Residential Mortgage Renegotiation During the Great Depression

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Abstract

Between 1929 and 1932, home prices in New York fell an average of 50% and the unemployment rate rose substantially. As a result, many residential mortgages were at serious risk of foreclosure. Lenders in the 1930s faced substantial incentives to avoid foreclosure. We use loan level data from the NYC metropolitan area to examine the extent to which lenders attempted to prevent foreclosures with concessionary modifications. We find no principal forgiveness in the sample and only a handful of concessionary mortgage modifications of other types. Far more mortgages terminated through foreclosure than received any sort of concessionary modification.

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1 Introduction

The 1930s saw a fall in both nominal and real home prices as well as a significant increase in unemployment. Nationally, the non-farm foreclosure rate in metropolitan communities nearly quadrupled between 1926 and 1933, rising from 3.6 foreclosures per 1000 dwellings to 13.3 foreclosures per 1000 dwellings (Federal Home Loan Bank Board, 1937a). Similar to the situation at present, if the lender foreclosed on a property, the lender stood to recover substantially less on the property than its fair market value and would incur significant foreclosure costs. Finally, some lenders held mortgages they originated themselves while others held mortgages originated by third parties who had no intention of holding the mortgages themselves.

This paper asks to what extent lenders used concessionary mortgage modifications to prevent foreclosures during the Great Depression using a sample of residential mortgages originated in the New York City (NYC) metropolitan area between 1920 and 1939. Our data include detailed information on the original mortgage agreement and any subsequent modifications to it. In particular, the sample collection specifically included a box where lenders could indicate whether there was a reduction in principal "by compromise". We are also able to observe changes in amortization, interest rate changes, and, to a lesser extent, changes in maturity.

In no year between 1929 and 1935 did more than 2% of outstanding loans receive what may have been a concessionary modification. We find no instances of principal forgiveness in our main sample. We find some interest rate reductions possibly due to a concession on the part of the lender but the average concession to the interest rate is less than 100 basis points. Changes in amortization that result in a reduction in the payment are similarly rare. We find a handful of loans where the lender may have exercised forbearance such that there is a small increase in the principal balance owing. We find that far more loans went into foreclosure than received what may have been a concessionary modification during the 1930s. Rather, we find evidence that lenders may have forced some mortgagors into foreclosure by refusing to refinance short-term loans with a balloon payment coming due although this effect is only present in the years the Home Owner's Loan Corporation (HOLC) was accepting applications.

We find little difference in the propensity to grant concessionary mortgage modifications across lender types: Life insurers, commercial banks, and savings and loan associations (henceforth savings

and loans) all appear to have been very reluctant to modify loan terms in response to an increased risk of foreclosure. Life insurers appear to have recorded changes in their loan terms somewhat more faithfully and thus have a slightly higher concessionary modification rate than commercial banks and savings and loans. However, life insurers held riskier loans than savings and loans and the proportion of their recorded modifications that may be concessionary is lower than that of commercial banks and savings and loans.

A caveat to our results is that lenders in our sample may have engaged in some forbearance that we are unable to observe. Indeed, we observe a significant delay between when home prices and employment in the NYC region fall and when the foreclosure rate in our sample reaches its peak. While we try to identify forbearance in our data, the short-term nature of most mortgages originated in the 1920s makes it impossible to identify forbearance if the lender did not amortize missed payments.

Our results mirror those of Alan White (2009a, b) and Adelino, Gerardi, and Willen (2009) for the foreclosure crisis that began around 2007. Alan White (2009a) finds only 40 principal reductions of more than 10% of the balance owing in his analysis of over 100,000 securitized subprime loans. Alan White (2009b) examines 1.5 million subprime and alt-A mortgages and finds only 1100 modifications involving principal forgiveness. Adelino, Gerardi, and Willen (2009) find that fewer than 3% of all seriously delinquent mortgages received payment-reducing modifications in the 2007-2008 period. Alan White (2009a) finds that the most common form of concessionary modification was a rate freeze or a reduction in the interest rate. We also find rate concessions to be the most common concession on the part of the lender in our analysis of loans during the Great Depression.

The results in this paper and those of Alan White (2009a, b) and Adelino, Gerardi, and Willen (2009) regarding the renegotiation of residential mortgages contrast with the frequency of concessionary renegotiation of other sorts of financial contracts. Benmelech and Bergman (2008) find that airlines are frequently able to renegotiate their leases downwards when they are financially distressed. James (1996) examines a sample of financially distressed public firms not in bankruptcy and finds that, provided public debt holders agree to an exchange, banks frequently reduce principal on bank loans. James (1995) similarly finds frequent instances of banks forgiving principal on debt in exchange for an equity stake in a firm. The rarity of concessionary renegotiation for residential mortgages may owe to the relatively greater difficulty lenders have in distinguishing between finan-

cially troubled mortgagors and mortgagors unlikely to default but that still have negative equity. In contrast, information on the financial condition of publicly traded firms is readily available.

Since only a handful of loans in our sample would have been securitized, and none of the loans from commercial banks were securitized, our results suggest that there are reasons beyond securitization that lenders may be hesitant to modify residential mortgages and, especially, to forgive principal. Our results should not, however, be viewed as suggesting that securitization has played no role in lenders' reluctance to modify loans in the recent foreclosure crisis. Indeed, Cordell, Dynan, Lehnert, Liang, and Mauskopf (2009) and Piskorski, Seru, and Vig (2009) show that securitization is part of the reason that few loans received voluntary mortgage modifications prior to the introduction of the Obama administration's Home Affordable Modification Program (HAMP).

This paper also contributes to a growing body of recent literature that aims to understand the real estate lending environment of the 1920s and the 1930s. Courtemanche and Snowden (2009), Fishback, Flores-Lagunes, Horrace, Kantor, and Treber (2010), and Rose (2010) examine the impact of the HOLC, a federal program wherein the federal government directly refinanced troubled loans. In exchange for their troubled loans, lenders were given HOLC bonds. We find some evidence that lenders may have refused to refinance distressed mortgages with balloon payments coming due in hopes that the mortgagor would apply to the HOLC consistent with Rose's (2010) that the HOLC was primarily a program that benefitted lenders. Wheelock (2008) provides an overview of the government response to the foreclosure crisis of the 1930s. Goetzmann and Newman (2010) examine securitization in the 1920's. Eugene White (2009) provides an overview of the causes of the real estate boom of the 1920s and its subsequent collapse.

To my knowledge, this is the first paper to examine the extent to which lenders tried to prevent foreclosures by granting concessionary modifications in the 1920s and 1930s. It is also the first paper since the 1950s to examine the NBER mortgage experience cards for life insurers, commercial banks, and savings and loans. Rose (2010) examines the loan experience cards from the HOLC and has generously provided digitized versions of this data to the NBER to post on its website.

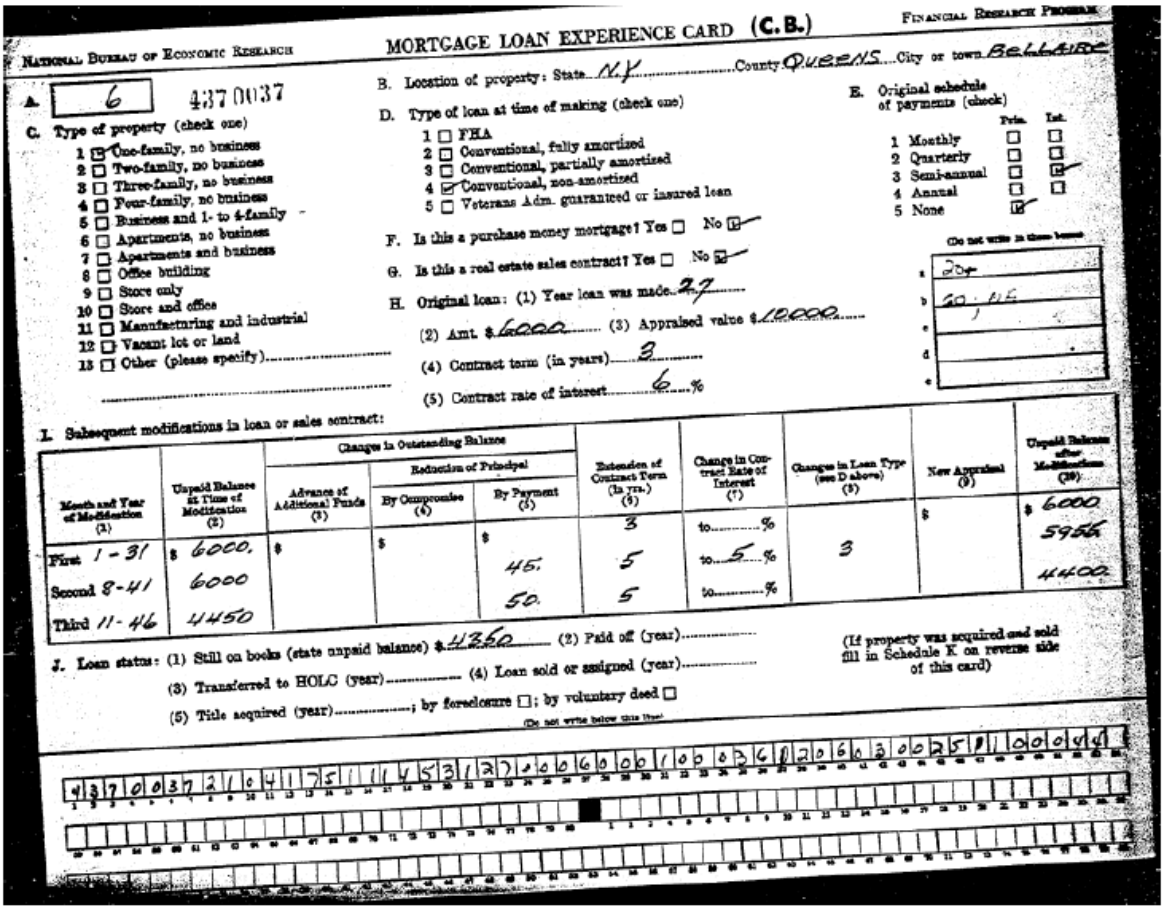
The next section of the paper describes the data set. Section 3 summarizes the renegotiations we observe in the data. Section 4 discusses the implications of our findings for loan renegotiation in the current foreclosure crisis while section 5 concludes.

2 The Data

The data in this sample are the NBER's mortgage experience cards for loans originated in the 1920-1939 period for the NYC metropolitan area. We use only data on non-farm, conventional mortgages for $1-4$ family homes. The mortgage experience cards were collected by the NBER in the late 1940s and were designed to be a representative national sample of the loans of mortgage lenders extant as of 1944. These data are available on microfiche files at http://www.nber.org/nberhistory/historicalarchives/archives.html.

Figure 1 is an example of a mortgage experience card from our sample. This particular experience card represents a mortgage held by a commercial bank (rolls 1-3 on the NBER's website). Field A represents the lender's internal coding of the loan; the numbers immediately to the right of field A represent the NBER institution number (437 in this case) and the NBER loan number specific to each institution (37 in this case). There is little missing data in fields B through E, which are self-explanatory. Questions F and G are sometimes blank in the data or filled out and then subsequently scribbled out. It seems possible that many lenders did not fully understand these questions despite the detailed instructions they were given (see Morton, 1956, appendix B); many savings and loans indicated that the purpose of the loan was "purchase" (the experience cards for savings and loans are slightly different than those for commercial banks and include an additional field where the institution indicates the purpose of the loan) and then went on to indicate that the loan was not a purchase mortgage which seems puzzling. It is unclear exactly what is meant by real estate sales contract but only 8% of the mortgages in our sample meet this definition according to the reporting institutions and only 71% of our mortgage experience cards have a response to this question. Approximately 7% of our loans are missing appraisal at origination (Field H). Field J indicates the current status of the loan. In this case, the loan is outstanding. For foreclosed loans, an additional sheet records details of the foreclosure.

Field I is the field of most interest in this paper. This particular loan has three modifications. However, it seems the lender did not record all maturity extensions (extensions of contract term) since there was not a maturity extension in either 1930 (when the original term expired) or in 1934 when the term set in 1931 expired. Such missing term extensions are especially prevalent in the commercial loan sample since they have the shortest loan maturities, in part due to regulations.



NATIONAL BUREAU OF ECONOMIC RESEARCH

MORTGAGE LOAN EXPERIENCE CARD (C.B.)

FINANCIAL RESEARCH PROGRAM

A. 6 4370037

B. Location of property: State N.Y. County QUEENS City or town BELLAIRE

C. Type of property (check one)
1 ☑ One-family, no business
2 ☐ Two-family, no business
3 ☐ Three-family, no business
4 ☐ Four-family, no business
5 ☐ Business and 1- to 4-family
6 ☐ Apartments, no business
7 ☐ Apartments and business
8 ☐ Office building
9 ☐ Store only
10 ☐ Store and office
11 ☐ Manufacturing and industrial
12 ☐ Vacant lot or land
13 ☐ Other (please specify)

D. Type of loan at time of making (check one)
1 ☐ FHA
2 ☐ Conventional, fully amortized
3 ☐ Conventional, partially amortized
4 ☑ Conventional, non-amortized
5 ☐ Veterans Adm. guaranteed or insured loan

E. Original schedule of payments (check)

	Prin.	Int.
1 Monthly	☐	☐
2 Quarterly	☐	☐
3 Semi-annual	☐	☑
4 Annual	☐	☐
5 None	☑	

F. Is this a purchase money mortgage? Yes ☐ No ☑

G. Is this a real estate sales contract? Yes ☐ No ☑

H. Original loan: (1) Year loan was made 27
(2) Amt. $6000 (3) Appraised value $10000
(4) Contract term (in years) 3
(5) Contract rate of interest 6 %

(Do not write in these boxes)
a 20+
b 60; NE
c
d
e

I. Subsequent modifications in loan or sales contract:

Month and Year of Modification (1)	Unpaid Balance at Time of Modification (2)	Changes in Outstanding Balance: Advance of Additional Funds (3)	Reduction of Principal: By Compromise (4)	Reduction of Principal: By Payment (5)	Extension of Contract Term (in yrs.) (6)	Change in Contract Rate of Interest (7)	Changes in Loan Type (see D above) (8)	New Appraisal (9)	Unpaid Balance after Modifications (10)
First 1-31	$ 6000.	$	$	$	3	to %		$	$ 6000
Second 8-41	6000			45.	5	to 5 %	3		5955
Third 11-46	4450			50.	5	to %			4400.

J. Loan status: (1) Still on books (state unpaid balance) $4350 (2) Paid off (year)
(3) Transferred to HOLC (year) (4) Loan sold or assigned (year)
(5) Title acquired (year); by foreclosure ☐; by voluntary deed ☐

(If property was acquired and sold fill in Schedule K on reverse side of this card)

(Do not write below this line)

Figure 1: Example of a Mortgage Experience Card (Roll 3, Slide 419 on NBER Website)

Indeed, many of the commercial bank loans are demand loans after an original one year term. Commercial banks sometimes explicitly indicated that the maturity structure was demand after one year; it is likely that this was the standard contract for many lenders and that many lenders simply recorded the maturity as one year even if it was, in fact, demand after one year. In the event that the loan had more than three modifications, the institution sometimes filled out another card or two additional cards if there were more than six modifications.

For life insurers, the NBER data are a 1% random sample of the mortgage loans originated after 1920 of the 30 largest (by size of the non-farm mortgage portfolio) life insurance lenders. For life insurance companies, the coverage of current loans (i.e., loans active in the late 1940s) is similar to the coverage for historical loans. Furthermore, life insurers kept detailed records of their loans such that it was easy for them to link successor loans with earlier loans (i.e., to identify modifications). Finally, there is little survivorship bias for life insurance companies as few of them failed in the 1930s. For additional details on the sampling procedure, see Morton (1956).

For commercial banks and savings and loans, the NBER samples roughly corresponds to a 1% random sample conditional on achieving a representative national sample; in areas of the country where a lender was the predominant local lender, the NBER requested that the institution sample more then 1% of its loans. Similarly, small lenders sampled less than 1% of their mortgages since they originated a smaller proportion of loans. The data for commercial banks are a somewhat less reliable sample of the loans extant in the 1920s and 1930s than those of life insurers. 68% of participating lenders were able to report on inactive as well as active loans. Several commercial banks collapsed in the early 1930s such that we expect to see some survivorship bias in this sample. Morton (1956) concludes that biases due to inadequate linking of successor loans with earlier loans are likely to have been negligible for large commercial banks which comprise the bulk of the NBER's data on commercial bank mortgages.

The data for savings and loans, usually known as building and loan associations before the early 1930s, are the least representative of the three NBER samples. Only 46% of the responding savings and loans were able to report their inactive loans. Furthermore, survivorship bias is likely the worst for the savings and loans sample. As a result, we have a smaller number of loans made by savings and loans in the 1920s and 1930s than their share of lending in the 1920s and 1930s. The survivorship bias in the commercial bank and savings and loans implies that the institutions

in our sample are likely to have been among the healthier institutions in existence during the 1920s and 1930s.

There is nothing on the cards that specifically indicates whether the loan was securitized. Commercial banks were specifically instructed to sample only loans held for their own accounts (Morton, 1956, appendix B), however. For life insurers and savings and loans, only a handful of loans in our sample would have been securitized even if some institutions included their securitized loans in their sample. While residential securitization did exist throughout the 1920s, a very small fraction of institutionally held residential mortgage debt was securitized. Eugene White (2009, Figure 14) reports that the volume of residential mortgage bonds reached a peak of just under $500 million in 1928; the total volume of institutionally held non-farm residential mortgages was nearly $11.5 billion in the same year (Morton, tables C-1 and C-3).

However, many of the loans reported by life insurers would have been acquired in the secondary market. Throughout the 1920s life insurers almost exclusively acquired loans through correspondents, also known as mortgage companies, rather than through branches (Saulnier, 1950). Saulnier (1950, pp. 30-32) reports that the usual arrangement was for the life insurer to pay the correspondent a fixed fee at the time of loan origination in exchange for originating the loan and servicing the loan while it was outstanding. As the volume of new loans decreased in the early 1930s, many correspondents went out of business or life insurers proposed new arrangements for the compensation of correspondents. The compensation structure worked out was usually either a flat fee per mortgage being serviced each month or a fee set as a percentage of collections. In some cases, life insurers themselves took over the servicing of the loans. Snowden (1995) suggests that, early on in the crisis, life insurers approved many bad loans to ensure that their correspondents had adequate revenue.

Snowden (1995) reports that commercial banks and savings and loans were in general local lenders such that they had little need to use correspondents. In many cases, they were forbidden by statute from engaging in interstate lending. A handful of our commercial banks engage in interstate lending, almost always in neighboring states. Our savings and loans appear to be almost exclusively very local lenders.

2.1 Summary Statistics

Table 1 illustrates summary statistics for our sample. About half the loans in our sample come from life insurers with the remainder roughly split between commercial banks and savings and loans. This is not representative of the share of loans by each type of institution at the time. The share of life insurers in institutional residential mortgage holdings (by amount outstanding) was approximately 11% in 1925 and 16% in 1935 (Morton, 1956, Table C-2). Commercial banks held 18% of residential mortgage debt in 1925 and 19% in 1935. Savings and loans accounted for fully 51% of mortgage holdings in 1925 and 39% in 1935. Thus, life insurers are over-represented in our sample, and savings and loans are under-represented, due to the data collection procedure described above.

The loans in our sample have an average nominal interest rate of 5.82%. The average rate masks differences over time in the rate: The average rate for a new loan was close to 6% throughout nearly all of the 1920s and the early 1930s. Likely due to competition from FHA loans, which had a fixed rate of interest set by the FHA rather than the lender, the average interest rate fell gradually from 1934 until 1939 when it stood at 5.1%. There do not appear to be major differences across lender types in the interest rates on mortgages.

The average original maturity on the loans is quite short at just under 6 years. The average maturity differs significantly across both lenders and across time. Commercial banks have the shortest average maturity, in large part because of regulations preventing many of them from making long term loans on non-farm mortgages. Prior to 1927, federally regulated commercial banks could not legally own residential mortgages with maturities any longer than one year; this restriction was lifted to five years in 1927 (Behrens, 1952). Loans held by life insurers have an average maturity of just under six years. It is unclear exactly why life insurers had such short loan terms particularly given the long-term nature of their liabilities. For all types of lenders, the average loan term rose substantially from around 1934 to 1939, perhaps in response to the introduction of 15 year FHA mortgages.

The average realized maturity of the loan (the time from origination until termination) is around eight years. Furthermore, it is much more similar across lenders with commercial banks in fact having the longest realized maturity of the three types of lenders. The average LTV in our sample

Table 1: Summary Statistics

	Mean	Std. Dev.	Min.	Max
Original Interest Rate (%, Nominal)	5.83	0.41	4	7.2
Life Insurers Only	5.79	0.39	4	7
Commercial Banks Only	5.87	0.34	4.5	6
Savings & Loans Only	5.87	0.48	4	7.2
Original Term (Yrs, Ex. Demand Loans)	7.31	5.75	0.5	25
Life Insurers Only	5.95	5.53	0.5	25
Commercial Banks Only	3.48	3.42	1	20
Savings & Loans Only	12.71	3.14	1	20
Original Appraisal ($)	12,593	26,469	2,000	475,000
Orignal Amount ($)	6,819	12,921	480	250,000
Life Insurers Only	7,514	9,939	1,500	150,000
Commercial Banks Only	7,373	22,323	600	250,000
Savings & Loans Only	4,916	2,761	480	20,000
Original LTV (As Recorded by NBER)	0.57	0.12	0.04	1
Origination Year	1929	5	1916	1939
Life Insurers Only	1929	5	1920	1939
Commercial Banks Only	1928	4	1916	1939
Savings & Loans Only	1930	6	1918	1939
Number of Years Active (Excluding Loans Active at end of NBER Sample)	8.1	5.2	0	24
Life Insurers Only	7.1	4.7	0	23
Commercial Banks Only	9.8	5.6	0	21
Savings & Loans Only	8.5	5.2	0	24
Number of Modifications (Any Type, to End of NBER Sample)	0.91	1.36	0	8
Life Insurers Only	1.25	1.61	0	8
Commercial Banks Only	0.54	0.79	0	4
Savings & Loans Only	0.56	0.97	0	5
	%			
Amortization Characteristics:				
Non-amortizing at Origination	50.1			
Partially-amortizing at Origination	16.3			
Property Characteristics:				
Single-Family	83.9			
Lender Characteristics:				
Held by Life Insurer	51.8			
Held by Commercial Bank	22.7			
Held by Saving & Loan	25.5			
Termination Characteristics (at end of NBER Sample):				
Active	28.4			
Paid Off	43.7			
Transferred to HOLC	7.2			
Other Transfer / Assignment	4.2			
Foreclosed	16.5			
Modification Characteristics:				
With Modification(s)	47.0			
With More Than 1 Modification	22.1			
Total Number of Loans	890			

is just under 60%. Commercial banks and life insurers were often restricted by either state or federal regulations from holding loans with LTVs above 50 or 60%. Loans held by life insurers and commercial banks are somewhat larger than loans held by savings and loans.

About half of the loans in our sample are non-amortizing and only a third are fully amortizing. The high share of non-amortizing loans reflects the disproportionate influence of life insurers in the sample: More than 80% of mortgages held by savings and loans are fully-amortizing, either through a share accumulation plan, a direct reduction plan, or a "cancel and endorse" arrangement.[1]

Nearly half the loans in our sample have at least one modification while 22% have two or more modifications. Despite having the shortest realized maturities, life insurers report the largest average number of modifications. Commercial banks and savings and loans report less than half the number of modifications per loan of life insurers. Since many of the modifications in our sample are term extensions, the low number of modifications by savings and loans may be due to higher initial terms. Conversely, many of the commercial bank mortgages have one-year terms at origination and are effectively demand loans after that point such that they may simply not have many term extensions to record. Alternatively, life insurers may have kept better records than commercial banks and savings and loans. We investigate this possibility further later in the paper.

2.2 Foreclosures

We focus on the NYC region during this period because of the availability of Nicholas and Scherbina's (2010) transactions-based hedonic home price (see Figure 2). To our knowledge, neither repeat sales nor hedonic home price indices are available for other regions of the country during the 1920s or the 1930s.[2] During our sample period, lenders faced significant incentives to avoid foreclosures. At a minimum, the lender would recover about 26% less on the property than its fair market value (Nicholas and Scherbina, 2010) and would incur foreclosure costs of approximately 5% of the value of the property (Russell, 1937). If the first mortgage were made at a 60% loan to value and the property fell in nominal terms by 30% from the time of origination to the time of default, a far more modest drop than the drop of over 50% between 1929 and 1932 in the Nicholas and Scherbina index, the lender would stand to lose 13% of the value of the loan.

[1] See Ryan and Weese (1935) for a discussion of the different amortization structures of savings and loans' mortgages.

[2] Shiller (2005), however, provides a national index.

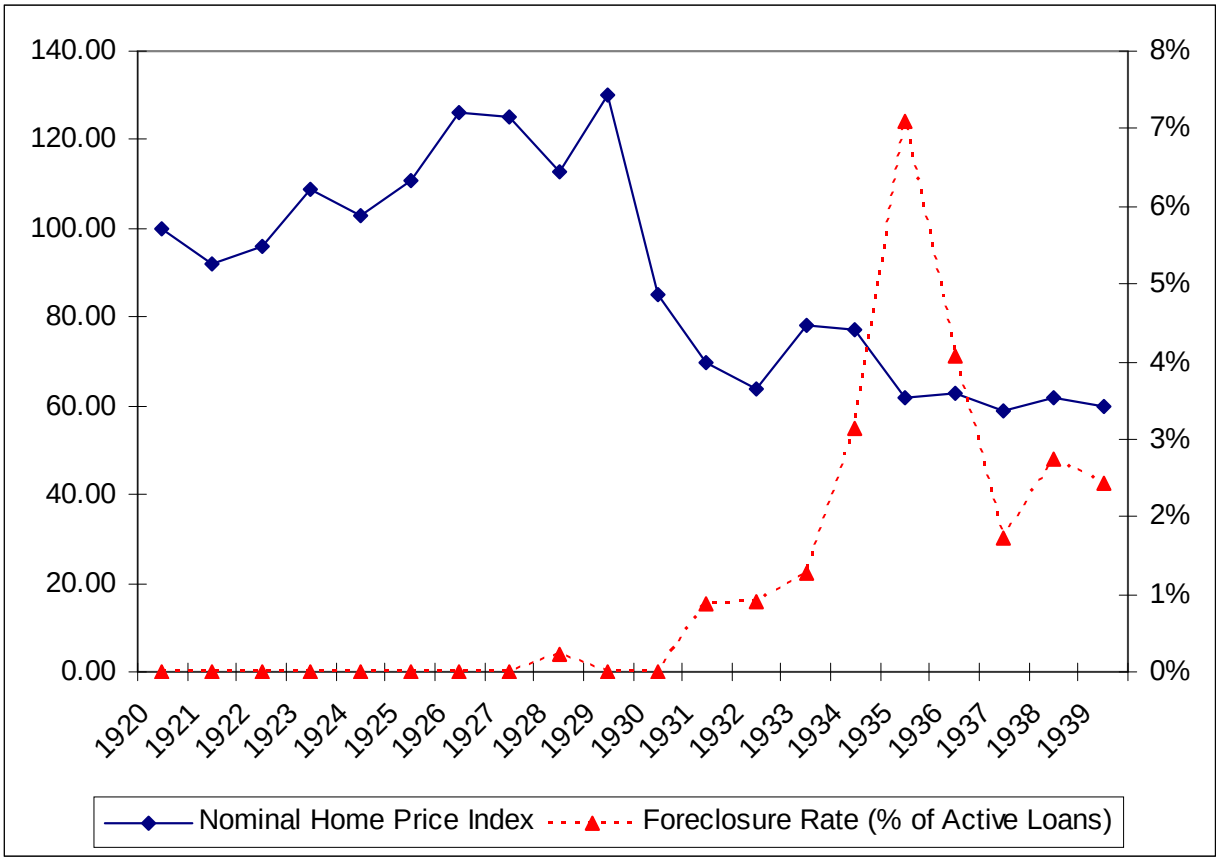


Figure 2: Nicholas and Scherbina Nominal Index and NYC Metro Area Foreclosure Rate
Deeds-in-lieu included as foreclosures in calculating the foreclosure rate.

The information from foreclosures in our sample also provides some information regarding how costly foreclosures were for lenders. For foreclosures and deeds-in-lieu initiated prior to 1940, it took the lender an average of 4.7 years to sell the property. In the interim, lenders sometimes rented the property out and the nominal home price sometimes increased. Nevertheless, after taking into account net income, foreclosure expenses, recoveries on deficiency judgments, delinquent interest, and the foreclosure sale price, the average loss, as a percent of the outstanding loan balance at the time of foreclosure, was 27%. Thus, on many loans in our sample lenders may have fared better by engaging in a concessionary modification than by instituting a foreclosure if a concessionary modification would prevent a foreclosure and they could identify the mortgages that would enter foreclosure in the absence of concessionary modifications.

Prior to 1933, lenders in this region neither expected to be able to off-load their distressed

mortgages to the federal government nor were prevented from exercising their right to foreclose. The Home Owner's Loan Corporation (HOLC) began accepting applications in July 1933. Legislation to establish the HOLC began in June 1933 with the first formal request by Roosevelt to establish something similar to the HOLC appearing to be in April 1933 (Harriss, 1951) such that it is unlikely that there were significant anticipatory effects in 1932.[3] After 1932, the presence of the HOLC may have deterred lenders from making modifications since they may have anticipated that the HOLC would take on their distressed loans; indeed, Rose (2010) concludes that the HOLC was primarily a program that benefitted lenders. The HOLC stopped accepting applications in 1935.

Many states began enacting long-term foreclosure moratoria in 1932 and 1933; see Wheelock (2008) for a discussion of the effects of the moratoria. Some of these moratoria were limited to farm foreclosures or to individuals that had not made timely payment of principal and interest; still others were voluntary. Connecticut never had a foreclosure moratorium. New York enacted a foreclosure moratorium from August 1933 that was limited to defaults on principal (Skilton, 1943; *New York Times* 1933b). Originally scheduled only to last until July 1934 (*New York Times*, 1933b), the New York moratorium was not completely dismantled until after 1943 (Skilton, 1943). New Jersey enacted a foreclosure moratorium at the end of March 1933 that was also limited to defaults on principal (*New York Times*, 1933c); the first mention of the possibility of a foreclosure moratorium in New Jersey by the *New York Times* is mentioned on February 18th (*New York Times*, 1933d).

Despite the sharp fall in both nominal and real home prices between 1929 and 1932, Figure 2 illustrates that the foreclosure rate in this sample does not reach its peak of over 7% of active loans until 1935, after home prices appear to have stabilized at a new lower level. This does not seem likely to result from a lengthy legal delay in processing foreclosures. Russell (1937) examines a sample of foreclosures in 1936 and finds that the average length of time between the time at which the lender dispatches the loan to a foreclosure attorney and when the foreclosure is completed is 5.2 months. Similarly, the *New York Times* (1932) reports an average foreclosure time of just over five months.

Figures 3 and 4 illustrate that the peak in the foreclosure rate in this data set does not coincide

[3] A search through the *New York Times* from 1930 using the term "foreclosure" revealed that the first mention of the possibility of something similar to the HOLC is on April 14th, 1933 (*New York Times*, 1933a).

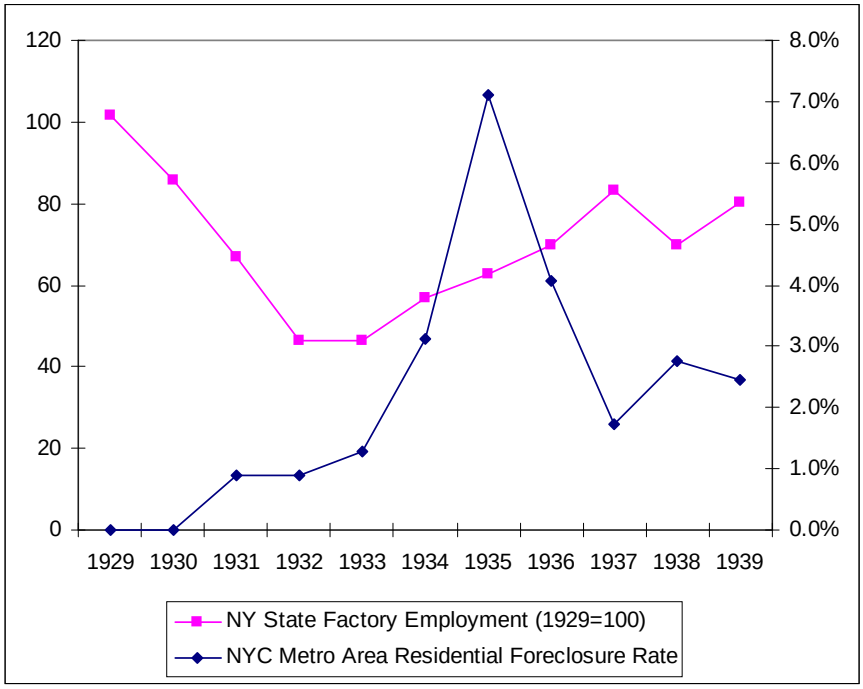


Figure 3: Employment and NYC Metro Area Foreclosure Rate
Deeds-in-lieu included as foreclosures in calculating the foreclosure rate.

with the peak in the national unemployment rate (NBER historical macro database series m08292a) or NY state factory payroll employment (NBER historical macro database series m08078a). Both series suggest that the labor market had started to recover by 1935. It thus seems puzzling that the foreclosure rate is much higher in the 1934 to 1936 period than in the 1930 to 1932 period.

In light of the sharp fall in employment and home prices, it is perhaps surprising that foreclosures and deeds-in-lieu never exceed 7% of loans outstanding. Although, to my knowledge, there are not other estimates of foreclosures as a share of mortgages outstanding for NYC in this period, the Federal Home Loan Bank Board (FHLBB) published foreclosure rates as a share of dwellings outstanding. For the year ending Sept. 30, 1937, the FHLBB (1937b) reports 11.9, 13.4, and 13.7 foreclosures per 1000 dwellings in the states of Connecticut, New Jersey, and New York. By comparison, our foreclosure rate in 1937 for all three states (not just the NYC metro area) equates to 18.8 per 1000 residential *mortgages* outstanding. For the entire New York district (New Jersey and New York), the FHLBB (1942) reports that the foreclosure rate per 1000 dwellings in 1935 - 1939 was 16.9, 12.9, 12.0, 9.4, and 8.9. Our foreclosure rate shows a much sharper peak in 1935 and

Figure 4: Unemployment Rate and NYC Metro Area Foreclosure Rate
Deeds-in-lieu included as foreclosures in calculating the foreclosure rate.

a slight increase in 1938 and 1939 suggesting that our sample is too small to get precise estimates of the foreclosure rate in each year.

Overall, our average foreclosure rate per 1000 mortgages over 1935-1939 for all loans in Connecticut, New Jersey, and New York is 33.1 while the average foreclosure rate per 1000 non-farm dwellings over 1935-1939 reported by the FHLBB (1942) for New Jersey and New York is 12.0. Fisher (1951, table 8) reports that approximately half of homes in this region were mortgaged suggesting that the average FHLBB rate per *mortgage* is approximately 24 per 1000. Thus, our average rate seems to be fairly representative but may be higher than that in the general population. Our higher foreclosure rate is likely because life insurers, who held more non-amortizing and partially amortizing loans than savings and loans, are overrepresented in our sample. A caveat, however, is that our sample is sufficiently small that caution should be used regarding inferences from our data regarding the time series pattern in the foreclosure rate in our sample.

Thus, we can summarize by saying that a substantial portion of mortgages were at risk of foreclosure, that most foreclosures resulted in significant losses, and that there was usually a long

delay between when the lender could take possession of a foreclosed property and when it could dispose of it. As a result, if a mortgagee could save any particular loan by modifying it, the mortgagee would have been better off than foreclosing.

3 Modifications

Table 2 summarizes the frequency of modifications by year and type. As noted earlier, life insurers have a proportionately higher number of modifications. However, some of the difference in the number of modifications per loan between life insurers and other types of lenders is due to their recording of maturity changes alone. Commercial banks and savings and loans almost never report a modification that is just a change in the maturity. Excluding modifications that involved only a change in maturity, life insurers report an average of 0.56 modifications per loan, commercial banks an average of 0.28 modifications per loan, and savings and loans an average of 0.36 modifications per loan.

Turning to the types of modifications we observe by each lender type, life insurers report proportionately more of all types of modifications except partial prepays and principal increases. Commercial banks report the largest share of loans with partial prepayments while savings and loans report a much larger share of loans with principal increases. The disproportionate number of loans with principal increases for savings and loans can largely be explained by their involvement in construction lending; regulations required life insurers and commercial banks to lend only on improved property. Of the 54 principal increases by savings and loans, 32 of them were on construction loans.

The loan cards identify principal forgiveness with the field principal reduction "by compromise" (see Figure 1). There is no principal forgiveness in our sample. In examining residential and commercial mortgages for the entire three states of Connecticut, New Jersey, and New York over the 1920-1947 period, we see only a handful of cases where the lender forgave principal. We turn now to the possibility that some of the interest rate decreases, changes in loan type, or principal increases are due to concessions by the lender to make the mortgage more affordable to the borrower and thus reduce the risk of foreclosure.

Table 2: Modifications (1920-1939) by Institution Type and by Year

	All	Maturity Change	Rate Reduction	Rate Increase	Change in Loan Type	Prin. Write Down	Partial Prepay	Prin. Increase	Maturity Change Only	# of Loans
All	**583**	**501**	**177**	**29**	**194**	**0**	**71**	**62**	**191**	**890**
By Institution Type:										
Life Insurers	437	404	122	26	142	0	32	5	180	461
Commercial Banks	56	39	48	0	33	0	28	3	2	202
Savings & Loans	90	58	7	3	19	0	11	54	9	227
By Year:										
1920	1	1	0	0	0	0	0	0	1	9
1921	0	0	0	0	0	0	0	0	0	22
1922	0	0	0	0	0	0	0	0	0	43
1923	2	1	0	0	0	0	0	1	1	75
1924	4	2	0	0	1	0	0	2	1	125
1925	13	9	1	0	4	0	0	5	3	189
1926	15	14	1	0	1	0	0	4	9	285
1927	25	22	0	1	3	0	1	7	14	367
1928	36	34	1	3	5	0	2	10	19	423
1929	52	45	3	5	7	0	3	5	28	483
1930	40	36	4	2	5	0	1	8	20	536
1931	34	33	7	0	5	0	7	5	14	567
1932	63	61	4	4	31	0	11	3	21	554
1933	36	34	1	5	20	0	5	0	11	545
1934	26	21	4	4	7	0	2	0	13	544
1935	44	39	23	4	16	0	6	1	9	493
1936	45	35	28	0	15	0	3	6	9	493
1937	47	42	32	1	24	0	14	1	6	463
1938	46	39	35	0	24	0	7	1	7	472
1939	39	28	26	0	21	0	6	1	2	491
Year Unknown	15	5	7	*0*	5	0	3	2	3	

Notes: 1) For data by year, # of loans is the number of loans active in that year (including loans terminated in that year). 2) Many modifications included changes to multiple loan elements such that the modification types are not mutually exclusive. 3) Modifications that involve a rate change and a change to an FHA loan are not included as rate changes.

3.1 Potentially Concessionary Modifications

Table 3 shows the number of modifications that may be concessionary. We use the term potentially concessionary to refer to a modification that results in a either a lower payment for the borrower that is not due to a reduction in the principal outstanding from prepayment or a principal increase potentially due to forbearance. Our definition of a concessionary modification is quite generous such that our estimates should be viewed as upper bounds on the number of concessionary modifications; many of the modifications we identify as potentially concessionary may in fact be idiosyncratic changes to contract terms that do not reflect attempts by the lender to prevent foreclosures.

We identify concessionary interest rate reductions as situations in which the lender reduces the interest rate to a level more than 25 basis points below both the original rate and at least one standard deviation below the rate prevailing on new loans in the year of the modification. Lenders at that time did not engage in risk-based pricing based on the individual's default risk (see Morton, 1956) such that a reduction in the interest rate to significantly below the rate for new loans is highly unlikely to be due to improvements in credit risk. Table 3 illustrates that only a small fraction of loans received what might be concessionary rate modifications. With our most generous definition of a concessionary rate reduction, a reduction in the rate to a rate more than one standard deviation below the rate on newly originated loans in the year of the modification, less than 7% of all loans received one. The average rate on a rate reduction is a mere 65 basis points below the rate on new originations however, suggesting that our definition may be too lenient. With a more stringent definition of a rate reduction, a reduction in the rate to a rate more than two standard deviations below the rate on newly originated loans, we find that only 2% of all loans ever received one. Even with this more stringent definition, the average rate reduction is to a rate only 78 basis points below the rate on new originations. The most significant rate reduction we observe is to a rate only 202 basis points below the rate on new originations in the year of the modification. Furthermore, our definition of rate reductions likely indicates concessions where there was in fact none in 1931 and 1932; because there were very few originations in these years, the standard deviation of the rate on new loans is exactly zero such that the rate reductions we observe in these years are not likely to be true concessions on the part of the lender.

We identify changes in amortization from "Fully Amortizing" to "Partially Amortizing" or

Table 3: Potentially Concessionary Modifications (1920-1939) by Institution Type and by Year

	Rate Reduction 1 (One Std. Dev.)	Rate Reduction 2 (Two Std. Dev.)	Reduction in Amortization	Prin. Increase <15%	# of Loans	All Concessions (rate reduction 2 definition) as % of Loans	Foreclosures as % of Loans
All	**59**	**18**	**19**	**11**	**890**	**5.4%**	**13.8%**
By Institution Type:							
Life Insurers	38	12	16	1	461	**6.3%**	**17.6%**
Commercial Banks	20	6	1	1	202	**4.0%**	**14.4%**
Savings & Loans	1	0	2	9	227	**4.8%**	**5.7%**
By Year:							
1920	0	0	0	0	9	**0.0%**	**0.0%**
1921	0	0	0	0	22	**0.0%**	**0.0%**
1922	0	0	0	0	43	**0.0%**	**0.0%**
1923	0	0	0	0	75	**0.0%**	**0.0%**
1924	0	0	0	1	125	**0.8%**	**0.0%**
1925	1	1	1	0	189	**1.1%**	**0.0%**
1926	1	0	0	0	285	**0.0%**	**0.0%**
1927	0	0	2	0	367	**0.5%**	**0.0%**
1928	0	0	1	0	423	**0.2%**	**0.2%**
1929	2	1	5	0	483	**1.2%**	**0.0%**
1930	4	0	1	2	536	**0.6%**	**0.0%**
1931	7	7	0	1	567	**1.4%**	**0.9%**
1932	4	4	0	1	554	**0.9%**	**0.9%**
1933	2	1	0	0	545	**0.2%**	**1.3%**
1934	4	0	1	0	544	**0.2%**	**3.1%**
1935	10	1	3	1	493	**1.0%**	**7.1%**
1936	15	1	1	3	493	**1.0%**	**4.1%**
1937	1	0	3	1	463	**0.9%**	**1.7%**
1938	1	0	1	0	472	**0.2%**	**2.8%**
1939	7	1	0	0	491	**0.2%**	**2.4%**
Year Unknown				1			
Average basis points below average rate on new originations	65	78					
Max basis points below average rate on new originations	202	202					

Notes: 1) For data by year, # of loans is the number of loans active in that year (including loans terminated in that year). 2) Many modifications included changes to multiple loan elements such that the modification types are not mutually exclusive. 3) Modifications that involve a rate change and a change to an FHA loan are not included as rate changes. 4) A rate reduction 1 (one std. dev.) is defined as a reduction in the rate to a rate more than one standard deviation below the average rate on new originations (excluding FHA loans) in that year. 5) A rate reduction 2 (two std. dev.) is defined as a reduction in the rate to a rate more than two standard deviations between the average rate on new originations in that year (excluding FHA loans).

"Non-Amortizing" and from "Partially Amortizing" to "Non-Amortizing" as potentially concessionary since such a change would have resulted in a decrease in the periodic payment. As table 3 illustrates, just 2% of all mortgages received a reduction in the amortization. While there is a spike in the number of concessionary changes in amortization in 1929, there is no such increase in the years when they would have been the most needed, 1930-1932, the years with the sharpest drops in home prices and employment and where there was not yet any significant government intervention in the mortgage market.

We identify principal increases of less than 15% as possibly concessionary as these may indicate situations where the lender engaged in forbearance such that the principal owing on the mortgage increased due to capitalization of unpaid interest and principal. It is highly unlikely that a large principal increase indicates forbearance, however. We view any principal increase of 15% or more of the balance at origination as not due to the lender exercising forbearance. To put this into perspective, for a mortgage with monthly payments and a 6% annual interest rate, a year of neither principal nor interest payments would result in an increase in principal of 6.2%; two years of neither principal nor interest payments would result in an increase in principal of 12.7%. We view it as unlikely that a lender would exercise forbearance for more than two years. Most mortgages in our sample have interest rates of less than 6% with payments due no more frequently than monthly which is why we choose a threshold of 15%. Finally, we exclude all principal increases on construction loans as concessionary as the nature of construction loans is such that lenders likely used something somewhat similar to the now standard monthly draw method, wherein the lender disburses the funds for the loan on a gradual basis as construction proceeds.

Some of the balance increases we identify are quite possibly something entirely different from forbearance. However, even assuming that all of the principal increases we identify are due to forbearance, we find that less than 2% of all loans received a concessionary modification of this sort. It must be kept in mind that at least 10% of the population was unemployed from 1931 onwards such that many more borrowers would have benefited from forbearance. Furthermore, we do not see any rise in the proportion of loans that received forbearance in the years 1932-1935 making it unlikely that these modifications truly represent forbearance.

To summarize, combining all three forms of modification (using the more stringent definition of a rate reduction), we find that a mere 5% of all loans received any sort of modification that

might be a concession on the part of the lender. By comparison, almost 14% of loans originated prior to 1939 were terminated by either a foreclosure or a deed in lieu by the end of 1939. To the extent that the modifications we identify are concessions at all, we still arrive at the conclusion that lenders and borrowers did not renegotiate nearly as many loans as went into foreclosure.

It is worth noting that a slightly larger fraction of the modifications that savings and loans and commercial banks recorded are potentially concessionary. Excluding term only modifications, which life insurers seem to have recorded and other lenders usually did not, about 11% of the modifications of life insurers are potentially concessionary while the shares for commercial banks and savings and loans are around 15% and 14%. The sample size is too small to conclude that these are meaningful differences, however.

3.2 Concessionary Modifications and Mortgage Distress

This section investigates the extent to which we observe loans that are in distress receiving a modification. In this section, we work with a panel version of our data set that we create from the mortgage records. Each observation corresponds to one loan-year. Thus, a loan originated in 1936 and terminated in 1939 would have a total of four observations. We update the amortization status if there was a change in amortization through a modification. If the loan is modified to become an FHA loan, we drop any loan-years after the modification.

To identify what sort of mortgages were in distress, we first identify the factors that are associated with the probability that a mortgage terminates through a foreclosure, through a deed-in-lieu, or by being transferred to the HOLC. Column 1 of table 4 reports the results of a probit regression where the dependent variable is an indicator variable that takes on a value of one if the loan terminates through a foreclosure or a deed-in-lieu in that year.[4] The sample is all loan-year observations prior to 1940. The independent variables are the LTV at origination, the amount of the loan, indicator variables for the lender type, an indicator variable that takes on a value of the one if the mortgage is for a single-family home, and the percent change in the Nicholas-Scherbina (NS) home price index since origination.

[4] Appendix table A1 presents the results from estimating all the specifications in table 4 using a Cox proportional hazard model rather than a probit model.

Table 4: Characteristics of Bad Loans

	(1)	(2)	(3)	(4)	(5)
			Termination		
	Foreclosure or Deed-in-Lieu	Foreclosure or Deed-in-Lieu	Foreclosure, Deed-in-Lieu, or HOLC	Foreclosure or Deed-in-Lieu	Foreclosure or Deed-in-Lieu
Original LTV	2.15***	2.05***	1.50***	1.36*	1.62**
	(3.84)	(3.57)	(3.31)	(1.84)	(2.08)
Original Amt ($100)	-0.00013	-0.00016	-0.00037		
	(-0.39)	(-0.49)	(-0.94)		
Single Family	-0.11	-0.09	-0.017		
	(-0.94)	(-0.94)	(-0.2)		
Held by Life Insurer	0.50***	0.021	-0.22		
	(3.47)	(0.08)	(-0.98)		
Held by Commercial Bank	0.23	-0.30	-0.46*		
	(1.43)	(-1.05)	(-1.91)		
Fully Amortizing		-0.58**	-0.52**	-0.52*	-0.44
		(-2.37)	(-2.50)	(-1.91)	(-1.63)
Partially Amortizing		-0.13	-0.041		
		(-1.26)	(-0.47)		
Original Maturity (Years)	0.0069	0.0049	0.0006	0.0630**	0.0523**
	(1.42)	(1.01)	(0.14)	(2.58)	(2.05)
% Change in NS Index Since Origination	-1.99***	-1.95***	-1.64***	-1.41***	-1.59***
	(-8.50)	(-8.31)	(-8.98)	(-4.13)	(-4.35)
Term_expiry				0.493***	0.004
				(2.62)	(0.01)
Term_expiry * HOLC Year					1.227***
					(4.98)
Constant	-4.22***	-3.61***	-2.86***	-3.92***	-4.05***
	(-10.34)	(-7.16)	(-7.22)	(-8.48)	(-8.34)
Pseudo R-Squared	10.3%	10.9%	8.1%	11.2%	18.1%
# of Observations	6,665	6,665	6,665	4,025	4,025

Notes: 1) Each column presents the coefficients from a probit regression where the dependent variable takes on a variable of 1 if the loan terminates in that year through the termination type indicated. 2) *** denotes significant at 1%; ** denotes significant at 5%; * denotes significant at 10%. 3) HOLC means lender transferred loan to HOLC. 4) T-statistics in parentheses. 5) NS Index is the nominal Nicholas-Scherbina (2010) New York home price index. 6) Term Expiry takes on a value of one for non-amortizing and partially amortizing loans in the year during and the year immediately following the expiry of the original loan maturity. 7) HOLC Year takes a value of one if the year corresponds to 1933, 1934, or 1935.

While we could in principle compute the expected LTV on the property using the NS index, we do not follow this approach because we cannot compute the balance owing at any given time. For partially amortizing mortgages, our data do not tell us the size of the balloon payment due at maturity. For fully-amortizing loans, our loan cards from insurance companies and commercial banks

unfortunately do not tell us exactly what the amortization structure was: Many fully-amortizing loans would have been constant amortization mortgages (CAMs) rather than the now-standard constant payment mortgages (CPMs). Furthermore, many of the loans in our sample would have had second mortgages attached to them. The prevalence of second mortgages in the 1930s is indicated by the data the NBER collected from the HOLC; over 35% of the HOLC loans had second mortgages. Studying the Chicago market of the 1920s, Bodfish and Bayless (1928) report that nearly 50% of homes were financed using both first and second mortgages.

Consistent with negative equity being the main determinant of mortgage distress, the LTV at origination and the percent change in the NS index since origination are important determinants of whether a loan goes into foreclosure. Loans held by life insurers perform worse than loans held by savings and loans. Because our sample contains proportionately more loans from life insurers than life insurers' share of residential lending in the 1920s and 1930s, this finding explains why our sample has a higher foreclosure rate than the FHLBB records indicate for the New York region.

As column 2 shows, however, the higher foreclosure rate of loans held by life insurers is entirely due to life insurers holding a higher proportion of non-amortizing loans than savings and loans; after controlling for the loan's amortization structure, loans held by life insurers perform no worse than those held by savings and loans. Loans that are fully amortizing perform best while partially amortizing loans perform similarly to non-amortizing loans. Larger loans are no more likely to go into foreclosure than smaller loans and mortgages on single-family homes are no more likely to go into foreclosure than loans for two to four unit properties. Loans with longer terms are no more likely to go into foreclosure than short term loans.

Another option lenders had to dispose of their bad loans from mid-1933 through the end of 1935 was to transfer them to the HOLC, although it was the mortgagor that had to apply to the HOLC. Column 3 reports the results of a probit regression in which the dependent variable is an indicator variable that takes on a value of one if the loan terminated in that year by being transferred to the HOLC, through a foreclosure, or through a deed-in-lieu. The results are similar to the results for foreclosures and deed-in-lieu alone; the LTV at origination, the loan's amortization structure, and the percent change in the NS index are the only statistically significant determinants of a loan being a bad loan.

We now turn to the relationship between the modifications we identify as potentially being

concessionary and mortgage distress. Table 5 reports the results of probit regressions in which the dependent variable is an indicator variable that takes a value of one if the mortgage received a concessionary modification of any kind in that year. In this specification, we include as concessionary only rate reductions where the rate is at least two standard deviations below the rate on new originations in that year; the results using the one standard deviation definition of a rate reduction suggest there is even less of a relationship between rate concessions and our measures of mortgage distress. For this specification, we include as a control variable the amortization status in the previous year, rather than the current year, since one of the concessions may be a reduction in amortization. The other independent variables are the LTV at origination and the % change in the NS index since origination.

Table 5: Concessionary Modifications and Loans in Distress

	1920 - 1932	1920 - 1939	1920-1932 and 1936-1939
Original LTV	2.67**	0.90	0.94
	(2.45)	(1.35)	(1.33)
Fully Amortizing (Lagged)	-0.20	-0.28*	-0.25
	(-0.91)	(-1.69)	(-1.46)
% Change in NS Index Since Origination	-0.17	-0.08	-0.08
	(-0.54)	(-0.33)	(-0.30)
Constant	-4.00***	-2.99***	-2.99***
	(-6.23)	(-7.64)	(-7.18)
Pseudo R-Squared	2.5%	1.0%	0.9%
# of Observations	3,432	6,665	5,200

Notes: 1) Each column presents the coefficients from a probit regression where the dependent variable takes on a variable of 1 if the loan receives a concessionary modification of one of the kinds shown in Table 3 (2 standard deviation definition of rate concession). 2) *** denotes significant at 1%; ** denotes significant at 5%; * denotes significant at 10%. 3) T-statistics in parentheses. 4) NS Index is the nominal Nicholas-Scherbina (2010) New York home price index.

We first look only at modifications prior to 1933 since this is the period where there was little government intervention in the foreclosure market. Loans with high LTVs at origination were more likely to receive what may have been a concessionary modification. However, there is not a significant relationship between whether a loan received a concessionary modification and whether it was amortizing using or with the change in the price index. The relationship between loan distress and loan modifications is even weaker when we look at the entire sample or the sample excluding

the HOLC years. In these samples, not even the LTV at origination makes it significantly more likely that the loan receives a concessionary modification. Over the full 1920-1939 sample, only whether the loan was fully amortizing in the previous period is a significant predictor of whether the loan receives a concessionary modification.

Thus, it appears that our concessionary modifications are at best weakly related to measures of loan distress. The fact that concessionary modifications are not closely correlated to measures of mortgage distress suggests that many of the concessionary modifications we identify are not the result of the lender trying to help a distressed borrower avoid foreclosure. The true number of modifications that were actually concessions on the part of the lender is likely much lower than what is listed in Table 3.

3.3 Refusals to Refinance

It has been suggested (e.g., Wheelock, 2008; Harriss, 1951, ch. 1) that part of the reason for the increase in the foreclosure rate during the 1930s was the refusal of lenders to refinance short-term mortgages. In some sense, this can be viewed as the opposite of a concessionary modification since the lender is taking action that it knows increases the risk of foreclosure. We turn now to the question of the effect of an expiring loan maturity on the probability that a loan went into foreclosure.

If lenders had faithfully recorded all maturity extensions, the ideal approach to answer this question would be to compare the foreclosure rate among loans that were due for a term extension to those that were not due for a term extension as well as to examine whether lenders were less likely to renew a loan that was likely to be in distress than a loan that was likely to be healthy. Unfortunately, many of our loans have missing term extensions in the sense of the loan being terminated long after its term expires or not having a modification within one year of when the term expires. This is true even for loans originated by life insurers, who recorded a proportionally greater number of maturity changes only. Furthermore, we have no way of knowing why lenders faithfully recorded maturity extensions for some loans and were more lax about recording term extensions for others. As discussed above, commercial banks and savings and loans appear not to have recorded modifications that only involved a maturity extension as a general rule. There may also be systematic biases in which loans life insurers omitted customary term extensions. Thus, we

are wary of looking at the effect of a term expiry using the loan term stated on the most recent modification or at origination.

We consider another approach in which we look at the probability that a loan went into foreclosure as a function of whether the *original* maturity was set to expire. We create a dummy variable called term_expiry that takes on a value of one if the loan is due to be refinanced in a given year and the loan is not fully amortizing. Term_expiry does not take on a value of one if the loan's term is expiring but there is no balloon payment due; an expiring term should not be problematic for a fully amortizing mortgage. Since the foreclosure process took about five months to execute and lenders likely allowed some period of delinquency before they commenced foreclosure proceedings, we also set term_expiry to one in the year after the loan is due to be refinanced. We drop loan-year observations more than one year after the original term is set to expire so as not to include observations for which we have no information about whether the maturity is set to expire. We drop all observations for which the original maturity is not listed.

The results in column 4 of Table 4 illustrate that loans for which the maturity was set to expire, or for which the term expired in the previous year, are significantly more likely to go into foreclosure than loans not due to be refinanced. The coefficients on the other determinants of foreclosure are similar to what we found using our benchmark specification in the previous section although some of them fall below the 5% significance level. The effect of term_expiry is not likely due to any sort of selection bias in which loans were originated with long terms and which ones were originated with short terms since we control for the length of the term in both specifications. Our results are very similar when we set term_expiry to 0 for loans for which the lender specifically recorded a term extension prior to the loan's original term expiring.

Thus, it appears that, rather than assisting troubled borrowers avoid foreclosure by modifying the loan terms to make the payment more affordable, lenders forced certain loans into foreclosure by refusing to refinance short-term mortgages with a balloon payment due. This finding is especially puzzling since lenders do not risk moral hazard by simply refinancing a loan. The risk of granting a concessionary modification to a troubled mortgagor is that all mortgagors will pretend to be willing to default to get the concession such that lenders may reduce the value of their overall pool by following a policy of granting concessionary modifications. However, it is impossible for a borrower to pretend that his loan's maturity is expiring. Furthermore, the lender almost certainly knew that

a maturing loan with a balloon payment due would go into foreclosure if he did not refinance it in the years in which the HOLC was not operative.

Column 5 of Table 4 explores the possibility that lenders' refusal to refinance loans stemmed from expectations of being able to transfer loans to the HOLC by including an interaction term that takes a value of one if the observation comes from an HOLC year (1933, 1934, or 1935) and the term is set to expire. Given the benefits that lenders received from loans refinanced by the HOLC (see Rose, 2010), it is possible that lenders refused to refinance distressed loans because they expected that the mortgagor would apply to the HOLC if they refused to refinance a troubled loan. Indeed, one of the criteria the HOLC used to determine eligibility was whether the borrower had attempted to refinance the loan. The results in column 5 suggest that the effect of expiring loan maturities is exclusively due to observations during 1933-1935; the coefficient on term_expiry is far from significant once we include the interaction between term_expiry and HOLC year.

The HOLC may have been aware of this problem. In November, 1934, the HOLC announced that it would accept no new applications. The announcement was unexpected and shortly thereafter the HOLC wrote applicants and lenders to ask them to try to refinance the mortgages between themselves (Harriss, 1951, ch. 1). The suspension did not last, however; the HOLC resumed accepting applications in early 1935.

3.4 Potentially Concessionary Modifications Outside the NYC Metro Area

We have thus far restricted our analysis to the NYC metro area because this is the region of the country for which we have good home price data such that we know lenders faced increased risks of foreclosures on these loans. A disadvantage of this approach is that restricting ourselves to only this region means we limit the total number of loans we have to analyze.

Table 6 reports the number of potentially concessionary modifications on all 1-4 family properties in the states of Connecticut, New Jersey, and New York. In table 6 we use the algorithm described in section 3.1 to define a potentially concessionary modification. The results are similar to those from our main sample: Far more loans went into foreclosure than received a potentially concessionary modification. When we use the two standard deviation definition of a concessionary interest rate reduction, we see a slightly larger average rate reduction than in our main sample. However, the increase in the size of the rate reduction is largely because, with a larger sample, we

have more variance in the interest rate on new originations in 1931 and 1932. In our main sample, there was no variance in the rate on originations in 1931 or 1932 because there were very few originations. As a result, in our main sample, we included rate reductions for 1931 and 1932 that were unlikely to be truly concessionary; with the larger sample, we have only one rate reduction in 1931 and 1932 when we use the two standard deviation definition.

In the larger sample, we see two instances of principal forgiveness, one by a life insurer and one by a commercial bank. The principal forgiveness by the life insurer (roll 6, slide 1129) occurred in October 1935. The loan was transferred to the HOLC shortly thereafter, in late 1935. The life insurer reduced the balance owing by $407 on a principal outstanding of $3900. The loan was originated in 1928 and was modified once before, in 1931, to make it a partially amortizing loan rather than a non-amortizing loan. The loan had an LTV of 57% at origination and is thus unlikely to be a second mortgage.

The principal forgiveness by the commercial bank (roll 3, slide 231) occurred in 1938 and was for $415 on an outstanding balance of $3665. That modification also entailed a reduction in the rate to 4%, more than two standard deviations below the rate on new originations in 1938. The loan was originated in 1932 and was changed from a partially-amortizing loan to a non-amortizing loan in 1933. The loan had an LTV of 97% at origination and is thus almost certainly a first mortgage.

4 Discussion

What do our results have to say about the reasons lenders are reluctant to modify mortgages in the current environment? First, the fact that lenders did not engage in many voluntary modifications suggests that inability to distinguish which mortgages require modification to prevent foreclosures, and thus granting unnecessary modifications, is a serious concern for mortgage lenders. In our sample, less than 20% of loans terminated through foreclosure. Lenders in the 1920s and 1930s had far fewer tools with which to identify which of their mortgages were at serious risk of default than modern lenders. Credit scores for consumers were not yet in use and lenders do not appear to have recorded such things as debt-to-income ratios. Underwriters used a credit-screening model rather than risk-based pricing. Unlike lenders today, lenders in the 1920s and 1930s were unlikely to have had access to carefully constructed price indices to ascertain the depth of the negative equity their mortgagors faced.

Table 6: Potentially Concessionary Modifications (1920-1939) for All Residential Mortgages in CT, NJ, and NY

	Principal Writedown	Rate Red. 1 (One Std. Dev.)	Rate Red. 2 (Two Std. Dev.)	Reduction in Amor.	Prin. Increase <15%	# of Loans	All Concessions (rate reduction 2 definition) as % of Loans	Foreclosures as % of Loans
All	**2**	**69**	**10**	**24**	**13**	**1261**	**3.9%**	**13.3%**
By Institution Type:								
Life Insurers	1	39	4	19	3	680	**4.0%**	**18.1%**
Commercial Banks	1	29	6	4	1	277	**4.3%**	**11.6%**
Savings & Loans	0	1	0	1	9	304	**3.3%**	**4.3%**
By Year:								
1920	0	0	0	0	0	16	**0.0%**	**0.0%**
1921	0	0	0	0	0	35	**0.0%**	**0.0%**
1922	0	0	0	0	0	71	**0.0%**	**0.0%**
1923	0	0	0	0	0	115	**0.0%**	**0.0%**
1924	0	0	0	0	1	188	**0.5%**	**0.0%**
1925	0	2	1	1	0	285	**0.7%**	**0.0%**
1926	0	0	0	0	0	425	**0.0%**	**0.0%**
1927	0	0	0	2	0	536	**0.4%**	**0.0%**
1928	0	0	0	1	0	618	**0.2%**	**0.2%**
1929	0	2	1	5	0	694	**0.9%**	**0.0%**
1930	0	4	0	1	2	756	**0.4%**	**0.0%**
1931	0	7	1	1	1	791	**0.4%**	**0.9%**
1932	0	0	0	0	1	772	**0.1%**	**1.2%**
1933	0	3	2	2	0	750	**0.5%**	**1.7%**
1934	0	4	0	1	0	743	**0.1%**	**2.0%**
1935	1	16	1	4	1	666	**1.1%**	**6.3%**
1936	0	21	2	2	4	666	**1.2%**	**3.9%**
1937	0	1	0	2	2	640	**0.6%**	**1.9%**
1938	1	2	1	1	0	654	**0.5%**	**2.3%**
1939	0	7	1	1	0	690	**0.3%**	**2.2%**
Year Unknown					1			
Average basis points below average rate on new originations		68	120					
Max basis points below average rate on new originations		201	201					

Notes: 1) For data by year, # of loans is the number of loans active in that year (including loans terminated in that year). 2) Many modifications included changes to multiple loan elements such that the modification types are not mutually exclusive. 3) Modifications that involve a rate change and a change to an FHA loan are not included as rate changes. 4) A rate reduction 1 (one std. dev.) is defined as a reduction in the rate to a rate more than one standard deviation below the average rate on new originations (excluding FHA loans) in that year. 5) A rate reduction 2 (two std. dev.) is defined as a reduction in the rate to a rate more than two standard deviations between the average rate on new originations in that year (excluding FHA loans).

Without the ability to distinguish which mortgages would go into foreclosure, lenders were very hesitant to grant concessionary mortgages on all their mortgages to prevent losses on less than 20% of them. While it seems clear that forgiving principal would have significantly reduced the probability of a foreclosure, with little ability to predict which mortgages would end in default, lenders generally not engaging in principal forgiveness was an economically sensible strategy.

One might expect that local lenders in the 1920s and 1930s would have had better information about which mortgages required modification to prevent a foreclosure and which mortgagors simply pretended to be in distress to receive a concession. The fact that we do not observe a higher share of modifications among savings and loans is quite possibly because they had higher quality mortgages, largely because more of their mortgages were fully-amortizing. Furthermore, it appears that savings and loans and commercial banks kept less careful records of their mortgages than life insurers, who were exclusively national lenders. These two factors make it difficult to draw many inferences from comparing the rates of concessionary modifications across different lender types.

Lenders in the foreclosure crisis that began around 2007 may be better able to identify which mortgages are likely to go into foreclosure, or at least which pools of mortgages have especially high foreclosure rates, using tools not available in the 1920s and 1930s. As a result, they may face less risk of granting unnecessary modifications on a large number of mortgages, modifications which would of course reduce the overall value of their pool of loans, such that they may have more of an incentive to modify at least some pools of mortgages. To the extent that our results suggest that giving unnecessary modifications is a serious concern on the part of lenders, we might expect to see the highest rate of concessionary modifications in pools of loans with high foreclosure rates such as subprime and alt-A mortgages.

We do not observe a difference in the share of loans that ended in foreclosure across different lender types once we control for other factors suggesting that loans acquired in the secondary market were not of lower quality based on unobservables than loans originated directly by the lender. While more loans held by life insurers terminated through a foreclosure or deed in lieu, the difference in the foreclosure rate is entirely explained by the fact that loans originated by life insurers were more likely to be interest only or partially amortizing. In contrast, Elul (2009) and Krainer and Laderman (2009) find that, in the recent foreclosure crisis, loans originated under the originate-to-distribute model are of lower quality after controlling for observable differences in

mortgage characteristics.

However, the secondary market of the 1920s was different than it is today. First, as Snowden (1995) reports, mortgage companies generally bought back any mortgages that became delinquent within one year of origination such that mortgage companies may have had more of an incentive to adequately screen loans than independent mortgage brokers did in the buildup to the subprime crisis. Secondly, Snowden reports that life insurers felt an obligation to continue to accept loans originated by correspondents after the onset of the crisis. Snowden's finding suggests that life insurers tended to rely on a handful of correspondents, a system which may have provided further discipline on the quality of loans originated. It remains possible that the reason loans originated by life insurers were less likely to be fully amortizing than loans originated by savings and loans is due to life insurers' use of correspondents. Finally, it is possible that securitization itself, rather than simply originating with the intent to distribute, leads to lower quality mortgages.

Our results also suggest a possible downside to government programs such as the HOLC. To the extent that lenders benefit from government programs that remove non-performing mortgages from their balance sheets, such programs may adversely affect lenders incentives to preserve the values of their mortgages through private renegotiation.

5 Conclusions

We have analyzed whether residential mortgage lenders engaged in concessionary loan modifications during the 1930s. While we observe a handful of modifications that may have been concessions on the part of the lender, we find that far more mortgages went into foreclosure than received what may have been concessionary modification. We find no principal forgiveness whatsoever in our main sample (the NYC metropolitan area) and only two cases of principal forgiveness when we examine all residential mortgages originated in Connecticut, New Jersey, and New York.

The results suggest that lenders during the Great Depression were seriously concerned about granting modifications unnecessary to prevent a foreclosure and thus reducing the overall value of their pool of loans. Although securitization has likely played a role in the reluctance of lenders to renegotiate residential loans in the foreclosure crisis that began around 2007, our results indicate that lenders must be able to identify which loans are most likely to go into foreclosure before it is in their financial interest to modify loans.

We find some evidence that lenders' refusal to refinance short-term mortgages with balloon payments contributed to the elevated foreclosure rate during the 1930s. This result, however, is only present during the 1933-1935 period suggesting that it may be due to the presence of the HOLC.

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Table A1: Characteristics of Bad Loans, Hazard Ratios

	(1)	(2)	(3)	(4)	(5)
			Termination		
	Foreclosure or Deed-in-Lieu	Foreclosure or Deed-in-Lieu	Foreclosure, Deed-in-Lieu, or HOLC	Foreclosure or Deed-in-Lieu	Foreclosure or Deed-in-Lieu
Original LTV	1.059***	1.053***	1.036***	1.023	1.028
	(3.56)	(3.16)	(3.02)	(1.08)	(1.24)
Original Amt ($100)	1.000	1.000	0.999		
	(-0.30)	(-0.41)	(-0.84)		
Single Family	0.811	0.848	1.021		
	(-0.93)	(-0.72)	(0.11)		
Held by Life Insurer	4.586***	1.717	0.936		
	(3.82)	(0.84)	(-0.14)		
Held by Commercial Bank	2.507**	0.867	0.583		
	(2.09)	(-0.21)	(1.04)		
Fully Amortizing		0.315**	0.409**	0.193**	0.234**
		(-2.04)	(-2.05)	(-2.49)	(-2.09)
Partially Amortizing		0.814	0.971		
		(-0.89)	(-0.15)		
Original Maturity (Years)	1.022**	1.014	1.004	1.160**	1.153**
	(2.11)	(1.36)	(0.46)	(2.16)	(2.05)
% Change in NS Index Since Origination	0.975***	0.976***	0.986***	0.978**	0.973**
	(-3.51)	(-3.43)	(-2.68)	(-2.15)	(-2.35)
Term_expiry				1.769	0.598
				(0.94)	(-0.70)
Term_expiry * HOLC Year					11.961***
					(3.93)
Log-likelihood	-683	-681	-1,020	-163	-154
# of Observations	5,843	5,843	5,843	3,210	3,210

Notes: 1) Each column presents the hazard ratios from estimating a Cox proportional hazard model where the failure variable is the termination type indicated. 2) *** denotes significant at 1%; ** denotes significant at 5%; * denotes significant at 10%. 3) HOLC means lender transferred loan to HOLC. 4) T-statistics in parentheses. 5) NS Index is the nominal Nicholas-Scherbina (2010) New York home price index. 6) Term Expiry takes on a value of one for non-amortizing and partially amortizing loans in the year during and the year immediately following the expiry of the original loan maturity. 7) HOLC Year takes a value of one if the year corresponds to 1933, 1934, or 1935. 8) % Change in NS Index Since Origination and Original LTV in %.