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COLLATERAL DAMAGE:
THE IMPACT OF FORECLOSURES ON NEW HOME MORTGAGE LENDING IN THE 1930S

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ABSTRACT

Foreclosures led to severe disruptions in home mortgage lending during the recent Great Recession and the Great Depression of the 1930s. It is difficult to measure these impacts in the modern market where origination, funding and servicing are separated within complex lending structures, but during the 1930s local building & loans (B&Ls) combined all three functions. We measure the impact of foreclosures on new mortgage lending using a panel of all B&Ls in 4 states. The foreclosure overhang explains about 30 percent of the drop in new mortgage lending by B&Ls as the housing crisis intensified between 1930 and 1935.

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1. INTRODUCTION

The large literature on the Great Depression over the past several decades has paid relatively little attention to the housing sector and mortgage finance. Many scholars have written about business credit and the commercial banking system during the Depression, but the residential mortgage sector was largely financed by non-banks in this period.[2] In the wake of the 2007-2009 financial crisis and the central role of mortgage finance in that crisis, a rapidly growing literature has placed a new lens on the Depression to examine the causes, severity, and impact of the collapse of the housing sector. As a result, scholars have recently discovered a great deal about the interwar mortgage finance system, house prices, home ownership, residential construction, and government policies designed to address all of these concerns.[3] Indeed, the Depression featured a severe, nationwide housing crisis. Housing construction fell catastrophically, far more than the general economy, and recovered more slowly as well. The joint collapse of housing prices and employment led to widespread foreclosures, caused a decline in home ownership, and revealed the fragility of the patchwork 1920s mortgage finance sector—the subject of this paper. We describe how the housing crisis created substantial restrictions in the provision of credit by the leading residential mortgage lender in the nation on the eve of the great Depression, building and loan associations (B&Ls).

Beyond its historical significance, the paper also contributes to the extensive recent literature on financial frictions. In their survey of that literature Gertler and Gilchrist (2018) note that these frictions take many forms during credit crises and work through the balance sheets of households, businesses and intermediaries, such as B&Ls. Our focus is on how frictions caused by the acquisition of foreclosed real estate by B&Ls impaired the flow of credit. Foreclosures contribute to housing crises through several different channels, of course, including through household balance sheets and the downward pressure they exert on general housing prices (Mian, Sufi, and Trebbi 2015; Annenberg and Kang 2014). Variations in the costs and delays associated with foreclosure across states generate longer-run differences in the cost and availability of mortgage credit even after the crisis has passed (Pence 2006; Ghent and Kuykendall 2011).

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[2] White (1984); Wicker (1996); Calomiris and Mason (1997); Mitchener (2005); Richardson and Troost (2009); Carlson and Mitchener (2009); Carlson, Mitchener, and Richardson (2011).

[3] Courtemanche and Snowden (2011), Fishback, Flores-Lagunes, Horrace, Kantor, and Treber (2011), Rose (2011), and Fishback, Rose, and Snowden (2013) examine the Home Owners' Loan Corporation. See also Field (2014), Fishback and Kollman (2014), White (2014), Brocker and Hanes (2014), Gjerstad and Smith (2014), Postel-Vinay (2016), and Cortes and Wiedenmier (2018).

We focus more narrowly here on a direct and immediate mechanism—the short-run decrease in new mortgage lending by an intermediary during a crisis as revenue-generating mortgage loans are replaced on its balance sheet with costly and low-earning foreclosed real estate. This channel is at work during every foreclosure crisis and is likely to be important. We know, to begin with, that the direct costs to lenders of liquidating foreclosed real estate in the modern market are substantial—about 12 percent of the original loan balance in normal times and rising to 20 percent and higher during a crisis when foreclosure rates also increase dramatically (Cordell et al 2015)[4]. Given that *ex ante* expected deadweight losses from default and foreclosure are central to our understanding and explanation of optimal contracting and renegotiation within the mortgage market, it is reasonable to conjecture that a spike in the actual level of these costs during a crisis can generate significant and immediate disruptions to the supply of credit.

During the 2007-2009 financial crisis, for example, foreclosures led to a large excess supply of vacant homes, and the supply of credit tightened considerably (Federal Reserve, 2012). It is difficult to study the direct link between these two developments, however, because loan origination, servicing and funding have been separated in the modern market within complex institutional structures. As a result, the costs and delays generated by foreclosures are shared, and often contested, by a variety of participants with different incentives and contractual obligations. Underscoring the difficulties and potential importance of understanding these complexities, a literature has developed examining whether and how the institutional fragmentation associated with securitization may have been responsible for increases in foreclosure rates during the latest crisis.[5]

The setting for 1930s B&Ls was much simpler. Foreclosures led to real estate owned (REO) on the balance sheet. To examine the link between REO and mortgage lending, we collected annual balance sheet data for every state-chartered building and loan association operating in four states between 1928 and 1940: Iowa, New York, North Carolina, and Wisconsin. These four states capture important regional variation in housing crisis and recovery, and the evolution of the thrift industry, during the 1930s. But the selection of these states was primarily driven by the availability of data on the volume of new mortgage lending

[4] Cordell et al focus on variations in the direct costs of foreclosure across states. Their measure of direct costs to the lender includes the fixed legal costs and the variable costs associated with foregone principal and interest, property taxes, hazard insurance, and excess depreciation. Not included, therefore, are external costs of foreclosures such as losses to the homeowner due to the disruption or the loss in value of neighboring properties.

[5] Piskorsi and Seru (2010); Adelino, Gerardi and Willen (2014); Kruger (2018)

each year. Having information about the flow of new lending is unusual and particularly valuable because in its absence we would be forced to rely on annual changes in the stock of mortgage loans reported on the balance sheet to measure the volume of new loans. This proxy is frequently employed in examination of new lending by banks, but it is a noisy and potentially biased measure for institutions that hold portfolios dominated by mortgages of different vintages and durations when they are dealing with unusually high levels of terminations due to foreclosures. We show that the reduction in measurement error from using the actual value of new loans leads to materially different coefficients and more precisely estimated results.

Our empirical strategy leverages yearly shocks to the value of the REO at each B&L to analyse how REO affected the annual flow of new loans. These changes in REO are generated by repayment failures at the B&L level, which typically were driven by job loss, house price declines, health failures, and other negative shocks to households. After conditioning on the structure of each B&L's assets and liabilities, market-by-year fixed effects that control for local shocks to the economy and housing markets, and fixed effects to control for time-invariant features of each B&L, our identification is based on an absence of correlation between the unmeasured annual variation in the correlates of new loans and the failures in repayment that contributed to increased REO. In addition, we show that the results are robust to potential threats to identification coming from changing the definition of markets, changes in the identity of B&L managers, differences in long run firm survival, differential access to liquidity through government programs, and decisions by state-chartered B&Ls to transition to the new federal savings and loan model.

We find that an increase in foreclosed real estate on a B&L's balance sheet had a powerful and negative effect on new mortgage lending during the 1930s. A one-standard-deviation rise in REO as a share of assets was associated with a 5 percentage point drop in new loans as a percentage relative to assets. Such a drop was nearly one-third of the mean value of the ratio of new loans to assets among B&Ls. The impact of REO was felt throughout the crisis, but changed in character during the decade Between 1929 and 1935, the increase in the mean REO share was associated with 30 percent of the drop in the mean new loan share. In contrast, the REO mean share of B&L assets remained elevated throughout the last half of the decade with only a small reduction that accounted for 5 percent of the total increase in new loans

2. LITERATURE

This paper contributes to a well-established literature on the impact of financial factors during the Great Depression and especially to a recent resurgence of interest in the role that housing finance played during that crisis. The importance and centrality of the home mortgage market was certainly not lost on President Hoover who by August 1930 convened his own conference on housing and homeownership that examined, among other issues, weaknesses and potential improvements in home mortgage finance. Over the next four years the federal government put in place a far-reaching program of emergency and permanent interventions specifically designed to reduce frictions that were thought to have caused the 1930s housing crisis and impeded its recovery. The FHLB Act of 1932 established a discount lending facility to improve the liquidity of home mortgage lenders, the Home Owners Loan Act of 1933 set up a temporary agency that refinanced distressed home mortgages on 10 percent the nation's owner-occupied homes and set up a system of federal charters for home mortgage lenders and the National Housing Act of 1934 set up federal insurance programs for federal savings and loan associations (the FSLIC) and individual home mortgages (the FHA). The 1930s housing crisis was the pivotal episode in the institutional development of the modern US housing finance, and those policies were directly linked to policy-makers assessment at that time of the financial frictions in mortgage finance that were at work (Snowden, 2010).

By the late 1930s economists began to assess the real impacts of the housing finance crisis. This literature embedded the issue in a broader approach to the role of a general "building cycle" as a contributor to recessions and "long-swings" in building cycles as important contributors to the severe crises in the 1870s, 1890s and the 1930s (Abramovitz, 1964; Hansen, 1964). The interest in construction and building as integral to severe macroeconomic events waned after the building cycle was declared to have "passed" in the 1960s (Hickman, 1973), although apparent "overbuilding" and "unplanned development" have been examined by economic historians since then (Bolch et al, 1971; Field, 1992).

Interest in the developments in housing finance during the 1930s also began to wane in the 1960s, in part because the National Bureau of Economic Research sponsored and produced a comprehensive and authoritative series during the 1950s of developments in home mortgage lending during the Depression and the immediate postwar era (Snowden, 2014). Just as important was the renewed attention paid to the banking sector as a result of Friedman and Schwartz (1963). Bernanke (1983), in particular, turned the voluminous literature on banking towards financial frictions and since then a large number of papers have

yield many insights into sources and consequences of commercial bank fragility during the Depression.[6]

The literature on banking during the Depression has generally touched little on housing finance, as commercial banks were a relatively small part of that market. Indeed, before 2010, scholars devoted relatively little attention to the housing crisis of the 1930s. Of course, there are exceptions. Most notably, Mishkin (1978) studies the household balance sheet during the Depression. Eichengreen and Mitchener (2003) describe the multifaceted nature of the 1920s credit expansion, including in housing finance. Calomiris and Mason (2003) examine how commercial bank balance sheets affected their new lending, with a focus on real effects in the housing sector.

Since 2010, scholars have come to view the Depression as featuring a severe and prolonged crisis in the housing and housing finance sectors that had been largely overlooked by previous research. Housing starts dropped 85 percent between 1929 and 1933, compared to a 30 percent drop in real GDP. Starts also failed to recover to their 1929 level until 1940, while real GDP had recovered to its 1929 level by 1936. Median nominal home values fell by 18% to 32% between 1930 and 1940 for the nation, and by at least 25% in 80 percent of the nation's counties. More to the point of this paper, 10 to 20 percent of mortgaged homeowners experienced a foreclosure between 1926 and 1936, while new lending volumes throughout the 1930s—the subject of this paper—remained at most half of the level of the late 1920s. Finally, residential mortgage debt as a share of total mortgage debt fell from 34% to 24% between 1934 and 1940, while the nonfarm homeownership rate fell from 45 to 40 percent between 1930 and 1940.[7]

The central role of housing finance in the 2007-2009 financial has generated a surge of recent interest in the 1930s housing crisis.[8] A key feature of that crisis is its drawn-out resolution, especially relative to the disruptions in the commercial banking sector, as described by Fleitas, Fishback, and Snowden (2018) and Rose (2014). These studies have not yet attempted to estimate how foreclosure shocks limited new mortgage lending.

[6] White (1984); Wicker (1996); Calomiris and Mason (1997); Mitchener (2005); Richardson and Troost (2009); Carlson and Mitchener (2009); Carlson, Mitchener, and Richardson (2011).
[7] Housing starts: Carter, et. al. 2006, series Dc24; Housing prices: Fishback and Kollman (2011), U.S. Census; Residential mortgage debt: Grebler, Blank, and Winnick 1956, Table L-6; Carter, et. al. 2006, series Dc1257.
[8] Courtemanche and Snowden (2011), Fishback, Flores-Lagunes, Horrace, Kantor, and Treber (2011), Rose (2011), and Fishback, Rose, and Snowden (2013) examine the Home Owners' Loan Corporation. See also Field (2014), Fishback and Kollman (2014), White (2014), Brocker and Hanes (2014), Gjerstad and Smith (2014), Postel-Vinay (2016), and Cortes and Wiedenmier (2018).

The literature on the recovery from the Great Depression has also grown in recent years. Fishback (2017) provides a survey of the growing literature in this area. Several papers have focused narrowly on the sharp turnaround during the spring of 1933, including Hausman, Rhode, and Wieland (2017), Taylor and Neumann (2016), Jalil and Rua (2015), and Eggertson (2008). Other papers examine the longer period of recovery that lasted up to World War II, including Fishback, Horrace and Kantor (2005) and Fishback and Kachanovskaya (2015). For the most part, these papers focus on inflationary expectations and nonfinancial microeconomic variables. In contrast, this paper looks at the role of continued financing frictions within the residential mortgage sector.

3. NEW LOANS AND REO IN BUILDING AND LOAN COMPANIES

There were three fundamental features about B&Ls to keep in mind when analyzing the impact of foreclosures on new loans in the 1930s. First, B&Ls were the key actors in the shortage of housing credit during the Great Depression. Second, the business model of B&Ls created a strong credit channel through which B&Ls had to reduce new loans after they foreclosed on loans. Third, institutional changes, like the creation of the Home Owners' Loan Corporation (HOLC) and Federal Home Loan Bank Board (FHLBB) and the shift toward federal saving and loans, did not alter the damaging effect of foreclosures and the holding of REO on B&L balance sheets. This section elaborates on each of these features, in turn.

B&Ls in the Housing Crisis of the 1930s

Building and loans were the primary institutional source of mortgage funds in the interwar US, and therefore played a central role in the housing boom of the 1920s and the housing crisis of the Depression. By 1929 more than 12,000 of these lenders, which specialized in local residential loans, were operating in every state and region and in cities of all sizes.[9] At that point B&Ls claimed 12 million members, had financed 4.2 million of the 7 million homes built during the 1920s and accounted for 48 percent of the mortgage debt held by institutional lenders on the nation's 1 to 4 family homes.[10] All the success came to a halt in the 1930s.

[9]See Bodfish (1931, 136). More than 5,000 B&Ls were established and began operation during the urban building boom of the 1880s. During the housing boom of the 1920s, more than 3,000 new B&Ls appeared. In both periods B&Ls grew in number and importance in all regions and states, and in cities of all sizes (Snowden, 2003).

[10] *Housing Statistics Handbook*, 1948, p. 114. Individuals held 40 percent of home mortgage debt as late as 1930. See also Carter, et.al. (2006, 4-540). In 1929, individuals were still a major non-institutional source of credit, accounting for about 26 percent of new housing mortgages. The data for B&Ls are reported under the listing for savings and loan associations, the nomenclature to which B&Ls widely switched during the 1930s

Between 1929 and 1939 the number of B&Ls and their total assets decreased by one-third, while the industry's loan portfolio shrank by nearly one-half. Two features of this experience are noteworthy. First, the decline in the B&L industry was more severe than for other intermediaries serving the residential market, as their market share fell by 10 percentage points over the decade of the 1930s. Second, the disruption in the industry varied across space. As shown in Table 1, all regions suffered reversals during the decade, but the damage was most severe and the recovery weakest in the Mid-Atlantic and East North Central regions that had been B&L strongholds before 1930. In contrast, the assets and loans of B&Ls in the South Atlantic region fully recovered and actually increased between 1929 and 1939 despite a one-third decrease in number of associations.

New Lending and Real Estate Owned

B&Ls primarily existed to make housing loans. Their ability to make those loans was reduced when they had to foreclose on borrowers and hold real estate on their balance sheets until it could be resold. Between 1930 and 1933 B&L real estate owned increased from nearly 3 percent to 17 percent of total assets. Yet, even worse lay ahead. The industry's REO peaked at an enormous 20 percent of assets, and then began a slow protracted decline for the rest of the decade. By 1939 B&L real estate holdings still represented 12 percent of assets for the industry as a whole; a high of 22 percent in the Mid-Atlantic region, and between 9 and 12 percent in New England and the East North and South Central regions. Even more sobering, these figures apply only to B&Ls that were still operating in 1939; an unknown amount of real estate was owned by closed B&Ls who were in the process of liquidating. Throughout the 1930s the overhang of foreclosed real estate on the B&L industry's balance sheet was substantial, severe, and persistent.

The difficulties associated with large amounts of foreclosed real estate on B&L balance sheets were well understood at the time. Articles that appeared in the 1930s in the *Federal Home Loan Bank Review,* a residential mortgage periodical published by the Federal Home Loan Bank Board, repeatedly described how the large amounts of foreclosed real estate were inhibiting B&Ls from operating as well-functioning mortgage lenders (Federal Home Loan Bank Board 1934, 1936, and 1938). To explain how, it is necessary to briefly characterize the contractual structure and balance sheet of a building and loan.

B&Ls used a contractual structure designed for cooperative residential mortgage lending. The members of these cooperative associations were owners and not depositors. Non-borrowing members saved by purchasing shares in the B&L on the instalment plan. For a

maturity value of $100, for example, they paid one dollar each month until the amount paid in plus dividends accumulated to $100. At that point the member could withdraw from the association or continue to own "fully paid" shares. Borrowing members of the B&L were also required to purchase shares on the same instalment plan, which served as a form of amortization. Borrowing members pledged to purchase shares with a combined maturity value equal to the principal on their loans, and then made monthly purchases of those shares while also paying interest on their full loan amounts. When the value of a sinking fund reached the principal value of a loan, the borrower could repay the loan and exit the B&L.

Recent research has improved understanding of how the contractual structure of the B&L shaped the pace and character of its recovery from the 1930s crisis. Members of B&Ls were owners of the institution and did not have rights to withdraw their funds if withdrawal compromised the value of the shares held by the remaining members. Thus, many members were stuck with an illiquid investment. Rose (2014) shows that a number of members sold their shares, often at a substantial loss, in the secondary markets for B&L shares. Meanwhile, B&L managers avoided losses by exchanging foreclosed real estate for purchased second-hand shares. Rose shows that the market for shares remained active until 1938, after which resolution began to take the form of voluntary liquidations and reorganizations. Fleitas, Fishback and Snowden (2017) show that B&Ls were slow to liquidate and reorganize because their bylaws and case law required support of two-thirds of the members in a vote before the institution could be liquidated. Borrowing members had strong incentives to vote against liquidation because they could avoid significant losses if they could repay their loans before the B&L liquidated. Consequently, liquidation was delayed significantly until the share of borrowing members fell below one-third.

The question in this paper arises naturally from these insights. How did substantial real estate holdings affect the lending behavior of a B&L industry that operated throughout the 1930s in a relatively illiquid condition? To understand the impact, consider the relatively simple structure of the B&L balance sheet. Mortgage loans generally represented 90 percent of assets, and the members' ownership shares—both non-borrowers and borrowers—represented more than 90 percent of liabilities. Under non-distressed conditions, the B&L lending channel involved the decision of how to allocate the pool of current resources generated each year to its asset categories: primarily mortgage loans, stock (personal) loans, securities, or cash. The size of this pool was determined by the volume of net earnings: the difference between inflows (loan repayments plus members' contributions of dues) and gross outflows

(operating and legal expenses plus members' withdrawals). In normal times net earnings were generally positive as payments of interest and principal exceeded withdrawal requests.

During the crisis of the 1930s, when borrowers stopped repaying their loans, B&Ls foreclosed on these loans, converting them into real estate on their balance sheets. The foreclosure process often took 6 to 12 months and the eventual sales price of the real estate was 30 to 50 percent lower than the original purchase prices. The situation worsened because dues paid into the association by non-borrowers dropped precipitously because of concerns about investing in B&Ls saddled with low earning REO. The combination of these forces reduced current earnings and the total pool of resources available to invest in all assets, of which roughly 90 percent typically went to new mortgages.

Additional forces decreased the volume of new mortgage lending by B&Ls. The Depression generated high unemployment and reduced incomes, which reduced new household formation and the demand for housing. Field (1992) suggests that uncontrolled land development during the 1920s made home construction more difficult in the 1930s by creating lots and land use configurations that did not fit the new economic environment. The drops in housing prices might have changed households' assessments of the security of a home as a household investment.

Our focus here is on disruption in the new loan supply that came from the shocks from mortgage repayment failures that led to foreclosures. In the large literature on financing frictions, Bernanke (1983) famously explored these ideas in the Great Depression primarily in the context of commercial banking suspensions and failures. Financial accelerator models by Bernanke, Gertler and Gilchrist (1996) and Kiyotaki and Moore (1997), in general rely, on economics effects stemming from changes in the value of the collateral underlying loans. Our goal is to examine how the unprecedented volume of foreclosed residential real estate on the balance sheet of B&Ls in the 1930s reduced their capacity to make new mortgage loans.

Institutional Changes

New Deal policymakers were aware of and responsive to the distress created by the housing crisis of the 1930s. These interventions reshaped the character and structure of the nation's mortgage market for decades but had only limited or indirect impact on the REO problem faced by the B&L industry. The most aggressive federal program was the HOLC, which was created in 1933 to purchase distressed home mortgages from private lenders and

refinance those loans on more liberal terms (Harriss 1951; Fishback, Rose, and Snowden, 2013). Between 1934 and 1936 the agency purchased and refinanced one million home loans with a nominal value of $2.75 billion and 30 percent of these were originally held by B&Ls. These purchases clearly reduced the volume of real estate that B&Ls carried on their balance sheet because applicants for HOLC loans were approved only if they could demonstrate they were likely to default on their loan. But the HOLC also rejected 1 million applications, often because the borrower's distress appeared to be "too severe" to be ameliorated by a loan modification. HOLC refusals, therefore, left substantial amounts of foreclosed real estate on the balance sheets of B&Ls and other intermediaries. The consensus of recent evidence suggests that the HOLC ameliorated but did not reverse the negative impact of the crisis on home values, ownership and construction (Fishback et al. 2011; Courtemanche and Snowden 2011). The goal of this paper is to examine whether the real estate that remained on the B&Ls balance sheet curtailed their mortgage lending.

A second New Deal policy that had limited impact in the 1930s on the foreclosure problems of the B&Ls was the establishment of the Federal Housing Administration (FHA) mortgage loan insurance program in 1934 (Snowden, 2013, 78-82). The FHA focused on insuring amortized direct reduction mortgages that ran for 15 or more years. As lenders shifted their lending to take advantage of the insurance, this created more competition for B&Ls, which had up to that point dominated nonfarm mortgage lending by offering the sort of fully amortized medium or long-term loans that the FHA now encouraged all lenders to write.[11] In fact, to avoid such competition, the United States Building & Loan League strenuously opposed the creation of FHA, then insisted it remain a separate agency outside of the FHLB system, and then used the FHA program less than any other major lending group during the 1930s and for decades after that (Ewald 1962, 134–45).

Federal policymakers also enacted three policies specifically addressed to the B&L sector. First was the creation in 1932 of the Federal Home Loan Bank (FHLB) system that was designed to alleviate distress by providing liquidity to B&Ls through short-term loans. But membership in the FHLB was restricted, and B&Ls with high amounts of REO had trouble

[11]The B&L loan contracts combined an interest-only loan with a balloon payment of the principal with monthly purchases of membership shares that went into the sinking fund. The membership shares in the sinking fund also paid dividends to the sinking fund. The typical monthly payment stayed the same until the borrower had accumulated enough in the sinking fund to repay the full principal on the loan. During the repayment period, the amount of principal remained the same. Depending on the dividend rate, accumulating enough to repay the principal typically took about 11 to 13 years. This contrasted with the amortized direct reduction loans, which set a specific repayment period and for which each payment reduced the amount of principal. During the 1930s B&Ls lso began offering the direct reduction loans (Rose and Snowden 2012).

attaining membership. Second, the Reconstruction Finance Corporation (RFC) operated a loan program for B&Ls in 1932 and to a much lesser extent through 1935. As they did with commercial banks, the RFC provided loans to B&Ls to provide access to liquidity and reduce the probability of closure. Calomiris, Mason and Bobroff (2013) found that the lending did not provide much help to commercial banks, although Vossmeyer (2016) found that a combination of loans and direct investments had more positive effects.

Third was the creation in 1933 of the Federal Savings & Loan (FSL) system. The new federal charter was taken up both by brand new associations and by existing state-chartered B&Ls. By the end of the 1930s the rebranded "S&L" industry, which moved away from traditional share-based B&L contracts, had largely displaced the traditional B&L industry (Snowden, 2003). While the FHA, FHLB, and FSL programs reshaped the structure of the mortgage lending sector and contractual structure of building and loans, they did little to reduce REO within the B&L and S&L industries, or to reduce its impact on new loan activity.[12]

4. DATA AND DESCRIPTIVE STATISTICS

The data analyzed here include annual balance sheet data and new real estate loan volume for every state-chartered building and loan association that operated in Iowa, New York, and North Carolina between 1928 and 1940 and in Wisconsin between 1935 and 1940. These were the only states that reported both the volume of new loans and balance sheet data in these years.

It is common in the banking literature to use annual changes in the stock of loans as a measure of new lending, but this approach is inappropriate for mortgage specialists like the B&Ls. New mortgage lending would be understated, for example, when early repayments or defaults and foreclosures reduced the stock of mortgage loans. Both possibilities were likely to have been at work for B&Ls during the 1930s. The sinking fund mortgage loan contract used by these intermediaries provided strong incentives for borrowers with sufficient resources to repay early—by doing so they avoided sharing in the losses earned by their associations (Fleitas et al 2018). The increase in foreclosures of interest here, moreover, depressed the stock of loans held by B&Ls throughout the 1930s. So too did purchases of distressed loans by the HOLC. For all of these reasons we presumed that changes in the stock of loans would be a

[12] Of particular relevance was the discount facility that was created to improve the liquidity of FHLB members. The loans from FHLB to members, called advances, required collateral in the form of mortgage loans in good standing. Real estate or related assets were not eligible.

poor and noisy proxy for new lending by B&Ls in the 1930s and chose to focus only on institutions in states for which new lending each year was reported in regulatory reports. We show below, in fact, that our central empirical results cannot be precisely or consistently estimated using annual changes in the stock of loans.

Although Wisconsin did not start to report annual lending until 1935, we included it in the sample to incorporate information from a state in the East North Central region along with information from the Mid-Atlantic (New York), the West North Central (Iowa) and the south Atlantic (North Carolina). As shown in Table 1, these four regions (out of nine) claimed 87 percent of the Nation's B&Ls in 1930 and 76 percent of the industry's assets. These four areas also capture the marked regional variation in disruption experienced within the B&L industry during the 1930s. Finally, all four states in our sample claimed substantial B&L sectors and large and diverse economies.[13]

Table 2 provides an overview of the composition of the B&L panel across states and over time. All four states saw the number of state-chartered B&Ls decrease during the 1930s, and the spatial pattern mirroring the regional trends with a low percentage of exits in Iowa relative to the other three states. Most of these exits resulted from voluntary liquidations, but one-sixth of them (53) occurred when an operating B&L was granted a Federal S&L charter. Most of these charter conversions (39) were in New York. Although 262 of the 859 B&Ls in the sample exited at some point, 597 (70%) remained in operation in 1940 including the 53 that had converted to federal S&L charters.

The number of active B&Ls each year that made no new mortgage loans had risen to 118 by 1933 before slowly declining over the rest of the decade. Even when the Depression hit its trough in 1933, however, 459 of 577 operating B&Ls made at least some new loans. Descriptive histories of B&Ls during the crisis emphasize the existence of "frozen" associations that were so severely distressed that they ceased making loans and operated for years only to manage foreclosures, to service existing loans, and to pay off withdrawing non-borrowers (Ewalt 1962 (pp. 16-18).. In fact, relatively few B&Ls in the four states examined here were frozen in this way—of the 118 B&Ls in our sample that made no loans in 1933, 39 exited the industry within the next two years and only 13 of the rest exited the industry without having made new loans. The other 66 B&Ls that suspended lending in 1933 restarted new

[13] In 1930 the occupation listings across all states show that New York had the most manufacturing workers, while North Carolina, Wisconsin, and Iowa ranked 11th, 13th, and 27th. In construction the ordering was New York 1st, North Carolina 13th, Wisconsin 17th, and Iowa 21st. Each state also had significant numbers of agricultural workers with rankings of North Carolina 4th, Iowa 8th, Wisconsin 13th, and New York 21st.

lending sometime later in decade. The last two columns of Table 2 report the number of B&Ls that were members of the new FHLB system after 1932 or either FHLB or the similar New York state system that was established in the mid-1920s.

To provide comparability across states and times in the empirical work presented here, we organized all reported balance sheet variables into six categories each of assets and liabilities shown in Table 3. Each of these are heterogeneous aggregates. Mortgage loans, for example, include the traditional sinking fund B&L loans and the modern, fully-amortized loan that became popular late in the decade. Ownership shares, on the other hand, include traditional B&L installment shares as well as varieties of prepaid shares that gained popularity in the 1920s. The real estate owned aggregate includes not only foreclosed real estate, but also real estate deeded to a B&L in lieu of foreclosure, judgments for real estate not yet foreclosed upon, and real estate contracts for foreclosed properties sold on credit. The B&Ls in our sample, as was generally the case in the industry, entered the 1930 with mortgage loans representing 90 percent of assets and member shares representing a similar share of liabilities.

In bad times, like the 1930s, loans were foreclosed upon and replaced on the balance sheet with real estate owned (REO). Figure 1 shows that REO accounted for only one percent of B&Ls' assets in the 1920s but reached roughly 20 percent of assets by the mid-1930s. Figure 2 shows how REO displaced mortgages as a share of total assets. Over the period *new* loans as a share of assets fell from around 23 percent in 1928 to 5 percent in 1933 before rising to 17 percent at the end of the decade.

5. EMPIRICAL APPROACH

Our empirical approach estimates how the annual flow of new loans from B&Ls was influenced by the holding of foreclosed real estate between 1928 and 1940. The mechanism was relatively simple. Relative to the mortgage loans that generally dominated the assets of a healthy B&L, foreclosed real estate earned lower average returns, often represented unrealized losses, and were generally illiquid even if a B&L was willing to recognize the loss. As a result, foreclosed real estate directly decreased the pool of loanable funds generated by a B&L's existing mortgage portfolio, and made new and additional investments in the association less attractive to non-borrowing savers. Our focus is on estimating the relationship between the B&L's new lending and the share of assets soaked up by foreclosed real estate.

To assess the magnitude of this disruption to B&L mortgage lending we estimate the following regression equation:

$$NewLoans_{ijt} = \delta_i + \alpha_1 REO_{ijt-1} + lnS_{ijt-1}\,\beta_0 + A_{ijt-1}\,\beta_1 + L_{ijt-1}\,\beta_2 + \mu_j * \theta_t + \varepsilon_{ijt} \quad (1)$$

where $NewLoans_{ijt}$ is the value of new loans as a percentage of the value of assets in firm *i* in county *j* in year *t*. REO_{ijt-1} is real estate owned as a share of assets in the prior year. Additional controls for each B&L include firm size (the log of total assets (lnS_{ijt-1})), and the shares of all the other assets and liabilities on the B&Ls balance sheet (A_{ijt-1} and L_{ijt-1}: miscellaneous assets and miscellaneous liabilities are the omitted categories throughout). To avoid simultaneity, the balance sheet information is lagged one year. A firm fixed effect (δ_i) controls for unchanging features of the B&L, including location within the city, by-laws, and other structural features. We control for local changes in economic activity, housing markets, and government policies at the county level with a full set of county-by-year fixed effects $\mu_j * \theta_t$. We chose counties because the vast majority of the B&Ls loaned only within the county where they were located. We also report an alternate specification with city-by-year fixed effects. The model is completed with a stochastic error term ε_{ijt}. Because of the use of lags and the loss of firms with only one observation year due to firm and county-by-year fixed effects, we lose 545 B&L-year observations. Descriptive statistics for our final sample of 7,315 observations are shown in Table 4.

The coefficient α_1 of REO share shows the correlation between the new loan share and the shift toward real estate holdings in the assets after controlling for the other correlates. It can be given a causal interpretation if there are no unmeasured factors that are correlated with both the REO share and new loans share. The control variables eliminate a long list of such factors. The compositions of assets and liabilities are the primary factors that determine the ability of the B&L to make loans because they describe the solvency, liquidity and risk exposure of the B&L. The total asset measure controls for size-related brand recognition or preferential access that might have drawn borrowers and investors as well as the burden of higher overhead costs associated with large building. The B&L fixed effects control for unobserved characteristics that did not very over time. These might include locations near prime neighborhoods or the quality of long-term managers who could influence the cost of foreclosing loans, selling property, making new loans, or attracting investors and borrowers.

Conditional on the balance sheet controls, the market-by-year fixed effects, and the firm fixed effects, our identification assumption is that the changes in REO in the previous period are uncorrelated with the unmeasured shocks to new loans below the county level and within

B&Ls over time. After presenting our results, we subject them to several robustness tests that indicate support for our identification strategy.

6. RESULTS

Table 5 presents estimates of the relationship between lagged share of REO and the share of new loans for a variety of specifications with and without the full set of controls in equation 1. Specification 1 presents the relationship while controlling only for the size of the B&L.[14] The coefficient is -0.23 and statistically significant at the 1 percent confidence level. When we add controls for individual B&L fixed effects to control for unchanging features of each B&L and year fixed effects to control for national shocks, the coefficient increases sharply to -0.38. Adding the composition of the balance sheets in specifications 3 through 5 leads to coefficients that range between -0.40 and -0.36. In the final step in specification 6 we add the county-by year fixed effects to control for the substantial variation in local economic and housing activity during the period (Fishback and Kachanovskaya (2015) and Fishback, Horrace, and Kantor 2005). The coefficient becomes only slightly less negative with a value of -0.33.

To understand the magnitude of the coefficient, recall that the mean and the standard deviation of the REO share in Table 4 are 0.08 and 0.14, respectively. Therefore, the estimate from the full specification in column 6 implies that a one standard deviation increase in the REO share is associated with a 4.6 percentage point decrease (0.140 * -0.329 = -0.046) in the new loans share of total assets in the next period. This is a considerable effect of roughly one-third of the mean of the new loans share in Table 4.

There were abnormally large changes in economic activity during the 1930s along with a number of changes in government housing policies that might have altered the relationships between REO and new loans from year to year. Therefore, we re-estimate the model while allowing the effect of the lagged REO share on the new loans to be different each year. The point estimates and 95-percent confidence intervals of the year dummies interacted with the lagged REO share in a regression including all the variables in full specification 6 in Table 5 are presented in Figure 3. The negative effects of holding REO in the balance sheet begin in 1930 and are negative and statistically different from zero after 1933. The point estimates after

[14]The REO share coefficient changes very little when excluding the size variable. In the most complete specification 6 the coefficient in Table 5 is -0.3299, compared with -0.3319 when the size variable is excluded (Column 2 in Table 6).

1933 range from -0.25 to -0.44, compared with the statistically insignificant estimates of -0.39 and -0.33 in 1931 and 1932. The fact that the effect becomes most negative after 1935 fits well with other evidence about B&L activity during the same time frame. After 1935 a number of associations were in trouble, while a significant number began liquidating as the share of borrowing members fell below the one-third threshold around that time (Fleitas, Fishback, Snowden, 2018).

To approximate the impact that the effect of lagged REO share had on the new loans share, we can analyze how much of the change in mean new loans share is explained by the change in mean REO share times the REO coefficient. We do this over two time frames, 1929 to 1935 and 1935 to 1940. The rise of REO between 1929 and 1935 accounts for a larger share of the change in new loans than it does between 1935 and 1940. For the 1929-1935 period, we compute this effect by multiplying the 5.5 percentage point increase in the mean REO share between 1929 and 1935 by the coefficient estimate (-0.33) and then dividing by the 6.5 percentage point drop in the new loan share between 1929 and 1935. Thus, the REO channel was associated with approximately 30% of the total drop in new loans during the period. Between 1935 and 1940, the new loan share at the B&Ls increased by 6.6 percentage points while the mean REO share decreased by 1 percentage point. After multiplying by the REO coefficient, the reduction in the mean REO share accounted for only 5% of the total increase in new loans because the change in the mean REO share was so small.

Our outcome variable is the value of new lending. As noted above, a common alternative measure of lending in the banking literature is the change in the value of outstanding loans. We examine the differences that arise from using changes in loans as the outcome variable, rather than gross new lending. The correlation between new loans and the change in the loan stock in the sample is a moderate 0.34. Estimating the model with the dependent variable as the change in the loan stock as a percent of assets, instead of the new lending yields a coefficient on lagged REO changes of -1.8, overestimating the effect of REO by a factor of six compared to the gross lending variable. This result stems from the fact that increases in foreclosures causes the change in loans to be substantially more negative than the actual number of new loans. These results underscore the importance of using new loans as the outcome variable.

Robustness Checks

We have explored several robustness checks related to challenges to identification arising from factors not absorbed by the control variables or fixed effects, i.e. time-varying factors within counties or within B&Ls. In turn, this section discusses controlling for the impact of economic activity at the city rather than county level; changes in B&L management; interaction effects between REO and other balance sheet factors; unmeasured factors related to B&Ls that failed in the second half of the decade; the results from using changes in the stocks of loans rather than gross lending; and finally other possible unobserved factors. We then explore additional results related to changes in government policies during the 1930s, and heterogeneity across cities and states.

First, we consider city-level factors. Although we control for county-by-time fixed effects, there is a possibility that differential unmeasured shocks at the city level within the same county might have threatened identification. When we control for city-by-year fixed effects in Column 3 of Table 6, the coefficient is -0.3591, which is similar to the coefficient of -0.3299 using county-by-year fixed effects in our preferred specification (repeated for the sake of convenience in Column 1 of Table 6). We prefer the specification with county-by-year fixed effects because a number of cities in multi-city counties only had one building and loan; therefore, we have to drop those cities because the effect of the REO share in those cities is collinear with the city-by-year fixed effects.

Second, we address changes in B&L management. By incorporating fixed effects for individual B&Ls, the main specification controls for the unmeasured factors in the B&L that did not change with time. In many B&Ls this essentially controls for the quality of the managers because the leaders did not change. However, in 46% percent of the B&Ls during the 1930s, the leaders changed and such changes in leadership potentially were correlated with both the REO and loan shares. Thus, in specification 4 of Table 6 we estimate the effect of the lagged REO share while allowing the coefficient to be different for B&Ls in which the secretary changed. We focus on the secretary because he or she was the official who directly managed the activities of the association. The REO coefficient for firms with no secretary change is -0.35, similar to the -0.33 for the main specification (Column 1 in Table 6). After changing management, the B&L still had a strong negative and statistically significant REO effect of -0.27 (=-0.3537+0.0824).

Third, we examine the many B&Ls that failed towards the end of the period. When compared with the surviving B&Ls, it is possible that the firms that failed experienced negative shocks that we have not observed. To the extent that the unknown factors were positively correlated with the REO share and negatively correlated with the share of new loans, the

coefficient for failed firms might have been more negative than for surviving firms. When we estimate the preferred specification for only firms that survived through 1940 in specification 5 of Table 6, the coefficient is -0.29 compared with -0.33 for the results with all firms. Therefore, the unknown factors for failing firms seems to have had only a small effect on the negative relationship between REO share and new loans.

Fourth, we have run a specification that interacts the REO measure with the cash asset share and the securities asset share to see if access to other liquid assets changes the relationship. When lagged REO share is interacted with the lagged cash share, the REO effect when lagged cash share is zero is -0.30, still very close to the coefficient of -0.33 in the preferred specification. The interaction coefficient of -1.31 seems large, but the mean lagged cash share is -0.03, so that the full effect of REO when the lagged cash share is at the mean is -0.34, similar to the -0.33 in the preferred specification. The coefficient for the interaction between the lags of REO share and the securities share is statistically insignificant. The REO effect is -0.32 for B&Ls that held no securities, and -0.30 at B&Ls with the mean lagged security share.

Overall, these robustness checks indicate that the REO share effect is robust and the effect remains statistically significant and does not become lower than -0.27 in any of the robustness checks.Finally, in addition to the robustness tests, we follow a strategy used by Altonji, Elder and Taber (2005) to evaluate the sensitivity of our results to potential correlation between unobservables and both new loans and the REO share. In general these other unobservable factors are other time-varying shocks within B&Ls or within each local market. We have in mind here factors such as whether potential borrowers stayed away from B&Ls with high REO shares. To examine whether these considerations could be responsible for our results, the Altonji et al. procedure suggests that if the estimates are not sensitive to the inclusion of observables, then they are also unlikely to be driven by the presence of unobservables. To estimate the sensitivity, they compute the ratio of the OLS estimates with covariates as controls divided by the implied bias, which is computed as the OLS estimate with covariates minus the OLS estimate without covariates. This ratio measures how strong the selection on unobservables would have to be, relative to selection on observables, to explain the entire OLS treatment effect. For the coefficient of -0.33 in the full specification in column 6 of Table 5, the estimated ratio implies that selection on unobservables would need to be 3.2

times stronger than selection on observables to reach that value. The lowest ratio measure for any specification in Table 5 is 2.3, and the range of estimates for Table 6 is 1.7 to 3.7.[15]

Controlling for Government Policy During the 1930s there were several government policy changes in the mortgage industry that might have influenced the relationship between the new loans share and the lagged REO share and the new loans share.

In 1916 the state of New York organized its own "S&L Bank," that became the model for the Federal Home Loan Bank (FHLB) created at the national level in 1932 (Scott Frame, Hancock and Passmore, 2012). Both institutions were designed to provide access to liquidity to firms that voluntarily joined the system by purchasing shares in the institutions. System members could obtain advance "loans" based on mortgage collateral. By 1927 about half of New York B&Ls had joined, and during the 1930s about half of those firms also joined the FHLB while staying in the state bank. The remaining members of the New York S&L bank did not join the FHLB. Very few New York B&Ls joined the FHLB and not the State bank. In this sense, the New York bank and the FHLB were close substitutes.

To determine how the New York and Federal system influenced the impact of REO on new loans, we run different specifications where we interact the REO share with alternative measures of FHLB access. We use two variables to approximate this access. The first dummy identifies banks that were members of either the New York S&L Bank, the FHLB, or both. The second dummy variable includes only FHLB members, independently of their status in the New York S&L Bank. These two variables are identical, of course, for the other states. The results in Columns 2 and 3 in Table 7 show that controlling for the inclusion in the FHLB system leads to the same REO effects of around -0.32 and -0.33 for firms that were not in either system. Meanwhile, the independent effect of entering the FHLB system was positive as expected, since it gave the firm more access to liquidity. The coefficients of the interactions of FHLB access with REO were -0.048 and -0.002, which imply that access to the FHLB led to more negative effects of REO on new loans, although these coefficients are not statistically significant. Thus, problems with REO became even more salient for new lending when the B&Ls had better access to short-term liquidity. We see this finding as a robustness check of the impact of REO rather than an analytical finding about the interactions of the two because

[15]The ratio estimates for Table 5 from specification 2 to 6 are 2.4, 2.3, 2.7, 2.7. and 3.2. In Table 6 the ratio estimates from specifications 2 to 6 are 2.1, 1.7. 1.8, and 3.7.

joining the FHLB system likely was determined by other factors affecting both REO share and new loans.

Firms that switched from the B&L format to the new S&L structure might have had unmeasured features we have not captured. The negative effect of lagged REO share on new loans share might only have been present in the old B&Ls that were not able to convert to the new way to do business in the industry. If true, we would expect to see no REO effect on new loans in B&Ls after they transformed into S&Ls. Column 4 of Table 7 shows the estimates of the full specification when we add to the sample the observations of the B&Ls that converted to S&Ls after they make the switch. We also allow the coefficient of interest to vary before and after the change. The REO coefficient for this group of firms is even more negative and it is statistically significant.

In 1932 and to a much lesser extent through 1935, the Reconstruction Finance Corporation began providing loans to B&Ls as part of its program for helping financial institutions. This was similar to the program that offered loans to commercial banks (Calomiris, Mason, and Bobroff 2013; Vossmeyer 2016). The aid was meant to provide liquidity to the financial institutions to prevent closure and return to more normal operations. The RFC aid may reveal information about the B&L that was otherwise unobserved with our data and also provided additional funds for new loans. In Table 7 we show the results of the analysis when we add the correlate for RFC lending in two forms. In column 5 the analysis adds a dummy that has a value of 1 for all years after the B&L received a loan and 0 otherwise, and an interaction between the dummy and REO from the prior year. In column 6 the analysis adds an RFC variable that replaces the 1 in the dummy in specification 5 with the value loaned and also has an interaction term. In the two columns the coefficient of the REO measure is -0.308 and -0.324, which suggests that the impact of REO for B&Ls that did not receive loans is very similar to the coefficients in other specifications. In addition, the coefficients of the RFC measures and their interaction terms with REO are not statistically significant, which implies that the B&Ls receiving RFC loans did not act differently from those who did not. The conclusion therefore is that the RFC did not change the relationship between REO and new loans.[16]

In the main estimation procedure we control for the impact of the HOLC troubled loan purchase and refinance program with the county-by-year fixed effects because we do not have

[16] We owe special thanks to Angela Vossmeyer who shared with us the RFC data cards for the B&Ls in these states that she had collected.

firm-specific information on the loan purchases made by the HOLC. When the HOLC purchased a troubled loan, a foreclosure and consequent REO was prevented, while the B&L had additional funds that could be loaned. Thus, any omitted variable bias was likely to be negative, leading to overstatement of the negative relationship between REO and new loans. The HOLC program made only a handful of purchases in December 1933, then made the vast majority in 1934 and 1935 (Home Owners Loan Corporation 1933).We can assess the situation for firms in the absence of the HOLC by comparing the year-by-year coefficients between 1931 and 1933 and the HOLC years of 1934 and 1935 in Figure 3. Prior to 1931 foreclosure rates were very low and the REO share was low enough that there is only a weak relationship between REO share and new loans. Between 1931 and 1933 the foreclosure crisis spiked and the HOLC had barely started its purchases. In Figure 3 the average for the coefficients for 1931 through 1933 is roughly the same as the coefficients in 1934 and 1935 when the HOLC was actively purchasing loans, although the earlier coefficients are imprecisely estimated.[17] The results suggest that the negative omitted variable bias associated with the absence of firm-specific HOLC information was relatively small.

Heterogeneity by State and City Size

The structure of mortgage finance might have varied across states and city sizes given state regulations, laws governing the foreclosure process, or other housing market features. For example, the foreclosure process took about 16 months to complete in Iowa and Wisconsin, on average, but just a few months in New York and North Carolina (Russell 1937). Table 8 provides estimates of the impact of the REO share on new loans by state and by county size. The REO coefficients for smaller counties in specification 2 in Table 8 suggest that the negative impact of REO on new loans was -0.43, much stronger than the overall coefficient of -0.33 and roughly double the -0.21 coefficient for larger counties in specification 3.

The REO coefficients for three of the four states in Column 4 of Table 8 are negative and statistically significant. Iowa's coefficient of -0.44 and North Carolina's of -0.48 are about a third larger than the overall coefficient of -0.33 while New York's coefficient of -0.29 is roughly the same. In specifications 5 and 6 the REO coefficients are estimated by county size within the states. As in the whole sample, the negative coefficients for smaller counties in New York and Iowa are roughly twice the magnitude of the coefficients in the larger counties. The

[17] When we estimate the model with just the years from 1928 through 1933, the REO coefficient is -0.293, but it is imprecisely estimated with a standard error of 0.22.

REO effects in Wisconsin are negative but are smaller and not statistically significant. One reason may be that the sample for Wisconsin starts only in 1935 and thus does not cover the peak period of foreclosures that is included in the time frame for the other states.

The more negative effects in the smaller counties may be a sign of less liquidity and less depth in the housing markets than in larger markets. Resale of REO likely had stronger negative effects on housing prices, thus lowering the value of the loan collateral that backed the failed loans more. Secondary markets for B&L shares were less likely to develop in smaller counties and B&Ls in smaller areas likely had smaller networks of potential investors. Courtemanche and Snowden (2011) and Fishback et al (2011) found substantially larger effects of the HOLC purchase and refinancing of loans on housing prices and home ownership in smaller counties for similar reasons.

7. CONCLUSIONS

Events since 2007 have reminded us that recessions accompanied by housing crises are unusually severe and protracted. In response, there has been much recent work on the contributory role of financial frictions in these outcomes. For the 1930s episode examined here, we have shown that the supply of credit from the nation's most important class of mortgage lenders was reduced by frictions caused by foreclosures generated during the crisis. The friction in this case, perhaps better called a clog, was real estate on B&Ls' balance sheets. The real estate that replaced interest-bearing loan assets within these mutual lending organizations generated lower gross returns and imposed higher service and maintenance costs. The combination reduced the pool of loanable funds generated by current assets and cut off new sources of funding by discouraging new B&L investments. For the intermediaries in our four-state sample, a one-standard-deviation increase in the share of assets owned as foreclosed real estate in the prior year lowered the share of assets devoted to new loans by approximately 5 percentage points, or about one-third of the mean share of assets dedicated to new loans during the 1930s. This mechanism accounts for 30 percent of the drop in the mean value of new mortgages issued by these B&Ls between 1929 and 1935 and much less of the recovery in new lending after 1935 as REO shares remained elevated throughout the decade. These empirical results stand up to a broad range of robustness checks and represent evidence that REO on the balance sheet of intermediaries strongly depressed new lending.

Mortgage foreclosures also spiked dramatically during the Great Recession of 2007 and generated similarly low returns and high costs to participants within mortgage lending

networks. It is not easy to trace, measure or estimate the impact of this REO on new lending for the modern era, however, because the impacts are imposed on, and often contested by, multiple participants linked through complex lending networks. The historical context, therefore, offers an unusual and valuable perspective on a mechanism that is less transparent today. B&Ls were the leading institutional residential mortgage lender entering the Great Depression, were exclusively local and residential in lending, and originated, held and serviced each loan in their portfolio. As equity-financed corporations, and not depository institutions, B&Ls were permitted to continue operation even as REO increased dramatically as a share of assets. These features make the REO-new lending mechanism transparent and measurable for B&Ls of the 1930s and, as we have argued here, especially for B&Ls in our four-state sample for which new lending activity is observable for each year.

Our results suggest fruitful areas of investigation for both the historical and modern eras. The large literatures on the role of commercial bank suspension and failures during the Great Contraction, to begin with, largely miss the housing crisis of the 1930s because banks played such a small role in home lending. It is important to better understand how the restrictions in B&L lending shown here impacted households and homebuilders. We also need to better understand whether federal policy ameliorated the reduction in credit. Chief among these is the Home Owners' Loan Corporation (HOLC) that purchased distressed mortgage loans from lenders, including B&Ls, and then refinanced and funded the new loans. More than 2 million homeowners applied for HOLC refinancing between 1934 and 1936, and the agency accepted one-half of these applications with many of the 1 million rejected applications ascertained to be "too distressed" to warrant refinancing (Fishback, Rose, and Snowden 2013). Most of these ended up as foreclosed real estate on the balance sheets of B&Ls or other lenders. The analysis here, in this respect, offers a complementary view of the positive impact that HOLC had on homeownership, prices and building during the 1930s.

The results also suggest some important questions for the modern era. Financial innovation has segmented origination, servicing and funding, but during a foreclosure crisis those systems must still absorb the costs and delays associated with the resulting REO. We need to better understand how these costs are distributed and funded within modern lending channels, whether and by how much they choke off new lending, and how policy interventions can be structured to ameliorate these impacts.

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Figure 1: Real estate owned as a percent of assets at building and loan associations in Iowa, New York, North Carolina and Wisconsin, 1920-1940

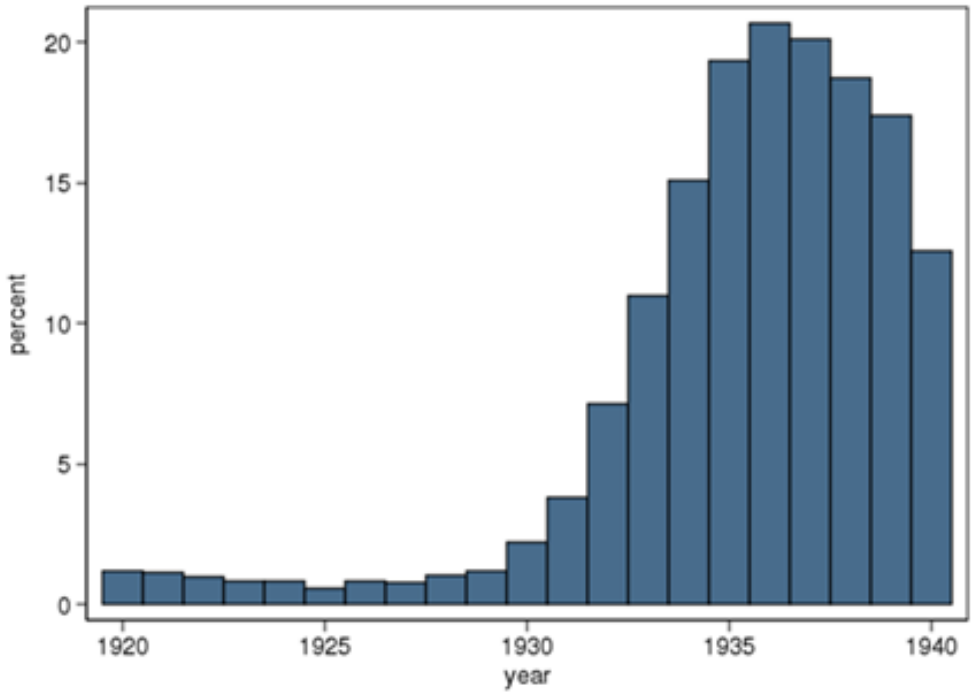

Figure 2: Home Mortgage Loans and REO

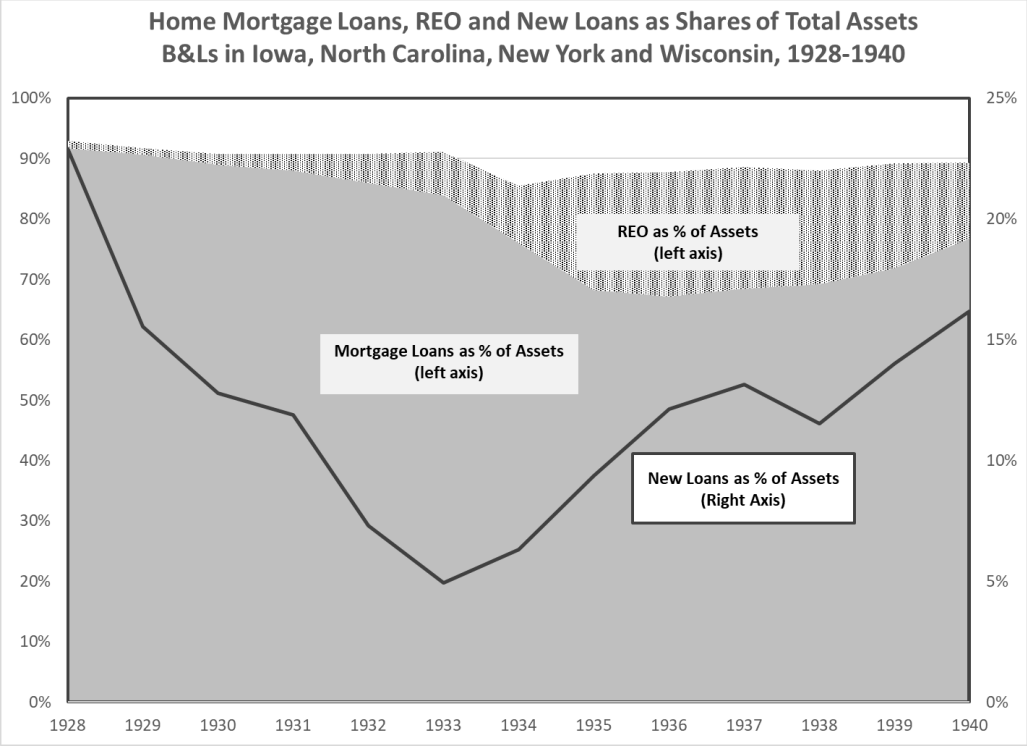

Figure 3: Effect of REO on New Loans, Event Study Specification

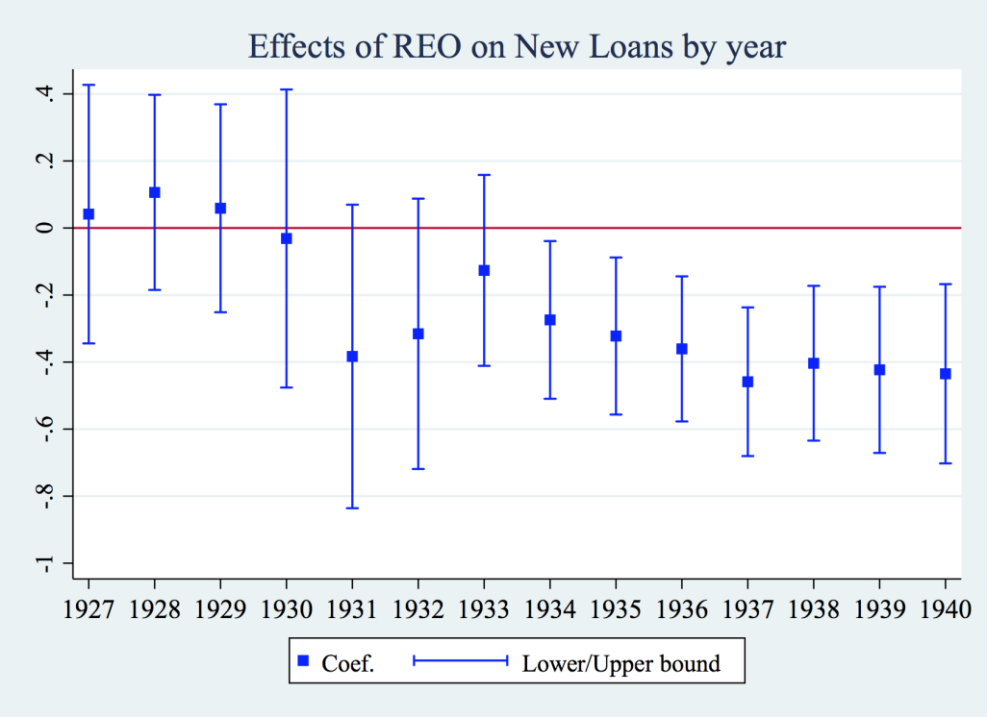

Table 1: The Building and Loan Industry in 1929-1939

REGION	1929		% Change 1929-1939			1939
	Number	Assets (millions)	Number	Assets	Mortgage Loans	% Assets in REO
U.S.	12,342	8,695	-33%	-35%	-47%	12%
New England	358	637	-1%	-2%	-18%	9%
Mid-Atlantic	5,772	2,974	-46%	-51%	-64%	22%
E North Central	2,395	2,488	-22%	-34%	-51%	12%
W North Central	671	599	-6%	-31%	-40%	8%
South Atlantic	1,911	547	-32%	18%	6%	2%
E South Central	279	176	6%	-7%	-24%	12%
W South Central	444	511	-24%	-48%	-53%	6%
Mountain	178	152	-13%	-35%	-45%	8%
Pacific	334	611	-16%	-38%	-42%	5%

Sources: *Monthly Labor Review*, Nov 1930, pp.114-5, Jan 1941, pp.126-7, May 1943, p.937, Federal Home Loan Bank Board, Eighth Annual Report, 1940, pp.175-6, Federal Home Loan Bank Board, Ninth Annual Report, 1941, pp. 242-5

Table 2: Building and Loans in Sample Reporting New Loans

Year	All	Iowa	North Carolina	New York	Wisconsin	Active in 1940	Making Zero New Loans	Member of FHLB	Member of FHLB or NYSB
1928	607	73	227	307		440	28		124
1929	610	74	233	303		444	33		130
1930	617	75	235	307		453	44		143
1931	606	75	229	302		454	61		159
1932	595	74	222	299		454	84		180
1933	577	74	209	294		453	118	163	297
1934	542	74	197	271		438	82	192	312
1935	677	69	182	243	183	533	71	255	360
1936	653	69	174	230	180	524	66	268	365
1937	628	66	167	220	175	528	54	263	357
1938	614	64	163	216	171	534	59	276	366
1939	590	64	163	205	158	539	41	271	356
1940	544	63	160	198	123	544	18	246	326
Total	7860	914	2561	3395	990	6338	759	1934	3475

Sources and Notes: Sources are balance sheet information reported in various years by the Iowa State Auditor, the New York Superintendent of Banks, the North Carolina Insurance Department, and the Wisconsin State Banking Commission.

Table 3: Assets and Liabilities Categories

Assets	Liabilities
Mortgage Loans	Ownership Shares
Cash Items	Advanced Payments Received
Real Estate Owned	Undivided Profits
Securities	Borrowings
Receivables	Reserves
Office & Miscellaneous	Miscellaneous

Table 4: Descriptive Statistics

	All Sample (N=7315)		Pre 1935 (N=4131)		Post 1935 (N=2592)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
New Loans Share	0.15	0.18	0.15	0.20	0.16	0.14
Lagged REO Share	0.08	0.14	0.02	0.06	0.15	0.18
Lagged Tot Assets	12.60	1.53	12.46	1.60	12.81	1.40
Lagged Shares Share	0.86	0.09	0.87	0.09	0.85	0.09
Lagged Advanced Payments Share	0.00	0.01	0.00	0.01	0.00	0.00
Lagged Undivided Profits Share	0.04	0.04	0.05	0.04	0.04	0.04
Lagged Borrowings Share	0.05	0.07	0.06	0.07	0.04	0.06
Lagged Reserves Share	0.03	0.03	0.02	0.02	0.04	0.03
Lagged Mortgage Loans Share	0.83	0.16	0.90	0.09	0.74	0.19
Lagged Cash Share	0.03	0.05	0.03	0.05	0.04	0.04
Lagged Securities Share	0.04	0.05	0.03	0.04	0.05	0.05
Lagged Receivables Share	0.02	0.02	0.02	0.03	0.01	0.02

Sources and Notes: Sources are balance sheet information reported in various years by the Iowa State Auditor, the New York Superintendent of Banks, the North Carolina Insurance Department, and the Wisconsin State Banking Commission.

Table 5: Effects of Real Estate Owned on New Loans

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged REO Share	-0.2260***	-0.3840***	-0.4004***	-0.3564***	-0.3593***	-0.3299***
	(0.0421)	(0.0419)	(0.1043)	(0.0410)	(0.1031)	(0.1053)
Lagged Tot Assets	-0.0138***	-0.0845***	-0.0685***	-0.0888***	-0.0737***	-0.0717***
	(0.0029)	(0.0124)	(0.0119)	(0.0120)	(0.0121)	(0.0140)
Lagged Mortgage Loans Share			-0.0690		-0.0503	-0.0850
			(0.0938)		(0.0935)	(0.1083)
Lagged Cash Share			0.4327**		0.4275**	0.3399**
			(0.2040)		(0.1975)	(0.1530)
Lagged Securities Share			-0.2788**		-0.2638**	-0.1281
			(0.1220)		(0.1174)	(0.1297)
Lagged Receivables Share			-0.0094		-0.0234	-0.2068
			(0.2712)		(0.2726)	(0.2410)
Lagged Shares Share				0.0674*	0.0657*	0.0813*
				(0.0369)	(0.0394)	(0.0451)
Lagged Advanced Payments Share				0.1939	0.1168	-0.1559
				(0.5256)	(0.5093)	(0.5506)
Lagged Undivided Profits Share				-0.2906	-0.2751	-0.0565
				(0.1887)	(0.1828)	(0.1972)
Lagged Borrowings Share				-0.1651***	-0.1371**	-0.1129*
				(0.0593)	(0.0611)	(0.0655)
Lagged Reserves Share				-0.3789**	-0.3762**	-0.1181
				(0.1602)	(0.1622)	(0.1747)
B&L FE	No	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes	Yes	Yes
County-by-Year FE	No	No	No	No	No	Yes
Observations	7315	7315	7315	7315	7315	7315

Sources and Notes: Sources are balance sheet information reported in various years by the Iowa State Auditor, the New York Superintendent of Banks, the North Carolina Insurance Department, and the Wisconsin State Banking Commission. The asterisk (*), (**), (***) means statistically significantly different from zero at the 10, 5 and 1 percent level in a two-tailed t-test, respectively.

Table 6: Results of Robustness Tests: City-by-Year Fixed Effects, Changes in Leadership, Survivors, and Interactions with Liquid Assets

	-1	-2	-3	-4	-5	6	7
Lagged REO Share	-0.3299***	-0.3319***	-0.3591**	-0.3537***	-0.2867***	-0.2962***	-0.3201***
	(0.1053)	(0.1181)	(0.1400)	(0.1082)	(0.1025)	(0.1048)	(0.1102)
Lagged REO Share times				0.0824*			
Lagged Management Change				(0.0455)			
Lagged REO Share times						-1.3121**	
Lagged Cash Share						(0.6136)	
Lagged REO Share times							-0.2161
Lagged Securities share							(0.3693)
Lagged Tot Assets	-0.0717***		-0.0794***	-0.0722***	-0.0724***	-0.0711***	-0.0717***
	(0.014)		(0.0257)	(0.014)	(0.016)	(0.0139)	(0.0140)
Lagged Mortgage Loans Share	-0.085	-0.1949	-0.1065	-0.0815	0.0407	-0.0808	-0.0822
	(0.1083)	(0.1212)	(0.1396)	(0.1077)	(0.1005)	(0.1067)	(0.1087)
Lagged Cash Share	0.3399**	0.3576**	0.1537	0.3459**	0.5240***	0.3906**	0.3432**
	(0.153)	(0.1621)	(0.1777)	(0.1528)	(0.1902)	(0.1683)	(0.1533)
Lagged Securities Share	-0.1281	-0.2490*	-0.2029	-0.1208	-0.0468	-0.1257	-0.1065
	(0.1297)	(0.1413)	(0.1581)	(0.1297)	(0.112)	(0.1287)	(0.1467)
Lagged Receivables Share	-0.2068	-0.3762	0.0055	-0.1999	-0.2644	-0.2139	-0.2080
	(0.241)	(0.257)	(0.4176)	(0.2405)	(0.2088)	(0.2394)	(0.2405)
Lagged Shares Share	0.0813*	0.0451	0.0709	0.0813*	0.0094	0.0773*	0.0819*
	(0.0451)	(0.0479)	(0.0506)	(0.0448)	(0.0673)	(0.0446)	(0.0453)
Lagged Advanced Payments Share	-0.1559	-0.2047	-0.2385	-0.1589	-0.1182	-0.1642	-0.1533
	(0.5506)	(0.5969)	(0.7158)	(0.5474)	(0.5324)	(0.5476)	(0.5516)
Lagged Undivided Profits Share	-0.0565	-0.0386	-0.364	-0.0516	0.0772	-0.0603	-0.0585
	(0.1972)	(0.1929)	(0.2792)	(0.1964)	(0.2283)	(0.1960)	(0.1970)
Lagged Borrowings Share	-0.1129*	-0.1713**	-0.0632	-0.1112*	-0.2097**	-0.1158*	-0.1122*
	(0.0655)	(0.0677)	(0.089)	(0.0656)	(0.0901)	(0.0646)	(0.0658)
Lagged Reserves Share	-0.1181	0.0488	0.0537	-0.1071	-0.2616*	-0.1244	-0.1168
	(0.1747)	(0.1621)	(0.2848)	(0.1751)	(0.1337)	(0.1699)	(0.1754)
B&L FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County-by-Year FE	Yes	Yes	No	Yes	Yes	Yes	Yes
City-by-Year FE	No	No	Yes	No	No	No	No
Sample	All	All	All	All	Stayers	All	All
Observations	7315	7315	4309	7315	5614	7315	7315

Sources and Notes: Sources are balance sheet information reported in various years by the Iowa State Auditor, the New York Superintendent of Banks, the North Carolina Insurance Department, and the Wisconsin State Banking Commission. The asterisk (*), (**), (***) means statistically significantly different from zero at the 10, 5 and 1 percent level in a two-tailed t-test, respectively.

Table 7: Robustness Checks Associated with Government Policies

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged REO Share	-0.3299***	-0.3161***	-0.3298***	-0.3003***	-0.3075***	-0.3249***
	(0.1053)	(0.1079)	(0.1076)	(0.1006)	(0.1089)	(0.1057)
Lagged REO Share times		-0.0475				
Lagged FHLB Indicator 1		(0.0574)				
Lagged REO Share times			-0.0023			
Lagged FHLB Indicator 2			(0.0560)			
Lagged REO Share times				-0.6302***		
Lagged Federal Indicator				(0.2076)		
Lagged FHLB Indicator 1		0.0330**				
		(0.0162)				
Lagged FHLB Indicator 2			0.0243**			
			(0.0117)			
Lagged REO Share times					-0.0724	
Lagged RFC Indicator					(0.0899)	
Lagged REO Share times						0.0000
Lagged RFC Amount						(0.0001)
Lagged RFC Indicator					0.0093	
					(0.0234)	
Lagged RFC Amount						0.0001
						(0.0001)
Lagged Tot Assets	-0.0717***	-0.0744***	-0.0729***	-0.0688***	-0.0715***	-0.0717***
	(0.0140)	(0.0137)	(0.0140)	(0.0135)	(0.0139)	(0.0139)
Lagged Mortgage Loans Share	-0.085	-0.0898	-0.085	-0.0569	-0.0865	-0.0859
	(0.1083)	(0.1099)	(0.1094)	(0.1045)	(0.1087)	(0.1085)
Lagged Cash Share	0.3399**	0.3321**	0.3353**	0.3909**	0.3384**	0.3393**
	(0.1530)	(0.1524)	(0.1533)	(0.1526)	(0.1527)	(0.1529)
Lagged Securities Share	-0.1281	-0.1460	-0.1398	-0.1100	-0.1308	-0.1294
	(0.1297)	(0.1320)	(0.1318)	(0.1293)	(0.1290)	-0.1293
Lagged Receivables Share	-0.2068	-0.2150	-0.1975	-0.1803	-0.2089	-0.2064
	(0.2410)	(0.2429)	(0.2416)	(0.2350)	(0.2416)	(0.2415)
Lagged Shares Share	0.0813*	0.0890*	0.0816*	0.0867*	0.0814*	0.0807*
	(0.0451)	(0.0450)	(0.0453)	(0.0490)	(0.0454)	(0.0453)
Lagged Advanced Payments Share	-0.1559	-0.1632	-0.1696	0.1313	-0.1582	-0.157
	(0.5506)	(0.5274)	(0.5418)	(0.4879)	(0.5550)	(0.5515)
Lagged Undivided Profits Share	-0.0565	-0.0388	-0.0204	-0.102	-0.0451	-0.0551
	(0.1972)	(0.2023)	(0.1979)	(0.2042)	(0.1982)	(0.1967)
Lagged Borrowings Share	-0.1129*	-0.1379**	-0.1249*	-0.1128*	-0.1147*	-0.1134*
	(0.0655)	(0.0656)	(0.0659)	(0.0638)	(0.0648)	(0.0658)
Lagged Reserves Share	-0.1181	-0.1217	-0.1048	-0.1496	-0.1092	-0.1174
	(0.1747)	(0.1749)	(0.1755)	(0.1845)	(0.1742)	(0.1743)
B&L FE	Yes	Yes	Yes	Yes	Yes	Yes
County-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All	All	All	+ Federals	All	All
Observations	7315	7315	7315	7429	7315	7315

Sources and Notes: Sources are balance sheet information reported in various years by the Iowa State Auditor, the New York Superintendent of Banks, the North Carolina Insurance Department, and the Wisconsin State Banking Commission. The asterisk (*), (**), (***) means statistically significantly different from zero at the 10, 5 and 1 percent level in a two-tailed t-test, respectively.

Table 8: Heterogeneity of REO Effects by State and City Size

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged REO Share	-0.3299***	-0.4355***	-0.2098**			
	(0.1053)	(0.1251)	(0.0917)			
Lagged REO Share times				-0.4504***	-0.4818***	-0.2716**
State of Iowa				(0.1463)	(0.1696)	(0.0956)
Lagged REO Share times				-0.4393***	-0.4574***	
State of North Carolina				(0.1176)	(0.1319)	
Lagged REO Share times				-0.2877**	-0.4735**	-0.2216**
State of New York				(0.1145)	(0.2189)	(0.0920)
Lagged REO Share times				-0.1588	-0.1115	-0.1724
State of Wisconsin				(0.1110)	(0.1756)	(0.1045)
Lagged Tot Assets	-0.0717***	-0.0704***	-0.0839***	-0.0729***	-0.0707***	-0.0843***
	(0.0140)	(0.0190)	(0.0127)	(0.0138)	(0.0192)	(0.0129)
Lagged Mortgage Loans Share	-0.0850	-0.1254	-0.0513	-0.0912	-0.1256	-0.0485
	(0.1083)	(0.1226)	(0.1104)	(0.1083)	(0.1233)	(0.1096)
Lagged Cash Share	0.3399**	0.4386*	0.2048	0.3317**	0.4366*	0.2054
	(0.1530)	(0.2315)	(0.1545)	(0.1531)	(0.2291)	(0.1528)
Lagged Securities Share	-0.1281	-0.1431	-0.1133	-0.1356	-0.1466	-0.1114
	(0.1297)	(0.1835)	(0.1207)	(0.1280)	(0.1827)	(0.1196)
Lagged Receivables Share	-0.2068	-0.1305	-0.3007	-0.2147	-0.1359	-0.3002
	(0.2410)	(0.4494)	(0.1837)	(0.2407)	(0.4499)	(0.1813)
Lagged Shares Share	0.0813*	0.1144*	0.0167	0.0797*	0.1119*	0.0172
	(0.0451)	(0.0601)	(0.0535)	(0.0440)	(0.0601)	(0.0529)
Lagged Advanced Payments Share	-0.1559	0.4025**	-1.1686	-0.1633	0.4042**	-1.1523
	(0.5506)	(0.1613)	(0.7795)	(0.5478)	(0.1586)	(0.7695)
Lagged Undivided Profits Share	-0.0565	0.0535	-0.3393	-0.0444	0.0506	-0.3476
	(0.1972)	(0.2589)	(0.2634)	(0.1978)	(0.2590)	(0.2644)
Lagged Borrowings Share	-0.1129*	-0.1069	-0.1243	-0.1076	-0.1091	-0.1206
	(0.0655)	(0.0988)	(0.0901)	(0.0653)	(0.0986)	(0.0912)
Lagged Reserves Share	-0.1181	-0.2387	0.1215	-0.1156	-0.2439	0.1178
	(0.1747)	(0.2319)	(0.2209)	(0.1757)	(0.2406)	(0.2244)
B&L FE	Yes	Yes	Yes	Yes	Yes	Yes
County-by-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Counties in Sample	All	Smaller	Larger	All	Smaller	Larger
Observations	7315	4569	2733	7315	4569	2733

Sources and Notes: Sources are balance sheet information reported in various years by the Iowa State Auditor, the New York Superintendent of Banks, the North Carolina Insurance Department, and the Wisconsin State Banking Commission. The asterisk (*), (**), (***) means statistically significantly different from zero at the 10, 5 and 1 percent level in a two-tailed t-test, respectively.