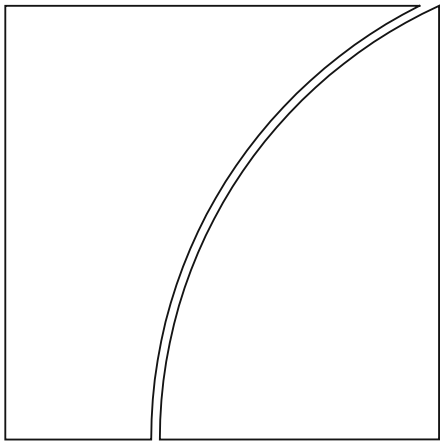

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Affordable housing, unaffordable credit? Concentration and high-cost lending for manufactured homes

by Sebastian Doerr and Andreas Fuster

Monetary and Economic Department

April 2025

JEL classification: G21, G23, L13, R31

Keywords: manufactured homes, mortgage market, competition, household finance, HOEPA

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Affordable housing, unaffordable credit? Concentration and high-cost lending for manufactured homes

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April 2025

Abstract

Policy makers place high hopes in manufactured homes—the largest source of unsubsidized affordable housing in the US—to alleviate housing supply shortages. This paper shows that high market concentration in the multi-billion-dollar manufactured home loan market allows lenders to charge significantly higher interest rates than for site-built homes. Loan-level data indicate that borrowers in counties with higher lender concentration face significantly higher rates. Evidence from bunching at the regulatory HOEPA rate threshold, an instrumental variable analysis, and a difference-in-differences analysis around HOEPA's introduction suggests a causal link. We further show that integrated lenders, which play an outsized role in the manufactured home loan market, charge particularly high rates, and we provide evidence suggesting that these lenders exploit their market power over borrowers.

JEL Codes: G21, G23, L13, R31.
Keywords: Manufactured homes, mortgage market, competition, household finance, HOEPA.

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1 Introduction

For decades, expanding homeownership has been a prominent goal of public policy in the US and other countries. Homeownership allows families to build wealth and provides financial security (Goodman and Mayer, 2018; Sodini et al., 2023), in particular for traditionally disadvantaged groups (Herbert et al., 2014; Wainer and Zabel, 2020). Homeowners exhibit higher savings rates (Di et al., 2007; Turner and Luea, 2009) and benefit from a higher internal rate of return and the favorable tax treatment of housing compared to alternative investments. Moreover, housing wealth can stimulate entrepreneurship and investment by easing collateral constraints (Corradin and Popov, 2015; Schmalz et al., 2017; Bahaj et al., 2020).

The acute housing shortage and rapid rise in house prices, however, threaten the objective of expanding homeownership.[1] Surging construction costs, among other factors, have led to a steadily widening housing supply deficit. Recent estimates put it at a staggering four million units (Freddie Mac, 2021). Meanwhile, the cost of a typical American home substantially increased in the last decades, lowering housing affordability.

One proposed solution to the housing shortage are manufactured homes. Manufactured homes, also called mobile homes, are prefabricated, permanent residences that are factory-built and then installed on a lot. Their sales price is oftentimes less than half of what a similarly sized on-site home would cost, largely reflecting substantially cheaper construction costs. Policy makers hence place high hopes in manufactured homes to ease supply constraints in the housing market.[2]

Manufactured homes currently house about 17 million Americans, making them the largest source of unsubsidized affordable housing.[3] The market for manufactured home loans is also sizable: between 2018 and 2022, lenders originated almost one million manufactured home mortgages for a total of about $150 billion, predominately to borrowers with lower socio-economic status. The market for manufactured home loans is thus comparable in size to other important loan markets, such as the market for payday loans with an annual volume of $30 billion.[4] And yet, despite its importance and size, the

[1] See Wall Street Journal: The Next Housing Crisis: A Historic Shortage of New Homes; The New York Times: The Housing Shortage Isn't Just a Coastal Crisis Anymore; or Financial Times: Housing shortage risks breaking the American dream.

[2] See Council of Economic Advisers, 2021 and Fannie Mae's "Duty to Serve Underserved Markets Plan".

[3] Number taken from Jensen (2024), based on Census data. Industry publications estimate a number of manufactured home residents in excess of 20 million (see e.g., here).

[4] The market for payday loans has attracted significant attention in the economics literature, see Stegman (2007); Agarwal et al. (2009); Melzer (2011); Carrell and Zinman (2014); Di Maggio et al. (2020), and Allcott et al. (2022), among others. For estimates on the size of the payday loan market, see here and here.

market structure and lending conditions for manufactured home loans have received little attention from academic researchers, in contrast to the mortgage market for site-built homes.

This paper provides novel evidence that the market for manufactured home loans is characterized by substantial market concentration that contributes to high interest rates when compared to mortgages on site-built properties. Our study uses public application-level data on manufactured home loans collected under the Home Mortgage Disclosure Act (HMDA). We first provide a series of stylized facts on the manufactured home loan market. We then show that market concentration is a key driver of higher interest rates on manufactured home loans. Our results also highlight the role of integrated ("captive") lenders as a potential driver of the link between market concentration and interest rates.

The HMDA data provide a wealth of information on lenders, applicants, and loan terms. Crucial to our analysis, since 2018 HMDA contains new data points specific to manufactured housing. First, HMDA provides information on whether the manufactured home is secured by the home and the land (a mortgage) or the home and not the land (a chattel or personal property loan). Second, it indicates whether the land on which a manufactured housing unit is located is owned or rented. This distinction enables us to restrict our sample to properties where the borrower owns the land (two-thirds of the sample of manufactured home loans in HMDA) to ensure a closer comparison to the market for mortgages for site-built homes. Third, HMDA contains detailed information on loan interest rates and rate spreads, which are defined as the difference between a loan's interest rate (in terms of annual percentage rate, APR, which incorporates upfront costs) and the average APR on similar-maturity mortgage loans issued to prime borrowers at the same time (the APOR).

Our data show that, compared to site-built mortgages, manufactured home loans have substantially higher interest rates (5% vs 3.6%) and rate spreads (1.9 percentage points (pp) vs 0.5 pp). Property values and loan amounts are lower, loan terms shorter, and LTV ratios higher. Banks (i.e., deposit-taking institutions) are less important in the manufactured home loan market than in the site-built market, and loans are more likely to be retained by the lender rather than sold in the secondary market. Compared to site-built mortgages, borrowers in the manufactured home loan market have lower incomes and are more likely to be white, under 35 or over 62 years old.

We also find that the loan market for manufactured homes is characterized by much higher local market concentration than the market for site-built mortgages. In the average county, the Hirschman-Herfindahl Index (HHI), a standard measure of competition used in the literature (e.g., Scharfstein and Sunderam, 2016; Buchak and Jørring, 2024), is

more than three times larger. Every third county has an HHI that exceeds 0.25, i.e., is classified as highly concentrated, in the manufactured home loan market. This compares to only 2% of highly concentrated counties in the market for site-built loans.

Motivated by these facts we investigate whether local market concentration is a driver of higher rate spreads. We find a highly significant positive relationship between local market concentration and rate spreads. In our preferred specification, a 10 bp (0.1) higher county-level HHI is associated with a 10 bp higher rate spread. This result stands in stark contrast to analyses for the site-built mortgage market, where studies typically find little relationship between local concentration measures and rate spreads (Hurst et al., 2016; Amel et al., 2018; Bhutta et al., 2024; Buchak and Jørring, 2024; Fuster et al., 2024).[5]

A concern with identifying the effects of market concentration on rate spreads is that higher spreads could reflect differences in borrower characteristics. For example, riskier borrowers could cluster in more concentrated markets, leading to a positive relationship between market concentration and spreads. To account for differences in borrower characteristics, our regressions include a battery of loan- and borrower-level controls, as well as various census tract characteristics. Furthermore, our preferred specification includes county fixed effects, meaning that time-invariant local characteristics are absorbed and the effect of interest is identified based on within-county changes in market concentration over time.

To further assess the causality of the link between concentration and rate spreads, we use a Bartik-style instrumental variable strategy. We first predict the number of originations of each lender in each county for the years 2019–2022 based on the lender's initial originations in 2018 in a county and the national growth rate in the lender's originations. We then use these predicted origination numbers to re-construct the HHI. The resulting instrument thus uses only variation in market shares coming from lenders' initial local footprint alongside their nationwide growth in later years. While initial originations could correlate with unobserved local factors, county fixed effects absorb this. Two-stage least squares (2SLS) regressions confirm our baseline result: higher market concentration leads to significantly higher rate spreads. We perform a large number of additional tests to ensure the robustness of this finding.[6]

[5]We verify for our sample period, 2018 to 2022, that there is no positive relationship between the HHI and rate spreads in the site-built mortgage market once borrower characteristics are controlled for. In fact, using the same regression specification as for the manufactured home loans, the estimated relationship between local market concentration and rate spreads is sometimes negative, although in our instrumental variable specification, there is no significant relationship.

[6]For instance, we show that our results are robust to using alternative measures of market concentration; restricting the sample to purchase loans only; removing chattel loans from the sample; restricting the sample period to pre-COVID years; and to adding lender × year fixed effects or loan amount × property value fixed effects to the regression.

To provide additional evidence on the nexus between market concentration and rate spreads, we exploit the Home Ownership and Equity Protection Act (HOEPA) threshold for rate spreads. HOEPA seeks to ensure that borrowers who take out high-cost loans, defined as having a rate spread exceeding 6.5 pp, have a clear understanding of the terms. High-cost mortgages are therefore subject to additional consumer protections, such as special disclosures and restrictions on loan features. Moreover, they come with various restrictions and require the lender to provide transparency to the borrower about all costs entailed. These requirements imply significantly higher administrative and compliance costs for the lender, and make lenders reluctant to originate loans with spreads above the threshold (Benzarti, 2024).

First, we find a positive and highly significant effect of the HHI on the probability of a loan having a rate spread in the bunching region ($[6, 6.5$ pp$]$). A 10 bp increase in the HHI within county increases the probability of a loan having a rate spread in the bunching region by 0.15 pp, relative to an unconditional mean of 4%. This bunching suggests market power. In a perfectly competitive market, a threshold above which origination costs discontinuously increase would lead to a "missing mass" of observations right above the threshold, but no bunching. In the presence of market power, however, lenders can charge a markup so that the rate spread exceeds the loan cost. Lenders can thus decide to give up some of their rents to avoid paying the higher costs associated with HOEPA. The resulting bunching below the threshold is then indicative of market power (Bachas et al., 2021; Cox et al., 2023).

Second, we focus on the introduction of HOEPA in January 2014 and estimate difference-in-differences (DiD) regressions. We find that the introduction of HOEPA significantly reduced rate spreads in more concentrated markets. Moreover, the positive effect of market concentration on bunching below the threshold only emerged after the introduction of HOEPA, while there was no bunching and no correlation between market concentration and bunching prior to 2014. Consistent with our 2SLS regressions, these results suggest that the relationship between rate spreads and market concentration is not driven by borrowers' unobservable credit risk.

We then investigate an important contributor to concentration in the manufactured home loan market, namely the presence of integrated lenders, who account for over 20% of loans in our sample. We show that the rate spreads they charge are about 1.8 pp higher than those of nonintegrated lenders, controlling for all the borrower observables as well as county and year fixed effects. These higher rates are the opposite of what one might expect if integrated lenders have informational advantages (e.g., because they know the quality of collateral better than other lenders); instead, they suggest that integrated lenders may be exploiting their market power over borrowers at the point-of-sale of the

home.[7]

An alternative explanation for the higher rate spreads of integrated lenders is that they are part of a bundling strategy: cash-constrained buyers may be willing to pay a higher interest rate in return for a lower price on their manufactured home. We test this in two ways, but do not find support for the predictions from bundling. First, rate spreads at integrated lenders are not differentially higher for borrowers with low income (relative to the typical purchase price for a manufactured home in their area), who should benefit most from such bundling. Second, we explain that bundling would predict that after HOEPA was introduced, loan amounts and application denial rates at integrated lenders should increase, but we do not find evidence for these predictions in the data. We also study differences in lenders' financing costs as an alternative explanation for the higher rates charged by integrated lenders (who retain almost all their loans on balance sheet), but find little supporting evidence. Finally, we demonstrate that integrated lenders are more likely to originate loans as expensive chattel loans (rather than mortgages collateralized by the land) in more concentrated markets, suggestive of steering.

Despite the importance of the market for manufactured home loans for lower-income households, there has been essentially no academic research on it.[8] We systematically investigate the effects and drivers of lender concentration in the market for manufactured home loans, and thereby make three main contributions to the literature and policy debate.

First, our findings cast doubt on manufactured homes as a straightforward solution to America's housing crisis. A naive look at the US housing market might suggest that while house prices are high, the mortgage market is highly competitive and quite efficient. Cheaper housing options should thus alleviate supply constraints and provide an affordable alternative to the ownership of site-built homes. However, our results suggest that the cheaper price of manufactured homes may be partly outweighed by higher financing costs that reflect frictions in the loan market for these homes. Policy initiatives that promote manufactured housing should thus also consider the lack of competition,

[7] On the other hand, we do find that nonintegrated lenders charge higher spreads on their loans when the local market share of integrated lenders is higher, consistent with concerns about adverse selection (Stroebel, 2016).

[8] At least since the year 2000, we could not find any articles on manufactured housing in the top-3 finance and top-5 economics journals. The main existing studies of the manufactured home loan market are provided by the CFPB (2014, 2021), focusing on descriptive statistics. Johnson and Todd (2017) focus specifically on concentration in manufactured home loans to American Indian and Alaska Native borrowers. After publishing our initial draft, we became aware of a dissertation chapter (not available online) by Banga (2022) that documents some of the same facts as we do and also studies the HOEPA introduction in 2014. Her paper does not study different potential drivers of the price premium charged by integrated lenders (including bundling and steering), and does not compare the loan market for manufactured homes to that for site-built homes.

and in particular the role of integrated lenders, in the mortgage market for manufactured homes.[9]

Second, our results suggest that consumer protection regulation in the form of HOEPA can benefit many manufactured home buyers. Due to high market concentration and lenders' market power, without HOEPA manufactured home loans would have even higher rates on average. Since we find little to no effect of the introduction of HOEPA on loan originations, our results suggest that lowering the HOEPA threshold further could reduce the cost of financing manufactured homes without materially affecting the supply of loans. These findings contribute to the literature investigating the effects of rules aimed at preventing predatory lending on (mortgage) credit (Bond et al., 2009; Agarwal et al., 2014; Di Maggio and Kermani, 2017; Di Maggio et al., 2019; Benzarti, 2024).

Third, our evidence from the market for manufactured home loans also complements existing insights from other credit markets. In particular, our results contribute to the long-standing debate on market power and loan pricing in the US mortgage market. Most studies have failed to establish a reliable link between market concentration and loan rates for mortgages (Hurst et al., 2016; Bhutta et al., 2024; Buchak and Jørring, 2024; Fuster et al., 2024).[10] Rather, the US mortgage market is generally considered as highly competitive (Amel et al., 2018) and "national in scope" (Federal Reserve System, 2008). Our setting helps in identifying the effect of concentration on rate spreads. And it shows that a segment of the mortgage market that is particularly important for low-income borrowers is characterized by low competition and high spreads, even if the mortgage market as a whole is deemed competitive. In addition, we complement studies that have considered the role of integrated (or captive) lenders for credit supply and other outcomes (e.g., Benmelech et al., 2016; Stroebel, 2016; Murfin and Pratt, 2019; Benetton et al., 2023; Hankins et al., 2023).

The rest of the paper proceeds as follows. Section 2 provides background on manufactured housing and HOEPA. It also explains our data and main variables. Section 3 reports the results for concentration, rate spreads and bunching, as well as results from instrumental variable and difference-in-differences analyses. Section 4 examines the role of integrated lenders. Section 5 concludes.

[9]Recent work by Jensen (2024) explores another dimension of market power, specifically in the provision of inventory financing from manufacturers to retailers. She argues that high prices charged for this financing lower the quantity of homes shipped, exemplifying a case of "vertical foreclosure."

[10]Although Buchak and Jørring (2024) find no relationship between interest rates and market concentration, they document a positive relationship between non-interest fees and concentration. Bhutta et al. (2024) find that the dispersion of rates is higher in locations with lower concentration, consistent with stronger competition benefitting primarily sophisticated borrowers.

2 Institutional background and data

The first part of this section provides institutional background on manufactured housing. The second part discusses the Home Ownership and Equity Protection Act, which seeks to ensure that borrowers who take out high-cost loans have a clear understanding of the terms. The final part introduces the data that underlie our analysis, explains the construction of our main variables, and provides summary statistics.

2.1 Manufactured housing

Manufactured homes are prefabricated, permanent residences that are factory-built and then installed on a lot.[11] Once placed, manufactured homes are typically not moved from their original site (CFPB, 2021). Unlike for site-built homes, the homebuyer does not necessarily own the land on which the home is located. If the homebuyer does not own the land, financing is usually done through so-called chattel loans, which make up around 40% of the manufactured home loan market. Among homebuyers that do not own the land, a further distinction is made between those that pay rent for the land hosting the home (around 50% of all chattel loans) and those that do not.[12]

According to the 2019 American Community Survey, there were 6.8 million manufactured homes in the US, housing over 17 million Americans. Almost 6% of all owner-occupied housing units are manufactured homes. The same data reveal significant variation in the share of manufactured homes out of all housing units across regions. In the average county (census tract) 11.9% (5.7%) of all housing units are manufactured homes, with a standard deviation of 9.5% (10.4%).[13]

Manufactured homes are an important source of affordable housing in the US and more common in lower-income areas (Kaul and Pang, 2022a,b). For example, among counties in the bottom quartile of the median household income distribution, the share of manufactured homes averages 19.9%, while for those in the top quartile the share averages 6.6%. Consistent with these patterns, Figure 1, panel (a) shows that the share of manufactured homes is higher in rural areas as well as in the South and Southwest.

[11] To be precise, manufactured homes are factory-built housing constructed after June 1976 in accordance with the US Department of Housing and Urban Development's Manufactured Home Construction and Safety Standards code.

[12] See here for a summary on how manufactured home loans differ from site-built mortgage loans and what rights tenants/owners have. An important difference between chattel loans and traditional mortgage loans is that in the case of chattel lending, the property remains in the ownership of the lender until fully paid off.

[13] Counties are more unequally sized than census tracts, and the manufactured home share tends to be higher in rural, less populated counties.

Their prevalence among lower-income households partly reflects cheaper construction costs, which leads to a substantially lower sales price. Data from the 2019 Manufactured Housing Survey shows that manufactured homes have an average sales price of $81,900, for an average of 1,448 square feet. In contrast, for site-built homes the average sales price is $383,900, with an average of 2,518 square feet. In a more systematic analysis, Herbert et al. (2023) show that the cost of a manufactured home ranges from 35% to 75% to that of a comparable site-built home, even when including finished lot costs. Moreover, prices for manufactured homes move in tandem with overall house prices; and appreciation rates of manufactured homes on owned land are similar to those for site-built homes (Goodman and Pang, 2024).

The market for manufactured home loans is large. According to HMDA data, which we discuss in more detail below, lenders originated almost 1,000,000 such loans for a total amount of about $150 billion between 2018 and 2022. For comparison, the payday loan market—which has garnered considerable attention in academic research—sees annual originations of roughly $30 billion, as noted earlier.

Anecdotal evidence suggests that obtaining affordable financing for manufactured homes is challenging (Kaul and Pang, 2022b). This could result from the way manufactured homes are sold and financed. New and used manufactured homes are sold via retail stores, where prospective homebuyers select one of the available models and choose from multiple financing options available on the so-called lending board. To be on the lending board, lenders need to convince the retailer that they have a reasonable probability of financing the purchase while providing a positive experience to the customer. Otherwise, retailers may worry that the sale will fall through because of financing or customer service issues. Although homebuyers can shop for financing outside the retailer, most choose from the lending board options. This setup has raised concerns that lending boards create barriers to entry for new or smaller lenders and incentivize the presence of integrated lenders, thereby lowering competition. It could further encourage retailers or lenders to steer customers into unfavorable financing options. We discuss these aspects in more detail in Section 4.

2.2 The Home Ownership and Equity Protection Act

As borrowers with poor credit histories are typically offered significantly more expensive loans, the Home Ownership and Equity Protection Act seeks to ensure that borrowers who take out high-cost loans have a clear understanding of the terms. HOEPA is a 1994 amendment to the Truth in Lending Act (TILA) that protects consumers from predatory mortgage lending. In 2010, the Dodd-Frank Act amended TILA by expanding

the scope of HOEPA coverage to purchase and refinance mortgages, as well as home equity lines of credit and home equity loans, all for primary residences. Mortgages secured by manufactured housing (whether titled as real property or personal property) and other types of personal property (e.g., an RV or a houseboat) are also subject to HOEPA.

HOEPA establishes two thresholds to classify high-cost transactions. A mortgage is a high-cost transaction if its annual percentage rate (APR, measured as of the date the interest rate for the transaction is set) exceeds the average prime offer rate (APOR) for a comparable transaction on that date by more than: 6.5 percentage points for first-lien transactions, or 8.5 percentage points for first-lien transactions that are for less than $50,000 and secured by personal property. High-cost mortgages are subject to additional consumer protections, such as special disclosures and restrictions on loan features. Moreover, they require the lender to provide transparency to the borrower about all costs entailed. These requirements imply significantly higher administrative and compliance costs for the lender. In other words, for two comparable loans to comparable borrowers, with one having a rate spread right below the HOEPA threshold and one a rate spread just above the threshold, lenders will have to incur additional costs (in terms of administration and compliance, among others) for the latter (Bhutta et al., 2015; Benzarti, 2024).

The HOEPA requirements, including the thresholds for high-cost mortgages, went into effect on January 10, 2014. Previous studies on the US mortgage market have rarely considered the HOEPA thresholds as binding. Indeed, for traditional mortgages, the rate spread during our sample period averages around 0.5 pp and is thus so far below the threshold that it is a non-binding constraint for the vast majority of mortgages for site-built loans. However, as we show in what follows, interest rate spreads for manufactured home loans are significantly higher, and a substantial share of all manufactured home loans fall in the region near the HOEPA threshold.

2.3 HMDA data and descriptive statistics

To investigate the loan market for manufactured housing in the US, we use loan-level data collected under the Home Mortgage Disclosure Act for 2018-2022. HMDA covers the vast majority of applications and approved mortgages. It contains information on the lender, the application outcome, loan amount, loan program (e.g., conventional, FHA, or VA), borrower income, and borrower demographic characteristics such as census tract, race/ethnicity, and gender. Relative to earlier years, the data fields collected have been expanded since 2018. They now include information on property value, loan-to-value ratio (LTV), debt-to-income ratio (DTI), credit score type, borrower age, and, for approved

loans, the interest rate, rate spread, and information on closing costs.

Crucial for our analysis, HMDA data report the construction method as either site-built or a manufactured home. Moreover, since 2018, HMDA provides information on whether the manufactured home is secured by the home and the land (a mortgage), or the home and not the land (a chattel or personal property loan). In addition, it indicates whether the land on which a manufactured housing unit is located is directly or indirectly owned, or if the borrower has an unpaid or paid lease. For land owners, "direct ownership" means the borrower owns the land on which the manufactured housing unit is located, while "indirect ownership" usually occurs when the borrower is a member of a resident-owned community (ROC).[14]

For our analysis, we restrict the sample to manufactured home loans where the borrowers own their land, in order to provide a cleaner comparison with regular mortgage loans. We further restrict the sample to originated conforming first-lien loans for home purchases or refinancing (incl. cash-out) of single-unit, primary residences. We drop VA loans and loans classified as primarily for a business or commercial purpose, open-end lines of credit, and reverse mortgages. In addition, we drop observations with missing loan term or property value, as well as with a missing property state or county code. Online Appendix OA.3 provides more details on the sample selection and associated changes in the sample size.

Our main outcome variable is the rate spread. It is defined as the difference between the covered loan's APR and the APOR for a comparable type mortgage as of the date the interest rate is set. The APR of a loan is calculated based on the loan's interest rate and the upfront costs at origination (which are assumed to be amortized over the loan's life). The APR also incorporates the costs of mortgage insurance (which is relevant in particular for FHA loans). The APOR is based on a lender survey and the same for all lenders at a given point in time; it reflects the average interest rate charged on a similar-maturity loan issued to borrowers with very good credit histories.[15] We set the rate spread to missing if it is < -1 or > 10 (0.3% of observations), as such values are implausible and likely reflect data errors. In addition, we define an indicator variable that captures bunching below the HOEPA threshold. The variable $Bunch < 6.5$ takes a value of one for loans with a rate spread in the "bunching region" of $[6, 6.5\ pp]$ and zero otherwise. It is defined only for loans with amounts of \$50,000 and above.

[14]Such ROCs act as a housing cooperative with the members collectively owning the land where the manufactured housing is located. For lease holders, "paid leasehold" typically indicates the borrower is paying rent for the property, while "unpaid leasehold" means that the borrower is not making rent payments. The latter includes, for example, loans where the manufactured home is located on land owned by a family member without a written lease and no agreement to rent payments.

[15]See https://ffiec.cfpb.gov/tools/rate-spread for details.

To analyze market concentration, we compute two standard competition measures: the Herfindahl–Hirschman index (HHI) and the concentration ratio of the top four lenders in a market (CR4), where we consider markets at the county-year level (Scharfstein and Sunderam, 2016; Buchak and Jørring, 2024). Let $share_{l,c,t}$ denote the market share of lender l among all lenders L in county c in year t in the number of loan originations.[16] Then

$$HHI_{c,t} = \sum_{l \in L} share_{l,c,t}^2, \tag{1}$$

$$CR4_{c,t} = \sum_{l \in L^4} share_{l,c,t}. \tag{2}$$

In addition, we use the following variables at the loan and borrower level: the loan amount and the property value (both rounded to the nearest \$10k in the public HMDA data), the loan term (in months), the loan product type (e.g., FHA), the LTV ratio[17], the DTI ratio bracket, loan purpose, borrower income, age bracket, race, ethnicity, sex, credit score type, and whether there is a co-applicant. We furthermore control for total loan closing costs relative to the loan amount and for the share of denied loan applications within each lender-county-year cell. We winsorize the LTV ratio, loan amount, property value, loan term, borrower income, and closing costs relative to loan amount at the 1^{st} and 99^{th} percentile to reduce the importance of outliers.

For our difference-in-differences analysis around the introduction of HOEPA in 2014, we use HMDA data for the years 2012 to 2016. We restrict this sample to owner-occupied, first-lien, originated manufactured home loans. We drop home improvement and VA loans, as well as mortgages with amounts below \$50,000. A caveat is that, prior to 2018, HMDA contains less detailed information on borrowers and loan terms. In particular, rate spreads are only reported when exceeding 1.5 pp, there is no information on property value or LTV ratio, and there is no breakdown into land owners and renters for manufactured home loans. We end up with a sample of 958,007 applications and 308,555 originations, with information on the rate spread for 49% of the sample.[18]

Descriptive statistics. Table 1 reports summary statistics for our main sample of over 520,000 manufactured home loans, covering the years 2018 to 2022. Panel (a) reports loan characteristics. The average loan amount is \$143,000 for an average property value

[16]For robustness tests, we also construct the HHI and CR4 with loan amounts. The correlation between the measures based on the number of loans and those based on loan amounts is 0.95.

[17]The combined LTV (CLTV) is directly provided in HMDA, though not for all loans. We therefore calculate the LTV ratio manually, by dividing the (rounded) loan amount by the (rounded) property value. The resulting value is highly correlated with the HMDA CLTV when provided.

[18]For site-built homes, the share of mortgages with a rate spread exceeding 1.5 pp is much lower. For example, in 2013 less than 4% of mortgages for site-built homes have information on the rate spread.

of $181,000. The average interest rate is 5.04% and the average rate spread 1.9 percentage points. Total loan closing costs average 3.6% of the loan amount, and the average loan term is 25.7 years. 14% of the loans in our sample are chattel loans, even though our sample is restricted to land owners that are hence eligible for mortgage loans where the land is used as collateral. Mortgage loans carry a significantly lower rate spread (1.55 pp) than chattel loans (4.08). The geographic distribution of the average share of manufactured home loans out of total mortgages in the HMDA data (Figure 1, panel a) mirrors the prevalence of manufactured housing units in the ACS (Figure 1, panel b).

Panel (b) of Table 1 reports borrower characteristics. A share of 4.4% of all manufactured home borrowers are Black, 9.7% Hispanic, and 22.6% female. Borrower income averages $64,000. Almost 30% of borrowers are younger than 35 and 18.3% are older than 62.

Compared to site-built mortgages, manufactured home loans have substantially higher interest rates and rate spreads. Moreover, average property values and loan amounts are lower, loan terms shorter, and LTV ratios higher. Banks are less important in the manufactured home loan market than in the site-built market, and loans are less likely to be sold in the secondary market. Compared to their counterparts in the market for site-built mortgages, borrowers in the manufactured home loan market have lower incomes and are more likely to be white, young or old (see Online Appendix OA.2 for a detailed comparison).[19]

Panel (c) reports summary statistics for our concentration measures, the HHI and CR4, at the county-year level. Concentration in the manufactured home market far exceeds concentration in the market for site-built homes. The average HHI is more than three times larger.[20] In our sample, 31% of all county-year observations have an HHI >0.25 in the manufactured home loan market, i.e., they are considered as "highly concentrated" based on the usual classification.[21] Only 2% of counties are highly concentrated in the market for site-built loans.

[19] Table OA8 shows detailed descriptive statistics. Table OA9 reports results from multivariate regressions of a dummy for a borrower taking out a loan on a manufactured home (rather than on a site-built home) on various borrower characteristics as well as year, county × year, or census tract × year fixed effects. It shows, for instance, that Black, Hispanic and female borrowers have a lower unconditional propensity to take out a manufactured home loan, but a higher propensity conditional on the census tract the property is in.

[20] These statistics weight all county-year observations equally. When we instead weight counties by their population, the average values for the HHI and CR4 are 0.11 and 0.49 in the manufactured home loan market. They are 0.05 and 0.34 in the site-built mortgage market.

[21] A market is usually considered "unconcentrated" if the HHI is below 0.15, "moderately concentrated" if the HHI is between 0.15 and 0.25, and "highly concentrated" if the HHI is above 0.25.

3 Concentration, rate spreads, and bunching

The summary statistics shown in Section 2.3 suggest that the market for manufactured home loans is characterized by significant market concentration and high rate spreads. These patterns raise the question of whether market concentration is a driver of higher rate spreads.

Before moving to the regression analysis, Figure 2 provides binned scatter plots of the rate spread on the vertical axis against the county-level HHI on the horizontal axis. It shows that there is a strong positive correlation between local market concentration and the average rate spread, suggesting that borrowers in counties with greater market concentration also pay higher rate spreads on their manufactured home loans. This relationship, which also holds separately for mortgages and chattel loans (panel b), could of course reflect observable and unobservable differences between counties with high vs. low concentration. We thus turn to regression analysis to examine the robustness of this relationship to controlling for such factors.[22]

3.1 Empirical strategy

We estimate the following regression at the loan level:

$$y_{i(l,c,t)} = \beta \; HHI_{c,t} + controls_i + \theta_t + \kappa_c + \varepsilon_i. \tag{3}$$

The dependent variable y is the rate spread of loan i by lender l to a borrower located in county c in year t. Our main independent variable is the HHI in borrower county c in year t, as defined in Equation (1). We cluster standard errors at the county level.

To account for factors that may correlate with both rate spreads and local market concentration, we control for a large number of loan- and borrower-level characteristics: log income, log property value, the LTV ratio (both linearly and with dummies for different bins[23]), the loan term, total closing costs over loan amount, and fixed effects for loan amount ($10k bins), DTI bins, borrower age, race, sex, co-applicant yes/no, credit score type, loan purpose, occupancy type, loan product type, pre-approval yes/no, zero/missing income yes/no, and adjustable-rate mortgage yes/no. In addition, we control for the share of denied loan applications within each lender-county-year cell, and for the follow-

[22] Note that even though a positive relationship between market concentration and prices is intuitive, Yannelis and Zhang (2023) show that in credit markets with fixed screening costs, the opposite relationship can obtain; they document a negative relationship between concentration and interest rates in the US subprime auto loan market.

[23] We use dummies for the following LTV bins: $< 70\%, [70-80\%), [80-90\%), [90-100\%), > 100\%$.

ing variables at the census tract-year level: the log of the total population, the minority share, median income relative to MSA income, the average age of housing units, and the share of homeowners out of the total population. We also include year fixed effects (θ_t) to account for common trends.

Furthermore, in some specifications, we include county fixed effects (κ_c). This means that our coefficient of interest β is identified from within-county changes in concentration across the five sample years (2018-2022). County fixed effects absorb any constant unobserved differences across counties that could relate both to their (average) market concentration and to rate spreads.

Instrumental variable approach. Despite controlling for many observable borrower and location characteristics, one may remain worried that (changes in) concentration may correlate with some factors we are unable to control for (e.g., we do not observe borrower credit scores). We address this concern by constructing a Bartik-style instrumental variable to leverage quasi-exogenous variation in local market concentration. To do so, we construct the HHI based on the market share of lender l in county c in year t for the years 2019–2022, but instead of actual originations we predict each lender's originations based on their initial number of manufactured home loans in a county ($loans_{l,c,2018}$) interacted with the national growth rate in the lender's total loans. Specifically, we compute the 'leave-one-out' national growth rate in the number of loans of a lender, i.e., we exclude each respective county from the nationwide evolution used to adjust the initial loans in that county:

$$\widehat{loans}_{l,c,t} = loans_{l,c,2018} \times (1 + \Delta\ loans_{l,t}), \tag{4}$$

where $\Delta loans_{l,t} = \frac{loans_{l,t} - loans_{l,2018}}{loans_{l,2018}}$ and $loans_{l,t} = \frac{1}{C}\sum_{j \neq c}^{C} loans_{l,j,t}$. We then use lenders' predicted loan originations ($\widehat{loans}_{l,c,t}$) to construct market shares in each county and then the county-level HHI according to Equation (1) for each year.

The idea behind this strategy is that instead of using (changes in) originations calculated based on realized lending activity within a county-year cell, which could reflect for instance changes in the riskiness of the borrower population, we use variation in originations that is a combination of lenders' initial footprint in 2018 alongside their nationwide growth in later years, which is plausibly exogenous to the developments within any given county. While initial originations could correlate with unobserved local factors, county fixed effects in our most stringent specification would absorb this. Further, the fact that there are 19 (24) lenders active in the average (median) county in 2018, with average (median) origination shares of 8.5% (4%), mitigates concerns that the HHI mainly captures

initial originations by just small set of large lenders.[24]

3.2 Results

This section first presents OLS and 2SLS result on the link between market concentration and rate spreads. It then investigates bunching below the HOEPA threshold and discusses robustness tests.

3.2.1 Rate spreads

Table 2, column (1) reports results for Equation (3) with year fixed effects only. It shows a highly significant positive relationship between local market concentration and rate spreads, similar to the binned scatter plot discussed earlier. Column (2) adds our battery of loan-, borrower-, and location-level control variables. While the coefficient estimate declines in magnitude relative to column (1), it remains highly significant. Column (3) further adds county fixed effects, which absorb any observable and unobservable fixed county-level characteristics. Our estimates remain effectively unchanged.[25] In terms of economic significance, an increase of 0.1 (i.e., 10 bp) in the HHI is associated with a 10 bp higher rate spread (6% of the mean).

Columns (4) and (5) separate the sample into mortgage and chattel loans. For both types of loans, we obtain a positive and statistically significant coefficient estimate on the HHI. The fact that the point estimates are slightly smaller in both of these subsamples than in the pooled sample in column (3) can be understood by considering that higher concentration is associated with a larger propensity of land-owning borrowers to take out chattel loans, which typically have much higher spreads—see Section 4.4 for further discussion.

Panel (b) reports 2SLS regressions, in which we instrument the HHI with our predicted HHI, as explained above. In the pooled sample in columns (1)–(3), higher market concentration leads to significantly higher rate spreads, suggesting a causal relation. This finding is obtained without and with controls and county fixed effects. The coefficient estimates are also positive for mortgage and chattel loans in columns (4) and (5) albeit the effect is insignificant for chattel loans where the sample size is much smaller.

[24] In Section 3.2.3 below, we summarize results from a robustness check where we use the HHI in the site-built segment instead of or in addition to the HHI in the manufactured home segment in our regressions. If changes in HHIs reflect changes in unobserved local conditions, we would expect similar coefficients, but we find the opposite.

[25] As we move from column (2) to (3), county fixed effects absorb around 60% of the variation in the HHI.

How does the increase in spreads due to high market concentration translate into borrowing costs? In the average county, the HHI equals 0.26 in the market for manufactured home loans, while it equals 0.08 for site-built mortgages. According to our estimates in panel (a), column (3), if the market for manufactured home loans were as competitive as the one for site-built homes, borrowers would pay a 18 bp lower rate spread, and hence interest rate, per year. For an average loan amount of $143,000 this amounts to annual savings of about $260. If we use the 2SLS estimates from panel (b), column (3) instead, the predicted reduction in the rate spread would be 69 bp, corresponding to annual savings of $990.

3.2.2 Bunching

Figure 3 shows that there is significant bunching of observations just below the HOEPA threshold. It plots the distribution across spreads for loans with amounts above $50,000, for which the HOEPA threshold is 6.5 pp. Panel (a) focuses on less concentrated counties with an HHI ≤ 0.15, panel (b) on those with an HHI > 0.15. We note that there are almost no observations above the threshold in either panel, which suggests that lenders find the additional requirements associated with high-cost mortgages very costly. Moreover, bunching is substantially more pronounced in less competitive counties (panel b) than more competitive counties (panel a).

This bunching of observations below the threshold could indicate lenders' market power. In a perfectly competitive market, a threshold above which origination costs discontinuously increase would lead to a "missing mass" of loans right above the threshold. For these "missing" loans the marginally higher rate spread does not cover the additional cost. But there would be no bunching.

In the presence of market power, however, lenders can charge a markup so that the rate spread exceeds the loan cost (i.e., the sum of credit risk and origination cost). Lenders can decide to give up some of their rents to avoid paying the higher costs associated with originating a mortgage above the HOEPA threshold. As long as charging a slightly lower rate (so that the rate spread is below the HOEPA threshold) and not incurring additional costs leads to higher profits on a given loan than charging a rate spread above the threshold and incurring costs associated with HOEPA, there will be an excess mass of observations right below the threshold. As shown in Cox et al. (2023), "the distribution of excess mass [below the threshold] is indicative of bank's market power." Rather than having a missing mass, there will be bunching below the threshold (Bachas et al., 2021).

The patterns in Figure 3 thus suggest that lenders in counties with greater market concentration have more market power. Without HOEPA, they would likely charge even

higher spreads, but are willing to give up some of their margins to avoid the additional administrative burden that spreads above the HOEPA threshold would entail.

We confirm this finding in regression analyses. Table 3 reports results for Equation (3) with the bunching indicator as dependent variable. Columns (1) and (2) show a positive relationship between local market concentration and the share of loans in the bunching region in OLS regressions. Both without and with county fixed effects, the relationship is significant at the 1% level.[26] In terms of magnitude, a 10 bp increase in the HHI increases the probability of a loan having a rate spread in the bunching region by 0.15 pp in column (2), relative to an unconditional mean of 4%. Columns (3) and (4) confirm these patterns in 2SLS regressions.

3.2.3 Robustness and additional analyses

The Online Appendix reports various robustness tests for our rate spread and bunching analyses. First, Table OA1 shows that our results are similar when we use the CR4, rather than the HHI, as our measure of market concentration. Second, Table OA2 shows that our results are robust to a wide range of alternative specifications. These include:

- Restricting the sample to purchase loans or to conventional (non-FHA) loans;
- Restricting the sample to observations with a rate spread below 5%;
- Using only pre-COVID observations (from 2018 and 2019);
- Removing some controls and fixed effects that are potentially "mechanically" related with the rate spread (e.g., the borrowers' DTI ratio);
- Adding loan amount × property value fixed effects (which also subsumes LTV ratio fixed effects);
- Adding lender × year fixed effects;
- Calculating the HHI based on loan amounts rather than loan counts;
- Treating the two largest integrated lenders, which are both affiliated with Clayton Homes (see Section 4), as one entity in the HHI calculation.

[26] A concern with our bunching analysis is that areas with greater market concentration and more bunching also see bunching in co-variates that factor into the rate spread. For example, for whatever reason there could be an excess mass of borrowers with an income or credit score in concentrated markets that results in a rate spread in the bunching region. While this seems unlikely, our data for the 2013–14 period, i.e., when HOEPA was introduced, allow us to explicitly rule it out. See Table OA4 and the discussion in the Online Appendix.

Third, Table OA3 compares the effect of the HHI constructed from manufactured home loans on rate spreads and bunching to the effects of the HHI constructed from site-built mortgages (a "placebo test"). We find no evidence that the site-built HHI is associated with higher spreads or more bunching in the manufactured home loan market, mitigating concerns that the HHI (either in the site-built or the manufactured home market) reflects unobservable county-level characteristics.

Fourth, in Table OA10 we use a sample of mortgages on site-built properties as comparison group for manufactured home mortgages and show that, controlling for all other borrower and loan observables, (i) the rate spread is significantly higher for manufactured home loans in the same location and year, and (ii) the more so the more concentrated the manufactured home loan market is. This remains the case when we do coarsened exact matching (CEM) on income, property value, LTV, and DTI ratio.

Finally, Table OA11 repeats our rate spread regressions for the site-built mortgage market only. We find no positive relationship between HHI and rate spreads in that segment once loan characteristics are controlled for; in fact, the estimated coefficient on HHI is sometimes negative. This finding is in line with existing literature (cited in the introduction) and suggests that, at the overall low levels of concentration in the site-built segment, marginal changes in concentration do not matter, while in the much more concentrated manufactured home loan segment, they do.

3.3 The introduction of HOEPA: Difference-in-differences analysis

As another way to link market concentration, rate spreads and bunching, we now study what happened around the introduction of HOEPA in January 2014. Figure 4 shows that bunching only emerged after the introduction of the HOEPA threshold. Panel (a) plots the distribution of rate spreads on manufactured home loans before HOEPA was introduced (gray solid bars) and after (in black). While there was no bunching of observations below the 6.5 pp threshold in 2012–2013, there was significant bunching once HOEPA came into effect in 2014 (see also Bhutta et al., 2015; Benzarti, 2024). Moreover, as panel (b) shows, the shift towards bunching was more pronounced in more concentrated counties. In 2013 (blue diamonds), there was only a weak county-level relationship between the share of loans bunching below the HOEPA threshold and the county-level HHI. In 2014 (red dots), however, bunching was much more frequent in general but especially in more concentrated markets.

To investigate the effects of the introduction of HOEPA on rate spreads and bunching,

we estimate the following difference-in-differences specification from 2012 to 2016 with the earlier HMDA vintage:

$$y_{i(l,c,t)} = \beta_1 \; HHI_{c,pre} \times 1(2014)_t + controls_i + \theta_c + \tau_t + \epsilon_i. \tag{5}$$

The dependent variable $y_{i(l,c,t)}$ is either the rate spread of loan i by lender l to a borrower located in county c in year t, or an indicator that takes on a value of one if a loan has a rate spread in the bunching region ([6–6.5 pp]). The variable $HHI_{c,pre}$ is the Herfindahl–Hirschman index, averaged for each county over the pre-HOEPA years (2012 and 2013). The variable $1(2014)_t$ is a dummy with a value of one for the years after the introduction of HOEPA (2014–2016). Controls include the log of income and log loan amount, as well as fixed effects for loan type, loan purpose, sex, ethnicity, race, co-applicant yes/no, and purchaser type. Finally, we include county fixed effects (θ_c) and year fixed effects (τ_t). Standard errors are clustered at the county level.

Table 4 reports results for Equation (5). For rate spreads, column (1) shows a significant negative coefficient on the interaction term: counties with a higher HHI experienced a stronger decline in the rate spread after HOEPA came into effect. We obtain similar results when we add controls and fixed effects in column (2). When we focus on bunching in columns (3) and (4), results show that after the introduction of HOEPA, more concentrated counties saw a significant increase in bunching of loans below the HOEPA threshold.[27]

Figure 5 shows that there were no differential pre-trends in bunching between high- and low-HHI counties. Panel (a) plots the evolution of the share of loans in the bunching region over time, once for counties with an HHI above 0.15 (blue solid line), and once for counties with an HHI below 0.15 (black dashed line). Panel (b) plots coefficients and 99% confidence intervals for Equation (5) with the *HHI* dummy interacted with dummies for each year, relative to the year 2013. Coefficient estimates are statistically and economically insignificant prior to the introduction of HOEPA in January 2014. They are positive and significant from 2014 onward.[28]

We do not find any significant differential changes in loan amounts or denial rates from before vs. after 2014 depending on local market concentration (see columns (3) and (4) in Table OA5). This result is consistent with Benzarti (2024), who finds no overall

[27] Our results are similar when we set the bunching indicator to zero for loans with missing data on rate spreads (including loans with a rate spread below 1.5pp). When we use an indicator variable as dependent variable that takes on a value of one for observations with missing rate spreads, the coefficient on the interaction term is economically and statistically insignificant. See Table OA5, columns (1) and (2).

[28] Figure OA1 plots coefficient estimates for the rate spread and an indicator that equals one if the rate spread is observed and zero if it is not observed.

effects of the introduction of HOEPA on credit supply.

In sum, results from this difference-in-differences analysis also support a causal link between market concentration and rate spreads. They furthermore suggest that the introduction of HOEPA in 2014 benefitted borrowers, especially those in more concentrated markets, by lowering their rate spreads. At least in the short term, we do not detect any offsetting costs in terms of tighter credit supply.

4 The role of integrated lenders

One reason for the relatively high concentration in the market for manufactured home loans is the presence of integrated (or captive) lenders. Integrated lenders are responsible for 21% of all loans in our baseline sample.[29] In the average county, their market share equals 31%.

The presence of integrated lenders could be explained by synergies between manufacturing/building homes, selling them in retail stores, and having affiliated lenders that are listed as financing options by retailers. For example, a company that builds manufactured homes and operates its own retail stores could also provide financing options through its affiliated lenders. In fact, the two largest integrated lenders, 21st Mortgage and Vanderbilt, are subsidiaries of Clayton Homes, by far the largest builder of manufactured housing and modular homes in the United States. Clayton Homes also owns over 750 retailers across the country.[30]

Table 5 provides summary statistics at the loan and borrower level for integrated and nonintegrated lenders. Integrated lenders charge higher rate spreads (4.3 pp vs 1.3 pp on average) and are responsible for the vast majority of loans with spreads in the bunching region. They are also much more likely to engage in chattel lending. In terms of other borrower and loan characteristics, loans by integrated lenders tend to be smaller and loan terms somewhat shorter, while LTV ratios are higher. Integrated lenders hold on to the vast majority of their loans, while nonintegrated lenders sell almost three-quarters of them—an issue we revisit below. Integrated lenders serve a much larger share of Black and Hispanic borrowers, while average incomes are similar across the two lender categories.

[29] Among the major lenders active in the manufactured home loan market, we hand-identify a total of seven integrated lenders that are affiliated with manufactured home producers; the list is provided in Table OA13.

[30] Both lenders and Clayton Homes are wholly owned subsidiary of Warren Buffett's Berkshire Hathaway. While beyond the scope of this paper, there have been reports of Berkshire Hathaway abusing its market dominance, especially among non-landowners.

The rest of this section proceeds as follows: first, we estimate the differential rate spread charged by integrated lenders after accounting for borrower and loan observables. We then study potential contributors to the higher spreads, namely market power, bundling, differences in funding models, and steering into chattel loans. Finally, we study effects of the local presence of integrated lenders on the rates charged by other lenders.

4.1 Rate spreads and bunching

Whether the presence of integrated lenders is to the benefit or detriment of borrowers depends on the nature of the synergies between selling and lending. If integrated lenders have a substantial informational advantage, for example because of lower informational asymmetries about collateral values or borrower quality, or lower uncertainty that a home sold by a retailer to a customer will also find a lender willing to finance it, then integrated lenders could offer cheaper loans. However, integrated lenders could also be exploiting their market power over borrowers at the point-of-sale of the home, which would lead to higher rates (as suggested by the summary statistics above).

To investigate this aspect, we estimate loan-level regressions with the rate spread as dependent variable and a dummy that takes on a value of one for integrated lenders as our independent variable of interest:

$$y_{i(l,c,t)} = \gamma \; integrated_l + controls_i + \theta_t + \kappa_c + \varepsilon_i. \tag{6}$$

We control for the same borrower observables and loan characteristics, as well as county and year fixed effects, as in Equation (3).

Columns (1) and (2) of Table 6 show that, conditional on borrower and loan observables, integrated lenders charge significantly higher average rate spreads and originate more loans in the bunching region. In terms of magnitude, integrated lenders charge a 1.8 pp higher rate spread. Table OA6 shows that this estimated rate premium remains nearly unchanged when we estimate regressions with census tract×year fixed effects, i.e., when we compare loans by integrated and nonintegrated lenders to borrowers in the same tract, and when we estimate the regression on a matched sample after coarsened exact matching on income, loan amount, LTV ratio, and DTI buckets.[31] These patterns suggest that integrated lenders' market power may outweigh their informational advantage,

[31] Results also hold separately when restricting the sample to either mortgages or chattel loans (see Figure OA2 and Table OA6, columns 3–6). When we separate integrated lenders into those affiliated with Clayton Homes and those that are not, we find that both lenders charge significantly higher average rate spreads. Only Clayton Homes affiliated lenders appear to engage in significantly more bunching (see Table OA6, columns 7–8).

although another possibility is that they charge higher rates as a form of bundling, which we turn to next.

4.2 Bundling

Integrated lenders charging higher rates need not be bad for borrowers if the high rates are part of a "bundling" arrangement. Integrated sellers/lenders could offer the home at a lower price so that borrowers with insufficient cash can still afford the downpayment (or get a home without making any downpayment at all). In return, borrowers pay a higher interest rate.

To provide intuition, consider the following example: a house has a "fair price" of $100,000 and requires a downpayment of 20%. The rate spread in a competitive market would be 5%. Now suppose there are two prospective borrowers, with $18,000 and $16,000 in cash, respectively. They cannot afford a house that costs $100,000 and requires a downpayment of $20,000. An integrated lender could, however, offer the following options:

1. Sell the house for $90,000, with a downpayment of $18,000, leading to a loan size of $72,000. To compensate for the lower price, the lender charges 7%.

2. Sell the house for $80,000, with a downpayment of $16,000, leading to a loan size of $64,000. To compensate for the lower price, the lender charges 9%.

Now both prospective borrowers could afford a house, albeit at a higher interest rate. A key assumption is that the larger the discount on the house price, the higher the spread needs to be to compensate the seller/lender.[32]

Investigating bundling in our data directly is difficult because we do not observe any details about the property beyond its price, so we cannot measure whether a borrower was given a discount relative to the usual price. We thus provide different pieces of indirect evidence.

One prediction of the bundling argument is that interest rates of integrated lenders should be relatively higher for more financially constrained borrowers. We test this in columns (3) and (4) of Table 6, using as our proxy for a borrower's financial constraints the ratio of the median price for a manufactured home in their county divided by their income.[33] Column (3) uses a continuous measure, column (4) dummies for each quartile. Our estimates do not detect large differences in integrated lender rate spread premiums

[32]This specific examples assumes the following schedule: $rate = 5\% + 0.0002 \times discount$.

[33]We winsorize this ratio at the 1st and 99th percentile; it then averages 3.25, with a standard deviation of 2.07.

between borrowers with relatively low incomes and those with high incomes. For example, the estimates in column (4) indicate that those borrowers in the highest quartile of property prices to income (i.e., relatively low incomes) are not charged significantly more by integrated lenders than those in the lowest quartile, contrary to what we would expect in case of bundling as outlined above.[34]

Another way to test for whether bundling could explain the presence of loans with high spreads is provided by the introduction of HOEPA in 2014. Recall that HOEPA effectively prevents lenders from charging a spread above 6.5pp. In the example above, the maximum discount is thus \$7,500, so the house price needs to be at least \$92,500, with a downpayment of \$18,500. Should borrowers be able to scrape together the missing cash, loan amounts would thus increase. For borrower 1 the loan amount would increase from \$72,000 to \$74,000. For borrower 2, from \$64,000 to \$74,000. Should they not have the necessary cash, they face two options: apply and get rejected (because of not enough cash/downpayment for a \$92,500 home) or not apply to begin with. In the presence of bundling by integrated lenders, the introduction of HOEPA thus yields the following predictions:

1. The average loan amount on loans originated by integrated lenders should increase by more from pre- to post-HOEPA compared to nonintegrated lenders.

2. The denial rates because of too little cash/downpayment should increase by relatively more for integrated lenders post-HOEPA if borrowers still apply.

3. In areas with a higher share of loans with a rate spread exceeding 6.5 pp pre-HOEPA, the market share in applications and originations of integrated lenders should decrease, as some of the bundling that made them attractive pre-HOEPA is no longer possible.

To test predictions 1 and 2, we estimate the following DiD specification from 2012 to 2016:

$$y_{i(l,c,t)} = \delta \; \textit{Integrated lender}_l \times \textit{1(2014)}_t + \textit{controls}_i + \theta_c + \tau_t + \epsilon_i, \tag{7}$$

The dependent variable $y_{i(l,c,t)}$ is either the loan amount of *originated* loan i by lender l to a borrower located in county c in year t, or an indicator that takes a value of one if a *loan application* was denied because of insufficient cash/downpayment. $\textit{Integrated lender}_l$ is a dummy that takes on a value of one for integrated lenders. The variable 1(2014) is a

[34]Similarly, in Table OA7 we find the differential rate spread charged by integrated lenders to be even higher for low-LTV loans, where it is less likely that the borrower is constrained.

dummy with a value of one for the years after the introduction of HOEPA (2014–2016). Controls include the log of income, as well as fixed effects for loan type, loan purpose, sex, ethnicity, race, co-applicant yes/no, and purchaser type. Finally, we include county and year fixed effects (θ_c and τ_t), or county $\times$ year fixed effects. If there is bundling, we expect $\delta > 0$ for loan amounts and denial rates.

Table 7, columns (1) and (2) show that the loan amount did not differentially change for integrated vs. nonintegrated lenders when HOEPA came into effect. Columns (3) and (4) show that denial rates because of insufficient down payment did also not differentially change.[35] Results remain similar without and with county $\times$ year fixed effects. These findings are inconsistent with predictions 1 and 2, and thus do not support the presence of bundling.

To test prediction 3, we first compute the share of loans in each county with a spread above 6.5 pp in 2012 and 2013, i.e., prior to the introduction of HOEPA.[36] We then estimate DiD regressions as in Equation (5), but with the *integrated lender* dummy as the outcome variable and with the average share of loans with a spread $>$ 6.5 pp instead of the HHI as interacted explanatory variable. If there is bundling, we expect a negative coefficient on the interaction term. Table 7, columns (5) and (6) show no significant change in the likelihood of an origination or application being by/to an integrated lender in areas with a higher ex-ante share of loans with high spreads after the introduction of HOEPA. Again, these results are inconsistent with prediction 3 and bundling.

Taken together, our analysis of the introduction of HOEPA in January 2014 yields the following results: while spreads decreased and bunching increased by more in more concentrated markets (as discussed in Section 3.3), there were no changes in loan amounts, denial rates, or the market share of integrated lenders. Together with the fact that integrated lenders' spreads are not higher for likely more financially constrained buyers, these patterns cast doubt on the theory that the high spreads charged by integrated lenders reflect discounts on manufactured homes that enable cash-constrained households to buy. Of course, it is still possible that some borrowers benefit from the presence of integrated lenders, if those lenders make loans to risky borrowers who would not be able to get credit from nonintegrated lenders. This possibility is difficult for us to test directly, especially given that credit scores are not available in the public HMDA data.

[35] We also find no evidence that overall denial rates increase (see Table OA5).

[36] In the average county, the 2012-13 share of loans above the HOEPA threshold averages 10.8%.

4.3 Financing

Table 5 showed that integrated lenders hold the vast majority of their loans on balance sheet. Meanwhile, nonintegrated lenders sell almost three-quarters of loans. If integrated lenders face a higher cost of balance-sheet lending (e.g., because they have no access to cheap deposits) and/or limited access to secondary markets, this higher cost of financing could explain the higher rates charged by these lenders.

We investigate this possibility in Table 8. Column (1) controls for the share of manufactured home loans each lender has sold by the end of the calendar year.[37] It is indeed the case that loans by lenders that sell a larger share of their loans are somewhat cheaper, but the coefficient on the *integrated lender* dummy is only slightly reduced relative to our baseline specification from Table 6. Column (2) drops banks (i.e., deposit-taking institutions) from the sample and again reports a similar coefficient in terms of size, sign, and significance. Columns (3) and (4) instead restrict the sample to lenders that have sold fewer than 50% or 25% of their total loans by the end of the year, while column (5) only keeps loans that were not sold by the end of the year. Finally, column (6) retains only conventional (non-FHA) loans. Across all specifications, the coefficient on *integrated lender* remains highly significant and large in magnitude. These results suggest that differences in financing do not explain the higher spread charged by integrated lenders.

4.4 Chattel lending and steering

We saw above that 14% of the borrowers in our sample take out chattel loans and that integrated lenders are much more likely to originate chattel loans—for them, 50% of loans are chattel, compared to only 4% for nonintegrated lenders. Chattel loans have certain advantages for borrowers. For example, the land is not encumbered and would remain in their possession in case they default on the loan. On the other hand, interest rates on chattel loans are much higher than for regular mortgages, as the lender has less valuable collateral to repossess. All borrowers in our sample own the land on which the home is placed and would thus in principle be eligible for mortgage loans.[38]

It is plausible that integrated lenders have a comparative advantage at offering chattel loans, as they may be better at reselling repossessed manufactured homes (while for a

[37] The HMDA data only record whether a loan has been sold by the end of the reporting year. As is well-known, this leads to some measurement error due to the frequent 1-3 month lag between when a loan is originated and when it is sold.

[38] A manufactured home must be titled as real property to qualify for a mortgage instead of a chattel loan, and the requirements and tax implications of this classification vary widely by state (e.g., Burkhart, 2014). Note that the county fixed effects in our preferred specifications absorb any state-level differences.

nonintegrated lender, it is mostly the land that would have value as collateral). At the same time, integrated lenders could also be using their market power to steer borrowers into more expensive chattel loans.[39] If there is steering, that should be easier if competition is lower and obtaining alternative financing more difficult. In such a case, we expect chattel lending by integrated lenders to be more frequent when the local market is more concentrated.

Table 9, column (1) confirms that integrated lenders do significantly more chattel lending, controlling for other borrower and loan characteristics, as well as county and year fixed effects. Column (2) further shows that chattel lending is generally more frequent in more concentrated markets. However, this is driven only by integrated lenders, as shown in column (3): the coefficient on HHI is not significant, while the interaction between integrated lender and HHI is significantly positive, i.e., integrated lenders do differentially more chattel lending in more concentrated markets. These results also persist in 2SLS regressions in columns (4) and (5). This evidence is suggestive of integrated lenders originating chattel loans to land-owning borrowers at least partly by steering them into taking out these more expensive loans, and this steering being more common in locations with higher market concentration.[40]

4.5 Effects on other lenders

If integrated lenders charge "excessive" rates and earn rents, this begs the question of why other lenders do not compete these rents away. One possibility is that informational asymmetries may play a role, even if they do not make the loans of integrated lenders cheaper. The idea here is based on Stroebel (2016): when integrated lenders have an informational advantage about collateral values, this should lead to higher rates charged by *other* lenders in the area. The reason is adverse selection: integrated lenders lend against above-average quality collateral, so nonintegrated lenders will face a pool of applications with worse quality. To test for this, we focus on the sample of nonintegrated lenders and estimate loan-level regressions with the rate spread as dependent variable and the market

[39] On steering in mortgage markets, see Agarwal et al. (2016); Gurun et al. (2016); Guiso et al. (2022). Freddie Mac and the Center for Community Capital at UNC Chapel Hill (2020) report results from a survey of 1,350 manufactured home loan borrowers in Texas, of which 61% owned the land on which the home was placed. 60% of those borrowers nevertheless obtained financing via a chattel loan, which is much higher than in our national HMDA sample (14%). Chattel borrowers frequently cited the desire to avoid encumbering their land as a main reason for their choice, but the study also found substantially higher odds of ending up with a chattel loan for landowners that were assisted by the seller/retailer in obtaining financing.

[40] It would be interesting to calculate how much money borrowers leave on the table by taking out a chattel loan rather than using the land as collateral. One difficulty with this calculation is that the property value recorded in HMDA for these borrowers does not include the value of the land, so we cannot calculate a counterfactual LTV.

share of integrated lenders in each county as independent variable.[41]

Table 10, column (1) shows that nonintegrated lenders charge higher rate spreads in areas where integrated lenders have a higher market share. This is true when we add county fixed effects (column 2), robust to the inclusion of lender fixed effects in column (3), and when we control for the local HHI (unreported). Finally, we obtain similar results when we instrument the local market share of integrated lenders with the distance to the three nearest factories of integrated lenders, which we geolocate by hand (columns 4 and 5).[42] In terms of magnitudes, a 10 pp increase in the market share of integrated lenders increases the rate spread by 2-4 bps. Thus, consistent with adverse selection playing a role, a larger presence of integrated lenders increases the rates charged by other lenders as well.

5 Conclusion

Policy makers place high hopes in manufactured housing, the largest source of unsubsidized affordable housing in the US, as a solution to the housing crisis. This paper provides novel evidence that the multi-billion dollar market for manufactured home loans is characterized by high market concentration that enables lenders to charge higher interest rates. Using detailed loan-level data from HMDA, we show that mortgages originated in counties with higher market concentration carry significantly higher rate spreads. Evidence from bunching around the HOEPA threshold, an instrumental variable analysis, and a difference-in-differences analysis suggest a causal relation.

We also provide evidence on the role of integrated lenders in the manufactured home loan market, and tentatively conclude that they are an important contributor to the high interest rates in this market. These lenders charge high rates themselves, in particular by originating mostly chattel loans rather than mortgages, and via their potential information advantage seem to lead other lenders to charge higher rates as well. Moreover, we do not find direct evidence indicating that the high rates charged by integrated lenders compensate for other benefits they provide to borrowers (although our ability to test for such benefits is admittedly limited). In any case, a deeper assessment of integrated lenders' behavior is essential to understand the drivers of the high cost of credit for manufactured homes and to identify the most effective policies to promote competition.

[41] The average (median) market share of integrated lenders at the county-year level is 30.8% (25.0%), with a standard deviation of 27.6%.

[42] As detailed in Jensen (2024), considerable transportation costs of manufactured homes—which increase with the shipping distance—mean that manufacturers typically locate their factories close to the markets they serve. The Manufactured Housing Institute provides a detailed list of manufactured housing plants and the associated manufacturer (as of 2024), which we use to geolocate factories.

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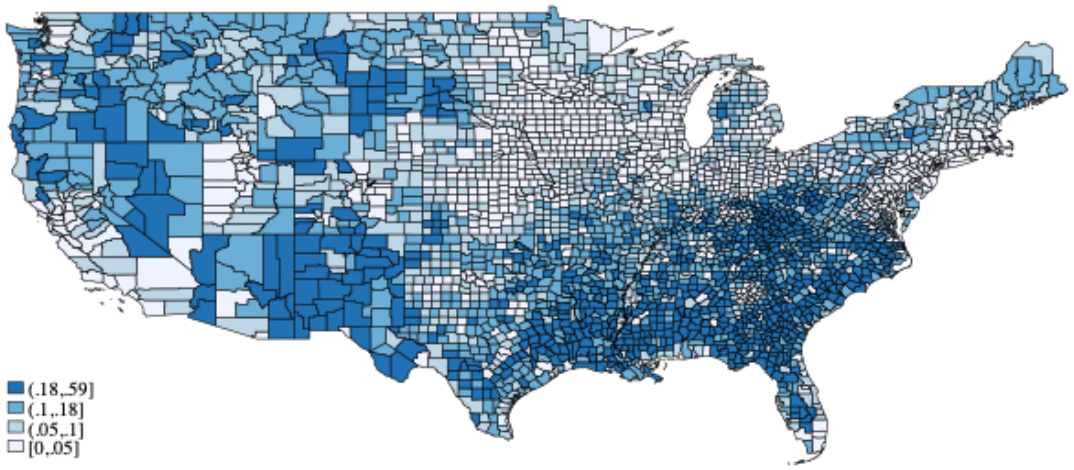
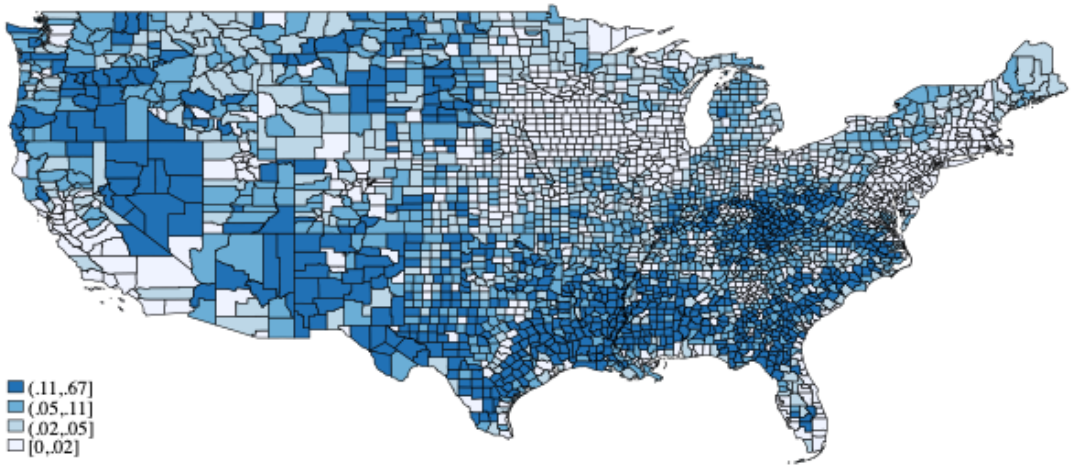
A Figures and tables

Figure 1: **Manufactured housing across US counties**

(a) Share of manufactured housing units (ACS)



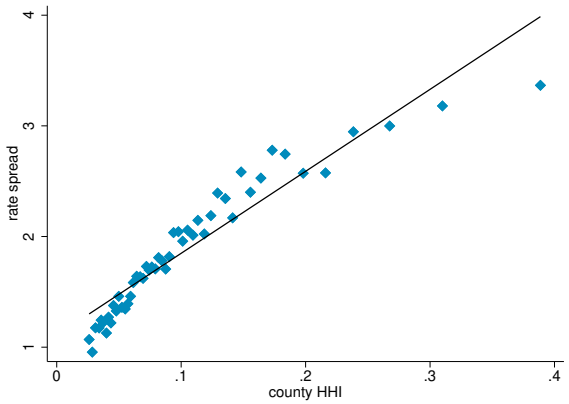
(b) Share of manufactured home loans (HMDA)



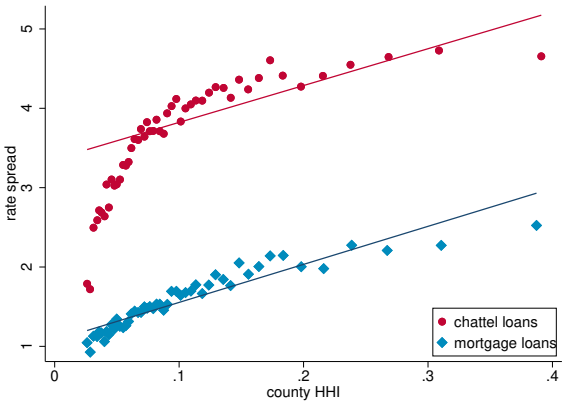
For each US county, this figure shows the share of manufactured housing units out of total housing units (panel a) and the average share of manufactured home loan originations out of total mortgage originations (panel b). Source: 5-year ACS in 2019; HMDA 2018–2022.

Figure 2: **Market concentration and rate spreads**

(a) All loans



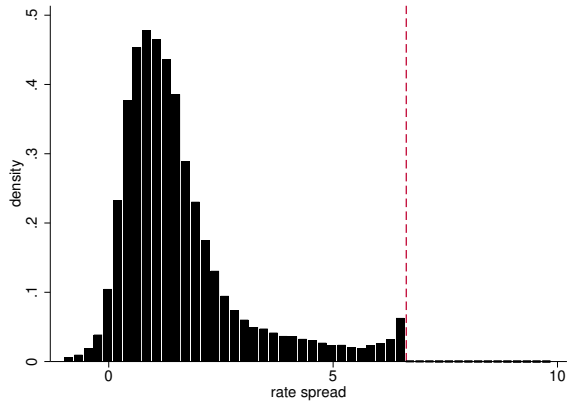
(b) Mortgage vs chattel loans



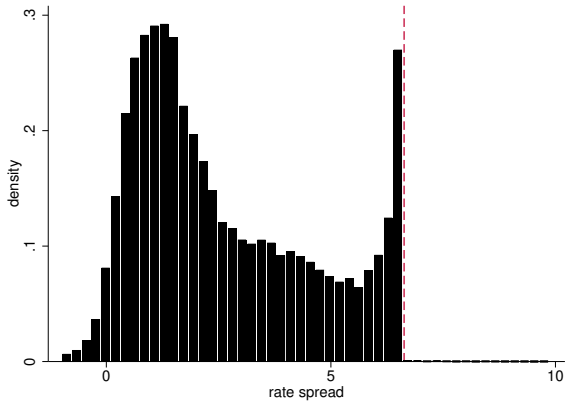
This figure provides a binned scatter plot of the rate spread on the vertical axis against the county-level HHI (as defined in Equation (1)) on the horizontal axis. Panel (a) pools mortgage and chattel loans. Panel (b) splits the sample into mortgage and chattel loans.

Figure 3: **Rate spread and bunching below the HOEPA threshold**

(a) Low HHI counties



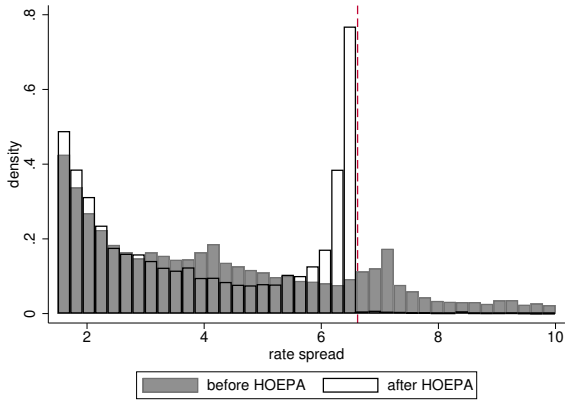
(b) High HHI counties



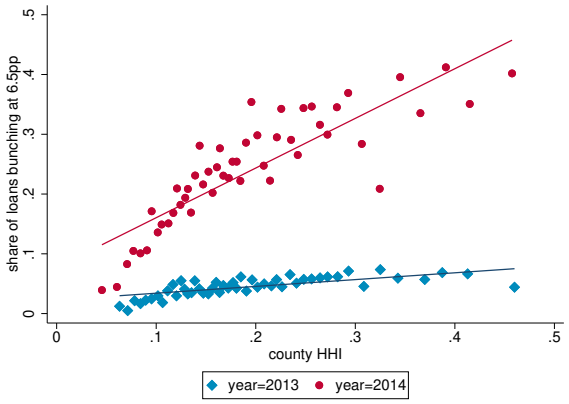
This figure provides a histogram of the rate spread on loans with amounts above $50,000, for which the HOEPA threshold is 6.5 pp (indicated by the red dashed line). Panel (a) restricts the sample to counties with $HHI \leq 0.15$ (low concentration), panel (b) to counties with $HHI > 0.15$ (high concentration).

Figure 4: **Market concentration and bunching around the introduction of HOEPA**

(a) Density: Rate spread



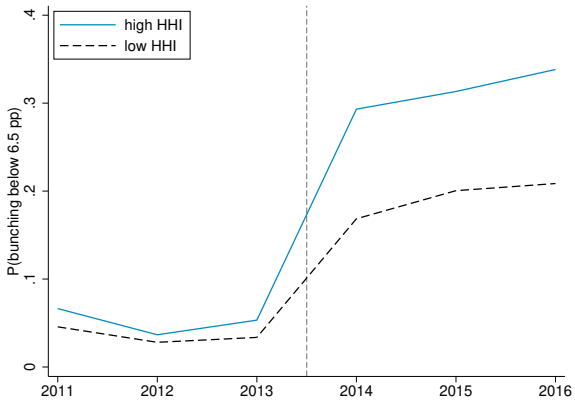
(b) Bunching



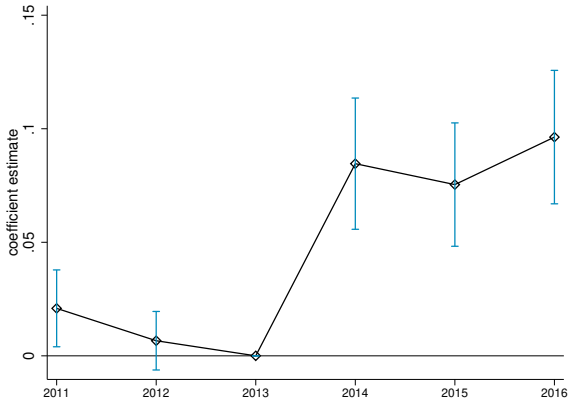
Panel (a) provides a density plot of the rate spread on loans with amounts above $50,000 in 2013 (gray shaded areas) and 2014 (black bars). HOEPA, which features the threshold at 6.5 pp (indicated by the red dashed line), was introduced in January 2014. Panel (b) provides a binned scatter plot of the share of loans in the bunching region on the vertical axis against the county-level HHI (as defined in Equation (1)) on the horizontal axis in 2013 (blue diamonds) and 2014 (red dots).

Figure 5: **Pre-trends in bunching around the introduction of HOEPA**

(a) DiD pre-trends graph: raw data



(b) DiD pre-trends graph: coefficient plot



Panel (a) plots the evolution of the share of loans in the bunching region over time for counties with $HHI > 0.15$ (blue solid line) and $HHI \leq 0.15$ (black dashed line). HOEPA, which features the threshold at 6.5 pp, was introduced in January 2014. Panel (b) plots coefficient estimates and 99% confidence intervals from regression (5), where we interact the HHI dummy that takes on a value of one if $HHI > 0.15$ with dummies for each year, relative to the base year 2013.

Table 1: **Summary statistics**

Panel (a): Loan characteristics

Variable	Obs	Mean	Std. Dev.	Min	Max	P50
Rate spread	522739	1.903	1.707	-1	9.998	1.362
Interest rate	522120	5.043	1.933	2.5	11.29	4.625
Bunch 6.5 pp (0/1)	492795	.04	.197	0	1	0
Total closing costs	522739	4728.846	2984.621	0	12475.54	4176.22
Cost/amount	522739	.036	.018	0	.075	.034
Loan amount	522739	143127.7	78748.68	15000	385000	125000
Property value	522739	181195.5	101979.4	15000	485000	155000
Loan term	522739	308.462	71.618	117	360	360
LTV ratio	522739	.821	.191	.304	1.4	.873
Retained by lender (0/1)	522739	.387	.487	0	1	0
Non-cashout refinance (0/1)	522739	.189	.392	0	1	0
Cashout refinance (0/1)	522739	.109	.312	0	1	0
Loan is FHA (0/1)	522739	.31	.462	0	1	0
Principal residence (0/1)	522739	.955	.208	0	1	1
Lender is bank (0/1)	522739	.285	.451	0	1	0
Chattel loan (0/1)	522739	.14	.347	0	1	0

Panel (b): Borrower characteristics

Variable	Obs	Mean	Std. Dev.	Min	Max	P50
Income	522739	64091.8	36946.59	0	200000	57000
Asian (0/1)	522739	.006	.077	0	1	0
Black (0/1)	522739	.044	.206	0	1	0
Hispanic (0/1)	522739	.097	.296	0	1	0
White (0/1)	522739	.818	.386	0	1	1
Female (0/1)	522739	.226	.418	0	1	0
Age below 35 (0/1)	522739	.295	.456	0	1	0
Age above 62 (0/1)	522739	.183	.386	0	1	0
DTI below 36% (0/1)	522739	.423	.494	0	1	0

Panel (c): Market concentration

Variable	Obs	Mean	Std. Dev.	Min	Max	P10	P50	P90
HHI manufactured home loans	14202	.26	.26	.02	1	.07	.17	.56
CR4 manufactured home loans	14202	.69	.23	.19	1	.39	.67	1
HHI site-built mortgages	14202	.08	.06	.01	1	.03	.06	.15
CR4 site-built mortgages	14202	.44	.15	.14	1	.27	.42	.63

Panel (a) reports summary statistics for loan characteristics. Loan amount, interest rate, total loan cost, loan cost over loan amount, property value, loan term, as well as the LTV ratio are winsorized. LTV is calculated as loan amount divided by property value; both of these variables are rounded to the nearest $10k in the public HMDA data. Panel (b) reports summary statistics for borrower characteristics. Income is winsorized. Panel (c) reports summary statistics for our main measures of market concentration, the HHI and CR4 (as defined in Equations (1) and (2)) at the county-year level, separately for the manufactured home loan and the site-built mortgage market.

Table 2: **Market concentration and rate spreads**

Panel (a): OLS

	(1)	(2)	(3)	(4) mortgage	(5) chattel
VARIABLES	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread
HHI	4.14***	1.05***	1.00***	0.88***	0.70***
	(0.24)	(0.09)	(0.06)	(0.07)	(0.09)
Observations	522,739	522,739	522,739	449,317	73,120
R-squared	0.08	0.58	0.61	0.53	0.55
Year FE	Y	Y	Y	Y	Y
Controls	-	Y	Y	Y	Y
County FE	-	-	Y	Y	Y
Mean dep var	1.90	1.90	1.90	1.55	4.08

Panel (b): 2SLS

	(1)	(2)	(3)	(4) mortgage	(5) chattel
VARIABLES	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread
HHI	5.74***	1.28***	3.90***	3.66**	0.63
	(0.36)	(0.15)	(1.34)	(1.48)	(1.38)
Observations	428,291	428,291	428,268	369,367	58,679
R-squared	0.10	0.18			
Year FE	Y	Y	Y	Y	Y
Controls	-	Y	Y	Y	Y
County FE	-	-	Y	Y	Y
Mean dep var	1.87	1.87	1.87	1.52	4.09
Anderson-Rubin test (p-val)	0.00	0.00	0.00	0.01	0.65
F stat	1224.50	1008.98	21.18	15.45	23.64

This table reports results for Equation (3). The dependent variable is the rate spread. The main independent variable is the county-level HHI, as defined in Equation (1). Panel (a) reports results from OLS regressions. Panel (b) reports results from 2SLS regressions, in which the HHI constructed from the predicted market shares is used as instrument. Columns (4) and (5) split the sample into mortgage and chattel loans. Controls from column (2) onward consist of the following variables: log income, log property value, the LTV ratio (both linearly and with dummies for different bins: $< 70\%, [70-80\%), [80-90\%), [90-100\%), > 100\%$), the loan term, and total closing costs over loan amount; dummies for loan amount ($10k bins), DTI bins, borrower age bins, race, sex, co-applicant yes/no, credit score type, loan purpose, occupancy type, loan product type, pre-approval yes/no, zero/missing income yes/no, and adjustable-rate mortgage yes/no; at the lender-county-year level: the share of denied loan applications; and at the census tract-year level: the log of the total population, the minority share, median income relative to MSA income, the average age of housing units, and the share of homeowners out of the total population. Standard errors (in parentheses) are clustered at the borrower county level. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: **Market concentration and bunching**

	(1)	(2)	(3) 2SLS	(4) 2SLS
VARIABLES	Bunch < 6.5	Bunch < 6.5	Bunch < 6.5	Bunch < 6.5
HHI	0.10***	0.15***	0.09***	0.48**
	(0.01)	(0.01)	(0.01)	(0.24)
Observations	492,795	492,781	407,620	407,592
R-squared	0.19	0.20	0.04	
Year FE	Y	Y	Y	Y
Controls	Y	Y	Y	Y
County FE	-	Y	-	Y
Mean dep var	0.04	0.04	0.04	0.04
Anderson-Rubin test (p-val)			0.00	0.06
F stat			1016.77	18.19

This table reports results for Equation (3) for loans with amounts above $50,000. The dependent variable is the indicator $Bunch < 6.5$, which takes on a value of one for loans in the bunching region. The main independent variable is the county-level HHI, as defined in Equation (1). In 2SLS regressions, the HHI constructed from the predicted market shares is used as instrument. Controls are the same as listed in the note to Table 2. Standard errors (in parentheses) are clustered at the borrower county level. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: **Concentration, spreads and bunching – 2012-16**

VARIABLES	(1) Rate spread	(2) Rate spread	(3) Bunch < 6.5	(4) Bunch < 6.5
HHI $\times$ 1(2014)	-0.30*	-0.64***	0.39***	0.34***
	(0.16)	(0.10)	(0.06)	(0.06)
Observations	138,929	138,929	138,929	138,929
R-squared	0.23	0.49	0.17	0.26
Controls	-	Y	-	Y
County FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Mean dep var	4.09	4.09	0.20	0.20

This table reports results for Equation (5). The dependent variable is the rate spread or the indicator $Bunch < 6.5$ for loans with amounts above \$50,000, which takes on a value of one for loans in the bunching region. The main independent variable is the HHI (as defined in Equation (1)), averaged for each county over the pre-HOEPA years. The dummy 1(2014) takes on a value of one in the years after the introduction of HOEPA in January 2014 and zero in the years prior to HOEPA. Controls include the log of income and log loan amount, as well as fixed effects for loan type, loan purpose, sex, ethnicity, race, co-applicant yes/no, and purchaser type. Standard errors (in parentheses) are clustered at the borrower county level. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: **Integrated vs nonintegrated lenders: summary statistics**

Panel (a): Loan characteristics

	Integrated		*Non-integrated*	
	mean	sd	mean	sd
Rate spread	4.26	(1.79)	1.27	(0.97)
Interest rate	7.60	(1.83)	4.36	(1.27)
Bunch 6.5 pp (0/1)	0.19	(0.40)	0.00	(0.04)
Total closing costs	3924.78	(2200.92)	4944.16	(3126.78)
Cost/amount	0.04	(0.02)	0.04	(0.02)
Loan amount	108545.02	(54602.35)	152388.32	(81594.07)
Property value	118679.42	(60979.82)	197936.28	(104221.53)
Loan term	284.51	(39.70)	314.88	(76.72)
LTV ratio	0.92	(0.15)	0.79	(0.19)
Retained by lender (0/1)	0.85	(0.36)	0.26	(0.44)
Non-cashout refinance (0/1)	0.02	(0.14)	0.23	(0.42)
Cashout refinance (0/1)	0.00	(0.05)	0.14	(0.34)
Loan is FHA (0/1)	0.09	(0.29)	0.37	(0.48)
Principal residence (0/1)	0.95	(0.22)	0.96	(0.20)
Lender is bank (0/1)	0.00	(0.00)	0.36	(0.48)
Chattel loan (0/1)	0.50	(0.50)	0.04	(0.20)
N	110,414		412,325	

Panel (b): Borrower characteristics

	Integrated		*Non-integrated*	
	mean	sd	mean	sd
Income	65204.16	(32930.13)	63793.93	(37944.55)
Asian (0/1)	0.00	(0.07)	0.01	(0.08)
Black (0/1)	0.11	(0.32)	0.03	(0.16)
Hispanic (0/1)	0.13	(0.33)	0.09	(0.29)
White (0/1)	0.73	(0.44)	0.84	(0.36)
Female (0/1)	0.21	(0.41)	0.23	(0.42)
Age below 35 (0/1)	0.30	(0.46)	0.29	(0.46)
Age above 62 (0/1)	0.14	(0.35)	0.19	(0.40)
DTI below 36% (0/1)	0.40	(0.49)	0.43	(0.49)
N	110,414		412,325	

Panel (a) reports loan characteristics for loans by integrated and nonintegrated lenders. Panel (b) reports borrower characteristics for loans by integrated and nonintegrated lenders. Loan amount, interest rate, total loan cost, loan cost over loan amount, property value, loan term, LTV ratio, as well as income are winsorized. LTV is calculated as loan amount divided by property value; both of these variables are rounded to the nearest $10k in the public HMDA data.

Table 6: **Integrated lenders and rate spreads/bunching**

VARIABLES	(1) Rate spread	(2) Bunch < 6.5	(3) Rate spread	(4) Rate spread
Integrated lender (0/1)	1.80***	0.12***	1.84***	1.77***
	(0.32)	(0.02)	(0.30)	(0.30)
Prop value/income			-0.04**	
			(0.02)	
Integrated × prop value/income			0.00	
			(0.02)	
Prop value/income (2nd quartile)				-0.03*
				(0.02)
Prop value/income (3rd quartile)				-0.07**
				(0.03)
Prop value/income (4th quartile)				-0.16***
				(0.04)
Integrated × prop value/income (2nd)				0.13***
				(0.05)
Integrated × prop value/income (3rd)				0.09
				(0.07)
Integrated × prop value/income (4th)				0.10
				(0.12)
Observations	522,739	492,781	505,104	505,104
R-squared	0.67	0.22	0.68	0.68
Year FE	Y	Y	Y	Y
Controls	Y	Y	Y	Y
County FE	Y	Y	Y	Y
Mean dep var	1.90	0.04	1.93	1.93

This table reports results for a regression of the rate spread or the indicator *Bunch* < 6.5 on a dummy that takes on a value of one for *integrated lenders*. Column (2) restricts the sample to loans with amounts above $50,000. Columns (3) and (4) interact the dummy *integrated lender* with the ratio of the median property value in a county-year cell over applicant income (continuous in column (3) and quartile dummies in column (4)). Controls are the same as listed in the note to Table 2. Standard errors (in parentheses) are clustered at the borrower county and lender level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: **Integrated lenders and bundling**

VARIABLES	(1) Log(loan amt)	(2) Log(loan amt)	(3) Denied cash (0/1)	(4) Denied cash (0/1)	(5) Originations Integrated (0/1)	(6) Applications Integrated (0/1)
Integrated lender (0/1)	-0.00	-0.01	-0.02***	-0.02***		
	(0.02)	(0.02)	(0.01)	(0.01)		
Int lender × 1(2014)	0.00	0.01	0.00	0.00		
	(0.01)	(0.01)	(0.00)	(0.00)		
Share spread 6.5pp × 1(2014)					-0.00	0.01
					(0.14)	(0.10)
Observations	138,945	137,269	957,952	957,576	138,741	956,553
R-squared	0.36	0.40	0.02	0.03	0.50	0.51
Controls	Y	Y	Y	Y	Y	Y
County FE	Y	-	Y	-	Y	Y
Year FE	Y	-	Y	-	Y	Y
County-Year FE	-	Y	-	Y	-	-
Mean dep var	4.37	4.37	0.01	0.01	0.51	0.48

Columns (1)–(4) report results for Equation (7). The dependent variable is the log loan amount in columns (1)–(2). It is the dummy *denied cash* that takes on a value of one if a loan application was denied because of insufficient cash/downpayment in columns (3)–(4). The dummy *integrated lender* takes on a value of one for integrated lenders. The dummy 1(2014) takes on a value of one in the years after the introduction of HOEPA in January 2014 and a value of zero before. Columns (5) and (6) report results for Equation (5), but use the share of loans in each county with a rate spread above 6.5 pp, averaged over 2012 and 2013, as main independent variable. Standard errors (in parentheses) are clustered at the borrower county and lender level. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: **Integrated lenders and rate spreads – financing channel**

VARIABLES	(1) Rate spread	(2) nonbanks Rate spread	(3) sold < 50% Rate spread	(4) sold < 25% Rate spread	(5) purchaser NA Rate spread	(6) conventional Rate spread
Integrated lender (0/1)	1.66***	1.68***	2.00***	2.01***	1.91***	2.36***
	(0.26)	(0.29)	(0.17)	(0.16)	(0.20)	(0.27)
Share of MH loans sold	-0.59***					
	(0.18)					
Observations	522,739	373,810	182,688	157,815	202,449	357,589
R-squared	0.68	0.74	0.68	0.66	0.67	0.73
Year FE	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y
Mean dep var	1.90	2.15	3.11	3.40	2.96	2.07

This table reports results for a regression of the rate spread on a dummy that takes on a value of one for *integrated lenders*. Column (1) controls for each lender's share of manufactured home (MH) loans sold in a given year. Column (2) restricts the sample to non-bank lenders, columns (3) and (4) to lenders that sold less than 50% and 25% of their manufactured home loans in a given year. Columns (5) and (6) focus on loans that were not sold at the end of the year and conventional loans only (i.e., no FHA/FSA loans). Controls are the same as listed in the note to Table 2. Standard errors (in parentheses) are clustered at the borrower county and lender level. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: **Integrated lenders and steering into chattel loans**

	(1)	(2)	(3)	(4)	(5)
				2SLS	2SLS
VARIABLES	Chattel (0/1)	Chattel (0/1)	Chattel (0/1)	Chattel (0/1)	Chattel (0/1)
Integrated lender (0/1)	0.28***		0.24***		0.23***
	(0.06)		(0.06)		(0.07)
HHI		0.12***	-0.03	0.57**	0.06
		(0.03)	(0.07)	(0.27)	(0.31)
Integrated lender × HHI			0.28***		0.41**
			(0.09)		(0.19)
Observations	522,739	522,739	522,739	428,268	428,268
R-squared	0.47	0.43	0.47		
Year FE	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y
Mean dep var	0.14	0.14	0.14	0.14	0.14
Anderson-Rubin test (p-val)				0.01	0.05
F stat				21.18	11.70, 139.29

The dependent variable is an indicator variable that takes on a value of one for chattel loans and zero for mortgage loans. The dummy *integrated lender* takes on a value of one for integrated lenders. The variable *HHI* denotes the county-level HHI, as defined in Equation (1). In 2SLS regressions, the HHI constructed from the predicted market shares is used as instrument; in column (5), $Integratedlender \times HHI$ is further instrumented by this predicted HHI interacted with the integrated lender dummy . Controls are the same as listed in the note to Table 2. Standard errors (in parentheses) are clustered at the borrower county and lender level. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: **Integrated lenders' market share and rate spreads among nonintegrated lenders**

	(1)	(2)	(3)	(4)	(5)
				2SLS	2SLS
VARIABLES	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread
Market share of integrated lenders	0.44***	0.21***	0.25***	0.29*	0.40***
	(0.03)	(0.04)	(0.03)	(0.15)	(0.14)
Observations	412,325	412,305	411,986	412,325	412,006
R-squared	0.32	0.38	0.59		
Year FE	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y
County FE	-	Y	Y	-	-
Lender FE	-	-	Y	-	Y
Mean dep var	1.27	1.27	1.27	1.27	1.27
Anderson-Rubin test (p-val)				0.07	0.00
F stat				35.84	20.94

This table reports results for a regression of the rate spread on the county-level market share in originations of integrated lenders. The sample is restricted to loans originated by nonintegrated lenders. 2SLS columns instrument the market share of integrated lenders with the distance to the three nearest factories of integrated lenders. Controls are the same as listed in the note to Table 2. Standard errors (in parentheses) are clustered at the borrower county level. *** p<0.01, ** p<0.05, * p<0.1.

OA Online Appendix

OA.1 Additional tables and figures

- Table OA1 reports OLS and 2SLS results for Equation (3), but with the CR4 as measure of market concentration.

- Table OA2 reports a number of robustness checks for Equation (3). Column (1) repeats our baseline estimate for the specification with county fixed effects, corresponding to column (3) of Table 2. Column (2) restricts the sample to purchase mortgages. Column (3) restricts the sample to conventional (non-government) loans, which removes FHA loans from the sample. Column (4) restricts the sample to observations with rate spreads below 5 percentage points. Column (5) restricts the sample to 2018 and 2019; since we still have county fixed effects, this means only within-county variation in HHI across two years is used. Column (6) removes a few control variables that could be seen as "over-controlling": the fixed effects for the borrower's DTI ratio (since DTI is partly affected by the interest rate on the loan itself); the closing costs of the loan (since the loan's APR should already reflect them); and the denial rate at the lender-county-year level (since this could reflect a lender's willingness to originate manufactured home loans, which could also influence its rate spread). Column (7) adds fixed effects for fully interacted loan amount $\times$ property value bins (which effectively also subsumes LTV fixed effects, given that the LTV we use is calculated as the ratio between rounded loan amount and rounded property value). Column (8) adds lender $\times$ year fixed effects; the fact that HHI remains significant in this specification suggests that individual lenders adjust their pricing depending on the intensity of local competition. In column (9), an HHI calculated based on amounts (rather than loan counts) is used. Finally, in column (10), an HHI based on the loan count is used that treats both Clayton Homes-affiliated lenders as one integrated lenders.

- Table OA3 reports results for Equation (3) and contrasts the impact of the HHI in the manufactured home market with the impact of the HHI in the site-built (SB) market on rate spreads and bunching in the manufactured home (MH) loan market. The dependent variable is the rate spread in columns (1)–(3) and the indicator $Bunch < 6.5$ in columns (4)–(6). The main independent variable is the county-level HHI, as defined in Equation (1), for the manufactured home loan market or the site-built market. Columns (3) and (6) report results from 2SLS regressions, in which the HHI constructed from the predicted market shares is used as instrument. The MH HHI always has a statistically and economically significant positive impact

on the rate spread and bunching. The coefficient on the site-built HHI has a mostly insignificant and negative coefficient. Column (7) reports univariate regressions at the county-year level, with the HHI as the dependent variable. It shows that there is no statistically significant correlation between the HHI in the site-built market and the HHI in the manfuactured home loan market.

- Table OA4 performs an exercise to rule out systematic differences in borrower characteristics around the bunching threshold that could correlate with market concentration. The analysis focuses on the years 2013 and 2014 and loans with a rate spread in the bunching region $[6, 6.5]$. It reports results for the following regression: $y_{i(l,c,t)} = \beta\ HHI_{c,pre} \times 1(2014)_t + \theta_{l,c} + \tau_t + \epsilon_{c,t}$. The dependent variable are different borrower and loan characteristics. The variable $HHI_{c,pre}$ is the HHI, averaged for each county over the pre-HOEPA years. $1(2014)_t$ is a dummy with a value of one for the years after the introduction of HOEPA, i.e., for 2014. $\theta_{l,c}$ denote lender*county fixed effects, τ_t year fixed effects. Standard errors (in parentheses) are clustered at the county level. A significant coefficient β would indicate that borrower or loan characteristics change between 2013 and 2014 in a systematic way with the HHI. Results show that borrower income, the loan amount, the probability of the borrower being white, black, Hispanic or male, or the loan being purchase (vs refinance) do not vary systematically with the HHI across years (columns 1 to 7). The coefficient β is insignificant in every column, suggesting that loans just below the non-existent HOEPA threshold in 2013 were similar in observables to loans below the HOEPA threshold after the introduction of HOEPA in 2014.

- Table OA5 reports results for Equation (5). In column (1), the dependent variable is the bunching indicator, but set to zero for loans with missing data on rate spreads (including loans with a rate spread below 1.5pp). In column (2), it is an indicator variable that takes on a value of one for observations with missing rate spreads. Columns (3) and (4) use a dummy for whether a loan was denied or the log of the loan amount as dependent variable.

- Table OA6 reports results from loan-level regressions with the rate spread or bunching indicator as dependent variable and a dummy that takes on a value of one for integrated lenders as independent variable. Columns (1)–(2) include census tract × year fixed effects, columns (3)–(6) split the sample into mortgage and chattel loans. Across specifications, integrated lenders charge higher spreads and have more loans in the bunching region compared to nonintegrated lenders. Columns (7) and (8) contrast Clayton Homes lenders and other integrated lenders. The latter also charge significantly higher spreads and engage in (insignificantly) more bunching. Finally,

in columns (9)–(11) we use coarsened exact matching (CEM) of observations by integrated vs. nonintegrated lender on income, property value, and LTV ratio (10 bins each), as well as the DTI ratio buckets (exact).

- Table OA7 reports results from loan-level regressions with the rate spread as dependent variable and a dummy that takes on a value of one for integrated lenders as independent variable. Column (1) reports results for the full sample, columns (2), (3), and (4) for loans with an LTV ratio below 80% based on the baseline LTV ratio, a computed upper bound (UB) and a computed lower bound (LB) LTV ratio. The upper and lower bound are computed as (loan amount + 5000)/(property value - 5000) and (loan amount - 5000)/(property value + 5000). Across sub-samples, integrated lenders charge higher spreads compared to nonintegrated lenders.

- Figure OA1 plots coefficient estimates and 99% confidence intervals for the variable *HHI* used in regression (5), interacted with dummies for each year, relative to the year 2013. Panel (a) plots coefficient estimates for the rate spread as dependent variable and panel (b) for an indicator variable that equals one if rate spread is observed and zero if it is not observed as dependent variable.

- Figure OA2 shows that integrated lenders charge a higher rate spread in both the chattel and mortgage market compared to nonintegrated lenders, and that they are more likely to engage in bunching in both markets.

Table OA1: **Market concentration, rate spreads, and bunching – CR4**

	(1)	(2)	(3)	(4)
		2SLS		2SLS
VARIABLES	Rate spread	Rate spread	Bunch < 6.5	Bunch < 6.5
CR4	0.61***	1.16**	0.09***	0.22**
	(0.05)	(0.59)	(0.01)	(0.09)
Observations	522,739	434,095	492,781	413,099
R-squared	0.61		0.20	
Year FE	Y	Y	Y	Y
Controls	Y	Y	Y	Y
County FE	Y	Y	Y	Y
Anderson-Rubin test (p-val)		0.05		0.02
F stat		24.52		23.35

This table reports results for Equation (3). The dependent variable is the rate spread or the indicator $Bunch < 6.5$. The main independent variable is the CR4 in borrower county c in year t, as defined in Equation (2). In 2SLS regressions the CR4 constructed from the predicted market shares is used as instrument. Standard errors (in parentheses) are clustered at the borrower county level. *** p<0.01, ** p<0.05, * p<0.1.

Table OA2: **Market concentration and rate spreads – robustness**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	baseline	purchase	conventional	spread < 5	pre-2020	fewer controls	amt*val FE	L*Y FE	HHI amt	HHI CH
VARIABLES	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread
HHI	1.00***	0.96***	1.07***	0.53***	0.54***	1.14***	0.87***	0.15***	0.83***	1.15***
	(0.06)	(0.07)	(0.07)	(0.06)	(0.11)	(0.07)	(0.06)	(0.03)	(0.07)	(0.06)
Observations	522,739	366,720	357,589	476,820	173,628	522,739	521,816	521,631	522,739	522,739
R-squared	0.61	0.63	0.65	0.50	0.60	0.56	0.62	0.78	0.61	0.61
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

This table reports various results for Equation (3). The dependent variable is the rate spread. The main independent variable is the HHI in borrower county c in year t, as defined in Equation (1). Standard errors (in parentheses) are clustered at the borrower county level. *** p<0.01, ** p<0.05, * p<0.1.

Table OA3: **Testing for effects of the HHI for mortgages on site-built homes**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			2SLS			2SLS	C-Y
VARIABLES	Rate spread	Rate spread	Rate spread	Bunch < 6.5	Bunch < 6.5	Bunch < 6.5	HHI
HHI		1.03***	3.68***		0.15***	0.46**	
		(0.06)	(1.26)		(0.01)	(0.23)	
HHI (site-built)	-0.79***	-1.14***	-1.85***	0.04	-0.01	-0.10	0.10
	(0.19)	(0.20)	(0.51)	(0.04)	(0.03)	(0.09)	(0.06)
Observations	522,724	522,724	428,268	492,766	492,766	407,592	14,171
R-squared	0.61	0.61		0.20	0.20		0.78
Year FE	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	-
County FE	Y	Y	Y	Y	Y	Y	Y
Anderson-Rubin test (p-val)			0.00			0.06	
F stat			23.85			20.81	

This table reports results for Equation (3) in columns (1)–(6). The dependent variable is the rate spread in columns (1)–(3) and the indicator $Bunch < 6.5$ that takes on a value of one for loans in the bunching region in columns (4)–(6). The main independent variable is the county-level HHI, as defined in Equation (1), for the manufactured home loan market or the site-built market. Columns (3) and (6) report results from 2SLS regressions, in which the HHI is constructed from the predicted market shares is used as instrument. Column (7) reports univariate regressions at the county-year level, with the HHI as the dependent variable. Standard errors (in parentheses) are clustered at the borrower county and lender level. *** p<0.01, ** p<0.05, * p<0.1.

Table OA4: **Balancedness in borrower/loan characteristics (2013 and 2014)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Log(income)	Log(loan amt)	White (0/1)	Black (0/1)	Hispanic (0/1)	Male (0/1)	Purchase loan (0/1)
HHI × 1(2014)	0.03	0.04	0.02	0.06	0.02	-0.05	-0.01
	(0.09)	(0.05)	(0.15)	(0.05)	(0.07)	(0.10)	(0.02)
Observations	7,517	7,517	7,517	7,517	7,517	7,517	7,517
R-squared	0.27	0.24	0.30	0.42	0.47	0.21	0.28
County*Lender FE	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y

This table performs an exercise to rule out systematic differences in borrowers around the bunching threshold that correlate with market concentration. The analysis focuses on the years 2013 and 2014 and exploits the fact that HOEPA came into effect only in January 2014. It focuses on loans with a rate spread in the bunching region $[6, 6.5]$. It reports results for the following regression: $y_{i(l,c,t)} = \beta\ HHI_{c,pre} \times post\ 2014_t + \theta_{l,c} + \tau_t + \epsilon_{c,t}$. The dependent variable are different borrower and loan characteristics. The variable $HHI_{c,pre}$ is the HHI, averaged for each county over the pre-HOEPA years. $Post\ 2014_t$ is a dummy with a value of one for the years after the introduction of HOEPA, i.e., for 2014. $\theta_{l,c}$ denote lender*county fixed effects, τ_t year fixed effects. Standard errors (in parentheses) are clustered at the county level. Results show that for borrower income, the loan amount, the probability of the borrower being white, black, Hispanic or male, or the loan being purchase (vs refinance) do not vary systematically with the HHI across years (columns 1 to 7). The coefficient β is insignificant in every column, suggesting that loans just below the non-existent HOEPA threshold in 2013 were similar in observables to loans below the HOEPA threshold after the introduction of HOEPA in 2014.

Table OA5: **Concentration, denial rates, and loan amounts – 2012-16**

VARIABLES	(1) Bunch < 6.5 (with missing)	(2) Spread missing (0/1)	(3) Denied (0/1)	(4) Log(loan amt)	(5) Denied (0/1)
HHI × 1(2014)	0.34***	-0.02	0.01	-0.03	
	(0.05)	(0.02)	(0.01)	(0.03)	
Integrated lender (0/1)					0.05
					(0.04)
Int lender × 1(2014)					-0.14***
					(0.02)
Observations	308,411	308,411	957,843	308,411	957,952
R-squared	0.24	0.43	0.19	0.44	0.19
Controls	Y	Y	Y	Y	Y
County FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y

This table, columns (1)–(4) report results for Equation (5). In column (1) the dependent variable is a dummy that takes on a value of one for loans with a rate spread in the bunching region and a value of zero for those with either a rate spread not in the bunching region or for loans with missing rate spread info. In column (2), it is a dummy for whether info on the rate spread is missing. In column (3), it is a dummy for whether the loan was denied, and in column (4) it is the log loan amount. The main independent variable is the HHI (as defined in Equation (1)), averaged for each county over the pre-HOEPA years. The dummy 1(2014) takes on a value of one in the years after the introduction of HOEPA in January 2014 and zero before. Column (5) reports results for Equation (7). The dependent variable is the dummy *denied* that takes on a value of one if a loan application was denied. The dummy *integrated lenders* takes on a value of one for integrated lenders. Standard errors (in parentheses) are clustered at the borrower county level. *** p<0.01, ** p<0.05, * p<0.1.

Table OA6: **Integrated lenders and rate spreads/bunching – alternative specifications**

VARIABLES	(1) Tract*Year FE Rate spread	(2) Tract*Year FE Bunch < 6.5	(3) Mortgage Rate spread	(4) Chattel Rate spread	(5) Mortgage Bunch < 6.5	(6) Chattel Bunch < 6.5	(7) Rate spread	(8) Bunch < 6.5	(9) CEM sample Rate spread	(10) CEM Rate spread	(11) CEM Bunch < 6.5
Integrated lender (0/1)	1.77***	0.12***	1.72***	1.25***	0.14***	0.10**			1.78***	1.68***	0.13***
	(0.29)	(0.02)	(0.41)	(0.33)	(0.03)	(0.04)			(0.32)	(0.29)	(0.02)
CH lender (0/1)							2.41***	0.18***			
							(0.22)	(0.02)			
Other integrated lender (0/1)							0.75***	0.03			
							(0.16)	(0.03)			
Observations	494,695	464,517	449,317	73,120	430,732	61,709	522,739	492,781	497,541	497,541	470,022
R-squared	0.73	0.36	0.60	0.57	0.26	0.19	0.70	0.24	0.68	0.60	0.22
Year FE	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
County FE	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y

This table reports results for a regression of the rate spread or the indicator $Bunch < 6.5$ on a dummy that takes on a value of one for *integrated lenders*. Columns (1) and (2) include census tract × year fixed effects. In columns (3)–(6) regressions are estimated separately for mortgage and chattel loans. Columns (7) and (8) split integrated lenders into those affiliated with Clayton Homes and those that are not. Columns (9)–(11) report results for a matched sample with CEM weights. We match on income, property value, and LTV ratio (10 bins each), as well as the DTI ratio buckets (exact). Column (9) first restricts the sample to the smaller sample that is successfully matched. Columns (10) and (11) then use the matched sample with CEM weights. Standard errors (in parentheses) are clustered at the borrower county and lender level. *** p<0.01, ** p<0.05, * p<0.1.

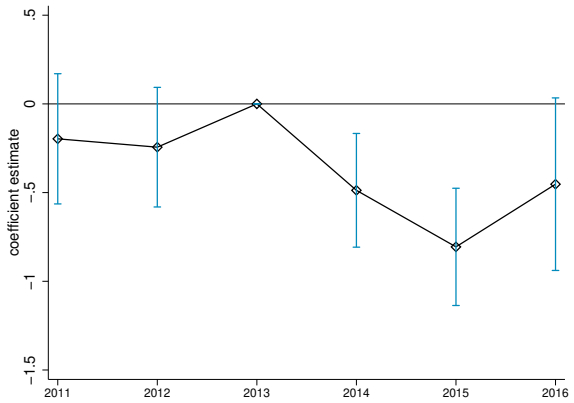
Table OA7: **Integrated lenders and rate spreads/bunching – low LTV borrowers**

VARIABLES	(1) full sample Rate spread	(2) LTV≤ 0.8 Rate spread	(3) LTV UB≤ 0.8 Rate spread	(4) LTV LB≤ 0.8 Rate spread
Integrated lender (0/1)	1.80***	2.26***	2.14***	2.30***
	(0.32)	(0.33)	(0.36)	(0.30)
Observations	522,739	194,361	139,525	257,181
R-squared	0.67	0.60	0.53	0.67
Year FE	Y	Y	Y	Y
Controls	Y	Y	Y	Y
County FE	Y	Y	Y	Y

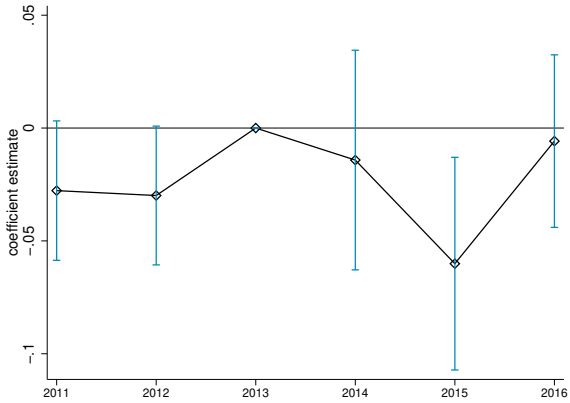
This table reports results for a regression of the rate spread on a dummy that takes on a value of one for *integrated lenders*. Column (1) reports results for the full sample, columns (2), (3), and (4) for loans with an LTV ratio below 80% based on the baseline LTV ratio, a computed upper bound (UB) and a computed lower bound (LB) LTV ratio. The upper and lower bound are computed as (loan amount + 5000)/(property value - 5000) and (loan amount - 5000)/(property value + 5000). Standard errors (in parentheses) are clustered at the borrower county and lender level. *** p<0.01, ** p<0.05, * p<0.1.

Figure OA1: **Pre-trends in rate spreads and missing rate spread information**

(a) Coefficient plot: rate spreads

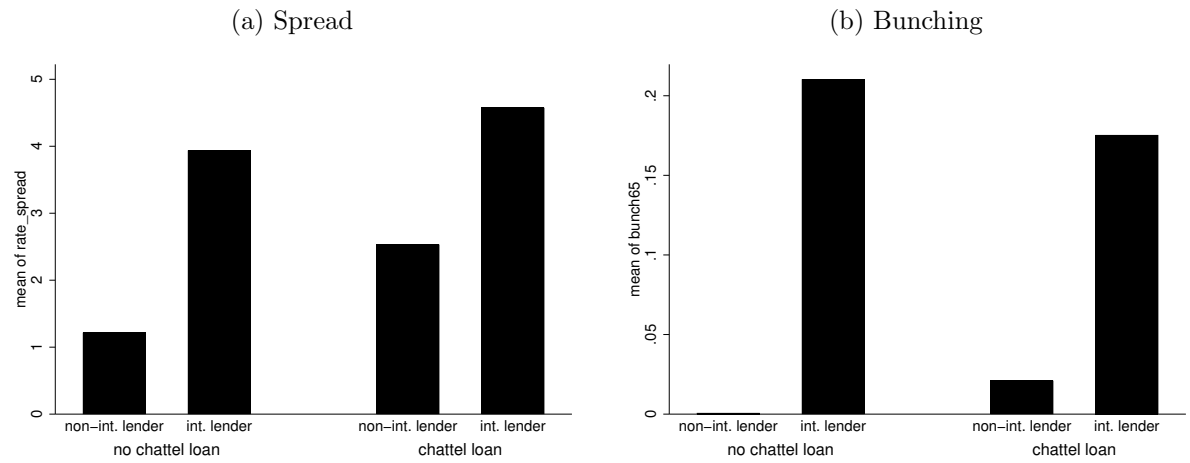


(b) Coefficient plot: rate spread is missing



Panels (a) and (b) plot coefficient estimates and 99% confidence intervals on the variable *HHI* in regression (5), interacted with dummies for each year, relative to the base year 2013. Panel (a) uses the rate spread as dependent variable, panel (b) a dummy that takes on a value of one if information on the rate spread is missing and zero if the rate spread is reported.

Figure OA2: **Rate spread and bunching below the HOEPA threshold – integrated vs. nonintegrated lenders**



This figure provides a bar graph of the average rate spread (panel a) and the average share of loans in the bunching region (panel b) for loans originated by integrated and nonintegrated lenders, separately for chattel and mortgage loans.

OA.2 Manufactured homes vs site-built homes

This section compares borrower and loan characteristics as well as rate spreads in the manufactured home loan market to those in the market for site-built loans. Figure OA3 shows the evolution of the average sales price of all new homes sold (left axis) and new manufactured homes sold (right) in the Census data, showing that the prices for the two types of homes have moved in parallel over the past decade.

Turning to our HMDA analysis, we use the same sample of manufactured home (MH) loans as in the main analysis. To construct the site-built (SB) loan sample for comparison, we apply the same sample selection criteria as for the MH loan sample (restrict the sample to conforming loans for home purchases / refinancing / cash-out of single-unit; drop VA loans, loans classified as primarily for a business or commercial purpose, open-end lines of credit, and reverse mortgage; keep only those secured by a first lien; drop observations with missing loan term, property state or county code). This results in a sample of 35,670,708 SB loan originations between 2018 and 2022.

- Table OA8 compares loan and borrower characteristics in the MH and SB loan markets.
- Table OA9 provides results from multivariate regressions of whether a borrower takes out an MH loan (as opposed to a SB loan) on various demographic characteristics, as well as year, county × year or census tract × year fixed effects. For this estimation, we use purchase loans only. The goal is to test to what extent differences in the propensity to take out an MH loan e.g., across race/ethnicity groups are driven primarily by differences in where these groups live. The results illustrate that for some characteristics (such as income and age) the effect is stable across and within geographies, whereas for others the sign changes depending on whether effects are estimated with or without geographic fixed effects. In particular, while Black and Hispanic borrowers are overall less likely to take out a loan to purchase an MH rather than a SB home, this is no longer the case once we look within census tract (or even within county in the case of Hispanic borrowers).
- Table OA10 uses a pooled sample of manufactured home (MH) loans and site-built (SB) loans to revisit our rate spread regressions from the main text (Equation (3)).[43] Column (1) shows that, controlling for all the borrower and loan characteristics from our specifications in the main text, MH loans have significantly higher rate spreads,

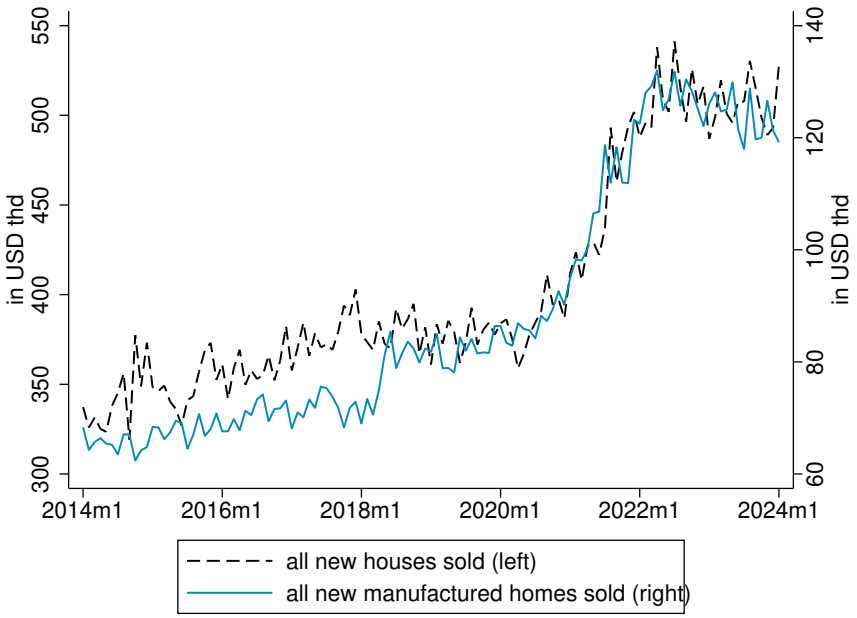
[43] To speed up the estimation, especially in the case of coarsened exact matching (CEM), we take a 3% sample of originated mortgages on site-built homes, using otherwise the same restrictions as for our manufactured home loan sample.

and more so in counties with higher HHIs in the MH loan market. Furthermore, the HHI in the MH loan market has no effect on rate spreads in the SB market. In columns (2)–(4), we restrict the sample to observations that we successfully matched via CEM. In particular, we match MH and SB loans on income, property value, and LTV ratio (10 bins each), as well as the DTI ratio buckets (exact). Column (2) with CEM weights shows that the results are very similar to column (1). Column (3) confirms this in 2SLS regressions, and column (4) when we add county × year fixed effects.

- Table OA11 undertakes a similar exercise, but using only mortgages on SB homes.[44] Column (1) shows that the local HHI in the SB market has a positive association with rate spreads on SB loans. However, column (2) shows that the association is negative once we include our battery of control variables. When we include county fixed effects in column (3), the coefficient becomes more negative. Columns (4) and (5) report 2SLS regression results, using the instrumental variable strategy described in Section 3.1 but using predicted market shares in the SB market. In column (5), with county fixed effects, there is no relationship between the HHI and rate spreads in the site-built market. Finally, columns (6) and (7) show that the HHI in the MH market has no statistically significant effect on rate spreads in the site-built market, neither in OLS nor in 2SLS regressions.

[44] We again use a 3% sample of originated mortgages on site-built homes in order to speed up the estimation.

Figure OA3: **Manufactured vs site-built homes: average sales price**



This figure shows the evolution of the average sales price of all new homes sold (left) and new manufactured homes sold (right). Source: US Census Bureau.

Table OA8: **Manufactured home vs site-built mortgages: summary statistics**

Panel (a): Loan characteristics

	manufactured home		*site built home*	
	mean	sd	mean	sd
Rate spread	1.90	(1.71)	0.45	(0.60)
Interest rate	5.04	(1.93)	3.65	(0.96)
Bunch < 6.5	0.04	(0.20)	0.00	(0.01)
Total closing costs	4728.85	(2984.62)	4674.59	(3086.96)
Cost/amount	0.04	(0.02)	0.02	(0.01)
Loan amount	143127.65	(78748.68)	268928.31	(139156.29)
Property value	181195.48	(101979.43)	387477.40	(230131.16)
Loan term	308.46	(71.62)	325.21	(69.88)
LTV ratio	0.82	(0.19)	0.74	(0.19)
Retained by lender (0/1)	0.39	(0.49)	0.16	(0.37)
Non-cashout refinance (0/1)	0.19	(0.39)	0.33	(0.47)
Cashout refinance (0/1)	0.11	(0.31)	0.20	(0.40)
Loan is FHA (0/1)	0.31	(0.46)	0.14	(0.35)
Principal residence (0/1)	0.95	(0.21)	0.94	(0.24)
Lender is bank (0/1)	0.28	(0.45)	0.33	(0.47)
Loan term is 180m (0/1)	0.09	(0.29)	0.13	(0.33)
Loan term is 240m (0/1)	0.08	(0.27)	0.05	(0.21)
Loan term is 276m (0/1)	0.13	(0.33)	0.00	(0.02)
Loan term is 360m (0/1)	0.58	(0.49)	0.78	(0.41)
N	522,739		35,670,708	

Panel (b): Borrower characteristics

	manufactured home		*site built home*	
	mean	sd	mean	sd
Income	64.09	(36.95)	107.81	(74.89)
Asian (0/1)	0.01	(0.08)	0.06	(0.24)
Black (0/1)	0.04	(0.21)	0.06	(0.23)
Hispanic (0/1)	0.10	(0.30)	0.10	(0.29)
White (0/1)	0.82	(0.39)	0.71	(0.46)
Female (0/1)	0.23	(0.42)	0.23	(0.42)
Age below 35 (0/1)	0.30	(0.46)	0.26	(0.44)
Age above 62 (0/1)	0.18	(0.39)	0.15	(0.35)
DTI below 36 (0/1)	0.42	(0.49)	0.48	(0.50)
Has coapplicant (0/1)	0.43	(0.49)	0.46	(0.50)
N	522,739		35,670,708	

Panel (a) reports summary statistics for loan characteristics for all manufactured home loans and site-built mortgages. Panel (b) reports borrower characteristics. Loan amount, interest rate, total loan cost, loan cost over loan amount, property value, loan term, and LTV ratio as well as income are winsorized.

Table OA9: **Manufactured home vs site-built mortgages: effects of borrower characteristics**

VARIABLES	(1) MH loan	(2) MH loan	(3) MH loan
Log(income)	-1.64***	-1.17***	-1.08***
	(0.01)	(0.00)	(0.00)
Asian (0/1)	-1.98***	-0.63***	-0.22***
	(0.01)	(0.01)	(0.01)
Black (0/1)	-0.84***	-0.11***	0.38***
	(0.01)	(0.01)	(0.01)
Other minority (0/1)	0.91***	0.41***	0.36***
	(0.05)	(0.05)	(0.04)
Hispanic (0/1)	-0.38***	0.24***	0.47***
	(0.01)	(0.01)	(0.01)
Female (0/1)	-0.60***	-0.32***	-0.07***
	(0.01)	(0.01)	(0.01)
Age below 35 (0/1)	-0.53***	-0.27***	-0.18***
	(0.01)	(0.01)	(0.01)
Age above 62 (0/1)	0.80***	0.42***	0.49***
	(0.01)	(0.01)	(0.01)
DTI below 36 (0/1)	0.27***	0.12***	0.15***
	(0.01)	(0.01)	(0.01)
Has coapplicant (0/1)	0.16***	0.07***	0.02**
	(0.01)	(0.01)	(0.01)
Observations	17,222,848	17,222,774	17,208,518
R-squared	0.01	0.09	0.20
Year FE	Y	-	-
County*Year FE	-	Y	-
Tract*Year FE	-	-	Y
MH mean	2.19%	2.19%	2.19%

For a pooled sample of manufactured home (MH) and site-built home loans (purchase loans only), this table reports results of multivariate regressions of a dummy that takes on a value of 100 for MH loans on different borrower characteristics. Omitted categories: white, non-Hispanic, male, ages between 35 and 62. Standard errors (in parentheses) are heteroskedasticity-robust. *** p<0.01, ** p<0.05, * p<0.1.

Table OA10: **Market concentration and rate spreads – matching sample**

	(1)	(2) CEM	(3) CEM 2SLS	(4) CEM 2SLS
VARIABLES	Rate spread	Rate spread	Rate spread	Rate spread
HHI	0.01	0.01	1.29	
	(0.02)	(0.02)	(0.91)	
manu. home loan	0.31***	0.37***	0.34***	0.35***
	(0.01)	(0.01)	(0.03)	(0.03)
HHI × manu. home loan	1.55***	1.53***	1.88***	1.80***
	(0.09)	(0.09)	(0.21)	(0.21)
Integrated lender (0/1)				
Observations	1,483,070	1,326,581	1,004,799	1,004,754
R-squared	0.64	0.52		
Year FE	Y	Y	Y	-
Controls	Y	Y	Y	Y
County FE	Y	Y	Y	-
County*Year FE	-	-	-	Y
Anderson-Rubin test (p-val)			0.00	0.00
F stat			16.34, 377.71	712.15

Columns (1)–(4) report results for a sample pooling manufactured home loans and regular mortgages. The dependent variable is the rate spread. The main independent variable *HHI* is the county-level HHI in the manufactured home loan market, as defined in Equation (1). In 2SLS regressions, the HHI constructed from the predicted market shares is used as instrument. The variable *manu. home loan* is a dummy that takes on a value of one if the loan is a manufactured home loan and a value of zero if it is a site-built loan. Column (1) uses the full pooled sample, columns (2)-(4) use the matched sample with CEM weights. We match on income, property value, and LTV ratio (10 bins each), as well as the DTI ratio buckets (exact). Columns (5)–(7) focus on manufactured home loans. The dependent variable is the rate spread or the indicator $Bunch < 6.5$. The variable *integrated lenders* is a dummy that takes on a value of one for integrated lenders. Column (5) restricts the sample to the smaller sample that is successfully matched. Columns (6) and (7) use the matched sample with CEM weights. Standard errors (in parentheses) are clustered at the borrower county level. *** p<0.01, ** p<0.05, * p<0.1.

Table OA11: **Market concentration and rate spreads – site-built homes only (random SB sample)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				2SLS	2SLS		2SLS
VARIABLES	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread	Rate spread
HHI (site-built)	0.57**	-0.39***	-1.06***	-0.26***	0.12		
	(0.22)	(0.08)	(0.16)	(0.09)	(1.35)		
HHI (manufactured homes)						0.01	-0.11
						(0.01)	(0.68)
Observations	976,825	960,348	960,265	839,560	839,478	960,265	693,681
R-squared	0.05	0.42	0.43			0.43	
Year FE	Y	Y	Y	Y	Y	Y	Y
Controls	-	Y	Y	Y	Y	Y	Y
County FE	-	-	Y	-	Y	Y	Y
Anderson-Rubin test (p-val)				0.00	0.93		0.88
F stat				496.09	22.08		3.40

This table reports results for Equation (3). The dependent variable is the rate spread. The main independent variable is the county-level HHI, as defined in Equation (1) – constructed either for the manufactured home loan or site-built home loan market. Columns (4), (5) and (7) reports results from 2SLS regressions, in which the HHI constructed from the predicted market shares is used as instrument. Controls from column (2) onward consist of the following variables: log income, log property value, the LTV ratio (both linearly and with dummies for different bins: $< 70\%, [70-80\%), [80-90\%), [90-100\%), > 100\%$), the loan term, and total closing costs over loan amount; dummies for loan amount ($10k bins), DTI bins, borrower age bins, race, sex, co-applicant yes/no, credit score type, loan purpose, occupancy type, loan product type, pre-approval yes/no, zero/missing income yes/no, and adjustable-rate mortgage yes/no; at the lender-county-year level: the share of denied loan applications; and at the census tract-year level: the log of the total population, the minority share, median income relative to MSA income, the average age of housing units, and the share of homeowners out of the total population. Standard errors (in parentheses) are clustered at the borrower county level. *** p<0.01, ** p<0.05, * p<0.1.

OA.3 Sample selection and integrated lender list

Table OA12 documents the change in the number of observations as we apply our sample selection criteria.[45] The total number of applications for manufactured home loans between 2018 and 2022 is 3,271,966, of which 987,355 lead to originations. We restrict the sample to non-VA loans to land owners. We also restrict the sample to conforming loans for home purchases / refinancing / cash-out of single-unit properties. We drop loans classified as primarily for a business or commercial purpose, open-end lines of credit, and reverse mortgage. We keep only those secured by a first lien; drop observations with missing loan term or property value; as well as with a missing property state or county code. We then match the HMDA sample to the LEI public panel and restrict sample to those counties for which we can compute the HHI (originations>0). Finally, we require non-missing data in a regressions with the full set of controls and fixed effects. This results in 522,739 observations.

Table OA13 provides a list of our manually identified integrated lenders in the 2018-2022 sample. It also reports the number of total loan originations for each lender in our baseline sample.

[45] The purpose of the table is to provide an approximate sense of the importance of the different sample restrictions. Of course, the order in which the restrictions are applied matters for the impact of each specific restriction.

Table OA12: **Sample selection – Waterfall**

Selection criteria	Observations
All applications for manufactured home loans in HMDA 2018–2022	3,271,966
Restrict sample to originations	987,355
Restrict sample to land owners	698,495
Restrict sample to non-VA loans	630,063
Drop non-conforming loans	627,430
Drop multi-unit homes	622,690
Keep only purchase/refinance/cash-out refinance	586,575
Drop loans classified as primarily for business or commercial purpose	571,158
Drop observations classified as open-end lines of credit	559,461
Drop observations classified as reverse mortgage	558,911
Drop observations not secured by a first lien	547,203
Drop observations with missing property state or county code	545,528
Drop observations with missing loan term	544,867
Drop observations with missing property value	537,446
Restrict sample to observations with non-missing data for controls/FE	522,739
Final sample	522,739

Table OA13: **List of integrated lenders**

LEI	Lender name	Loans
549300XQVJ1XBNFA5536	21st Mortgage Corporation	55,358
5493000YNV8IX4VD3X12	Vanderbilt Mortgage and Finance, Inc.	35,360
549300249G20MDIDRR27	Southwest Stage Funding, LLC (dba Cascade)	8,737
549300CB67L6KPJLHE19	Triad Financial Services, Inc.	6,920
5493009XSE00M8B9R434	Countryplace Mortgage, Ltd.	3,067
549300OSY236S7MBKO83	CIS Financial Services, Inc.	867
549300QRLVIA94OVXY15	American Homestar Mortgage, L.L.C.	105

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