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Jonathan D. Rose

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Contract Choice in the Interwar US Residential Mortgage Market

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Abstract

This paper studies mortgage contract choice in US history using a first-of-its-kind sample of residential loans from 1930 and 1940, linked to the decennial censuses. Contract choices reflected borrowers' reactions to the risks posed by different contracts. The majority of borrowers chose contracts with the longest available terms, despite required frequent amortization, likely in order to avoid refinancing risk and to maximize leverage. In contrast, the most creditworthy borrowers with high socioeconomic status preferred short-term contracts, confident that they could refinance at will. The combination of short terms and frequent amortization was unpopular, used disproportionately by the least creditworthy. Between 1930 and 1940, contract use shifted toward longer term contracts, reflecting the advent of federal involvement in the residential mortgage market.

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1 Introduction

This paper studies residential mortgage contract choice in United States history. Contracts with short terms, around 1-5 years in length, have all but faded away from the modern mortgage market, but were once commonly used, particularly before the Great Depression. The main goal of the paper is to understand why borrowers may have chosen short-term contracts instead of a medium-term alternative of around 8-15 years, and in the process to elucidate why short-term contracts became uncommon in the post-war market.

The analysis uses a new dataset of mortgage loans outstanding as of 1930 and 1940, constructed from municipal land records in Baltimore, MD. I link these data to the 1930 and 1940 household censuses, which provide characteristics of the borrowers and their households. I also compile some credit history information from the land records.

Overall, no single contract was optimal for every borrower. Instead, borrowers chose contracts in the context of the risks they were willing to tolerate. I find that short-term contracts were the choice of the socioeconomic elite, but only if those contracts did not require regular principal payments. These well-off borrowers—with relatively well-paying jobs, big properties, live-in servants, good credit histories, and additional indicators of socioeconomic status extracted from the census and land records—likely had access to any contract they desired. I suggest that these borrowers were willing to take on the refinancing risk associated with short-term contracts because they viewed themselves as creditworthy and able to refinance at will if needed. In addition, these borrowers were able to avoid frequent principal payments, which were generally required on longer-term contracts but not necessarily on short-term ones. Given irregular income from businesses they owned, many of these borrowers may have valued the option to pay down their loans at a pace of their own choosing, or not at all.

In contrast, contracts that combined short terms with frequent principal payments tended to be used by the least creditworthy borrowers. In addition, black borrowers were slightly more likely to use such contracts in the raw data. In both cases, the use of such contracts was likely less the result of a choice among contracts and more the result of difficulties in accessing other contract types. The least creditworthy borrowers, such as those who had maxed out their mortgage credit and taken out additional chattel loans on furniture inside their houses, were likely seen by

lenders as too risky for long terms or infrequent payments. Black homeowners also faced severe discrimination in credit and housing markets in this period.

Finally, medium-term frequently amortized contracts were the choice of the masses. These choices likely reflected borrowers' preferences to avoid refinancing risk, even as they took on the requirement to make frequent principal payments, which could pose risks for those with uncertain income streams. In addition, the widespread use of these contracts likely reflects the preference of lenders to require frequent amortization by borrowers with average credit quality. Indeed, contemporary discussions describe amortization payments as a useful way to monitor and maintain contact with borrowers whose creditworthiness was otherwise relatively opaque. Likewise, the lenders who made these loans tended to be small-scale neighborhood lenders, arguably more able to observe soft information about borrowers.

Contract choice was also influenced by a number of other factors, including interest rates and leverage. Some short-term contracts carried slightly lower interest rates, and medium-term contracts generally featured higher leverage, likely driving some of the choices in the data. Yet, the basic patterns described above persist within subsets of loans with limited leverage, or with the same interest rate. Moreover, interest rate dispersion was relatively low, and borrowers could always obtain higher leverage through multiple mortgages. Another factor that is often central to modern treatments of mortgage contract choice is interest rate risk. This risk was not a major influence on choices up to 1930, though, given low interest rate volatility and a monetary regime tied to the gold standard.

Between 1930 and 1940, borrowers reduced their use of short-term contracts. At least some of this shift is certainly attributable to policies introduced by the federal government—which became involved in the nonfarm residential mortgage market for the first time during the Depression—to subsidize or otherwise encourage longer-term contracts. These policies were motivated by the realization of refinancing risk during the financial crisis of the Depression, which also could have directly caused borrowers to change their preferences away from short-term contracts regardless of federal policy. Another explanation for this shift could be that preferences changed, as borrowers may have taken refinancing risk more seriously after being pressured for repayment on short-term loans during the Depression. Yet, the most pronounced shift away from short-term contracts occurred among borrowers with high socioeconomic status, who as a group also recorded relatively

low foreclosure rates. Instead, it is likely that these borrowers switched to long-term contracts only once sufficiently long terms were available. Indeed, in the 1920s short-term contracts commonly extended far past their stated durations in practice, allowing for de facto longer terms but subject to a high degree of refinancing risk since they became callable at any time after maturity. Borrowers reduced their use of this arrangement, though, once long-term contracts became available.

Long-term contracts continued to spread after 1940, slowly but steadily. The median contract term for single-family homes was still only 12 years in 1950, then reached 20 years in 1960, 25 years in 1970, and 29 years in 1980. Today, widespread access to long-term 30-year contracts is supported in part by the government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac. Both remain in conservatorship of the federal government at the time of this writing, with an unclear future. Consumer advocates have expressed concern that reforms to Fannie and Freddie could create difficulties for consumers in obtaining long-term mortgage contracts. The postwar period, though, offers little opportunity to study contract choices in absence of the influence of policies set by the government or GSEs. The interwar period studied in this paper provides a fresh point of view for thinking about these concerns. The 1920s are the most recent time in US history in which nonfarm residential mortgage contract choices were little shaped by federal policy to favor long-term contracts. The analysis therefore supplies an historical perspective on what types of borrowers have come to benefit from policies to promote long-term contracts since the Depression. The results indeed show important gaps in the ability of low creditworthiness and minority borrowers to access the longer-term contracts embraced by the majority of borrowers. The results also show willingness by high socioeconomic status borrowers to stray from the vanilla long-term contract. This result is similar to the findings of Amromin, Huang, Sialm, and Zhong (2011), that sophisticated borrowers were more likely to choose complex mortgages during the mid-2000s housing bubble.

2 Data and Background

The interwar period was a dramatic one for the housing market. House prices advanced significantly during the 1920s and then plummeted during the early 1930s, perhaps by about one-third or more. Nonfarm homeownership likewise trended up during the early 20th century in the US,

peaking before the Depression. It then fell during the 1930s amidst a major foreclosure crisis and reduced household formation. While urban homeownership had become increasingly common during the 1920s, as of 1930 there was essentially no federal government policy aimed at supporting it. Therefore, as the mortgage market expanded to meet the demands placed on it during the 1920s, a patchwork of lenders and contracts evolved without much direction from policymakers. This patchwork market exposed borrowers to a variety of risks, most of which were largely dormant during the prosperous 1920s, but no longer during the exigencies of the 1930s.¹

A shortage of micro data has limited the ability of economic historians to analyze mortgage credit in this era. This paper therefore introduces a dataset of mortgages loans in the US during the interwar period. Specifically, the data are a one percent sample of owner-occupied properties and the mortgage loans outstanding on those properties as of 1930 and 1940, from the city of Baltimore, Maryland, constructed using municipal land records. I follow the same properties from 1930 to 1940. The appendix details the sampling.

While the main limitation of these data is that they capture loans in only one city, they represent a significant advancement beyond existing data. The only other data set containing individual mortgage loans in the pre-Depression 1920s or 1930s is a dataset constructed by the NBER in 1947. Unfortunately, that data has some sampling biases and contains no information about borrowers.²

I link each property from the land records to the 1930 and 1940 censuses, by name and address. The match has a 96 percent success rate in 1930, and 95 percent in 1940. The final sample yields 987 owner-occupied households in 1930, with 539 first mortgage loans, 171 second mortgage loans, and 24 third mortgage loans. From 1930 to 1940, the number of owner-occupied homes in the sample drops to include 908 properties and 409 first mortgages. In the remainder of this section, I will focus on the data in 1930, and a later section will return to the 1940 data.³

¹Regarding house prices, see Shiller 2000, Snowden 2006, Fishback and Kollman 2014; on home ownership and foreclosures, see Fetter 2014, White 2014, Brouck and Hanes 2014; on the history of federal policy, see Snowden 2010. The only involvement of the federal government came through its regulation of nationally chartered banks. National banks were small players in the mortgage market, in part because of fairly tight limits placed on them by statute. In particular, total exposure to real estate lending was limited to a small fraction of banks' capital. National banks wrote only short-term loans, as by law until 1927 they could only write mortgage loans on nonfarm properties with terms of one year or less. In 1927, the limit was raised to 5 years, and then raised further in 1935 to 10 years, or longer if insured by the FHA. These laws also regulated other contract characteristics, especially the loan-to-value ratios. State banks were able to be more involved in mortgage lending, depending on state law. See Behrens (1952).

²The NBER data have bias due to the survey being conducted in 1947, and due to the exclusion of several categories of lenders.

³I use the IPUMS preliminary complete count census data; see Ruggles, Genadek, Goeken, Grover, and Sobek

Table 1: Breakdown of Mortgage Loan Contract Types in 1930

Type of contract	First Mortgage		Second Mortgage	
	Number	Percent	Number	Percent
Short term, no amort.	139	25.8	46	26.9
Short term, infrequent amort.	25	4.6	8	4.7
Short term, frequent amort.	32	5.9	61	35.7
Medium term, frequent amort.	341	63.3	53	31.0
Other	2	0.4	3	1.8
Total	539	100.0	171	100.0

Notes: A term is considered short if it is 7.5 years or less, medium if it is 7.5-15 years, and long if more than 15 years. Amortization is considered infrequent if it is semiannual or annual, and frequent if weekly, monthly, or quarterly.

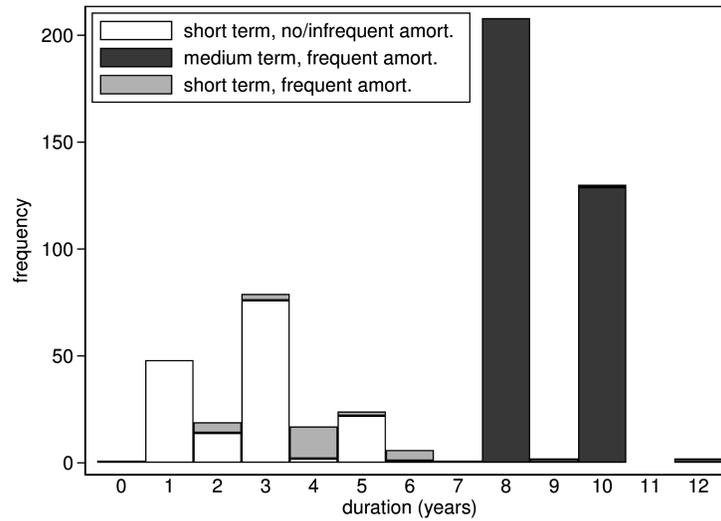
Table 1 displays a breakdown of the sample by type of contract associated with the first mortgage loans. The most common contract in Baltimore was the medium-duration frequently amortized loan. These loans also nearly always carried a fixed interest rate and full amortization of a magnitude that would extinguish the loan by the end of the term. Here, I define a duration as medium if it has a maturity of more than 7.5 years. In Baltimore, the most common durations were 8 or 10 years. (In other parts of the country, terms of about 12 years were relatively more common, and it's not clear why Baltimore differed on that front, beyond a divergence in the long-term evolution of its lenders dating back to the 19th century.)⁴

(2017). The 1950 complete count census data are not yet available. In principle, the analysis could be extended backwards to 1920 and before. However, since a large amount of new construction took place during the 1920s, extending the analysis back to 1920 would probably require resampling in 1920. In contrast, new construction was limited between 1930 and 1940.

The most common reason for the match between the land records and the census to fail is that the census and the land records positively identify different people as owning the house. Usually this appears to be because the resident is purchasing the house on a sales installment contract, so that they do not yet own the deed and therefore would not show up in the land records, even though they occupy the house and might consider themselves owners when asked. Often, such occupants do eventually acquire the deed in the land records. Otherwise, for a small number of properties I cannot find any owners at all in the land records, probably because of a filing error in the land records. The final sample excludes one mortgage that was unreadable due to faulty preservation, and any households that were purchasing their homes through installment contracts.

⁴Contemporary sources describe most borrowers with weekly amortization as choosing to pay it on a monthly basis. See "Home Building and Owning Encouraged in Baltimore," *Baltimore Sun*, 11 June 1922. I abstract in this paper from the exact mechanics of amortization used. Rose and Snowden (2014) discuss in detail the types of amortization used by building and loan associations. The predominant method prior to the Depression involved the creation of a sinking fund, into which a borrower would make payments which would be invested in the equity of the association. The loan would be extinguished once the sinking fund reached the principal value of the loan. Borrowers would therefore pay interest on the full amount of the loan for its entire life, but would also receive dividend payments on their sinking funds. Baltimore associations, however, had largely abandoned this form of amortization by the 1920s.

Figure 1: Distribution of Durations on Mortgages in 1930



Notes: Amortization is defined as infrequent if it is semiannual or annual.

Other contracts had short durations. I define a duration as short if it was 7.5 years or less, though Figure 1 shows that, in Baltimore, one and three year contracts were most common. Some of these loans had amortization requirements, while others did not. In addition, the amortization was sometimes on a frequent basis (defined as quarterly, monthly or weekly), and sometimes less frequent. (Generally, interest payments on loans with amortization were required at the same frequency as the amortization payments, and were semiannual or annual on loans without amortization.)

Upon maturity, a short-term contract generally could either be refinanced into a new loan or carried as a demand loan at the willingness of the lender, with payments of interest continuing at the same rate and frequency. In practice, it was common for loans to persist far past their stated terms. The choice to continue on a demand basis would have exposed borrowers to the risk of their loans

Most often they implemented amortization using the “drop-share” method, in which borrowers would buy shares one by one, and once each equity share was bought it would be used to extinguish an equal amount of the loan, i.e. the share would be dropped. Elsewhere this was more commonly known as the “cancel and endorse” method, referring to the cancellation of part of the loan in return for the share being endorsed over to the association. Direct reduction is the more modern form of amortization, in which each payment directly reduces the outstanding principal. There is little economic distinction between the direction reduction, drop-share, and cancel and endorse methods. The direct reduction method became standard by the end of the 1930s. The old sinking fund method lost much popularity during the Depression, as it exposed borrowers to risk through their equity share investments, and those investments suffered greatly during the Depression.

being called by their lenders. Borrowers nevertheless may have preferred to avoid formal renewals in order to avoid the fees associated with new contracts, and may have had informal agreements with lenders about how long their loans could remain outstanding. Similar practices appear to have prevailed in other cities as well.⁵ Whatever the case, lenders appear to have generally conducted a prudential reassessment at maturity and annually thereafter.

Table 2: Breakdown of First Mortgage Lenders in 1930

Type of lender	First Mortgage		Second Mortgage	
	Number	Percent	Number	Percent
Builders	8	1.5	8	4.7
Building and Loans	354	65.7	92	53.8
Commercial Banks	21	3.9	3	1.8
Individuals	50	9.3	59	34.5
Insurance Companies	14	2.6	0	0.0
Mortgage Companies	21	3.9	7	4.1
Savings Banks	71	13.2	2	1.2
Total	539	100.0	171	100.0

Turning to lenders, Table 2 displays a breakdown of the sample by type of lender that held the loans as of 1930. (Some loans were sold in the secondary market after origination and therefore the lender owning the loan in 1930 could differ from the lender that originated the loan). Building and loans (i.e. the institutions that were known as savings and loans after the 1930s) dominated the Baltimore market, funding about two-thirds of the first mortgages. The remaining loans were held by a variety of lenders: savings banks, insurance companies, commercial banks, mortgage companies, builders, and individuals.⁶

Finally, the Baltimore housing market had one unusual feature: the prevalence of leasehold properties. To this day, Baltimore has a large number of properties owned subject to long-term leases, typically 99 years with the option to renew, and therefore indefinite in practice. About

⁵In Boston, savings banks reportedly tended to loan mortgage money on “3 year notes which are held indefinitely on demand after maturity.” In New York, “banks and trust companies, mutual savings banks, and mortgage companies formerly made short-term loans and either renewed or allowed them to run as open mortgages.” See Home Owners Loan Corporation Papers; the Baltimore Survey Report is in box 89; the Boston report in box 42, and the New York report in box 116.

⁶Some of the loans held by individuals were actually held in trust accounts at commercial banks, and the underwriting was often conducted by the trust department officials; however, since the loans were funded by individuals, and since the banks themselves may not have even had the legal ability to own the loans, I classify these as held by individuals.

two-thirds of of mortgaged properties in the data were owned as leaseholds. In economic terms, leaseholds are essentially a financing method, which in the data financed on average about 15 percent of property value.⁷ A later section discusses how leasehold ownership may have affected contract choice in Baltimore.

3 Borrower preferences

In a 1934 survey of potential mortgage borrowers, 25 percent expressed a preference for short-term (defined as 3-5 year) unamortized contracts, while the rest preferred “long”-term (8-13 year) fully amortized contracts.⁸ This paper seeks to understand the underlying factors that generated different preferences across borrowers. The basic argument of this section is that no single contract was optimal for every borrower. Instead, borrowers formed preferences by considering the importance for them of the risks presented by each of the contracts outlined in the previous section.

3.1 Risks presented by interwar mortgage contracts

In the 1920s and 1930s, the key risks to borrowers when considering mortgage contracts were *refinancing risk* and *income risk*. *Refinancing risk* applies to short-term contracts, which upon maturity require borrowers to refinance or continue on a demand basis. Therefore, borrowers carried the risk that a lender would call in their loan at maturity or some point thereafter. This may happen for several reasons, such as if the value of a borrower’s house declined, causing the borrower’s leverage to rise above a level acceptable to the lender; if a borrowers’ creditworthiness fell; or if their lender desired to liquidate their mortgage due to some financial concern unrelated to the borrower.

Income risk applies to borrowers with uncertain income streams, who as a result may wish to avoid frequent amortization. Volatile income sources create the possibility that borrowers may not be able to satisfy frequent payments. For example, a borrower with seasonal income, or higher than average risk of unemployment, might prefer a loan with no amortization or infrequent amortization.

⁷Residential leasehold properties are common in some foreign countries but rare in the US, primarily confined to Hawaii, rural Pennsylvania, and Baltimore. The annual payments required from the leasehold owner to the fee simple owner are known as ground rents. The term “ground” in “ground rent” is misleading, suggesting that the fee simple owner has some claim to the ground but not the structure, which is not true.

⁸The survey was national in scope, with responses from 2,385 people in 100 cities. See American Savings and Loan Institute (1934).

Likewise, business owners or self-employed professionals may have relatively volatile income streams and therefore may prefer to avoid rigid amortization schemes.

Interest rate risk is a topic of much discussion today. Indeed, much of the modern literature on mortgage financing choices focuses on the use of fixed or floating rate contracts. Short-term contracts implicitly carry interest rate risk, as interest rates could potentially be higher when borrowers seek to refinance. However, interest rate risk was largely a non-factor in the 1920s, amid steady mortgages rates. I have not seen any substantial discussions of interest rate risk among contemporaries in the 1920s.

Table 3: Risks posed by mortgage contracts

<p>Short term, frequent amortization</p> <p>More refinancing risk More income risk</p>	<p>Medium term, frequent amortization</p> <p>Less refinancing risk More income risk</p>
<p>Short term, no/infrequent amortization</p> <p>More refinancing risk Less income risk</p>	<p>Medium term, no/infrequent amortization</p> <p>Less refinancing risk Less income risk</p>

To summarize how these risks applied to different contracts, Table 3 presents a menu of four contracts. Contracts in the lower left, with short terms and infrequent amortization, might appeal to borrowers with very good creditworthiness but volatile income. Such borrowers would have relatively more tolerance for refinancing risk given their creditworthiness, and place relatively high value on the optionality of making amortization payments at a schedule of their own choosing. In contrast, contracts in the upper right might appeal to borrowers with relatively low creditworthiness and low income volatility. Such borrowers may have valued the ability to lock in the longest terms available, and would have placed little weight on income risk. Contracts in the upper left, with short terms and frequent amortization, would be relatively unattractive, given their combination of refinancing risk and income risk.

Contracts in the lower right of the table, with long durations and infrequent amortization, were

rare. This is because lenders are typically unwilling to allow large debts to remain outstanding by contract for long periods with no reduction in the principal. That said, the Baltimore market actually offered one financing vehicle of this type, the leasehold estate, as described at the end of the previous section. Leasehold estates were quite popular, likely because they allowed for higher leverage while avoiding both income and refinancing risk. Typically, though, ground rents effectively financed only a small portion of the property value. Overall, since leasehold ownership imposes neither refinancing risk nor income risk on borrowers, it should not factor into contract choice.

3.2 Literature on contract choice

Much of the literature on modern mortgage contract choice focuses on the choice of fixed or floating rates, such as Coulibaly and Li (2009) and Barlevy and Fisher (2011). Refinancing risk is not a factor in these studies, given long terms on either type of contract. Income risk is an important factor, though. Campbell and Cocco (2003) focus on income risk in particular. In their model, most borrowers prefer a floating rate to avoid paying the premium for a fixed rate, but if they have sufficiently volatile labor income they prefer fixed rates in order to avoid shocks to their payment sizes. Piskorski and Tchisty (2010) also study households with uncertain labor income. They conclude the optimal contract is a combination of an interest-only mortgage and a home equity line of credit. These results help support the focus on income risk in this paper, and the Piskorski and Tchisty results in particular are consistent with this paper's results, that borrowers with high income risk could prefer a short-term unamortized contract.

Scholars have also studied the role of financial sophistication in shaping contract choices, including the use of alternative mortgage products. One relevant finding from this literature is that financially literate borrowers often have a higher likelihood of using non-standard products, including interest-only mortgages, and taking on the risks accompanying them. Amromin, Huang, Sialm, and Zhong (2011) find this result in the US, and Cox, Brounen, and Neuteboom (2015) in the Netherlands, though Gatherwood and Weber (2017) find more mixed evidence in the UK. These findings parallel the results of this paper, that relatively high socioeconomic status borrowers were more likely to use short-term interest-only mortgages. Though such mortgages were not a non-standard product in the 1920s, the commonality is the willingness of relatively sophisticated

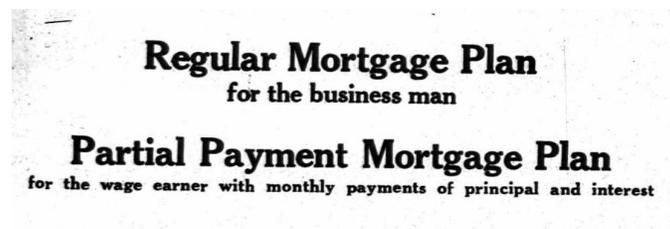
borrowers to take on the risks of interest-only loans.

Outside of households, contract choice is also a subject in the corporate finance literature. Of particular relevance, Flannery (1986) considers how asymmetric information affects debt maturity choices for firms. He concludes that, firms may choose to use short-term debt in order to signal to lenders their creditworthiness through their willingness to take on refinancing risk. Flannery's result again is consistent with this paper's findings that high socioeconomic status borrowers sort into short-term loans.

3.3 Lender preferences

Lender preferences of course also affect what contracts borrowers select, as fundamentally the contract is a joint choice between borrower and lender. Some historical sources suggest that lenders saw frequent amortization payments as a useful way to monitor and maintain contact with borrowers whose creditworthiness was otherwise relatively opaque. In particular, a discussion of Baltimore building and loan associations noted that their "close contact with the borrower" led them to accept higher borrower leverage than most other lenders.⁹

Figure 2: Advertisement by the Central Savings Bank of Baltimore for mortgage loans suitable for the "business man" and the "wage earner"



Source: *Baltimore Sun*, 9 June 1930 p. 6.

Indeed, Figure 2 shows an example of a Baltimore lender explicitly advertising different contracts for different types of borrowers: "the business man" and "the wage earner." The ad suggests business men would be interested in a "regular" contract, which was another term for a short-term unamortized contract. The ad also suggests wage earners would be interested in a "partial payment" contract, which was a 10-year fully amortized contract.

⁹HOLC papers, Box 89, "Building and Loan Associations."

4 Analysis of contract choice in 1930

4.1 Empirical setup

To analyze contract choice, I classify contracts into three types:

1. Short-term contracts of 7.5 years or less, with no amortization or infrequent (annual or semi-annual) amortization
2. Medium-term contracts of more than 7.5 years, with frequent amortization
3. Short-term contracts of 7.5 years or less, with frequent amortization

This classification groups together short-term contracts that have infrequent amortization with those that have no amortization. The rationale is that both types are likely to pose smaller income risk to borrowers compared to more frequent amortization. The data contain virtually no loans that feature medium-term durations and no or infrequent amortization.

I estimate a set of three probit models, with the outcome of each model being a dummy variable representing the choice of each of the three contract types.

4.2 Explanatory variables

Table 4 displays summary statistics for the explanatory variables used in the analysis. Each variable derives either from the 1930 census or from the land records. Census-derived variables describing the characteristic of an individual, such as race or occupation, relate to the household head as identified in the census.

The discussion of risks in the previous section suggests that measures of creditworthiness would be useful in an empirical analysis of contract choice. Credit reports for individuals did exist at the time, but I am not aware of an extant collection that would contain information on Baltimore mortgage borrowers. Instead, I construct two pieces of information related to credit history from the land records data: the number of previous mortgages on the same property, and whether the household used a chattel loan in 1930 or before. Chattel loans, in which borrowers used household possessions like furniture as collateral, are an indicator of a household reaching the end of its ability to raise credit. The number of mortgages provides some information on credit history. In

Table 4: Summary statistics in 1930

variable	N	mean	median	sd	min	p25	p75	max
<i>Baseline variables</i>								
log property frontage	539	3.08	2.75	0.69	2.4	2.6	3.4	5.7
number working adults	539	1.81	1	1.14	0	1	2	6
1(never married)	538	0.033	0	0.18	0	0	0	1
age at first marriage	500	25.2	24	6.0	17	21	28	76
1(has boarders or renters)	539	0.29	0	0.46	0	0	1	1
1(race=black)	539	0.17	0	0.38	0	0	0	1
1(veteran)	539	0.11	0	0.31	0	0	0	1
1(immigrant)	539	0.21	0	0.41	0	0	0	1
age	539	45.9	44	11.8	23	37	54	86
year of purchase	539	1922.5	1924	6.3	1893	1920	1927	1930
1(had chattel mort.)	539	0.037	0	0.189	0	0	0	1
Cumulative # mtges	539	2.425	2	2.007	1	1	3	18
1(has occupation)	539	0.89	1	0.31	0	1	1	1
<i>Additional variables</i>								
1(has servants)	539	0.028	0	0.165	0	0	0	1
log property value	516	8.71	8.70	0.65	6.2	8.3	9.0	10.6
occupational score	375	31.0	28	12.4	4	23	42	80
1(employer)	477	0.059	0	0.235	0	0	0	1
1(self employed)	477	0.191	0	0.393	0	0	0	1
occupation income sd	470	0.575	0.592	0.118	0.3	0.5	0.61	1.18

Notes: Property frontage is measured in feet. The standard deviation of income is estimated using income information for the same occupations in the 1940 census, as described in the text.

particular, a very large number of previous mortgages might be an indicator of borrowers straining to finance their house.

The major limitation of using the land records to construct credit history information is the infeasibility of collecting information on people before they acquired the house which they owned as of the 1930 census. As a result, those who acquired their properties closer to 1930 will naturally have had fewer mortgages on that property, as it would be quite difficult to record what loans they had on previous properties. Including the year of purchase both adjusts for the relationship between tenure and the number of mortgages, and provides another measure of creditworthiness.

In addition, I use several pieces of information from the 1930 census that relate to socioeconomic status. These factors may correlate with creditworthiness, or a more general ability to obtain loans easily. Relevant measures available in the census include whether a household employs live-in servants, the number of working adults living in the house, and the presence of boarders or

renters. In addition, the age of marriage, or never having married, can indicate that the household head was economically capable of delaying marriage, yielding insight into economic status. In terms of income and occupation information, the 1930 census does not report income, but it does report occupation. As a measure of income, Ruggles, Genadek, Goeken, Grover, and Sobek (2017) estimate a median earnings by occupation, known as an occupational earnings score.

House values, as reported by households in the census, could also be an indicator of economic status, but would likely pose challenging interpretation issues. For example, house values could capitalize access to desirable forms of mortgage credit. Therefore, house values could endogenously reflect the availability of certain contract types. (Of course, this effect depends in part on the flexibility of the housing supply in areas with access to desirable mortgage credit; greater flexibility of supply would tend to diminish this price effect.) Therefore, instead of house prices, I use property frontage width as a proxy for the attractiveness of the property, a measure that should not capitalize on local economic opportunities.

The previous section also suggests that a measure of income volatility would be useful. Some information from the 1930 census may be correlated with such volatility, including whether a borrower is self-employed, and whether the borrower is an employer. In addition, I use occupational information to look at the within-occupation dispersion of incomes. Since income information is not available in the 1930 census, though, I calculate this measure using the occupation and income information in the 1940 census.¹⁰

4.3 Simple differences across contracts

Table 5 breaks down the summary statistics across the three types of contracts. Figure 3 shows some of these simple relationships graphically. The data show some strong patterns in which borrowers with markers of relatively high creditworthiness and socioeconomic status are more likely to use short-term contracts with no or infrequent amortization. These markers include no history with chattel mortgages, not having had a large number of mortgages, larger properties, higher incomes, fewer working adults in the house, not having been married young, higher property values, and employing live-in servants.

¹⁰Specifically, I match occupation-state-gender-age bins in 1930 with the same bins in 1940, and take the median income for each bin. I thank Dan Aaronson and Karl Schulze for generously sharing with me their algorithm to perform this matching with the 1940 census.

Table 5: Differences in Means Across Contract Types, 1930

Variable	Full sample		Short term, infreq. amort.	Medium term, frequent amort.	Short term, frequent amort.		
	N	mean	mean	mean	p value	mean	p value
<i>Baseline variables</i>							
log property frontage	539	3.08	3.54	2.88	0.00	2.95	0.00
number working adults	539	1.81	1.59	1.94	0.00	1.69	0.58
1(never married)	538	0.03	0.03	0.04	0.78	0.03	0.98
age at first marriage	500	25.2	26.5	24.7	0.00	25.8	0.57
1(has boarders or renters)	539	0.29	0.26	0.31	0.24	0.25	0.89
1(race=black)	539	0.17	0.13	0.18	0.23	0.38	0.00
1(veteran)	539	0.11	0.13	0.10	0.40	0.09	0.59
1(immigrant)	539	0.21	0.18	0.24	0.17	0.09	0.22
age	539	45.87	45.41	45.93	0.64	48.06	0.25
year of purchase	539	1922.5	1923.1	1922.4	0.23	1920.8	0.06
1(had chattel mort.)	539	0.04	0.01	0.03	0.31	0.28	0.00
Cumulative # mtges	539	2.42	2.23	2.37	0.37	4.13	0.00
1(has occupation)	539	0.89	0.87	0.89	0.59	1.00	0.03
<i>Additional variables</i>							
1(has servants)	539	0.03	0.08	0.00	0.00	0.06	0.75
log property value	516	8.71	9.26	8.47	0.00	8.53	0.00
occupational score	375	31.0	35.6	29.2	0.00	27.5	0.01
1(employer)	477	0.06	0.07	0.05	0.38	0.06	0.87
1(self employed)	477	0.19	0.25	0.16	0.01	0.25	0.97
occupation income sd	470	0.58	0.59	0.57	0.05	0.61	0.37

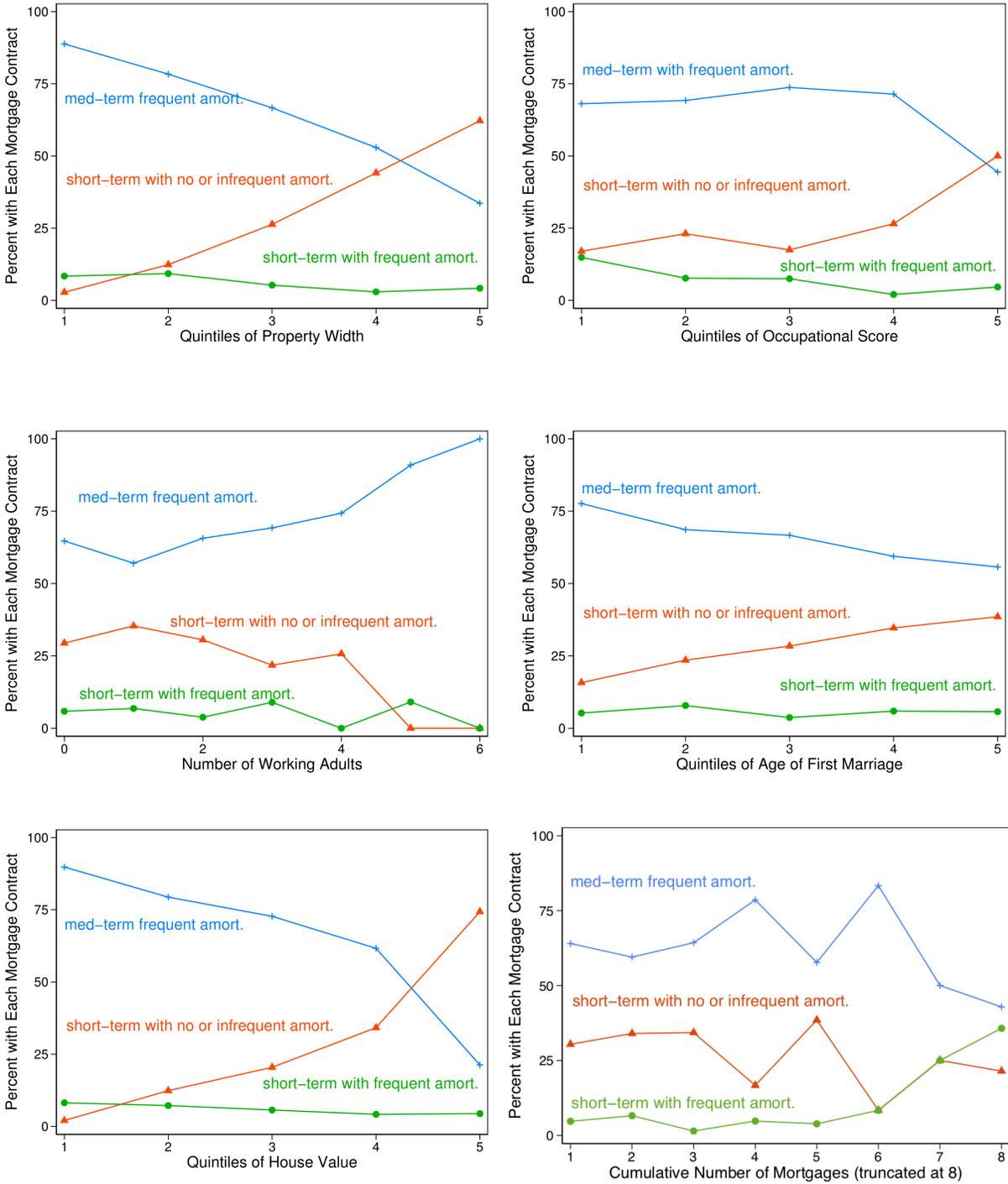
Notes: The p values are the result of simple difference in mean tests between each of the two subsamples on the right with the short-term infrequent amortization subsample.

Note that in Table 5, zero borrowers with medium-term contracts had live-in servants, and every borrower with short-term frequently amortized contracts had an occupation. As a result, I omit these variables from the probit models below when including them would perfectly predict contract choice.

4.4 Baseline results

The results of the probit models are reported in Table 6. I report two different specifications, including and not including the marriage age variables, which reduce the sample size a bit given missing data. This baseline specification also excludes the occupational variables, which I analyze in the next section since they significantly reduce the sample.

Figure 3: Associations Between Contract Choice and Selected Independent Variables, 1930



The results confirm the basic patterns that emerged in the summary statistics. Measures of relatively high socioeconomic status predict less use of medium-term contracts or more use of

Table 6: 1930 Probit Estimates, Marginal effects

	Probit Short term, infreq. amort.		Probit Medium term, frequent amort.		Probit Short term, frequent amort.	
	(1)	(2)	(3)	(4)	(5)	(6)
log property frontage	0.306*** (0.0711)	0.291*** (0.0713)	-0.307*** (0.0690)	-0.295*** (0.0699)	-0.00998 (0.0199)	-0.0109 (0.0189)
Number working adults	-0.0360 (0.0232)	-0.0217 (0.0234)	0.0611*** (0.0224)	0.0489** (0.0245)	-0.0110* (0.00638)	-0.0125* (0.00683)
1(never married)		0.265 (0.166)		-0.293* (0.166)		0.0514 (0.0631)
age at first marriage		0.00802* (0.00436)		-0.00966** (0.00433)		0.00178 (0.00126)
1(has boarders/renters)	0.0166 (0.0622)	0.0275 (0.0720)	0.0412 (0.0661)	0.0287 (0.0740)	-0.0396*** (0.0153)	-0.0353** (0.0168)
1(race = black)	0.134* (0.0766)	0.0584 (0.0866)	-0.168** (0.0666)	-0.0829 (0.0671)	0.0322 (0.0407)	0.0161 (0.0299)
1(veteran)	0.0793 (0.0662)	0.0701 (0.0671)	-0.0510 (0.0665)	-0.0433 (0.0653)	-0.0123 (0.0176)	-0.0114 (0.0155)
1(immigrant)	0.0617 (0.0795)	0.0541 (0.0771)	-0.0250 (0.0625)	-0.0216 (0.0585)	-0.0306* (0.0161)	-0.0274* (0.0161)
age	-0.000439 (0.00204)	-0.00224 (0.00232)	-0.00174 (0.00224)	0.000655 (0.00262)	0.000800 (0.000694)	0.000502 (0.000645)
year of purchase	-0.00382 (0.00638)	-0.00469 (0.00615)	0.00335 (0.00631)	0.00495 (0.00613)	0.000571 (0.00182)	0.000330 (0.00161)
1(had chattel mort.)	-0.182 (0.131)	-0.146 (0.132)	-0.214 (0.136)	-0.212 (0.144)	0.120*** (0.0316)	0.104*** (0.0304)
Cumulative # mtges	-0.0110 (0.0153)	-0.00367 (0.0149)	0.000932 (0.0164)	-0.0106 (0.0168)	0.00548 (0.00445)	0.00871* (0.00462)
1(has occupation)	-0.0908 (0.0701)	-0.0534 (0.0769)	-0.0190 (0.0794)	-0.0535 (0.0916)		
Observations	539	500	539	500	539	500
Pseudo-R2	0.172	0.179	0.145	0.155	0.159	0.165

Notes: Each column is a separate probit estimation. The table reports the marginal effects on the probability of each column's contract, evaluated at the means of the independent variables. For dummy variables, the table displays the effect of a change from zero to one. This standard errors are clustered at the block level. The symbols ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels.

the short-term contracts with no or infrequent amortization. High status borrowers likely had the ability to arrange for the contract of their choice, and therefore the results suggest that the medium-term fully amortized contract was not necessarily the most sought after contract for all borrowers.

In particular, the predictive power of the property size is statistically quite strong, with borrowers less likely to use a medium-term contract if they had wider properties. In terms of magnitude,

a 0.5 log point increase in property width (say from 2.5 to 3.0, or roughly from 12 to 20 feet, the difference between a very narrow house and a larger than average rowhouse) is associated with about a 15 percent decrease in the probability of a medium-term contract.

Otherwise, households with chattel mortgage history were more likely to use frequently amortized short-term contracts, by about 10 percentage points. Households whose heads married relatively late (or never married) tended to use short-term infrequently amortized contracts. The results also show that households with more working adults are more likely to use medium-term frequently amortized contracts, consistent with theory. Each additional adult is associated with a 6 percentage point increase in the likelihood of choosing this contract. The number of working adults is a socioeconomic indicator, but could also relate to income risk. Income diversification from multiple working adults might lower expected income volatility and therefore increase a household's willingness to take on frequent amortization. The results concerning borrower race will be discussed in a subsequent section.

4.5 Occupational variables

Table 7 displays the results from including the occupational and income variables, again using a set of probit models. These variables were excluded from the prior analysis because missing information for many observations reduces the sample size. (In particular, many older borrowers report no occupation, likely because they are retired.) Except for the inclusion of the occupational variables, each specification includes the full set of baseline controls from Table 6.

The results in specifications A and B show strong predictive power for the occupational score. Specification A includes the occupational score as a linear term, while specification B includes it more flexibly as quintiles. The latter specification suggests the effects are largely due to the highest occupational scores, as borrowers with occupations in the upper quintile are 28 percentage points more likely to have short-term infrequent amortization contracts.

Specification C indicates that self employed borrowers were more likely to use short-term infrequently amortized contracts. This result could be consistent with higher creditworthiness of such borrowers, for example if they have built up a successful business. The results could also reflect potential income volatility for the self employed, leading them to dislike frequent amortization. In a specification including both the self employed variable and the occupational score quintiles

Table 7: 1930 Probit Estimates Including Occupational and Income Variables

	Short term, infreq. amort. (1)	Medium term, frequent amort. (2)	Short term, frequent amort. (3)
<i>Specification A</i>			
occupational score	0.00640** (0.00249)	-0.00531* (0.00304)	-0.000824 (0.000595)
Observations	357	357	357
<i>Specification B</i>			
1(occ score quintile 2)	0.125 (0.0876)	-0.109 (0.100)	0.00610 (0.0278)
1(occ score quintile 3)	0.0750 (0.101)	-0.0543 (0.0995)	-0.00379 (0.0260)
1(occ score quintile 4)	0.143* (0.0840)	-0.0468 (0.0846)	-0.0365** (0.0178)
1(occ score quintile 5)	0.283*** (0.102)	-0.241** (0.107)	-0.0261 (0.0270)
Observations	357	357	357
<i>Specification C</i>			
1(employer)	0.0754 (0.0902)	-0.125 (0.0862)	-0.00110 (0.0239)
1(self employed)	0.121** (0.0499)	-0.130** (0.0514)	0.00937 (0.0200)
Observations	455	455	455
<i>Specification D</i>			
occupational income dispersion	0.191 (0.264)	-0.314 (0.285)	0.0755 (0.0617)
Observations	447	447	447

Notes: Each specification includes the full set of baseline controls from Table 6. Each column is a separate probit estimation. The table reports the marginal effects on the probability of each column's contract, evaluated at the means of the independent variables. For dummy variables, the table displays the effect of a change from zero to one. This standard errors are clustered at the block level. The symbols ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels.

(not shown), the self employed variable loses predictive power while the topmost occupational score quintile retains strong predictive power. This suggests that the mechanism underlying the predictive power of the self employed variable is largely through economic status.

Finally, specification D includes the occupational income dispersion variable, estimated from

1940 census data. The results indicate the variable has little predictive power over contract choices, though this result should not be taken too seriously given the poor measure of expected income volatility.

Table 8: Contract Use by Borrowers' Industry of Employment

Industry	Number	Percent with		
		Short term, infreq. amort.	Medium term, frequent amort.	Short term, frequent amort.
Transportation, communication, utilities	38	5.3	84.2	10.5
Government	32	12.5	71.9	15.6
Manufacturing - nondurable goods	64	25.0	70.3	4.7
Manufacturing - durable goods	62	29.0	67.7	3.2
Construction and mining	28	32.1	57.1	10.7
Other services	90	33.3	58.9	7.8
Wholesale and retail trade	93	36.6	58.1	5.4
Finance, Insurance and Real Estate	36	50.0	44.4	5.6
Unclassifiable, unavailable, or none	94	35.1	63.8	1.1

Notes: The industries are sorted by use of short-term contracts with infrequent amortization, in increasing order.

Turning to industry information, Table 8 displays a simple cross-tabulation of contract choice by broad industry of employment for borrowers that report such information in the census. Generally, borrowers appear more likely to use frequently amortized medium term contracts if they are employed in sectors with relatively little seasonal volatility, such as the government. In contrast, borrowers in more seasonally volatile sectors, such as wholesale and retail trade, are more likely to use contracts with infrequent amortization.

4.6 Race

Black borrowers are a population historically of interest in the study of access to credit, as they have long been discriminated against in the housing and mortgage markets. The literature on racial discrimination in mortgage markets tends to focus on the post-1930 period, and especially on the redlining practices of federal government programs. Jackson (1980) and Hillier (2003) are defining papers in this literature. Recently, new research by Aaronson, Hartley, and Mazumder (2017) examines the long-term effects of federal policies from this era.

Of course, discrimination in the mortgage market pre-dated the federal government's intervention, though the federal government institutionalized it to a much greater degree. The data used in this paper from Baltimore cannot address the matter of redlining given the limited geographic variation. Nevertheless, the data do provide an opportunity to study differences in mortgage contracts along racial lines. In addition, the setting in 1930 means that the differences are not due to federal policy that promoted racial discrimination or the use of long-term contracts.

Raw summary statistics in Table 9 show that the share of black borrowers using medium-term contracts was about the same as the share of white borrowers.¹¹ However, the results from the baseline estimation in Table 6 suggested that black borrowers were about 17 percentage points less likely to use a medium term contract. These results are consistent with a line of thought in which black borrowers would have used medium term contracts even more than white borrowers, but discrimination prevented some black borrowers from obtaining these contracts while similar nonblack borrowers were able to obtain them. Of course, more information on creditworthiness and other borrower characteristics would strengthen this finding. The modern literature on racial discrimination in lending typically uses a host of creditworthiness controls, and lenders in 1930 certainly had access to more creditworthiness information than I have been able to assemble for the estimation.

Another element in the racial dynamics of mortgage lending was the exclusion of blacks by certain types of lenders. Table 9 shows very little interaction between black borrowers and savings banks, insurance companies, and commercial banks. These institutions were known as well-regulated and conservative institutions, but in the process of cherry picking the best credit risks, they appear to have avoided the city's black population. For example, Thon (1935) describes savings banks in Baltimore as generally making loans "on high class residential, church, or business property. The poorer residential sections of the city are avoided" (p. 69). Black borrowers instead were more likely to borrow from mortgage companies and building and loans, both of which were unregulated in Maryland. For borrowers exposed to refinancing risk on short-term contracts, the stability of their lenders was quite important. Lenders running risky business models may have been more likely to refuse refinancing at maturity because of poor financial condition.¹²

¹¹Note that the sample contains only white and black homeowners. A small number of other nonblack minorities owned homes in Baltimore at the time, but they did not end up in the sample.

¹²The mortgage companies in particular operated fragile business models, dependent on wholesale funding. Many

Table 9: Lender and Contract Breakdowns by Race of Borrower, 1930

Type of lender	White borrowers		Black borrowers	
	Number	Percent	Number	Percent
Individuals	42	9.4	8	8.5
Building and Loans	283	63.6	71	75.5
Savings Banks	69	15.5	2	2.1
Mortgage Companies	11	2.5	10	10.6
Insurance Companies	14	3.1	0	0.0
Commercial Banks	19	4.3	2	2.1
Builders	7	1.6	1	1.1
Total	445	100.0	94	100.0

Type of contract	White borrowers		Black borrowers	
	Number	Percent	Number	Percent
Short term, no amort.	119	26.7	20	21.3
Short term, infrequent amort.	23	5.2	2	2.1
Short term, frequent amort.	20	4.5	12	12.8
Medium term, frequent amort.	281	63.1	60	63.8
Other	2	0.4	0	0.0
Total	445	100.0	94	100.0

Additional data on racial aspects of mortgage lending in this era are scarce. The 1934 Financial Survey of Urban Housing (Wickens 1937) reports race-lender information for five cities. In these limited data, the most consistent difference along racial lines is that life insurance companies made relatively few loans to blacks, providing 12 percent of white borrowers' loans versus 4 percent for black borrowers. This is consistent with the pattern in Baltimore. Otherwise, the racial gaps across lenders exhibit different patterns across even just these five cities. National statistics from the 1940 census cover more cities, but they reflect developments during the 1930s including the Depression and federal policies. These data show a similar pattern to Baltimore in which commercial banks, savings banks, and life insurance companies provided 28 percent of mortgages for white borrowers, but only 13 percent for black borrowers.

mortgage companies in this period were dependent in particular on a wave of securitization that took place in the 1920s, in which the companies issued bonds direct to investors. All came under catastrophic funding pressure in the late 1920s, even before the onset of the Depression, when investors refused to buy any more of their bonds and demanded redemption at maturity of the bonds they held. The latter caused these mortgage companies to insist on payment at maturity from their borrowers, realizing the refinancing risk inherent in those short-term contracts.

4.7 Interest rates and leverage

The analysis thus far has focused on how income and refinancing risk affected contract choice. Of course, other contract characteristics also affected contract choice. This section focuses in particular on interest rates and leverage.

Table 10: 1930 Interest Rates by Contract and by Lender

Interest Rate	Total Obs.	By Contract Type			By Lender Type		
		Short term, infreq. amort.	Medium term, frequent amort.	Short term, frequent amort.	Savings banks, commercial banks, insurance companies	Building and loans	Individuals, mortgage companies, builders
5	6	5	1	0	4	0	2
5.5	57	55	0	2	55	0	2
6	271	98	160	9	47	150	74
6.24	196	0	176	17	0	197	0
6.66	1	0	1	0	0	1	0
6.93	2	0	2	0	0	2	0
7.8	1	0	1	0	0	1	0
NA	4	1	2	0	0	3	1
Total	538	159	343	28	106	354	79

Notes: Interest rate information is missing for one observation.

Table 10 shows the distribution of interest rates in the sample. Interest rate variation was relatively limited, with almost all contracts bearing interest rates between $5\frac{1}{2}$ and $6\frac{1}{4}$ percent. Nevertheless, the limited variation in interest rates is not random across contract types. Rates below 6 percent were generally only found in short-term infrequently amortized contracts. The lower interest rates could reflect lower risk premiums, which would be consistent with high creditworthiness borrowers sorting into those contracts. Lower rates would also be consistent with lower term premiums, though, given the shorter durations of the contracts.

This variation in interest rates, though limited, raises the question of whether the contract choices in the data are simply the result of some borrowers seeking lower rates. To address this, Table 11 displays a robustness check, repeating the baseline probit analysis but for the subsample of loans with 6 percent interest rates, the most common rate in the data. With no interest rate variation in this sample, the choice among contracts is necessarily driven by other factors. (I omit

Table 11: Robustness: Restricting Sample by Interest Rate

	Sample: interest rate = 6 percent	
	Probit Short term, infreq. amort.	Probit Medium term, frequent amort.
<i>Specification A</i>		
log property frontage	0.186*** (0.0547)	-0.225*** (0.0772)
Number working adults	-0.00564 (0.0278)	0.0192 (0.0308)
1(never married)	0.188 (0.239)	-0.171 (0.250)
age at first marriage	0.00577 (0.00585)	-0.00693 (0.00623)
Observations	253	253
Pseudo R-squared	0.0992	0.102
<i>Specification B</i>		
occupational score	0.00726** (0.00328)	-0.00752** (0.00346)
Observations	180	180
Pseudo R-squared	0.0920	0.116

Notes: Both specifications include the full set of explanatory variables shown in Table 6. Each column is a separate probit estimation. The table reports the marginal effects on the probability of each column's contract, evaluated at the means of the independent variables. For dummy variables, the table displays the effect of a change from zero to one. This standard errors are clustered at the block level. The symbols ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels.

the estimation for the third contract type, with short-term frequently amortized contracts, given the very low number of positive outcomes for this third group in the restricted sample.) The results are broadly similar to the baseline results, with log property frontage and occupational scores continuing to predict usage of short-term infrequently amortized contracts. However, the results show no predictive power for the number of working adults or age of marriage variables. For the borrowers using short-term contracts in this sample, low interest rates were not the reason. Instead, the only remaining advantages would be infrequent amortization, and potentially the relationship with certain lenders.

Turning to leverage, short-term loans tended to have stricter loan-to-value (LTV) ratio requirements than medium-term contracts. In Baltimore, LTVs on short-term contracts usually could not

exceed 60 percent, whereas LTVs on medium term contracts could reach 70 percent. Lenders of medium-term contracts may have been more comfortable with the higher LTVs because of the amortization required by their contracts, which ensured the gradual reduction of debts over time. The stricter LTV requirements on short-term loans may also reflect the institutional conservatism on the part of savings banks, commercial banks, and insurance companies, that offered such loans.¹³

In principle, it is not clear whether the leverage available on a first mortgage contract really imposed much of a constraint on borrowers, since a borrower could always take out junior mortgages. Indeed, a borrower seeking both high leverage and infrequent amortization could be better off with the combination of an unamortized first mortgage and an amortized second mortgage, compared to a single large amortized first mortgage.

Nevertheless, as a robustness check, Table 12 displays the results from restricting the sample to loans with leverage of 60 percent or less. In this restricted sample, the choice of contracts is necessarily not the result of obtaining first mortgage leverage only available through medium-term loans. A major caveat is that measuring leverage in the data is difficult, since the data only record loan amounts at origination. To proceed, I calculate a crude measure of leverage as of 1930 using the original loan amount and the self-assessed property value as of the 1930 census. I also constrain the sample to loans made in 1925 or after, a period of relative house price stability (since property prices peaked around 1925 and did not significantly decline until 1931-1933), in order to limit potential changes in leverage between the time of origination and 1930. The results are broadly similar to the baseline results, though the occupational score loses statistical significance, likely in part because of the small number of observations.

4.8 Junior mortgages

Thus far, the analysis has largely considered only borrowers' first mortgage choices. Of course, the first mortgage contract is just one part of a decision over how to finance the ownership of a property, which also includes whether to have a second or third mortgage contract, and the form of those contracts. For borrowers concerned about income or refinancing risk, second mortgage contracts can clearly pose the same risks, even if the risks would be more moderate in magnitude

¹³HOLC papers, Baltimore Survey pp. 16-20

Table 12: Robustness: Restricting Sample by Leverage

	Sample: lower loan-to-value loans		
	Probit Short term, infreq. amort. (1)	Probit Medium term, frequent amort. (2)	Probit Short term, frequent amort. (3)
<i>Specification A</i>			
log property frontage	0.267*** (0.0968)	-0.339*** (0.108)	0.0231 (0.0278)
Number working adults	-0.0452 (0.0433)	0.0720* (0.0410)	-0.00906 (0.0141)
1(never married)	0.382* (0.206)	-0.480** (0.221)	0.0621 (0.121)
age at first marriage	0.00357 (0.00641)	-0.00707 (0.00579)	0.00193 (0.00264)
1(had chattel mort.)	-0.123 (0.127)	-0.714*** (0.265)	0.234** (0.0991)
Observations	195	195	195
Pseudo R-squared	0.201	0.216	0.211
<i>Specification B</i>			
occupational score	0.00460 (0.00339)	-0.00191 (0.00423)	-0.00116 (0.00142)
Observations	137	137	137
Pseudo R-squared	0.258	0.287	0.365

Notes: Each specification includes the full set of explanatory variables shown in Table 6. Each column is a separate probit estimation. The table reports the marginal effects on the probability of each column's contract, evaluated at the means of the independent variables. For dummy variables, the table displays the effect of a change from zero to one. This standard errors are clustered at the block level. The symbols ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels.

given the smaller sizes of second mortgages.

With this in mind, column (1) of Table 13 displays the result of a probit estimation in which the outcome variable is a dummy for whether a borrower has any mortgage that contains frequent amortization. Column (2) shows the results of a similar estimation in which the outcome variable is a dummy for whether the borrower has any mortgage with a short term. In these estimations, I cannot include the chattel variable, as every borrower who had a chattel mortgage also had frequent amortization on at least one of their mortgage contracts. The results are again similar to the previous analysis.

Table 13: Robustness - Junior Mortgages

	Probit Frequent amort. on any mortgage (1)	Probit Short term on any mortgage (2)
<i>Specification A</i>		
log property frontage	-0.180*** (0.0399)	0.283*** (0.0569)
Number working adults	0.0370* (0.0192)	-0.00954 (0.0269)
1(never married)	-0.136 (0.129)	0.299* (0.180)
age at first marriage	-0.00529 (0.00347)	0.00963** (0.00482)
1(has boarders/renters)	-0.0266 (0.0505)	-0.0835 (0.0579)
1(race = black)	0.143*** (0.0434)	0.218*** (0.0611)
1(veteran)	-0.0184 (0.0582)	0.0341 (0.0755)
1(immigrant)	0.00680 (0.0522)	0.0186 (0.0694)
age	0.000265 (0.00180)	0.00233 (0.00334)
year of purchase	0.00739 (0.00460)	0.0111 (0.00698)
1(had chattel mort.)		0.185 (0.118)
Cumulative # mtges	0.0501*** (0.0156)	0.0730*** (0.0192)
1(has occupation)	0.0497 (0.0606)	0.0220 (0.0993)
Observations	500	500
Pseudo R-squared	0.230	0.155
<i>Specification B</i>		
occupational score	-0.00529*** (0.00175)	0.00585* (0.00301)
Observations	357	357
Pseudo R-squared	0.248	0.187

Notes: Column one shows results from a probit predicting a dummy variable that equals one if a borrower has any mortgage that requires frequent (greater than semiannual) amortization. Column two shows results from a probit predicting a dummy variable that equals one if a borrower has any mortgage with a short term. The table reports the marginal effects on the probability of each column's contract, evaluated at the means of the independent variables. For dummy variables, the table displays the effect of a change from zero to one. This standard errors are clustered at the block level. The symbols ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels.

4.9 Leasehold ownership

How did the prevalence of leasehold ownership in Baltimore, described in section 2, affect contract choice? Starting with the data, Table 14 shows some strong differences in loan contracts across properties owned as leaseholds or in fee simple. Leaseholds borrowers were much more likely to have medium term mortgages, and indeed building and loan associations in Baltimore were known for their greater willingness to loan on leasehold properties compared to other lenders. Some other lenders, particularly the conservative savings banks, insurance companies, and commercial banks, were reluctant to lend on leasehold properties because of lien priority issues, since leasehold obligees have first liens above any mortgages.

Table 14: Leasehold ownership in 1930

	Leasehold ownership	Fee simple ownership	Percent leasehold
Not mortgaged	228	220	50.9
Mortgaged	346	193	64.2
Short term, no amort.	41	98	29.5
Short term, infrequent amort.	4	21	16.0
Short term, frequent amort.	25	7	78.1
Medium term, frequent amort.	275	66	80.6
Other	1	1	50.0
All	574	413	58.2

Whether these lender preferences drove the mix of contracts in the data depends on whether leasehold ownership acted as a constraint on borrowers' abilities to obtain certain contracts, which in general is false. Rather than a constraint, leasehold ownership should be viewed as a choice by borrowers. A leasehold was a choice because leaseholds could be redeemed at the option of the leasehold tenant at a price fixed by law. The details of the redemption transaction are somewhat complicated, but essentially at the time of the 1930 census any lease created after 1884 or before 1925 was redeemable. The price of redemption was generally capped at a 6 percent capitalization. Therefore, leaseholds should be seen as a financing method that borrowers could choose as part of a joint choice with any mortgage contract they might also enter into. Indeed, an optimizing borrower with a redeemable leasehold could obtain a contract with the lender of his or her choice by executing a redemption, essentially refinancing the leasehold in the process. A redemption

would have been especially easy to arrange at the time of purchasing a home. The land records contain many examples of such redemptions.

Leaseholds were a popular form of financing because they imposed no refinancing risk and low income given that payments were required at only a semi-annual basis. In fact, they appear to have allowed borrowers to increase their overall leverage as well. For example, consider a \$5,000 property. Without a ground rent, a homeowner might take out a first mortgage loan for 70 percent of value, or \$3,500. Alternatively, the homeowner could create a leasehold estate by with a capitalized value of, say, \$500, i.e. \$30 a year at a 6 percent capitalization. At that point, the homeowner could take out a 70 percent loan on the leasehold estate, or \$3,150 of the \$4,500 value. Altogether, then, the homeowner would have somewhat higher leverage, having financed \$3,650, or 73 percent of the property value.

The takeaway from this discussion of leaseholds, and the discussion of leverage in the previous section, is that the pursuit of leverage likely was a motivator for many to choose medium term contracts and leasehold ownership. But leverage choices cannot explain all of the variation in the data. In particular, high socioeconomic status borrowers could have chosen any contract they desired, but show strong preferences for short-term contracts. The choices of low creditworthiness borrowers is also hard to explain through leverage. These borrowers likely would have taken out a medium term contract if a lender were willing, but found it difficult to access anything except short-term frequently amortized contracts.

5 Depression experience

This section briefly discusses the large economic shocks that affected the mortgage market during the Great Depression, and the associated institutional changes that took place in the market. These events are key background for understanding contract choice in 1940, which is analyzed in the next section.

The combination of lower house prices and reduced incomes during the Depression years led to a wave of foreclosures across the country. Fishback, Rose, and Snowden (2013) estimate that the rate of foreclosure was likely 2.5-3.0 percent of outstanding loans a year at peak in the early 1930s, and that the cumulative total from 1926 to 1936 was 10-20 percent of all residential mortgages. In

line with these estimates, the Baltimore data show that 14 percent of the mortgages outstanding in 1930 ended either in foreclosure or in the borrower deeding the property to the lender in lieu of repaying the debt. Another 11 percent were refinanced by the Home Owners' Loan Corporation (HOLC), which was a federal relief program that refinanced distressed mortgages from 1933 to 1936.

Table 15: Rates of foreclosure and HOLC take-up among loans outstanding as of 1930

Type of contract	Total	Foreclosures or deeds-in-lieu		Refinanced with HOLC	
		Number	Percent	Number	Percent
Short term, no or infrequent amort.	164	16	9.8%	19	11.6%
Short term, frequent amort.	31	6	19.4%	5	16.1%
Medium term, frequent amort.	342	54	15.8%	35	10.2%
Other	2	0	0.0%	0	0.0%
Total	539	76	14.1%	59	10.9%

Across contract types, Table 15 shows that foreclosure rates were highest on short-term contracts with frequent amortization. These results should not be interpreted causally, especially since this paper shows strong selection of borrowers into different contracts. For example, the higher rate of foreclosure on short-term contracts with frequent amortization likely reflects a combination of factors, including the risky nature of those contracts, the fragile business models of lenders who wrote those contracts, and the relatively poor creditworthiness of the borrowers who took out those contracts.

In response to this foreclosure crisis, the federal government responded by setting up a number of new institutions in quick succession to shore up the home mortgage market. In 1931, the Federal Home Loan Banks (FHLBs) were created to provide liquidity facilities for mortgage lenders, particularly building and loan associations. In 1932, a charter for federal savings and loan associations (FSLAs, using the new nomenclature for building and loans) became available for the first time. In 1933, the HOLC was created. In 1934 the Federal Housing Administration (FHA) began offering insurance to lenders on their mortgage loans. In 1938, the Federal National Mortgage Association (quickly dubbed Fannie Mae) launched as a secondary market actor in the FHA loan market. Altogether, these institutions represented a major intervention by the federal government

in residential mortgage finance.

Federal policymakers took many lessons from the poor experience of the mortgage market in the Depression, and had grand visions for remaking it. This vision was explicitly laid out, for example in a 1934 article by John Fahey, the head of the newly founded Federal Home Loan Bank Board, which oversaw the HOLC, the FHLBs, and the FSLAs.¹⁴ The manifesto listed many goals, not all of which were successfully put in place. One major goal espoused by Fahey was the widespread adoption of long-term loans with frequent amortization, and the phasing out of short-term contracts. Fahey wrote:

To the home owner the short-term first mortgage has caused almost as much distress as the second mortgage. When a short-term mortgage comes due in hard times, the lending institution usually refuses to renew or else demands a substantial reduction of principal. As this demand is made at the very time when the home owner is least able to make that reduction, foreclosure is frequently the only alternative. This situation works a hardship also on the entire real estate market, for foreclosures and inability to borrow on real estate depress the prices of all properties.

Fahey's plans resembled earlier calls for reform, reflecting a long-standing concern by policymakers about short-term contracts. For example, President Hoover convened a conference in 1931, amidst rising foreclosures, to diagnose defects in the American home financing system. The conference report criticized short-term unamortized mortgages for the refinancing risk they exposed borrowers to and recommended that all borrowers consider longer-term fully amortized contracts. Yet, consistent with the findings of this paper, the report stopped short of calling for an elimination of short-term loans, as it still admitted that "there are times when short term straight mortgages are necessary" and suggested that borrowers consult with their local mortgage agencies to find the loan that best fits their financial situation (Gries and Ford 1932, pp. 6-7).

The FHLB and S&L programs encouraged a modest lengthening of loan terms up to about 15 years, and the HOLC directly provided 15-year contracts to all of its borrowers. The FHA promoted longer terms of 20 years from its inception, and 25 years for some borrowers beginning in 1938. The reach of these programs, however, was uneven. Only some B&Ls and S&Ls joined the

¹⁴*Federal Home Loan Bank Review*, vol. 1 no. 1, October 1934, pp. 1-14.

FHLB system or converted to federal charters. The HOLC reached many borrowers but ultimately was a temporary program that ceased writing new loans in 1936. Likewise, the FHA reached only a subset of borrowers that it targeted, and by policy directed lenders to avoid black neighborhoods.

6 Contract choice in 1940

6.1 Changes in the market from 1930 to 1940

Over the ten year period from 1930 to 1940, the use of short-term contracts fell roughly 10 percentage points, from about 35 percent in 1930 to about 25 percent in 1940, as can be seen in Table 16. This table also shows a small number of long-term loans, capturing a snapshot of a time when long terms were just beginning to become more widespread. (Long terms are defined somewhat arbitrarily as exceeding 15 years. All HOLC loans carried 15 year terms, which therefore in this table are classified as medium terms.)¹⁵ The table also shows a significant reduction in the overall number of mortgages compared to 1930, from 539 to 409, reflecting a decline after the Depression in the number of homeowners and in the use of mortgages among homeowners.

Table 16: Contracts in 1940

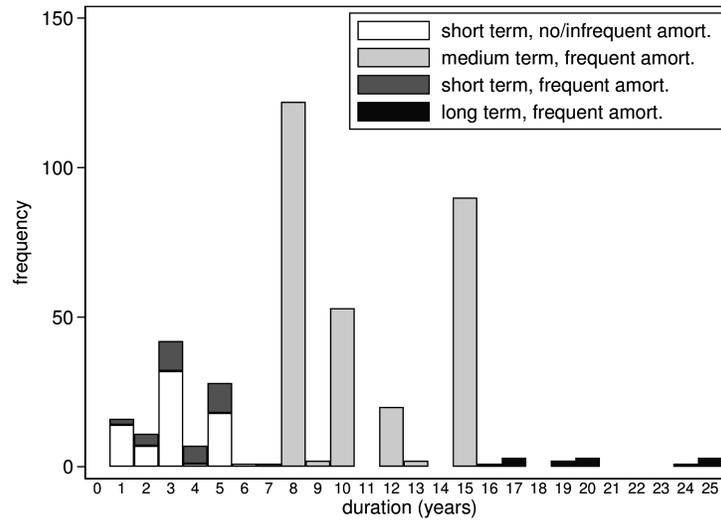
Type of contract	First Mortgage		Second Mortgage	
	Number	Percent	Number	Percent
Short term, no amort.	61	14.9	38	43.7
Short term, infrequent amort.	12	2.9	0	0.0
Short term, frequent amort.	35	8.6	44	50.6
Medium term, frequent amort.	287	70.2	5	5.7
Long term, frequent amort.	14	3.4	0	0.0
Total	409	100.0	87	100.0

Notes: A term is considered short if it is 7.5 years or less, medium if it is 7.5-15 years, and long if more than 15 years. Amortization is considered infrequent if it is semiannual or annual, and frequent if weekly, monthly, or quarterly.

The composition of lenders, shown in Table 17, also evolved over this period. One of the biggest changes is the credit outstanding from the HOLC. The HOLC's reach was quite large,

¹⁵Beginning in late 1939, the Mead-Barry Act granted the HOLC authority to extend loans to as long as 25 years. The sample, a snapshot of early 1940, did not end up capturing any such loans.

Figure 4: Distribution of Durations on Mortgages in 1940



Notes: Amortization is defined as infrequent if it is semiannual or annual.

having refinanced about 20 percent of all nonfarm mortgages nationwide. As of 1940 in this sample from Baltimore, it accounted for 17 percent of outstanding loans.¹⁶

The FHA's reach was still limited in 1940. Nationally, only 13 percent of outstanding loans were FHA insured, and takeup appears to have been lower in Baltimore, with FHA loans accounting for 4 percent of the 1940 loans. The durations on these FHA loans ranged from 10 to 25 years, with half exceeding 15 years. Of the long-term loans in the sample, FHA-insured loans accounted for about half, and the rest were uninsured and all written by insurance companies.

Overall, the presence of the HOLC and FHA raises issues of interpretation. In 1930, contract choices reflected decisions by borrowers and lenders, not government policy, whereas in 1940 access to federal programs also affects contract choice. HOLC borrowers were a specific group whose loans were in danger of foreclosure between 1933 to 1936 and were able to qualify for

¹⁶This 17 percent figure is larger than an earlier figure presented in Table 15, which showed that 11 percent of the mortgage outstanding in 1930 were refinanced by the HOLC. The discrepancy is likely the result of the fact that Table 15 tracks only what happened to mortgages outstanding as of April 1930. In the sample, an additional 20 borrowers refinance those mortgages between the April 1930 observation and the establishment of the HOLC, and then refinance again with the HOLC, bringing the total takeup rate of the HOLC for borrowers existing as of 1930 to 15 percent. In addition, others with outstanding loans as of April 1930 sold their houses before the establishment of the HOLC, and some of the new owners likely sought HOLC financing.

Table 17: Lenders in 1940

Type of lender	First Mortgage		Second Mortgage	
	Number	Percent	Number	Percent
Individuals	42	10.3	36	40.9
Building/Savings and Loans	211	51.6	25	28.4
Savings Banks	31	7.6	0	0.0
Mortgage Companies	11	2.7	13	14.8
Insurance Companies	17	4.2	0	0.0
Commercial Banks	23	5.6	6	6.8
Builders	4	1.0	8	9.1
Home Owners' Loan Corp.	70	17.1	0	0.0
Total	409	100.0	88	100.0

Notes:

HOLC refinancing. Other borrowers may not have had the same access to 15-year contracts from non-HOLC sources, and therefore the presence of the HOLC would have changed the relationship between borrower characteristics and contract choice. Likewise, the FHA selected certain borrowers. Its underwriting criteria were notoriously racist, favored suburban style detached houses over urban rowhouses, and targeted newly constructed homes in particular.

6.2 1940 Analysis

The 1940 analysis follows the same framework for modeling mortgage contract choice as in the 1930 analysis. As a baseline, I group together medium and long term contracts, given the small number of the latter and for comparability with the 1930 analysis.

Table 18 shows summary statistics for variables that are available from the 1940 census and the land records. Compared to the 1930 census, the 1940 census did not ask about the age of marriage, but did ask about educational attainment and earned income.

Simple comparisons of borrower characteristics across contracts in Figure 5 show a fairly broad shift toward longer-term contracts across the various socioeconomic characteristics. However, the cross-sectional patterns generally remain the same. The new 1940 data on education and income add new dimensions to the analysis, with better-educated and higher-income borrowers more likely to use short-term contracts with infrequent amortization.

The results from the probit models in Table 19 likewise continue to show that borrowers with

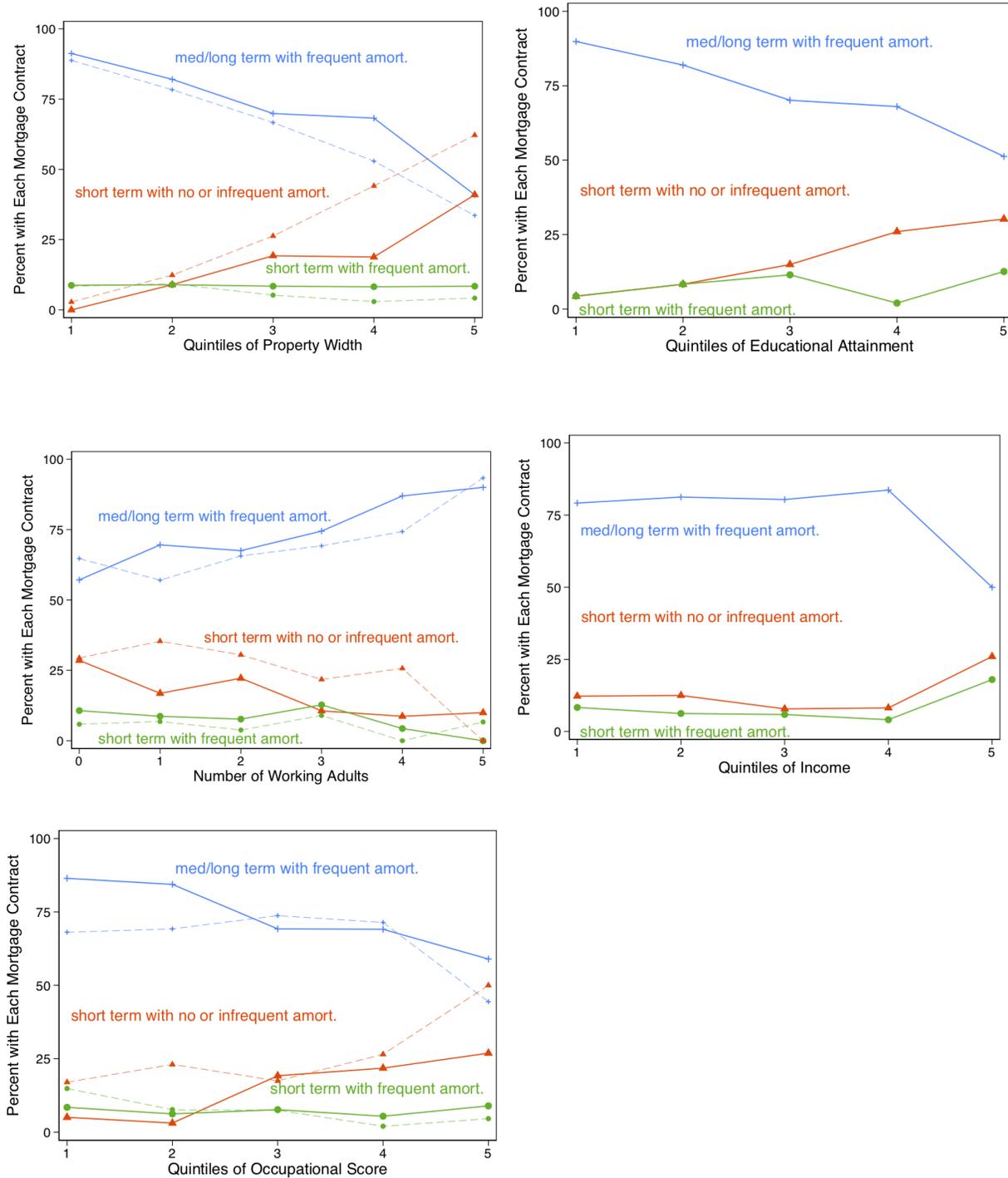
Table 18: Summary Statistics in 1940

variable	N	mean	median	sd	min	p25	p75	max
<i>Baseline variables</i>								
log property frontage	409	3.06	2.75	0.65	2.44	2.63	3.20	5.44
highest educational grade	397	8.95	8.00	3.95	0.00	6.00	12.00	17.00
number working adults	409	1.94	2.00	1.34	0.00	1.00	3.00	12.00
1(never married)	409	0.05	0.00	0.22	0.00	0.00	0.00	1.00
1(has boarders or renters)	409	0.15	0.00	0.35	0.00	0.00	0.00	1.00
1(has servants)	409	0.03	0.00	0.17	0.00	0.00	0.00	1.00
1(race=black)	409	0.16	0.00	0.37	0.00	0.00	0.00	1.00
1(foreign born)	409	0.16	0.00	0.37	0.00	0.00	0.00	1.00
age	409	48.51	48.00	11.77	18.00	40.00	57.00	88.00
1(has job)	409	0.78	1.00	0.41	0.00	1.00	1.00	1.00
<i>Additional variables</i>								
log property value	405	8.14	8.01	0.73	3.22	7.63	8.52	10.13
log(wage and salary income)	246	7.19	7.24	0.74	3.00	6.84	7.65	8.76
occupational score	328	30.60	26.00	13.04	4.00	23.00	38.00	80.00
occupation income sd	256	0.64	0.60	0.29	0.18	0.55	0.69	2.64

markers of higher socioeconomic status had a higher probability of a short-term contract with no or infrequent amortization. In particular, the newly available education variable has strong predictive power, with each additional grade of education associated with a 2 or 3 percentage point change in the probability of short or medium or long term contracts. However, the coefficient magnitudes are generally smaller than in 1930. In column one, the coefficient on log property frontage to 0.12 in 1940 from 0.30 in the similar specification in 1930. In column 2, the coefficient on the number of working adults falls to about zero and loses predictive power. The less pronounced relationships reflect a disproportionate shift in contracts among borrowers at the highest end of the socioeconomic spectrum.

Table 20 shows the results of including occupational variables: log income (available in 1940, unlike 1930), occupational scores, and dispersion in occupational income. Here, the income variables have little predictive power, and more flexible specifications (such as quintiles for the occupational score as used in the 1930 analysis) do not improve their predictive power, even though the raw relationship in Figure 5 seems to suggest a change in contract use among the highest income group. Overall, these results are another sign of the weaker relationship between socioeconomic status and contract choice in 1940.

Figure 5: Simple Associations between Contract Choice in 1940 and House Width, Educational Attainment, Number of Working Adults, Income, and Occupational Score



Dashed lines indicate the relationships in 1930, if the variable is available in 1930.

Table 19: Probit Estimates, Marginal Effects, 1940

	Short term, infreq. amort. (1)	Medium/Long term freq. amort. (2)	Short term, freq. amort (3)
log property frontage	0.120*** (0.0351)	-0.130*** (0.0474)	-0.0143 (0.0214)
Highest edu grade	0.0200*** (0.00700)	-0.0320*** (0.00859)	0.00916*** (0.00326)
Number working adults	-0.0112 (0.0170)	0.0190 (0.0179)	-0.00652 (0.0122)
1(has boarders/renters)	-0.0409 (0.0610)	0.0670 (0.0806)	-0.0147 (0.0385)
1(has servants)	-0.294** (0.139)	0.283 (0.203)	0.00756 (0.0949)
1(race = black)	-0.0656* (0.0369)	0.000480 (0.0586)	0.0425 (0.0296)
1(foreign born)	0.0752 (0.0584)	-0.124** (0.0632)	0.0471 (0.0410)
age	0.000504 (0.00196)	-0.000725 (0.00216)	6.12e-05 (0.00135)
1(has occupation)	-0.0394 (0.0532)	0.0761 (0.0771)	-0.0317 (0.0363)
year of purchase	-0.00728*** (0.00268)	0.00913** (0.00385)	-0.000725 (0.00215)
cumulative # mtges	-0.0181* (0.00934)	0.0243* (0.0131)	-0.00757 (0.00629)
1(had chattel)		-0.178 (0.124)	0.163** (0.0736)
Observations	397	397	397
Pseudo-R2	0.198	0.157	0.067

Notes: Each column is a separate probit estimation. The table reports the marginal effects on the probability of each column's contract, evaluated at the means of the independent variables. For dummy variables, the table displays the effect of a change from zero to one. This standard errors are clustered at the block level. The symbols ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels.

Finally, in terms of race, the 1940 data show similar patterns as the 1930 data. In the raw data, black borrowers continued to make much more use of short-term contracts with frequent amortization compared to other borrowers, and are much less likely to use short-term contracts with infrequent amortization. The regression results again suggest that, even after controlling for other socioeconomic characteristics, black borrowers were about 7 percentage points less likely to use short term contracts with infrequent amortization.

Table 20: Probit estimates Including Occupational Variables, 1940

	Short term, infreq. amort. (1)	Medium/Long term freq. amort. (2)	Short term, freq. amort (3)
<i>Specification A</i>			
log(income)	-0.00265 (0.0229)	-0.0269 (0.0384)	0.0249 (0.0187)
Observations	244	244	244
Pseudo R-squared	0.254	0.212	0.115
<i>Specification B</i>			
occ score	-0.000161 (0.00197)	-0.000202 (0.00242)	0.000366 (0.00147)
Observations	325	325	325
Pseudo R-squared	0.237	0.175	0.0463
<i>Specification C</i>			
occupational income dispersion	-0.0834 (0.109)	-0.0399 (0.118)	0.0293 (0.0529)
Observations	254	254	254
Pseudo R-squared	0.309	0.273	0.0988

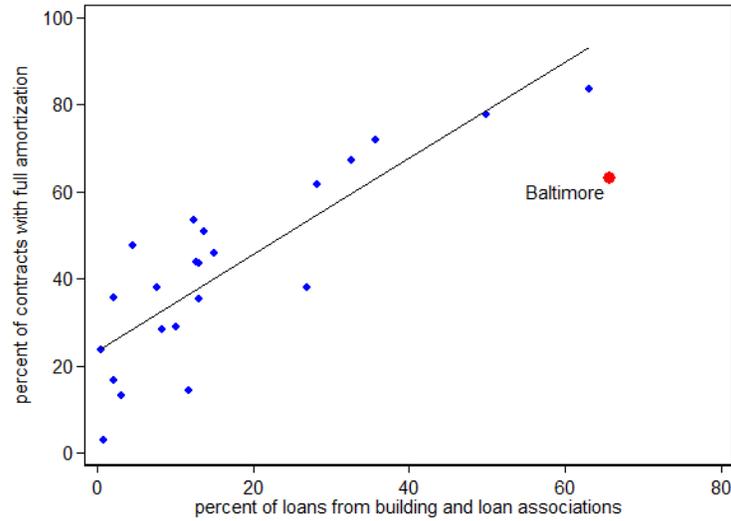
Notes: Each column reports the marginal effect on the probability of that contract. The standard errors are clustered at the block level. The symbols ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels.

7 Conclusion

The sample of mortgage loans used in this paper represents an advancement in economic historians' ability to analyze mortgage contracts historically. Its main limitation, though, is the inclusion of loans from only one city, Baltimore. The external validity of the results, therefore, depends on the extent to which other cities resembled Baltimore's mortgage market.

Compared to the country as a whole, Baltimore in the interwar period had a particularly good supply of medium-term fully amortized loans, a key source of which were building and loan associations. To compare Baltimore with other cities, the best data available come from a survey of borrowers in twenty-two cities, conducted in 1934 and reported in Wickens (1937). These data can only be loosely compared to the 1930 data on Baltimore, since major changes took place in the mortgage market from 1930 to 1934, including widespread foreclosures and the intervention of the HOLC. In addition, survey selection issues in the Wickens survey could affect the 1934

Figure 6: External validity - Comparison of Baltimore to other cities in a 1934 survey



Source: Wickens (1937) data on 22 cities in 1934, combined with this paper's Baltimore data set in 1930. The trend line is the result of a simple OLS regression that omits the Baltimore data point.

data. Broadly, though, Figure 6 confirms a strong correlation across cities between the presence of building and loan associations and the use of fully amortized contracts. The figure suggests that several of the sampled cities closely resembled Baltimore, insofar as large shares of outstanding contracts were fully amortized (and therefore likely medium in term as well). In contrast, in some cities fully amortized contracts had smaller market shares. Baltimore appears to be an outlier by the intensity of B&L activity, but here the 1934 data is likely to understate the market share of any private lender class, given that the HOLC acquired 20 percent of nonfarm mortgages starting in 1933.¹⁷

These data suggest that Baltimore should be considered representative of cities that featured wide availability of medium-term fully amortized mortgages. (Even then, Baltimore featured some

¹⁷Wickens also reports data on contract terms. However, in my view, the term data seriously under-report the number of contracts with short terms. I speculate that the survey results did not report terms for loans which were past their stated maturity dates, in a mistaken belief that the maturity dates were incorrect. Indeed, there are an inexplicably high number of observations with missing information on terms, and the extent to which these data are missing is highly correlated with the percent of loans that were unamortized (and therefore that very likely had short terms as well). For example, in Worcester Massachusetts, I would expect the data to show a large number of short-term loans, since the state was dominated by savings banks well known for making 1-year loans. Indeed, savings banks accounted for 819 of 1,096 loans in the data, and 770 of those were unamortized. Yet, the data report terms for only 37 savings banks loans, with almost all of these terms greater than 5 years. The report gives no explanation for the missing data.

subtle differences. Other cities with significant amounts of medium-term loans tended to feature slightly longer 10-15 year contracts compared to the 8-10 year contracts in Baltimore.) In other cities, short term contracts were used much more widely. Therefore, while the use of short-term unamortized contracts in Baltimore was particularly associated with the socioeconomic elite, in other cities a wider set of borrowers may have used such contracts. If so, refinancing risk may have been a more widespread problem in these cities as lenders came under pressure during the Depression, since the set of borrowers using short-term contracts may have included more borrowers with average or low creditworthiness. Data from other cities more dominated by short-term contracts would be especially valuable in rounding out this dimension of the 1920s mortgage market, and in understanding the basis for the strong federal move away from short-term contracts after the Depression.

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A Appendix: Sample construction

The sample consists of owner-occupied households located in a stratified one percent sample of 38 blocks out of the 3,839 blocks in Baltimore as of 1930.

The sampling is done by block rather than by household because of the structure of the land records. The Baltimore land records are organized by block, i.e. each block has an index that lists all land records that apply to that block in chronological order for the entire history of the block's existence in Baltimore. Sampling by blocks yields enormous economies of scale compared to sampling by individual properties. To follow a property over time, it is necessary to check the index for the entire block to find references to the property. Digitizing an entire block over time allows for the properties within that block to easily be followed over time, and also greatly lowers the probability of missing a record for a property.

The Census has, in the past, also employed block-level sampling, likely because of the economies of scale of contacting each household on a block. For example, the 1934 real property inventory (see Wickens 1937) was conducted with a sample of every seventh block in small cities and every tenth block in large cities.

I use a stratified sample in order to ensure the sample captures geographic areas with different access to mortgages. In particular, I focus on the varying willingness of lenders to make loans to different areas of the city. I divide the 3,839 blocks in the city into four segments, by cross-referencing the municipal block map of Baltimore with a "residential security map" produced in 1935. The residential security map, created by the Home Owners' Loan Corporation (HOLC) in conjunction with the advice of local realtors, lenders, and other real estate professionals, divides the city into four security "grades," based on the desirability of the neighborhood for lending. The least desirable neighborhoods are colored red, thus the term "red lining." Red lining was directly related to discriminatory practices in the real estate industry, and by using the map I must acknowledge that history. I use the map for sampling purposes because I believe it provides a guide to how lenders at the time viewed the city's different neighborhoods, highly relevant for understanding the allocation of real estate contracts to different borrowers. I do not intend my use of the map to constitute an endorsement of the discriminatory practice of that area.

The HOLC map shows the universe of developed residential blocks that existed in Baltimore as 1937, likely quite close to the universe of such blocks that existed in 1930 given the very small amount of new construction that occurred during the intervening years. I limit the sample to Baltimore City and exclude the surrounding Baltimore County, since the latter's land records are organized differently, making them difficult to sample. In addition, Baltimore County at the time had a population of only 125,000 in 1930, compared to 800,000 in Baltimore City.