

The Incredible HOLC? Mortgage relief during the Great Depression

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Abstract

This paper examines the relief for both lenders and borrowers available under the Home Owners' Loan Corporation, a New Deal era program which sought to help distressed borrowers avoid foreclosure by purchasing their mortgages from private lenders and then refinancing the debt. I document that the HOLC paid relatively high prices for its mortgages, which the historical record indicates was done most likely to encourage lender participation and stimulate the housing market. The consequence was that much of the burden of adjusting to the large change in house values, which fell by a third on average in many places, was left to the borrowers, while lenders were able to remove poorly performing assets from their balance sheets at attractive prices.

1 Introduction

The Home Owners' Loan Corporation was a federal program established in 1933 to provide relief to distressed mortgage borrowers and their lenders. It operated by purchasing mortgages from private lenders and issuing new mortgages to the borrowers. The two key channels for relief were the lenient terms of the HOLC mortgages and the reduction of the principal debt owed. While all new HOLC mortgages featured the same lenient structure, the extent of principal reductions varied widely. This paper details HOLC policy governing principal debt reductions, and in the process yields insights into the benefits of the program for both borrowers and for lenders.

The conclusion is that in many ways the HOLC was a lenders' program. Fundamentally, with a median decline in housing prices of 33%, large adjustments were needed to debts undertaken during the 1920s.¹ Under the HOLC, the bulk of this adjustment was left to the borrowers, while many lenders were absolved completely. Borrowers certainly benefitted from the HOLC's lenient

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¹The 33% decline refers to the sample used in this paper. Other data sources for the entire country yield similar figures.

mortgage structure, but lenders also benefitted greatly from the removal of poorly performing assets off of their balance sheets.

The extent of this benefit to lenders depended on the prices paid for their assets; I find that the HOLC deliberately set these prices at high levels, and a direct consequence of this was that fewer principal reductions were available to borrowers. The latter follows because principal reductions were only sought for borrowers with incumbent debts that were very high relative to the HOLC's appraisals for the properties, and those appraisals tended to be high in order to allow for high prices to be paid to the lenders. In fact, the HOLC designed an appraisal process that yielded appraisals generally higher than their own estimates of property market values; this decreased the number of borrowers whose incoming debts would be high relative to the appraisal and thus eligible for a principal reduction. If nevertheless a borrower was eligible for principal reduction under HOLC policy, a principal reduction would only be available if the lender(s) would agree to incur the reciprocal haircut when receiving payment from the HOLC. Lenders could not be forced to participate in the program, and it appears that the HOLC tailored itself to encourage their participation.

This was not done with disregard to the borrower; it was anticipated that HOLC borrowers would avoid foreclosure in the short run due to the availability of a three-year principal payment moratorium, and in the long run from a general housing market recovery, a recovery that the HOLC intended to reinforce by increasing the scale of the program with high lender participation. Nevertheless, Congressional testimony reveals that this *de facto* policy to encourage lender participation through manipulation of the property appraisal was contrary to the original intent of the legislation, archival HOLC documents indicate confusion and dissension about the implementation of the appraisal policy, and both the data and contemporary reports indicate that many borrowers were left with unreasonably high debts. This story suggests that the HOLC underestimated the continued weakness that would characterize the housing market and the importance of relieving debt burdens in the absence of a quick recovery.

An analysis of the cross sectional probability of foreclosure, in a newly recovered HOLC loans, finds that this probability significantly declined for those borrowers receiving principal reductions.² This is an expected but perhaps non-trivial finding; today it is reported that many mortgage mod-

²Harriss (1951) is the only prior study to have employed this data. Hillier (2003) employed a sample of 300 HOLC loans from the archives of the city of Philadelphia. That data has less information on characteristics of the property and the loan, but does identify individual borrowers and addresses, enabling an interesting analysis of the geographic distribution of HOLC loans. This is part of a larger literature on the racial aspects of HOLC lending, which has been the main focus of scholarly interest in the program until recently.

ifications programs have mixed success in helping borrowers avoid delinquency and foreclosure, but the HOLC demonstrates that when substantive modifications are given (though not as widespread as they could have been), there are real benefits to the borrowers.

These findings are the first detailed look at the specific nature of relief the HOLC brought for borrowers and lenders. Harriss (1951) is a valuable early summary of the HOLC, and Tough (1951) is another early appraisal focusing on the financial results. Two recent works, completed by Fishback, Lagunes, Horrace, Kantor, Treber (2009) and Courtemanche and Snowden (2009), examine on a cross-county basis the impact of the HOLC on macroeconomic variables such as the home-ownership rate or housing prices. Otherwise, until recently, there had been a limited amount of research with respect to the HOLC, save for a literature among historians and other social scientists studying its redlining practices. This paper also contributes to our understanding of the post-depression 1930s, and the potential role of the HOLC in spurring a recovery of mortgage lending and the larger residential housing market.

2 Provisions for principal reductions under the HOLC

HOLC policy

The lending practices of the HOLC were as follows. In dealing with a mortgage lender, the HOLC exchanged its bonds for the lender's claim on the mortgage.³ The exact price (by value of bonds) paid to the lender will be discussed below. If multiple lenders held claims to the property, the HOLC dealt with each. In dealing with a mortgage borrower, once the loan had been successfully purchased from the lender, the HOLC would then issue a new a loan to the borrower which was amortized for 15 years at 5% interest (reduced to 4.5% in the late 30s). This structure differed from the shorter and harsher term structures available in the private sector, as well as the higher

³These 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 callable, 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.

interest rates in the private sector. The HOLC loan had no prepayment penalties, and borrowers were given the option to pay only interest for the first three years of the mortgage. The HOLC would also make payments for delinquent taxes or necessary maintenance, in order to preserve their first lien on the property and to protect the collateral; the sum of those payments would be added to the total debt.

For a borrower to be eligible for a principal reduction, HOLC policy required that the incoming debt exceed 80% of the HOLC appraisal for the property. This 80% threshold was not a statutory requirement of the act which established the HOLC, but it was related to limitations on lending from that act. The act stipulated that no HOLC loan could exceed \$14,000 or 80% of the appraisal of the property, whichever was smaller. In practice, housing prices were low enough so that the \$14,000 limit was rarely binding, but the 80% threshold was very important in practice. The 80% limit implies that for any loan with incoming debt exceeding that threshold, the loan could only be included if either the lender agreed to be paid less than owed, or the HOLC paid the lender their full claim but then forgave some of the debt to the borrower in issuing the new loan. The latter never occurred, apparently due to HOLC policy, and the HOLC decided to only bargain with lenders over principal reductions if the 80% limit was an issue.

Thus, if a borrower's incoming debt exceeded 80% of the HOLC appraisal at the time of their application to the HOLC for relief, the HOLC would only accept the application if the lender agreed to accept a haircut on the amount owed that was sufficient to reduce the borrower's debt to 80% of the property's appraisal.⁴ If the lender would not accept the required haircut, then the HOLC would reject the application; as a matter of policy the HOLC never paid more than 80% of the appraisal to a lender.⁵

Principal reductions did not necessarily represent real losses to lenders. While principal reductions were sought in a subset of applications, the *de facto* loan-level participation constraint on lenders implies that the lenders benefitted relative to their alternatives. It appears that lenders either accepted or rejected each HOLC offer individually; I can find no evidence that the HOLC sought to increase its leverage by bargaining with lenders over multiple loans at once. This may have been for the sake of expediency, given that multiple loans from a single lender were unlikely to have been ready at any given single point in time. Nevertheless, it suggests that for every loan

⁴I define incoming debt here to include mortgage debt, as well as delinquent taxes. If the HOLC made a loan to the borrower for necessary repairs to the property, this would also have to fit under the 80% threshold.

⁵There are a handful of loans in the sample below in which the lender payment exceeds 80% of the appraisal. This could be a transcribing error in the data, or an error made by the HOLC. Nevertheless, the rule almost universally prevailed.

purchased from a lender, the lender expected the HOLC bonds to be a more attractive investment than the loan itself.

According to the data in Table 1, of the loan applications that were not successfully completed, 25.6% involved lenders refusing to participate. Of these 25.6%, 17.9% were due to “inadequate security,” a euphemism which I believe indicated that the HOLC offer was rejected by the lender as being too low, i.e. that the collateral (security) was appraised low enough so that a lender would have had to agree to a principal reduction, and that agreement was not forthcoming. This 17.9% can be interpreted as a relatively low but certainly nontrivial number; it indicates that lender participation was a real concern, even with the generous prices described in this paper, but it also indicates that the large majority of loans unable to be completed by the HOLC were not held up by the lender. Finally, the other 7.7% were unable to be completed specifically because the lender refused to accept HOLC bonds. This is somewhat confusing since HOLC bonds were tantamount to Treasury securities after Congress guaranteed their principal; however, it is possible that these refusals occurred at the beginning of the program, before Congress had guaranteed the principal, and before many states had legalized the ability of savings banks and other intermediaries to hold these bonds.

All of this is not to imply that borrowers with no principal reductions did not benefit from the HOLC. The change in the structure of the mortgage was itself a large benefit to many, and can be thought of as an improvement in the technology of mortgage financing. Many mortgages of the 1920s were structured to last a short period such as five years, and did not necessarily include any amortization or requirement for principal payments before maturity. These mortgages were then usually refinanced upon maturity. Tight credit markets interrupted that system as banks tightened standards and terms for refinancing and sought to improve their liquidity positions. Other mortgages, such as those through building and loan associations, featured structures that were even less attractive in the event of a downturn (Snowden 2003). These mortgages allowed for amortization by using a share installment contract as a sinking fund; the result was that as the equity position of the building and loan association deteriorated, the borrower’s real loan burden increased.

The 80% threshold can be thought of as essentially resolving the incompleteness of the mortgage contract. Mortgage contracts typically do not envision large changes in the macroeconomic environment that might substantially change interest rates or housing prices adversely. In an environment with substantial declines in home values, there is uncertainty with respect to whether the

borrower or the lender will bear the burden of adjusting for the large change in the real terms of the mortgage loan. HOLC policy essentially left that adjustment to the borrower if the borrower retained at least 20% equity, according to the HOLC appraisal. This aspect of HOLC policy is central to understanding the type of relief available under the program.

To better understand the impact on borrowers of the 80% threshold, it is necessary to examine the extent of indebtedness across borrowers before and after the HOLC intervention. To that end, we now turn to the data.

The Data

The data set of HOLC loans is described in detail in the appendix. Briefly, it consists of a sample taken by the NBER from three HOLC warehouses in New York City in 1947.⁶ The sample consists of HOLC loans from New York, New Jersey and Connecticut, totaling 3032 observations, which is a 2.4% sample of all of the loans from those three states, and .3% of all loans nationwide. One important feature of the sampling process was that one warehouse was undersampled, and so in the empirical analysis I weight each observation according to its probability of having been sampled. It should be noted that also that this is not a representative sample of the nationwide loan portfolio of the HOLC. Loans from New York, New Jersey, and Connecticut were in fact among the worst performing loans in the HOLC portfolio. 40% of the loans in these states foreclosed, much higher than the 16.1% rate in the rest of the country.

Debt Characteristics of HOLC Borrowers

Table 2 summarizes, by year of purchase, the sample's information on deflation in house prices. Deflation is measured here as the percentage fall from the purchase price to the HOLC's estimate of the market price when the application was made, which for most observations is late 1933 or 1934. The worst deflation occurred for houses bought in the mid twenties, peaking at over 30%, which is consistent with other research that has noted the peak of a real estate boom in that period. Nevertheless, houses purchased as recently as 1931 still declined by 20% on average, consistent with the general monetary deflation of the period.

Table 2 also provides the average loan-to-appraisal ratio at the time of application to the HOLC, grouped by year of purchase. In general, one would expect greater amounts of deflation to

⁶The HOLC had ceased accepting new loans in 1936, with some small exceptions that are not relevant to this paper. After that, the HOLC simply administered its loans and liquidated its portfolio. In 1952, the HOLC sold off its remaining portfolio of active loans and ceased operations.

be associated with higher loan to appraisal ratios. Interestingly, while the loan-to-appraisal ratio does increase for the loans with the worst deflation from the mid-twenties, it peaks for loans from the late twenties. Part of this is surely because more principal payments had been made on the older loans. Nevertheless, this may also suggest that lending terms had loosened in the latter part of the decade, with smaller down payments and thus greater loan to appraisal ratios.

The distribution across the sample of the incoming loan-to-appraisal ratios is given by a histogram in Figure 1. About one-fifth of the observations have loan-to-appraisal ratios exceeding one, indicating negative equity in the property, and about half have less than 20% equity in their property. By value of total loans, the share of properties with less than 20% equity is a bit higher, at 56%, according to the appraisal.

A priori, the case for relief may be starker for those borrowers with little equity or negative equity, since the ability of such borrowers to repay their debts through the sale of their properties is constrained. It is significant that the HOLC estimated that a large portion – roughly half – of borrowers in this sample had at least 20% equity at time of application. The reality, though, is that even for these borrowers there were still significant adjustments necessary due to the increased real debt burdens.

The market for mortgage credit may have been in such disfunction that those with positive equity could not find a buyer that was able to obtain a new mortgage, or not willing to pay high interest rates on the new mortgage. Potential buyers may have also been deterred due to uncertainty over the future course of house prices. Alternately, the HOLC may have admitted these cases to the program simply in order to avoid the need to sell their home, a form of relief arguably within the HOLC's mission of preserving the stability of homeownership. Possibly, some of these cases were the result of moral hazard, with the borrowers not urgently needing relief but finding the HOLC program attractive anyway. Regardless, the fact that roughly half of the sample had at least 20% equity is a significant characteristic of HOLC operation. The lenders associated with loans whose borrowers had at least 20% equity (according to the appraisal) were paid their claims in full, regardless of the viability of the underlying loan, which in many cases were quite compromised despite the loan-to-appraisal ratio. These lenders surely received a large benefit from replacing these mortgage assets with liquid and stable HOLC bonds.

Turning to principal reductions, the result of the 80% threshold policy is depicted in Figure 2, which graphs the new loan-to-appraisal ratio against the old loan-to-appraisal ratio. Indeed, the two ratios are largely the same until the 80% threshold, at which point the new loan-to-appraisal

ratio stays at 80%. Figure 3 demonstrates the same policy, but with explicit focus on the principal reductions. The principal reduction is measured as the ratio of the old loan to the new loan; a higher ratio indicates a greater reduction in the principal. Again, the data very much confirm HOLC policy, with principal reductions becoming available for cases with loans exceeding 80% of the HOLC appraisal.

The linearity of the relationship between the principal reduction and loan-to-appraisal ratio above the 80% threshold is caused by the nature of the HOLC policy. Let P^{new} be the principal due on the HOLC loan, P^{old} be the principal due on the original loan, and A be the HOLC's appraisal. HOLC rules require that

$$\max\left(\frac{P^{new}}{A}\right) = .8$$

In the binding case in which the equality holds, multiplying both sides by $\frac{A}{P^{old}}$ yields an inverse relationship between the principal reduction and the original loan to value ratio:

$$\frac{P^{new}}{P^{old}} = .8 \times \frac{A}{P^{old}}$$

and inverting these ratios yields a linear relationship between the principal reduction measure and the outstanding loan-to-appraisal ratio:

$$\frac{P^{old}}{P^{new}} = \frac{5}{4} \times \frac{P^{old}}{A}$$

Finally, for a broader perspective on the 1930s mortgage market, there is a limited amount of national data available. Depressed housing prices, lower incomes, and tight credit all contributed to create great distress in the depression housing market. The activity of the national mortgage market is depicted graphically in Figures 4 and 5, which give the value of outstanding mortgages and the value of new mortgages held by different classes of lenders from 1925 to 1949. By 1933, the value of outstanding mortgages on 1-4 family non-farm homes had declined to \$16.7 billion from \$19.5 billion in 1929, a 14% drop. The value of new mortgage loans declined from \$4.4 million to \$1.1 million. These figures reflect foreclosures, a fall in the number of new loans, and a fall in housing prices. The median asking price for single family housing declined 24% in the same period. The mortgage portfolios of all classes of lenders shrank in roughly the same proportion, but the shrinking portfolio of mortgages held by thrifts accounted for a large share of the aggregate decline,

simply because thrifts were the largest source of mortgage lending

The result of this for many borrowers was foreclosure. Figure 3 displays over time the number of nonfarm foreclosures, which rose from 135,000 in 1929 to a peak of 252,000 in 1933. The state of the housing market was such that a study of 22 cities by the Department of Commerce found that, as of January 1, 1934, 43.8 percent of mortgaged urban, owner-occupied homes were in default.⁷ Extrapolating this against census data, this constitutes roughly two million mortgages in default. Though default does not necessarily lead to foreclosure, this is a very high degree of distress.

It is with this background that the HOLC was established to refinance distressed mortgages. The HOLC accepted applications from June 1933 to November 1934 and from May - June 1935. 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. 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. A little under half of the applications were rejected or withdrawn, and 1,017,821 loans totaling \$3.28 billion were made.⁸ Of these, 194,134 were eventually acquired by the HOLC through foreclosure, a 19% aggregate foreclosure rate. The value of outstanding HOLC loans over time as compared to private sector loans is depicted in Figure 4. 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, the administration and gradual 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.

3 The effect of principal reductions on the probability of foreclosure

In this section, I establish the empirical importance of principal reductions for reducing the probability of foreclosure in the sample of HOLC loans. Of course, the larger purpose of this paper is to document the tradeoff between the relief to borrowers and relief to lenders, and the centrality of the

⁷via Wheelock (2008)

⁸In 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.

appraisal policy to that tradeoff. Such an analysis is only relevant, however, if principal reductions altered the outcomes for some borrowers; otherwise there is no tradeoff. As such, while this paper nominally focuses on the benefits of the HOLC to lenders, it should be clear that no analysis can exclusively focus on one while avoiding the other.

An alternative to studying the impact of a principal reduction is to study the change in the loan-to-value ratio, since the former just changes the latter. Nevertheless, a principal reduction is a more tangible variable in the presence of uncertainty over the true value of a property. In addition, there is a need to focus on those borrowers affected by the 80% threshold and the HOLC appraisal policy. If we are interested understanding the process by which principal reductions were given and their impact, it is helpful to focus explicitly on them rather than the loan-to-value ratio in general.

A naive approach would simply estimate a model relating the probability of foreclosure to the extent of a principal reduction. With this approach, the estimate of the marginal impact of principal reductions is likely to be biased, since, as a matter of policy, principal reductions were only given to those borrowers with high incoming loan-to-appraisal ratios, a characteristic which itself helps determine the probability of foreclosure. An alternate approach involves more directly exploiting the nonlinearity in HOLC policy around the 80% threshold. Below this threshold, borrowers received generally no principal reductions, while above the threshold, the principal reduction is proportional to the incoming loan-to-appraisal ratio.

An instrumental variables approach can be applied here. The original loan to appraisal ratio is not quite a proper instrument; it certainly predicts the provision of principal reductions strongly, but it also is likely correlated with the likelihood of foreclosure. A more careful instrument is $1\left(\frac{l}{a} > .8\right) \times \frac{l}{a}$, a variable that equals zero if the loan-to-appraisal ratio $\frac{l}{a}$ is below the 80% threshold, and equal to the loan-to-appraisal ratio if it is above the 80% threshold. The exclusion restriction is that the marginal relationship between the principal reduction and foreclosure probability would not have changed across the 80% threshold in absence of HOLC policy. In other words, in the absence of this 80% policy threshold, an increase in the loan to appraisal ratio for loans over the 80% threshold would not have had a different effect on the probability of foreclosure than an increase below the threshold. This is supported by the historical context of HOLC policy described further in the following sections; the 80% threshold was chosen somewhat arbitrarily, and was certainly not chosen because the marginal effect of the loan-to-appraisal ratio was believed to differ above and below it. This approach is similar to a regression discontinuity analysis, however HOLC principal reductions around the threshold are not discontinuous, rather their slope is discontinuous.

The estimation proceeds by an IV probit model, as well by an IV linear probability model. For simplicity, the linear probability model can be described as follows; in the first stage, I estimate the following:

$$pr_i = \alpha + \beta \left[1 \left(\frac{l_i}{a_i} > .8 \right) \times \frac{l_i}{a_i} \right] + \gamma \frac{l_i}{a_i} + \delta 1 \left(\frac{l_i}{a_i} > .8 \right) + u_i$$

The variable pr is a measure of the extent of the principal reduction. The definition of a principal reduction used here is the old loan divided by the new loan; greater principal reductions would be associated with higher values of this measure, and if there is no principal reduction, the measure equals unity. The variable $\frac{l}{a}$ is the original loan to appraisal ratio, and $1(\cdot)$ is the indicator function. The instrument is interaction term between the loan-to-appraisal ratio and the indicator of the 80% threshold. This first stage yields a fitted prediction \hat{pr} . In the second stage, I estimate

$$\text{foreclosure}_i = \eta + \psi \hat{pr}_i + \lambda \frac{l_i}{a_i} + \theta 1 \left(\frac{l_i}{a_i} > .8 \right) + \epsilon_i$$

where foreclosure_i is a dummy indicating foreclosure, and note that the interaction term instrument is excluded. The key parameter of interest is ψ , which if negative indicates that higher principal reductions on average reduced the probability of foreclosure.

Tables 3 and 4 reports the results for second and first stages of the probit model, and the following Tables 5 and 6 report the same for the linear probability model. Column one of Table 3 displays the results from the simple ‘naive’ model which includes the principal reduction measure as the only independent variable. The result is a small coefficient not statistically different than zero. The likely confound here is the loan-to-appraisal ratio as noted above; controlling for this ratio in the second column yields a highly significant negative value, indicating that a greater principal reduction decreases the probability of foreclosure, controlling for the incoming debt burden.

Holding the original loan-to-appraisal ratio constant implies that the remaining source of variation in principal reductions is the nonlinearity in the reductions with respect to the new appraisal. This variation is similar to that exploited in the instrumental variables empirical strategy outlined above. The third column reports the result of that estimation. The coefficient on principal reductions is highly significant, and turns out to be little different from the non-IV estimation in column (2). The coefficient of interest, ψ , in the third column equals -.82. To interpret this, consider an example in which the old debt was 10% higher than the old debt. In such a case, the probability of foreclosure would be on average about 8 percentage points lower. Column (3) of Table 4 reports the first stage results as well. The instrument is highly significant, as anticipated due to the nature

of HOLC policy.

Figure 7 summarizes this result graphically in reduced form. I group every observation, according to the incoming loan-to-appraisal ratios, into 135 equally sized bins, and calculate the foreclosure rate within each bin. The figure graphs the rate of foreclosure for each bin along with the trends above and below the 80% threshold. Below the threshold, foreclosure rates increase with the loan to appraisal ratio. Above the threshold, the slope is insignificantly different from zero. Essentially, all borrowers with indebtedness above this threshold receive a new loan worth 80% of the appraisal, and so there is no marginal increase in foreclosure probability. The foreclosure rate at the limit is around 43%. Note also that without the 80% threshold, the probability would not have reached unity had the sloped line continued, further reinforcing the plausibility of the counterfactual and the exclusion restriction.

Finally, column (4) of Table 3 reports the results of the same estimation procedure, with the inclusion of several control variables that would be expected to affect the likelihood of foreclosure. This estimation loses a nontrivial portion of the sample, however, since these various pieces of information were not available for every observation. Nevertheless, the coefficient of interest, ψ , does not appear to be affected by the inclusion of controls or the change in the sample, as it is nearly identical to column (3). Higher debt, as indicated by a higher HOLC appraisal, appears to itself be associated with higher foreclosure probabilities, along with the age of the borrower. In addition, the HOLC loan order appears to be negatively correlated with the probability of foreclosure, indicating that the earliest loans were most likely to foreclose. The loan order result is interesting and not entirely clear; it may indicate that the earliest loans were selected because they were in the most dire emergencies, and some of this desperation persisted even after conversion to an HOLC loan. In the context of this regression, the other variables, including the monthly HOLC mortgage payment as divided by the borrowers' monthly income, the estimated house price deflation since time of purchase, the year of purchase, and the age of the house, have no conditional relationship with the probability of foreclosure. It should also be noted that in column (4) of the first stage estimates reported in Table 4, none of these other controls appear to affect the extent of principal reductions, which is consistent with HOLC policy as described here.

4 HOLC appraisal policy

The HOLC appraisal was the final piece which determined the availability of principal reductions. Despite its centrality to the type of relief to be provided, the bill establishing the HOLC neglected to specify an appraisal methodology, and instead it allowed the HOLC to develop and implement its own appraisal methodology. In testimony prior to the legislation's passage, D.E. McAvoy, chairman of the Long Island Division of the FHLBB, exhibited prescience in noting the need for clarifying appraisal methods:

[One outstanding defect in the bill is] the absence of an appraisal method defined so as to ensure reasonable values. The liberal percentage of the loan, 80 percent, is nullified as to its intent unless the method of valuation is defined and a reasonable standard set up.⁹

This section documents that the actual appraisal strategy implemented was quite generous, in that it resulted in appraisals that were on average significantly above the HOLC's estimates of property market prices. The implication of this is then that there were some borrowers that would have been eligible for a principal reduction (or for a larger principal reduction) with a lower appraisal based on the property market prices, but did not receive such treatment.

In particular, the appraisal formula adopted by the HOLC involved appraising a house with three different techniques, and then taking the average of the three different appraisals. The first technique consisted of estimating the present market value of the house, the second of estimating the purchase price of a similar lot plus the cost of reproducing the house and less any depreciation, and the third of estimating the monthly rental value prevailing in the past ten years and capitalizing that over a ten year period (with no discount rate). Given the decline in the housing market, the result of this third technique should have been generally above the others, and so together the three-part formula was expected to generally yield an appraisal greater than the market price. (For the purpose of terms used in this paper, I distinguish between the final appraisal, which is based off of the average of these three inputs, and the HOLC's market value estimate, which is one of those inputs.)

The preliminary formula appraisal just outlined is the main engine of the high prices paid by the HOLC. A few further details are worth noting, though. Technically, there were four steps in the appraisal process. The first was a cursory appraisal in which a district-level HOLC official

⁹Home Owners Loan Act, testimony, April 20, 1993, before the U.S. Senate, Committee of Banking and Currency, pp. 38-39 Lexis Nexis Congressional Universe; Accessed: 10/28/2008.

would briefly review the property to determine if any hope of receiving a loan was possible, and if not, to avoid the cost of the rest of the application process. This was mostly to rule out non-dwellings and other obviously ineligible cases, but also to assure that the home was in good enough condition to be worthwhile collateral.¹⁰ The second step was the three-part formula appraisal. Calculations necessary for the formula appraisal were based on a relatively large amount of data that were required by a four page appraisal worksheet. The appraisers who completed this step were independent from the rest of the organization, or were outside contractors, and were not given any information on the amount of outstanding debt on the property. After that, two reviews were conducted in the third and fourth steps, one at the district level and one at the state level, with the issuance of a final appraisal by the state office. Part of the purpose of these reviews was to “ensure the injection of the ‘lending sense’ in the valuation” (*FHLBR*, 1935).¹¹

The HOLC loan sample provides the only evidence I know of on the outcomes of this appraisal process, for New York, New Jersey, and Connecticut. While Harriss (1951) contains average loan-to-appraisal ratios across states, the aggregation of the data limits its usefulness, and there is no information on the divergence between the appraisals and the market value estimates. In this data set, the three-part formula appraisal exceeded the market price estimate in 73.9% of the observations, equaled it in 7.7%, and was exceeded in 18.4%. The average markup was 8.0%.¹² For the final appraisal, in the majority of cases in the sample, the final appraisal was lower than the preliminary appraisal, but on average the final appraisal still remained above the market price. The final appraisal exceeded the market price estimate in 58.5% of the observations, equaled it in 10.6%, and was exceeded in 30.9%. Across all observations, the average markup is 4.2%. Of the subset of foreclosed observations, these markups are larger on average: 76.8% have higher final appraisals, and the average markup is 6.3%.

It is also interesting to revisit the 80% statutory threshold in this context. For 32.3% of the observations, the HOLC loan to the mortgage borrower actually exceeded 80% of the market price estimate while still being under 80% of the appraisal.¹³

¹⁰See pp. 17-18 of the HOLC *Final Report* for more detail. The HOLC term for this was the “preliminary” appraisal, but for clarity I use that term for the second step, which involved the three-part formula outlined in the previous paragraph.

¹¹According to HOLC policy, the final review could raise the appraisal by no more than 10 percent, but lower it without limit. However, I find no evidence of this cap in the three-state sample.

¹²2,925 observations contained information on both the market price and the formula appraisal, and 2,746 contained information on both the market price and the final appraisal, and 2,738 observations have all three. The calculations do not significantly change when different subsamples are considered.

¹³Due to the possibility of rounding error and the desire not to count observations with debts just ϵ over 80% of market price, the 32.3 figure reported here is a conservative estimate, equaling the number of observations exceeding

Implicit in this analysis is the assumption that the HOLC's market price estimates were generally meaningful enough to make comparisons with the overall appraisals worthwhile. The HOLC's manual of instruction for appraisers directed them to estimate a price that would be obtained from a sale by a non-distressed owner. The basis for this price calculation was a four page worksheet giving detail on a set of comparable pieces of data, including everything from square footage to the finish on the floors, a technique similar to those underlying valuations today. However, it is true that many sales that were occurring during this period were sales out of distress, and in some areas distressed sales predominated. As a result, in an environment dominated by distressed sales, non-distressed market prices, on which the market price estimates depended, may have been difficult to discern even with the supporting data. Fundamentally, however, the HOLC did make market price estimates, and comparing these estimates with final appraisals shows that the final appraisals generally exceeded the HOLC's own market price estimates. This trend should not be interpreted as the HOLC compensating for market price estimates that they believed to be negatively biased estimates of true market prices; the process was simply designed to not fully mark property values down to the actual current value of the collateral. In fact, the evidence from internal HOLC documents presented below suggests that HOLC officials knew the overall appraisals were excessive, and also recognized that the confusion surrounding market prices allowed for further manipulation. The next section expands on the motivations for this policy.

Motivations for the appraisal policy

The fact that generous appraisals were made was not a secret, although it is not widely known today. A 1933 pamphlet published by the HOLC to give information to potential borrowers described the appraisal as being an estimate of "fair worth" rather than of "technical market value." The *Federal Home Loan Bank Review* (July 1941, p. 336) stated that HOLC loans "were permitted to be equal to 80 per cent of liberal appraisals. They were intended to be generous and may have frequently approached or sometimes exceeded market values at that time." Harriss echoes the point, noting that "in most areas appraisals were sufficiently generous to permit loans nearly as large – possibly larger – than current market price" (p. 25).

80% as a threshold was not much more than an arbitrary rule of thumb, but the rationale for its exact value was given in testimony to Congress during deliberation of the bill. A traditional lending limit on an individual loan in the twenties had been fifty percent of value, although more

81% of the market price estimate.

debt could be incurred via multiple liens. The original HOLC proposal was to similarly limit loans to 50% of “normal” value, which HOLC officials determined to be roughly equivalent to 80% of present market value, consistent with a 37.5% loss in value.¹⁴

As noted above, HOLC officials described their implemented appraisal framework as designed to estimate the “fair worth” of the property; it is difficult to conceive how this implementation is consistent with the reasoning given in the testimony prior to the act’s passage, in which the appraisal was treated as synonymous with the market price, and the idea of using an estimate of “normal value” was specifically rejected as unsound. Moreover, the testimony made clear that federal officials and policy makers believed that burdens beyond 80% were very likely to result in foreclosure. The 80% level was considered to be a compromise between desire to give relief and desire to draw a sufficient amount of borrowers into the program. Some senators even expressed concern that 80% of market value was too liberal and likely to result in excessive amounts of foreclosures.

In HOLC and Federal Home Loan Bank Board publications, federal officials and others criticized the appraisal methods that had been used prior to the depression by private firms and lauded the three part formula developed by the HOLC. The main criticism of prior methods was the inconsistency of appraisals, which led to borrowers being offered significantly different loans from different lenders. John Fahey, chief of the HOLC, mocked previous appraisal techniques as being executed from the running board of a moving car (Fahey, 1934). HOLC literature frequently cited the HOLC’s contributions toward the codification of more ‘scientific’ and ‘professional’ appraising methodology.¹⁵ The desire to set appraisals at a “fair value” rather than the market value may be related to these concerns, because the HOLC believed its appraisal techniques would be widely adopted by the private sector, and believed that the levels of its appraisals would become price references for many years, and so they claimed to design techniques that they believed to be reflective of normal conditions and not tailored to the nature of the depression.

In addition, HOLC officials were probably attempting to increase participation by lenders. As noted above, there is evidence that HOLC officials thought of the appraisals as long term values rather than current market prices, language which suggests awareness that the program’s success for borrowers depended on the course of the housing market. Possibly, the overvaluations were also

¹⁴Russell, Horace. Home Owners Loan Act, testimony, April 20, 1933, before the U.S. Senate, Committee of Banking and Currency. Lexis Nexis Congressional Universe; Accessed: 10/28/2008.

¹⁵Federal Home Loan Bank Review, January 1935. Los Angeles Times, January 14 1934 p. 20. New York Times May 6 1934 p. RE2.

intended to indirectly recapitalize lenders, or even to compensate them for the moral hazard on borrower behavior introduced by the HOLC.

From the primary historical evidence in newspapers, magazines and journals, there is a some evidence of controversy at the time over the appraisal policy. In 1934, the chief economist of the Home Loan Bank Board, the HOLC's parent organization, speaking at a meeting of realtors, was reported as having "defended" the high appraisals as being made "on the basis of expected recovery."¹⁶ Newspapers commonly contained anecdotes relating the burdens caused by overappraisals, such as the following: "Loans are made in many cases for twice the actual market value of the property. . . The only one [who] really benefited is not the home owner but the mortgage holder, who receives payment in full for a mortgage often worth half its face value."¹⁷ Early HOLC operations in many locations but particularly Illinois and New Jersey were described as scandalous, involving patronage, collusion, and similar sins, but also accusations of "exorbitant valuations of houses by appraisers, so that larger loans could be more easily made."¹⁸ Nevertheless, it was probably difficult for anyone at the time to grasp the extent to which these anecdotes were indicative of common practice, because the HOLC typically released statistics regarding the aggregate number of applications and loans but no information at all on the appraisals, market price estimates, or debt burdens. The important point, though, is that when appraisals were discussed in these primary sources, it was almost always to describe the novel appraisal methodology, contain anecdotes about excess appraisals, or describe allegations of fraud in the appraisal process.

Memoranda written by HOLC officials in the 1930s, and archived at the US National Archives, help confirm that the high appraisals were the result of deliberate choices made by state level HOLC officials, with the desire to increase the quantity of loans and to support the real estate market. In particular, the Loan Review division of the HOLC's national office wrote a regular series of memoranda for each state, in which they reviewed small samples of loans for their appraisal methodology, as well as other issues, such as the eligibility of the property, the acquisition of the title, the financial risk, and so on. The memoranda covering New York, New Jersey, and Connecticut were, in general, scathing. The principal problems involved the generally excessive appraisals, which related to generally erratic appraisal methodologies. For example, memoranda regarding the New York loans criticized the appraisals for not allowing for sufficient depreciation of the property.

¹⁶*New York Times*, January 27, 1934, p. 21.

¹⁷This is part of an exchange between letter writers and HOLC appraisers printed in the *Chicago Daily Tribune* in 1935, August 17 p. 10, August 26 p. 8, and August 31 p. 8.

¹⁸Quote from *Los Angeles Times*, April 19, 1934, p.1. See also *Washington Post*, April 20, 1934, p. 1.

The appraisal work appears quite erratic and mostly unreliable although in general our security appears ample. There seems to be no uniformity of method in the appraisal work and there is evidenced a general disregard for depreciation in which tends to make the final valuations often appear excessive. It is quite apparent that the staff of fee appraisers, as well as our salaried employees connected in that work, need considerable coaching to secure results in conformity with our standards.¹⁹

The tone of some of these memoranda, as noted, was quite urgent in the need to address the appraisal methodologies, including depreciation allowances, and capitalization of rental prices.

When thirty-seven appraisals receive the criticism of the Review Examiner for the various defects listed below, the situation appears not only alarming but demands that immediate and thorough coaching be given in order to improve the apparent inferior quality of the appraisal work now being performed in the state, and especially in Metropolitan New York. Apparent excessive valuations are still evident in many cases, caused mostly by disregard for the necessary allowances of depreciation and obsolescence. In many others the fee appraiser sets the Present Day market price obtainable in excess of the Summation Value, which appears unreasonable and unwarranted. There are cases where the Capitalized Rental Value seems entirely out of line, thereby causing apparent high final fee appraisals.²⁰

The same charge is made against the Connecticut office:

The appraisal work is almost uniformly bad and either done by unqualified appraisers or deliberately made to fit the size of the loans closed.²¹

The memoranda also include some discussion of the motivations of the appraisers. A March, 1934 memorandum on New Jersey loans contains a description of appraisals being manipulated in order to accommodate existing debts:

It has been the policy of the Camden Office to endeavor in every way to make appraisals that will fit the present encumbrances, in total, of the property. The Fee Appraiser, along with his order for appraisal, is given a copy of the preliminary appraisal. He is given a recapitulation sheet showing the showing the amount due, including all existing liens, and showing the amount of appraisal that will be necessary to cover same, already imported on the recapitulation sheet. He has received specific instructions, supposed to have come from the State Appraiser, directing them that inasmuch as we are bailing

¹⁹Memo from R.R. Wright, Examiner, Loan Review Division to Charles A. Jones, Re: New York Bond Loans; May 24, 1934; National Archives Microfilm Publication, roll 23; Microfilm copy of general administrative correspondence, 1933-36; Records of the Home Owners' Loan Corporation, Record Group 195.3; National Archives II, College Park, MD.

²⁰Memo from Kale Alexandar to Col. Harold Lee, September 17, 1934, Re: Summary of Review of Fifty New York Bond Loans; Roll 29, General administrative correspondence, 1933-36, Record Group 195.3; National Archives II.

²¹Memo from R. R. Wright to Charles A. Jones, February 3, 1934, Re: Connecticut Loans; Roll 13, General administrative correspondence, 1933-36, Record Group 195.3; National Archives II.

out the owner, make the appraisal high enough to cover it. The District Appraiser, in case the appraisal does not fit, attempts to suggest and argue with the Fee Appraiser to raise his appraisal to fit the picture.²²

The reference to “bailing out the owner” is somewhat ironic, since higher appraisals generally shifted more burden to homeowners. The best interpretation is likely that HOLC officials concentrated on the volume of loans admitted to their program but not the quality of those loans. Changing the appraisal essentially can increase one of the two, but not both. The lack of concern about quality was likely due to a belief that the HOLC would itself stimulate housing prices, an effect that would be even stronger given higher participation, combined with a belief that the terms of HOLC loans were forgiving enough to keep borrowers solvent in the short run, which would be long enough for the recovery to arrive and wipe away the disadvantageous equity position in which the HOLC may have put borrowers.

There is evidence that lenders encouraged the manipulations of appraisals. A letter from the State Manager of Connecticut reported this concern to the national office:

We are being criticized by certain lending institutions in the State of Connecticut for what they claim is a lack of proper interpretation of the spirit of the HOLC Act and we are supposed to interpret the act as allowing us to make the appraisals liberal. . .²³

In addition, there is some confirmation that appraisals were made with the larger real estate market in mind.

There seems to be a deliberate effort made by the Connecticut officials to make high appraisals with the purpose of holding up real estate values. We have had this suspicion confirmed in a recent interview with the State Counsel, Mr. Tierney. This gentleman, during a call in our office last month, stated that they believed it necessary to prevent depreciation of realty value as much as possible so as to maintain the soundness of the banks and other financial institutions which had made mortgage loans during the past 5 years, to make high appraisals. His opinion was that many of these financial institutions would be today in an unsound condition if their mortgage loans were appraised on a basis of today’s realty values. This statement is illuminating when appraisals by our Connecticut offices are being analyzed.²⁴

²²Memo from Dalton G. De Witt to Philip Kniskern, March 27, 1934, Re: Appraisal Situation in New Jersey; Roll 21, General administrative correspondence, 1933-36, Record Group 195.3; National Archives II.

²³Memo from Patrick Kennedy, State Manager of Connecticut, to Horace Russell, October 27, 1933; Roll 13, General administrative correspondence, 1933-36, Record Group 195.3; National Archives II.

²⁴Memo from R. R. Wright to Charles A. Jones, March 8, 1934, Re: Analysis of Bond Loans Closed in the Hartford Connecticut Office, 6-C; Roll 16, General administrative correspondence, 1933-36, Record Group 195.3; National Archives II.

Nevertheless, the relative moderation of Connecticut's appraisals may be explained by the influence of its State Manager, who apparently reduced the preliminary appraisals.

Many loans reveal full, liberal, or excessive fee appraisals, due chiefly to insufficient allowance for depreciation and obsolescence.... However, in almost every case where the fee appraisal was criticized by the Examiner as appearing high, the State Manager set the Corporation appraisal at a materially reduced figure, thereby preventing excess loans, for which he is to be complemented.²⁵

Finally, the archive memoranda indicate a general confusion over HOLC appraisal guidelines. For example, on the quite important question of whether appraisals should be based on current or future real estate values, Connecticut officials expressed confusion and asked for guidance from the main office.

There seems to be considerable difference of opinion among appraisers as to exactly what the Corporation's attitude is supposed to be in the matter of appraising real estate, that is, whether or not we are to appraise property at today's intrinsic worth or whether we are to look 'through the fog of the depression' and have in mind the bailing out of the owner of some of the distress he has put upon himself in better times.²⁶

State level evidence

More evidence on HOLC intentions is available from a state level analysis. While the three-part formula appraisal was the main engine of the generous appraisal and was a practice instituted by national HOLC policy, there was still a significant amount of variation at the state level in appraisal practices, because the formula appraisal was not accepted without review, and the exact implementation of the formula appraisal was never specified at a national level. As a result, to fully understand the appraisals that were implemented, it is necessary to consider states individually.

Briefly, loans were executed in the following chronology. When borrowers applied to the HOLC, they applied to a local HOLC office (below the state level), which reviewed the eligibility of the applicant, conducted a personal interview, and requested a credit report. The formula appraisal would then be conducted on the property. The file would then be sent to the state office, where the appraisal would be reviewed, and a final appraisal issued. The district office then regained control of the file, and negotiated payments as allowed by the final appraisal with the lender.

²⁵Memo from Kale Alexander to Col. Harold Lee, November 5, 1934, Re: Summary of Review of Twenty-Five Connecticut Bond Loans; Roll 13, General administrative correspondence, 1933-36, Record Group 195.3; National Archives II.

²⁶Letter from Patrick Kennedy, State Manager of Connecticut, to Arthur J. Mertzke, Chief Economist of the Federal Home Loan Bank Board, January 23, 1934; Roll 13, General administrative correspondence, 1933-36, Record Group 195.3; National Archives II.

Two features of this are notable. First, while the formula appraisal was national policy, significant discretion remained on the state level both in implementing the parameters of the formula and in reviewing the results of that formula. Second, the negotiation with the lenders occurred after the final appraisal was set, so if the state office was concerned with participation when setting the final appraisal, it would have to anticipate the likelihood of the lender accepting whatever payment would be allowed by the appraisal.

The results for the three states in this sample were three subtly different empirical appraisal methodologies, which are summarized in Table 7. At the preliminary formula stage, New Jersey had the highest markups of the preliminary appraisal over market price, averaging 10.3%, while the average in both New York and Connecticut was 6.9%. At the discretionary stage, the appraisal was rarely changed in New Jersey, but on average was moderately lowered in New York and further lowered in Connecticut. Combining these two steps together, the final appraisal markup over average price was highest in New Jersey, followed by New York and Connecticut, with Connecticut actually having a lower final appraisal on average. The result was that even though Connecticut had the highest average incoming debt to market price ratio, its outgoing ratio was the smallest, while New York and New Jersey retained their relative ranks.

At the formula stage, to explain the differences across states in appraisal outcomes, the main source of variation is the method used in computing the capitalized rent stream. Recall that the preliminary formula appraisal averaged together a market price estimate, capitalized rental value estimate, and reproduction estimate. The precise method for computing the capitalized rental value was left to the individual states. There are different approaches to incorporating discount rates, time horizons, and other considerations into the capitalization calculation. The capitalization method used in New Jersey generally called for less discounting of future rent streams, and resulted in the higher markup of the preliminary appraisal compared to the market price than in the other two states.

At the discretionary stage, there is some evidence that the appraisal was manipulated with the goal of increasing participation. As noted above, HOLC officials described the discretionary stage's purpose as adding a "lending sense" to the determination of the appraisal. Figure 8 further examines the appraisal process in each state by examining how each markup varied with the incoming debt burden. The gray line is a lowess curve summarizing the markup from the preliminary appraisal to the final appraisal, and its relationship to the initial loan to preliminary appraisal. In New Jersey, the discretionary power was rarely used; 84% of the final appraisals equaled the preliminary

appraisals, as opposed to 21% in New York and 24% in Connecticut. As a result, the gray line is mostly flat in New Jersey, at unity. In comparison, in both Connecticut and New York the discretionary power was used to lower the appraisal for low loan-to-appraisal ratios, but not for high loan-to-appraisal ratios. It is clear that these were state level decisions; if the discretionary markup is examined within each state into different regions, its behavior is almost identical across every region within a state.²⁷

I formalize these results for New York with two estimations, displayed in Table 8. The dependent variable is the log of the final appraisal less the log of the preliminary appraisal. The goal is to evaluate whether the importance of the incoming debt-to-market price ratio is spurious. I include various controls that could be potential confounds; that is, variables that would plausibly be concerns of the HOLC when making the final appraisal, and are also plausibly correlated with the incoming debt burden. These controls include the estimated drop in the property's value, the markup of the formula appraisal over the market price, the incoming debt level, the borrower's income, and the order of the loan. The importance of the incoming debt ratio remains, indicating that loans with higher incoming debt burdens were less likely to have their appraisals reduced at the final stage.

The observed policies are difficult to explain without a participation-based motivation by the HOLC. Lowering the appraisal for a case with low indebtedness is irrelevant to that loan's outcome for either the borrower or the lender, because the loan was not eligible for a principal reduction. It is for cases with high indebtedness that the appraisal is an operative margin, and those are the cases in which the appraisals were kept relatively high to market value. Moreover, the change in the discretionary policy occurred around the 80% threshold in Figure 8, further indicating that the central office considered whether the appraisal would require a haircut of the lender, and keeping the appraisal relatively high if the answer was positive. The fact that the discretionary stage caused the appraisal to rise with indebtedness, and settle above unity, is suggestive of a policy that on average attempted to accommodate as much existing debt as possible.

Connecticut is a partial contrast to New York. Its gray curve has the same shape as the curve for New York, indicating a similar focus on participation. However, the entire curve is below unity, indicating that on average appraisals were significantly lowered from their preliminary levels. Such a policy would have the effect of accommodating lender interests but not as generously as in New

²⁷The only exception is the most western region of New York containing Buffalo, in which, for some reason, much less discretion was used than in the rest of New York.

York. New Jersey is distinct from both Connecticut and New York in its lack of variation. This yields no insights about state level goals, except that the policy essentially fully implemented the federally suggested formula appraisal, and insofar as the federally suggested appraisal was designed to increase participation by lenders, the New Jersey policy simply furthered that goal.

What caused these differences in appraisal policies across states? In New Jersey, there is no direct historical evidence on why so little discretion used. Beyond the goal of increasing participation, one possible explanation is that the discretionary stage may have been skipped in order to hasten the application process. The historical record from the time period noted that the HOLC's New Jersey operations were very slow at the beginning in processing applications. In addition, state banks, insurance companies, and thrifts had been legally barred from accepting HOLC bonds until an act of the state legislature in September 1933. Stalling tactics in the courts and foreclosure moratoria had been in place until the act was passed. This explanation is consistent with the data; almost all of the modifications that did occur at the discretionary stage in New Jersey occurred for loans with loan numbers indicating they came toward the end of the program's application window.

In New York and Connecticut, it would not be surprising, given the literature on the political economy of New Deal spending, to find that appraisals were manipulated for political purposes.²⁸ Below the state level, such influences are doubtful, though, because in the data both the formula appraisal and the discretionary appraisal are consistently determined across regions within a state. At the state level, policy was determined by the state managers, which were selected by the administration and possibly for political motives. The state manager of New York was Vincent Dailey, a close associate of James A. Farley, Roosevelt's campaign manager in 1932 and 1936, chair of the Democratic National Committee, and a generally influential figure in the implementation of the New Deal. That Dailey received his office partly due to politics is likely. Dailey even took a leave from the New York HOLC to run Roosevelt's 1936 re-election operations in New York. But whether any of this affected the appraisal and payment policies is difficult to know. Congressman Ralph Church contended that Dailey "allowed property to be appraised on a basis of the vote value rather than on a basis of real estate values."²⁹ Otherwise, Dailey was accused of patronage within his organization. In New Jersey, there are also anecdotes that the main appointees in New Jersey received their positions on the basis of politics and not experience. Evidence for this being important is that the New Jersey office was overhauled in December 1933 and January 1934, with

²⁸Recent treatments of the political determinants of New Deal spending include Fishback, Kantor, and Wallis (2003), and Wallis(1998).

²⁹Chicago Daily Tribune, August 3, 1939, p. 1.

new staff, general re-organization, and the movement of the state office to Newark from Trenton.³⁰

5 Conclusion

The HOLC's core mission was to help mortgage borrowers avoid foreclosure by purchasing their loans from private lenders and issuing new, restructured mortgages to the borrowers. For many borrowers, there was no possibility of real relief unless the total debt were to be decreased. The central tension of the program, however, was that borrowers could only be added to the program if the lender accepted the HOLC offer, and this limited the amount of principal reductions sought by the HOLC. This need to elicit voluntary cooperation of each mortgage lender was a key constraint on the refinancing process, and this paper documents that the HOLC responded with relatively generous payments to lenders, which increased their participation but decreased the quality of the program for borrowers. The three states with available loan-level data — New York, New Jersey, and Connecticut — were among the worst performing states in the country (New York was in fact the worst), and it is likely that some of that dismal performance can be considered as a consequence of the generous payments to lenders.

The HOLC's appraisals in these three states were high, relative both to the intention of the legislation and to the HOLC's own estimates of market prices, which resulted in correspondingly generous payments to lenders and higher debt burdens on many borrowers. This was made possible by the omission of a specific appraisal standard in the bill establishing the HOLC, along with general distress in the housing market which muddled the task of appraising any property. HOLC officials described their appraisal policy as "generous", insofar as by setting high appraisals, higher prices could be paid to lenders, which would increase participation by lenders, in addition to (somewhat speculatively) supporting the price level of the aggregate housing market. This generosity is thus one that increased the extensive margin of participation in the program, but reduced the quality of the program for all of those borrowers that would have been in the program regardless. The best interpretation is that the HOLC officials in these states made a gambit that a general economic recovery would help their borrowers stay solvent even with less generous debt reductions. In areas which experienced continued weakness in the housing market, such as the New York City area, such a gambit turned out to be particularly expensive.

Simple participation brought benefits to borrowers, through forgiving loan structures if not

³⁰Chicago Daily Tribune, January 21, 1934. New York Times, September 18 1933, December 20 1933.

through reductions in principal debts. This paper should not be interpreted as diminishing the value of that relief, nor of the positive macroeconomic effects studied by Fishback, Lagunes, Horrace, Kantor, Treber (2009) and Courtemanche and Snowden (2009). That being said, in many cases, borrower equity relative to market prices post-HOLC intervention was small, less than the 20% and in some cases even negative, leaving those borrowers vulnerable to any further deterioration of the property's value. Moreover, this affected not just the loans that were added to the program through the generous appraisal, but also the innocent bystanders – the loans whose lenders would have participated even under a less generous appraisal based on market values. At the same time, many lenders were paid the full values of their claims on mortgages that could not on average have been expected to yield those full amounts. As a result, in many ways the HOLC was as much lenders' program as it was a home owners' program.

Since the Depression, it is interesting to note that while the system of mortgage finance has evolved, the fundamental technology for refinancing has not much advanced, remaining labor intensive, *ad hoc*, and fraught with moral hazard. Mortgage lenders were reluctant during the Depression to engage in much serious refinancing, especially debt reductions, and they appear similarly reluctant today. In the context of a highly distressed financial market, this paper highlights some of the inherent difficulties that continue to complicate any proposed government program for refinancing private sector debts, including the need to elicit voluntary participation of lenders, and the uncertainty of the value of assets and the underlying collateral.

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A Data Appendix

A.1 HOLC Data

As noted in the main text, The HOLC data available for this paper includes 3,032 observations, a 2.39% sample of the 126,735 HOLC loans in New York, New Jersey, and Connecticut.

3,172 observations were microfilmed. The difference is due to faulty microfilming, in which 140 observations were made unreadable due to overexposure.

The amount of observations in the original NBER sample was probably 3,172, although it might possibly have been 3,883. The Harris (1951) book is the only available information on the data collection process, and this passage requires interpretation:

Owing to the inaccessibility of records, only every sixtieth loan was sampled at one of the three warehouses where the HOLC records were stored. As a result, it was necessary to inflate the loan sample from that warehouse, raising the total number of loans actually sampled from 3,172 to the inflated number of 3,883.

As far as I can tell, there are two possible interpretations of this passage. First, an additional 711 loans were sampled from the warehouse in question, at some other date or by some other unknown method. This seems unlikely, because the “inaccessibility of records” would seem to indicate that a further sample was not forthcoming, and also because there is no evidence from the microfilming process that more than 3172 records were ever present. This leaves the second option, that the observation from the warehouse in question were “inflated” by increasing their weight in the original study. I assume the latter interpretation is correct.

The data were collected from three warehouses in Manhattan, including two on Park Avenue, and one on Christopher Street. These three warehouses were the central repositories for all records for New York, New Jersey, and Connecticut. This one-thirtieth samples were taken at the two Park Avenue warehouses, yielding 1,158 and 1,303 observations respectively. The one-sixtieth sample was taken at the Christopher Street warehouse, yielding 711 observations. These added together total 3,172.

During the microfilming on March 30, 1948, 140 observations were lost, as noted above. The number of surviving loans, then, are 1,111 of 1158 from the first Park Avenue warehouse, 1,279 of 1303 from the second Park Avenue warehouse, 642 of 711 from the Christopher Street warehouse. These sum to 3,032.

In the paper, I correct for the sampling by appropriately adjusting the weights on observations from each warehouse.

The geographic distribution of the sample is characterized in Table A-2, which lists by region the number of loans, the foreclosure rate, the median loan amount, and the median loan-to-value ratio. A large share of the loans occurred in the five boroughs of New York City, and the greater metropolitan area including the suburbs in Westchester and Long Island and parts of northern New Jersey and western Connecticut. Manhattan received few loans, despite its large population, most likely due to its uniquely low home ownership rate. There are also a large number of loans in areas around Rochester, Buffalo, Newark, New Haven, Bridgeport, Trenton, and Bloomfield. Rural areas have fewer loans both due to their smaller populations and because farms were not eligible for the HOLC (but were eligible for a different mortgage relief program).

The data for each mortgage includes information on the terms and amounts due on the original mortgage(s), characteristics of the borrower, characteristics of the property, statistics from the HOLC appraisal, and the terms and outcome of the HOLC loan. In this section I present summary statistics to describe the distribution of some key variables of the data.

Loans from New York, New Jersey, and Connecticut constituted a large portion of the number of loans in the HOLC portfolio, and a larger portion of the value of loans. There were 126,735 loans completed out of 262,119 applications in these three states, amounting to \$630,885,228, or an average of \$4978 per loan. In the rest of the country, 891,086 loans were made, amounting to \$2,462,272,791 with an average loan of \$2763. Thus, these three states accounted for 12.5% of the 1.01 million loans made nationwide, and 20% of the value of loans nationwide.

Further summary statistics are presented in Table A-3, describing the distribution of several variables. Characteristics of the properties include the original purchase price of the home, HOLC appraisal, HOLC market price estimate, age of the house, number of rooms and baths, and a dummy indicating central or noncentral heating. Characteristics of the mortgages include the amount borrowed and amount due, and the interest rate. Characteristics of the borrowers include the number of families residing in the house, number of dependents, borrower's age, and monthly income. Finally, characteristics of the HOLC loan include the payments to the primary and secondary lienholders, loans for taxes and reconditioning, and the total loan.

Table 1: Rejected HOLC Loan Applications

Reason for Rejection	Number	Share
Inadequate security	103,145	17.9%
Mortgagee's refusal to accept bonds	44,446	7.7
Property primarily for commercial use	27,668	4.8
Property of nonhomestead type	46,353	8.0
Unstable credit or income of mortgagor	43,249	7.5
Lack of distress	72,778	12.6
Failure of applicant to cooperate	56,186	9.7
Defective or insufficient title	20,362	3.5
Miscellaneous	73,361	12.7
Withdrawn	90,094	15.6
Total	577,642	100.0

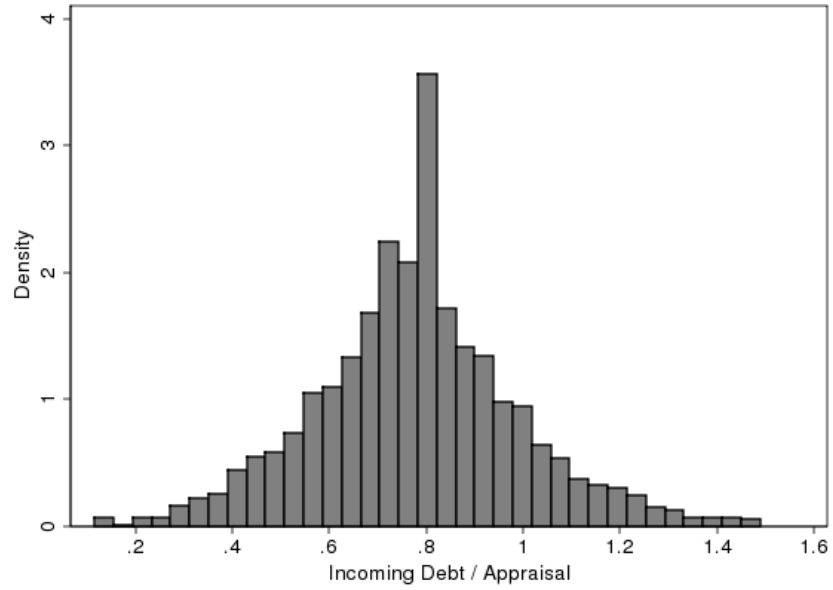
Notes: These are results from an unpublished HOLC study tabulating the reasons for rejecting loan applications. The data was made available to Harriss (1951), and covers the first 577,642 rejections dating to May 16 1935, out of 868,670 total rejections.

Table 2: Housing Price Deflation and Loan-to-Appraisal Ratios by Year of Purchase.

Year	N	Fall in Home Price			Loan to Appraisal Ratio		
		Median	25%	75%	Median	25%	75%
1916	29	-15.7	-28.6	20.0	0.64	0.44	0.72
1917	32	-12.7	-22.2	4.5	0.73	0.64	0.82
1918	55	-14.1	-21.7	21.0	0.73	0.57	0.82
1919	90	-14.3	-29.3	0.0	0.70	0.56	0.80
1920	118	-18.0	-32.8	-3.1	0.70	0.58	0.83
1921	111	-23.5	-38.5	-11.1	0.73	0.57	0.83
1922	156	-29.3	-41.0	-15.6	0.73	0.58	0.83
1923	199	-33.3	-40.9	-21.5	0.74	0.60	0.87
1924	251	-30.0	-41.1	-19.4	0.78	0.69	0.86
1925	246	-33.3	-40.8	-22.5	0.79	0.68	0.89
1926	272	-30.2	-38.6	-20.8	0.81	0.72	0.93
1927	247	-27.5	-38.3	-20.0	0.81	0.74	0.92
1928	235	-27.5	-35.1	-18.6	0.85	0.75	0.98
1929	228	-25.0	-33.3	-12.5	0.80	0.71	0.94
1930	150	-22.2	-32.6	-12.0	0.81	0.72	0.97
1931	144	-20.0	-27.5	-9.5	0.81	0.73	0.94
1932	106	-12.5	-26.9	8.3	0.80	0.72	0.88
1933	21	-4.8	-29.2	18.6	0.72	0.57	0.82

Notes: The fall in home price is measured using the HOLC's market price estimate as of the time of application, and the original purchase price of the home plus the value of any subsequent improvements. The loan to appraisal ratio is the amount outstanding on the loan at the time of application, divided by the HOLC's final appraisal value. The data are a 2.4% sample of HOLC mortgages from New York, New Jersey, and Connecticut.

Figure 1: Distribution of incoming debt-to-appraisal ratios of HOLC loans.



Notes: The appraisal is the final appraisal by the HOLC. The incoming debt includes both mortgage debt and delinquent taxes and any emergency repairs as determined by the HOLC. A small number of outlier observations on the upper end have been omitted to preserve a meaningful scale.

Figure 2: Loan to appraisal ratios, before and after HOLC intervention.

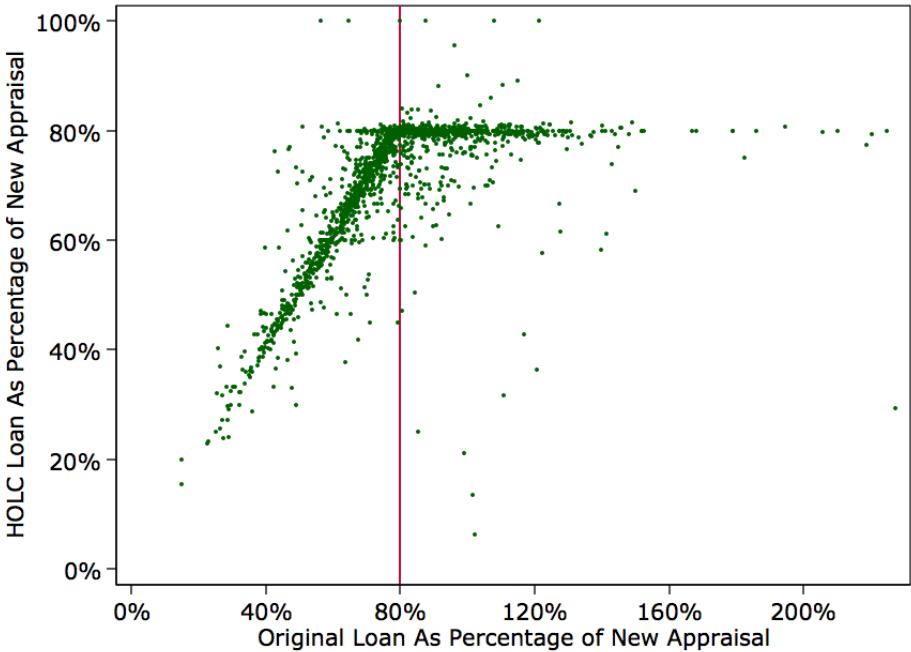
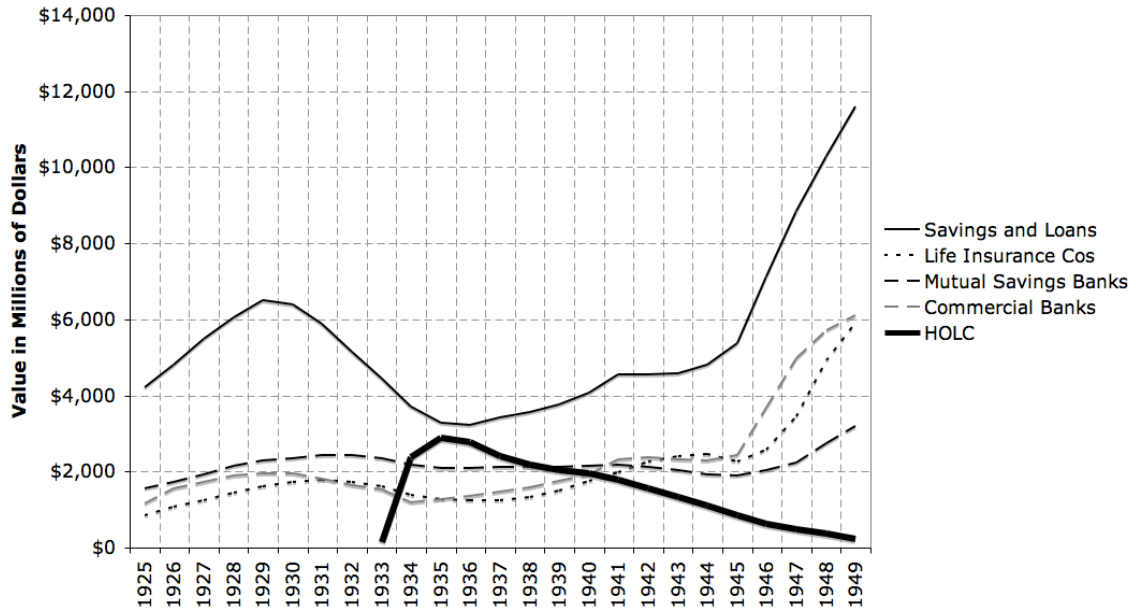


Figure 3: Principal reductions arranged by the HOLC.



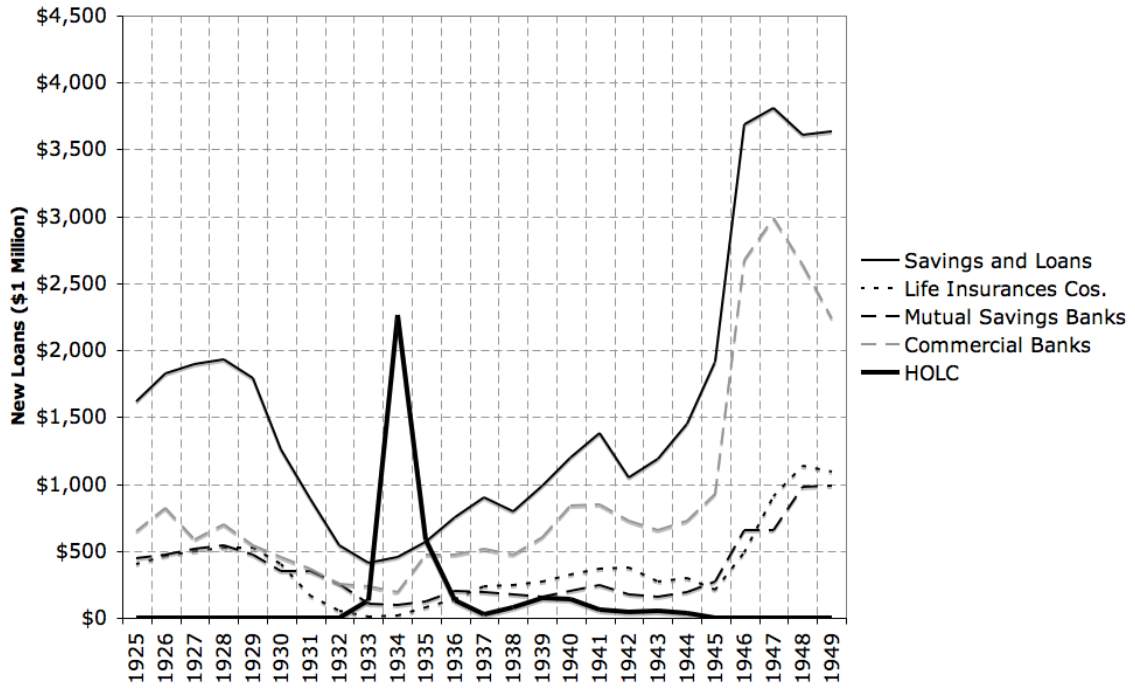
Notes: The vertical axis is the reduction in the principal, measured as the new HOLC loan divided by the original amount due. The horizontal axis is the original loan to value ratio. Eight outlier observations that had unusually large principal reductions were omitted from this graph to preserve a meaningful scale.

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



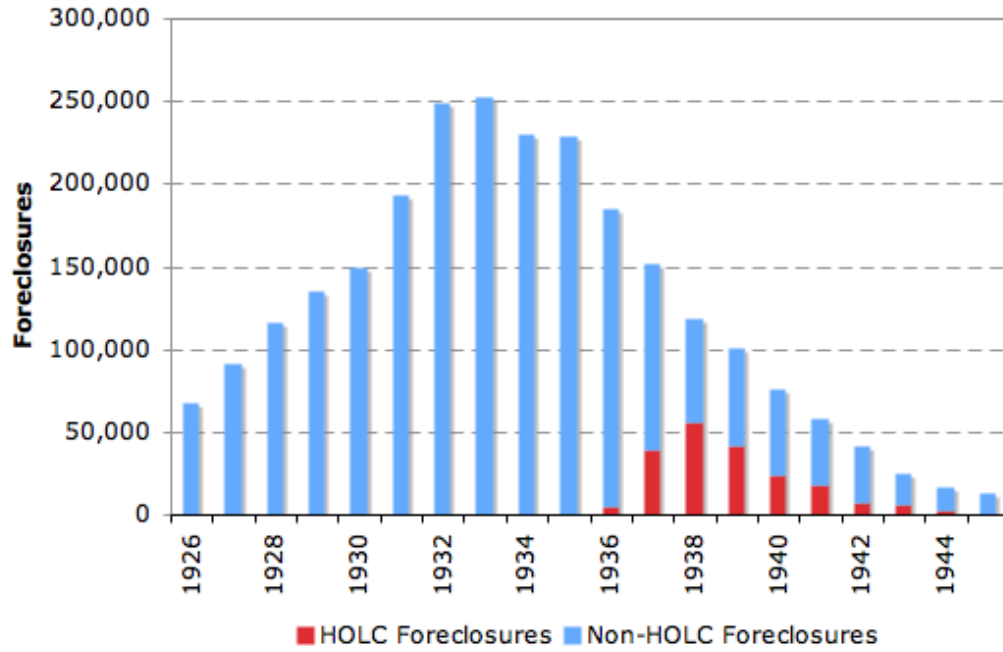
Notes: Values are in millions of dollars. Source: Federal Savings and Loan Insurance Corporation, via Fisher (1951), p. 64.

Figure 5: New mortgage loans on 1-4 family homes, by type of lender.



Notes: Values are in millions of dollars. Source: Historical Statistics of the United States, Series DC 983-989.

Figure 6: Nonfarm mortgage foreclosures, 1926-1945, and HOLC foreclosures, 1936-1945.



Notes: Source: Historical Statistics of the United States, Series Dc1255-1270, and the 1952 Termination Report of the HOLC. The 1936 HOLC foreclosures are actually the sum of 1934-1936, since individual years were not available.

Table 3: The impact of debt relief on the probability of foreclosure: probit second stage results.

Dependent Variable: Foreclosure Dummy				
	Probit	Probit	IV-Pr	IV-Pr
	(1)	(2)	(3)	(4)
Principal Reduction	0.00	-0.81**	-0.82**	-0.82**
	[0.04]	[0.09]	[0.11]	[0.16]
Old Debt/Appraisal		0.98**	0.98**	1.15**
		[0.09]	[0.12]	[0.18]
1(Old Debt/Appraisal > .8)			0.005	-0.002
			[0.029]	[0.034]
HOLC Mortgage Payment/Monthly Income				0.05
				[0.04]
Appraisal				0.0022**
				[0.0004]
Estimated House Price Deflation				-0.026
				[0.039]
HOLC Loan Order				-0.346**
				[0.044]
Year Purchased				-0.001
				[0.002]
Age of House				0.001
				[0.001]
Age of Borrower				0.005**
				[0.001]
Observations	3001	2791	2791	2143
Pseudo R-squared	0.00	0.05		

Notes: Marginal effects are reported, and robust standard errors are in brackets. The * indicates significance at 5% and ** significance at 1%. The dependent variable is a dummy indicating foreclosure. The principal reduction measure is the ratio of the old loan to the new loan; higher values indicate larger reductions. In columns (3) and (4), the excluded instrument for the principal reduction measure is the interaction between the loan-to-appraisal ratio and the dummy indicating that the loan-to-appraisal ratio exceeds 80%. See Table 4 for the first stage.

Table 4: The impact of debt relief on the probability of foreclosure: probit first stage results.

First stage estimates		
Dependent Variable: Principal Reduction		
	(3)	(4)
(Old Debt/Appraisal) × 1(Old Debt/Appraisal > .8)	1.26**	1.22**
	[0.03]	[0.034]
Old Debt/Appraisal	0.015	0.066*
	[0.013]	[0.027]
1(Old Debt/Appraisal > .8)	-1.00**	-0.97**
	[0.026]	[0.03]
HOLC Mortgage Payment/Monthly Income		-0.031
		[0.015]
Appraisal		-0.00002
		[0.00007]
Estimated House Price Deflation		-0.013
		[0.009]
HOLC Loan Order		-0.00008
		[0.013]
Year purchased		-0.0009
		[0.0007]
Age of house		0.00017
		[0.00016]
Age of Borrower		0.0011
		[0.0006]

Notes: Marginal effects are reported, and robust standard errors are in brackets. The * indicates significance at 5% and ** significance at 1%. The dependent variable is the principal reduction measure, which is the ratio of the old loan to the new loan; higher values indicate larger reductions. See Table 3 for the second stage results.

Table 5: The impact of debt relief on the probability of foreclosure: linear probability model, second stage results.

Dependent Variable: Foreclosure Dummy				
	OLS	OLS	IV	IV
	(1)	(2)	(3)	(4)
Principal Reduction	0.00	-0.44**	-0.67**	-0.60**
	[0.04]	[0.09]	[0.09]	[0.12]
Old Debt/Appraisal		0.65**	0.80**	0.88**
		[0.07]	[0.08]	[0.11]
1(Old Debt/Appraisal > .8)			0.023	0.039
			[0.029]	[0.033]
HOLC Mortgage Payment/Monthly Income				0.05
				[0.04]
Appraisal				0.0021**
				[0.0004]
Estimated House Price Deflation				-0.028
				[0.033]
HOLC Loan Order				-0.338**
				[0.040]
Year purchased				-0.001
				[0.002]
Age of house				0.000
				[0.001]
Age of Borrower				0.004**
				[0.001]
Constant	0.36**	0.35**	0.485**	0.1623
	[0.04]	[0.06]	[0.065]	[0.1229]
Observations	3001	2791	2791	2143
R-squared	0.00	0.05	0.043	0.122

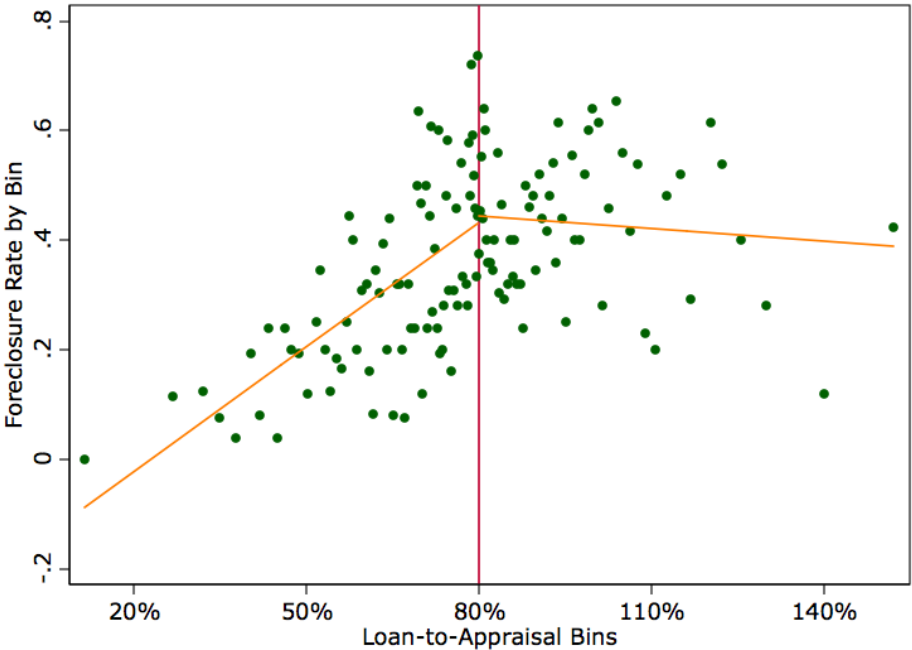
Notes: Robust standard errors are in brackets. The * indicates significance at 5% and ** significance at 1%. The dependent variable is a dummy indicating foreclosure. The principal reduction measure is the ratio of the old loan to the new loan; higher values indicate larger reductions. In columns (3) and (4), the excluded instrument for the principal reduction measure is the interaction between the loan-to-appraisal ratio and the dummy indicating that the loan-to-appraisal ratio exceeds 80%; see Table 6 for the first stage results.

Table 6: The impact of debt relief on the probability of foreclosure: linear probability model, second stage results.

First stage estimates		
Dependent Variable: Principal Reduction		
	(3)	(4)
(Old Debt/Appraisal) \times 1(Old Debt/Appraisal > .8)	1.26**	1.22**
	[0.03]	[0.04]
Old Debt/Appraisal	0.01	0.07*
	[0.01]	[0.03]
1(Old Debt/Appraisal > .8)	-1.000**	-0.966**
	[0.026]	[0.033]
HOLC Mortgage Payment/Monthly Income		-0.03
		[0.02]
Appraisal		-0.0000
		[0.0001]
Estimated House Price Deflation		-0.013
		[0.009]
HOLC Loan Order		-0.000
		[0.013]
Year purchased		-0.001
		[0.001]
Age of house		0.000
		[0.000]
Age of Borrower		0.001
		[0.001]
Constant	1.011**	0.9722**
	[0.009]	[0.0349]
Observations	2791	2143
R-squared	0.677	0.609

Notes: Robust standard errors are in brackets. The * indicates significance at 5% and ** significance at 1%. The dependent variable is the principal reduction measure, i.e. the ratio of the old loan to the new loan; higher values indicate larger reductions. See Table 5 for second stage results.

Figure 7: Reduced form relation between foreclosure rates and the incoming debt-to-appraisal ratio.



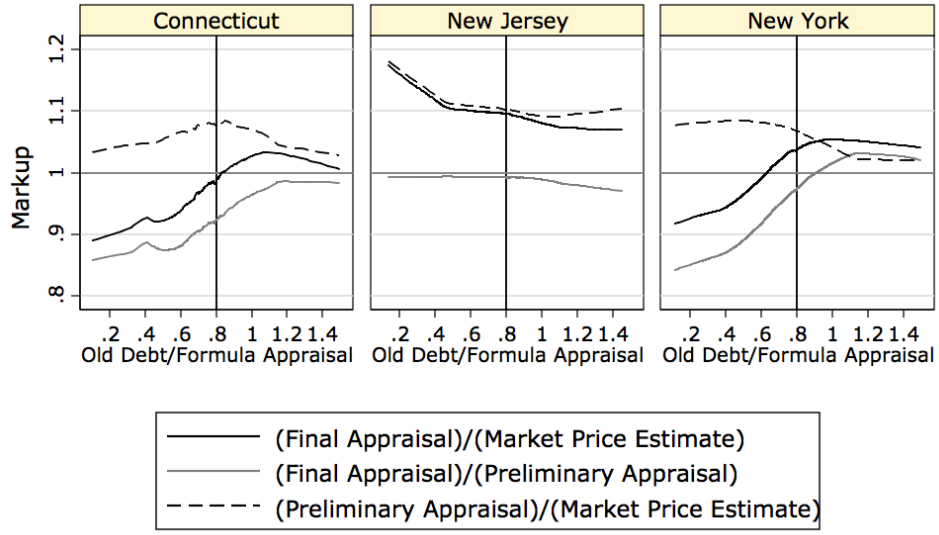
Notes: The data points correspond to averages within 135 bins, grouped according to incoming loan-to-appraisal ratios, from low to high. The horizontal axis is the average loan-to-appraisal ratio in each bin. The vertical axis is the foreclosure rate in each bin. The red vertical line is placed at the bin in which the loan-to-appraisal ratio reaches 80%, which is the threshold for HOLC refinancing policy.

Table 7: Appraisal summary statistics across the three states in the sample.

	New Jersey	New York	Connecticut
Preliminary/Market Price	1.103	1.069	1.069
Final/Preliminary	0.993	0.959	0.918
Final/Market Price	1.096	1.023	0.977
Incoming Debt/Market Price	0.822	0.798	0.850
Outgoing Debt/Market Price	0.730	0.712	0.703

Notes: Each figure is a mean within the state. The preliminary appraisal was the result of the three part formula, and the final appraisal the result of a review of the preliminary appraisal. The market price is an estimate by the HOLC appraiser of the present market price of the property.

Figure 8: Results of the appraisal process, by state.



Notes: Each line is a lowest curve summarizing the relationship between three variables and the level of incoming indebtedness, as measured by the initial debt to formula appraisal ratio.

Table 8: Appraisal discretion and the incoming debt burden.

Dependent variable: $\log(\text{Final Appraisal}) - \log(\text{Preliminary Appraisal})$				
	(1)	(2)	(3)	(4)
Incoming Debt/Market Price	0.143**	0.171**	0.326**	0.384**
	(0.0122)	(0.0164)	(0.0564)	(0.0688)
[Incoming Debt/Market Price] ²			-0.105**	-0.120**
			(0.0288)	(0.0341)
Controls	No	Yes	No	Yes
	(0.0109)	(0.0148)	(0.0266)	(0.0318)
Observations	1619	1508	1619	1508
R^2	0.136	0.229	0.146	0.241

Notes: The data is for New York. Robust standard errors in parentheses. * significant at 5%; ** significant at 1%. The controls include estimated deflation in the property's value and its quadratic, the markup of the preliminary formula appraisal over the market price, incoming debt, income, and loan order.

Table A-1: HOLC Activity by State

State	Loans	Average Loan Value	Foreclosure Rate	Acceptance Rate	Average Loan-to-Appraisal Ratio
New York	80,115	\$ 5,134	42.9%	50.7%	72.0%
Massachusetts	24,524	4,448	41.3	48.6	73.7
New Jersey	36,339	4,825	38.4	44.4	67.1
Kansas	18,504	1,818	31.2	58.8	63.2
South Dakota	6,122	1,780	30.4	65.9	62.8
Nebraska	13,597	2,068	29.2	68.0	67.5
Missouri	24,535	3,052	27.4	53.7	69.9
North Dakota	4,416	2,047	27.4	59.2	60.6
Oklahoma	23,960	2,270	25.3	62.4	67.7
Vermont	1,576	2,664	24.2	61.4	68.5
Rhode Island	6,118	4,037	23.6	49.6	68.0
Connecticut	10,281	4,303	23.2	46.0	73.7
Wisconsin	33,101	3,486	22.4	59.4	67.6
New Hampshire	1,867	2,417	21.7	50.8	64.0
Maryland	15,928	2,863	21.7	55.2	68.1
Maine	3,398	2,276	19.3	43.7	65.2
Alabama	16,611	2,230	18.4	59.3	67.6
Texas	44,355	2,327	17.9	58.0	66.0
Pennsylvania	58,793	2,841	17.9	48.4	68.9
Virginia	12,031	3,133	17.1	56.9	70.3
Kentucky	9,234	2,743	16.5	45.1	66.9
Louisiana	14,379	2,799	16.4	58.1	69.4
Arkansas	10,344	1,806	16.1	52.3	68.9
Tennessee	13,761	2,255	16.0	56.4	70.3
Mississippi	8,762	1,879	15.0	47.1	62.1
Utah	10,749	2,329	14.8	72.2	68.7
Iowa	19,633	1,978	14.7	61.7	62.9
Arizona	6,508	2,423	14.1	68.8	67.0
Delaware	1,642	3,109	14.0	58.3	72.9
Indiana	48,815	2,298	13.5	59.5	66.6
Minnesota	21,021	2,282	13.2	58.0	67.6
North Carolina	12,319	2,548	13.0	50.7	65.0
Illinois	69,985	3,993	12.9	55.1	70.7
Ohio	98,556	3,104	12.6	50.9	67.3
Washington	21,438	1,814	12.2	54.2	68.6
Georgia	14,850	2,267	12.0	63.6	71.3
Dist of Columbia	2,087	5,819	11.1	47.1	75.1
South Carolina	5,683	2,340	11.0	56.8	69.3
California	51,554	2,652	10.7	50.3	72.7
Colorado	11,613	1,974	10.6	58.9	70.8
Florida	13,524	2,268	9.7	54.3	68.8
Oregon	9,416	1,971	9.7	55.8	69.0
Montana	3,679	1,980	9.2	52.4	62.6
Idaho	4,692	1,744	8.8	69.5	64.5
Michigan	81,126	2,959	8.8	55.7	65.2
West Virginia	9,079	2,519	8.4	48.8	63.8
New Mexico	2,462	2,086	7.6	51.5	65.4
Wyoming	2,446	2,234	5.3	64.5	65.5
Nevada	1,211	2,724	4.4	71.1	56.8
United States	1,016,739	\$3,039	19.1%	54.0%	68.6%

Table A-2: Sample statistics by region.

New Jersey				
Region	Loans	Foreclosure Rate	Median Loan Amount	Median Loan-to-Value
Newark Area	200	31.4%	5,600	77.3%
Northwest	94	32.5%	3,200	75.0%
Jersey City Area	162	37.2%	5,400	79.1%
NYC Suburbs	276	38.0%	4,700	77.8%
South	180	44.0%	3,400	80.0%
Statewide	912	36.9%	4,600	78.2%
New York				
Region	Loans	Foreclosure Rate	Median Loan Amount	Median Loan-to-Value
Rochester	154	24.0%	3,200	67.9%
Buffalo	189	27.2%	3,000	66.7%
Central	104	33.3%	3,200	76.7%
North Hudson	121	34.1%	3,600	72.5%
Bronx	113	27.1%	6,000	70.4%
Queens	287	30.6%	4,700	75.0%
Manhattan and St. Isl.	102	40.2%	4,600	69.3%
Brooklyn	400	45.4%	5,900	80.0%
Long Island	219	49.6%	4,400	73.8%
North NYC suburbs	160	51.9%	6,800	76.0%
Statewide	1849	37.7%	4,600	73.9%
Connecticut				
Region	Loans	Foreclosure Rate	Median Loan Amount	Median Loan-to-Value
East	78	21.8%	3,700	72.7%
Northwest	20	25.9%	4,000	75.0%
Southwest	126	27.2%	4,100	72.0%
Statewide	224	25.8%	4,000	73.3%
All	2987	36.5%	4,500	75.0%

Notes: In calculating the loan-to-value ratios, the value of the property is measured by the HOLC market price estimate.

Table A-3: Summary statistics for a selection of variables in the HOLC sample.

Variable	<i>N</i>	Mean	Median	25%	75%
Purchase Price	2920	8228.94	7,200	5,000	10,050
HOLC Appraisal	2817	6960.31	6,300	4,700	8,500
HOLC Market Price Estimate	2934	6785.82	6,000	4,500	8,500
First Mortgage Loan Amount	1232	4515.83	4,000	2,800	6,000
First Mortgage Total Due	3003	4237.30	3,800	2,500	5,300
First Mortgage Interest Rate	1192	5.93	6	6	6
Second Mortgage Loan Amount	476	2324.58	2,000	1,000	3,000
Second Mortgage Total Due	1171	1555.25	1,200	600	2,100
Second Mortgage Interest Rate	488	5.96	6	6	6
Age of House	2797	17.95	12	8	25
Number of Rooms	3011	8.66	7	6	11
Number of Bathrooms	2991	1.41	1	1	2
1(Central Heating)	3006	0.89	1	1	1
Families	3014	1.46	1	1	2
Age of Borrower	2999	46.94	46	39	54
Number of Dependents	2886	3.07	3	2	4
Monthly Income	2874	119.91	110	60	150
Payment to Primary Lienholder	3023	4082.40	3,700	2,500	5,200
Payment to Secondary Lienholder	2059	392.37	0	0	600
Loan for Delinquent Taxes	3032	396.23	300	140	510
Loan for Maintenance	3032	55.55	0	0	0
Total Loan	3026	4870.11	4,400	3,000	6,100