)	(116.1)	(57.5)	(18.8)	(8.65)
1st Stage F	61.9	47.1	61.9	47.1	61.9.9	47.1
AR Wald (p)	0.000	0.007	0.000	0.001	0.000	0.007
N	11,382	11,382	11,382	11,382	11,382	11,382
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameter from an estimation of the following regression:

$$Y_{ct} = \gamma_c + \phi_{FRS,t} + \beta\big[Post_t \times MemAssetShare_c\big] + \kappa\big[Post_t \times \boldsymbol{X}_c\big] + \varepsilon_{ct}$$

in panel A, where Y_{ct} corresponds to the dependent variables indicated in column headers. In panel B, $Post_t \times MemAssetShare_c$ is used to instrument for county-wide seasonal credit borrowing as a share of total deposits, $Post_t \times \frac{SCF_c}{Deposits_c}$. Standard errors (in parentheses) are clustered at the county level. The Kleibergen-Paap (2006) first stage F-stat, the p-value of the Anderson-Rubin (1949) weak-instrument robust inference test of the statistical significance of the endogenous regressor in the structural equation, and the number of observations are reported for each 2SLS specification. Statistical significance: $^{***}\ p \leq 0.01,^{**}\ p \leq 0.05,^{*}\ p \leq 0.10$.

Table A1: Employment and establishment growth for ultra-rural counties

Reduced Form Estimates						
	ln(Employment)		ln(Proprietors' Employment)		ln(Non-farm Prop. Employment)	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.018**	0.017**	0.020***	0.020***	0.023**	0.023**
	(0.007)	(0.007)	(0.008)	(0.007)	(0.010)	(0.009)
Adj. R^2	0.99	0.99	0.99	0.99	0.99	0.99
N	7,854	7,854	7,854	7,854	7,854	7,854
			ln(Small Establishments)			
	Building Materials		Bars & Restaurants		Misc. Retail	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.056***	0.051***	0.095***	0.074**	0.178***	0.157***
	(0.020)	(0.018)	(0.040)	(0.036)	(0.043)	(0.041)
Adj. R^2	0.95	0.95	0.82	0.83	0.86	0.87
N	7,708	7,708	6,182	6,182	5,968	5,968
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameter from an estimation of the following regression:

$$ln(Y_{ct}) = \gamma_c + \phi_{FRS,t} + \beta\big[Post_t \times MemAssetShare_c\big] + \kappa\big[Post_t \times \boldsymbol{X}_c\big] + \varepsilon_{ct}$$

where Y_{ct} corresponds to the dependent variables as indicated. Standard errors (in parentheses) are clustered at the county level. Ultra-rural counties are those with a total urban population of fewer than 2,500 people or counties with a total urban population of fewer than 20,000 that are not adjacent to an MSA. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table A2: Balance sheet and income changes for member banks that the Federal Reserve identified as likely beneficiaries (county-level geographic unit, intent-to-treat/reduced form estimates)

Panel A			
	$\frac{\text{Liq. Assets}}{\text{Assets}}$	$\frac{\text{Loans}}{\text{Assets}}$	ln(Loans)
$Post_t \times \mathbb{1}_{SCF}(b)$	-0.020***	0.022***	0.044**
	(0.006)	(0.006)	(0.019)
Adj. R^2	0.83	0.82	0.97
N	12,974	12,974	12,972
Panel B			
	$\frac{\text{C\&I Loans}}{\text{Assets}}$	$\frac{\text{CRE Loans}}{\text{Assets}}$	$\frac{\text{Cons. Loans}}{\text{Assets}}$
$Post_t \times \mathbb{1}_{SCF}(b)$	0.009***	0.000	0.005*
	(0.003)	(0.002)	(0.003)
Adj. R^2	0.80	0.84	0.89
N	9,483	9,483	9,483
Panel C			
	$\frac{\text{RRE Loans}}{\text{Assets}}$	$\frac{\text{Ag Loans}}{\text{Assets}}$	$\frac{\text{Int. Income}}{\text{Assets}}(\%)$
$Post_t \times \mathbb{1}_{SCF}(b)$	0.003	0.008**	0.203***
	(0.002)	(0.004)	(0.047)
Adj. R^2	0.93	0.93	0.64
N	9,483	9,483	5,154
Bank FEs	✓	✓	✓
FIPS×Time FEs	✓	✓	✓

Notes: This table reports difference-in-differences estimates from regressions of the indicated dependent variables on the interaction term, $Post_t \times \mathbb{1}_{Mem50}(b)$, which equals one for post-treatment (1973 Q2 and later) observations of banks that the Federal Reserve identified as the most likely to benefit from the SCF given the terms at the time, bank fixed effects, and county-time fixed effects:

$$Y_{bt} = \gamma_b + \phi_{FIPS,t} + \beta\big[Post_t \times \mathbb{1}_{Mem50}(b)\big] + \varepsilon_{bt}.$$

Standard errors (in parentheses) are clustered at the bank level. Statistical significance: $^{***}\ p \leq 0.01,^{**}\ p \leq 0.05,^{*}\ p \leq 0.10$.

Table A3: Employment and establishment growth with a binary measure of treatment for high membership share counties

Reduced Form Estimates

	ln(Employment) (1)	ln(Employment) (2)	ln(Proprietors' Employment) (1)	ln(Proprietors' Employment) (2)	ln(Non-farm Prop. Employment) (1)	ln(Non-farm Prop. Employment) (2)
$Post_t \times Treat_c$	0.013**	0.012**	0.018***	0.011**	0.017**	0.011*
	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)	(0.007)
	ln(Small Establishments)					
	Building Materials (1)	Building Materials (2)	Bars & Restaurants (1)	Bars & Restaurants (2)	Misc. Retail (1)	Misc. Retail (2)
$Post_t \times Treat_c$	0.049***	0.033**	0.087***	0.062**	0.110***	0.062**
	(0.015)	(0.014)	(0.026)	(0.027)	(0.028)	(0.028)
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameter from an estimation of the following regression:

$$ln(Y_{ct}) = \gamma_c + \phi_{FRS,t} + \beta\big[Post_t \times Treat_c\big] + \kappa\big[Post_t \times \boldsymbol{X}_c\big] + \varepsilon_{ct}$$

where Y_{ct} corresponds to the dependent variables as indicated. Standard errors (in parentheses) are clustered at the county level. $Treat_c$ is a dummy variable that identifies counties with a $MemAssetShare_c$ value in the top tercile. Banks with a $MemAssetShare_c$ in the bottom tercile compose the control group. Statistical significance: *** $p \leq 0.01$,** $p \leq 0.05$,* $p \leq 0.10$.

Table A4: Employment and establishment growth using the DID_{M} estimator

Reduced Form Estimates						
	ln(Employment)		ln(Proprietors' Employment)		ln(Non-farm Prop. Employment)	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.016**	0.016**	0.021***	0.018**	0.022**	0.020**
	(0.007)	(0.007)	(0.008)	(0.008)	(0.010)	(0.009)
			ln(Small Establishments)			
	Building Materials		Bars & Restaurants		Misc. Retail	
	(1)	(2)	(1)	(2)	(1)	(2)
$Post_t \times MemAssetShare_c$	0.079***	0.062***	0.062	0.096**	0.108***	0.100**
	(0.019)	(0.017)	(0.045)	(0.042)	(0.042)	(0.041)
County FEs	✓	✓	✓	✓	✓	✓
District×Time FEs	✓	✓	✓	✓	✓	✓
County Controls	–	✓	–	✓	–	✓

Notes: This table reports the β parameter using the DID_{M} estimator described in de Chaisemartin and D'Haultfœuille (2021), which can accommodate continuous treatment and non-staggered designs. Y_{ct} corresponds to the dependent variables as indicated. Statistical significance: $^{***}\ p \leq 0.01,^{**}\ p \leq 0.05,^{*}\ p \leq 0.10$.

Table B1: Item Numbers for Bank-Level Financial Information (Forms FR 105, FR 107)

Description	Item #	Description	Item #
Total Assets	2170	Consumer Loans	1975
Cash and Due From Banks	0010	Residential RE Loans	1430, 1460
Treasury Securities	0400	Agricultural Loans	1420, 1590
GSE/Agency Securities	0600	Loan Interest & Fees	4010
Fed Funds Sold	1350	Income on Fed Funds Sold	4020
Total Loans	1400	Interest on Treasury Securities	4030
C&I Loans	1600	Interest on GSE/Agency Securities	4040
CRE Loans	1480	Interest on Muni Securities	4060

Notes: This table lists the item numbers from each bank's FR 105 and FR 107 forms that were used to generate each reported series. Prefix mnemonics are RCON for all balance sheet items and RIAD for all income items.