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Abstract

An explanation of the Great Depression based on mortgage debt via the banking channel has been downplayed due to the conservatism of mortgage contracts at the time. Indeed, maturities were particularly short compared to today's average terms (around three years), and loan-to-value ratios often did not exceed 50 per cent. Using newly-discovered archival documents and a newly-compiled dataset from 1934, this paper uncovers the darker side of 1920s U.S. mortgage lending: the so-called "second mortgage system." As borrowers often could not make a 50 per cent down payment, a majority of them took on second mortgages at usurious rates. As theory predicts, debt dilution, even in the presence of seniority rules, can be highly detrimental to both junior and senior lenders. The probability of default on first mortgages was likely to increase, and commercial banks were more likely to foreclose. Through foreclosure they would still be able to retrieve 50 per cent of the property value, but often after a protracted foreclosure process - a great impediment to bank survival in case of a liquidity crisis. This paper is thus a timely reminder that second mortgages, or "piggyback loans" as they are called today, can be hazardous to lenders and borrowers alike. It provides further empirical evidence that debt dilution can be detrimental to credit.

JEL classification: G11, G21, N22

Keywords: Great Depression, Commercial Banks, Portfolio Choice, Mortgage

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1 Introduction

The recent financial crisis has led economists to draw parallels with the Great Depression, either by focusing on speculation generally or, in the case of the U.S., on the real estate market. While it is clear that a real estate bubble and reckless mortgage dealings can be blamed for the current U.S. crisis, the causes of the U.S. Great Depression remain far less evident, and indeed no single explanation for it has ever attracted unanimous support. Given the occurrence of a nationwide real estate boom throughout the 1920s, it is tempting for economic historians to see if any useful comparisons may be made between this boom and the more recent one. And as widespread commercial bank failures were a notorious aspect of the Great Depression (Friedman & Schwartz, 1963; Wicker, 1996), commercial bank mortgages made in the 1920s naturally deserve particular attention. Yet recent studies found that there could be no direct link between the 1920s real estate boom and commercial bank failures (see, in particular Field (2013) and White (2009)). An important argument against a possible causation link has to do with the conservatism of commercial bank real estate loans made at the time: most of them did not exceed a maturity of 3 to 5 years and had a 50 per cent loan-to-value ratio (ibid.). This would tend to discard any explanation of the Depression based on mortgage lending via the banking channel.

This paper re-examines the alleged safety of the structure of pre-Depression commercial bank mortgages. By inquiring whether borrowers could in practice make 50 per cent down payments, it uncovers the extent of the "second mortgage system" (as it was called at the time), one of the most widespread – and yet least well-known – forms of debt dilution in the twentieth century. While the negative effects of debt dilution are well documented in the theoretical economics literature, its prevalence in the 1920s U.S. commercial bank mortgage market is much less so. This is despite contemporaries, such as President Hoover, describing the second mortgage system as "the most backward segment of [the US's] whole credit system" (Gries & Ford, 1932). As few authors have analysed debt dilution empirically (see Degryse et al. (2011)), this paper thus also provides further empirical support to the idea that debt dilution can be highly detrimental to credit.

While borrowers were urged to "own their own homes" in the early 1920s, banks on the other hand often would not lend more than half the price of the house. As contracts did not

contain any covenants against further borrowing, borrowers were tempted to borrow from third parties to help them make the high down payment. A second mortgage market flourished, benefiting more than 75 per cent of first-mortgage borrowers. In addition to the serious debt dilution problem it created for first mortgage lenders, the second mortgage system presented other aspects which only aggravated it. Indeed, second mortgage lenders charged exorbitant interest rates, and insisted that their loans be repaid before first mortgages and at more regular intervals. This meant that while second mortgages were junior before the law, they acquired a certain form of seniority in practice, putting repayments of first mortgages under further threat.

The paper starts with a brief overview of existing models of debt dilution in the economics literature. Particular attention will be drawn to Bizer & DeMarzo (1992)'s model which analyses the negative impact of "sequential banking" (the occurrence of borrowing from different lenders) on the first lender. While Fama & Miller (1972) intend to show that sequential banking is not a problem in the presence of seniority rules, Bizer & DeMarzo (1992) effectively demonstrate that extra lending from a second bank creates an externality through the devaluation of prior debt which seniority rules cannot completely eliminate. In equilibrium, as first lenders anticipate the problem, interest rates end up higher on all debt, and so do probabilities of default.

The paper then moves on to provide qualitative evidence on the existence and extent of the second mortgage system (Section three). Information gathered from the National Association of Real Estate Boards archives in Chicago allows me to establish that around 76 per cent of first mortgage borrowers resorted to this system, so that total mortgage debt was not 50 per cent of the value of the property but rather around 75 per cent, from two different lenders. I document average interest rates for both types of loans in most states, and report on what contemporaries described as the negative effects of the second-mortgage system. In particular, I examine factors which aggravated the debt dilution problem. Higher interest rates, shorter maturities and systematic amortization made second mortgage payments more pressing and acquire some priority in the eyes of the borrower. While separate from the debt dilution problem, this seniority reversal effect certainly made matters worse.

Section four examines a newly compiled dataset on commercial bank mortgages made in 22 U.S. cities before the Great Depression started, and provides quantitative evidence that low loan-to-value ratios (LTVs) led to higher foreclosure rates in those cities. The data are taken

from the *Survey of Urban Housing* published in 1937 by the Department of Commerce under the supervision of David L. Wickens. While the data do not allow one to analyse each mortgage individually, it exploits variation in average LTVs and foreclosure rates on first mortgages between cities to examine the nature of the relationship between the two variables. The result is a strong negative correlation: the lower the loan-to-value ratio, the higher the probability of foreclosure. This result would be counter-intuitive to observers without a knowledge of the second mortgage system. However, the existence of the second mortgage system explains it perfectly.

Finally, I provide evidence that the foreclosure process was particularly lengthy at the time, often lasting up to eighteen months (Section five). This meant that although house prices usually did not fall by more than 50 per cent in the Great Depression period, commercial banks would be seriously weakened by an increased default probability. A protracted foreclosure process meant that a house would be difficult to turn quickly into cash - a great impediment in case of a liquidity crisis. As most commercial banks lost tremendous amounts of deposits starting in 1930, higher probabilities of foreclosure no doubt severely weakened their positions at that particular time. In addition, if depositors knew about this problem a liquidity crisis could easily turn into a self-fulfilling prophecy. As Postel-Vinay (2013b) recently showed, high proportions of mortgages together with deposit losses caused many banks to fail, at least in Chicago.

Section six concludes that 1920s commercial bank first mortgage contracts presented significant risks to first mortgage lenders. More generally, the Depression experience serves as an incentive for caution regarding the use of additional loans (such as "piggyback" mortgages) whose debt dilution effects are difficult to mitigate.

2 Models of Debt Dilution

Debt dilution is one of the central topics of contract theory. It is suspected to have played an important role in a number of financial crises, such as the Latin-American debt crisis of the 1970s, the East-Asian crisis of the late 1990s (Bisin & Guaitoli, 2004; Radelet & Sachs, 1998), and even the recent worldwide financial crisis (see Acharya & Bisin (2010)).

At the core of debt dilution is the idea of contract incompleteness. When a lender enters into a contractual relationship with a borrower, he usually cannot make his contract contingent

on all other contracts that the borrower might sign aside from the original contract. This is because such contingent contracts would be very costly to implement, as they would imply intense monitoring of the borrower. As a result, most financial contracts are non-exclusive.

As the borrower takes on one or more additional loans, an externality is created because effort to repay the original loan is reduced proportionately, in a way that was not taken into account when the initial contract was signed. If expectations of straightforward debt dilution are taken into account by the original lender, he will likely react by changing the terms of his original loan, which can lead to higher default rates.

Fama & Miller (1972) initially showed that a simple solution to this problem would be for each lender to be assigned a clear priority level in the bankruptcy process. According to this theory, seniority rules would reduce the first lender's anxiety about possible debt dilution as he would be first in line to recover the borrower's assets in case of default. However since then a great number of authors have warned that seniority rules were no panacea, and that first lenders were still likely to modify their loan terms in equilibrium.

Such changes in terms can include, for example, a rise in interest rates. This is the most common change described in the theoretical literature. In their much-cited model of "sequential banking," for example, Bizer & DeMarzo (1992) begin by showing that in situations where the borrower can only take loans from one bank, additional lending from that same bank imposes an externality on prior lending but the bank can internalise it by increasing the marginal price (interest rate) of each new loan, which compensates for the devaluation of prior debt. This contrasts with a situation in which the borrower can take an additional loan not from the first bank, but from a second bank. In that case the first bank cannot compensate for the externality that the second loan imposes on its own prior debt by charging a higher rate on that second loan. Instead, in equilibrium, it charges a higher interest rate on its own original debt, which leads to a higher probability of default on that loan, even in the presence of seniority rules. Such a result is also found by Holmström & Tirole (1997) and more recently by Parlour & Rajan (2001).

First lenders can also ration credit, change the maturity of loans and make them shorter, or, in the case especially of sovereign debt, make their loans harder to restructure. The latter is described in a model by Bolton & Jeanne (2009), where sovereign debt is described as exces-

sively difficult to restructure in equilibrium, due to expectations of debt dilution. Shortening maturities is something that lenders to banks, in particular, resort to, according to Brunnermeier & Oehmke (2013). By shortening the maturity of their loans junior lenders can become *de facto* senior; but this in turn leads first lenders to shorten the maturity of their own debt: thus a "maturity rat race" is created.[1] Finally, a number of authors point to credit rationing as a reaction to debt dilution (see, in particular, Bennardo et al. (2013); Degryse et al. (2011); Kahn & Mookherjee (1998)).

Which of these reactions was commonest in the 1920s? We will see that while debt dilution increased the probability of foreclosure, the channels through which this occurred varied. In some cases it is possible to ask simply whether lenders could clearly anticipate that debt dilution would occur, given that second mortgage lending was, according to contemporary sources, a relatively new phenomenon. In others, such as for mortgages made in 1928, it seems that interest rates are too blame. The possibility of credit rationing makes things even more complex, as in the 1920s the very reason for the existence of second mortgages was the small size of the original loans. This means that a negative feedback effect towards smaller and smaller loans cannot be excluded.

3 The second mortgage system: qualitative evidence

This section aims to give a sense of the extent of the second mortgage system. Based on contemporary accounts and newly-discovered archives from the National Association of Real Estate Boards in Chicago, it provides an explanation for its existence and an examination of its most negative consequences. It begins by describing how first mortgages were made by commercial banks and why they would often refuse to lend over 50 per cent of the value of the property. It then moves on to describe the most salient features of the resulting second mortgage system, before analysing its consequences for first lenders: debt dilution on the one hand, and seniority reversal on the other. The next section will empirically test the hypothesis that low LTVs led to higher foreclosure rates.

[1] This paper has wider implications than those directly linked to the debt dilution problem. Indeed, it questions the very efficiency of banks' maturity mismatch, long heralded as a liquidity enhancer and a disciplining device (see Diamond & Dybvig (1983) and Calomiris & Kahn (1991)). It argues that bank debt may in fact be excessively short-term and thus inefficient.

3.1 Conservatism of first mortgages

Starting around 1921 commercial banks greatly expanded their holdings of real estate loans. As Figure 1 shows, the peak in total U.S. mortgage debt held by commercial banks was reached between 1925 and 1929.[2] As is well-known in the literature, most of these loans up until 1927 were made by state rather than national banks, as the latter's real estate lending powers were considerably constrained by law until then.

The literature also rightly insists that the contract maturity of these first mortgage loans rarely exceeded 5 years, and that most of the time it only averaged 3 years. Nor did their loan-to-value ratio often exceed 50 per cent, and most only required interest payments, with the principal payable at maturity in a "balloon" payment. The most authoritative source on these figures is Morton (1956, pp. 3-7, 178),[3] though numerous contemporary sources confirm this (see for instance Adair (1923) and Gries & Ford (1932, pp. 6, 16, 20)).[4]

An interesting feature of these contracts is that, despite their conservatism, they were not usually implemented for legal reasons in the case of state banks.

National banks were the most constrained type of bank in terms of mortgage lending. The National Banking Act of 1864, whose aim was partly to bring banks under the control of the federal government and thereby to set standards of good practice (White, 1983), prohibited any type of lending on real estate.[5] Under the Federal Reserve Act of 1913, conditions were slightly liberalized for country national banks so as to allow them to make farm mortgages for a duration of up to 5 years, which could not exceed 25 per cent of capital and surplus or a third of time deposits (United States, 1913, p. 25). In September 1916, this act was amended to allow urban banks to make urban real estate loans of up to one year, though excluding banks located

[2]Commercial banks were not the only mortgage lenders. Both building and loan (B&L) associations and mutual savings banks held higher shares. Life insurance companies held almost just as much as commercial banks, and mortgage companies held a much lower share. See Grebler et al. (1956), Tables N-2 and N-3, pp. 468-74. They are not analysed here as the topic of interest is the relationship (if any) between mortgage lending and widespread bank failures. The figures provided here and in Figure 1 may take renewals into account.

[3]Since these figures are based on a National Bureau of Economic Research survey of urban mortgage lending, their absolute precision may be taken with care. The survey was made in 1945 on a sample of 170 commercial banks, "representing about one-third of the commercial banks total nonfarm mortgage portfolio as of mid-1945." It included "commercial banks of all sizes" (ibid., p. 71).

[4]This contract differed from, say B&L contracts whose mortgages were amortized over 11 years. It would be useful to see how this difference in contracts impacted these institutions' chances of survival during the Depression, but B&L's are known to have suffered from other structural problems with their share participation system which would make them particularly hard to compare with commercial banks (see, in particular, Snowden (2010).

[5]Except to "prevent losses on debts previously contracted in good faith" (Behrens, 1952, p. 15). In such cases, if necessary, they could acquire title to the property but had to dispose of it within five years (United States, 1864).

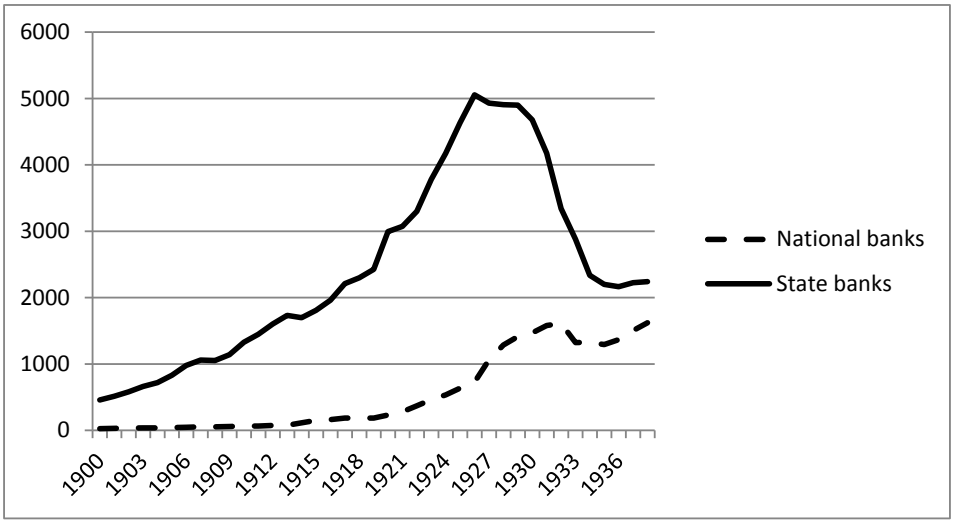

Figure 1: Real estate loans by type of bank (all categories), 1900-1938 ($ million)

Source: Board of Governors of the Federal Reserve System (1956).

in central reserve cities (Chicago, New York and St Louis) (Federal Reserve Board, 1918, p. 44). It is only after the passage of the McFadden Act in 1927 that all national banks were allowed to loan on real estate for 5 years, to an aggregate amount of 50 percent of their time deposits (Behrens, 1952, p. 18). The legal maximum loan-to-value ratio thus never exceeded 50 per cent for national banks (Lloyd, 1994).[6]

However, there is good reason to think that had national banks been allowed to loan more and for longer than the McFadden Act allowed them, they would have rarely done so. Such was the case with state banks, which despite particularly lax legislation would not commonly lend above 50 per cent and for longer than 3 to 5 years - on average. The only precise data available on state-chartered bank legislation comes from Welldon (1910), although this source should be a rather conservative one as real estate regulation had a tendency to become more lax in the following decades. According to this survey, only Michigan, Minnesota, North Dakota, Ohio,

[6]Much of this liberalization was due to an effort on the part of the national banking system to compete with state banks. During hearings on the Inquiry into membership in the Federal Reserve System, Senator Glass insisted that restrictions on real estate were an important reason for the reluctance of state banks to join (U.S. Congress, 1926b, p. 13). Senator McFadden openly supported liberalization to achieve this purpose, as can be seen in the 1926 Hearings on the Consolidation of National Banking Associations chaired by him (U.S. Congress, 1926a, p. 25). It is also interesting to note that Mr Bains of the National Bank of Philadelphia remarked that one reason why state banks might still be reluctant to join the system was that they could not rediscount real estate paper at the Federal Reserve Banks: "You take the State banks: the principal loans are on real estate. That may be why so many State banks do not want to go into the national system, because they have no use of the rediscount privileges. They can get rediscount from their correspondent banks, but not from the Federal Reserve bank, because most of their bonds are on real estate; that is, in Pennsylvania" (U.S. Congress, 1926b, p. 644).

Oregon and Texas limited loan-to-value ratios to 50 per cent.

The reasons for such conservatism are of two different kinds. On the one hand, up until the early 1920s commercial banks thought of real estate loans as particularly illiquid. As there was no market for them and they could not be rediscounted at the Federal Reserve, many were aware of the fact that long-term, high-leverage loans would be hard to liquidate in case a bank run occurred.[7]

On the other hand, redemption laws that were particularly favourable to borrowers increased first mortgage lenders' cost of lending and contributed to their contract conservatism. Variation in redemption laws and loan-to-value ratios by state helps to see this. While the average loan-to-value ratio was indeed around 50 per cent, this figure tends to conceal some interesting variation among the different U.S. states. Likewise, there was substantial variation between states in terms redemption laws: some state legislations were much more favourable to borrowers than others, as Table 1 makes clear. Examining the relationship between the two variables by state, it is possible to notice a modest negative correlation (around .5) between the number of months allowed by a particular state for redemption and this state's mean LTV for commercial banks. In other words, the more generous state laws were towards borrowers, the more likely banks were to reduce their mortgage loan amounts.[8]

Once these self-imposed restrictions were in place, state banks would allow themselves to lend a fair portion of their assets on real estate. Thus mortgages came to account for 16 per cent of assets in the portfolios of state banks in 1926 (Board of Governors of the Federal Reserve System, 1956).[9] Figures 2 and 3 show the main assets of national and state banks from 1900

[7]Note that some mortgage securitization took place, especially in Chicago. See (Postel-Vinay, 2013a). At a 1913 congressional hearing, a national banker declared that real estate loans should not be made "out of any money left on deposit or subject to check. If such loans are made upon money subject to check sooner or later you are bound to involve yourself in trouble for two reasons: First, you can not always find a market for these notes. (...) [Second], if you foreclose on your mortgage and want to sell the property there is not always a buyer for it" (U.S. Congress, 1913, p. 180). This attitude was reinforced by the "real bills doctrine," a pervasive ideology at the time according to which commercial banks should only engage in short-term commercial business. Of course many bankers did not in practice follow it, especially with respect to stock investments and loans on securities, but it certainly acted as a constraint once a commercial banker decided to make any mortgage loans at all (see, in particular, U.S. Congress (1913, p. 180)).

[8]The data on redemption laws are taken from Jones (1928). The data on LTVs by state are taken from the same NBER database as Morton (1956) used to derive his averages, mentioned above. As pointed out earlier, these data are to be taken with great care as they come from a survey, made only in 1945, of commercial banks which by definition survived the Great Depression. As Morton himself insists, banks were less likely to report accurately on loans made twenty years earlier than on more recent loans (see Morton (1956, p. 133-8)). I thank Andra Ghent for making these data available to me in a processed format. The raw data are available online on the NBER website: <http://www.nber.org/nberhistory/historicalarchives/archives.html> .

[9]In the same year national banks' real estate loans only amounted to 5.4 per cent of their assets.

Table 1: Redemption laws and urban LTVs by state, 1928 and 1920-1929

State	Redemption period, in months (1928)	Commercial bank urban LTV (1920-1929)
Alabama	24	-
Arizona	6	-
Arkansas	12	-
California	6	44
Colorado	6	-
Connecticut	0	47
Delaware	0	-
Florida	0	38
Georgia	0	55
Idaho	0	50
Illinois	12	44
Indiana	12	48
Iowa	12	-
Kansas	12	46
Kentucky	18	-
Louisiana	0	-
Maine	12	40
Maryland	0	56
Massachusetts	0	57
Michigan	12	46
Minnesota	12	44
Mississippi	0	-
Missouri	12	63
Montana	12	-
Nebraska	9	-
Nevada	6	-
New Hampshire	0	-
New Jersey	0	48
New Mexico	9	-
New York	0	55
North Carolina	0	-
North Dakota	12	-
Ohio	0	50
Oklahoma	-	40
Oregon	4	-
Pennsylvania	0	53
Rhode Island	0	53
South Carolina	0	53
South Dakota	12	-
Tennessee	24	39
Texas	0	50
Utah	6	-
Vermont	12	-
Virginia	0	48
Washington	12	47
West Virginia	0	49
Wisconsin	12	-
Wyoming	6	-

Notes: Data on LTVs are missing for some states, and in general presents quite a few weaknesses (see text).
Sources: See text, and Jones (1928).

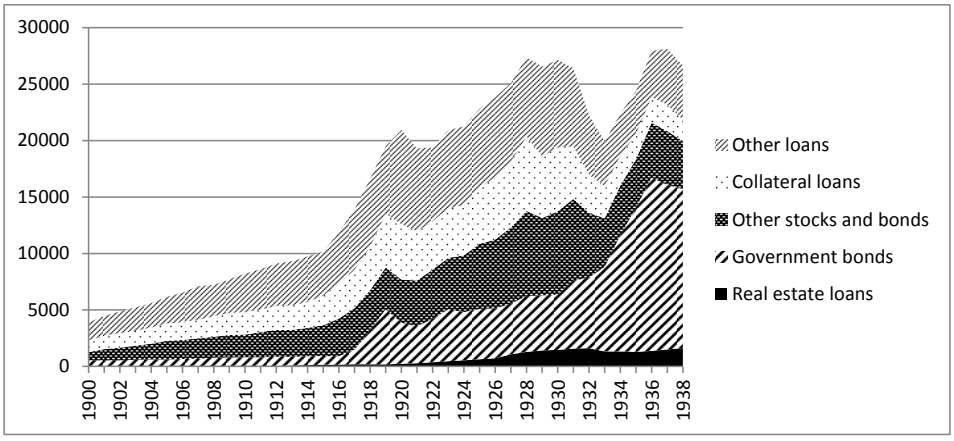

Figure 2: Main asset holdings at national banks, 1900-1938 ($ million, stacked)

Source: Board of Governors of the Federal Reserve System (1956).

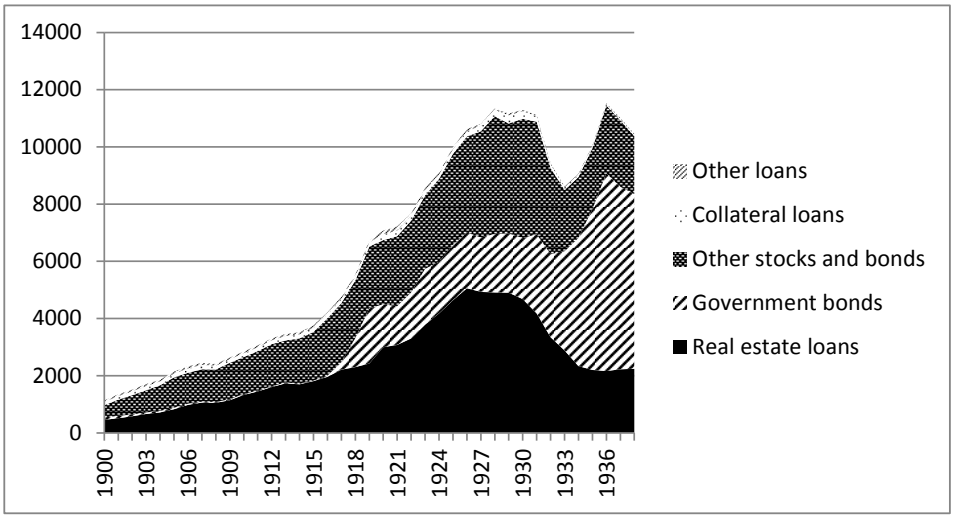

Figure 3: Main asset holdings at state banks, 1900-1938 ($ million, stacked)

Source: Board of Governors of the Federal Reserve System (1956).

to 1938.

3.2 The second mortgage system

In the depth of the Depression, President Hoover ordered 25 committees to work for a number of months on the problems facing mortgage borrowers and lenders. The Committee on Finance for the Conference then drew conclusions that two years later would form the basis of the justification for the National Housing Act. One of these conclusions was that the frequent 50 per cent limit on first mortgages was based on erroneous principles: "If security is considered, this would seem to be in line with sound public policy. On the other hand, the practice is the principle cause for most second mortgages with their exorbitant rates and frequent failures" (Gries & Ford, 1932, p. ix). As a result the bill for the National Housing Act was specifically designed, among other things, "to eliminate the necessity for costly second-mortgage financing" (U.S. Congress, 1934, p. 1). The necessity for second mortgages in the 1920s was best described by Reep (1928, p. 1):

> "The chief financing problem (...) is that of financing above the first mortgage. (...) In purchasing a property (...) it is assumed, of course, that at least a small down payment is made. The difference between the sum of the first mortgage plus the down payment and the total cost of the property must be financed by junior liens. If the cost of the property is $10,000, the purchase money mortgage $5,000, and the down payment $2,500, then the balance, $2,500, is the junior lien."

But what proportion of borrowers took out a second mortgage in addition to the first? And what was its average loan-to-value ratio? Newly-discovered data from the National Association of Real Estate Boards show that, in 1923, 76 per cent of first residential mortgage borrowers took out a second mortgage (National Association of Real Estate Boards, 1923).[10] The average loan-to-value ratio for second mortgages was 29.6 per cent, so that the total average ratio for first and second mortgages combined was 83.3 per cent (National Association of Real Estate Boards, 1923). Other sources put the average LTV lower, at 75 per cent (Beach, 1926; Gries & Ford, 1932). Most loans lasted on average one to three years; in other words, they usually matured before the first mortgage (Dunton, 1926; Gries & Ford, 1932). [11] Also contrasting with

[10] This figure excludes B&L's. It is confirmed by Gries & Ford (1932, p. 21) who say that "two-thirds or more of all home purchase transactions require junior financing." See also Adair (1923).

[11] Gries & Ford (1932, p. 20) note that sometimes the first mortgage matured before the second, but they present this fact more as an oddity than common practice.

Table 2: First and second mortgage loan characteristics, 1923

Loan characteristics	First mortgage	Second mortgage	Combined
Contract maturity	3-5 years	1-3 years	-
Loan-to-value ratio	50% to 54%	25% to 29%	75% to 83%
Annual interest rate	6%	14% to 16%	-
Renewal expectation	Yes	No	-
Monthly interest payments	Yes	Yes	-
Monthly principal payments	No	Yes	-

Sources: Beach (1926), Gries & Ford (1932, pp. 6, 16, 20-1) and National Association of Real Estate Boards (1923).

first mortgages, second liens were not expected to be renewed, and required monthly amortized payments (see Bayless & Bodfish (1928), Beach (1926), Brigham (1928), Dunton (1926), and Gries & Ford (1932, pp. 6, 20)).[12] Table 2 summarizes these findings.

The prevalence of very high interest rates and charges - on average 14 to 16 per cent for second mortgages on homes - can be explained in part by the underdevelopment of large institutions making second mortgages. As Bayless & Bodfish (1928) put it, "the majority of second mortgage business is carried on by small firms and individuals, which prevents the operation of the insurance principle through the spreading of risk" (ibid.).[13]

Yet the most important reason behind these high interest rates was the lack of security backing the second mortgage and the resulting "discounting business." As the liens were junior they were by definition hazardous for the lender - so much so that charging the maximum legal rate would not be enough to cover the risks attendant to second mortgages. As charging a usurious rate would bring disrepute to the firm or individual offering the loan, they would in turn sell it to a third party, at a discount. This would render the transaction between borrower and investor legal.[14] The third party would then charge an even higher rate to the borrower to

[12]Brigham (1928) noted, regarding second liens: "one of the commonest sharp tricks is to sell a man a house for more than it is worth with a small down payment and a one-year second mortgage which at the end of the year the seller mortgagee says that he cannot renew in spite of his assurances to the contrary at the time of sale."

[13]Gries & Ford (1932, p. 29) mention the existence of "second mortgage companies," the great majority of which failed to weather the Depression.

[14]As Reep (1926, p. 19) puts it, "instead of financing the borrower direct, the lender will purchase the second mortgage and land contract paper if it has been executed. This procedure is not affected by usury law because any man has the right to sell his mortgage or his contract at any rate of discount (...) provided that the mortgage or contract is not already tainted with usury in the hands of the seller." Further detail can be found in Reep (1925), where the author insists that "second mortgages are bought at a discount and are not made directly with the owner of the property," and the following example is provided: "[t]he seller can take this second mortgage to a second mortgage company and discount it $500 and thereby realize his $5,000 cash for the property as follows:

compensate for the commission it had to pay the dealer (Beach, 1926; Reep, 1928).[15] In other words, through the discounting business the borrower ended up paying a higher rate than the already usurious rate he would pay without it. Consequently many contemporary observers, including Reep, criticized usury legislation itself and supported higher statutory maximums. Table 3 provides information on legal rates (the default interest rate suggested by law) and statutory maximums.

To what extent was this discounting business established? According to Reep (1928, p. 86), the discounting of second mortgage paper was carried out in most U.S. cities for most second mortgages. In this regard it is interesting to note that a small portion of second mortgages were in fact pooled with others and sold to banks and investors as securities. Such securities were the direct obligation of the issuing company. But as Beach (1926, p. 13) makes clear, this practice had yet to become more common and better known.[16]

3.3 Consequences

Drawing on 1925 data for Chicago, Bayless & Bodfish (1928) described the second mortgage as a rather sound instrument since it only lasted one to three years, there was no intention of renewal, and it required monthly payments.[17] They also asserted that it "has broadened the real estate market and has often been the financial ladder by which the urban tenant climbs to complete ownership."

However they did recognize a "complete lack of standardization," emphasizing particularly

$1,500 cash from the purchaser, $2,500 in cash from the first mortgage and $1,000 cash from the discounted $1,500 second mortgage. In fact, the seller can discount the $1,500 second mortgage any amount that he wishes or even give it away without any danger of usury."

[15]This was explained by Beach (1926): "The individual investor, fearing that he had more hazard and knowing that he had more trouble demanded a large profit. The dealer wanted a profit too. The borrower paid both - two profits - both large."

[16]Reep also provided an interesting account of what has survived today in the literature on building and loan associations (B&Ls) as the "Philadelphia experiment." It is often described as a relatively rare form of innovative behaviour on the part of B&Ls, in which some Philadelphia B&Ls started specializing in the second mortgage business in what seemed at first sight an attempt to reap a larger profit (Loucks, 1929; Snowden, 2010). Reeps account provided additional information in explaining why even first mortgage borrowers who were B&L members also needed access to the second mortgage market. He conceded that B&Ls monthly amortization principle allowed them to make first mortgages about 15 per cent higher "with equal safety" (ibid., p. 90). However for him, 65 per cent LTVs had not solved the junior lien problem as "they have merely limited the problem to a narrower margin of security." Indeed, many borrowers still could not make a 35 per cent down payment and still needed to take out a second mortgage (ibid., p. 92). But Reep was quite pessimistic about the future of B&Ls in this business as he thought they would in the end face similar constraints as other second mortgage dealers (ibid., p. 100).

[17]According to their survey, based on a small sample of properties in Chicago, about half of homes, and around two thirds of apartments, were encumbered with a second mortgage in 1925 (ibid.).

Table 3: Legal interest rates on mortgages and statutory maximums by state, 1928

State	Legal rate (%)	Statutory maximum (%)
Alabama	8	8
Alaska	6	10
Arizona	6	10
Arkansas	6	10
California	7	12
Colorado	8	no limit
Connecticut	6	12
Delaware	6	6
D.C.	6	10
Florida	8	10
Georgia	7	8
Idaho	7	10
Illinois	5	7
Indiana	6	8
Iowa	6	8
Kansas	6	10
Kentucky	6	6
Louisiana	5	8
Maine	6	no limit
Maryland	6	6
Massachusetts	6	no limit
Michigan	5	7
Minnesota	6	8
Mississippi	6	8
Missouri	6	8
Montana	8	12
Nebraska	7	10
Nevada	7	no limit
New Hampshire	6	no limit
New Jersey	6	6
New Mexico	6	12
New York	6	6
North Carolina	6	6
North Dakota	6	10
Ohio	6	8
Oklahoma	6	10
Oregon	6	10
Pennsylvania	6	6
Rhode Island	6	30
South Carolina	7	8
South Dakota	7	12
Tennessee	6	6
Texas	6	10
Utah	8	12
Vermont	6	6
Virginia	6	6
Washington	6	12
West Virginia	6	6
Wisconsin	6	10
Wyoming	8	12

Sources: Reep (1928, pp. 215-7).

high interest charges. Indeed, these interest rates were often blamed for borrowers' inability to pay back their second mortgages. Consequently, most lenders specializing in second mortgages went bankrupt in the Depression. As Fahey pointed out in his 1934 article, the mortality rate of second mortgages was "practically 100 per cent" (Federal Home Loan Bank Board, 1934).[18]

More importantly from the point of view of commercial banks, the second mortgage system also impaired borrowers' ability to repay first mortgages. Although having a large loan split between two lenders in theory also splits the risk between those two lenders, in reality the risk is not entirely split as first mortgage lenders may suffer.

First, first mortgage lenders suffered due to debt dilution. If they expected that a second mortgage would be taken to help with the down payment, they would not be able to make their contract exactly contingent on this second loan, as usually the loan would be taken after the first mortgage contract was signed. Instead theory predicts that they would introduce modifications such as a rise in the interest rate. Should first lenders be uncertain about whether a second mortgage would be taken or not, similar modifications would still be brought about. And in the (not so unlikely) case where first lenders wrongly expected that no second mortgages would be taken, they would suffer from straightforward debt dilution (effort to pay back the first loan would be diluted by the existence of second loan) with no compensating reactions.[19] While little data remain to ascertain which of these situations was most prevalent, it is clear that in any of these cases debt dilution would be detrimental to first mortgage lenders.[20]

Second, differences in contract terms between first and second mortgages would strongly aggravate the situation by creating a seniority reversal effect. Since interest rates on second mortgages were usurious, and since the latter matured in general before the former, the second mortgage acquired some priority in time – what is sometimes called "*de facto* priority" (Brunnermeier & Oehmke, 2013). This seniority reversal effect was reinforced when second mortgages required monthly payments, unlike first mortgages which usually remained unamortized.

The existence of both of these negative effects is confirmed by numerous contemporary accounts. It was best expressed by Schmidt (1930):

[18] See also Cope (1929).

[19] It is possible to think that first lenders would wrongly expect that no second mortgages would be taken if their expectations were adaptive and they had no knowledge of the extent of the second mortgage system, which in any case was a relatively new phenomenon.

[20] The next section will show that, analysing 22 cities, a rise in interest rates at least for first loans made in 1928 was likely.

> "Experience proves that it is better and safer to have one mortgage for seventy per cent than to have, say, a fifty per cent first mortgage and junior financing above that amount. The expense of the junior financing is very great, and such second and third mortgages, because of heavy amortization and other causes, have been frequently the occasion of leading a first mortgage issue into difficulty."

Adams (1928) likewise expressed his concern: "[i]t has been our experience that where a corporation is dealing purely in conservative first mortgage paper, it is almost invariably the case that the borrower is not being pressed by his obligation, but that he has incurred other obligations, (...) in the form of a second mortgage (...)." For Beach (1926), while the borrower should not worry about paying the first mortgage as it wasn't amortized and would mature later, "[y]ou reserve a portion of your income each month for the retirement of this second mortgage."[21]

This problem was not confined to urban mortgages. Although second mortgages were of a slightly different character in farm lands than in cities, Wickens (1933) insisted that:

> "(...) the man who mortgages his land and later mortgages his crop or other income from the land in effect borrows twice on the same security. Not only does he pledge to another the income on which the first loan was based, but the resulting increase in his total liabilities and burden of payment reduces his capacity to meet all of his obligations."

It is interesting to note that junior liens were sometimes paid before maturity. For Reep this could be due to two reasons. Either the borrower was a "successful man" and he paid it off "because he does not like the hazard of a junior lien." Or he was not successful and would need to entirely refinance his first mortgage, which at the time included paying the junior lien (Reep, 1928, p. 37). This would appear to be especially important in times of crisis: it would imply that if the borrower for various reasons could not pay back the second mortgage, he would not be able to refinance his first mortgage, and would be more likely to face foreclosure.

There is also evidence that in some rare cases second mortgages were made by commercial banks themselves. One study comparing five North-Eastern states shows great variation in terms of first, second and third mortgage providers. It was carried out in 1936 on Home Owners' Loan

[21] See also U.S. Congress (1934). It should also be noted that a 25 per cent effective down payment meant that borrowers had less equity in their homes, prompting them, as theory predicts, to make less of an effort in times of stress to pay back their mortgages than if the equity was 50 per cent as some first mortgage lenders may have believed.

Corporation (HOLC) loans so may not be entirely representative of 1920s loans. Nevertheless, it is striking to see that in Ohio nearly 20 per cent of the amount of second mortgages were provided by bank and trust companies. Individual firms provided around 50 per cent, while the rest was mainly provided by building and loans associations and financial and mortgage companies (Federal Home Loan Bank Board, 1936, p. 352).[22] This means that in some isolated cases commercial banks were affected by second mortgages not only indirectly through second mortgages' impact on first mortgage risk, but also directly through their exposure to second mortgage risk.

3.4 Aftermath

It is not clear why this highly problematic situation has not been emphasized to a larger extent in the recent literature on the 1920s mortgage boom. President Hoover said in 1931 that "the finance of home building, and especially for second mortgages, is the most backward segment of our whole credit system" (Gries & Ford, 1932, p. ix). Samuel Reep, a scholar and author of a 1928 book on second mortgages, designated them as "the chief real estate financing problem" (Reep, 1928, p. 1). Finally John Fahey, Chairman of the Federal Home Loan Bank Board and a key actor behind the National Housing Act of 1934, described them as "the outstanding sore spot in the [U.S.'s] home-financing system" and"The Evils of Ultraconservative Lending" (Federal Home Loan Bank Board, 1934, p. 4).

In the 1930s bills were introduced in Congress by the Roosevelt administration not only to relieve distressed homeowners but also to overhaul the real estate lending system. While the Home Owners Loan Act of 1933 already bought mortgages from troubled lenders and re-structured them by extending their maturity up to 30 years and amortizing them, it was only designed as an emergency measure (U.S. Congress, 1933, p. 1).

The National Housing Act of 1934, on the other hand, clearly aimed at the long-term restructuring of the mortgage financing system as a whole, and to do so primarily by introducing national mortgage insurance. The goal of mortgage insurance was not simply to increase the liquidity of real estate finance. It was in fact the main incentive structure through which the

[22]The four other states studied were: New York, New Jersey, Connecticut and West Virginia. The numbers are similar for West Virginia, while for Connecticut bank and trust companies held fewer second mortgages (14 per cent). The lowest shares are for New York and New Jersey, which still held around 8 per cent of these mortgages (ibid.).

U.S. government hoped to make commercial banks, insurance companies and savings and loan institutions increasingly offer long-term (15 to 20 years), low down payment, monthly amortized and low interest (6 per cent) mortgages. Indeed, once the law was enacted, a bank could only insure its mortgages if they conformed to these criteria (U.S. Congress, 1934). This way the U.S. government hoped to eliminate the second mortgage system, which it successfully managed to do for some time.

4 Empirical analysis

In this section I analyse a newly-compiled dataset of commercial bank first mortgages in 22 U.S. cities and establish a strong negative correlation between LTVs and foreclosure rates. While Section three made clear that LTVs on such mortgages rarely exceeded 50 or 55 per cent, Table 1 also showed that there was some geographical variation in LTVs. This variation can be exploited to test the hypothesis that particularly low LTVs led to higher foreclosure rates. The result that there was indeed such a negative correlation would seem counterintuitive at first, but it can readily be explained by the existence of the second mortgage system whose prevalence was described in the preceding section. This section thus provides empirical grounding to the idea that low LTVs, which gave rise to the widespread use of second mortgages, posed a significant threat to first mortgage lenders.

4.1 Data description

The data are derived from the *Financial Survey of Urban Housing* published in 1937 by the Department of Commerce under the direction of David L. Wickens.[23] To my knowledge this survey provides the most elaborate and detailed data on first mortgages made by commercial banks just before the Great Depression. For 22 "representative" U.S. cities, most of which had a population of over 100,000 souls, information was gathered on January 1st, 1934 on existing owner-occupied residential properties, whether mortgaged by a commercial bank, not mortgaged or undergoing foreclosure.

For this study the important items of the survey were, in each city: 1) the average cost of properties by year of acquisition (whether acquired through debt or bought outright); 2) the

[23]The data in raw form can be accessed online at <http://catalog.hathitrust.org/Record/001106778>.

average value of properties acquired in 1926 on January 1st, 1934; 3) the average original amount of existing first mortgages; 4) the average percentage of existing first mortgages undergoing foreclosure; 5) the average amount of existing first mortgages by year loan made or renewed; and 6) the average contract interest rates on existing first mortgages.[24]

Unfortunately there was no ready-made LTV variable for first mortgages made by commercial banks by year loan made. Instead I had to construct such an average LTV variable by dividing (5) by (1) (and multiplying the result by 100) for each year before the Depression. As the foreclosure rates concern only first mortgage loans still existing on January 1st, 1934 - with no breakdown by year loan made - it was important to find out the most likely contracting dates for those existing loans. This would allow the study of relationships between foreclosure rates and LTVs of loans made roughly in the same years. Correlations included in the Appendix show that most existing loans were made in 1927 and 1928, which induces me to focus on those two years (see Figure 10). This should not pose too much of a problem as the peak in residential construction was reached in 1926 (see Figure 11 in the Appendix) and mortgage lending plateaued around 1927 (see again Figure 3).[25]

As the sample contains only 22 observations (and sometimes even fewer where commercial banks were not big lenders), the analysis of simple two-way correlations with fitted regression lines seemed appropriate.

4.2 Results

The results are striking. In both 1927 and 1928, average LTVs on first mortgage loans made by commercial banks are strongly and negatively correlated with foreclosure rates on those loans. This is shown in Figures 4 and 5. In other words, the lower was the LTV on these loans, the higher was the foreclosure rate. To many observers today this would seem counterintuitive, as high LTVs are usually associated with higher risk. But the existence of the second mortgage system explains this negative correlation perfectly. The lower was the LTV on the first mortgage,

[24] Another potentially useful source is the data collected by the NBER in 1945 mentioned earlier. However, as was pointed out, and as Morton himself insists, the foreclosure data from this source are likely to be fraught with errors since many banks declined to fill out the questionnaire and many others may have been dishonest about their foreclosure experience (see Morton (1956, p. 133-8)). In this respect Wickens's data are more reliable, being closer to the Depression and surveying individual properties instead of individual banks, which avoids the self-selection problem.

[25] Unfortunately no second mortgage data can be used as in 1934 it can be expected that most second mortgages, which had a very short maturity, would have been either paid off or foreclosed long ago.

the larger was the second mortgage loan, and the greater was the debt dilution problem.

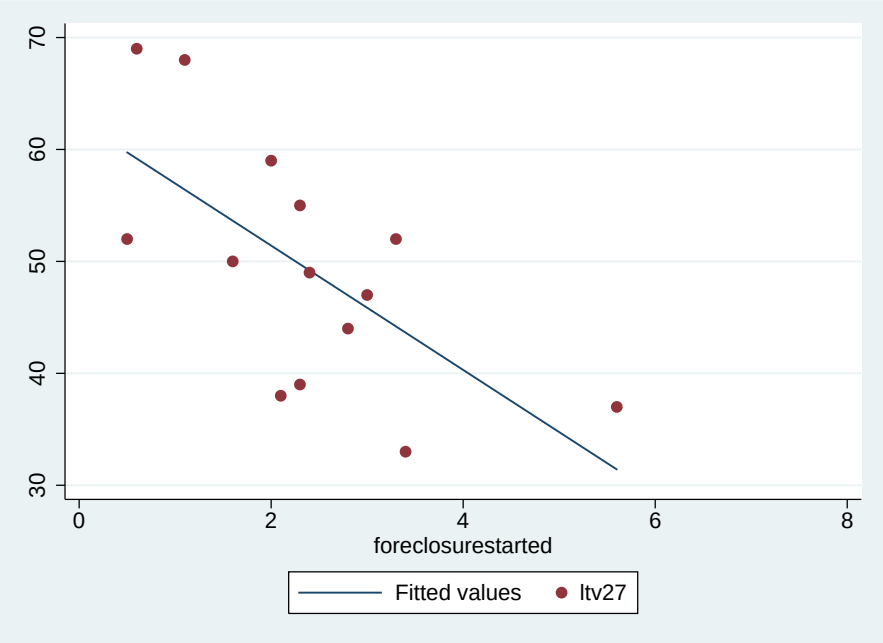

Figure 4: Average LTV in 1927 and percentage of foreclosures started on loans existing on January 1st, 1934

Source: Wickens (1937).

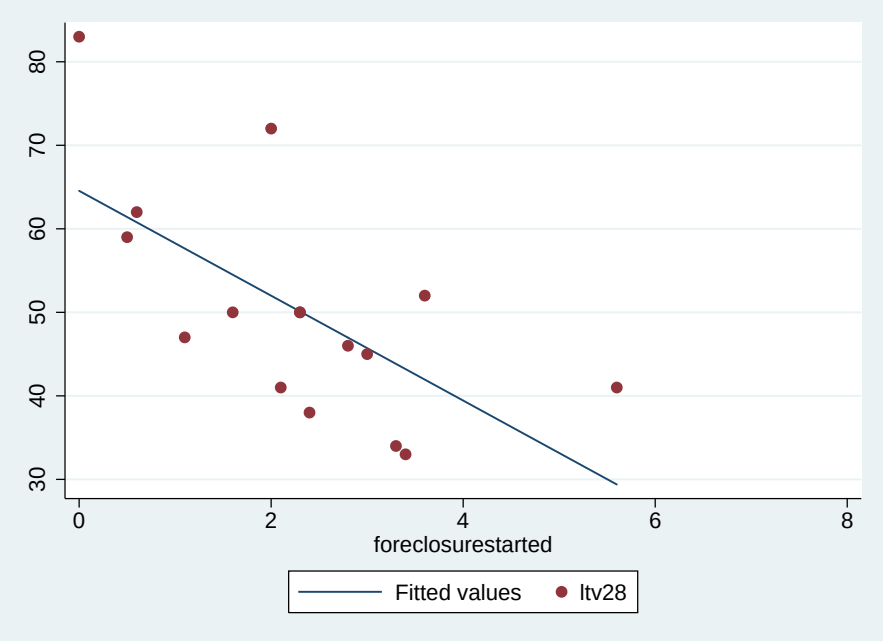

Figure 5: Average LTV in 1928 and percentage of foreclosures started on loans existing on January 1st, 1934

Source: Wickens (1937).

Unsurprisingly, foreclosure rates are also associated with falls in property values between 1926 (the peak in construction) and January 1st, 1934. This is shown in Figure 6, where the percentage fall in property values, calculated by using variables (1) and (2), often averaged as much as 30 per cent.

Now as was seen previously the precise channels through which second mortgages could have led to higher foreclosure rates on first mortgages are of various kinds. All that can be said given the available data is that, on average, interest rates were not the obvious problem in 1927, whereas they may have been in 1928. Figure 7 helps to see this, plotting average LTVs against average interest rates on first mortgages for both years. In 1928, there is a strong negative correlation between LTVs and interest rates: the lower the LTV, the higher the interest rate. But the correlation is much weaker for 1927, which suggests an unstable relationship between the two. This could mean that foreclosures increased due to other kinds of modifications of the first mortgage loan contracts, or that first mortgage lenders suffered from straightforward debt dilution due to their possible ignorance of the extent of the second mortgage system.

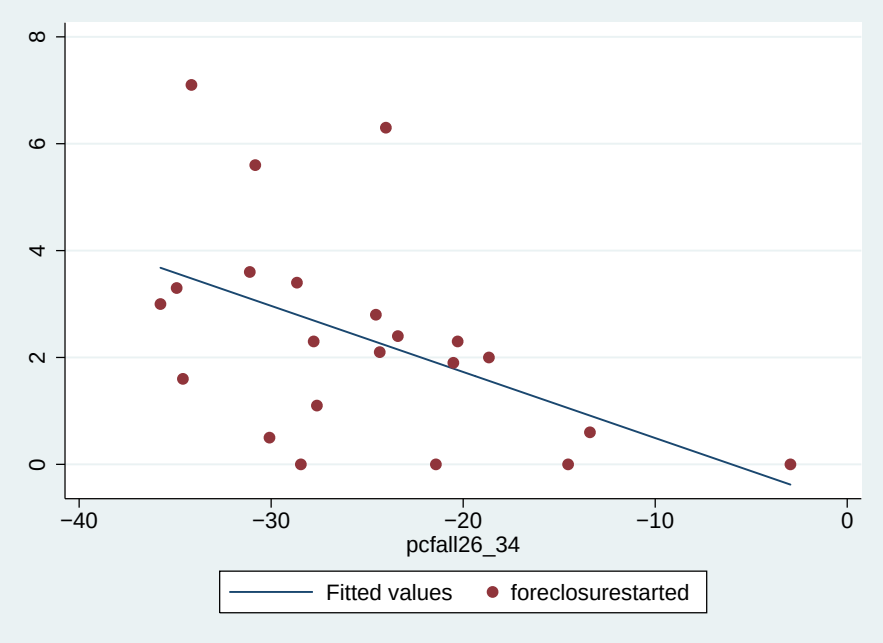

Figure 6: Percentage of foreclosures started on loans existing on January 1st, 1934 and average percentage fall in property values between 1926 and January 1st, 1934

Source: Wickens (1937).

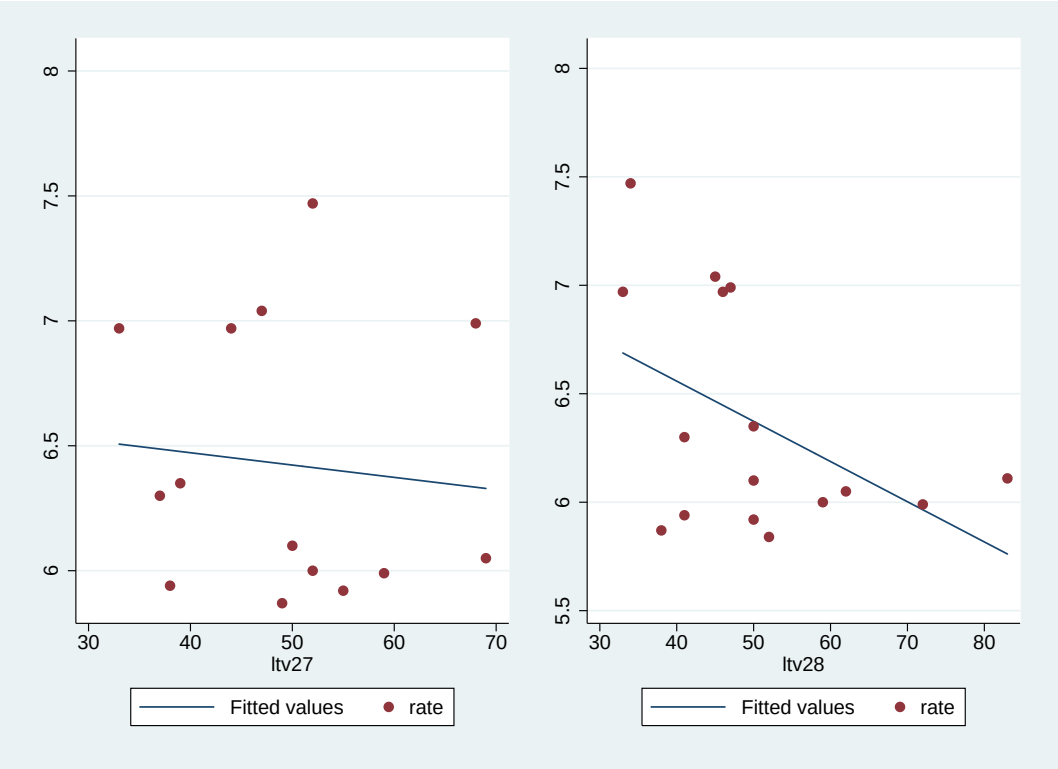

Figure 7: Average LTV and average interest rate, 1927 and 1928

Source: Wickens (1937).

5 The negative impact of foreclosures

As Figures 8 and 9 show, U.S. foreclosure rates increased dramatically for loans made in 1925, and increased even more for loans made in 1928. Did an increased foreclosure risk on first mortgages matter for banks, given a 50 per cent LTV? Theory predicts that it would, if liquidity needs were pressing. Of course, were they given all the time in the world to foreclose, they would in the end get their security back, unless land values fell by more than 50 per cent (which is unlikely).[26] But problems arose for banks facing large deposit withdrawals. In such cases, banks' liquidity needs were urgent, and should they have to foreclose on some properties, they would often have to wait for at least one year before acquiring title.

Table 4 complements Table 1 by providing precise information not only on redemption laws but also on court proceedings in each state around 1925. As Ghent (2012) also insists, many states required lenders to go to court in order to acquire title to the property. Therefore while in 26 states the redemption period was 6 months or more, court time (which can vary) often needs to be added. Among these 26 states, 19 had a redemption period of one year or more.

That the foreclosure process was particularly lengthy and thus posed a significant threat to banks' health is emphasized by Gries & Ford (1932, p. 39)'s study of mortgage lending:

> "One of the greatest hindrances to the availability of mortgage money in some states is the right of redemption from sale under foreclosure. During the period of redemption, foreclosed property is rendered practically unmarketable, may suffer serious damage or depreciation, and presents in a high degree a type of frozen asset."[27]

Numerous accounts of the Depression emphasize the tremendous amounts of deposit losses that commercial banks had to endure during the period. Friedman & Schwartz (1963) and Wicker (1996) provide extensive evidence of this fact, which can be seen in Figure 12 in the Appendix. Given the relatively large holdings of real estate loans, especially at state commercial banks (see again Figure 3), it is clear that large deposit losses combined with high foreclosure rates would have been problematic at best. In addition, if depositors knew about this problem a

[26] Section four showed that in the 22 cities surveyed the fall in property values from 1926 to 1934 often averaged 30 per cent but never exceeded 40 per cent.

[27] See also Anderson (1927), Hopper (1927), Johnson (1923) and Stalker (1925). Sometimes, in the case of income-producing properties, an "assignment of rents" contract would be signed by borrower and lender to ensure that all rents during the foreclosure period would be collected by the lender, not by the borrower. This would tend to limit the financial damage over the period (Hoppe, 1926).

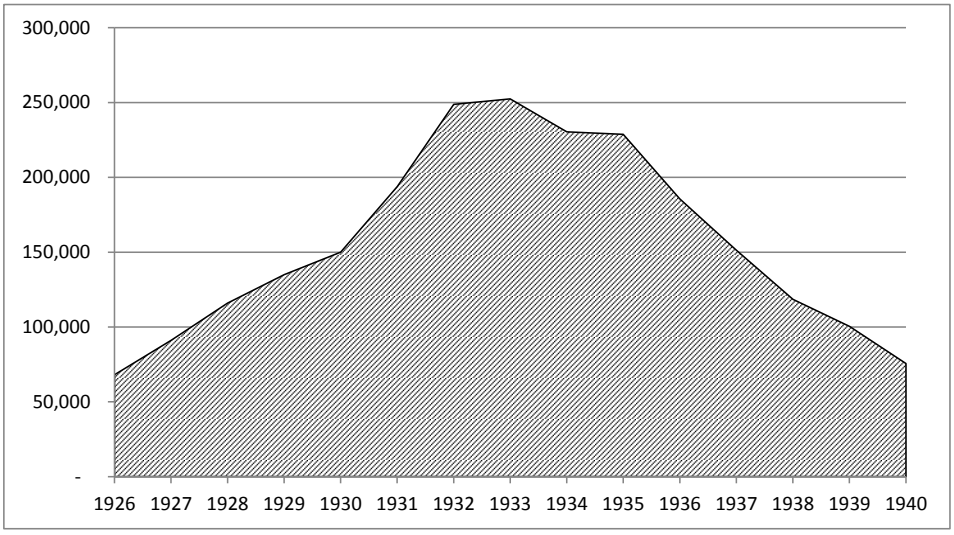

Figure 8: Number of nonfarm foreclosures (all lenders), 1926-1940

Source: Fisher (1951, p. 179).

Figure 9: Residential foreclosure rates at commercial banks by year loan made, 1920-1935 (%)

Source: Morton (1956, p. 100). Note: in this graph a foreclosure rate in a particular year represents the average foreclosure rate for loans made in this particular year.

Table 4: Redemption laws and foreclosure practice by state, 1925

State	Suit in court	Redemption period	Total approximate time to get title
Alabama	No	2 years	psd + 2 years
Arizona	Yes	6 months	court time + 6 months
Arkansas	Yes	1 year w	court time
California	Yes	1 year	court time + 1 year
Colorado	No	9 months	10 months
Connecticut	Yes	-	court time
Delaware	Yes	-	court time
Florida	Yes	-	court time
Georgia	Yes	-	court time
Idaho	Yes	1 year	court time + 1 year
Illinois	Yes	15 months	court time + 15 months
Indiana	Yes	1 year	court time + 1 year
Iowa	Yes	1 year	court time + 1 year
Kansas	Yes	18 months	court time + 18 months
Kentucky	Yes	1 year 2/3av	court time
Louisiana	No	-	50 days
Maine	No	-	1 year
Maryland	No	-	psd + confirmation of sale by court
Massachusetts	No	-	21 days
Michigan	No	1 year	15 months
Minnesota	No	1 year	13.5 months
Mississippi	No	No	21 days
Missouri	No	-	20 days
Montana	Yes	1 year	court time + 1 year
Nebraska	Yes	9 months	court time + 9 months
Nevada	Yes	6 months	court time + 6 months
New Hampshire	No	1 year	1 year
New Jersey	Yes	-	court time
New Mexico	Yes	3 months	court time + 1 year
New York	Yes	-	court time
North Carolina	No	-	psd + 10 days
North Dakota	No	1 year	14.5 months
Ohio	Yes	-	court time
Oklahoma	Yes	6 months	court time + 6 months
Oregon	Yes	1 year	court time + 1 year
Pennsylvania	Yes	1 year w	court time
Rhode Island	No	-	psd
South Carolina	Yes	-	court time
South Dakota	No	1 year	13.5 months
Tennessee	No	2 years w	psd
Texas	No	-	20 days
Utah	Yes	6 months	court time + 6 months
Vermont	Yes	1 year	court time + 1 year
Virginia	No	-	psd
Washington	Yes	1 year	court time + 1 year
West Virginia	No	-	20 days
Wisconsin	Yes	1 year	court time + 1 year
Wyoming	No	9 months	10.5 months

Notes: The data used in this table differ slightly from those used in Table 1 as information on court time was needed, which can be found in Child (1925). Court time varied according to the case, the location in the state and the state itself. Some estimate it to be around three months (Johnson, 1923). "psd" - power of sale days; "w" - period may be waived in the mortgage; "2/3av" - redemption allowed only if property does not sell for 2/3 appraised value.
Sources: Child (1925).

liquidity crisis could easily turn into a self-fulfilling prophecy. As Postel-Vinay (2013b) recently showed, high proportions of mortgages together with deposit losses caused many banks to fail, at least in Chicago. An explanation of the widespread commercial bank failures that plagued the Depression era (Friedman & Schwartz, 1963; Wicker, 1996) can therefore hardly do without reference to the second mortgage system.

6 Conclusion

A 50 per cent down payment is not easy to make for many borrowers - and indeed, more than two-thirds of them could not make one in the 1920s. Their solution was simple but more burdensome than they probably imagined at first: taking out a second, junior mortgage from another institution or individual, in order to bridge the gap between the down payment they were initially able to make and the mortgage itself. This in effect allowed them to make the required 50 per cent down payment, but in reality their equity in the home was only around 25 per cent. The interest rate on the second mortgage was usurious, maturities were shorter and more binding than in the first mortgage case, and as such it greatly impaired the borrower's ability to repay even the first mortgage. Should foreclosure occur, the first mortgage lender would indeed receive 50 per cent of the value of the property, but at great costs.

This paper presents compelling qualitative and empirical evidence of the extent of the second mortgage system and of its negative consequences for commercial banks during the Depression. In today's world of "piggyback" lending and multi-party over-the-counter trading in derivatives such as credit-default swaps, it is a timely reminder that debt dilution, or "sequential banking" can be highly detrimental to credit. In particular, it is noteworthy that even though first mortgage contracts have changed considerably, the 2000s saw the reemergence of interest-only loans combined with piggybacks (second mortgages). Recent research by Mayer et al. (2009) and LaCour-Little et al. (2011) has indeed shown that by 2006-7 the share of Alt-A mortgages that were interest-only rose by 44 per cent, the share of those with piggybacks rose to 42 per cent, and that the share of subprime mortgages with piggybacks reached 28 per cent. Overall, they find that, controlling for LTVs, such loans had a significantly higher probability of default – an unsurprising fact in the light of history.

7 Appendix

Figure 10 shows that the strongest correlations between the average original amount of existing first mortgage and the average amount of existing loans contracted or renewed in some particular years can be found in 1927 and 1928. This suggests that a focus on LTVS for loans made in those years is recommended, given that the data on foreclosure rates are not broken-up by year loan made but are average foreclosure rates for existing loans. Figure 11 shows residential housing starts in the U.S. for the period 1914-1933, pointing out a peak around 1926. Figure 12 shows deposits at state and national commercial banks between 1900 and 1938.

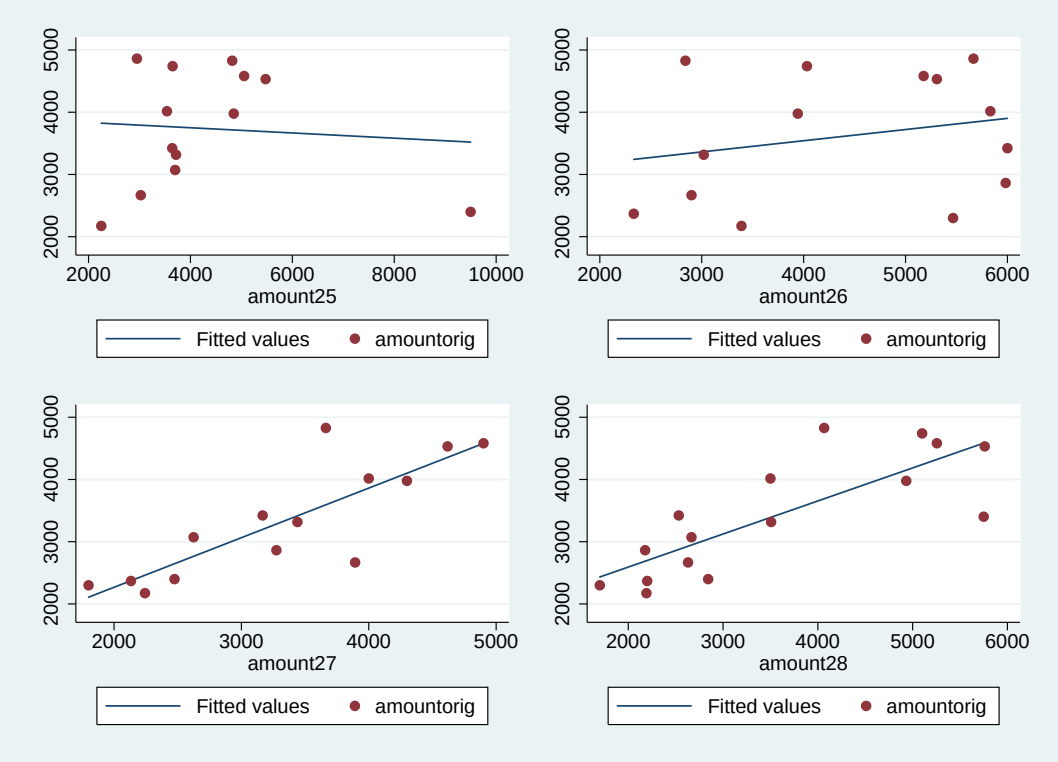

Figure 10: Average original amount of existing loan and average amount of existing loan contracted or renewed in 1925-8 (in dollars)

Source: Wickens (1937).

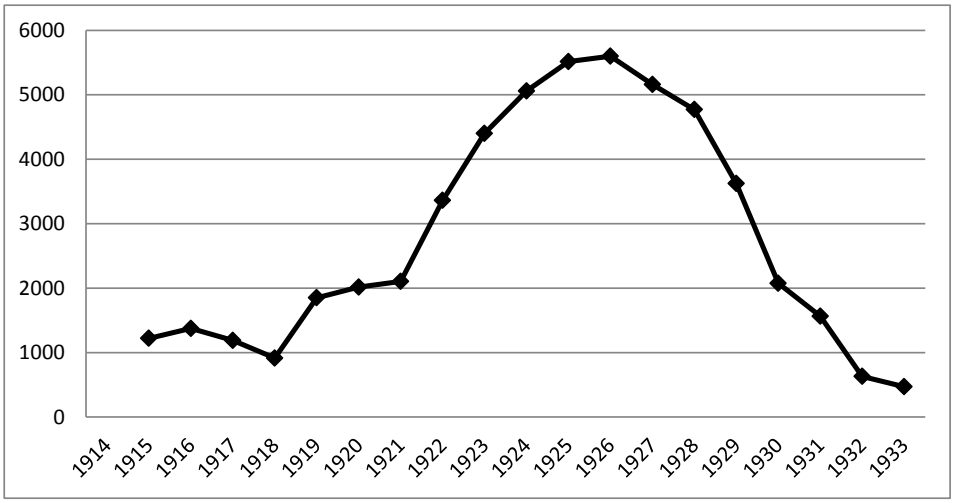

Figure 11: U.S. Nonfarm housing starts, 1914-1933

Source: Carter et al. (2006, Series Dc-510).

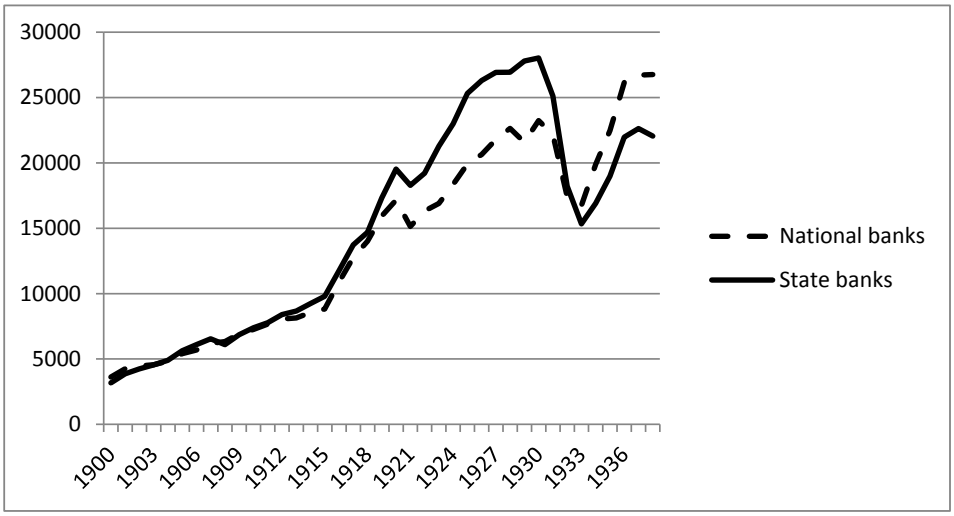

Figure 12: Deposits at national and state commercial banks, 1900-1938 ($ million)

Source: Board of Governors of the Federal Reserve System (1956).

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