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UNDERSTANDING THE UNEQUAL COSTS OF NATIVE AMERICAN HOMEOWNERSHIP*

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Abstract

We document significant disparities in home loan prices between Native Americans, whether living on or off federally recognized reservations, and Whites. Differences in underwriting characteristics such as credit score and loan amount do not explain these disparities but do explain considerably more of the off-reservation Native gap. The price gap is driven mostly by the disproportionate use of home-only loans, which are not secured by land, by both on- and off-reservation Native borrowers. The likelihood of using home-only loans correlates with property rights, but this factor cannot fully explain the greater reliance on home-only loans by Native Americans.

Keywords: Indigenous peoples, racial disparities, access to credit, inequality, mortgage pricing
JEL classification: G50, J15, G21, G28, R21

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I Introduction

Disparities in accessing mortgage lending among minorities have long been documented (Holmes and Horvitz, 1994; Munnell et al., 1996; Quillian et al., 2020). Even when credit is available, existing studies have shown that minorities pay higher interest rates on home loans (Agarwal et al., 2016; Ambrose et al., 2021; Bayer et al., 2018; Gerardi et al., 2023; Guiso et al., 2022). Despite this large body of literature, little is known about the cost of homeownership among Native Americans.¹ We do know that Native communities are often underrepresented in traditional financial services and access to capital (Cattaneo and Feir, 2021; Community Development Financial Institutions [CDFI] Fund, 2001; Cyree et al., 2004; Dimitrova-Grajzl et al., 2015; Dymski, 1999; Fund, 2001; Jorgensen and Akee, 2017a; Laderman and Reid, 2010; Schumacher et al., 2006; United States Congress Senate Committee on Indian Affairs, 2015). We also know that individual characteristics such as liquidity constraints vary by population groups and affect the cost of homeownership (Bhutta et al., 2022; Gupta et al., 2022). The relative importance of these factors will inform the causes of these differences and the effectiveness of policies intended to create more parity in housing finance markets.

In this paper, we offer evidence on the cause of pricing gaps in loans to finance home purchases between White and on- and off-reservation Native borrowers. Our paper is motivated by the set of facts we establish in Figure 1 that use the confidential Home Mortgage Disclosure Act (HMDA) data between 2018 and 2021. In this figure, we plot the rate spread and interest rate on home loans at each decile for on-reservation Native, off-reservation Native, and White borrowers. Relative to White borrowers, the average rate spread (or interest rate) paid by off-reservation Native borrowers is approximately 26 (7) basis points (bps) more, and approximately 204 (141) bps more for those living on reservations.

These average differences embed inequalities in rate spreads and interest rates between on-reservation

¹We specifically focus on American Indian and Alaska Native borrowers. We use the terms Native American, Indigenous, and Native interchangeably, though Native American commonly includes American Indians, Alaska Natives, and Native Hawaiians. Still, race is both a political and social construct; as a result, all racial classifications contain a degree of arbitrariness. Additionally, we do not know if the Native borrowers in HMDA have formal tribal affiliations with Native Nations. Thus, the usual caveats when grouping individuals by race apply here.

Native and White borrowers, which increase markedly at the high end of each distribution. For example, at the 90th percentile, the rate spread paid by on-reservation Native borrowers is more than three times larger than that of White borrowers. In addition, the interest rate paid by on-reservation Native borrowers at the 90th percentile is nine percent while the interest rate paid by Whites at the highest decile is roughly five percent. To illustrate the significance of these loan prices, consider the following: For a \$75,000 home loan over a 23-year period (the modal term length on a home-only loan, for which refinances are rare, is 23 years), Native borrowers facing this interest rate would end up paying more in interest than the principal borrowed—approximately \$100,000—by the time the loan matures.² At 5% interest for a loan of the same size, borrowers would be paying about \$50,000 in interest over the life of the loan, implying Native borrowers in the highest decile of interest rates pay twice as much in interest as White borrowers in the top decile.

We find that rate spread and interest rate disparities are not explained by differences in underwriting characteristics such as credit score, income, property value, and loan amount. Less than 17% of the disparity between Native borrowers on reservations and White borrowers is attributable to these factors. While these factors explain notably more for off-reservation Native borrower-White disparities, a non-trivial difference remains. Rather, we find that the significant presence of home-only loans³ explains the higher rate spreads and interest rates experienced by Native Americans relative to White borrowers. This importance of home-only loans is particularly salient for Native borrowers living on reservations. Among loans to Native borrowers in HMDA, approximately 39% of all loans in HMDA and 87% of all manufactured home loans on reservations are home-only loans.⁴

The heavy reliance on home-only loans on reservations is *not* inevitable because borrowers can apply for leasehold mortgages on trust land and, due to historical land policies, Native Americans may own land directly. While home-only loans are often associated with higher interest rates and fewer consumer protections, borrowers sometimes access these loans to avoid putting the underlying

² See the amortization calculator here: <https://finred.usalearning.gov/ToolsAndAddRes/Calculators/Housing>.

³ Home-only loans are loans for manufactured homes not tied to real property.

⁴ Manufactured homes are an important source of housing on reservations, making up approximately 17% of the housing stock and 39% of all home loans (Kunesh, 2018).

land at risk if the loan is foreclosed or if a borrower does not have direct land ownership (Russell et al., 2021). We find that property rights, i.e., whether the land on which a manufactured home is directly owned or leased, alone cannot explain the disproportionately large number of home-only loans used on reservations.⁵ This is important because other research shows that trust land directly limits wealth creation (Anderson and Parker, 2009). Other factors, such as proximity to a manufactured home dealership and state-level measures of trust in banking disaggregated by race, predict the likelihood of picking a home-only loan but do not fully explain the heavy reliance on home-only loans by Native borrowers, especially among those living on reservations.

In addition, we test whether the processing time to originate a mortgage is slower for on- and off-reservation Native borrowers (compared to White mortgages) and whether home-only loans, especially for on-reservation Native borrowers, provide a faster method of securing a loan. Russell et al. (2021) find that nationally, the median processing time in HMDA for home-only loans is slightly longer than the median processing time for mortgages. While this result may seem surprising, the authors point out that this comparison does not adjust for the time that may be required to transport a home to its site. Since the report also finds that new homes are more likely to be titled as personal property, transportation time adding to loan processing time may be more common for home-only loans. However, no research has identified whether loan processing times for any loan product vary between Native American and White borrowers.

Exploiting the days between the application and closing date contained in the confidential HMDA data, on-reservation Native mortgages are processed on average 23 days longer than White mortgages. Furthermore, relative to White home-only loans, it takes on average an additional 37 days to process on-reservation Native home-only loan originations. Thus, the racial disparity in origination times are 14 days longer for home-only loans than mortgage loans. The time to originate is also relatively slower for home-only loan originations than mortgage originations for off-reservation Native borrowers. Thus, relative to White borrowers, we find no evidence that Native borrowers either living on or off reservations benefit from faster loan processing times by using home-only loans rather than

⁵For more information on the mortgage process on trust land, see Appendix Section A.

mortgages.⁶

Last, we study whether there are racial disparities in mortgage approval rates and, if so, whether these disparities are smaller among home-only loan applicants. We do find large disparities in on-reservation Native mortgage approval rates after controlling for borrower characteristics. The estimated racial disparities in approvals decrease for both on- and off-reservation Native applicants when the application is for a home-only loan. Smaller racial disparities in approval rates for home-only loans may drive Native borrowers living either on or off reservations away from manufactured home mortgages and toward home-only loans. However, given the high overall rejection rate on home-only loans, the relative advantage in approval rates for Native American borrowers is unlikely to explain the relatively high use of home-only loans.

Taken together, our results suggest that higher use of home-only loans explains much of the premium in home loan prices paid by Native borrowers. The disproportionate use of home-only loans is not fully explained by factors like faster processing time or proximity to manufactured home dealerships. One potential reason for the dearth of mortgages on reservations is the heavy administrative burden placed on lenders and borrowers to complete mortgages on trust land, although property interest in the land, as indicated by HMDA, suggests this may not be the only cause.

Regardless, policies that could lower the price of home-only loans through secondary market purchases (whose rights would have to be approved by the tribe) would have outsized effects on Native borrowers living on reservations. Alternatively, efforts to build credit in Native borrowers could shrink (but not eliminate) disparities in rate spreads. For example, since many Native Community Development Financial Institutions (NCDFIs) provide credit-builder loans to low-credit borrowers, increased funding to the Native American CDFI Assistance (NACA) Program could help reduce

⁶This result may seem counterintuitive given the abundance of evidence on how long it takes to perfect a mortgage on reservations (Columbe, 2020; [GAO], 2023). Using reservation-level data on the amount of trust land per reservation (data was collected from a 2019 Freedom of Information Act request to the BIA and published publicly by), in the small number of census tracts contained within a reservation with 100% trust land, we find that the average days to close a loan by Native borrowers buying a stick-built (manufactured home) home was 178 (127) days. Both of these processing times are vastly longer than the average days to close a loan in the overall sample (51 days). Thus, for the small number of loans we can claim were on trust land, processing times in HMDA are consistent with these anecdotes. However, given the small number of mortgages on census tracts with 100% trust land in HMDA, these longer processing times are not representative of the typical on-reservation Native loan in HMDA.

our estimated disparities.

This paper contributes to a growing literature on racial disparities in mortgage rates. Focusing on loan purchases on the secondary market, Bartlett et al. (2022) find small differences in racial disparities in interest rates and attribute these differences to discriminatory lending practices. Heimer et al. (2021) also find evidence of individualized racial discrimination in mortgage applications by leveraging how monthly volume quotas reduce the degree of subjectivity loan officers apply to loans they process at the end of the month. Bhutta and Hizmo (2021) focus on Federal Housing Administration (FHA) lending and find that racial differences in utilizing discount points explain why minorities face higher interest rates (which is not the case in our context).⁷ Similar to work for other off-reservation population groups (Cheng et al., 2015; Ghent et al., 2014; Haughwout et al., 2009), our study does not find significant racial disparities in rate spreads on off-reservation Native loans after accounting for differences in loan products.

This paper also supplements the relatively small academic literature on manufactured home lending. Capozza and Thomson (2005) study the recovery rates of repossessed homes with home-only loans and find that less common home models have a lower recovery rate. Canner and Laderman (1999) analyzes the rise of manufactured home specialty lenders and the associated increased denial rates in HMDA. Schmitz (2020) discusses home-only loans, the manufactured housing market structure, and the recent push to create a secondary market for manufactured home loans. Jensen (2023) studies how the structure of floor financing at dealerships can distort competition at the retailer level.

Our results also complement the growing literature on the importance of property rights in economic development on reservations in Canada and the United States. Land tenure systems on reservations have important economic consequences (Leonard and Dominic, 2021; Leonard et al., 2020), but institutions can be developed so trust land can be effectively used for economic development. For example, Akee (2009) and Akee and Jorgensen (2014) suggest that long-term leasing arrangements

⁷In this paper, we consider a different context since we examine a much broader set of largely uninsured mortgage loans and heterogeneous set of lenders. We argue that differences in fees or discount points do not plausibly explain interest rate and rate spread disparities for Native American borrowers for properties on reservations.

on reservation trust land tenures can result in similar housing stock and business outcomes as land that is held as fee simple. However, not all property rights institutions that make trust land closer to fee-simple land deliver improved outcomes for Indigenous communities. In Canada, Aragón and Kessler (2020) show the introduction of transferable land tenures in small shares on reserves is only associated with improvements in housing stock for non-Indigenous people living on reserves. Our results suggest that differences in property rights between White and Native borrowers are not the sole determining factor that explains the Native-White gaps in rate spreads and interest rates.

The rest of the paper is organized as follows. We discuss the details of the HMDA data in section 2 and our empirical methods in section 3. In section 4 we discuss our primary results and examine the potential causes of the prevalence of home-only loans for Native Americans in section 5. In the appendix, we offer more institutional details on lending on reservations beyond the basics required for understanding our primary results. In the final section, we discuss the implications of our findings.

2 Data

Our analysis relies primarily on confidential HMDA data from 2018 to 2021.⁸ In general, institutions making more than a small number of loans and having a presence in an MSA must report to HMDA. As a result, HMDA covers approximately 88% of all home loan originations in the U.S. (Jo et al., 2020).⁹

Historically, HMDA data lacked information on loan contracting structure, loan type, property characteristics, and the applicant's creditworthiness, all of which lenders use to evaluate loan applications. In addition, HMDA data did not contain the entire distribution of interest rates and rate spreads. However, in 2018, additional information was added to HMDA due to the Consumer Fi-

⁸Additional data sources used for analyzing the causes for the disparities in home-only loan take-up are discussed in section 5.

⁹Year-to-year fluctuations in HMDA reporting can be substantial. All regression models contain year fixed effects to account for changes in year-to-year reporting, collection and reporting statute changes. Because HMDA may under-represent mortgage loans made to Native Americans since many rural, small-scale lenders are not required to report, we provide evidence below that the number of low-cost missing loans would have to be implausibly large to account for the difference we observe.

nancial Protection Bureau's (CFPB) implementation of Section 1094 of the Dodd-Frank Act. These new data fields include the applicant's credit score, the rate spread on the loan (for all prices) and key underwriting variables such as loan-to-value (LTV) ratios. The new HMDA fields germane to the Native borrower experience, especially among those living on federally recognized reservations and off-reservation trust lands, are whether a manufactured home loan is secured by both the home and the land or just by the home and whether the borrower has direct ownership of the land where the house sits or a leasehold property interest.

A limitation of the revised HMDA reporting standards is that Section 104(a) of the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA) added partial exemptions to HMDA reporting requirements for some fields for institutions making fewer than 500 loans annually.¹⁰ If Native borrowers disproportionately receive mortgage loans from these lenders, these fields will be disproportionately missing for them in the HMDA data.

The new HMDA reporting standards require lenders to report the land property interest when the loan is for a manufactured home. While the home and land are tied together for the vast majority of loans for stick-built homes, exceptions do exist. On reservations, leasehold mortgages can be used to finance the purchase of stick-built homes located on trust land. In our analysis, when we include both stick-built homes and manufactured homes in our sample, we assume that both the home and the land secure all stick-built homes.¹¹ Thus, we cannot identify the differential effect of property ownership on the cost of loans for stick-built homes. However, *conditional* on property ownership, our estimated disparities on loan prices for on-reservation Native loans are statistically identical whether we use a sample of all loans or just manufactured home loans.

We restrict our sample to residential loans for single-unit properties whose primary borrower is

¹⁰More information on the HMDA Rule can be found here: <https://www.consumerfinance.gov/rules-policy/final-rules/regulation-c-home-mortgage-disclosure-act/>. Information on the implementation of Section 104(a) of EGRRCPA can be found here https://files.consumerfinance.gov/documents/bcftp_hmda_interpretive-proceduralrule_2018-08_executive-summary.pdf.

¹¹On the small number of census tracts contained within a reservation with 100% trust land, we find that 16 out of 42 originated loans were for stick-built homes. Among the 26 manufactured home loans within these census tracts, 88% are reported as being placed on land leased rather than owned by the borrower. Thus, it is likely that HMDA contains some leasehold mortgages for stick-built houses.

American Indian/Alaska Native or White.¹² Our analysis identifies someone as Native if American Indian/Alaska Native was listed as one of the five-race fields; thus, our classification of “Native” borrowers in our sample is similar to the “American Indian/Alaska Native alone or in combination with other races” classification used in federal data sources.¹³ For comparison purposes, we limit our sample of White borrowers to those who listed White as their primary race with no other race listed. Many applications contain co-borrowers, and in our main specification, we control for the presence of a co-borrower (for the importance of co-borrowing, see Loya, 2022).

Since Native loans represent a small share of the universe of HMDA loans, we do not restrict our attention to a specific loan product. As a result, our sample includes mortgages (such as conventional loans or federal loan products¹⁴ for both site-built homes and loans for manufactured homes.¹⁵ Manufactured home loans can be classified into two types. First, manufactured home mortgages occur when the loan is secured by both the home and land, which makes those loan arrangements eligible for federal loan products such as FHA, VA, and RHS/FSA loan products, as well as specific loan products designed to spur tribal citizen homeownership such as the HUD Section 184 loan.¹⁶ Second, a manufactured home loan can be secured only by the home, in which case the loan is a personal property loan, otherwise known as a home-only loan. Except for a very small number of

¹²Racial identity is reported in HMDA in two ways: (1) the borrower can report the race on the loan application or (2) the loan officer can report the race based on visual inspection or surname. Only a small percent (0.62% of on-reservation Native borrowers and 1.41% of off-reservation Native borrowers) in HMDA were identified as Native based on visual observation or their surname.

¹³In HMDA, 99.6% of the overall self- or lender-identified Native population are single informants, i.e., the applicant is identified as only Native. Self-identified Native population is endogenous to local economic conditions (Antman and Duncan, 2023) and fluid over time (Liebler et al., 2017). In this analysis, the endogeneity of racial classification would bias the estimated disparities, but the direction of the bias is unclear. Ky and Lim (2022) find that HMDA applicants with missing race data have high loan amounts, high credit scores, and very low loan-to-value ratios. These characteristics do not align well with the characteristics of Native borrowers in our sample, particularly on-reservation Native borrowers. Suppose unreported Native borrowers with high credit scores and lower mortgage costs are more likely not to have their race listed on their loan application relative to similar, creditworthy White loan applicants. In that case, our rate spread disparities are biased upward.

¹⁴We can identify if a loan was Federal Housing Association (FHA) insured or guaranteed by Veteran Affairs (VA), the USDA Rural Housing Service (RHS) or the USDA Farm Service Agency (FSA).

¹⁵Given the wide range of loan products in our sample, our sample best mirrors that of the analysis in Bhutta et al. (2022) of the effects of automated underwriting systems. Their primary sample contains several loan types, and both new originations and refinanced loans.

¹⁶Native Hawaiians can access a similar loan product, the HUD Section 184A loan. Unfortunately, HMDA does not classify either HUD Section 184 or 184A loans.

home-only loans insured by the FHA's Title I program, these loans are often not eligible to be federally insured or guaranteed, are rarely purchased on the secondary market by private investors or government-sponsored enterprises, and are often issued by nonbanks.

While HMDA data contain a rich set of important covariates, the most precise geographic information is the U.S. Census tract on which the home is located. Since census tract boundaries do not perfectly align with reservation (or off-reservation trust land) boundaries, studies within the broader Indigenous economics literature use the percentage of a Census unit's area that overlaps with American Indian reservation (or off-reservation trust land) for the on-/off-reservation assignment rule. For example, when measuring differences in internet access and connectivity between reservation and non-reservation areas, Bauer et al. (2022) defines all Census block groups as being located "on reservations" when at least 50% of a Census block group's area overlaps with federal Indian reservation or off-reservation trust land.

We use calculations from a subset of 2021 loans with longitude and latitude to supplement our primary dataset. Using information on these loans and the shapefiles for reservations and census tracts, we choose what percentage of a census tract should overlap with a reservation to define an on-reservation loan.¹⁷ Figure 2 plots in 10 percentage point increments the Type I and Type II errors of each assignment rule. Suppose we assign a loan to a reservation when only 10% of the tract overlaps with a reservation. In that case, most loans designated as "on reservation" are falsely assigned when we compare the loan's latitude and longitude. The rate of false positives (Type I errors) goes to zero as we increase the percentage of a tract overlapping with a reservation for the loan to be designated as on-reservation. On the other hand, a tract assignment rule may also result in false negatives (Type II errors), where the latitude and longitude of the loan are on a reservation. This error decreases as we decrease the percentage of a tract that must overlap with reservation (or off-reservation trust) land for the loan to be considered an "on-reservation" loan.

¹⁷We do not have access to the overall geocoded 2018–2021 HMDA data. An advantage of using the census tract-based measure for the on-/off-reservation indicator is that not all loans have longitude and latitude populated in the available subset, which may introduce a source of bias not present in the census tract measure if the missing longitudes and latitudes are nonrandom.

We choose the point at which these types of errors are set equal, which will approximately minimize the sum of both types of errors. Figure 2 reveals that this occurs when the overlapping area of a census tract is approximately equal to 60%. As a result, when at least 60% of a Census tract’s area overlaps with reservation land (and off-reservation trust land), we assume all borrowers within these tracts regardless of race are located on American Indian reservations (or off-reservation trust lands).

Our final sample contains all new originations for home purchases by either Native or White borrowers within 21 states with at least one “on-reservation” loan (i.e., located on a Census tract with at least 60% of its area overlapping with federally recognized Indian reservation and off-reservation trust land) in the HMDA data.¹⁸ Since credit scores are not reported for roughly 10% of this sample, we dummy out these values to retain as many observations as possible. We use a similar method when we control for missing observations in other variables.¹⁹

Our main outcomes of interest are the rate spread and interest rate on a loan. The rate spread is the difference between the average prime offer rate (APOR) and the annual percentage rate (APR). The APOR is a survey-based estimate of APRs for comparable loans and is published weekly by the Federal Financial Institutions Examination Council (FFIEC).²⁰ The APR measures the loan’s total cost, incorporating discount points, fees, mortgage insurance premiums, and other costs (Bhutta and Hizmo, 2021). Since lenders are not required to include lender credits in their APR, if White borrowers are more likely to receive lender credits, then omitting lender credits may bias the estimates against finding racial disparities in rate spread. In the results section, we provide evidence that our results are unchanged when we account for differences in lender credits.

Summary statistics on this sample are shown in Table 1. The first column shows the mean values

¹⁸ Those states are Alaska, Arizona, California, Colorado, Idaho, Michigan, Minnesota, Montana, Nebraska, Nevada, New York, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming. The distribution of “on-reservation” Native-originated loans by state is shown in Appendix Figure A1.

¹⁹ As mentioned earlier, some of the new HMDA data fields can be exempt from reporting if the lender is an insured bank or credit union, originated fewer than 500 mortgages, or fewer than 500 lines of credit during the preceding two years, and received at least a “satisfactory” Community Reinvestment Act (CRA) rating for two previous years. These reporting exemptions, however, do not disproportionately impact data availability by race, ethnicity, or income ([GAO], 2021).

²⁰ These APORs can be found at <https://ffiec.cfbp.gov/tools/rate-spread>.

for each variable for on-reservation Native loans. The second column shows the mean values for off-reservation loans to Native borrowers. The third column shows the mean values for loans to White borrowers. The last three columns summarize the difference in means between on-reservation Native and White loans (column 4), off-reservation Native and White loans (column 5), and on-reservation and off-reservation Native loans (column 6).

Echoing the results in Figure 1, we present mean differences in the interest rate and rate spread in Table 1. The mean rate spread paid for on-reservation Native borrowers is 257 bps over prime compared to the mean rate spreads paid by off-reservation Native and White borrowers of 79 and 53 bps, respectively. The mean interest rate paid by on-reservation Native borrowers is 5.20% compared to a mean interest rate of 3.88% and 3.81% paid by off-reservation Native and White borrowers, respectively. In Appendix Figures A2 and A3, we provide evidence that even if loans made to Native borrowers are under-represented by HMDA, the number of low-cost loans that would have to be missing to explain away these differences need to be extremely large. In these Appendix figures, we show similar figures to Figure 1, but under three scenarios of adding 100, 1000, and 10,000 loans randomly selected from the White distribution to the Native rate spread and interest rate distributions. Adding an additional 10,000 loans neither eliminates racial differences across the interest rate distribution nor eliminates racial differences at the very top of the rate spread distribution. Thus, we take this as evidence that omitted, lower-cost loans to Native Americans cannot feasibly eliminate the racial disparities observed in HMDA.

The bottom half of Table 1 compares average borrower and loan characteristics in the sample across groups. On-reservation Native borrowers have, on average, lower credit scores, loan amounts, property values, and debt-to-income ratios relative to both groups. Off-reservation Native borrower averages tend to sit between those of on-reservation Native and White borrower averages. The mean differences between on-reservation Native borrowers and Whites, off-reservation Native borrowers and Whites, and on-reservation Native and off-reservation Native borrowers are statistically significant except for the difference in the presence of a co-borrower, income between on- and off-

reservation Native borrowers, income between on-reservation and White borrowers, and the age difference between on-reservation Native and White borrowers.

Table 2 shows the mean differences in the usage of major loan products across these three groups. The type of loan products used varies substantially across groups. Both on-reservation and off-reservation Native borrowers secure FHA-insured and RHS/FSA-guaranteed loans at roughly one-and-a-half to twice the rate of White borrowers. VA-guaranteed loans are most utilized by off-reservation Native borrowers and represent 13.5% of all new off-reservation Native loans. Approximately 39% of on-reservation Native loans were for manufactured homes, while only 3% for all new loan originations were for White borrowers. Roughly eight of 10 on-reservation Native manufactured home loans were home-only. Compared to White borrowers, on-reservation Native borrowers are 34 times more likely to use a home-only loan.

Taken together, we see a large share of manufactured home loans among Native borrowers relative to White borrowers and a substantial share of home-only loans secured by on-reservation Native borrowers. Our analysis will subsequently focus on whether this relatively high reliance on home-only loans can explain the large rate spread gaps we observed in Figure 1.

3 Empirical Method

We use the following linear regression model to estimate racial disparities in home loan prices:

$$y_{ist} = \beta_1 \text{on-Native}_{ist} + \beta_2 \text{off-Native}_{ist} + \mathbf{x}_{ist}\psi + \alpha_s + \tau_t + \epsilon_{ist} \quad (1)$$

where y_{ist} is the rate spread or interest rate for borrower i in state t in year t . The parameter $\beta_1 = E[y_1 - y_0 | \mathbf{x}]$ where $E[y_1 | \mathbf{x}]$ is the mean rate spread (or interest rate) for on-reservation Native borrowers and $E[y_0 | \mathbf{x}]$ is the mean rate spread (or interest rate) for White borrowers after controlling for \mathbf{x} . Likewise, the parameter β_2 documents the mean difference in rate spreads (or interest rates) between off-reservation Native and White borrowers, conditional on \mathbf{x} .

The baseline controls in vector \mathbf{x} include age (and its square), a female indicator, a co-borrower indicator, income (and its square), loan amount (and its square), property value (and its square), indicators for each federal loan product (FHA, VA, and RHS/FSA), credit score bins which follow Fannie Mae’s pricing matrix²¹, and indicators whether credit score, loan amount, income and property values are missing.²² Given the heavy reliance on home-only loans for reservation-located borrowers, we also run specifications with a home-only loan indicator as an additional control variable and, in some specifications, interact the baseline controls with the home-only loan indicator to allow the relationship between the loan price and the underwriting variables to vary by home-only loan status.²³ In some specifications, we include a property interest indicator that equals one if the underlying land is directly owned, and zero otherwise.

Our primary outcome variables are the rate spread and interest rate. While both variables measure the price of a loan, they do so in different ways. Rate spread is based on APR and is meant to represent the entire price of the loan that is known up front. Loan fees, in addition to interest, can be substantial and vary by loan type—for example, FHA loans have an up-front mortgage insurance premium of 1.75% that can be financed as part of the loan. The downside of using the APR is that it assumes that these up-front fees are spread over the life of a loan. Relatively few borrowers hold a mortgage for its entire term, with many refinancing or moving to another home before the loan’s term is complete. Home-only loans may prepay less often than mortgages due to the lack of a robust refinancing market for home-only loans. Thus, if a borrower refinances or moves before the end of the loan term, APR understates the effective annual loan cost by spreading out upfront fees paid regardless of how long the borrower holds the loan. If there are racial differences in the likelihood borrowers repay early, then APR comparisons could be misleading regarding racial differences in the cost of credit. This is because borrowers who pay earlier would effectively pay a higher price annually

²¹This pricing matrix can be found at <https://singlefamily.fanniemae.com/media/9391/display>.

²²We show in Figures 3 and 4 our imputations for missing values do not significantly affect the coefficients on the on-reservation Native and off-reservation Native indicators.

²³A borrower’s debt-to-income (DTI) ratios are not included in our main specifications because if pricing discrimination occurs, then DTI ratios for Native borrowers would be considered an outcome of pricing decisions. Nonetheless, we add DTI bins as a control in our robustness checks and do not find substantive changes to our estimated disparities.

than those holding the loan for longer. Neither measure includes any fees charged after the loan is originated, such as late fees. The interest rate clearly includes the interest the borrower pays on the loan but does not include other fees paid by the borrower and, thus, as a measure of price, is not affected by how long the borrower holds the loan. Thus, in addition to using the APR-based rate spread as an outcome, we also use the interest rate as an outcome alone. While we could control for observed up-front fees in the interest rate models, this would present a similar problem in measuring annual cost as the APR-based measures because we do not observe variation in the probability that a borrower will repay their loan early. In the appendix, we examine differences in up-front fees as an outcome variable.

Each specification includes state fixed effects, α_s , and year-fixed effects, τ_t . The error term, ϵ_{ist} , is for loan i in state s in year t . We cluster the standard errors at the county level to account for spatial autocorrelation in local lending markets. We show our results are robust to including county, rather than state, fixed effects.

Given that interest rate and rate spread disparities vary across their respective distributions, we also use unconditional quantile regressions to test whether observable differences between borrowers and loans can explain disparities across the distributions. It is important to distinguish the difference between a standard quantile regression and an unconditional quantile regression done here. Consider for a moment how to interpret the coefficient on a covariate in a standard OLS regression where Y is the outcome vector of interest, X is the covariate of interest, and β is the estimated relationship between Y and X . In this circumstance $E(Y|X) = X\beta$ and by the law of iterated expectations, it is also the case that $E(Y) = E_X[E(Y | X)] = E(X)\beta$. Thus we can interpret β as the effect of increasing the mean value of X on the unconditional mean value of Y . However, if we use a standard quantile regression that fits a regression model for the τ^{th} quantile, we obtain $Q_\tau(X) = X\beta_\tau$. Since the law of iterated expectations does not apply in the case of quantiles, we must interpret β_τ as the effect of X on the τ th conditional quantile of $Y|X$. In other words, β_τ gives the effect of changing X on the τ th quantile of the population with a set of characteristics given by X . However, we

often want to know the effect of X on the *unconditional* distribution of Y just like in a mean-based regression. For these reasons, we follow Firpo et al. (2009)'s method for estimating unconditional quantile effects. See Fortin et al. (2011) for more information.

4 Main Results

Table 3 presents our main results. Each column shows the results of OLS regressions of the rate spread (in panel A) and the interest rate (in panel B) on the on- and off-reservation Native borrower indicators (where the omitted reference group is White borrowers). Column 1 contains state and year fixed effects, but the estimated rate spread gaps are similar to those in Table 1. Column 2 adds controls for age, gender, co-applicant, federal mortgage indicators, binned credit score categories, borrower income (and its square), loan amount (and its square), and property value (and its square). The estimated disparities for off-reservation Native borrowers are much smaller under this specification (7.8 basis points), which means that demographic and underwriting loan characteristics explain roughly two-thirds of the estimated disparities between off-reservation Native and White loan prices. Interestingly, those characteristics explain only 16% of the raw differences in rate spread between on-reservation Native and White borrowers.

The regression in column 3 includes a home-only loan indicator to account for the rate spread variation between home-only and mortgage loans (i.e., manufactured home mortgages and site-built mortgages are included in this sample). When we account for the effect of home-only loans on rate spread, the estimated rate spread disparities for on-reservation Native loans decrease by roughly 90% (comparing coefficients from columns 2 and 3). Thus, our specification containing demographic and underwriting characteristics, and how the loan was secured explains 91% of the raw disparities for on-reservation Native loans (197 bps). Column 3 also shows that the smaller unexplained gap in rate spreads that is correlated with off-reservation Native loans is eliminated when we account for whether the loan is only for the home or for the land and home.

If lenders treat the underwriting variables differently for home-only loan applications and mort-

gage loan applications, our model in column 3 may be misspecified.²⁴ To determine if our model specification drives our results in column 3, the regression in column 4 interacts the home-only loan indicator with each baseline control variable. When we allow for the effect of each underwriting variable to vary by loan product, we see no substantial changes to the estimated racial disparities in rate spread.

Since on-reservation Native borrowers are less likely to own the land where the home sits compared to White borrowers and home-only loans are more commonly used when the borrower does not have direct ownership of the land, the home-only loan effect might be capturing differences in property interests between (on- and off-reservation) Native borrowers and White borrowers. To determine if home-only loan status is capturing differences in property ownership, we add a property interest indicator in column 5, which equals one if the borrower indirectly or directly owns the land where the home sits and zero if the borrower has an unpaid or paid leasehold property interest in the land where the home sits.²⁵

Despite the literature emphasizing property interest as the first-order binding feature for access to credit on federally recognized reservations, controlling for property interest does not explain as much of the estimated disparities on on-reservation Native loans as controlling for home-only loan status does. The null hypothesis that β_1 in column 3 equals the β_1 in column 5 was rejected at the 1% level ($\chi^2 = 15.68$ with $p\text{-value} < 0.001$). In other words, the estimated disparities on on-reservation Native loans after accounting for property interest are significantly higher than those after controlling for home-only loan status. This implies that differences in property interests between on-reservation

²⁴For example, if conventional loan lenders add more bps to the price of a loan compared to home-only lenders when the borrower has a low credit score, all else constant, and since the mean credit score for Native borrowers, whether living on or off reservations, is lower relative to Whites (see Table 1), then $\widehat{\beta}_1$ and $\widehat{\beta}_2$ in Table 3, column 3 would be biased towards finding no evidence of rate spread disparities.

²⁵Within many federally recognized reservations, property regimes range from land held in trust (where the beneficiaries are either the tribe or an individuals) to fee simple land. While individual landholders within reservations are often not tribal citizens (an estimated 10% of all fee simple within reservations are held by tribal members (Chang, 2011; Parman, 1994)), tribal citizens can own land outright (as fee simple property) or have direct ownership through arrangements with the tribe where land that was previously held in trust is transferred to the tribe as fee simple owners, but the land would be subject to restrictions against alienation and taxation (called restricted fee). HMDA allows for the land upon which a manufactured home to be coded as owned by the borrower, or coded as leased by the borrower from another entity.

Native and White borrowers only partially explain the rate spread disparities. On the other hand, netting out the effect of property interest on rate spread explains away the estimated disparities in rate spread on off-reservation Native loans.

Appendix Table A1 presents results where we first restrict the sample only to borrowers who directly own their land and where we allow specifications to include interaction terms between owning land and our Native indicators. The results confirm that differences in property interests cannot account for the estimated rate spread disparities. Appendix Table A1 column 1 shows racial disparities in rate spread between on-reservation Native and White landowners. Column 2 provides evidence that the on-reservation Native disparities in rate spread do not vary by property ownership. On the other hand, we find no evidence of rate spread disparities (column 1) and minimal interest rate disparities (column 3) between off-reservation Native and White loans among landowners. We also find no estimated racial disparities in rate spread on off-reservation Native loans when the borrower owns the land.

While home-only lending explains a substantial amount of the racial disparity in rate spread, those loans can only be used for manufactured homes. Since HMDA only reports property interests for manufactured home loans, we assume all stick-built homes were secured with loans to borrowers with direct or indirect land ownership (which is not necessarily true). To discern whether features unique to financing manufactured home financing or our assumptions about property ownership for stick-built loans drive our results, we add a manufactured home control in column 6 of Table 3. By doing so, we are controlling for the general effect of buying a manufactured home, many of which may be financed through home-only loans, on rate spread. Column 6 shows that accounting for property interest and manufactured home purchases does not explain the rate spread disparities in on-reservation Native loans to the same extent as home-only loan status does.²⁶ Alternatively, our estimated racial disparities in rate spread on off-reservation Native loans are again eliminated when we control for manufactured home loans. While we cannot isolate the factors driving the on-

²⁶The null hypothesis that β_1 in column 6 is the same as β_1 in column 3 is rejected at the 1% level ($\chi^2 = 9.46$ with p-value=0.002).

reservation Native disparities in rate spread, we can say definitively that neither property interests nor the choice of a manufactured home can completely account for the rate spread disparities paid by on-reservation Native borrowers. Home-only loans are more expensive forms of debt regardless of property interest, and Native Americans are more likely to have this form of debt, even if they own land directly.

We find similar results using the interest rate rather than the rate spread as the dependent variable. We present these results in panel B of Table 3. The influence of demographic and underwriting characteristics on the on- and off-reservation Native disparities reveal the same pattern as panel A. In particular, observed differences in demographic and underwriting characteristics (see $\hat{\beta}_1$ in column 2) explain very little of the on-reservation Native interest rate disparities (approximately 13% of raw interest rate gap). Rather, controlling for home-only loan status and borrower characteristics (column 3) explains about 90% of the raw interest rate disparities on on-reservation Native loans. For off-reservation Native disparities, demographic and underwriting characteristics (column 2) explain about one-third of the interest rate disparities, while adding the home-only loan indicator (column 3) explains the remaining off-reservation Native disparity. Consistent with the results regarding the rate spread, the results in columns 5 and 6 reveal that accounting for property interests or whether the home is a manufactured home do not have the same explanatory power as home-only loan status in explaining the interest rate disparities on on-reservation and off-reservation Native loans.²⁷ Again, differences in property interests cannot explain away the higher interest rates charged on on-reservation Native loans.²⁸

To determine the sensitivity to the main findings in Table 3, we run several robustness checks to determine if alternative model specifications omitting the home-only loan indicator explain away

²⁷The null hypothesis that β_1 in column 5 is equal to β_1 in column 3 is rejected at the 1% level ($\chi^2 = 16.71$, p-value < 0.001). The same test comparing β_1 in column 6 to β_1 in column 3 is also rejected at the 1% level ($\chi^2 = 7.44$, p-value = 0.006). The off-reservation Native coefficient β_2 in column 5 is also statistically different to β_2 in column 3 ($\chi^2 = 7.57$, p-value = 0.006). Same is true for comparisons between β_2 in column 6 and β_2 in column 3 ($\chi^2 = 8.36$, p-value = 0.004).

²⁸Appendix Table A1 shows that, after controlling for demographic and underwriting characteristics, on-reservation Native loans are associated with higher interest rates than White loans even when we restrict the sample to landowners (see column 3).

the estimated on-reservation Native disparities in a similar fashion as netting out the rate spread (and interest rate) variation between home-only loans and mortgage loans did. We also report the coefficient on the off-reservation Native indicator even though we find evidence of no racial disparities in rate spread after controlling for property interests in the underlying land. To this end, Figures 3 and 4 compare the on-/off-reservation Native coefficients from column 3 in Table 3, respectively, to different model specifications that omit the home-only loan indicator. In particular, Figures 3 and 4 adjust our model with baseline controls (but omits the home-only loan indicator) in column 3 in Table 3 in the following ways: (1) county fixed effects are added; (2) state-by-year fixed effects; (3) the use of lender credits is added as a control; (4) binned DTI categories are included; (5) binned credit score/LTV categories are included; (6) all observations with imputed credit score values are dropped; (7) on-reservation Native borrowers are defined when 10% or more of the home census tract overlaps with reservation land (or off-reservation trust land); (8) on-reservation Native borrowers are defined when 90% or more of the home census tract overlaps with reservation land (or off-reservation trust land); (9) all census tracts that overlap with Navajo Nation, by far the largest American Indian reservation in size, are dropped; (10) we consider the boundaries of all Census Bureau’s American Indian Areas (AIAs) – such as Oklahoma Tribal Statistical Areas (OTSA), Hawaiian Home Lands (HHL), and Alaska Native Village Statistical Areas (ANVSA) – when computing the “on-reservation” Native indicator. In both figures, we find no evidence that alternative model specifications account for the disparities on rate spread and interest rates on on-reservation and off-reservation Native loans in the same manner that accounting for home-only loan status does.

Our main specification uses state fixed effects to account for unobserved differences across states. For example, state laws around titling manufactured homes as real estate may affect manufacturing home lending markets. Using state fixed effects makes the comparison group for Native on-reservation borrowers all White borrowers in the state. While the data would allow us to estimate the effect with tract fixed effects, this estimation strategy may introduce bias. Including tract fixed effects will drop any tract that has solely Native borrowers and estimate the effect of being a Native

borrower solely based on tracts that also have White borrowers, thus eliminating some potentially important variation in rate spreads in tracts with large Native populations. County fixed effects exploit variation in rate spreads between on- and off-reservation areas within the same county, which might also eliminate some important variation in rate spreads in counties entirely within American Indian reservations. County fixed effects can, however, help alleviate concerns that, for example, the differences in on-reservation prices are due to differences in rurality. As a robustness test showed in Figures 3 and 4, we show that using county fixed effects estimates coefficients for on-reservation Native borrowers of similar size to those coefficients under a specification with state fixed effects.

As shown in Figure 1, the mean difference in rate spreads and interest rates does not fully capture where the unconditional rate spread gaps are the largest. For example, for on-reservation Native borrowers, the rate spread and interest rate gap are substantially larger at the upper end of their distributions. Thus, while Table 3's analysis sheds light on the forces that generate mean differences in rate spreads and interest rates, it may fail to explain why on-reservation Native borrowers pay much more at the top end of the distribution.

To understand the rate spread and interest rate disparities at each decile of the rate spread distribution, we estimate unconditional quantile regressions following Firpo et al. (2009) by leveraging recentered-influence functions for each decile of the rate spread distribution as discussed in the methods section. We consider the three specifications in Table 3, columns 1, 2, and 3: the unconditional relationship, one controlling for baseline covariates, and one that controls for baseline covariates and an indicator of whether the loan was a home-only or a mortgage loan. We consider the same three specifications in Table 3 when estimating the interest rate disparities at each decile of the interest rate distribution.

Figure 5 graphs the 95% confidence interval on the rate spread gaps for on-reservation Native borrowers in panel A and the same gaps for off-reservation Native borrowers in panel B at each decile under three different model specifications. Figure 6 uses the same three specifications to estimate the interest rate gaps. In both figures, the red lines are the unadjusted rate spread gaps. The blue lines

are the rate spread gap after controlling for the demographic and underwriting characteristics. The black lines are the rate spread gaps after adding the home-only loan indicator.

Both panels in Figure 5 reveal that differences in borrower and basic loan characteristics explain rate spread gaps between the 10th and 50th percentile. However, at the top end of the rate spread distribution, controlling for the borrower and basic loan characteristics does not eliminate racial disparities. When we add the home-only loan indicator, the racial disparities for off-reservation Native borrowers are eliminated at each decile. The same is largely true for those on-reservation, but we still see a small but positive disparity for on-reservation Native loans at the 90th percentile. Consistent with Table 3, columns 3-4, we find home-only loans account for the significant racial disparities in White-Native loan prices.

Panel A in Figure 6 shows that the interest rate disparities between on-reservation Native and White loans at each decile are also largely explained when we incorporate the home-only loan status into the model. Demographic and underwriting characteristics again cannot explain the disparities in interest rates by on-reservation Native borrowers at the top end of the distribution. The interest rate disparities in Panel B in Figure 6 reveal that interest rate disparities on off-reservation Native loans are explained by a combination of borrower characteristics for all but the most expensive loans. When we add the home-only loan indicator, the racial disparities for off-reservation Native borrowers are eliminated even within the top end of the interest rate distribution.

In addition to looking at the APR-based rate spread, which incorporates fees into the total costs of a loan, we can examine the racial differences in fees directly, as shown in Appendix Table A2. We construct a total fees variable as the sum of the total loan costs variable in HMDA, which is reported for mortgages, and the total points and fees variable, which is reported for home-only loans. Russell et al. (2021) describe how the total points and fees variable is a less comprehensive measure of fees than the total loan costs variable. If we find that home-only loan fees are lower than mortgage fees, the price gap between the loan types may be overstated. In that case, the price gap between Native and White borrowers could also be overstated given Native borrowers' higher use of home-only loans

Overall, Native American borrowers pay lower fees than White borrowers, but these lower fees do not plausibly account for the interest rate gap for on-reservation borrowers and, recall, these differences may be overstated. Column 2 of Table 3 shows that controlling for baseline characteristics, the mean on-reservation Native borrower pays 123 basis points more than a White borrower, and the mean off-reservation Native borrower pays 8 basis points more in interest rates, on average. At the mean loan amount (of all originated HMDA loans) of approximately \$330,000, the difference in interest rates for on-reservation borrowers works out to about \$70,000 in interest over the life of the loan, assuming a 23-year term. Using the mean fees shown in Appendix Table A2, column 2 shows that on-reservation Native borrowers pay roughly \$1,100 less in fees than White borrowers, while column 3 shows that the lower fees on-reservation Native American borrowers pay are entirely explained by the use of home-only loans.

Native-White differences in personal rates of time preference are unlikely to explain the interest rate gap. If a borrower were indifferent between the higher future interest payments and \$1,100 in up-front fees, it would imply that borrowers would need to value equally \$1 today and approximately \$0.02 received one year from now. To put it another way, in the first four months of the 23-year loan, the extra interest paid by on-reservation Native borrowers more than cancels out the lower fees. While White borrowers may refinance more often and pay higher up-front fees more often, even if White borrowers refinance three times as often and thus paid \$3,300 more in fees, to be indifferent between \$3,300 upfront and the interest rate premium, Native borrowers on-reservation would have to equally value \$1 today and \$0.31 one year from now. Off-reservation borrowers would have to equally value \$1 now and \$0.45 one year from now for the lower average fees they pay to offset the higher interest rates over the life of the loan.

Similar to the findings in Bhutta and Hizmo (2021), off-reservation Native American borrowers pay slightly lower fees and higher interest rates even after controlling for other factors, but there is no significant difference between off-reservation Native American borrowers and White borrowers in the APR-based rate spread.

So far, two main results about the large raw disparities in rate spreads (and interest rates) for on-reservation Native loans are worth noting. First, accounting for the variation in rate spreads between home-only and mortgage loans explains a large portion of the rate spread and interest rate disparities for on-reservation Native loans. This result is complemented when we implement the Shapley decomposition (Israeli, 2007) to the model in Table 3. This decomposition reveals that home-only loan status explains roughly two-thirds of the total variation in rate spread, compared to the demographic and underwriting variables, which explain roughly one-fifth of the rate spread variation. In contrast, the race variables directly account for less than 1% of overall variation in rate spread. Second, property interests in land alone cannot explain the rate spread and interest rate disparities for on-reservation Native loans in the same manner that home-only loan status does. For off-reservation Native borrowers, uptake of home-only loans and property interests are so highly correlated that one cannot isolate each effect.

These results beg the question: Why are expensive home-only loans used in greater frequency among on-reservation Native borrowers and, to a lesser extent, off-reservation Native borrowers? Information about home-only loan borrower experience can be gleaned from a 2018 survey of manufactured home borrowers in Texas (FreddieMac and UNC, 2020). Their survey found that borrowers were unlikely to enter the home-buying process preferring a home-only home loan; in particular, among the borrowers who ended up with a home-only loan, 46% originally intended to take out a mortgage and only 17% preferred a home-only loan from the outset.²⁹ The survey evidence suggests that manufactured home buyers are not likely to enter the home-buying process, preferring a home-only loan.

We know of no survey data on the Native manufactured home buyer experience. Thus, we de-

²⁹There may be some unobserved costs to securing a manufactured home mortgage, which may be avoided by using a home-only loan. For example, private mortgage insurance is required to obtain a mortgage, especially those with less than a 20% down payment and sold on the secondary market. The insurance company will likely require the manufactured home to comply with local building codes, which means these homes must sit on a permanent foundation and have proper electricity, water, and sewer hookups. Since most home-only loans are held by the lender on their portfolio, those requirements are more likely to be up to the lender's discretion. Some home-only loans may require much lower upfront investments (e.g., the costs of sitting the home on piers is likely a lower-cost alternative to building a permanent foundation), which could make home-only loan financing a viable alternative to mortgage financing. Our model does not allow us to make statements about the welfare effects of different types of financing.

vote the remainder of the paper to understand why Native borrowers are more likely than White borrowers to purchase home-only loans.

5 Racial Disparities in Home-Only Loan Usage

Underwriting variables alone, such as creditworthiness, cannot fully explain the pricing disparities between White and on-/off-reservation Native loans (See Table 3, col. 2). If the loan product used (i.e., either a home-only loan or a mortgage) explains the observed disparities in loan prices *and* borrowers sorted into loan markets based on their characteristics alone, then we would expect that controlling for those would explain away the disparities. However, observable borrower characteristics do not predict entry into the home-only loan market. We document this by plotting the share of originated loans that are home-only loans by credit classification (ranging from deep subprime to superprime) in Figure 7.

As expected, Figure 7 shows a negative relationship between credit scores and home-only loan shares; i.e., borrowers with higher credit scores are less likely to take out home-only loans than borrowers with lower credit scores. This relationship holds for all groups; however, this relationship is most pronounced for on-reservation Native borrowers. For example, when we move from the deep subprime loans to super-prime loans, the share of on-reservation Native loans that are home-only falls from 91% to 24%. Yet, even among the loans with the highest credit scores, the disparity in home-only loan usage between on-reservation Native and White borrowers is still 23 percentage points. Thus, even the most creditworthy on-reservation Native borrowers take out home-only loans at much higher rates than other groups.

5.1 Predicting home-only loan usage

To determine the factors that predict home-only loan usage, we limit our sample to manufactured home loan applications (whether accepted or rejected), which helps isolate areas where local zoning

laws and land use restrictions permit the option of buying a manufactured home.³⁰ Thus, if the borrower applies for a home-only loan or a manufactured home mortgage when purchasing a manufactured home, they are included in our sample. We merge the HMDA data with external data sources to test a few potential determinants that may explain the racial disparities in home-only loan use. Specifically, those sources help estimate differences in home-only loan use while accounting for (1) the distance to the nearest city using Census Bureau definitions for an urbanized area³¹, (2) the distance to the closest manufactured home dealer³², and (3.) differences in banking trust preferences between adult American Indians/Alaska Natives and Whites.³³

Table 4 contains the results from OLS regressions of home-only loan use on our two variables of interest (where the omitted category is White borrowers).³⁴ Column 1 contains the estimated disparities in home-only loan usage after controlling for state and year fixed effects. On-reservation Native borrowers are, on average, 49 percentage points more likely to apply for a home-only loan as opposed to a manufactured home mortgage relative to White borrowers. The difference in home-only loan application rates between off-reservation Native and White borrowers is approximately 14 percentage points. Since Native applicants have lower credit scores, which may deter access to

³⁰We also drop applications to lenders who were exempt from reporting whether the loan application is secured by a manufactured home and land or by a manufactured home and not land.

³¹The Census Bureau defines urbanized areas as cities and surrounding areas consisting of at least 50,000 people.

³²To our knowledge, there is no database on the universe of manufactured home dealers. To capture the location of as many manufactured home dealers as possible, we use a dataset on the exact location of roughly 10 million U.S. venues published by SafeGraph. We filter those venues by the six-digit NAICS code for residential property managers (531311), which contains the majority of manufactured home dealers in the SafeGraph data. This decreases the number of venues to roughly 74,000. We then filter that list by keeping only establishments with the term “home” in their company name. Our final sample contains 13,000 establishments. We then determine the distance from each census tract’s centroid to the nearest dealership.

³³We used data on self-reported Native and White survey respondents in the Collaborative Multiracial Post Election Survey of 2020, which contains an oversample of Native Americans. We use one question from the survey: “How much do you trust banks on a scale from 0 (no trust) to 10 (total trust)?” We convert this metric into a binary indicator of reporting a level of trust in banks of six or greater. If the value is greater than or equal to six out of ten, the variable equals one and zero otherwise. We then use the survey weights to construct averages by state and race. There are 1,956 Native and 3,626 White survey respondents in this sample. Given sample sizes, we do not differentiate the trust measure between on- and off-reservation Native groups within states. We can only isolate a respondent to a specific state, so we cannot determine any within-state racial variation in this measure of bank trustfulness. However, survey weights are used to construct by-group, state-level averages in a “trust in banks” measure.

³⁴We replicate this table in Appendix Table A3 using a sample of both manufactured and stick-built homes. We also estimate the racial disparities in home-only use among property owners using the full sample (columns 1–3 in Appendix Table A4) and using only manufactured home loans (columns 4–6 in Appendix Table A4).

mortgages, column 2 adds the full set of baseline controls, and both estimated disparities decrease, but borrower characteristics explain *more* of the off-reservation Native home-only loan application gap than the on-reservation Native home-only loan application gap. Given the larger reduction in the coefficient on off-reservation Native applicants (compared to the coefficient on on-reservation Native applicants) from column 1 to column 2, we find additional evidence that sorting into home-only loan applications by observables is more common among off-reservation Native applicants.

In column 3, we add four additional predictors of home-only loan usage: proximity to the nearest urbanized area, proximity to the nearest manufactured home dealer, a property interest indicator, and a measure of trust in banks by race. There are multiple reasons why being near a dealership may be related to a borrower's decision to finance their manufactured home with a home-only loan. First, dealerships may provide information that influences borrowers' loan choices. Survey results from a sample of manufactured home borrowers in Texas find that 50% of borrowers cited the lender appearing on a list provided by their retailer as an important factor. These lists may help borrowers find home-only lenders (FreddieMac and UNC, 2020). This survey also found that only 12.7% of borrowers chose whether to get a mortgage or home-only loan before selecting a lender, suggesting that they may learn more about the process from the lender that leads them to choose a home-only loan.³⁵ As discussed earlier, few borrowers enter the borrowing process planning to get a home-only loan, but many end up with one. Second, on average, new homes are much more likely to be financed with home-only loans. For example, a national survey of newly shipped homes found that 76% of new homes were financed with home-only loans; whereas, HMDA that year reported that

³⁵Regulations may affect whether a retailer recommends lender(s) to the borrower. The CFPB's 2014 report on manufactured housing explains that under the CFPB's 2013 Loan Originator (LO) Compensation rule, "many manufactured-housing retailers do not want to incur the cost of becoming a licensed LO. Retailers report that, instead of referring a consumer to a particular creditor or two, they do not advise consumers about which creditors are most likely to accept their applications" (CFPB, 2014). However, in May 2018, Section 107 of the Economic Growth, Regulatory Relief and Consumer Protection Act (EGRRCPA) published new provisions regarding manufactured home retailers. The provisions of Section 107 include, for example, that an employee of a manufactured home retailer is not a loan originator if they do not receive greater compensation for a transaction financed by a loan than a cash transaction, if they disclose an affiliation with any creditor, provide at least one unaffiliated creditor, and do not directly negotiate loan terms. Since the survey discussed above covered home purchases from 2015 until 2018, a majority of the purchases were likely made before this change. We are not aware of research on whether consumers' shopping experiences for manufactured home loans have changed as a result of EGRRCPA.

42% of manufactured homes were financed with home-only loans when combining new and used homes (Russell et al., 2021). Due to the high transportation costs of moving manufactured homes across long distances, people may be more likely to buy a new home if they live near a dealership.

Column 3 shows that these additional controls have the expected signs and, together, help increase the explained portion of the overall variation in home-only loan application rates by 23 percentage points. Individuals living farther from urbanized areas of a state are more likely to apply for a home-only loan than those in close proximity to a state's urbanized area. The negative and highly significant coefficient on the distance to the nearest manufactured home dealer implies that homes closer to manufactured home dealerships were more likely to use home-only loans, potentially for the above-mentioned reasons. The negative coefficient on the property interest indicator means individuals with direct ownership are much less likely to apply for a home-only loan.³⁶ Last, individuals living in areas where trust in banks exceeds the median level are less likely to apply for a home-only loan. None of these factors, however, eliminates the racial disparities in home-only loan usage by both on- and off-reservation Native borrowers. In fact, controlling for these additional controls slightly increases the point estimate for on-reservation Native disparities in home-only loan applications.

In column 4, we include county fixed effects, and the estimated racial disparities only decrease by a small amount. Interestingly, this large set of controls only accounts for less than half of the unconditional disparities in home-only loan application rates between on-reservation Native and White applicants but explains close to 81% of the raw difference in the likelihood of a home-only loan application between off-reservation Native and White applicants. Thus, similar to our estimated rate spread disparities, property interest alone and other potential observed factors cannot explain why on-reservation Native borrowers rely more on home-only loans than Whites. As a robustness check, we test whether we find disparities in the likelihood of applying for a home-only loan by limiting the

³⁶If a tribal member does not hold legal title to land, a manufactured home can still be tied to the land through a leasehold mortgage or a trust land mortgage. Under a leasehold mortgage, the underlying property, even if the land is held in trust, is tied to the home with a lease certified by the Bureau of Indian Affairs or, under agreements with the BIA, the tribe. Because of historical events, such as the General Allotment Act, we expect to see variation in property interest even within federally recognized reservations.

sample to only loans no greater than \$150,000 in column 5 and find the same disparities estimated using the full sample.

Several factors that are difficult to measure might be driving Native borrowers, especially those living in tribal areas, toward home-only loans that we cannot shed light on. First, one possibility could be financial literacy; i.e., the average Native borrower, due to the historical underdevelopment of banking services in Native communities, may have limited knowledge of all the available loan products compared to the average White borrower. Second, additional barriers specific to Native communities, such as disproportionately higher construction costs and a limited number of contractors willing to travel far distances to work in often rural Native communities, may raise the relative cost of building a permanent foundation to tie a home to land. If so, then cost considerations may push more on-reservation Native borrowers toward expensive, home-only loans compared to White borrowers. Third, if Native borrowers are less sensitive to interest rates than White borrowers, all else constant, then the potentially lower administrative burdens of using a home-only loan may outweigh the cost advantages of tying land and home together in a mortgage application. Fourth, advertising by manufactured home dealers might lead borrowers to choose to loans from home-only lenders, which may be more pronounced in Native communities where alternative banking options can be limited (Jorgensen and Akee, 2017b).

We consider two other, more measurable possibilities that might explain the disparities in home-only loan usage. First, we test whether Native borrowers face substantially longer processing times to originate a mortgage than Whites and, if so, whether home-only loans are relatively faster loans to originate for Native borrowers. Second, we test whether there are racial disparities in mortgage approvals and, if so, whether smaller racial disparities exist in home-only loan approvals. While we cannot make a causal claim, if potential Native homeowners believe mortgage lenders discriminate, then they may be more likely to use lenders that primarily make home-only loans to finance a home purchase.

5.2 Disparities in Loan Processing Times

Tying a home to land on trust land is a notoriously long and cumbersome process for both the lender and borrower on federally recognized reservations (Kunesh, 2018). The process involves the lender, the borrower, the Bureau of Indian Affairs, the Indian Health Service, the tribe, and other federal agencies, such as HUD. Less is known about the efficiency of processing home-only loans. In this section, we investigate two ways in which loan processing times may affect the decision of Native borrowers to take out a home-only loan. First, we investigate whether the loan processing times for manufactured home loan applications are shorter for home-only loans than for mortgages and whether this difference varies between (on and off-reservation) Native and White applicants. Second, when an applicant applies for a home-only loan, we determine whether those loan applications are processed faster for Native applicants than White applicants. If applicants trade off between loan processing times and loan costs, then the accessibility of home-only loans relative to manufactured home mortgages may drive Native borrowers toward these higher-cost loan products.

To this end, we investigate racial disparities in one component of securing a loan: the number of days the lender takes to originate a loan.³⁷ Similar to Wei and Zhao (2022), we run OLS regressions where the number of days it took a lender to originate a loan is the dependent variable, and racial indicators are key independent variables of interest (White loan applicants are omitted). We include a home-only loan indicator to determine whether teasing out the variation in loan processing speed between home-only and mortgage loan originations explains away racial differences in loan processing times. If so, differences in loan processing times between Native and White applicants are driven by differences in the likelihood of applying for specific loan types (in this case, home-only loans versus mortgages). If we find evidence that Native loans are originated slower than White loans after controlling for home-only loan status, then Native applicants face a loan processing penalty within

³⁷We calculate this variable as the difference between the application and action dates in HMDA. The application date is reported by the lender as the date the application was received or the date on the application form. For more details, see <https://www.consumerfinance.gov/rules-policy/regulations/1003/4/#a-1-ii>. The action taken date is generally the date of closing. For more information, see <https://www.consumerfinance.gov/rules-policy/regulations/1003/4/#a-8-ii>.

loan markets. In some models, we interact the home-only loan indicator with both on- and off-reservation Native indicators to compare the racial disparities in origination times among mortgage loans to the racial disparities in origination times among home-only loans.

Table 5 presents the results. In column 1, we estimate baseline measures of the racial disparities in origination times. We find that it takes on average four additional days (less than a week) to originate an off-reservation Native loan compared to a White loan. In contrast, it takes on average 32 additional days to process an on-reservation Native originated loan compared to an White originated loan.

In column 2, we control for whether the loan origination is for a home-only loan (the control group is White mortgage originations). The coefficient on the home-only indicator implies that it takes 15 additional days to originate a home-only loan compared to a mortgage. The positive coefficient on the on-reservation Native indicator means that the within-loan product racial disparity in loan processing times is 27 days for on-reservation Native loans and four days for off-reservation Native loans.

Column 3 more formally tests whether racial disparities in loan processing times vary by race and by loan product.³⁸ The on-reservation Native coefficient implies that it takes on average 23 additional days to close an on-reservation Native mortgage loan compared to a White mortgage loan. When we interact home-only loan status and the on-reservation Native indicator, we find that on-reservation Native home-only loans take on average 37 additional days to close versus White home-only loans. Thus, relative to White loan originations, on-reservation Native mortgage loans are *faster* to close than home-only loans. We see a similar story for off-reservation Native originations. Off-reservation Native mortgages take approximately four additional days to close compared to White mortgages, while off-reservation Native home-only loans take eight additional days to close opposed to White home-only loans. As a result, we find no evidence that home-only loans are processed faster for Native borrowers than for White borrowers.

³⁸We also interact each baseline control with the home-only loan indicator to allow for the effects of borrower characteristics on loan processing time to vary by home-only loan status.

5.3 Disparities in Approval Rates

Finally, we investigate whether there is evidence of racial disparities in mortgage approval rates and, if so, whether those disparities are lower if an applicant applies for a home-only loan. We speculate that the disproportionate use of home-only loans, especially by on-reservation Native borrowers, may be partly driven by smaller disparities in approvals for home-only loans relative to racial disparities in approvals for either stick-built or manufactured home mortgages.

Table 6 contains the average approval rates for home-only loans, manufactured home mortgages, and all mortgages across our three groups of interests. Only 30% of on-reservation Native home-only applicants get approved, compared to 36% for off-reservation Native applicants and 46% for White applicants. Off-reservation Native applicants have the lowest approval rates (only 57%) for manufactured home mortgages while White applicants have the highest approval rates (77%). When isolating all mortgage loan applications, Whites have the highest approval rate (93%), followed by off-reservation Native Americans (88%) and on-reservation Native Americans (81%).

To determine whether the estimated racial disparities in loan approvals differ between home-only loans and mortgages, we regress the likelihood of approving a loan for a mortgage loan on the two Native borrower indicators; the home-only loan indicator and the interaction between both Native indicators and the home-only status indicator while controlling for borrower characteristics. A positive (and significant) coefficient on the interaction term between the home-only loan status indicator and the Native borrower indicator means that the Native disparities in home-only approvals are smaller than the racial disparities in mortgage approvals. Alternatively, a negative coefficient on an interaction term implies that estimated disparities in home-only loan approvals are larger (in absolute value) than the estimated disparities in mortgage approvals.

The results are shown in Table 7. Columns 1 and 2 include all loan applications and columns 3 and 4 contain loan applications for manufactured homes. In column 1, Native American applicants living either on or off reservations are less likely to get approved for a mortgage than White applicants after controlling for borrower characteristics. However, the positive and significant coef-

ficients on both the on- and off-reservation Native interaction terms imply that the racial disparities in approvals for home-only loans are smaller. When we control for whether the borrower owns the land in column 2, we find no change in our estimated racial disparities in home-only loans. We find similar results when we compare the racial disparities in manufactured home mortgages to the racial disparities in home-only loans in columns 3 and 4. In column 3, we find that on- (off-) reservation Native mortgage applicants are 11 (9) percentage points less likely to get approved compared to White applicants. Those racial disparities are reversed when considering only home-only loan applicants. These results remain unchanged when we add the property interest indicator in column 4.

Taken together, the results in Table 4, 5, and 7 suggest that Native American borrowers are more likely to apply for loans that are secured only to the home, regardless of the underlying property interest or borrower characteristics. Table 5 reveals that home-only loans are originated no faster (in fact, slower) for either on or off-reservation Native borrowers compared to processing time of mortgage loan originations. Table 7 suggests that racial differences in approval rates for home-only loans are smaller than racial differences in approval rates for mortgages. Given that home-only loan applications are much more likely to be rejected than manufactured home mortgage applications, the small, relative advantage of Native acceptance rates is unlikely to explain the over-reliance on home-only loans by both on- and off-reservation Native homeowners.

6 Discussion and Conclusion

We find significant rate spread and interest rate disparities between Native borrowers and White borrowers, especially for Native borrowers located on reservations. The heavy reliance on home-only loans as a source of housing capital alone can largely explain the higher rate spreads and interest rates charged for on- and off-reservation Native loans. While one may speculate that this result is a direct consequence of building homeownership on trust land, we find that differences in property interest cannot explain the greater reliance on home-only loans by on-reservation Native borrowers. In particular, on-reservation Native borrowers are 29 percentage points more likely to apply for a

home-only loan compared to Whites living in the same county, even after controlling for property interests. Thus, structural differences above and beyond property interests are likely resulting in the disproportionate use of home-only loans by on-reservation Native borrowers. We find that Native borrowers face smaller racial disparities in the likelihood of getting a loan application approved when they apply for home-only loans rather than a manufactured home mortgage; however, we cannot claim that Native borrowers are turning to home-only loans when alternative loans are relatively scarce.

It is important to state that American Indians and Alaska Natives, especially tribal citizens living on reservations, have alternative venues to build homeownership than just home-only loans commonly issued by nonbanks or conventional mortgage products from large financial entities. Tribes and tribal designated housing entities (TDHEs) can use funds from the Native American Housing Assistance and Self Determination Act (NAHASDA) to provide down payment assistance. Tribes can provide housing units to tribal citizens on a lease-to-own basis (Ingram, 1998; Pierson, 2010; Pindus et al., 2017). Tribal housing authorities can also convert low-income housing tax credit (LIHTC) rental units into housing units for homeownership after the compliance period has expired (Bandy et al., 2014). Last, tribally owned banks and Native Community Development Financial Institutions (CDFIs) also provide Native-led financial services such as mortgages to underserved Native populations.

Government-sponsored entities (GSEs) have been considering starting a pilot program to invest in home-only loans for some time. The Federal Housing Finance Administration's Duty to Serve Underserved Markets Rule directs Freddie Mac and Fannie Mae to facilitate a secondary mortgage market for lower and moderate-income borrowers. Facilitating a secondary market for home-only loans is one of the measures that GSEs have discussed to fulfill their Duty to Serve requirements.

GSEs currently purchase manufactured home mortgages.³⁹ Historically, the GSEs did purchase

³⁹In its 2022-2024 Duty to Serve plan, Freddie Mac discussed purchasing 1,500-2,500 home-only loans in 2024. Fannie Mae said in their 2022-2014 plan that "We continue to work with our regulator to understand safety and soundness considerations and the viability of a home-only loan pilot program." <https://www.fhfa.gov/PolicyProgramsResearch/Programs/Documents/FannieMae2022-24DTSPPlan-April2022.pdf>

home-only loans before a market crisis in the early 2000s that in many ways foreshadowed the subprime mortgage crisis later that decade. The crisis was characterized by a high default rate on loans made to consumers with subprime credit scores, built-in incentives that encouraged loan officers to make loans that consumers could not afford, and fraud. Fannie Mae wrote down at least \$206 million in losses on home-only loans.⁴⁰

Since that market crisis, lenders have primarily held home-only loans in their portfolios. It is possible that expanding the secondary market for home-only loans while ensuring that consumers can afford to repay their loans would benefit consumers through more lenders participating in the home-only loan market. The Federal Housing Administration (FHA) recently proposed changes to its Title I program to improve its utility for borrowers taking out home-only loans.⁴¹ Since the FHA insures about half of all manufactured home mortgages recorded in HMDA, this change to FHA insurance regulation has the potential to be important in the home-only manufactured home loan market. Since many nonbank lenders have an originate-to-distribute business model and hold little capital in proportion to their loan volume, the lack of a secondary market for home-only loans likely makes this product unattractive for these lenders who now originate most mortgages for site-built homes. Our estimates suggest that if new policies lower the price of home-only loans, Native borrowers would benefit more than White borrowers on average due to their disproportionate use of home-only financing.

⁴⁰<https://www.wsj.com/articles/SB108060795897068570>.

⁴¹<https://archives.hud.gov/news/2022/pr22-215.cfm>.

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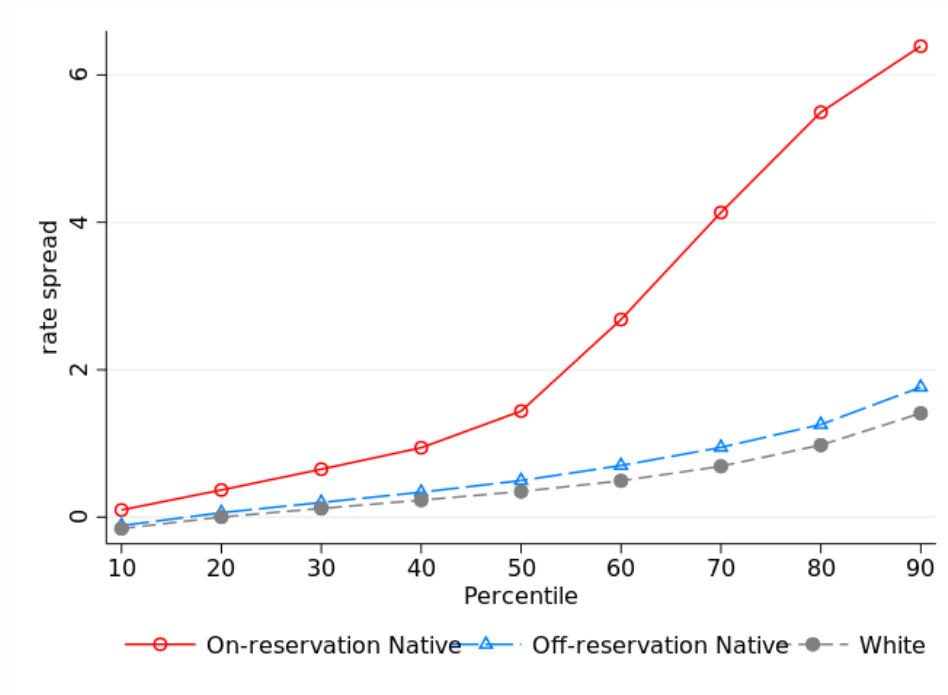
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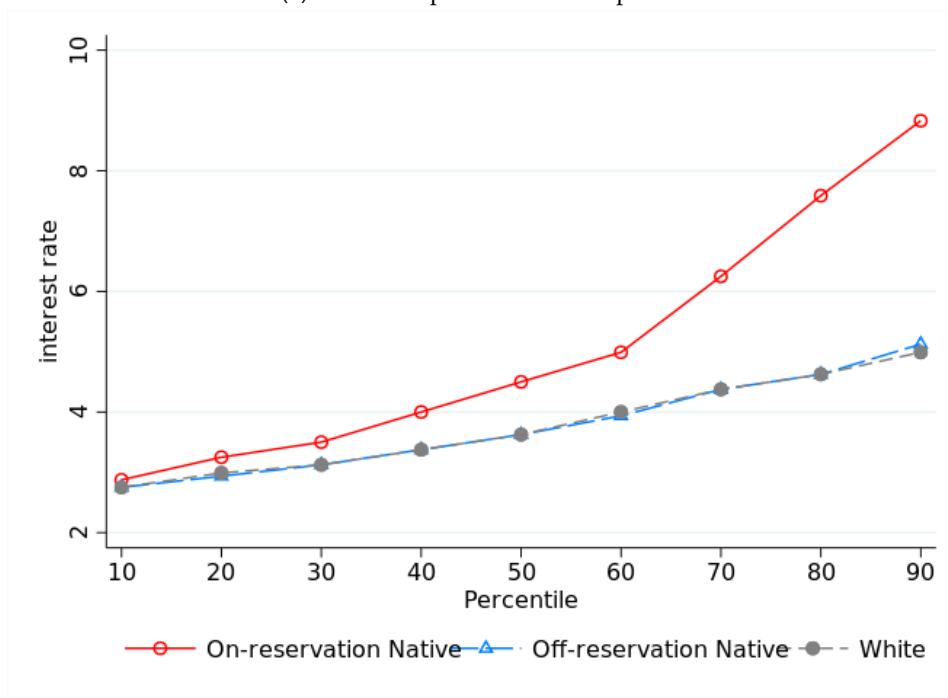
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(a) Racial Disparities in Rate Spreads



(b) Racial Disparities in Interest Rates

Figure 1: **Disparities in Home Loan Borrowing Costs**

Notes: The y-axis in panel A is the rate spread, defined as the difference between the average prime offer rate and the annual percentage rate. The y-axis in panel B is the interest rate. The x-axis in both panels shows the 10th through 90th percentile of the loan price across our three population groups. The red (blue) line plots the price paid by on-reservation (off-reservation) Native borrowers at each decile. The gray line plots the price paid by White borrowers at each decile. We discuss how on-/off-reservation Native and White borrowers are classified in HMDA in Section 2. Data are from the confidential HMDA data, 2018–2021.

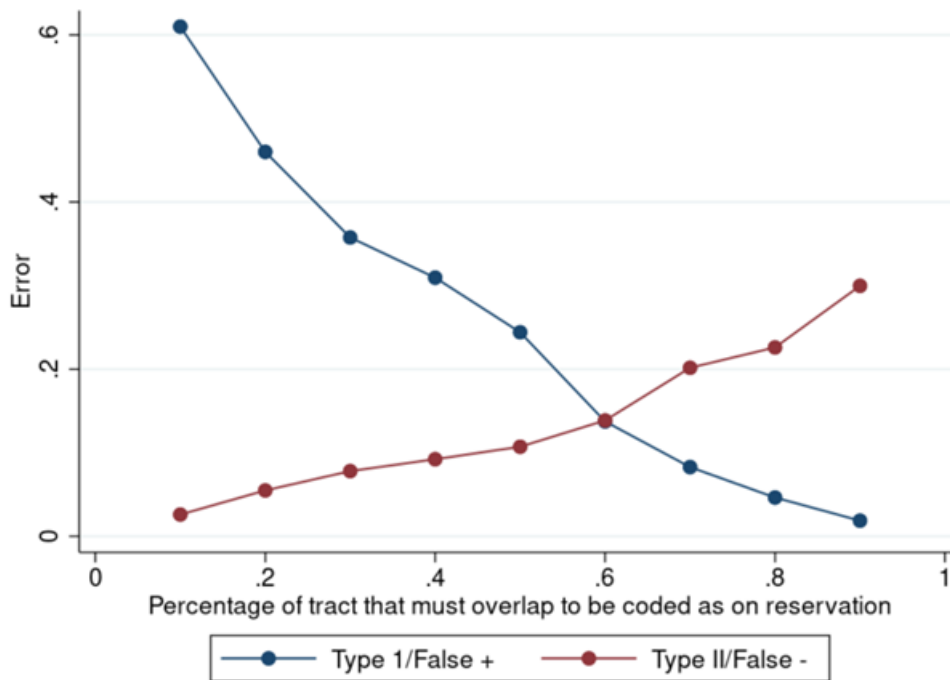


Figure 2: **Comparing address-based and tract-based AIR measures**

*Notes:*The Type I Error/False Positive rate shows, for a given tract overlap percentage assignment rule, the proportion of observations that the assignment rule considers to be on reservation but are not on reservation based on the geocoded data. The Type 2 Error/False Negative rate shows for a given tract overlap percentage assignment rule, the proportion of observations that are on reservation according to the geocoded data but are not designated as on reservation by the tract overlap percentage assignment rule. This figure was generated using observations from 2021 HMDA only.

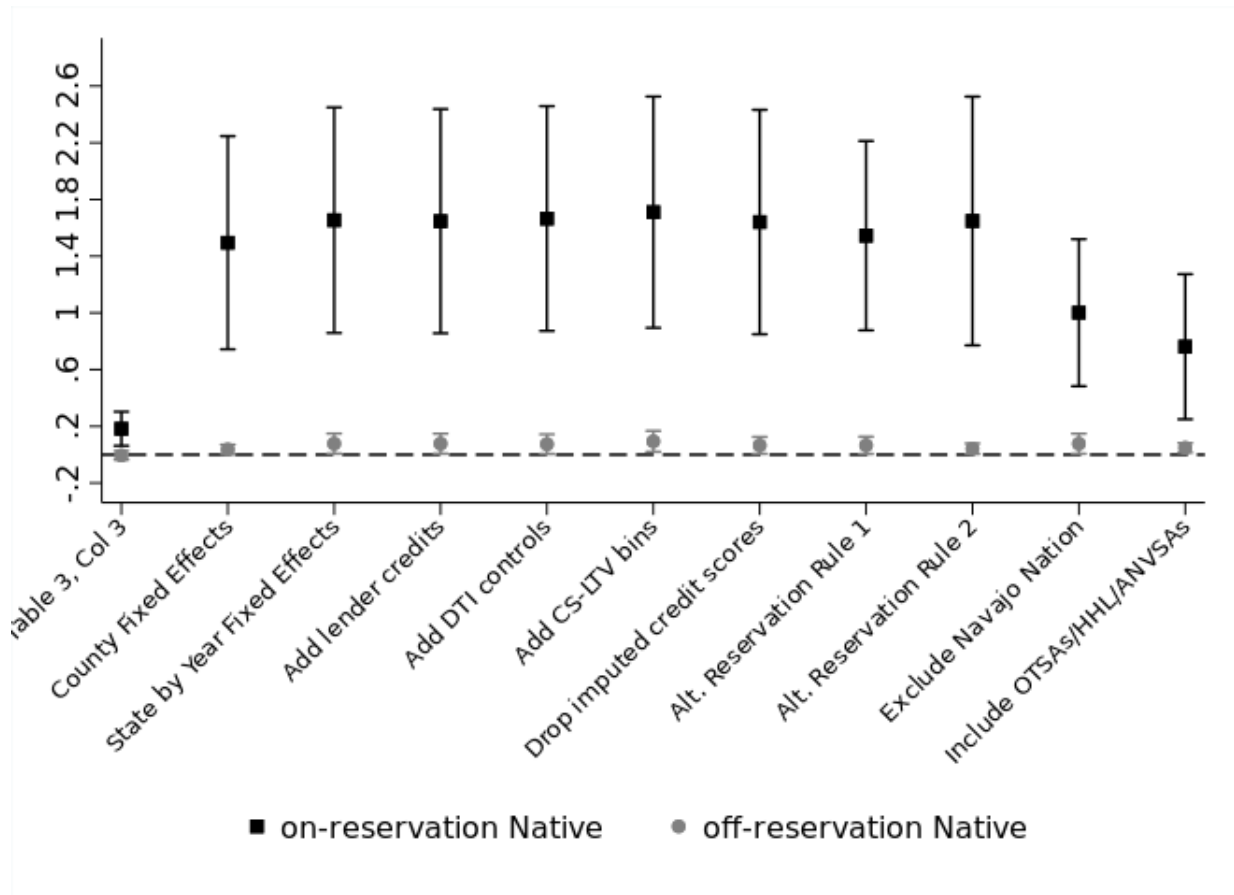


Figure 3: **Robustness Checks, rate spread disparities**

Notes: The 95% confidence intervals for the coefficients for on- and off-reservation Native borrowers in various model specifications are displayed above. The “baseline” specification is identical to Table 3, panel A, column 3. “County Fixed Effects” uses county fixed effects instead of state fixed effects, “Add lender credits” includes a dummy if lender credits were given to the borrower, “Add DTI controls” adds DTI bins as controls, “Add CS-LTV bins” contain credit score-LTV bins, “Drop imputed values” drops all observations with imputed credit scores, “Alt. Reservation Rule 1” assign Native borrowers to reservations if at least 10% of the home’s census tract area overlaps with reservation land, “Alt. Reservation Rule 2” assigns Native borrowers to reservation if at least 90% of the home’s census tract overlaps with reservation land, “Exclude Navajo Nation” drops all census tracts that overlap with the Navajo Nation, “Include OTSAs/HHL/ANVSAs” assigns Native borrowers to reservations if at least 60% of a census tract’s area overlaps with any Census Bureau-defined American Indian Area (reservations and off-reservation trust lands, OTSAs, HHLs, ANVSAs, state reservations).

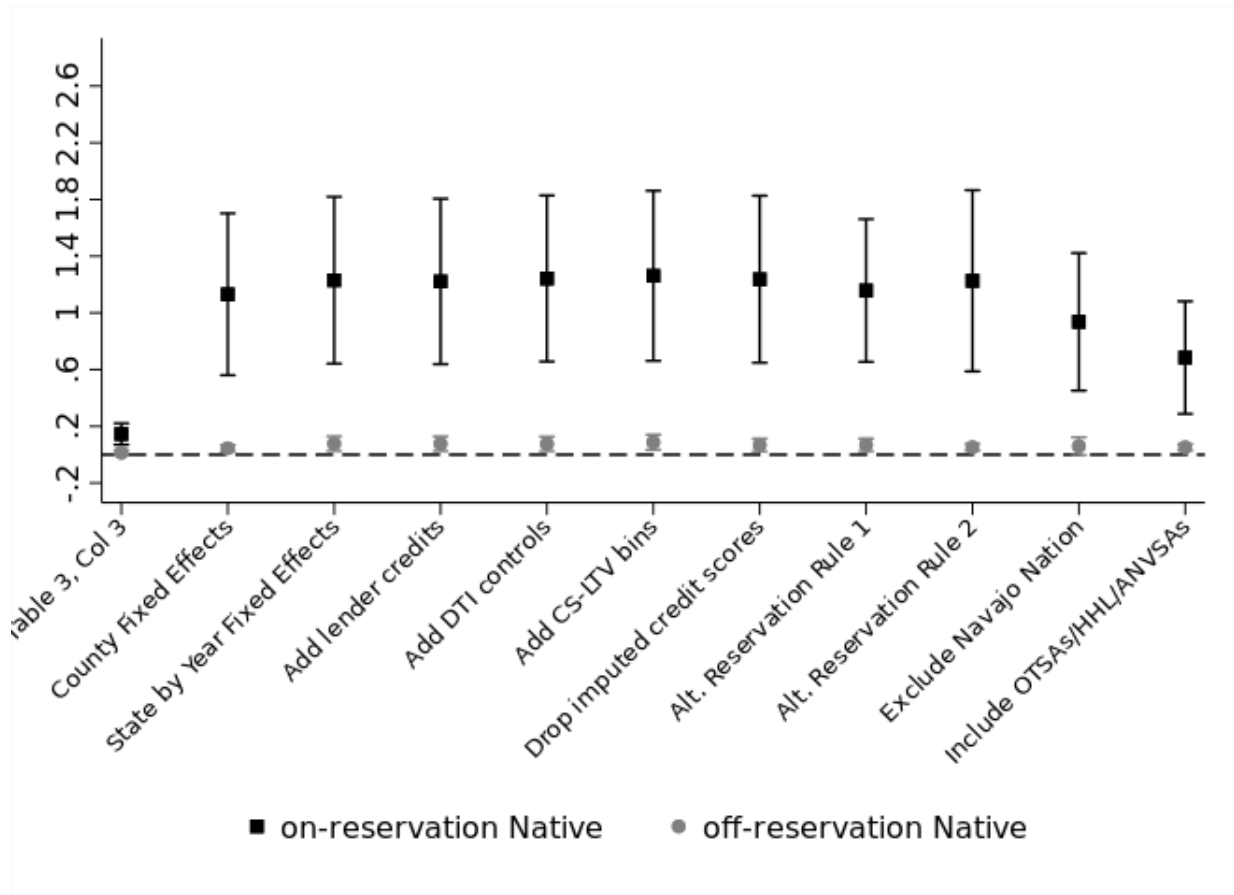
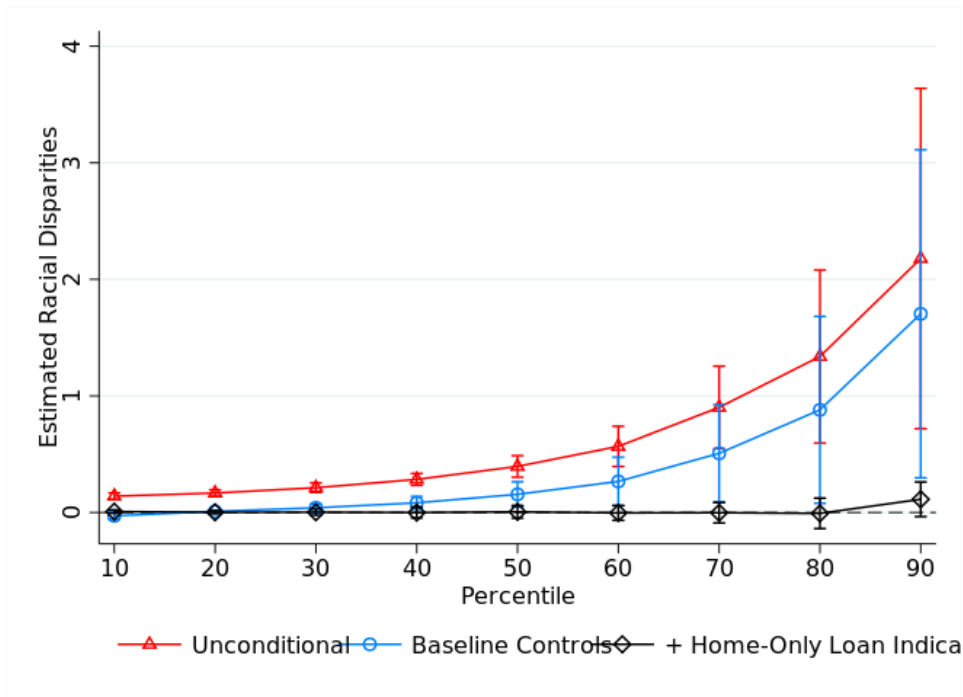
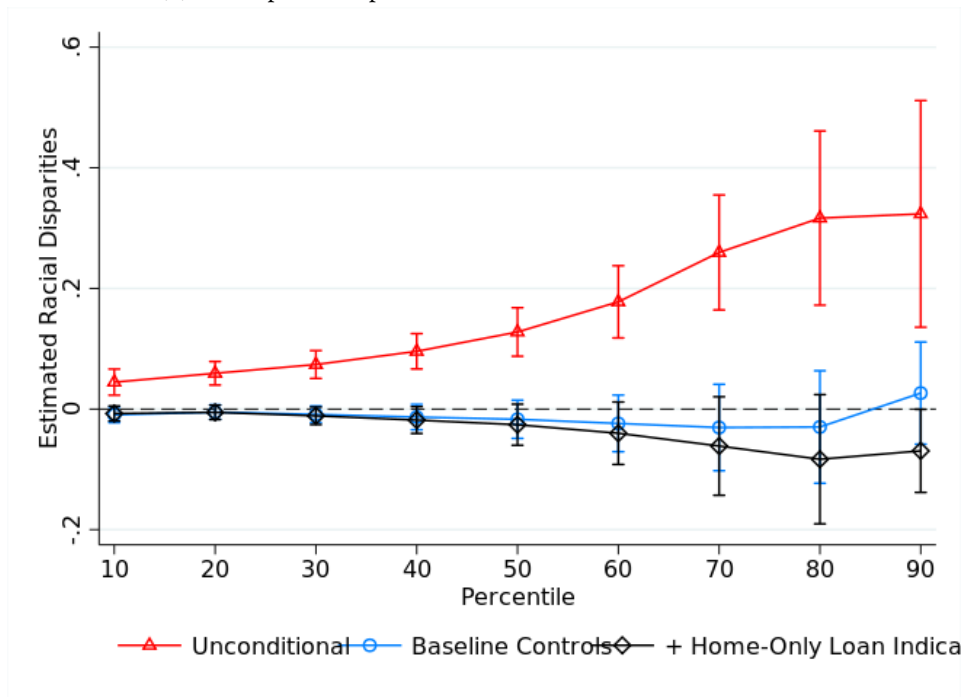


Figure 4: **Robustness Checks, interest rate disparities**

Notes: The 95% confidence intervals for the coefficients for on- and off-reservation Native borrowers in various model specifications are displayed above. The “baseline” specification is identical to Table 3, panel B, column 3. “County Fixed Effects” uses county fixed effects instead of state fixed effects, “Add lender credits” includes a dummy if lender credits were given to the borrower, “Add DTI controls” adds DTI bins as controls, “Add CS-LTV bins” contain credit score-LTV bins, “Drop imputed values” drops all observations with imputed credit scores, “Alt. Reservation Rule 1” assign Native borrowers to reservations if at least 10% of the home’s census tract area overlaps with reservation land, “Alt. Reservation Rule 2” assigns Native borrowers to reservation if at least 90% of the home’s census tract overlaps with reservation land, “Exclude Navajo Nation” drops all census tracts that overlap with the Navajo Nation, “Include OTSAs/HHL/ANVSAs” assigns Native borrowers to reservations if at least 60% of a census tract’s area overlaps with any Census Bureau-defined American Indian Area (reservations and off-reservation trust lands, OTSAs, HHLs, ANVSAs, state reservations).



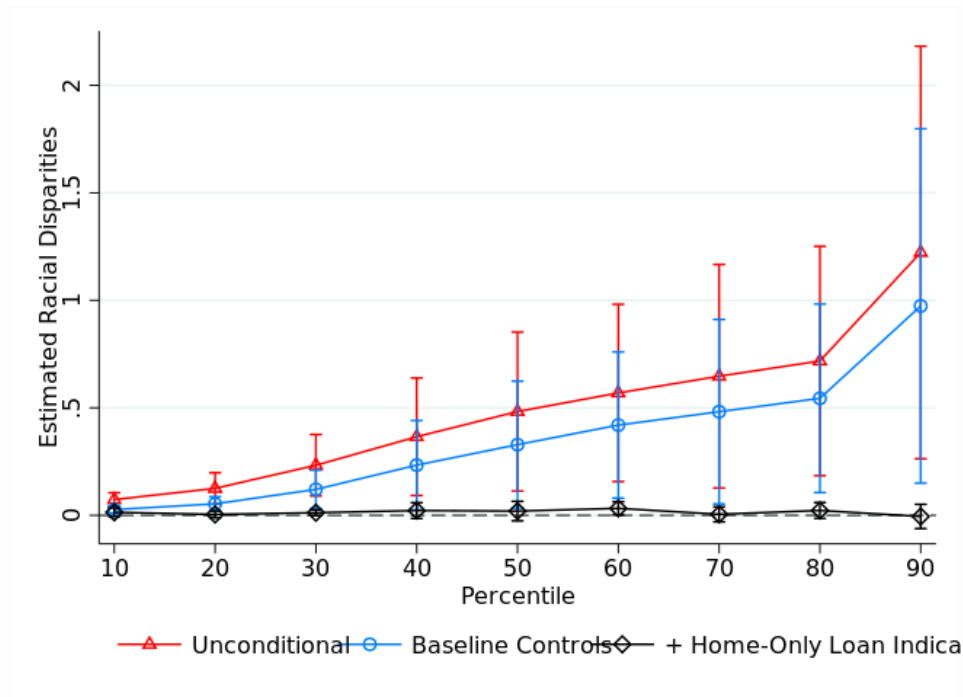
(a) Rate Spread Gaps for on-Reservation Native Borrowers



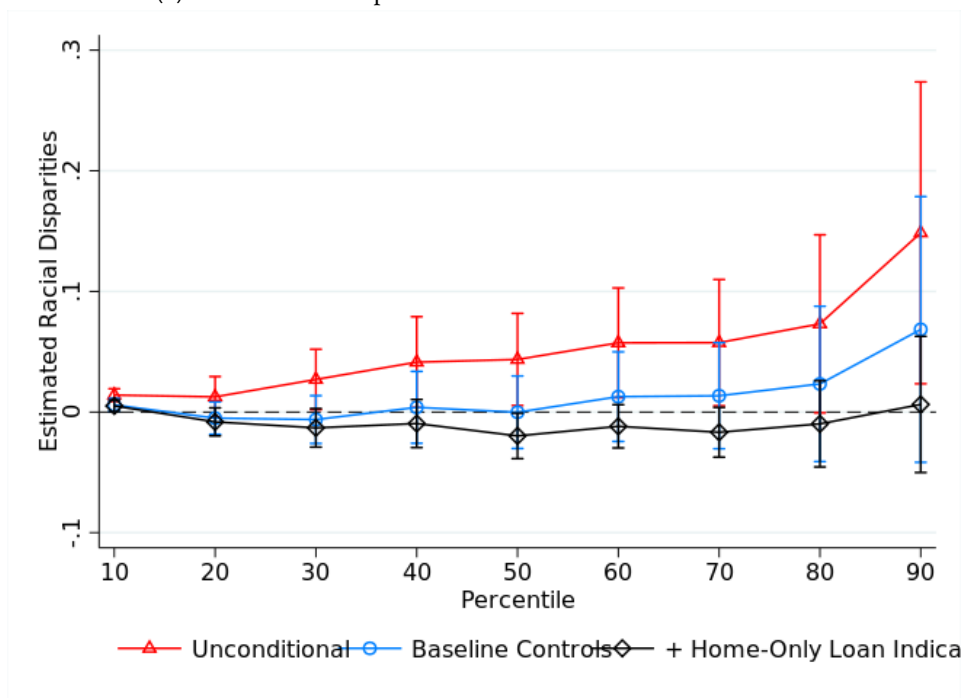
(b) Rate Spread Gaps for off-Reservation Native Borrowers

Figure 5: **Quantile Regression Results**

Notes: The outcomes in all regressions is the rate spread. Panels A and B show the 95% confidence interval for each coefficient on the on-reservation and off-reservation Native indicator from three separate quantile regressions: The red points are from a model without any individual controls, the blue points are from a model that includes demographic and basic loan characteristics, and the black points are from a model that includes the home-only loan indicator. Since we cut the data into deciles, we control for census region fixed effects instead of state fixed effects.



(a) Interest Rate Gaps for on-Reservation Native Borrowers



(b) Interest Rate Gaps for off-Reservation Native Borrowers

Figure 6: Quantile Regression Results

Notes: The outcome in all regressions is the interest rate. Panels A and B show the 95% confidence interval for each coefficient on the on-reservation and off-reservation Native indicator from three separate quantile regressions: The red points are from a model without any individual controls, the blue points are from a model that includes demographic and basic loan characteristics, and the black points are from a model that includes the home-only loan indicator. Since we cut the data into deciles, we control for census region fixed effects instead of state fixed effects.

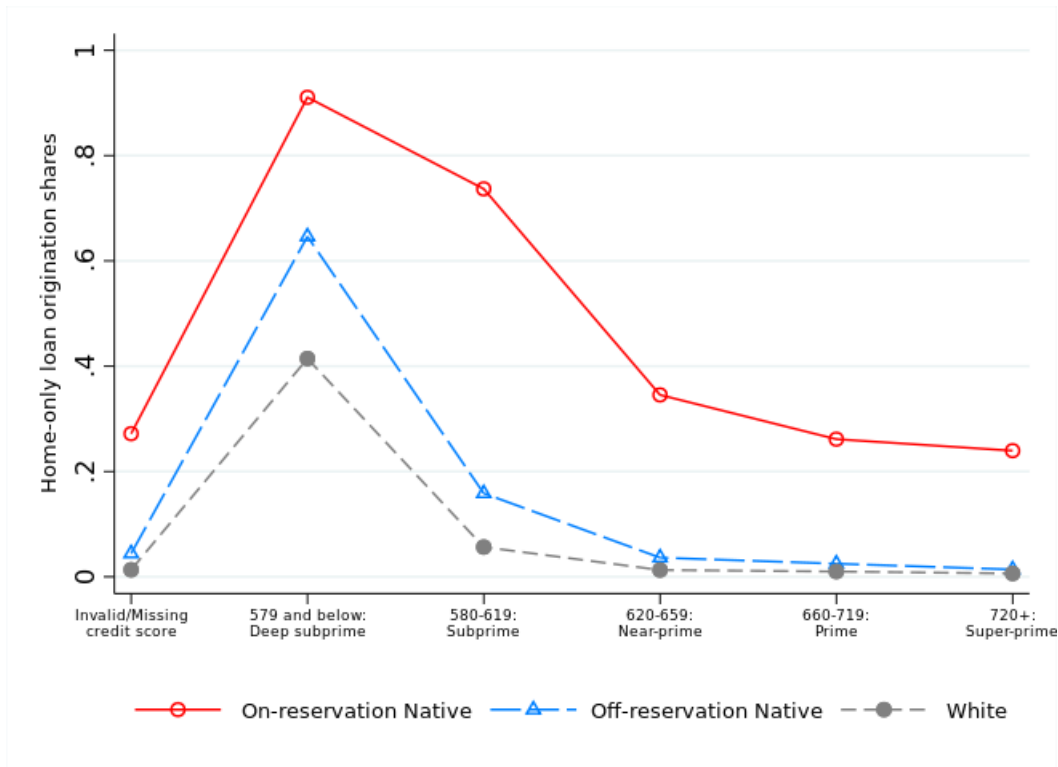


Figure 7: **Home-only Loan Shares by Credit Score and by Race**

Notes: The sample contains all new loan originations. The share of loan originations that are home-only loans is plotted by credit score categories in the spirit of figure 3 in Russell et al. (2021). The “invalid/missing credit score” contains loans that were exempt from reporting the applicant’s credit score or loans with invalid credit scores (i.e, credit scores less than 280 and greater than 850). Manufactured home loans whose home-only loan status was exempt from reporting are dropped from the sample. The number of on-reservation Native loans by credit classification (from left to right) are 103, 56, 133, 275, 482, and 455. The number of off-reservation Native loans by credit classification (from left to right) are 5,326, 560, 2,044, 9,987, 20,636 and 29,719. The number of White loans by credit classification (from left to right) are 389,655, 9,670, 64,526, 369,673, 984,902 and 2,644,524.

Table 1: Summary Statistics, group averages

	on-Reservation	off-Reservation	White	Statistical		
	Native	Native		Differences		
	(1)	(2)	(3)	(1)-(3)	(2)-(3)	(1)-(2)
rate spread	2.572 (2.574) [1292]	0.793 (1.197) [65033]	0.529 (1.716) [4395762]	***	***	***
interest rate	5.217 (2.246) [1454]	3.881 (1.212) [67952]	3.810 (0.964) [4451531]	***	***	***
credit score	688.630 (62.325) [1401]	713.406 (58.226) [62964]	737.360 (54.951) [4074472]	***	***	***
age	40.678 (13.943) [1675]	39.137 (12.859) [69546]	41.150 (13.826) [4544490]		***	***
co-applicant	0.427 (0.495) [1675]	0.437 (0.496) [69546]	0.481 (0.500) [4544490]	***	***	
female	0.470 (0.499) [1675]	0.396 (0.489) [69546]	0.332 (0.471) [4544490]	***	***	***
income (in \$000s)	112.686 (1378.255) [1667]	118.292 (1718.010) [68516]	154.369 (3426.955) [4490401]		***	
loan amount (in \$000s)	160.563 (111.615) [1675]	270.582 (177.513) [69545]	329.095 (273.800) [4544264]	***	***	***
property value (in \$000s)	181.494 (135.579) [1498]	310.871 (235.360) [67760]	440.153 (50565.262) [4436773]	***	***	***
debt-to-income (%)	35.673 (10.058) [1500]	38.026 (9.672) [67963]	37.263 (9.953) [4434349]	***	***	***

Notes: Means are reported with standard deviations in parentheses and the number of observations in brackets. The sample contains all accepted (i.e, approved and originated) loans in states with at least one loan on a census tract that can be considered an “on reservation” loan using our methodology. Some variables, such as rate spread and credit score, are exempt from reporting for small lenders. Thus, the number of loans in each population group refers to the number of loans with reported data. We winsorized the interest rate variable in order to drop interest rates that are greater than 99.9% of all interest rates. Even though negative debt-to-income (DTI) ratios can be considered valid, we restrict the sample to only DTI ratio between 0 and 100%. Significance stars: * 0.10 ** 0.05 *** 0.01.

Table 2: Summary Statistics for Loan Types

	on-reservation	off-reservation	White	Statistical		
	Native	Native		Differences		
	(1)	(2)	(3)	(1)-(3)	(2)-(3)	(1)-(2)
FHA	0.281 (0.450) [1675]	0.310 (0.462) [69546]	0.157 (0.364) [4544490]	***	***	*
VA	0.056 (0.229) [1675]	0.135 (0.342) [69546]	0.095 (0.293) [4544490]	***	***	***
RHS/FSA	0.059 (0.235) [1675]	0.035 (0.185) [69546]	0.022 (0.147) [4544490]	***	***	***
manufactured home	0.389 (0.488) [1675]	0.069 (0.254) [69546]	0.033 (0.180) [4544490]	***	***	***
home-only loan	0.337 (0.473) [1504]	0.032 (0.177) [68272]	0.010 (0.099) [4462950]	***	***	***

Notes: Means are reported with standard deviations in parentheses and the number of observations in brackets. Some lenders are exempt from reporting whether the covered loan is secured by a manufactured home and land, or by a manufactured home and not land. As a result, the sample size used to determine the home-only loan status is smaller than the total number of manufactured home loans in HMDA. Significance stars: * 0.10 ** 0.05 *** 0.01.

Table 3: The Role of Home-Only Loans on Rate Spread and Interest Rate Disparities

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable: Rate Spread						
on-reservation Native	1.967*** (0.434)	1.651*** (0.405)	0.183*** (0.061)	0.133*** (0.049)	0.402*** (0.105)	0.341*** (0.101)
off-reservation Native	0.231*** (0.042)	0.0776** (0.036)	-0.00485 (0.016)	-0.0157 (0.014)	0.0179 (0.023)	0.0112 (0.021)
home-only loan			4.041*** (0.051)	5.154*** (0.129)		
property interest (1=owned, 0=leased)					-3.946*** (0.066)	-3.305*** (0.071)
manufactured home						0.671*** (0.037)
Observations	4462087	4462087	4462087	4462087	4462087	4462087
Adjusted R^2	0.009	0.080	0.129	0.133	0.122	0.125
Dependent Variable: Interest Rate						
on-reservation Native	1.431*** (0.341)	1.241*** (0.302)	0.147*** (0.039)	0.0716*** (0.022)	0.295*** (0.070)	0.241*** (0.067)
off-reservation Native	0.120*** (0.032)	0.0785*** (0.027)	0.0143 (0.010)	0.00531 (0.007)	0.0324** (0.016)	0.0264** (0.013)
home-only loan			3.712*** (0.031)	3.786*** (0.074)		
property interest (1=owned, 0=leased)					-3.611*** (0.047)	-3.033*** (0.047)
manufactured home						0.605*** (0.024)
Observations	4520937	4520937	4520937	4520937	4520937	4520937
Adjusted R^2	0.492	0.563	0.691	0.697	0.672	0.680
baseline controls		✓	✓	✓	✓	✓
state fixed effects	✓	✓	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓	✓	✓
home-only interactions				✓		

Notes: Column 1 contains only state and year fixed effects. Column 2 includes demographic and basic loan controls: female indicator, co-applicant indicator, age and its square, income and its square, property value and its square, loan amount and its square, credit score bins that follow Fannie Mae's pricing model, and FHA, VA, and RHS/FSA indicators. Column 3 adds a home-only loan indicator. Column 4 interacts the home-only loan indicator with each baseline control. Column 5 includes a direct ownership indicator. Column 6 includes a manufactured home loan and direct ownership indicator. In panel B, the interest rates were winsorized in order to drop interest rates in the 99.9 percentile. The main results (i.e., the coefficients on the race indicators) are robust to including all the data, but the R^2 drops to <0.001 when these extreme values are not dropped. ***, **, *: significant at the 1%, 5%, 10% levels. Standard errors are clustered at the county level.

Table 4: OLS Estimates Predicting Likelihood of Applying for a Home-Only Loan

	Manufactured Homes Only				
	(1)	(2)	(3)	(4)	(5)
on-reservation Native	0.492*** (0.072)	0.306*** (0.038)	0.347*** (0.063)	0.293*** (0.051)	0.317*** (0.060)
off-reservation Native	0.142*** (0.035)	0.0660*** (0.020)	0.0337*** (0.009)	0.0274*** (0.007)	0.0294*** (0.011)
property interest (1=owned, 0=leased)			-0.681*** (0.012)	-0.644*** (0.013)	-0.638*** (0.013)
trust in banks			-0.143** (0.070)	-0.0338 (0.032)	-0.147* (0.076)
log(distance to nearest MH dealer)			-0.00809*** (0.002)	-0.00231 (0.002)	-0.00576*** (0.002)
log(distance to urban area)			0.00413** (0.002)	0.00175 (0.002)	0.00201 (0.002)
Baseline controls		✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓	✓
State fixed effects	✓	✓	✓		✓
County fixed effects				✓	
Observations	295846	295846	295846	295846	206312
Adjusted R^2	0.180	0.535	0.768	0.780	0.716

Notes: The sample in columns 1–5 contains only manufactured home loans that were either approved or denied with complete information on how the loan was financed (either as a home-only loan or a manufactured home mortgage) and valid census tract codes. The results for all loans are given in Appendix Table A3. Each regression predicts the probability of applying for a home-only loan given that the borrower picked a manufactured home. Column 1 shows the estimated differences after controlling for state and year fixed effects. Column 2 adds the baseline controls. Column 3 includes a property interest indicator, log distance to nearest manufactured home dealership, log distance to nearest urban area, and a trust in bank indicator. Column 4 includes county fixed effects. Column 5 uses the model specification in column 3 but limits the sample to loan amounts no greater than \$150,000. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 5: Model Predicting Loan Processing Time

	All Originated Loans		
	(1)	(2)	(3)
on-reservation Native	31.67*** (5.026)	27.53*** (4.432)	23.20*** (5.192)
off-reservation Native	4.543*** (0.521)	4.257*** (0.471)	3.999*** (0.457)
home-only loan		15.07*** (1.270)	14.57*** (1.291)
home-only loan × on-reservation Native			14.80* (8.588)
home-only loan × off-reservation Native			8.436*** (2.041)
state fixed effects	✓	✓	✓
year fixed effects	✓	✓	✓
baseline controls	✓	✓	✓
Observations	4615711	4615711	4615711
Adjusted R^2	0.041	0.042	0.042

Notes: The sample contains all originated loans. Since all lenders provided closing and opening dates, this sample is slightly larger than the sample used in Table 3. Column 1 contains the full set of baseline controls along with state and year fixed effects. Column 2 adds the home-only loan indicator. Column 3 includes interaction terms between the home-only loan indicator and the race variables along with a full set of interactions with the baseline controls. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 6: Loan Origination Rates, Descriptive Statistics

	on-Reservation	off-Reservation	White	Statistical Differences		
	Native	Native		(1)-(3)	(2)-(3)	(1)-(2)
	(1)	(2)	(3)			
approval rates, home-only loans	0.306 (0.461) [1941]	0.364 (0.481) [8098]	0.461 (0.498) [142292]	***	**	***
approval rates, manufactured home mortgages	0.604 (0.490) [225]	0.576 (0.494) [4621]	0.773 (0.419) [136706]	***	***	
approval rates, all mortgage loans	0.812 (0.391) [1488]	0.875 (0.330) [79442]	0.928 (0.259) [4982082]	***	***	***

Notes: “Approval rates, home-only loans” is the mean approval rate of home-only loan applications by race. “Approval rates, manufactured home mortgages” is the mean approval rate of manufactured home mortgage loan applications by race. “Approval rates, mortgage loans” is the mean approval rate of mortgage loan applications (either for stick-built or manufactured homes) by race. Loans that were approved but not accepted are included in the sample. The standard deviation is reported in parenthesis below the mean and the number of loan applications is listed in brackets. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 7: Native-White Disparities in Loan Approvals

	All Loans		Manufactured Homes Only	
	(1)	(2)	(3)	(4)
on-reservation Native	-0.0756*** (0.018)	-0.0759*** (0.018)	-0.111*** (0.038)	-0.112*** (0.038)
off-reservation Native	-0.0372*** (0.003)	-0.0373*** (0.003)	-0.0929*** (0.007)	-0.0940*** (0.007)
home-only loan	-0.783*** (0.019)	-0.806*** (0.020)	-0.476*** (0.027)	-0.506*** (0.027)
home-only loan × on-reservation Native	0.0645*** (0.021)	0.0741*** (0.021)	0.0901** (0.036)	0.102*** (0.036)
home-only loan × off-reservation Native	0.0406** (0.020)	0.0445** (0.020)	0.100*** (0.019)	0.104*** (0.019)
property interest (1=owned, 0=leased)		-0.0226*** (0.007)		-0.0327*** (0.008)
state fixed effects	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓
baseline controls	✓	✓	✓	✓
home-only interactions	✓	✓	✓	✓
Observations	5226255	5226255	295846	295846
Adjusted R^2	0.128	0.128	0.252	0.252

Notes: The sample in columns 1-2 contains all loan applications, while the sample in columns 3-4 contains only manufactured home loan applications. Each column includes a full set of borrower characteristics (female indicator, co-applicant indicator, age and its square, income and its square, property value and its square, loan amount and its square, indicators for each federal loan product, and credit score bins that follow Fannie Mae's pricing model), interaction terms between home-only loan status and each borrower control. Columns 2 and 4 add an indicator for property interest. ***, **, *: significant at the 1%, 5%, 10% levels. Standard errors are clustered at the county level.

A Background

Since mortgaging lending on reservations, specifically on trust land, differs significantly from mortgage lending in the rest of the U.S., we discuss some of the key decisions facing Native families living on reservations when buying a home and securing a mortgage.⁴²

The two main landowners on reservations are individuals (either tribal citizens or non-Natives) and Tribes.⁴³ Both groups can own fee simple property, restricted fee land, and trust land. Fee simple property means the owner has sole claim to the land subject to a limited set of encumbrances. The owner can encumber the real property as collateral for loans, sell or rent the property, and transfer the property to beneficiaries in a will. Owners of fee simple property on reservations also pay local property taxes and, thus, are subject to state law. Owners of restricted fee land hold the title to the land but are not subject to state laws and are subject to restrictions against alienation. Trust land is controlled by the tribe or a group of individuals (one of which may be the tribe) if the land was individually allotted. While the title to trust land is held by the federal government, these lands are under the jurisdiction of tribal government authority. However, since mortgaging on these lands is considered a “federal action,” all liens on trust land are subject to federal approval.

A conventional mortgage may be a logical option if an individual wants to take out a mortgage on fee simple land within a reservation. In this case, standard conventional lending processes apply. The only potential difference is related to financial assistance. For example, if a tribal citizen living on fee simple land qualifies and receives down payment assistance from their tribe’s NAHASDA⁴⁴ funds, then an environmental assessment (EA) of their property or the home will be required. This review takes many months and will be further prolonged if the land is undeveloped. These time costs may interfere with a prospective landowner’s process of applying for a mortgage application and, if approved, tying in an interest rate. If an owner of fee simple property wants to place a manufactured home on its property without encumbering the land, then the homeowner would consider a home-only (or personal property) loan.

Individuals interested in taking out a mortgage on trust land can access two general types of mortgages as defined in the BIA Mortgage Handbook (2017). A trust land mortgage can be issued to a borrower if the trust land was individually allotted. In this case, the lender will use the appraised value of the underlying trust status land as collateral for the underlying loan.⁴⁵ The mortgage loan ties the home and land together, which, in theory, would increase access to conventional lending. The risk of using allotted trust land as collateral is that the land could be removed from Native ownership if the loan goes through foreclosure.

The most common mortgage on trust land is a leasehold mortgage. If prospective homeowners want to take out a leasehold mortgage to live on trust land, they must first apply for a home-site lease with their tribe. To qualify for a mortgage, the home must sit on a permanent foundation. The tribe will likely require an environmental assessment (EA) to determine, among other things,

⁴²For an overview of the credit market conditions in Indian country, see Community Development Financial Institutions [CDFI] Fund (2001) and Jorgensen (2016).

⁴³Some reservations contain Federal land, e.g., national parks, but homeownership is prohibited on those lands.

⁴⁴NAHASDA stands for the Native American Housing Assistance and Self Determination Act of 1996.

⁴⁵Since trust land cannot be easily alienated, the value of the underlying land is estimated to equal the fair market value for the land. The details of the regulations of alienation of trust lands can be traced back to the *Indian Non-Intercourse Act of 1790* (25 USC 177).

the environmental consequences of the new home and the distance from the house to power, water lines, and nearby roads. Unless the tribe provides financial assistance, the cost of the EA is paid by the prospective homeowner. If a tribal citizen needs to build or repair their credit before applying for a mortgage, the pre-application process may take years. Many Native-led intermediaries, such as Oklahoma Native Asset Coalition, and Native-led community banks, such as Native Community Development Financial Institutions (NCDFI), provide small, credit-building loans and financial education to help prepare individuals to apply for a mortgage (Kokodoko, 2017).

A prospective homeowner will need to find a lender, apply and get approved for a mortgage loan, and qualify for a construction loan if, for example, electrical and water lines are inadequate at the home site. Since the federal government holds the title of the home-site lease, all leasehold mortgages require a title status report (TSR) that needs to be eventually certified by the Bureau of Indian Affairs (BIA). The certified TSR needs to contain all new actions on the trust land, such as the lease number, the mortgage approval, and the land's appraised value. The BIA will require an additional EA if the property is mortgaged since the mortgage is considered a new "federal action." If the borrower wants to use a federal government loan product, such as a USDA 502 Direct Loan, a HUD Section 184 loan, or a VA Native American Direct Loan, then those agencies will require a third EA. Thus, under many situations, a borrower will need to work with the tribe, the BIA⁴⁶, HUD or USDA, a lender, and NCDFI or other organizations to obtain financial education, a construction company, and an appraiser. The mortgage is perfected when the mortgage is recorded by the BIA.

In case a borrower is delinquent on mortgage payments on a home that sits on tribal trust land, the lender must send a Right of First Refusal notice to the tribe. The tribe has three options: (1) pay off the delinquent balance and take over the monthly payments; (2) pay off the loan in full, or (3) do nothing and have the borrower go into foreclosure, which would trigger HUD to proceed with the foreclosure process.

The federal government has created several lending products specific to Native Americans or specific to low-income households to encourage lending. First, the HUD Section 184 Indian Home Loan Guarantee Program, which was established in 1992, provides fully insured loans with a low down payment to Native homeowners located both inside and outside of tribal lands. The tribe needs to sign an MOU with HUD to allow Section 184 loans to be sold within the eligible areas. These loans are conforming and, thus, can be sold to investors in the secondary market. Second, the Native American Direct Loan (NADL) program administered by the VA also supports Native American veterans (or their spouses) by providing easy terms (e.g., no down payment and limited closing costs) associated with their loan product to build a home on federal lands, such as trust land. Again, this loan product is available after the tribe signs a different MOU with the VA. Last, the U.S. Department of Agriculture's Rural Development provides 100% direct financing to purchase

⁴⁶The role of the BIA is critical in the mortgage process on trust land. The tribal homesite lease needs to be recorded in the BIA's Trust Asset Accounting Management System (TAAMS) prior to the start of the mortgage process. When the mortgage application and verified lease is sent to the local BIA office, the BIA will enter the information into its Realty Tracking System (RTS) and its Mortgage Tracker. Within one day after receipt of the mortgage package, the local BIA office will determine if the package is complete. Within 20 days of the receipt of the complete mortgage package, the agency will approve or deny the leasehold mortgage. If approved, the following steps must be completed by the BIA: a legal document to the leasehold mortgage/deed of trust is assigned; a contract ID for the lender is created in TAAMS; the leasehold mortgage is recorded by the LTRO and cross-referenced to the original lease in TAAMS. A final, certified TSR needs to be recorded in order to close the mortgage.

a single-family home in rural areas for low-income applicants, which may apply to Native families living on tribal lands. The 502 direct loan and the VA direct loan are lender-less loans in that they are provided directly by the federal government, while Section 184 loans are originated by participatory lenders. Research suggests that each of these three government-insured loan products are not commonly used on trust land (Cyree et al., 2004; Laderman and Reid, 2010).

If a borrower living on trust land wants to bypass this process and still secure a loan for a home, then a prospective homeowner can apply for a home-only loan for a manufactured home. Home-only loans, much like car loans, are personal property loans. They face fewer consumer protections, have higher interest rates, and can be rarely refinanced. The benefit of a home-only loan for a home on trust land is that, as mentioned above, the cumbersome process of securing a leasehold or trust land mortgage is avoided.

From the borrower's side, tying the manufactured home and the land together is more advantageous than tying the loan just to the home. For one, the value of the manufactured home can appreciate over time if the land and home are tied together. Tying the home to the land will also allow the borrower to access conventional loans or, if eligible, low-cost federal loan products. From the lender's perspective, a mortgage can be sold to an investor, which will help manage the lender's liquidity. In addition, tying the home and land together would allow a lender to sell the prospective homeowner a 100% guaranteed loan such as the Section 184 loan. However, the cumbersome administrative process of securing a mortgage on trust land may deter lenders from participating in mortgage lending. For example, a lender may need to repurchase a loan, most likely at a loss, from an investor if the mortgage is not closed within two years of the initial secondary market purchase.⁴⁷ The transaction costs of securing a low-cost mortgage may cause lenders to supply fewer mortgages and borrowers to demand more higher-cost, home-only loans.

⁴⁷There may be additional burdens placed on both the lender and the borrower when the complete mortgage processing time is prolonged. For example, if a borrower's credit score decreases during this long process, the lender may be forced to restart the application process. An application may need to be rejected or not approved by the landowner if characteristics of the loan, like the interest rate, can no longer be locked into a rate.

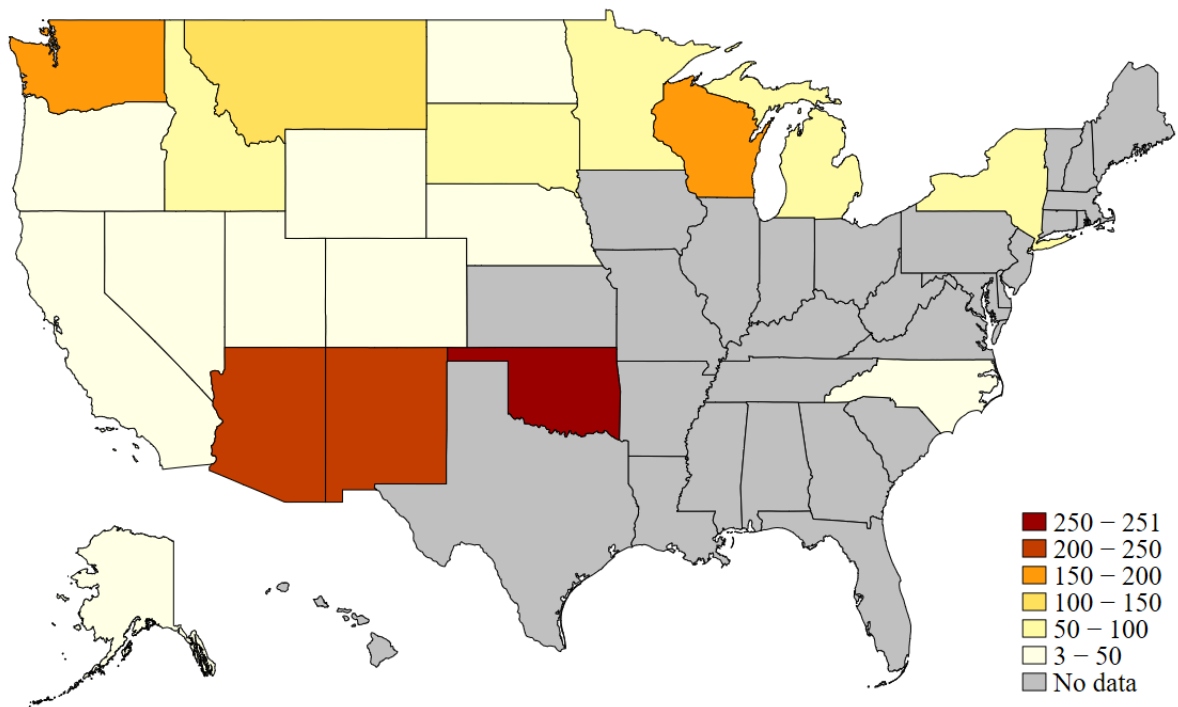
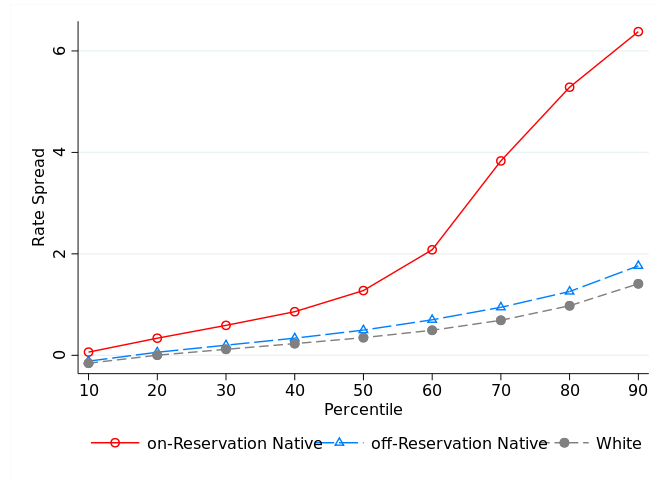
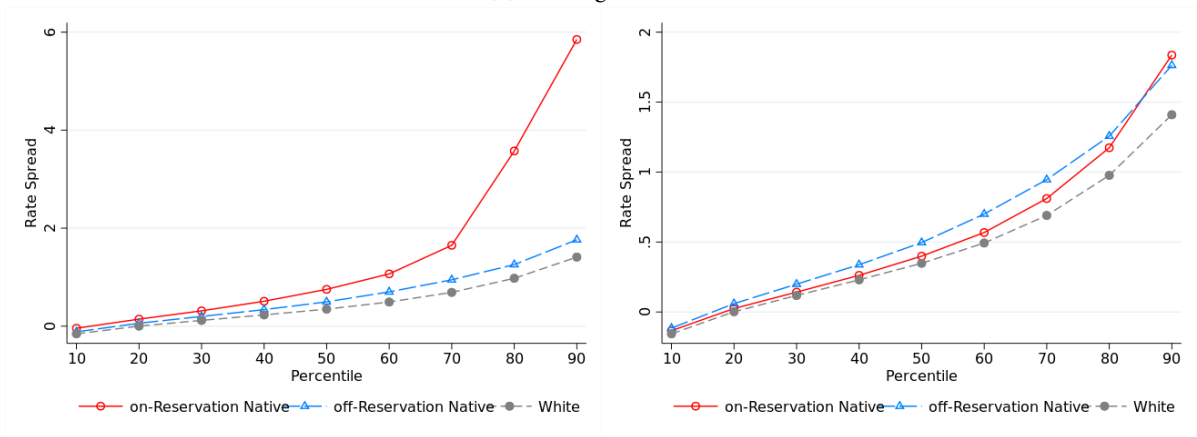


Figure A1: **Concentration of Originated Loans in Indian Country**

Notes: This figure maps the number of on-reservation Native-originated loans by state. Data from the 2018–2021 confidential HMDA.



(a) Adding 100 loans

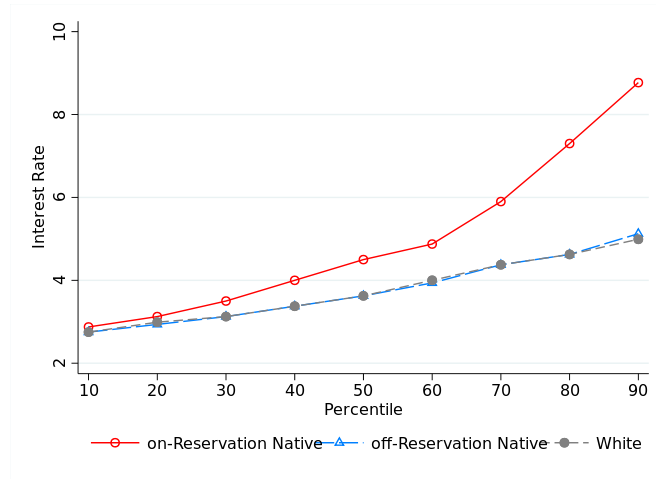


(b) Adding 1,000 loans

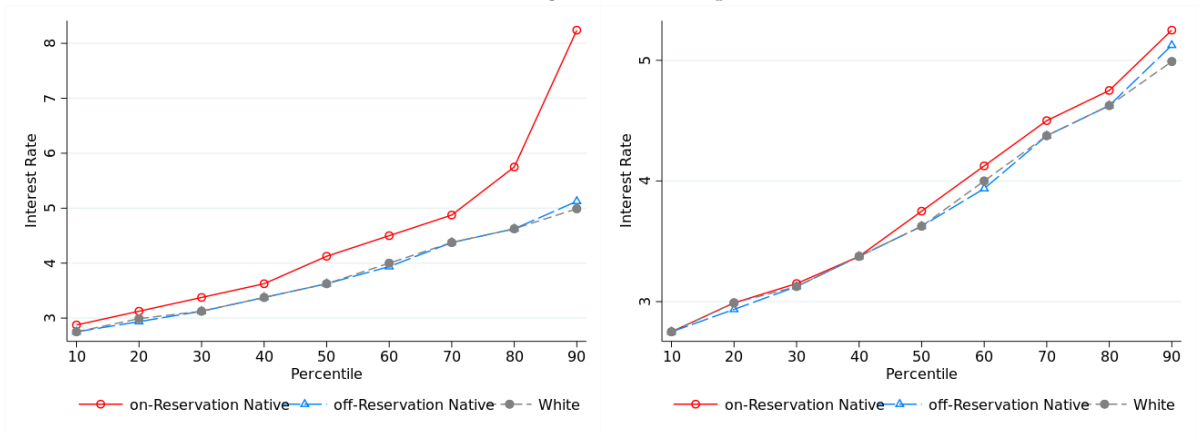
(c) Adding 10,000 loans

Figure A2: Rate Spread Disparities Under 3 Scenarios of Size of Missing Loans Due to Potential HMDA Under-coverage

Notes: Panel A adds 100 loans randomly sampled with replacement from the White loan distribution to the “on-reservation Native” group. Panel B adds 1,000 loans randomly sampled with replacement from the White loan distribution to the “on-reservation Native” group. Panel C adds 10,000 loans randomly sampled with replacement from the White loan distribution to the “on-reservation Native” group. The sample of loans is restricted to first-lien loans for home purchases located in states with at least one census tract that is defined as being located “on a reservation” using our methodology discussed in Section 2.



(a) Adding 100 loans sampled



(b) Adding 1,000 loans sampled

(c) Adding 10,000 loans sampled

Figure A3: Interest Rate Disparities Under 3 Scenarios of Size of Missing Loans Due to Potential HMDA Under-coverage

Notes: Panel A adds 100 loans randomly sampled with replacement from the White loan distribution to the “on-reservation Native” group. Panel B adds 1,000 loans randomly sampled with replacement from the White loan distribution to the “on-reservation Native” group. Panel C adds 10,000 loans randomly sampled with replacement from the White loan distribution to the “on-reservation Native” group. The sample of loans is restricted to first-lien loans for home purchases located in states with at least one census tract that is defined as being located “on a reservation” using our methodology discussed in Section 2.

Table A1: The Role of Direct Ownership on Racial Disparities in Loan Prices

	(1)	(2)	(3)	(4)
	The Dependent Variable is:			
	Rate Spread		Interest Rate	
on-reservation Native	0.396*** (0.137)	0.446*** (0.103)	0.240*** (0.063)	0.455*** (0.087)
off-reservation Native	0.00212 (0.020)	0.670*** (0.091)	0.0223 (0.014)	0.491*** (0.073)
owns land		-3.917*** (0.068)		-3.591*** (0.048)
owns land × on-reservation Native		-0.0514 (0.151)		-0.214** (0.086)
owns land × off-reservation Native		-0.669*** (0.082)		-0.468*** (0.066)
Observations	4422519	4462087	4481377	4520937
Adjusted R^2	0.071	0.122	0.632	0.672
baseline controls	✓	✓	✓	✓
state fixed effects	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓

Notes: The samples in columns 1 and 3 contain only originated loans associated with borrowers with direct ownership in the underlying land. The samples in columns 2 and 4 contains all originated loans. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Table A2: Racial Differences in Fees Paid

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent Variable: log(Total Fees)					
on-reservation Native	-0.192** (0.081)	-0.195*** (0.048)	0.00977 (0.035)	-0.0680** (0.031)	-0.0123 (0.033)	-0.0104 (0.033)
off-reservation Native	0.0431*** (0.008)	-0.0455*** (0.005)	-0.0326*** (0.004)	-0.0326*** (0.004)	-0.0356*** (0.004)	-0.0354*** (0.004)
home-only loan			-0.645*** (0.031)	-1.226*** (0.052)		
property interest (1=owned, 0=leased)					0.659*** (0.034)	0.640*** (0.033)
manufactured						-0.0198** (0.010)
baseline controls		✓	✓	✓	✓	✓
state fixed effects	✓	✓	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓	✓	✓
home-only interactions				✓		
Observations	4360246	4360246	4360246	4360246	4360246	4360246
Adjusted R^2	0.117	0.298	0.304	0.307	0.304	0.304
mean total fees	5570.75	5570.75	5570.75	5570.75	5570.75	5570.75

Notes: Column 1 contains only state and year fixed effects. Column 2 includes demographic and basic loan controls: female indicator, co-applicant indicator, age and its square, income and its square, property value and its square, loan amount and its square, credit score bins that follow Fannie Mae's pricing model, and FHA, VA, and RHS/FSA indicators. Column 3 adds a home-only loan indicator. Column 4 interacts the home-only loan indicator with each baseline control. Column 5 includes a direct ownership indicator. Column 6 includes a manufactured home loan and direct ownership indicator. ***, **, *: significant at the 1%, 5%, 10% levels. Standard errors are clustered at the county level.

Table A3: OLS Estimates Predicting Likelihood of Applying for a Home-Only Loan

	All Loans				
	(1)	(2)	(3)	(4)	(5)
on-reservation Native	0.568*** (0.093)	0.495*** (0.081)	0.325*** (0.074)	0.290*** (0.065)	0.351*** (0.066)
off-reservation Native	0.0570*** (0.013)	0.0457*** (0.010)	0.0111*** (0.003)	0.00743*** (0.002)	0.0286*** (0.007)
property interest (1=owned, 0=leased)			-0.953*** (0.004)	-0.950*** (0.004)	-0.905*** (0.006)
trust in banks			-0.0596** (0.024)	-0.0266** (0.011)	-0.0939** (0.044)
log(distance to nearest MH dealer)			0.00263*** (0.000)	0.00134*** (0.000)	0.00612*** (0.001)
log(distance to urban area)			0.000828*** (0.000)	0.00197*** (0.000)	0.00469*** (0.001)
Baseline controls		✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓	✓
State fixed effects	✓	✓	✓		✓
County fixed effects				✓	
Observations	5124389	5124389	5124389	5124389	930810
Adjusted R^2	0.025	0.161	0.837	0.841	0.848

Notes: The sample in columns 1–5 contains loan applications for either site-built homes or manufactured homes that were either approved or rejected. Each regression predicts the probability of applying for a home-only loan (rather than applying for a manufactured home mortgage or a site-built home mortgage). We omit applications by lenders who were exempt from reporting the property type of the manufactured home loan application. Column 1 shows the estimated differences after controlling for state and year fixed effects. Column 2 adds the baseline controls. Column 3 includes a property interest indicator, log distance to nearest manufactured home dealership, log distance to nearest urban area, and a trust in bank indicator. Column 4 includes county fixed effects. Column 5 uses the model specification in col. 3 but limits the sample to loan amounts no greater than \$150,000. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Table A4: Differences in Likelihood of Applying for a Home-Only Loan among Property Owners

	All Loans			Manufactured Home Loans		
	(1)	(2)	(3)	(4)	(5)	(6)
on-reservation Native	0.463*** (0.109)	0.451*** (0.106)	0.432*** (0.105)	0.676*** (0.085)	0.567*** (0.070)	0.547*** (0.076)
off-reservation Native	0.0215*** (0.006)	0.0208*** (0.006)	0.0118*** (0.003)	0.136*** (0.031)	0.109*** (0.026)	0.0818*** (0.019)
trust in banks			-0.0623** (0.026)			-0.132 (0.099)
log(distance to nearest MH dealer)			0.00297*** (0.000)			-0.00661*** (0.002)
log(distance to urban area)			0.000834*** (0.000)			0.00544** (0.002)
Baseline controls		✓	✓		✓	✓
Year fixed effects	✓	✓	✓	✓	✓	✓
State fixed effects	✓	✓	✓	✓	✓	✓
Observations	4992082	4992082	4992082	163539	163539	163539
Adjusted R^2	0.037	0.052	0.055	0.165	0.259	0.259

Notes: Each sample contains only loans whose main applicant has direct ownership in the underlying land where the home sits. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.