# Do Banks Lend After Government Bailouts?

## Evidence from the Depression

[Preliminary and Incomplete]

Jonathan D. Rose*

February 3, 2010

## 1 Introduction

This paper examines the slow recovery of real estate lending in the latter half of the 1930s, following the widespread and steep contraction from 1929 to 1934. In particular, I focus on supply side constraints, including the legacy of bad loans from prior periods for the health of the banks' balance sheets throughout the 1930s, and the importance of government policy via the Home Owners' Loan Corporation (HOLC) which helped remove some of these assets from banks' balance sheets in the mid 1930s.

The geographic setting of this paper is Massachusetts, where real estate lending was dominated by mutual savings banks and cooperative banks (known elsewhere as building and loan associations). Given the setting of real estate lending in Massachusetts, bank health is a less salient factor in explaining lending declines than it may have been for lending for different loan classes or in different areas. Few of the Massachusetts mutual savings banks failed during the Depression, likely due to relatively conservative underwriting standards and close regulation, although many nevertheless incurred significant loan losses and experienced funding problems. In addition, real estate lending itself is less relationship intensive than other forms of lending, and therefore may be less susceptible to disruption after bank-level loan supply shocks. Cooperative banks had greater health problems

*Economist, Federal Reserve Board of Governors. Email: jonathan.d.rose@frb.gov. The views presented are solely those of the author and do not necessarily represent those of the Federal Reserve Board or its staff.

than savings banks due to a contractual structures ill-suited to the depression (Snowden 2003), but again benefitted from a strong regulatory apparatus in Massachusetts relative to similar banks in other states. Consequently, mass disintermediation via failures of Massachusetts real estate lenders is unlikely to explain the slow recovery of mortgage lending in the state during the 1930s.

The banks at the time were nevertheless confronted with difficulties similar to those that have arisen today following a banking crisis initially centered around real estate assets. As late as 1936, the Massachusetts Commissioner of Banks described real estate loans as "frozen."[1] Holdings of foreclosed properties at Massachusetts banks did not decline significantly until the buildup to World War II. On the liability side, deposit growth at savings banks remained anemic throughout the second half of the decade, and barely made up for the outflows from 1931 to 1933. In the presence of depressed bank lending, there was a typical debate over whether supply or demand constraints were more pressing. Even in 1939, on the eve of the pre-war buildup, the Commissioner noted that "much has been written and spoken on the subject of banks refusing to lend money," and countered that "It is difficult to believe that lending institutions with the available resources possessed by our banks would purposely freeze their money and refuse to put it to work."[2]

Not all was grim for real estate lenders, however. The real economy was expanding beginning in 1933, albeit unevenly at first. Balance sheets were also buoyed due to a large-scale intervention by the federal government in the form of the HOLC, which bought distressed mortgages from private lenders from 1934-1936, essentially cleaning lenders' balance sheets under the guise of aiding the American home loan borrower. In prior work, I have noted that the HOLC was in many ways a lender's organization, purchasing distressed loans at generous prices and absolving the lenders of any further losses (Rose, 2010). This paper provides further research on the program's supply side implications with the examination of lending post-HOLC intervention. This exercise is possible with the new digitization of remarkably valuable call report data from Massachusetts banks in the 1930s, which allows an empirical cross-sectional assessment of the determinants of lending.

I find that in the mid 1930s, banks that sold more loans to the HOLC quickly originated more real estate loans, and that their holdings of foreclosed properties grew less rapidly. As a result, though the real estate holdings of such banks fell in the mid 1930s after having sold off loans to the

[1] Massachusetts *Annual Report*, 1936, p. xii.
[2] Massachusetts *Annual Report*, 1939, p. i-ii.

HOLC, by the end of the decade, these banks had largely rebalanced their portfolio to their pre-intervention state; in particular, by the end of the decade, combined holdings of real estate loans and foreclosed properties at such banks were no different on average than banks which transacted less with the HOLC, but the composition of these assets featured fewer foreclosed properties and more loans.

Though the HOLC appears to have aided banks in reducing loan losses on their real estate loans, by 1939, Massachusetts savings banks as a group had not managed to fully put the effects of the depression behind them, as their real estate lending remained persistently and substantially less expansionary than before the depression. Only during and after World War II did holdings of foreclosed properties and new mortgage originations approach pre-Depression levels. In the context of the HOLC's large size (it refinanced one tenth of all residential mortgages in the country) and the generous terms given to lenders in transacting for their loans, it may not be surprising to find the short-run balance sheet effects, but its neutrality in the long run is also significant and casts doubt on the ability of the government to resuscitate private lenders via a bailout of this form. Instead, the larger phenomenon of the World War II macroeconomic recovery appears to have allowed both borrowers and lenders to clean their balance sheets to an extent they had been unable to achieve for the entire 1930s.

# 2 Background

## 2.1 National mortgage lending

The aggregate activity of the national mortgage market is depicted graphically in Figures 1 and 2, which display the value of outstanding mortgages and the value of new mortgages in each year from 1925 to 1949. All of the major types of lenders, including mutual savings banks, commercial banks, savings and loan associations, and life insurance companies, originated many fewer mortgages in the 1930s than they had in the 1920s. The decline in lending was particularly pronounced at the savings and loan associations.[3]

[3] In the two figures, these associations are defined to include the surviving building and loan associations, the business model of which appears to have been proven so fragile by the associations' performances during the depression that they slowly abandoned their business model and converted to savings and loan associations, often with the help of newly available federal charters (see Snowden (2003) and Bodfish (1931)).

The other major lender of the period was the HOLC. The HOLC operated by purchasing distressed mortgages from private lenders, and then refinancing the debt with the borrowers. In dealing with a mortgage lender, the HOLC exchanged its bonds for the lender's claim on the mortgage.[4] Ostensibly, the primary goal was to aid distressed mortgage borrowers. However, the HOLC can also be thought of as a means to remove troubled assets from the balance sheets of banks across the country. Relative to distressed mortgages, the HOLC bonds provided more certain income streams as well as higher liquidity. In addition, the HOLC tended to generously compensate banks for their mortgage claims in order to induce their participation, and in the process provided some extent of recapitalization (Rose 2010). In that sense, the HOLC was in many ways as much of a lenders' program as it was a home owners'. Thus, it is quite germane to the study of the HOLC to ask how large the benefit to the lenders was, and what the behavior of the lenders was after having sold their mortgage loans to the HOLC.

The HOLC was also a large program. Refinancing was requested for 1,886,491 properties, which accounted for 40% of all mortgaged properties satisfying the condition of being 1-4 family non-farm dwellings, and 20% of all such properties in the country, mortgaged or not.[5] A little under half of the applications were rejected or withdrawn, and 1,017,821 loans totaling $3.28 billion were made.[6] The value of outstanding HOLC loans over time as compared to private sector loans is depicted in Figure 1. In 1935, the HOLC held more of this class of loans than any other type of lender except savings and loans. After new applications ceased in 1936, the administration and gradual

[4]These bonds were essentially equivalent to US Treasury securities. At first, only the interest on these bonds were guaranteed by the federal government. In April 1934, Congress passed an act to guarantee the principal as well. Before the principal guarantee, the bonds traded at a discount to par value, but it is difficult to disentangle the effect of the principal guarantee from other sources of uncertainty about the bonds, including the initial legality problems of whether the various types of lending institutions were allowed to hold HOLC bonds under state laws. The initial HOLC bonds paid 4% a year and had a maximum maturity of 18 years. There were more issuances over time at shorter maturities and lower interest rates. The initial bonds were recallable, so much of the initial issuance was replaced with new bonds at lower interest rates. In addition, a smaller number of mortgages were purchased with cash rather than bonds, if the HOLC perceived a particularly stark emergency for the borrower, and the lender refused to accept cash. However, the HOLC simply did not have enough cash with which it could finance all its mortgages transactions. The bonds were exempt from property taxes at the state and local level, and from income taxes at the state and federal level. At first the interest on the bonds was guaranteed by the federal government, and in April 1934 Congress acted to guarantee the principal as well.

[5]It accepted applications from June 1933 to November 1934 and from May - June 1935. Houses foreclosed up to two years prior were still eligible for application. The HOLC claimed it strongly discouraged applications from cases in which adequate refinancing was available from private sources, and for which the only purpose of application was to obtain a lower interest rate.

[6]In comparison, the Reconstruction Finance Corporation administered $4.4 billion in loans between March 1933 and June 1939, and total GNP in 1936 was $82.5 billion. RFC data is taken from Fishback, Kantor, and Wallace (2003) Table 1. GNP data is taken from the Historical Statistics of the United States, Series F1-F5.

liquidation of the HOLC loan portfolio followed, with operation finally ceasing in 1951 at which time the remaining active loans were sold to private lenders.

## 2.2 Mortgage Lending in Massachusetts

Mutual savings banks in Massachusetts numbered 196 in 1929, spread across 126 municipalities. Four failed in 1933, and two more closed temporarily but re-opened the following year. This constituted remarkable resiliency against the adverse conditions during the Depression that felled so many other banks. Some of this can be attributed to relatively conservative asset portfolios, which in turn was a product of state regulation. The assets of mutual savings banks were comprised primarily of real estate loans and bonds, with the latter consisting mostly of instruments issued by public entities at all levels, as well as instruments issued by railroads and utilities.[7] The concentration in loans versus securities varied across banks, but generally no bank held more than 65% of its portfolio in real estate loans at the end of the 1920s. In terms of the securities, while some of the railroad bonds declined in value and were illiquid during the Depression, this group of securities as a whole was generally able to provide liquidity to banks that needed it.

The mutual savings banks were also protected at the depth of the Depression by state laws allowing banks to mitigate deposit runs. By 1931, 19 savings banks had required ninety days' notice before withdrawl of deposits, and three additional savings banks required sixty days. Still, the bank commissioner noted in the 1931 *Annual Report* that "the period under review is without parallel in the history of the department. Our banking institutions have suffered from the prevailing business depression and from the loss of the confidence of some of our people..." There were additional provisions required banks to establish guaranty funds that also contributed to bank stability.

The source of funds for savings banks was deposits, nearly exclusively. The concentration of this banking system was quite low, with no bank holding more than 6 percent of statewide deposits at any point during the 1930s. However, 99 of 125 municipalities with savings banks in 1929 contained only one bank; branching was allowed but only within the same county, and 36 branches existed according the 1929 call report.

Mutual savings banks were the dominant real estate lenders in Massachusetts throughout the

[7] The only other loans were loans to individuals, but such lending was usually at least an order of magnitude below real estate lending.

1920s and 1930s, though that dominance began to wane in the 1940s. The other major real estate lenders in the state were the cooperative banks, which were known elsewhere as building and loan associations.[8] The rest of the depository institutions in the state were trust companies (including commercial, trust, and savings departments), credit unions, savings and loans, national banks, and after 1934, federal savings and loan associations. Savings departments of trust companies engaged in some real estate lending, but were an order of magnitude below savings banks and cooperative banks. Life insurance companies also conducted real estate lending, but as far as I know there is no consistent data available on their activities. Only a handful of state chartered savings and loan associations existed. Federally chartered savings and loan associations in Massachusetts numbered less than 10 in 1935 and 1936, and 26 for in each year for the rest of the decade, [all] representing conversions from cooperative banks.[9]

Table 1 displays information from the aggregate balance sheets of mutual savings banks and cooperative banks, from 1929 to 1939. Mutual savings banks held roughly four times the assets of cooperative banks as of 1929; however, since savings banks were far less concentrated in real estate loans, they held only about twice as much of such loans as cooperative banks, and since some (unknown) portion of savings banks loans were commercial real estate loans, the amounts of residential real estate loans held by each were likely even more similar. The main flaw characterizing the Massachusetts savings bank data is the lack of separation between commercial and residential real estate loans, so that only total real estate numbers are available. A proxy for bank level concentration in commercial real estate lending used throughout the paper is the average real estate loan value.

The Massachusetts savings bank data is particularly useful because it reports not just outstanding real estate loans but new mortgage originations as well, which is rare.[10] Most balance sheet information does not even separate out holdings of different loan categories, or list holdings of foreclosed property. In addition, as will be discussed and utilized below, the detail on banks' bond

[8] See Bodfish (1931), p. 425. As noted above, the term 'building and loan association' was largely abandoned during the 1930s, but in Massachusetts these institutions continued to be known as cooperative banks.

[9] Early state laws governing conversions to FS&LAs were lax but were subsequently tightened, which explains the rapid conversions early on, followed by an abrupt halt.

[10] Bank-level data from this period is generally only available from the annual reports of state regulators or from the OCC for national banks. The information reported across states is idiosyncratic, and few approach the level of detail given by Massachusetts for this set of banks. Even within Massachusetts, non-savings banks reported less detailed information in general, and did not report originations.

holdings is extraordinary and allows a quantification of each bank's holdings of HOLC bonds.

Similar to the national trend, it is apparent from Table 1 that the recovery of real estate lending during the 1930s was slow. In 1929, nearly 18,000 new mortgages were written at savings banks, and in the boom of the mid-twenties, over 20,000 had been written each year. This pace fell – or, perhaps, collapsed – to less than 6,000 originations in 1934, and had risen to only about 10,000 by 1939. Meanwhile, the total balance sheet of savings banks only contracted from 1931 to 1933, and mildly so; expansion followed in the rest of the 1930s, but was similarly mild. By comparison, total assets had expanded by 80 percent from 1920 to 1930. During the 1930s, holdings of foreclosed real estate grew and reached a maximum of nearly 7 percent of total assets in 1936. Consequently, though the share of assets held in real estate loans declined 12 percentage points from 1929 to 1939, combined holdings of real estate loans and foreclosed properties declined only 6 percentage points over the same period.

### 2.3 The HOLC in Massachusetts

A special feature of the Massachusetts data for savings banks is the comprehensive detail on bank-level bond holdings, including information on the value of HOLC bonds held by each bank at the annual call report dates. This is a rare measure of the extent of bank-level transactions with the HOLC.

In total, the HOLC issued *at least* $27.2 million worth of bonds to Massachusetts savings banks. This amounts to about 2.3% of all real estate loans on savings banks' balance sheets in 1933, while the average of this percentage across banks is about 2.9%, since the larger banks appear to have engaged in relatively more commercial real estate transactions which would not have been sold to the HOLC. These transactions with the HOLC began in 1933, but there were very few before the October 31 call report date for savings banks; the bulk occurred in 1934, continued in 1935, and finished in 1936 as the backlog of applications was depleted.

A qualification in the preceding paragraph was that the data capture "at least" $27.2 million worth of transactions between savings banks and the HOLC. This qualification is due to the fact that annual call report information cannot perfectly measure each bank's involvement in the HOLC. The most salient issue is that if a bank received and subsequently sold HOLC bonds between call

reports, its transaction with the HOLC would be undetected in this data.[11] This issue is discussed at length in section 5. In practice, it is possible to actually approximates flows rather than simply stocks because the HOLC issued different series of bonds, successively over time, and so by tracking the additions and subtractions of holding in each series individually, it is possible to overcome some of this issue. There is some measurement error remaining nevertheless, which could introduce bias to this paper's analysis of post-HOLC lending activities. If the mismeasurement applies to some banks and not others, at random and not with relation to their latent new mortgage origination practices, then this simply constitutes a measurement error that would attenuate any role of the HOLC. If, however, banks originating relatively large numbers of mortgages were more likely to sell their HOLC bonds, perhaps in order to raise the cash for a mortgage transaction, then this type of measurement problem would bias any analysis *against* finding an impact for the HOLC and perhaps even flip the sign of the HOLC's impact.

Finally, the call report data on securities holdings by cooperative banks is less detailed, since these banks typically held few assets of that type coming into the 1930s. However, an exception appears to have been made in 1934, and HOLC bond holdings (and only HOLC bond holdings) are detailed in that year. $15.7 million worth of bonds are recorded in that year at cooperative banks, which is 3.7% of total real estate loans held at the end of 1933.

# 3 Empirics

## 3.1 Who participated?

HOLC participation was widespread, which is unsurprising in light of the size of the program. Few savings banks and cooperative banks did not sell any loans to the program. However, given that most of the ensuing analysis in this paper is cross sectional in nature, a primary issue is why some banks sold more loans to the HOLC than others. That is, at the bank level, was the scale of HOLC intervention independent of bank characteristics? In particular, a key question is whether the HOLC intervened more with banks that had a higher latent tendency to expand real estate

[11] In addition, some unknown amount of loans were sold to the HOLC for cash. The HOLC greatly preferred to compensate lenders with bonds, however, since its initial capital stock was much more limited than its capacity for bond issuance. However, if the borrower would not accept HOLC bonds, in some cases the HOLC would pay with cash instead. This occurred in only 11,305 out of the HOLC's 1,017,821 loans (1.1%). In the data from Massachusetts banks, it is not possible to identify if a bank received such a cash payment.

lending in the period during and after the intervention.

There are reasons to doubt that the HOLC intervened, either deliberately or not, more with banks that were more likely to originate greater amounts of real estate loans in subsequent years. If anything, one might expect the HOLC to transact more with banks which owned large amounts of distressed loans. As a group, banks with relatively large such burdens would probably be less likely than others to engage in significant balance sheet expansion or new loan investment in the mid 1930s, given the costs associated with maintaining foreclosed properties and the burden of other frozen assets. This tendency would consequently be likely to bias any analysis *away* from finding that HOLC action was associated with greater subsequent lending by banks.

An important characteristic of the HOLC application process was that the HOLC transacted on a loan level basis and not on a lender basis. That is, the HOLC accepted applications from borrowers and then sought to purchase each loan from the lenders; it did not approach lenders independently to purchase their loans as a block. As a result, it would likely have been inconsistent with that framework for the HOLC to have actively targeted some lenders over others. It's doubtful that the HOLC as an organization, quickly assembled during 1933 and in many places overwhelmed by the backlog of applications from borrowers, would have even been capable of identifying and targeting certain banks.

Another way to look at this question is to ask if there are any reasons to expect the bias to hold, that the HOLC transacted more with banks that had a higher latent tendency to expand real estate lending in the period during and after the intervention. One possible story is that very weak banks had already foreclosed on many properties prior to 1933, when the HOLC was established, and so could not sell as much to the HOLC because the fate of many loans had already been sealed. This would not be a deliberate targeting by the HOLC, but a correlation could exist nonetheless as a result. The story is not entirely plausible, though, because properties that had been foreclosed up to two years prior were still eligible for HOLC refinancing.

Table 3 takes some of these ideas to the data. This table reports simple OLS regressions relating the scale of HOLC intervention on a bank level to bank characteristics in 1933, prior to the HOLC intervention.

The first group of variables measure characteristics of the towns in which the banks were located, and so the standard errors are clustered at the town level. Distance to the nearest HOLC office

is negatively correlated with the extent of HOLC transactions; the logic here, as suggested in prior research conducted by Courtemanche and Snowden (2009) and Fishback, Lagunes, Horrace, Kantor, and Treber (2009), is that it was easier for the HOLC to overcome the various transaction costs associated with closing a real estate deal when the borrower and the lender were close to an HOLC office.

Distance to the nearest HOLC office could then be considered as an instrument for HOLC activity; however, it turns out that the instrument is far more successful in a multi-state cross-county setting than in an intra-state setting. Across states, depending on how each state set up HOLC offices, similar cities may have had very different access to the HOLC; for example, the fifth largest city in a large state such as New York may be comparable in size to the first ranked city in other states, but the latter would be more likely to have an HOLC office given a limited number of offices in each state. In a within-state context, though, distance to the nearest HOLC office tends to be mostly be a measure of rurality, and thus may not be exogenous to underlying housing fundamentals. This also speaks to the nature of the endogeneity in the different cross-sectional contexts of banks and counties. Across counties over the entire country, the HOLC may vary well have intervened more in some states or counties in ways that correlate with underlying fundamentals of the housing market, but some random portion of the variation in HOLC activity may be explainable by HOLC office location. Across banks within the relatively small state of Massachusetts, run under one HOLC state office, with the ability to control for local economic conditions at least at the county level, the focus of any analysis must center more on bank level characteristics and the likelihood of HOLC activity being correlated with such characteristics.

Failures of banks (including national banks and state trust companies) tended to be concentrated in urban areas in Massachusetts. The presence of a nearby bank that failed also predicts HOLC activity well, most likely since other banks in those areas were distressed and had more distressed loans to sell to the HOLC. As a result, in column 2 of Table 3, when a dummy indicating that a bank failure occurred within a 10 mile radius is included, the distance variable no longer has any independent predictive power. This is consistent with the findings of Courtemanche and Snowden, that on a county-level basis, the HOLC transacted more in areas with greater degrees of housing distress, if that distress is correlated with bank failures. However, the combination of these results casts doubt on the viability of HOLC office location as a valid instrument for HOLC activity at

the sub-county level, as noted above.

The rest of the table sheds further light on the determinants of HOLC activity. Banks with higher average loan values – a proxy for larger degrees of commercial real estate lending – transacted less with the HOLC, as expected, since such loans were not eligible for the HOLC program. A high concentration of assets in real estate loans predicts HOLC activity in the first column, and with large economically significance; however, including nearby bank failures decreases the coefficient estimate. Otherwise, no other variables have any real predictive power, not even the foreclosure-to-asset ratio as of 1933.

What is the remaining variation that would explain variation in HOLC transactions across banks? Some was probably due to the lenders. Lenders themselves rejected 17.9% of the applications that had been initiated by the borrower to the HOLC, reportedly because the HOLC's offers were too low. Again, though, this would suggest that the HOLC may have transacted more with banks that had more distressed loans, which would be valued lower by banks and less likely to be rejected by them. Aside from the lenders, some variation is surely due to the borrowers as well. Borrowers were required to initiate the application process to the HOLC, and there was likely variation across banks in the number which exercised that option. Nevertheless, the program was large, and so it would appear that borrowers were largely aware of the program. A successful application was another matter, though. A degree of distress was needed for a successful application; though detecting such distress is not an exact science and continues to complicate any refinancing process even in the current period, the HOLC did reject 12.6% of its applications across the country due to lack of borrower distress. An additional 9.7% were rejected due to failure of the applicant to cooperate, 7.5% due to unstable credit or income of the applicant, and 3.5% due to defective or insufficient title.[12] Thus, the number of borrowers exhibiting the specific characteristics the HOLC was aiming for – distressed residential mortgage holders with clear titles but certain enough income streams to justify new lending – could easily have created substantial variation out of the hands of the banks. Finally, the policies of the local HOLC office may have mattered as well; such policies – including underwriting guidelines, appraisal methodologies, and interpretation of national HOLC policy – may have varied idiosyncratically across offices and bureaucrats. Such policies were not

[12]These data on application outcomes were made available to Harriss (1951) and cover the first 577,642 rejections dating to May 16, 1935, of out 868,670 total rejections.

insignificant to the completion of the HOLC application process, and variation is possible given the inexact science of appraising properties and running a large debt refinancing operation in 1934.

This section ultimately suggests that the net bias present in the ensuing analysis would likely be one against finding that the HOLC spurred new mortgage lending, since there is little credible reason to believe that the HOLC would have deliberately or not deliberately transacted more with banks that had higher latent tendencies to lend. Since many HOLC policies were designed to increase lender participation, the reality of the application process was that it was much less focused on the lender (many who were happy to accept the generous HOLC payments given a successful application), and more focused on the characteristics of the existing loan and of the borrowers.

### 3.2 Growth in loans outstanding and foreclosures

This section analyzes the factors affecting growth at Massachusetts savings banks after 1933 of two balance sheet items: holdings of real estate loans, and foreclosed properties.

I proceed with a simple specification, which examines cross-sectionally via OLS the growth rate of outstanding real estate loans from 1933 to a subsequent year $y$. Formally,

$$\ln L_{icy} - \ln L_{ic,33} = \alpha + \beta HOLC_{icy}/L_{ic,33} + \delta\left[\ln F_{icy} - \ln F_{ic,33}\right] + X'_{ic,33}\gamma + Z'_{icy}\lambda + \eta_c + u_{icy}$$

In this notation, $L_{icy}$ measures the value of real estate loans outstanding held at bank $i$ in county $c$ in year $t$, and $F_{icy}$ similarly measuring the value holdings of foreclosed real estate.[13] $HOLC_{icy}$ measures the value of transactions with the HOLC up to year $y$, and is divided by the value of real estate holdings as of 1933, the year before the HOLC was instituted. $X_{ic,33}$ and $Z_{icy}$ are vectors of additional bank level controls from 1933 and from the current year, and the elements of these vectors will be discussed below. Finally, $\eta_c$ are geographic county dummies.

Table 4 displays the results.[14] Each column contains estimates for the coefficients of this

[13]The value of foreclosed real estate is taken to be the bank's assessment of the value, rather than the original appraised value which is also available.

[14]Five banks are excluded from these estimations. Two banks, Millbury Savings Bank and Somerset Savings Bank, were closed temporarily in 1933 and re-oponed the next year. A third, Lawrence Community Savings Bank, was founded in 1933. Each of these three banks' balance sheets evolved significantly differently than the rest of the sample, since each bank was growing their loan portfolio at a much more rapid pace. Two additional banks, Lowell Institution for Savings and Lowell Five Cent Savings Bank, were also excluded, due to the extraordinarily large

specification using data for each year from 1934 to 1939.

Banks that sold a relatively high portion of their 1933 loan holdings to the HOLC had lower growth of real estate loan holdings in 1934 and 1935. This result is sensible and mostly mechanical; the HOLC removed real estate assets directly from the lenders' balance sheets during these years. This is also a finding that should help confirm the validity of the measure of HOLC transactions based on bond holdings. The point estimate drops substantially in 1936, as the HOLC effect quickly dissipates, with no further effect in the rest of the decade. Thus, the sales of loans to the HOLC only temporarily depressed real estate holdings relative to 1933. The quick dissipation of this effect suggests that lenders receiving more HOLC aid also subsequently originated relatively more new loans; this possibility will be confirmed in the next section in which I analyze originations data.

Banks with high growth in foreclosed property holdings had significantly lower growth in real estate loan holdings; this is also a natural and mechanical finding, since growth of foreclosures on a bank's balance sheet should take place only if the corresponding real estate loans were taken off the banks books. Deposit growth is also strongly associated with real estate loan growth, suggesting funding was a somewhat important concern for banks during this period, or perhaps that areas with high demand for new real estate lending also increased their deposits with local banks at greater paces. That being said, lagged deposit growth from 1929 to 1934 appears to have no effect, indicating that deposits lost during that unstable period did not have any lasting effect on bank operation.

Table 5 contains the results for a similar estimation, involving the determinants of growth in holdings of foreclosed properties (rather than growth in real estate loans as in Table 4) on banks' books from 1933 to each each year in the mid-to-late 1930s. In the short run, in 1935 to 1936, banks with more involvement with the HOLC had significantly lower growth in foreclosures held on their books. This appears to be evidence consistent with the idea that the HOLC purchases of distressed mortgages absolved banks of poorly performing assets in danger of foreclosure. This effect lasts a bit longer than the HOLC's impact on the change in real estate loans from Table 4, remaining significant in 1936, and the point estimate remaining large until 1939.

Otherwise, banks with high foreclosures relative to assets as of 1933 tended to have lower foreclosure growth thereafter for the rest of the decade. That being said, almost all banks continued to

amount of foreclosures each incurred in 1934 and 1935.

have foreclosure growth up to 1936, and so banks with high foreclosures simply had lower foreclosure growth, perhaps simply because more of a fixed stock had been foreclosed by 1933. Indeed, the correlation appears to be especially driven by a number of banks with low foreclosures in 1933 that then had very large foreclosure growth in subsequent years. Otherwise, banks with large average real estate loans, which indicates more commercial real estate mortgages rather than residential ones, had lower foreclosure growth, likely reflecting the relative weakness of the residential housing market. Finally, deposit growth appears to have had little impact on foreclosure growth, consistent with foreclosures being a function of asset quality and not bank funding capacity.

### 3.3 New originations

In this section, I explore the role of the HOLC, and other factors, in explaining new originations of real estate loans at savings banks. The advantage of originations data may be obvious after the analysis of the last section; most call reports yield data only on total loan holdings on the balance sheet at each call date, but total loans change not just due to new originations but also due to other factors including paydowns and the seizure of foreclosed assets. Especially since the short-run effect of the HOLC was to remove loans from the balance sheets, any hope of identifying the role of the HOLC in spurring new lending would require such originations data.

The analysis compares the size of new originations to the extent of transactions with the HOLC, scaled by the size of each bank's loans on balance sheets. Specifically, the general form of the regression is

$$NEW_{itcy}/L_{itc,y-1} = \alpha + \beta HOLC_{itcy}/L_{itc,33} + Z'_{itcy}\delta + X'_t\gamma + \eta_c + u_{itcy}$$

The subscripts $i$, $t$, $c$ and $y$ index banks, towns, counties, and years, respectively. Thus, the variable $NEW$ is the value of new real estate loans at bank $i$, in the town $t$, in the county $c$, in year $y$, divided by the value of real estate holdings in the previous year. The variable $HOLC_{itcy}$ is the extent of detected transactions with the HOLC up to year $y$, divided by the value of real estate holdings as of 1933, the year before the HOLC was instituted. The vector $X_t$ contains town level controls, including the distance to the nearest HOLC office and other variables, and the vector $Z_{itcy}$ contains other bank level controls. Finally, $\eta_c$ contains a set of county dummies.

Table 6 displays the results.[15] Banks transacting more with the HOLC, relative to their holdings of real estate loans in 1933, tended to originate more loans in each year of 1935, 1936 and 1937. By 1938, this effect dissipates, and the point estimate is near zero by 1939. The point estimate, which ranges from 0.2 to 0.25 between 1935 and 1937, suggests that if a bank sold 5 percent of its 1933 real estate holdings to the HOLC, it then originated new loans equal to $0.05 \times .225$ of its real estate holdings in the previous year, or about 1.1 percent. It is notable that the magnitude of this effect is about equal to the impact of deposit growth since 1934, which is consistently positively correlated with new originations throughout the period.

As expected from the previous analysis, the inclusion of the log average loan value is important, and these results again suggest that banks focusing more on high-value loans (likely commercial real estate) were originating larger volumes throughout the second half of the 1930s. The regression also included four variables intended to capture any legacy of financial fragility: deposit growth from 1929 to 1934, the ratio of foreclosed property holdings to assets, a dummy indicating that a bank failure had occurred within 10 miles, and a dummy indicating that a bank had resorted to funding itself partially with bills payable in 1933. None predicts new originations well, and so the results suggest a story in which the legacy of the Depression bank runs and weakness during the 1929-1933 period did not continue to depress new lending in the latter half of the 1930s. Rather, bank funding, via deposits or the HOLC, were more salient factors

Thus far I have not discussed much the demand for real estate loans. One alternative interpretation of these results that cannot necessarily be ruled out is that HOLC involvement with a bank gave benefits to the local community, through its effect on house prices and borrower balance sheets, and that in turn induced some of the positive correlation between bank level HOLC activity and new real estate originations. Of course, such a mechanism would have to operate very locally, given the county level dummies included in the analysis, and the generally limited geographic scope of the paper to a small New England state . Nevertheless, given the local nature of real estate lending at the time, it's not impossible. This HOLC effect would still be interesting, but would be an unknown mixture of demand and supply factors. The effect of deposit growth could indicate a

[15] This analysis omits three banks. One, the Lawrence Community Savings Bank, was *de novo* in 1933, and thus its behavior was expansionary in a way similar to no other bank, and it also did not participate with the HOLC, naturally. The other two were the Somerset Savings Bank and the Millbury Savings Bank, both omitted due to data availability problems arising from their temporary suspension in 1933.

similar phenomenon, that community recovery led to demand for mortgages and increased deposits, and not that the bank was constrained by funding. In a set of regressions unreported here [as of this draft], I could not find any increased lending on banks that were located within ten miles of *other* banks (savings banks or cooperative banks) that had received relatively large amounts of HOLC funding. This provides some indication that the feedback through demand factors may not be operative; I intend to pursue this line of thought more in the next draft.

# 4 The information content of HOLC bond holdings

This section details the information available from call reports on HOLC bonds held by savings banks and cooperative banks, and assesses their informational content. The concerns about using call report data to measure HOLC transactions, as noted in section 2.3, are fairly mollified with this examination of the data.

The main question is whether HOLC bond holdings as listed on the call report can be trusted as measures of interaction with the HOLC, given that banks may trade these bonds, thus altering their holdings for reasons not related to HOLC transactions. Perhaps the most convincing reason to use the call report data is that the banks with large amounts of HOLC bonds also experienced large declines in real estate holdings over 1934 and 1935, as noted in section 3.2 and in Table 4. The scatter plots in Figure 9 provide visual evidence along these lines, giving the bivariate relationship between growth in real real estate loans at savings banks between the 1934 and 1935 call reports, and the amount of new HOLC bonds that appear on balance sheets in 1934 and 1935. There is a quite strong relationship, with banks that recorded relatively large amounts of HOLC bonds also recording relatively steep contractions in loans. Of course, the relationship is not exact because of the other factors that affect growth in loans outstanding, such as paydowns and foreclosures.

Another way to approach this issue is to examine the breadth of HOLC bond holdings. Almost all institutions show some activity with the HOLC. Of the 190 savings banks in the sample for both 1934 and 1935, 182 show at least some HOLC bond holdings, while only 8 show none, and most of these 8 are among the smallest institutions in the sample. Of the 223 cooperative banks that existed in 1934, 209 show activity with the HOLC. As a result, the data is not obviously flawed in its breadth.

A second step in assessing the breadth of HOLC bond holdings is to gauge how much of the total HOLC activity in the state, which is known from the HOLC's final report in 1952, is captured by the call report. The total nominal value of HOLC bonds captured by call reports at savings banks and cooperative banks is \$42.9 million, which is about 39% of the \$109 million worth of mortgage transactions completed by the HOLC in Massachusetts. An additional tabulation of securities held by the savings departments of state chartered trust companies reveals \$4.2 million at those institutions, which would then increase the amount of total HOLC activity captured to 43%. We do know that the \$109 million across the state resulted from $24,524$ transactions, for an average of $\$4,448$ per transaction, which if applied to the above call report total, would imply about $9,644$ transactions captured by that data.

Is it reasonable to have captured 39% of total HOLC activity? The only risk is of underestimation. The rest of the HOLC's transactions were presumably with nationally chartered banks, life insurance companies, the commercial departments of trust companies, individuals, the handful of thrifts that existed before the federal charters became available, and other institutions. The distribution of payments across these institution types is not known at the state level, to the best of my knowledge, although national aggregates are available. National data indicates that individuals, life insurance companies, commercial banks, and other institutions (besides savings institutions and private real estate securities holders) held about 60% of of residential mortgage debt in 1930. This 39% figure is then within a reasonable ballpark.

Another way to analyze the data is to pay more attention to the specific series of bonds issued by the HOLC, each of which the call reports lists the holdings separately. As time went on, the HOLC issued new series of bonds to take advantage of lower interest rates for short maturities, and the guarantee of principal debt by act of Congress. As a result, four different series were exchanged for mortgage bonds, at the following rates of interest: 4%, 3%, 2.75% and 2.25%. The 4 percent series was issued between July 1933 and May 1934, and in turn, the 3 percent series was issued until August 1934, and the 2.75 percent series until July 1935, and finally the 2.25 percent series covered the remaining period. The share of total transactions for mortgage debt funded by these different series is approximately 23.5%, 23%, 50%, and 3.5%, respectively. As a result of this detail on individual series issued at different points in time, it is possible to obtain some detail on the

flow of bonds in each year.[16]

Table 8 displays information on the stocks of these four different issuances of HOLC bonds, held by savings banks, beginning in 1933. The table displays the counts of banks that hold each issue in each year, along with information about the amount of banks retaining the same amount of bonds from year to year, adding to existing holdings, selling part or all of their holdings, or having their bonds refinanced for a different issue.

1. The 3% issuance is perhaps the most straightforward. The great bulk of activity in the 3% issue appears in 1934. After 1934, holdings of the 3% were relatively stable: of the 162 banks with this issue at the end of 1934, 109 held the exact same amount at the end of the next year. Similarly, at the end of 1936, an even higher portion, 113 of 136, held the same amount as at the end of 1935. This pattern of steady holdings gives some confidence that each bank's volume of activity with the HOLC is being captured.

2. The 2.75% issue was the largest issue and its activity spans 1934-1936. Its first appearance is in 1934 when 154 banks held it, but 127 of these banks added to their holdings in 1935, in addition to 24 banks gaining this holding for the first time. In 1936, the last of the new activity appears as 77 banks added holdings, but the incidence of sales also increases, as 42 banks reduced their holdings to zero.

3. The 4% issuance is the most ephemeral of the four series, appearing on the balance sheets of 4 firms in 1933 and 49 in 1934, and then disappearing in 1935. A feature of this issue was its callability at any date, an option the HOLC exercised fairly quickly. Half of the bonds were exchanged in late 1934 for the 3% series, and so some of the 3% holdings that appear in 1934 are likely the result of this exchange. In fact, since HOLC documents indicate that equal amounts of the 4% and 3% series were issued, the 3:1 ratio of 3% to 4% bonds in 1934

[16] This is somewhat complicated by the fact that on a few occasions, the HOLC exercised its option to refund past issuances with new issuances at lower interest rates. The result is that an increase in a specific issuance from year to year may not be due to new activity with the HOLC, but instead due to a shift in the composition of HOLC bonds. However, this can be addressed fairly easily by noting observations in which a specific bond issuance disappears from a bank's balance sheet during a time in which it was refunded, and there is an exactly equivalent dollar amount increase in the bank's holding of the new issue into which the old issue was refunded. I find a limited number of instances of this, which are noted in Table 8. The only shortcoming here is that if a bank were to sell off a portion of the new bonds it receives, then the data will show the entire amount of the old bond disappearing, but the new bond increasing by a smaller amount. In that case, it is difficult to convincingly identify such an observation as being due to refunding rather than due to new transactions.

is consistent with that interpretation. In addition, HOLC documents indicate that the total amount of the 2.75% series issued was roughly equal to the combined amount of the 4% and 3% series, so again in order for the relative sizes of the holdings in this data to be consistent with that aggregate information, the best interpretation is that around one third of the 3% bonds that appear in 1934 are likely to be the result of the 4% exchange. Regardless, this is not necessarily important for the purpose of counting up aggregate bond holdings, since the 3% series itself did not appear until 1934, and so the above description of the 3% series does not need to be significantly re-interpreted. In May 1935, the second half of the 4% issue was exchanged for shorter maturity 1.5% bonds (not listed in Table 8), and so the 4% bonds disappear from balance sheets at that point. 12 of these exchanges are detectable on the balance sheets, in that the exact amount of the decrease in the 4% bonds appears as an increase in the 1.5% or 3% columns in the next year. For the 37 others, however, it appears the bonds were simply sold off.

4. The 2.25% series appears in 1936. This is a much smaller issuance than the others.

This analysis of the individual bond series is meant to suggest that, with such detailed information it is possible to have more confidence in the ability of the call report to capture each bank's interaction with the HOLC than had the call report simply listed total HOLC bonds held in each year. Since these bonds were issued over different, non-overlapping periods of time, it is possible to more closely approximate flows of bonds rather than stocks. In addition, information on different bond issuances decreases measurement error in some cases, because it may be possible to observe that holdings of one series were stable, while the holdings of another series were sold off. For example, if one series disappears from one year to the next, but a newly issued series appears, detail on the individual series allows us to know that new transactions with the HOLC actually did occur in that year. Thus, each bank's HOLC activity in this paper is measured as the combined holdings of each separate series, and so I am able to capture each bank's activity more accurately than if only total bond holdings were available.

Finally, it is worth noting what market commentators at the time wrote about these bonds. Relevant commentary is sparse, but there was some discussion of the 4% series prior to its refunding, which was discussed above. According to such commentators, up to the time of the refunding, banks

which held the 4% series apparently sold relatively few of their holdings, because of its relatively attractive interest rate, and so it was only lightly traded through May 1935.[17]

## 5 Conclusion

This paper analyzes the factors contributing to new real estate lending in the mid-to-late 1930s. In the mid-1930s, banks that sold many loans to the HOLC saw their real estate holdings decline (mechanically), but quickly originated new mortgages in greater amounts than other banks, and also experienced slower growth of foreclosed properties on their balance sheets. The suggested interpretation is that the HOLC aided banks in avoiding the costs associated with delinquencies and foreclosures, and that the banks responded with the addition of new loans to their portfolios. Thus, the HOLC may have led to an increase in economy-wide lending, rather than simply a transfer of mortgage debt from the private sector to the government. If weak balance sheets were a major impediment for some banks, then the ability of the HOLC to ameliorate this constraint may have been a large contribution of the program, and potentially interesting in light of current concerns over frozen assets and general bank balance sheet weakness.

There are two broader settings for this analysis. First is the idea that the HOLC may have been a program that in practice was as much for lenders as it was for borrowers. Given that lenders voluntarily participated in the program, they presumably benefited (at least in expectation) from that participation, and this paper has sought to examine whether any of that benefit resulted in additional lending. Second is the question of what was constraining bank lending during the 1930s. This particular setting, of real estate lending in Massachusetts, may not seem at first glance to be an area likely to face large constraints, given the relative strength of the state's savings institutions during the Depression, and the nature of real estate lending. Nevertheless, the reality of the post-depression 1930s period was that there was no large recovery of real estate lending. While the HOLC may have created some cross sectional variation in lending, realistically no factor could be described as generating a large rejuvenation of lending because there was no large rejuvenation of lending.

[17]"HOLC Bonds Rise in Quiet Market", *New York Times*, May 21, 1931, p. 31.

## References


**Behrens, Carl F.**, *Commercial Bank Activities in Urban Mortgage Financing*, National Bureau of Economic Research, 1952.

**Bell, Spurgeon**, "Shifts in the Sources of Funds for Home Financing, 1930-1937," *Law and Contemporary Problems*, Autumn 1938, *5* (4), 510–516.

**Bodfish, H. Morton**, *History of Building and Loan in the United States*, United States Building and Loan League, 1931.

____ , *The Depression Experience of Savings and Loan Associations in the United States*, United States Building and Loan League, 1935.

**Clark, Horace F. and Frank A. Chase**, *Elements of the Modern Building and Loan Associations*, The Macmillan Company, 1925.

**Colean, Miles L.**, *The Impact of Government on Real Estate Finance in the United States*, National Bureau of Economic Research, 1950.

**Courtemanche, Charles and Kenneth Snowden**, "Repairing a Mortgage Crisis: HOLC Lending and its Impact on Local Housing Markets," 2009.

**Davenport, Donald H.**, *The Co-operative Banks of Massachusetts*, Harvard University Graduate School of Business, 1938.

**Federal Home Loan Bank Board**, "Final Report to the Congress of the United States relating to the Home Owners' Loan Corporation [1933-1951]," 1952.

**Finney, Katherine**, *History of Mutual Savings Banks in Northampton, Massachusetts*, King's Crown Press, 1945.

**Fishback, Price, Alfonso Flores Lagunes, William C. Horrace, Shawn Kantor, and Jaret Treber**, "The Influence of the Home Owners' Loan Corporation in Housing Markets During the 1930s," 2009.

**Fisher, Ernest M.**, *Urban Real Estate Markets: Characterstics and Financing*, New York: National Bureau of Economic Research, 1951.

**Harriss, C. Lowell**, *History and Policies of the Home Owners' Loan Corporation*, New York: National Bureau of Economic Research, 1951.

**Lintner, John**, *Mutual Savings Banks in the Savings and Mortgage Markets*, Boston: Harvard University, 1948.

**Massachusetts Department of Banking and Insurance, Division of Banks and Loan Agencies**, *Annual Report of the Commissioner of Banks*, Commonwealth of Massachusetts, 1929-1939.

**Morton, J. E.**, *Urban Mortgage Lending: Comparative Markets and Experience*, Princeton University Press, 1956.

**Rose, Jonathan D.**, "The Incredible HOLC? Mortgage Relief During the Great Depression," manuscript, 2010.

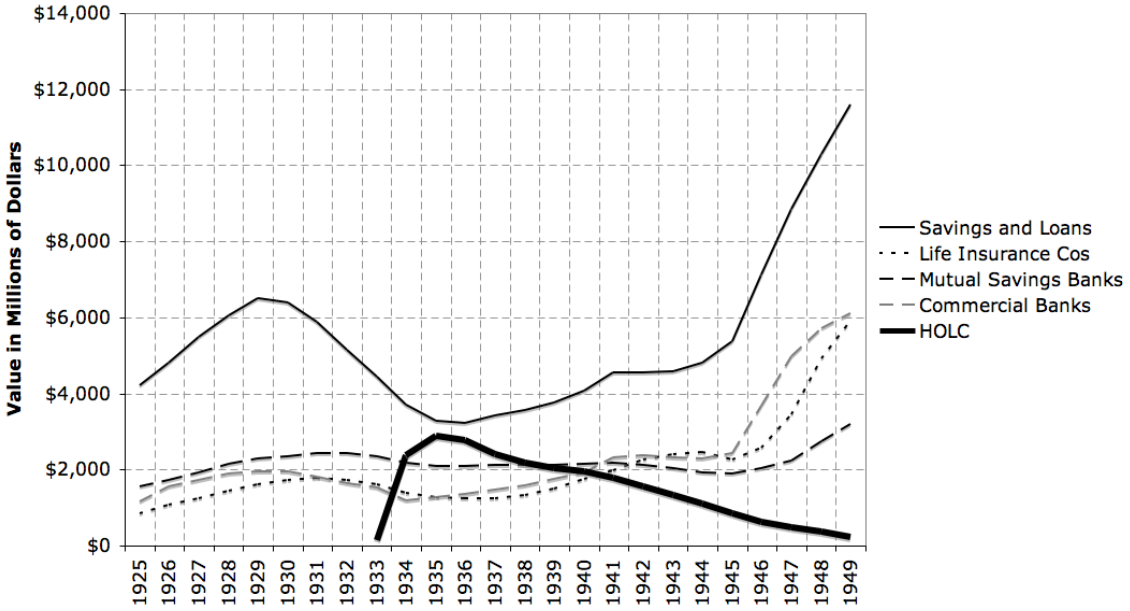
**Saulnier, R. J.**, *Urban Mortgage Lending by Life Insurance Companies*, National Bureau of Economic Research, 1950.

**Snowden, Kenneth A.**, "The Transition from Bulding and Loan to Savings and Loan, 1890-1940," in Stanley L. Engerman, Philip T. Hoffman, Jean-Laurent Rosenthal, and Kenneth L. Sokoloff, eds., *Finance, Intermediaries, and Economic Development*, Cambridge University Press, 2003, chapter 6, pp. 157–206.

——, "The Anatomy of a Residential Mortgage Crisis: A Look Back to the 1930s," manuscript, 2009.

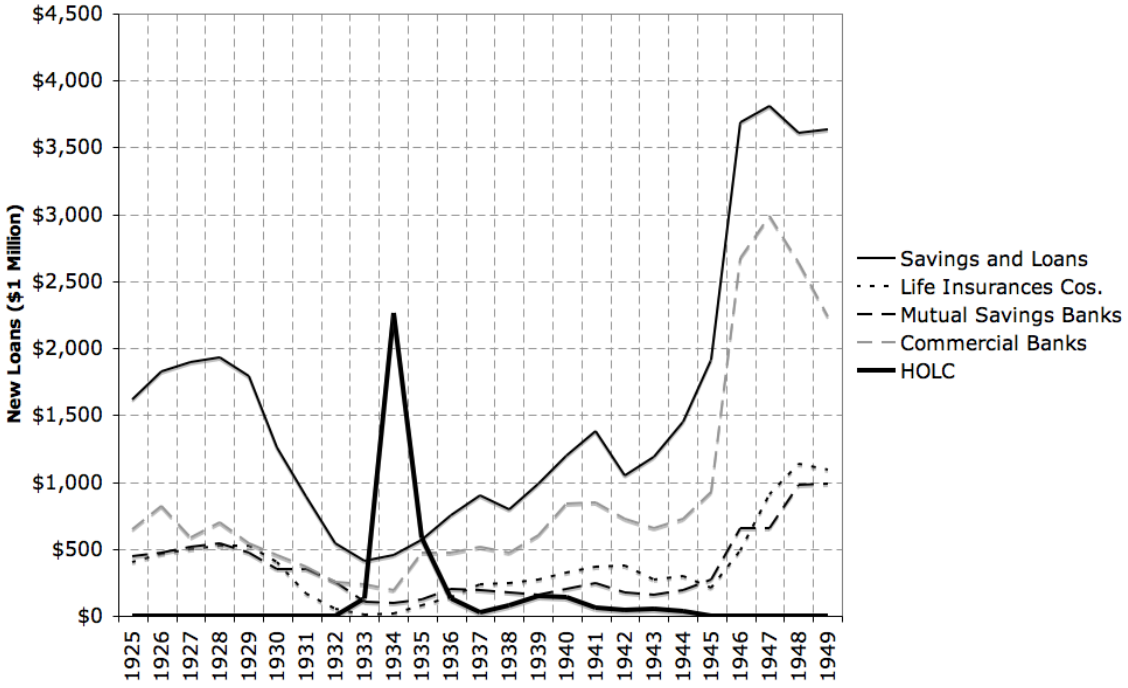
**Welfling, Weldon**, *Mutual Savings Banks: The Evolution of a Financial Intermediary*, The Press of Case Western Reserve University, 1968.

Figure 1: Outstanding mortgage loans on 1-4 family homes, by type of lender.




*Notes*: The savings and loan data include building and loan associations and savings and loan associations. Source: Federal Savings and Loan Insurance Corporation, via Fisher (1951), p. 64.

Figure 2: New mortgage loans on 1-4 family homes, by type of lender.




*Notes*: The savings and loan data include building and loan associations and savings and loan associations. Source: Historical Statistics of the United States, Series DC 983-989.

Table 1: Aggregate balance sheet items of Massachusetts Banks

**Mutual Savings Banks**

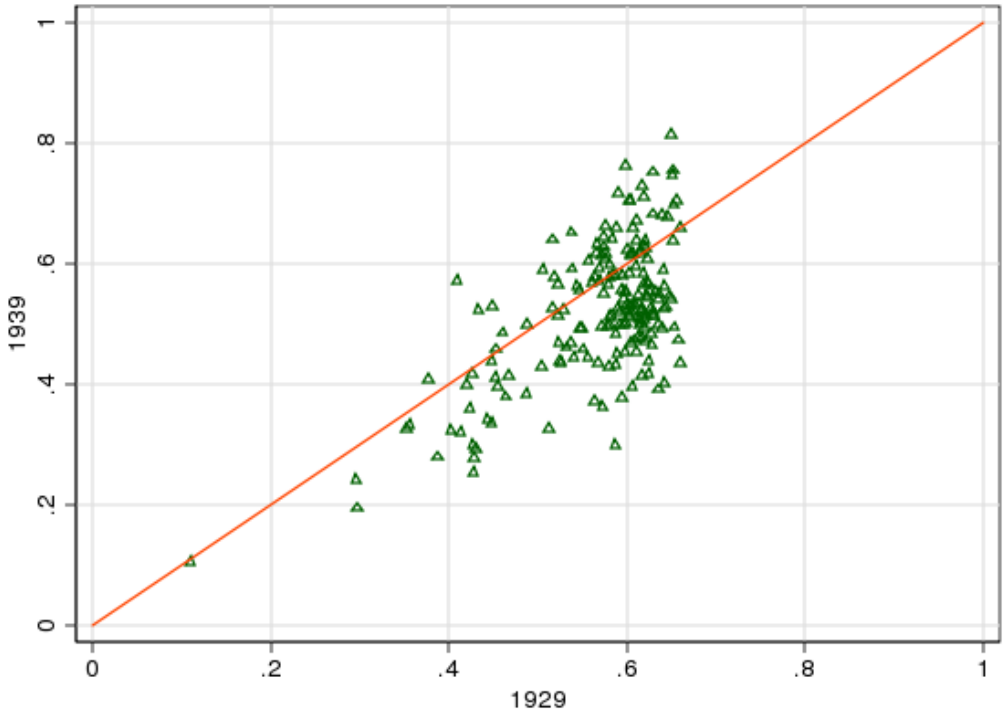
| Year | Total Assets (millions) | Share of Assets in ... | | | | Number of... | |
|---|---|---|---|---|---|---|---|
| | | Securities | Real Estate Loans | Foreclosed Property | RE Loans and Foreclosed Property | Outstanding Real Estate Loans | New Real Estate Loans |
| 1929 | $2,232 | 0.229 | 0.536 | 0.004 | 0.540 | 191,623 | 17,765 |
| 1930 | 2,288 | 0.227 | 0.537 | 0.007 | 0.544 | 195,502 | 15,909 |
| 1931 | 2,369 | 0.245 | 0.529 | 0.012 | 0.541 | 201,149 | 14,730 |
| 1932 | 2,280 | 0.240 | 0.540 | 0.022 | 0.561 | 200,006 | 8,335 |
| 1933 | 2,227 | 0.249 | 0.531 | 0.036 | 0.567 | 194,617 | 6,286 |
| 1934 | 2,252 | 0.279 | 0.501 | 0.048 | 0.549 | 186,880 | 5,877 |
| 1935 | 2,294 | 0.308 | 0.469 | 0.061 | 0.530 | 179,943 | 6,914 |
| 1936 | 2,347 | 0.351 | 0.441 | 0.067 | 0.508 | 176,632 | 7,433 |
| 1937 | 2,384 | 0.379 | 0.425 | 0.065 | 0.491 | 175,445 | 9,425 |
| 1938 | 2,370 | 0.388 | 0.421 | 0.065 | 0.486 | 175,579 | 9,517 |
| 1939 | 2,386 | 0.405 | 0.407 | 0.062 | 0.469 | 175,566 | 9,827 |

**Cooperative Banks**

| Year | Total Assets (millions) | Share of Assets in ... | | | |
|---|---|---|---|---|---|
| | | Securities | Real Estate Loans | Foreclosed Property | RE Loans and Foreclosed Property |
| 1929 | 544 | 0.028 | 0.928 | 0.013 | 0.941 |
| 1930 | 563 | 0.040 | 0.908 | 0.019 | 0.927 |
| 1931 | 560 | 0.047 | 0.896 | 0.025 | 0.920 |
| 1932 | 528 | 0.055 | 0.873 | 0.040 | 0.913 |
| 1933 | 503 | 0.068 | 0.839 | 0.064 | 0.903 |
| 1934 | 478 | 0.109 | 0.785 | 0.078 | 0.863 |
| 1935 | 458 | 0.119 | 0.751 | 0.103 | 0.855 |
| 1936 | 456 | 0.121 | 0.737 | 0.119 | 0.856 |
| 1937 | 397 | 0.115 | 0.747 | 0.115 | 0.863 |
| 1938 | 388 | 0.110 | 0.754 | 0.114 | 0.868 |
| 1939 | 393 | 0.124 | 0.749 | 0.106 | 0.856 |

*Source*: Annual Reports of the Massachusetts Commissioner of Banks, 1929-1939.

Table 2: Concentration in Real Estate Lending: 1929 and 1939




*Notes:* Each axis measures total real estate loans plus total foreclosed property holdings, divided by total assets. The diagonal line is a 45 degree line.

Table 3: Determinants of HOLC transactions

| | (1) | (2) | (3) |
|---|---|---|---|
| Distance to nearest HOLC office | -0.0004** | -0.0002 | -0.0001 |
| | [0.0001] | [0.0001] | [0.0003] |
| 1(failure within 10 miles) | | 0.0127** | 0.0145** |
| | | [0.0048] | [0.0052] |
| log(town population) | 0.0016 | 0.0007 | 0.0011 |
| | [0.0013] | [0.0013] | [0.0019] |
| share of town real estate loans | 0.0297* | 0.0288* | 0.0148 |
| held by cooperative banks | [0.0116] | [0.0113] | [0.0116] |
| log(average real estate loan) | -0.0181** | -0.0185** | -0.0178** |
| | [0.0044] | [0.0044] | [0.0041] |
| log(assets) | -0.0022 | -0.0020 | -0.0020 |
| | [0.0024] | [0.0024] | [0.0027] |
| foreclosures/assets | -0.0309 | -0.0228 | -0.0010 |
| | [0.0654] | [0.0648] | [0.0436] |
| real estate loans/assets | 0.0437* | 0.0283 | 0.0145 |
| | [0.0181] | [0.0181] | [0.0235] |
| deposit growth from 1929 | 0.0348 | 0.0339 | 0.0295 |
| | [0.0250] | [0.0244] | [0.0215] |
| 1(bills payable) | 0.0005 | 0.0009 | 0.0030 |
| | [0.0061] | [0.0060] | [0.0056] |
| Constant | 0.1737** | 0.1818** | 0.1800** |
| | [0.0326] | [0.0330] | [0.0333] |
| County Fixed Effects | No | No | Yes |
| Observations | 189 | 189 | 189 |
| R-squared | 0.216 | 0.244 | 0.344 |

*Notes:* The dependent variable is the total amount of HOLC bonds found on each bank's balance sheet, divided by the value of outstanding real estate loans held in 1933. The brackets include standard errors, which are clustered for each locality. One asterisk indicates significance at the 5 percent level, and two asterisks indicate the same at the 1 percent level.

Table 4: Growth of Real Estate Loans

| | (1) 1934 | (2) 1935 | (3) 1936 | (4) 1937 | (5) 1938 | (6) 1939 |
|---|---|---|---|---|---|---|
| HOLC | -0.90** | -0.84** | -0.57 | -0.57 | -0.61 | 0.79 |
| | [0.09] | [0.23] | [0.31] | [0.35] | [0.39] | [0.97] |
| foreclosure growth from 1933 | -0.06** | -0.05** | -0.05** | -0.04** | -0.03* | -0.02 |
| | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.02] |
| foreclosures/assets in 1933 | -0.51** | -0.65** | -0.48 | 0.14 | 0.55 | 0.73 |
| | [0.11] | [0.19] | [0.27] | [0.33] | [0.34] | [0.57] |
| loans/assets in 1933 | 0.05 | 0.07 | 0.08 | 0.05 | 0.04 | 0.09 |
| | [0.03] | [0.04] | [0.06] | [0.08] | [0.09] | [0.24] |
| log(average loan value) | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.19 |
| | [0.00] | [0.01] | [0.01] | [0.01] | [0.02] | [0.10] |
| deposit growth since 1934 | | 0.50** | 0.47** | 0.56** | 0.58** | 0.76** |
| | | [0.16] | [0.13] | [0.12] | [0.11] | [0.12] |
| deposit growth from 1929 to 1934 | 0.04* | 0.05 | 0.10 | 0.13* | 0.14 | 0.04 |
| | [0.02] | [0.04] | [0.06] | [0.07] | [0.08] | [0.14] |
| Constant | -0.09* | -0.07 | -0.20 | -0.19 | -0.21 | -1.89* |
| | [0.04] | [0.07] | [0.12] | [0.14] | [0.15] | [0.93] |
| County Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 187 | 187 | 187 | 187 | 187 | 186 |
| R-squared | 0.603 | 0.398 | 0.317 | 0.371 | 0.385 | 0.325 |

*Notes:* The dependent variable is the growth of holdings of real estate loans from 1933 to the year indicated in each column. Robust standard errors are in brackets. One asterisk indicates significance at the 5 percent level, and two asterisks indicate the same at the 1 percent level.

Table 5: Growth of Foreclosures

| | (1) 1934 | (2) 1935 | (3) 1936 | (4) 1937 | (5) 1938 | (6) 1939 |
|---|---|---|---|---|---|---|
| HOLC | -3.33 | -3.99* | -3.88* | -4.04 | -2.66 | -0.65 |
| | [1.72] | [1.65] | [1.61] | [2.06] | [2.12] | [2.41] |
| foreclosures/assets in 1933 | -3.75** | -7.02** | -9.59** | -13.55** | -14.35** | -13.38** |
| | [1.17] | [1.49] | [1.62] | [2.10] | [2.16] | [2.50] |
| loans/assets in 1933 | 0.68 | 1.39** | 1.40** | 1.61** | 1.64** | 1.64* |
| | [0.39] | [0.48] | [0.50] | [0.56] | [0.62] | [0.79] |
| log(average loan value) | -0.09 | -0.13 | -0.22** | -0.23* | -0.19 | -0.17 |
| | [0.07] | [0.09] | [0.08] | [0.10] | [0.10] | [0.13] |
| deposit growth since 1934 | | 1.86 | -0.72 | -1.51 | -1.21 | -1.10 |
| | | [1.65] | [0.89] | [0.77] | [0.72] | [0.70] |
| deposit growth from 1929 to 1934 | 0.00 | 0.12 | 0.16 | 0.18 | 0.34 | 0.04 |
| | [0.27] | [0.33] | [0.43] | [0.50] | [0.53] | [0.55] |
| Constant | 0.91 | 1.34 | 2.37** | 2.50** | 2.17* | 1.81 |
| | [0.70] | [0.88] | [0.81] | [0.91] | [1.00] | [1.29] |
| County Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 189 | 189 | 189 | 189 | 189 | 188 |
| R-squared | 0.190 | 0.334 | 0.365 | 0.364 | 0.361 | 0.322 |

*Notes:* The dependent variable is the growth of foreclosed property holdings from 1933 to the year indicated in each column. Robust standard errors are in brackets. One asterisk indicates significance at the 5 percent level, and two asterisks indicate the same at the 1 percent level.

Table 6: Effect on New Originations

| | (1)<br>1935 | (2)<br>1936 | (3)<br>1937 | (4)<br>1938 | (5)<br>1939 |
|---|---|---|---|---|---|
| HOLC | 0.236* | 0.199* | 0.252* | 0.102 | 0.0135 |
| | [0.106] | [0.0971] | [0.101] | [0.0982] | [0.0764] |
| log(average loan value) | 0.0166** | 0.0199** | 0.0277** | 0.0157** | 0.0205** |
| | [0.00266] | [0.00516] | [0.00557] | [0.00453] | [0.00409] |
| deposit growth since 1934 | 0.203* | 0.284** | 0.234** | 0.126** | 0.151** |
| | [0.0805] | [0.0482] | [0.0450] | [0.0229] | [0.0422] |
| deposit growth from 1929 to 1934 | 0.0347 | -0.0131 | 0.0188 | 0.0540* | 0.0206 |
| | [0.0201] | [0.0282] | [0.0415] | [0.0210] | [0.0271] |
| foreclosures/assets in 1933 | -0.00119 | 0.0532 | 0.143 | 0.102 | 0.108* |
| | [0.0485] | [0.0628] | [0.0956] | [0.0570] | [0.0431] |
| loans/assets in previous year | -0.0145 | 0.00468 | -0.0243 | 0.0183 | -0.00648 |
| | [0.0197] | [0.0297] | [0.0345] | [0.0334] | [0.0339] |
| 1(failure within 10 miles) | 0.00311 | 0.00235 | -0.00595 | -0.0168* | -0.00771 |
| | [0.00567] | [0.00735] | [0.00788] | [0.00672] | [0.00667] |
| Distance to nearest HOLC office | 0.000847* | 0.000699 | 0.00126** | 0.000938* | 0.000710 |
| | [0.000376] | [0.000393] | [0.000465] | [0.000388] | [0.000367] |
| Bank had bills payable in 1933 | 0.00820 | -0.00542 | 0.00926 | -0.00398 | 0.00170 |
| | [0.00672] | [0.00518] | [0.00852] | [0.00723] | [0.00655] |
| Constant | -0.114** | -0.154** | -0.204** | -0.101** | -0.133** |
| | [0.0229] | [0.0501] | [0.0468] | [0.0379] | [0.0339] |
| County Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Observations | 186 | 188 | 188 | 188 | 186 |
| R-squared | 0.344 | 0.375 | 0.435 | 0.437 | 0.486 |

*Notes:* The dependent variable is the value of new real estate loan originations, divided by the value of outstanding real estate loans held in the previous year's call report. Robust standard errors are in brackets, and are clustered at the town level. One asterisk indicates significance at the 5 percent level, and two asterisks indicate the same at the 1 percent level.

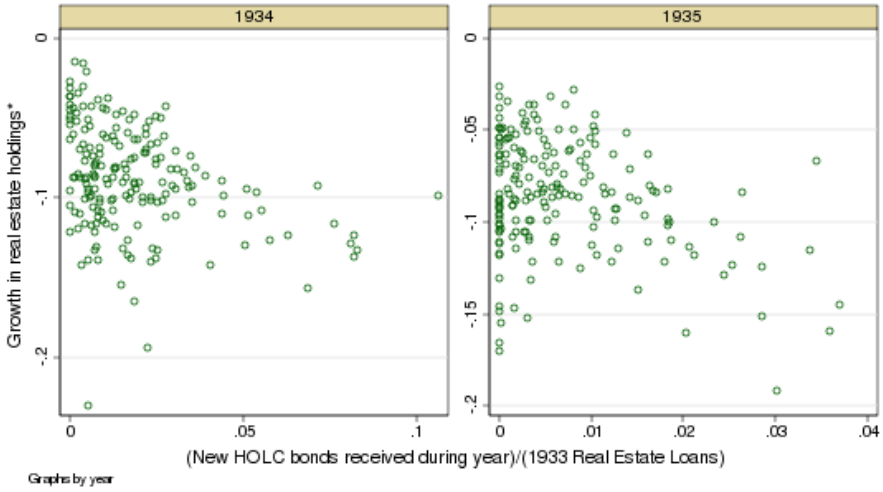
Table 7: HOLC bond holdings at savings banks

| year | 4 series | 3 series | 2.75 series | 2.25 series | Total |
|---|---|---|---|---|---|
| 1933 | 18,700 | | | | 18,700 |
| 1934 | 2,578,075 | 11,059,600 | 3,846,525 | | 17,484,200 |
| 1935 | | 9,597,275 | 9,812,325 | | 19,409,600 |
| 1936 | | 8,404,050 | 7,534,450 | 1,453,070 | 17,391,570 |
| 1937 | | 7,551,375 | 6,363,000 | 553,525 | 14,467,900 |
| 1938 | | 5,490,550 | 4,665,925 | 390,575 | 10,547,050 |
| 1939 | | 4,660,655 | | 355,850 | 5,016,505 |

Table 8: HOLC bond holdings at savings banks, by series

| Year | Held at end of the year | No change from previous year | Added to existing holdings | Sold some holdings | Sold all holdings | Refinanced | Added for first time |
|---|---|---|---|---|---|---|---|
| 4 percent series | | | | | | | |
| 1933 | 4 | 0 | 0 | 0 | 0 | 0 | 4 |
| 1934 | 49 | 0 | 1 | 0 | 3 | 0 | 48 |
| 1935 | 0 | 0 | 0 | 0 | 37 | 12 | 0 |
| 1936 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1937 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1938 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1939 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 percent series | | | | | | | |
| 1933 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1934 | 160 | 0 | 0 | 0 | 0 | 0 | 160 |
| 1935 | 138 | 109 | 14 | 13 | 24 | 0 | 2 |
| 1936 | 123 | 114 | 1 | 6 | 17 | 0 | 2 |
| 1937 | 113 | 109 | 1 | 2 | 11 | 0 | 1 |
| 1938 | 90 | 84 | 0 | 6 | 23 | 0 | 0 |
| 1939 | 79 | 74 | 0 | 5 | 11 | 0 | 0 |
| 2.75 percent series | | | | | | | |
| 1933 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1934 | 152 | 0 | 0 | 0 | 0 | 0 | 152 |
| 1935 | 171 | 3 | 127 | 17 | 5 | 0 | 24 |
| 1936 | 130 | 32 | 77 | 19 | 43 | 0 | 2 |
| 1937 | 113 | 104 | 3 | 5 | 18 | 0 | 1 |
| 1938 | 93 | 86 | 0 | 7 | 20 | 0 | 0 |
| 1939 | 0 | 0 | 0 | 0 | 93 | 0 | 0 |
| 2.25 percent series | | | | | | | |
| 1933 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1934 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1935 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1936 | 49 | 0 | 0 | 0 | 0 | 0 | 49 |
| 1937 | 43 | 39 | 1 | 1 | 8 | 0 | 2 |
| 1938 | 33 | 31 | 1 | 0 | 11 | 0 | 1 |
| 1939 | 29 | 29 | 0 | 0 | 4 | 0 | 0 |

Table 9: Call report data and the sales of loans to the HOLC




*Notes:* For the purpose of this graph, the growth in real estate loans excludes the value of new originations during each year. Thus the main reasons the holdings of real estate loans would change would be maturation or foreclosures of existing loans, and sales of loans to the HOLC.