CENTER FOR
INDIAN COUNTRY
DEVELOPMENT
FEDERAL RESERVE BANK OF MINNEAPOLIS

WORKING PAPER SERIES | 2023-04

Understanding the Unequal Costs of Native American Homeownership

REVISED APRIL 2026

Helen Banga

Donn L. Feir
University of Victoria

Matthew T. Gregg
Federal Reserve Bank of Minneapolis

UNDERSTANDING THE UNEQUAL COSTS OF NATIVE AMERICAN HOMEOWNERSHIP*

Helen Banga† Donn. L. Feir‡ Matthew T. Gregg§

April 2026

Abstract

While there is an extensive literature on racial disparities in mortgage lending, Native American borrowers are often excluded from these studies. Using confidential Home Mortgage Disclosure Act (HMDA) data from 2018 to 2021, we examine differences in home loan prices between White and Native American borrowers, located on and off federally recognized reservations. We find significant disparities in loan prices between White and Native American borrowers, regardless of reservation status. When we incorporate newly available applicant characteristics – such as credit scores and property values – we discover that these factors account for 67 percent of the price gap for off-reservation Native loans, but only 16 percent for on-reservation Native loans. The remaining price disparities for both on- and off-reservation Native loans are driven by the higher use of home-only loans, which are loans not secured by land. The greater reliance on home-only loans by Native borrowers cannot be explained by differences in property rights: in fact, Native landowners are more likely to use a home-only loan to purchase a manufactured home than comparable White landowners. Other explanations for the disproportionate use of home-only loans, such as racial disparities in mortgage approvals, proximity to a manufactured home dealership, faster home-only loan processing times, and differing degrees of trust in banks, are also ruled out.

Keywords: Native Americans, racial disparities, access to credit, mortgage pricing, manufactured housing
JEL Codes: G50, J15, G21, G28, R21

*The views expressed here are our own and do not necessarily represent those of the Federal Reserve Bank of Minneapolis and the Federal Reserve Board. Most of Helen's contributions occurred while employed by the Consumer Financial Protection Bureau. The views in this paper also do not necessarily reflect those of the Consumer Financial Protection Bureau or the United States.

†Unaffiliated. E-mail: helen.willis.banga@gmail.com

‡Department of Economics, University of Victoria, IZA, NBER. E-mail: dfeir@uvic.edu

§Corresponding Author. Center for Indian Country Development, The Federal Reserve Bank of Minneapolis. E-mail: matt.gregg@mpls.frb.org

1 Introduction

Disparities in access to mortgage lending among racial and ethnic minority groups have long been documented (Holmes and Horvitz, 1994; Munnell et al., 1996; Quillian et al., 2020). Even when credit is available, studies have shown that minority groups often 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] Though lenders can issue mortgages on trust land, American Indian reservations are often located in credit deserts (Community Development Financial Institutions [CDFI] Fund, 2001; United States Congress Senate Committee on Indian Affairs, 2015; Jorgensen and Akee, 2017; Laderman and Reid, 2010; Fund, 2001; Cyree et al., 2004; Dymski, 1999; Dimitrova-Grajzl et al., 2015a; Schumacher et al., 2006; Cattaneo and Feir, 2021). Native Americans, on average, are also more likely to have lower household income and wealth than White Americans, which likely makes accessing affordable credit more challenging (Ramakrishnan and Ahmad, 2014; Feir et al., 2024). Understanding the relative importance of borrower versus institutional characteristics will help inform policies aimed at promoting greater financial inclusion in Native American communities.

In this paper, we use confidential Home Mortgage Disclosure Act (HMDA) data from 2018 to 2021 to investigate the extent and potential drivers of disparities in home loan prices between White and Native American borrowers, both on and off reservations. After adjusting for state and year fixed effects, the average rate spread, which is an APR-based measure of loan price, of on-reservation loans was 197 basis points higher, and for off-reservation loans, 23 basis points higher, compared to White loans. We find that approximately 16 percent of the price disparity between Native borrowers on reservations and White borrowers can be explained by applicant characteristics. While these factors account for a notably larger portion (67 percent) of the gap between White and off-reservation Native loans, a non-trivial portion of the disparity remains unexplained.

The limited explanatory power of applicant characteristics in accounting for these price dispari-

[1] We specifically focus on American Indian and Alaska Native borrowers. We use the terms "Native American" and "Native" interchangeably, although the term "Native American" typically includes American Indians, Alaska Natives, and Native Hawaiians. We do not know whether the Native borrowers in HMDA have formal tribal affiliations with Native Nations. Thus, the usual caveats for grouping individuals by race apply here.

ties is further supported by a number of robustness checks. When we compare on-reservation Native loans to on-reservation White loans with similar borrower characteristics, we still observe large price disparities in rate spreads. Additionally, when controlling for land ownership, Native American borrowers, particularly those living on reservations, continue to pay more for home loans than White borrowers with similar borrower characteristics.

We find that the primary factor driving home loan price disparities, particularly among Native borrowers living on reservations, is the way manufactured homes are financed. Native borrowers – especially those living on reservations – disproportionately use home-only loans, which are not tied to real property.[2] This disproportionate use of home-only loans holds not only when we consider all types of loans but also when we focus specifically on manufactured home purchases.

The rest of the paper tests hypotheses to explain why Native borrowers disproportionately use home-only loans for home purchases. While the reasons borrowers choose a home-only loan instead of a manufactured home mortgage loan are not well-established, we focus on four potential reasons. First, we examine whether Native Americans use home-only loans more frequently because they are more likely to live on leased land compared to White borrowers. We find that differences in land ownership do not fully explain the high use of home-only loans on reservations. In particular, when isolating borrowers with direct land ownership, Native American borrowers – whether living on or off reservations – are still more likely to use home-only loans than White borrowers with similar applicant characteristics.[3] Our results imply that property ownership in and of itself is an unlikely explanation for the prevalence of loans that are not secured by land. This finding is important because other papers have emphasized that the challenge to collateralize trust land on Native American reservations is a key major barrier to economic development (see, e.g., Anderson and Parker, 2009; Fund, 2001; Jorgensen, 2016). Although our findings do not undermine the significance of this channel in economic development, they indicate a need to reassess the assumption that private property on reservations will

[2]Manufactured homes are an important source of housing, especially on reservations. In our sample, on-reservation Native borrowers in HMDA are approximately 12 times more likely to purchase a manufactured home compared to White borrowers.

[3]While HMDA does not provide direct information on why landowners might choose home-only loans, there is some suggestive evidence from survey data. For example, a study surveying manufactured home borrowers in Texas found that 43 percent of borrowers stated that the desire not to use land as collateral influenced their loan choice (Freddie Mac and UNC, 2020).

lead to greater investment. Our data show that Native American home buyers residing on reservations collateralize land less often than other groups, even when they possess the ownership rights to do so.

Second, we investigate the influence of geographic factors, including proximity to manufactured home dealerships and urban areas, and the average racial differences in trust towards banking across states on racial disparities in home-only loan application rates. Proximity to a dealership may influence loan choice. A survey of manufactured home borrowers in Texas found that 50 percent cited the lender appearing on a list provided by the retailer as an important factor in their decision and that most borrowers chose their lender and loan type together (Freddie Mac and UNC, 2020). This suggests that being near a dealership could influence whether a borrower chooses a home-only loan or a mortgage. While we cannot estimate any causal relationships, we show that proximity to a dealership, distance to an urban area, and trust in banks do not explain the heavy reliance on such loans among Native borrowers, particularly those on reservations.

Third, we test whether Native borrowers (both on and off reservations) experience shorter times from approval to origination when using a home-only loan instead of a mortgage. We find that, conditional on loan approval, on-reservation Native mortgages take 23 days longer to originate than White mortgages. However, on-reservation Native home-only loans take 37 additional days to originate compared to White home-only loans.[4] As a result, on-reservation Native home-only loans have a 14-day longer origination time than on-reservation Native mortgages. For off-reservation Native borrowers, loan origination times are also longer for home-only loans compared to mortgages. Thus, we find no evidence that Native borrowers, either on or off reservations, benefit from faster loan origination times by using home-only loans.

Fourth, we examine whether racial disparities in mortgage approvals might encourage Native borrowers to use home-only loans. We find that the racial disparities in mortgage approvals are relatively small. Given that the overall likelihood of getting a home-only loan approved is much lower than the likelihood of getting a mortgage approved, our results suggest that Native applicants are more likely to have their mortgage application approved than their home-only loan application. Thus, while we

[4]Though this finding might seem surprising, Russell et al. (2021) finds a similar result. The authors note that homes financed by home-only loans are more likely to be transported from a dealership to a home site in the time between approval and origination, which could explain the increased time to origination.

cannot directly observe applicants shopping for loan products, we conclude that Native borrowers are unlikely to use home-only loans to finance a home purchase simply because these loans are easier to obtain.

Taken together, our results suggest that the higher use of home-only loans explains much of the home loan premium paid by Native borrowers. The disproportionate use of home-only loans is not fully explained by factors such as land ownership, proximity to manufactured home dealerships or urban areas, faster processing times, or differences in denial rates. While these findings raise an important question about why Native borrowers disproportionately use home-only loans, they also highlight the potential importance of reducing the cost of home-only loans. If policymakers aim to narrow the gap in access to affordable home financing between Native American and White borrowers, addressing the cost of home-only loans could be a critical step.

This paper contributes to at least four distinct literatures. First, it adds to the growing body of research on racial disparities in mortgage rates, a field where studies on Native American borrowers have been limited. For instance, Bartlett et al. (2022) examines secondary market loan purchases and finds small racial disparities in interest rates, attributing them to discriminatory lending practices. Heimer et al. (2021) identifies taste-based discrimination in mortgage approvals by estimating larger racial approval gaps at the start of a month compared to those at the end of the month when loan officers need to meet their monthly performance targets. Hurtado and Sakong (2024) also finds racial disparities within banks and loan officers that are not fully explained by observable factors. Bhutta and Hizmo (2021) focuses on FHA lending and shows that racial differences in the use of discount points contribute to higher interest rates for minorities. In contrast, we examine a broader set of loans, including portfolio loans, from a diverse group of lenders. We argue that differences in fees or discount points are unlikely to explain the large rate spread disparities for Native American borrowers living on reservations. Similar to other studies (Haughwout et al., 2009; Ghent et al., 2014; Cheng et al., 2015), we do not find racial disparities in loan prices between Whites and off-reservation Native American borrowers after controlling for differences in applicant characteristics and loan products.

Our paper is most closely related to Cattaneo and Feir (2021), who use public HMDA data from 2009 to 2017 to document the share of first-lien loans with an APR of 1.5 percentage points or more

than the average prime rate between White and Native American borrowers. They find that Native borrowers are more likely to hold "higher-priced" loans, partly due to the prevalence of manufactured homes on reservations. However, our study differs in four key ways. First, we analyze the full distribution of rate spreads, while their study only looks at "higher-priced" loans.[5] Second, they lack data on manufactured home purchases such as property ownership or or how the loan is secured, both of which we consider. Third, we control for borrowers' credit scores, which are unavailable in the public HMDA data. Fourth, unlike their study, we consider racial disparities in denial rates, racial differences in origination times, and the impact of geographic factors as potential factors that might explain the disproportionate use of home-only loans. As a result, our paper provides more comprehensive evidence on why we see Native borrowers use costlier loans to finance home purchases compared to White borrowers.

The second stream of literature this paper contributes to is the relatively small body of research 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 lower recovery rates. Canner and Laderman (1999) analyze the rise of specialty lenders in the manufactured home market and the associated increase in denial rates, as reported in HMDA data. Schmitz (2020) discusses home-only loans, the structure of the manufactured housing market, and recent efforts to create a secondary market for manufactured home loans. Jensen (2023) examines how floor financing at dealerships can distort competition at the retailer level. Doerr and Fuster (2024) explore the relationship between market power in the lending market for manufactured homes and high loan prices, providing evidence that borrowers are more likely to choose home-only loans in more concentrated markets.

Our paper adds to this literature by highlighting the outsized effect of the manufactured home market on Native borrowers' finances. Although Doerr and Fuster (2024) show that borrowers are more likely to choose home-only loans in markets with higher lender concentration, we argue that this is unlikely to be a major driver of the prevalence of home-only loans on Native American reservations. On-reservation Native borrowers are about 30 percentage points more likely to apply for a home-

[5]The reporting requirements for rate spread have changed over time. Prior to the implementation of the Dodd-Frank Act, rate spread was only available for originated loans that met or exceeded the higher-priced mortgage thresholds for loans. Since 2018, HMDA has required the reporting of rate spread for the vast majority of originated mortgages.

only loan compared to White manufactured home borrowers, even when controlling for county fixed effects. Further, our finding that Native borrowers pay higher rate spreads is virtually unchanged when we control for county-by-year fixed effects, which should capture any changes in lender concentration. Home-only loans are disproportionately used in other minority communities; e.g., Hispanic and Black borrowers make up about twice the share of home-only loan borrowers as they do of manufactured home mortgage borrowers (Russell et al., 2021). Future research could explore similar questions for other minority groups.

Third, our results also complement the growing literature on the importance of property rights in economic development on Native communities in Canada and the United States. Land tenure systems on reservations have important economic consequences (Leonard et al., 2020; Leonard and Dominic, 2021), but institutions have been developed to allow trust land to be effectively used for economic development. For example, Akee (2009) and Akee and Jorgensen (2014) suggest that long-term leasing arrangements on trust land result in similar housing stock and business investment on neighboring land 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) shows the introduction of transferable land tenure in small shares on First Nation reserves is only associated with improvements in housing outcomes for non-Indigenous people living on reserves. Our results suggest that differences in property rights between White and Native borrowers are not the sole factor that explains the Native-White differences in loan products and loan prices.

Finally, this paper contributes to the growing field of Indigenous economics, which covers a broad range of topics. The most relevant research focuses on access to finance on American Indian reservations. For instance, Laderman and Reid (2010) finds that the Housing and Urban Development's (HUD) Section 184 Indian Home Loan Guarantee Program, which was initially designed to increase mortgaging on trust land, only marginally decreased mortgage denial rates on reservations. Other studies suggest that tribal jurisdictional authority may discourage lenders from offering credit or lead them to add a risk premium to loans in tribal areas (Cookson, 2010; Wellhausen, 2017).

This paper builds on this literature in a few ways. First, we find racial disparities in loan prices

after controlling for differences in property ownership. Thus, our main results are not driven by comparing borrowers living on and off trust land. Therefore, direct barriers to lending on trust land, whether real or perceived, are not driving our main results. Second, we show that conditional on applicant characteristics, both on- and off-reservation Native borrowers are more likely to use home-only loans (rather than mortgages) to finance their home purchases than White borrowers. Since tribes do not have jurisdictional authority on lands outside of their reservations, the dearth of mortgaging among off-reservation Native homeowners cannot be explained by lender concerns over the enforcement of contracts when a tribal government has jurisdictional authority. Thus, any explanation of the disproportionate use of home-only loans by Native borrowers would have to consider factors above and beyond tribal jurisdictional authority. For example, the higher use of home-only loans by Native American borrowers could be driven by a combination of hard-to-measure factors, including lender preferences, network effects within Native communities, borrowers' experience with mortgage financing, and both lender and borrower knowledge of available mortgage products, especially those on trust land. Future research may help uncover the role of these factors.

The rest of the paper is organized as follows. Section 2 provides an overview of how mortgage lending works on American Indian reservations. Section 3 provides details on the HMDA data and Section 4 outlines our empirical methodology. In Section 5, we present our main results, and in Section 6, we examine factors that may explain the relatively high prevalence of home-only loans among Native American borrowers. Finally, Section 7 discusses the broader implications of our findings.

2 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 borrowers living on reservations when buying a home and securing a mortgage.[6]

Due to historical land policies, Native Americans on reservation may have either direct land own-

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

ership or rights to trust land. Direct land ownership, as referred to as 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.[7] On the other hand, homeowners living on trust land must obtain a long-term, home-site lease from the tribe. Trust land cannot be sold without authorization by the Secretary of Interior and tribal governments have jurisdictional authority over those lands. However, mortgaging on these lands is considered a federal action and, as a result, 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 located either on or off 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 NAHASDA[8] 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 the loan to a pre-determined 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 loan.

Individuals interested in taking out a mortgage on trust land can access two general types of mortgages as defined in the Bureau of Indian Affairs (BIA) Mortgage Handbook (2017). A trust land mortgage can be issued to a borrower who is likely the sole claimant to a trust land parcel. In this case, the lender will use the appraised value of the underlying trust status land as collateral for the underlying loan.[9] The mortgage loan ties the home and land together, which, in theory, would increase

[7]There are a subset of fee simple properties on reservations that are not subject to county property taxes and are subject to restrictions against alienation. These properties are referred to as restricted fee lands. If the tribe owns restricted fee lands, the home owner living on the land would need to be granted a lease from the tribe to live on it. We cannot observe loan applications on restricted fee properties in HMDA.

[8]NAHASDA stands for the Native American Housing Assistance and Self Determination Act of 1996.

[9]Since 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).

access to conventional lending. The risk of using allotted trust land as collateral is that the land could be removed from tribal jurisdictional authority 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 EA to determine, among other things, 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 Community Development Financial Institutions (CDFI) provide small, credit-building loans and financial education to help either build or repair individual credit (Kokodoko, 2017).

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 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. If the borrower is using a federal guarantee loan, the federal agency who authorizes the guarantee loan may require an additional EA. Thus, under many situations, a borrower will need to work with the tribe, the BIA,[10] HUD or another federal agency, a lender, and a Native CDFI or other organization to obtain financial education, a construction company, and an appraiser. The mortgage is perfected when the mortgage is recorded by the BIA.

There is a well-documented literature on the housing shortages on American Indian reservations (Pindus et al., 2017). An alternative to buying a stick-built home could be the purchase of a new manufactured home. With respect to the general process of buying a manufactured home, consumers

[10]The 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.

may buy the home from a dealership, who will arrange transit to the home site, or buy a used home that is already placed on a lot. Manufactured homes are generally not moved to a new lot after being placed on their first lot because moving them is expensive. A home buyer may rent the underlying land[11] or may buy or already own land. If the buyer wishes to have the home titled as real estate rather than personal property, they generally have to go through a title conversion process which varies across states (Fannie Mae, 2023b). The state may require, for example, that the home's wheels and axles are removed.

From the borrower's side, tying the manufactured home and the land together can be more advantageous than tying the loan just to the home. For one, tying the home to the land will also allow the borrower to access conventional mortgage loans or, if eligible, low-cost federal loan products. From the lender's perspective, a mortgage can be sold to investors through channels including Fannie Mae and Freddie Mac, which will increase 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 HUD 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.[12]

If a Native borrower wishes to finance the purchase of a manufactured home without going through the mortgage process, they can apply for a home-only loan. Similar to car loans, home-only loans are classified as personal property loans. They face fewer consumer protections, have higher interest rates, and can rarely be 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. Alternatively, if a home buyer cannot afford the additional construction of building a new permanent foundation for the manufactured home, then the consumer may turn to a home-only loan. While we cannot fully disentangle the reasons to buy a mortgage rather than a home-only loan in our data, we

[11]Outside of reservations, most consumers who do not own land rent land in manufactured home communities, also known as "trailer parks." On American Indian reservations, the home-site lease from the tribe is often a trivial cost to the lessee.

[12]There may be additional burdens placed on both the lender and the borrower when the 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.

can identify racial disparities in home-only loan usage and test some leading theories.

3 Data

Our analysis relies primarily on confidential HMDA data from 2018 to 2021. Financial institutions that originate a significant number of loans and have a presence in a Metropolitan Statistical Area (MSA) are required to report to HMDA. As a result, the HMDA data covers at least approximately 93 percent of all home loan originations in the U.S. (CFPB, 2023).

HMDA data historically lacked key details used by lenders to assess loan applications, such as the full range of rate spreads, loan type for manufactured homes, property characteristics, and the applicant's creditworthiness. However, in 2018, the Consumer Financial Protection Bureau (CFPB) expanded HMDA reporting as part of the implementation of Section 1094 of the Dodd-Frank Act. This expansion added new data fields, including the applicant's credit score and the loan rate spread for all prices.

In addition, starting in 2018, HMDA includes two variables specifying whether owners of manufactured homes own the underlying land and whether the loan is secured by the underlying land. The first variable simply states whether the homeowner owns the underlying land or and whether they pay to lease it. The second states how the loan is secured. This variable tells us whether the loan is secured with the home and land ownership interest (a mortgage) or is a home-only loan. A borrower may directly own the land or a very small number own it indirectly in arrangements such as a cooperative community.[13] A borrower may also have a leasehold, which could be either paid or unpaid through circumstances such as living in a park, living on trust land, or living on a family member's land with permission.

A limitation of the revised HMDA reporting standards is that Section 104(a) of the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA) introduced partial exemptions for institutions that make fewer than 500 loans annually.[14] If Native borrowers are more likely to use

[13]Since less than one percent of manufactured home loans in our sample are on indirectly owned land, we include them with borrowers who directly own land.

[14]More information on the HMDA Rule can be found here: `https://www.consumerfinance.gov/rules-policy/final-rules/regulation-c-home-mortgage-disclosure-act/`. Some HMDA data fields may be exempt from reporting if the lender is an insured bank or credit union, originated fewer than

these smaller lenders, certain fields may be disproportionately missing for them in the HMDA data. However, research has shown that these reporting exemptions do not appear to unevenly affect data availability based on race, ethnicity, or income (GAO, 2021).

Racial identity in HMDA is reported in two ways: (1) the borrower can self-report their race on the loan application, or (2) the loan officer can assign the race based on visual inspection or surname. Only a small percentage (0.62 percent of on-reservation Native borrowers and 1.41 percent of off-reservation Native borrowers) were identified as Native American based on visual observation or surname, so we do not have a large enough sample to split the race variable by method of racial identity reporting. Our analysis classifies an individual as Native if American Indian/Alaska Native is listed in any of the five race fields. This classification is similar to the American Indian/Alaska Native alone or in combination with other races category used in federal data sources. However, in HMDA, 99.6 percent of Native American loan applications are single-race informants, meaning they are identified as exclusively Native American. For comparison, we limit our sample of White borrowers to those who self-identified as White with no other race listed. Since Native American loans represent a small share of the universe of HMDA loans, we do not restrict our focus to a specific loan product. Consequently, our sample includes all loan types for both stick-built and manufactured homes.[15]

HMDA loans are linked to the U.S. Census tract in which the home is located. Since census tract boundaries do not always align with the boundaries of American Indian reservations or off-reservation trust lands, researchers typically assign reservation status to a census tract based on the percentage of the tract's area that overlaps with reservation and off-reservation trust land (Bauer et al., 2022; Dimitrova-Grajzl et al., 2015b). For our analysis, we use the longitude and latitude coordinates of a subset of 2021 loans to pinpoint their exact locations. Using this data, we calculate the Type I and Type II errors for each share of the census tract's area that overlaps with reservation land.[16]

500 mortgages or lines of credit in the preceding two years, and received at least a "satisfactory" Community Reinvestment Act (CRA) rating for the previous two years. Information on the implementation of Section 104(a) of EGRRCPA can be found here: `https://files.consumerfinance.gov//documents/bcfp_hmda_interpretive-proceduralrule_2018-08_executive-summary.pdf`.

[15]Our sample is most similar to the sample restrictions used in Bhutta et al. (2025), which examines the effects of automated underwriting systems and includes multiple loan types. However, unlike their study, we include loans for manufactured homes.

[16]We did not have access to the full geocoded 2018–2021 HMDA data when analyzing this threshold. One advantage

Figure 1 plots the Type I and Type II errors in increments of 10 percentage points. We select the point at which both errors are equal, which approximately minimizes the sum of both types of errors. Figure 1 shows that this occurs when the overlap of a census tract's area with reservation land is about 60 percent. As a result, we assume that when at least 60 percent of the area of a census tract overlaps with reservation or off-reservation trust land, all borrowers within these tracts, regardless of race, are located on American Indian reservations (or off-reservation trust lands). In a later section, we test the robustness of our main model to the choice of this cutoff and find that the results are similar across a wide range of overlap thresholds.

Our final sample includes all purchase loan originations[17] for residential, single-unit properties where the primary borrower is either Native American or White, within 21 states[18] that have at least one on-reservation loan in the HMDA data. The distribution of on-reservation Native American loans by state is shown in Appendix Figure A1.

Our main outcome of interest is the rate spread on a loan, which 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, published weekly by the Federal Financial Institutions Examination Council (Council, Council). The APR reflects the total cost of the loan, including discount points, fees, mortgage insurance premiums, and other costs (Bhutta and Hizmo, 2021). When a loan offer includes general lender credits that are not reflected in the APR, the total cost of the loan will be lower for the borrower than reflected in the rate spread. In the results section, we provide evidence that our main results remain unchanged when we account for the presence of lender credits.

Summary statistics for this sample are shown in Table 1. The first column presents the mean values for loans originated to on-reservation Native borrowers. The second column presents the mean values for loans originated to off-reservation Native borrowers, while the third column displays the

of using the census tract-based measure for the on-reservation indicator is that not all loans have longitude and latitude data in the available subset. Sampling on the loans with lat-long data may introduce a source of bias if the missing coordinates are nonrandom. As a result, we use our census tract approach to assign loans to reservations.

[17]We also apply a few additional sample restrictions, including isolating residential loans for single-unit properties, excluding loans for business or commercial purposes, and requiring loans to have census tract information, age information, and rate spread data.

[18]These 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.

mean values for loans originated to White borrowers. The remaining three columns summarize the differences in means: Column 4 shows the difference between on-reservation Native and White loans, Column 5 shows the difference between off-reservation Native and White loans, and Column 6 shows the difference between on-reservation and off-reservation Native loans.

Table 1 shows that the average rate spread for loans originated to on-reservation Native borrowers is 257 basis points (bps) above prime, compared to 79 bps for loans originated to off-reservation Native borrowers and 53 bps for loans originated to White borrowers. Similarly, the mean interest rate on loans originated to on-reservation Native borrowers is 5.40 percent, compared to 3.91 percent for loans to off-reservation Native borrowers and 3.82 percent for loans to White borrowers.[19]

The remainder of Table 1 compares the average characteristics of originated loans across the three groups. Loans originated to on-reservation Native borrowers tend to have lower average credit scores, incomes,[20] loan amounts, and property values compared to those originated to off-reservation Native borrowers or White borrowers. The mean characteristics of loans originated to off-reservation Native borrowers fall between those originated to on-reservation Native and White borrowers. The mean differences between each group are statistically significant, except age when comparing loans originated to on-reservation Native and White borrowers, and co-borrower presence when comparing loans originated to on-reservation and off-reservation Native borrowers.

Table 2 presents the mean differences in loan types across our three borrower groups. Panel A uses data from all originated loans and Panel B uses data from only originated manufactured home loans. Panel A shows that loans to both on-reservation and off-reservation Native borrowers are 1.5 to 2 times more likely to be FHA-insured or RHS/FSA-guaranteed than loans to White borrowers. Off-reservation Native borrowers are especially likely to use VA-guaranteed loans, which account for 13.5 percent of their originated loans. Roughly 39 percent of loans to on-reservation Native borrowers

[19] As mentioned earlier, one potential issue with HMDA data is that institutions serving Native borrowers may be disproportionately exempt from HMDA reporting. BIA data show that in 2021 and 2022 combined, 393 total leasehold or land mortgages were made on trust or restricted fee land (GAO, 2023). This implies that we are not missing a large volume of loans in HMDA on trust status land. More formally, Appendix Figure A2 shows that if HMDA underreports loans to Native borrowers, the number of missing low-cost Native loans required to explain our observed racial disparities would need to be exceptionally large. Regardless, one way to interpret our results is that they reflect the experience of Native home buyers when interacting with financial institutions that meet the loan volume and other requirements to report to HMDA.

[20] To avoid the influence of outliers, we winsorize the top and bottom 0.01 percent of the applicant income variable, interest rate and property value. Our main results are insensitive to winsorizing.

are for manufactured homes, compared to just 3 percent of loans to White borrowers.

Panel B shows that roughly one third of the on-reservation Native borrowers with a manufactured home loan have direct ownership of the land the home sits on compared to 64 percent of off-reservation Native borrowers and 72 percent of White borrowers. Among manufactured home loans, 80 percent of loans originated to on-reservation Native borrowers are home-only loans, in contrast to 47 percent of off-reservation Native borrowers and 30 percent of White borrowers. Taken together, on-reservation Native borrowers are 10 times more likely than off-reservation Native borrowers and 31 times more likely than White borrowers to use a home-only loan for their home purchase compared to all other loan types.

To identify the factors driving the disproportionate use of home-only loans among Native borrowers that are not contained in HMDA, we rely on three external data sources. First, we use Census Bureau shapefiles to measure the distance from each home's Census tract to the nearest urbanized area, defined as cities with populations of at least 50,000. Second, we use SafeGraph Places data to locate manufactured home dealerships, filtering businesses by the six-digit NAICS code for residential property managers (531311) and including only those with "home" in their name. This results in a sample of approximately 13,000 locations, likely representing an upper bound. Finally, we incorporate data from the 2020 Collaborative Multiracial Post-Election Survey, which includes responses from 1,956 self-identified Native and 3,626 White respondents. We focus on a survey question about trust in banks, converting responses into a binary variable based on whether the respondent rates their trust in banks at 6 or higher (out of 10). We then compute state-level, race-specific averages using survey weights. Each of these variables are measured with error and any evidence that these factors influence the racial disparities in home-only loan use should be interpreted as merely suggestive.

4 Empirical Method

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

$$\text{y}_{ist} = \beta_1 \text{on-Native}_{ist} + \beta_2 \text{off-Native}_{ist} + \mathbf{x}_{ist}\psi + \alpha_s + \tau_t + \epsilon_{ist} \tag{1}$$

where y_{ist} is the rate spread on an originated loan to borrower i in state s in year t. The parameter $\beta_1 = \mathrm{E}[y_1 - y_0|\mathbf{x}]$ where $\mathrm{E}[y_1|\mathbf{x}]$ is the mean rate spread for loans originated to on-reservation Native borrowers and $\mathrm{E}[y_0|\mathbf{x}]$ is the mean rate spread for loans originated to White borrowers after controlling for $\mathbf{x}$. Similarly, the parameter β_2 represents the mean difference in rate spreads between loans originated to off-reservation Native borrowers and White borrowers after controlling for $\mathbf{x}$.

The borrower and loan characteristics (collectively referred to as applicant characteristics) in the 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 following Fannie Mae's pricing matrix (Fannie Mae, 2024), and indicators for missing values in credit score, loan amount, income, and property values.[21] Given the prevalence of home-only loans among on-reservation Native borrowers, we also include a home-only loan indicator as an additional control variable in some specifications. In certain models, we interact the baseline controls with this indicator to allow the relationship between loan price and applicant characteristics to vary by home-only loan status.

Each specification includes state fixed effects, α_s, and year fixed effects, τ_t. The standard errors are clustered at the county level to account for spatial autocorrelation in local lending markets. Empirically, our results are robust to the inclusion of either state-by-year, county and county-by-year fixed effects. As a robustness check, we also estimate unconditional quantile regression models to examine whether differences in applicant characteristics can explain racial disparities in rate spreads across the distribution. We follow a method outlined by Firpo et al. (2009) for estimating unconditional quantile effects.

While the HMDA data are incredibly rich, they do not include every underwriting variable a lender might consider when pricing an approved loan. To the extent that these unobserved variables differ by race-location combinations, they may bias our estimated racial disparities in loan prices. For example, we cannot observe an applicant's wealth. Other potential omitted variables described by Bhutta et al.

[21] Since credit scores are missing for roughly 10 percent of this sample, we create dummy variables for these missing values to retain as many observations as possible. Figure 2 shows that our imputations for missing credit scores do not significantly affect the main results. Regarding the loan amount variable, while we observe all loan amounts, according to HMDA instructions, all loan amounts less than $500 should not be reported. To this end, for the very small number of loans that are less than $500, we set them equal to zero and create an indicator for these loans.

(2025) are cash on hand, length of employment at current job, and ability to document income and assets for the lender.

5 Main Results

Table 3 presents our main results. Each column shows the results of OLS regressions of the rate spread on the on- and off-reservation Native borrower indicators (with White borrowers as the omitted reference group). The first three columns incrementally add controls to determine how specific variables explain the racial disparities in loan prices.

Column 1 includes state and year fixed effects and the estimated rate spread disparities are similar to those reported in Table 1. Column 2 adds applicant characteristics, which reduces the estimated price disparities for off-reservation Native loans to 7.7 basis points. This implies that applicant characteristics explain approximately two-thirds of the raw rate spread disparities between White and off-reservation Native loans. On the other hand, applicant characteristics explain only 16 percent of the raw rate spread differences between on-reservation Native and White loans.[22]

The third column in Table 3 includes a home-only loan indicator to account for rate spread variation between home-only and mortgage loans. After controlling for home-only loan status, the average rate spread on loans to Native borrowers on reservations is 18.3 basis points higher than for White borrowers.[23] This suggests that adding an indicator for whether the loan is secured by personal property rather than real property to the model with applicant characteristics explains roughly 90 percent of the raw price gap between Native borrowers on reservations and White borrowers. The third column also shows that the smaller unexplained difference in rate spreads between off-reservation Native and White loans in Column 2 disappears once we account for home-only loan status.[24]

[22]Appendix Table A1 shows that the large sample of White borrowers does not mechanically lead to small standard errors. When we randomly sample White loan originations to match the number of either on- or off-reservation Native originated loans, we still find large and statistically significant price gaps between White and on- and off-reservation Native loans.

[23]The R^2 for each model for relatively low. This is due to some potential outliers in the rate spread variable. We show in Appendix Table A2 that winsorizing the rate spread variable substantially increases the R^2 for each model in Table 3 but the OLS coefficients are qualitatively similar.

[24]If home-only loan lenders apply different underwriting standards than mortgage lenders, the model in Column 3 may be misspecified. For example, if home-only lenders charge higher interest rates for borrowers with low credit scores compared to mortgage lenders, then the OLS estimates of β_1 and β_2 would overstate the disparities in rate spread because on- and off-reservation Native borrowers tend to have lower credit scores than White borrowers (see Table 1). To test for

Columns 4, 5, and 6 are designed to assess whether variables correlated with the home-only loan indicator can explain the racial disparities in rate spreads as effectively as in Column 3. In Column 4, we add a property interest indicator, which equals one if the borrower owns the land where the home is located and zero if the borrower has a leasehold interest.[25] We include a property interest indicator because Native borrowers, especially those living on reservations, are less likely to own the land where their home is located. Since home-only loans are more commonly used when the borrower does not own the land, accounting for home-only loan status may mechanically capture differences in property interests between Native and White borrowers. Column 5 adds a manufactured home indicator since home-only loans can only be used to finance manufactured homes. Column 6 includes all three indicators: whether the loan is a home-only loan, whether the borrower has direct ownership in the land and whether the home is a manufactured home.

Column 4 shows that, when we omit the home-only loan indicator, the property interest indicator explains a large share (roughly 83 percent) of the reduction in the coefficient on the on-reservation Native indicator previously explained by the home-only loan status.[26] When we add the manufactured home dummy to Column 5, the coefficient on the on-reservation Native indicator decreases by only a small amount (17 percent). However, when we add back the home-only loan dummy in Column 6, the coefficient on the property interest indicator decreases by 84 percent, the coefficient on the manufactured home dummy decreases by 29 percent, while the coefficient on the home-only loan indicator decreases by only 22 percent (as compared to Column 3). This indicates that when we include all variables correlated with home-only loan status, the home-only loan status effect explains more of the variation in loan prices than the property interest and manufactured home loan effects.

model misspecification, we estimate an OLS regression that interacts the home-only loan indicator with each baseline risk factor. Under this specification, the coefficient on the on-reservation Native indicator is similar (beta = 0.124 (0.046) to the estimate in Table 3, Column 3.

[25]Since HMDA only reports property interests for manufactured home loans, we assume that all stick-built homes are financed by borrowers with direct or indirect land ownership. Appendix Table A3 shows that when we consider only manufactured home loans among borrowers who own the land the home sits on, we observe large price differences between White and Native borrowers. When we consider only stick-built loans, we still see no racial disparities in home loan prices. In fact, off-reservation Native loans on stick-built homes have lower rate spreads than White loans on stick-built homes. Thus, conditional on owning the land, we only observe price disparities if the borrower purchased a manufactured home.

[26]Alternatively, when we test the null hypothesis that β_1 in Column 3 equals β_1 in Column 4, we reject the null at the 1 percent level (χ^2 = 15.76, p-value < 0.001). Thus, the property interest indicator (when omitting the home-only loan dummy) does not explain the price disparities on on-reservation Native loans in the same fashion as the home-only loan indicator.

We alter our comparison group in two different ways and re-estimate our racial disparities in loan prices. First, Table 4 replicates the models in Table 3 but only for the subset of loans on rural Census tracts.[27] In this case, we are estimating the gaps in loan prices among borrowers in rural areas. Table 4 demonstrates that the estimated disparities in rural areas are roughly the same magnitude of those using the full sample and that controlling for home-only loan status accounts for the majority of the on-reservation Native loan price disparities. Second, we compute the within-reservation disparities in loan prices by using on-reservation White borrowers as the comparison group and report these results in Table 5. Table 5 reveals a large price disparity on on-reservation Native loans after controlling for applicant characteristics.[28] Yet, the home-only loan status explains the vast majority of the price gap on on-reservation Native loans in a way that is distinctly different from how the property interest and manufactured home variables account for this disparity

5.1 Robustness Checks

Alternative Specifications. To further test the robustness of our main result, we run several alternative models that omit the home-only loan indicator to see if they explain the on-reservation Native price gap to the same extent as the model in Table 3, Column 3. To this end, we adjust the OLS model specification in Table 3, Column 2 (which omits the home-only loan indicator) in the following ways: (1) we replace state and year fixed effects with state-by-year fixed effects; (2) we use county-by-year fixed effects; (3) we bin lenders into ten equal groups based on the average credit score of their loan applicants and estimate the racial disparities within each bin; (4) we control for differences in lender credits; (5) We bin debt-to-income (DTI) and add those bins as controls; (6) we include interactions between discretized bins of credit scores and loan-to-value (LTV); (7) we add the loan's term length as a control; (8) all observations with imputed credit score values are dropped; (9.) on-reservation Native borrowers are defined when 10 percent or more of the home's census tract overlaps with reservation land (or off-reservation trust land); and (10) on-reservation Native borrowers are defined when 90

[27] We use the USDA's Rural-Urban Continuum Codes to determine if a Census tract is located in a rural area.

[28] We also show in Figure A3 that our racial disparities are robust to changes in our tribal area assignment rule. Across all tribal assignments, ranging from an overlap of as low as 10% (i.e., more Type I errors) to as high as 90% (i.e., more Type II errors), the estimated disparities in on-reservation loans after controlling for applicant characteristics remain large and statistically significant. Similar to Table 3, when we add a home-only loan indicator, the disparities are effectively eliminated across all tribal assignment rules.

percent or more of the home census tract overlaps with reservation land (or off-reservation trust land).

The coefficients on the on- and off-reservation Native loan indicators for each alternative specification are displayed in Figure 2. For visual comparison, we also include the on-/off-reservation Native coefficients from Table 3, Column 3, which includes the home-only loan indicator. Figure 2 shows that no alternative model specification explains the rate spread disparities between White and on-reservation Native borrowers as effectively as the model that include the home-only loan indicator (Table 3, Column 3).

Quantile Regressions. To understand the drivers of racial disparities at each decile of the rate spread distribution, we estimate unconditional quantile regressions following Firpo et al. (2009), using recentered influence functions for each decile of the rate spread distribution. We consider three specifications from Table 3, Columns 1 through 3: (1) the unconditional relationship, (2) one controlling for applicant characteristics, and (3) one that controls for both applicant characteristics and an indicator of whether the loan was a home-only or mortgage loan.

Figure 3 reports the unconditional quantile regression coefficients and its 95 percent confidence interval at each decile for on-reservation Native loans in panel A and for off-reservation Native loans in panel B. The red lines are the unadjusted rate spread differences. The blue lines are the rate spread differences after controlling for applicant characteristics. The black lines are the rate spread differences after adding the home-only loan indicator. Panel A shows that differences in applicant characteristics explain rate spread differences between the 10^{th} and 50^{th} percentiles. However, at the top end of the rate spread distribution, controlling for these factors does not eliminate the racial disparities in loan prices. When we include the home-only loan indicator, the estimated racial disparities for on-reservation Native borrowers are eliminated, except at the 90^{th} percentile. Panel B demonstrates that applicant characteristics explain the racial disparities on off-reservation loans at each percentile, except at the 90^{th} percentile. Adding the home-only loan indicator eliminates the estimated disparities in rate spread for off-reservation Native loans at each decile. Thus, the unexplained rate spread gap for on-reservation Native borrowers in Table 3, Column 3 appears to be driven by loans in the top 10 percent of rate spreads.

Differential Time Preferences. If Native borrowers suffer from liquidity constraints because of low

wealth, they may have differential time preferences. For example, liquidity-constrained borrowers may trade off lower, upfront fees for higher future interest payments. Home-only loans, in fact, typically have lower upfront fees than mortgages but higher interest rates.

To estimate the size of the risk-adjusted racial disparities in fees paid and interest rates on originated loans, we report those estimated disparities separately in Table 6.[29] Column 1 shows that, after controlling for applicant characteristics, upfront fees on loans originated to on-reservation Native borrowers are 19 percent lower than those charged on loans to White borrowers. Using the mean fees shown in Table 6, Column 1, this implies that on-reservation Native borrowers pay roughly $1,000 less in upfront fees than White borrowers. Column 2 shows that, after controlling for applicant characteristics, the interest rate on loans to on-reservation Native borrowers is 137 basis points higher than on comparable loans to White borrowers. At the mean loan amount of approximately $330,000 (for all originated HMDA loans), the average on-reservation Native borrower pays roughly $70,000 more in interest than a White borrower over the life of the 23-year loan, which is the most common loan term for home-only loans.

The results in Table 6 are used to compare the average monthly payments over the life of a typical loan. Within the first four months of a 23-year loan term, the extra interest paid by an average on-reservation Native borrower more than offsets the lower upfront fees. Thus, any cost savings from picking lower-fee loans are dissipated in less than a year. If Native borrowers on reservations were indifferent between higher future interest payments and a $1,000 reduction in upfront fees, the results in Table 6 suggest that they value $1 today the same as $0.02 received one year from now. Using similar logic, off-reservation borrowers would need to value $1 today the same as $0.80 received one year from now for the lower average fees they pay to offset the higher interest rates over the life of the loan. Based on these estimates, we conclude that differences in the personal rates of time preferences between White and Native borrowers – particularly for those living on reservations – are unlikely to explain the choice of loans with lower upfront fees but higher interest payments.

[29]We construct a total fees variable as the sum of the total loan costs variable reported for mortgages in HMDA and the total points and fees variable reported for home-only loans. Russell et al. (2021) note that the total points and fees variable is a less comprehensive measure of fees than the total loan costs variable.

6 Racial Disparities in Home-Only Loan Usage

These results raise the question: Why are on-reservation Native borrowers, and to a lesser extent off-reservation Native borrowers, more likely to use costly home-only loans?[30] To better understand why Native borrowers are more likely than White borrowers to choose home-only loans, we test several hypotheses. First, we examine whether property interest in the land affects the likelihood of using a home-only loan to finance a home purchase. We also consider external factors, such as living in rural areas, proximity to manufactured home dealerships, and trust in the banking system, to see if they contribute to the higher use of home-only loans among Native borrowers. Second, we test whether Native borrowers face longer mortgage processing times than White borrowers, and whether home-only loans offer a faster alternative. Finally, we analyze racial disparities in mortgage and home-only loan approval rates to determine whether Native borrowers are more likely to have home-only loan applications approved compared to mortgage loans.

6.1 The Role of Property, Location and Banking Preferences

To identify factors predicting home-only loan usage, we restrict our sample to manufactured home loan applications, including both approved and denied applications.[31] This approach allows us to focus on areas where local zoning laws and land use restrictions permit the purchase of a manufactured home. In our regressions, the dependent variable is a binary indicator: one if the application is for a home-only loan, and zero if it is for a manufactured home mortgage. We include all applicant characteristics from Table 3, Column 2, along with four additional covariates: whether the borrower owns or leases the land on which the home sits, an indicator for above-average trust in the banking system (measured by race within each state), the distance from the home to the nearest manufactured home dealership, and the distance from the home to the nearest urbanized area.

[30] A 2018 survey of manufactured home borrowers in Texas (Freddie Mac and UNC, 2020) sheds light on this. It found that most borrowers did not initially prefer a home-only loan. Among those who ended up with a home-only loan, 46 percent originally intended to take out a mortgage, and only 17 percent preferred a home-only loan from the start. This suggests that the choice of loan type is not solely driven by initial borrower preferences. The survey also found that 61 percent of borrowers chose their lender and loan type together, which complicates the interpretation of loan type when controlling for lender. Only 17 percent chose a lender before deciding on the loan type.

[31] We also exclude applications from lenders who are exempt from reporting whether the loan is secured by a manufactured home with or without land.

Table 7 presents the OLS results. Column 1 shows the racial disparities in home-only loan usage, controlling for state and year fixed effects. On average, an on-reservation Native borrower is 49 percentage points more likely than a White borrower to apply for a home-only loan instead of a manufactured home mortgage.[32] The difference for off-reservation Native borrowers is roughly 14 percentage points. Since Native applicants tend to have lower credit scores and incomes, which may limit mortgage access, Column 2 adds applicant characteristics. Both disparities decrease, but applicant characteristics such as credit score explain a larger portion of the off-reservation Native disparity (53 percent of the gap) than the on-reservation disparity (38 percent of the gap).

In Table 7, Column 3, we incorporate four additional predictors of home-only loan utilization. These controls exhibit the anticipated signs. Specifically, loan applicants residing farther from urbanized areas demonstrate a higher propensity to apply for home-only loans compared to those situated closer to urban centers. The negative and statistically significant coefficient on the proximity to the nearest manufactured home dealerships suggests that applicants in closer proximity to dealerships are more inclined to apply for home-only loans. Furthermore, the negative coefficient on the property interest indicator implies that borrowers with direct ownership are less likely to apply for home-only loans. Lastly, loan applicants in states with an above-median trust in banking institutions exhibit a lower likelihood of applying for home-only loans. Collectively, the inclusion of these four variables increases the R^2 from 0.539 to 0.773.

Despite the predictive power of these variables, Column 3 shows they do not fully eliminate the racial disparities in home-only loan usage between White and on- and off-reservation Native borrowers. In fact, adding these controls slightly increases the estimated likelihood that on-reservation Native borrowers would apply for a home-only loan compared to White borrowers. When we add county fixed effects in Column 4, the racial disparities decrease slightly but remain statistically significant. As a robustness check, we limit the sample to loan amounts less than $150,000 in Column 5 and find similar disparities as in the full sample. Thus, all model specifications explain less than half of the raw gap in home-only loan applications for on-reservation Native borrowers.

In Table 8, we estimate racial disparities in home-only loan applications among property owners.

[32] Appendix Figure A4 shows that the large estimated disparities in home-only loan usage by on-reservation Native borrowers is robust to our tribal assignment rule.

In Columns 1 through 3, we focus on all loan applications, and in Columns 4 through 6, we focus on only manufactured home loan applications. As previously noted, limited research suggests that some property owners may strategically use home-only loans to protect their land from potential foreclosure.[33]

Table 8 reveals substantially larger racial disparities in home-only loan applications among property owners compared to those reported in Table 7. For instance, among applicants who own property and are purchasing a manufactured home, on-reservation Native applicants are 55 percentage points more likely to apply for a home-only loan than comparable White applicants. This finding provides compelling evidence that Native borrowers, particularly those residing on reservations, are not using home-only loans due to lack of land ownership where the home will be situated.

6.2 Racial Disparities in Loan Processing Times

Tying a home to land on trust land is a notoriously long and cumbersome process for both lenders and borrowers (Kunesh, 2018). This process involves the lender, the borrower, the Bureau of Indian Affairs, the Indian Health Service (if, e.g., a septic system is required), the tribe, and other federal agencies, such as HUD. However, less is known about the efficiency of processing home-only loans. In this section, we explore two ways in which loan processing times may influence Native borrowers' decisions to take out a home-only loan. First, we examine whether loan processing times are shorter for home-only loans compared to mortgages, and whether this difference varies between loans originated to White and Native borrowers. Second, we investigate whether the time to close an approved home-only loan is faster for Native borrowers than for White borrowers. If applicants are willing to accept higher loan costs in exchange for shorter loan processing times, then the relatively faster processing times of home-only loans could drive Native borrowers toward these higher-cost loans.[34]

[33]For Native American borrowers with direct land ownership, their willingness to use land as collateral could also be limited by historical factors. Historians have noted that through *The General Allotment Act* of 1887 (also often called the Dawes Act), millions of acres of tribally owned land were converted to individual private property. Some of this land was transferred out of Native American hands when individual Native landowners defaulted on mortgage loans (Cotroneo and Dozier, 1974; Berthrong, 1979).

[34]One concern with this analysis is that borrowers may influence the closing date based on personal preferences, such as when they want their first payment to be due. While we cannot control for this, we still proceed with this analysis because it provides the best available test of whether home-only loans offer faster closing times relative to alternative home loan products.

To examine loan processing times, we model the number of days it takes a lender to originate a loan. This is calculated as the difference between the application date and the action date in HMDA. The application date is either the date the lender received the application or the date listed on the application form. If the loan is approved, the action date generally corresponds to the closing date. Following Wei and Zhao (2022), we run OLS regressions where the dependent variable is the number of days to originate a loan, and racial indicators are key independent variables (with loans to White borrowers as the omitted category).

Table 9 presents the results. Column 1 displays the baseline racial disparities in loan origination times. After controlling for applicant characteristics, we find that, on average, it takes roughly five additional days to originate a loan for off-reservation Native borrowers compared to White borrowers. In contrast, it takes, on average, 32 additional days to process a loan for on-reservation Native borrowers compared to White borrowers.

In Column 2, we control for whether the loan origination is for a home-only loan or a mortgage. The coefficient on the home-only indicator shows that it takes, on average, 15 additional days to originate a home-only loan compared to a mortgage. Since home-only loans generally take longer to close, and Native borrowers are more likely to use home-only loans, the coefficients on the on-/off-reservation Native indicators decrease but remain statistically significant. Thus, regardless of loan type, both on- and off-reservation Native loans take longer to close relative to White loans.

Column 3 examines whether the extra time it takes to close a home-only loan varies between White and Native American applicants. After adjusting for applicant characteristics, we find that on-reservation Native mortgages take, on average, 23 more days to close than White mortgages, while on-reservation Native home-only loans take 37 more days than White home-only loans. Thus, on-reservation Native mortgages are faster to close than home-only loans. Similarly, off-reservation Native mortgages take about four more days to close than White mortgages, and off-reservation Native home-only loans take about 12 more days compared to White home-only loans. Therefore, we find no evidence that home-only loans are processed faster for Native borrowers than for White borrowers.

These results may seem counterintuitive given the well-documented delays in perfecting mortgages on trust land (GAO, 2023; Columbe, 2020). Using reservation-level data on trust land acreage

(collected via a 2019 Freedom of Information Act request to the BIA and published by the Native Land Information System (Native Lands Information System, 2019)), we find that in the small number of census tracts with 100 percent trust land, loans for Native borrowers purchasing stick-built homes take an average of 178 days to close, while loans for manufactured homes take 127 days. Both of these processing times are significantly longer than the overall sample average of 51 days. These figures align with anecdotal reports of delays for loans on trust land. However, due to the limited number of mortgages in HMDA from census tracts with 100 percent trust land, these longer processing times do not accurately reflect the typical on-reservation Native loan in the full HMDA dataset.

6.3 Racial Disparities in Loan Approval Rates

Finally, we examine loan approval rates for Native American and White applicants after controlling for applicant characteristics. Table 10 shows that, across all races, home-only loans have substantially lower approval rates than mortgages. For example, 31 percent of on-reservation Native home-only applicants were approved, compared to 36 percent for off-reservation Native applicants and 46 percent for White applicants. Off-reservation Native applicants have the lowest approval rates for manufactured home mortgages (58 percent), while White applicants have the highest (77 percent). For all mortgages, White applicants have the highest approval rate (93 percent), followed by off-reservation Native applicants (88 percent) and on-reservation Native applicants (81 percent).

To estimate racial disparities in loan approvals, we run an OLS regression of the approval indicator on the on-reservation Native dummy, the off-reservation Native dummy, the home-only loan indicator, the stick-built indicator, and interactions between the race-location dummies and the home-only and stick-built indicators. We also include the same set of controls as in Table 3, Column 2, and present the results in Table 11, Column 1. This model allows us to determine if a Native applicant is more or less likely to get a home-only loan application approved compared to the likelihood of getting a manufactured home mortgage or stick-built mortgage application approved after controlling for applicant characteristics. As a robustness check, in Column 2, we drop the stick-built applications and measure the likelihood of a Native applicant getting a home-only loan approved compared to a manufactured home mortgage. This approach allows the relationship between the applicant characteristics

and the approval rate to be determined solely by manufactured home loan lenders. In both models, manufactured home mortgage applications serve as the reference group.

Table 11 contains the OLS results. In Column 1, the positive coefficients on home-only interaction terms reveal that racial disparities in approvals for home-only loans are less pronounced than for manufactured home mortgages. However, this relative advantage (4.3 percentage points for on-reservation Native applicants and 10.8 percentage points for off-reservation Native applicants) does not offset the overall lower likelihood of getting a home-only loan approved compared to a manufactured home mortgage (coef=-0.306, se=0.008). Thus, Native applicants, regardless of whether living on or off reservations, remain less likely to get approved for home-only loans than for manufactured home mortgages. The same pattern holds for stick-built mortgage applications: Native applicants regardless of location are substantially less likely to get approved for a home-only loan than a mortgage for a stick-built home.

Column 2 presents results limited to manufactured home loan applicants. Native American applicants, both on and off reservations, face lower approval rates for manufactured home mortgage applications compared to White applicants. While racial disparities among home-only loan applicants are less pronounced (by 12 percentage points for both on- and off-reservation Native applicants), home-only loan applicants are 22.1 percentage points less likely to have their applications approved compared to manufactured home loan applicants. This generally lower approval rate for home-only loans means that the reduced racial disparity in approvals for home-only loans is insufficient to offset the overall approval disadvantage.[35]

While we are not aware of any work that has explained the relatively high denial rate for home-only loans, one possibility is that a share of manufactured home mortgages are insured by the U.S. government through programs targeted towards lower-income homebuyers that we cannot control for, such as HUD 184 loans, while the same programs are largely unavailable for home-only loans. Although it is of course always possible that there are unobservable factors that explain differences

[35]While this result may be surprising, the small literature on manufactured home loan choice suggests that home-only loan applicants share similar characteristics to manufactured home mortgage applicants. Russell et al. (2021) show that among approved loans, home-only loan borrowers have only slightly lower median credit scores than manufactured home mortgage borrowers (676 vs 691), and actually have more favorable combined loan-to-value and debt-to-income ratios. The same report shows that among superprime credit borrowers, over 30 percent of home-only loan borrowers are rejected compared with about 20 percent of manufactured home mortgage borrowers.

in manufactured home denials, the available evidence in the observables does seem to suggest that obtaining approval for a home-only loan is more challenging for a given borrower. Thus, consistent with this small literature, our findings suggest that Native American borrowers are unlikely to choose home-only loans simply because they are easier to get approved for than mortgage loans.

7 Discussion and Conclusion

We find significant disparities in rate spreads between Native and White borrowers, particularly for Native borrowers on reservations. The heavy reliance on home-only loans among Native borrowers, both on and off reservations, largely explains the higher rate spreads they face. While one might assume this result is due to the challenges of financing homeownership on trust land, we find that even on-reservation Native borrowers who own land are more likely to use home-only loans for manufactured homes compared to White borrowers who also own land. Specifically, on-reservation Native borrowers who own land are 43 percentage points more likely to apply for a home-only loan than White landowners after controlling for applicant characteristics. This indicates that structural factors beyond land ownership disparities play a significant role in driving the disproportionate use of home-only loans among Native borrowers living on reservations.

Government-sponsored entities (GSEs) have been exploring the possibility of launching a pilot program to invest in home-only loans. The Federal Housing Finance Agency's Duty to Serve Underserved Markets Rule directs Freddie Mac and Fannie Mae to support a secondary mortgage market for low- and moderate-income borrowers. One of the measures under consideration to fulfill this requirement is creating a secondary market for home-only loans.

GSEs currently purchase manufactured home mortgages.[36] Historically, GSEs did purchase home-only loans until a market crisis in the early 2000s, which foreshadowed the subprime mortgage crisis later in the decade. The crisis was marked by high default rates on loans to consumers with subprime credit scores, incentives that encouraged loans that consumers could not afford, and fraud. Fannie Mae wrote down at least $206 million in losses on home-only loans (Hagerty, 2004).

[36]In its 2022-2024 Duty to Serve plan, Freddie Mac outlined plans to purchase 1,500-2,500 home-only loans in 2024. Fannie Mae's 2022-2024 plan states, "We continue to work with our regulator to understand safety and soundness considerations and the viability of a chattel loan pilot program," (Fannie Mae, 2023a).

Since the market crisis, lenders have mainly kept home-only loans in their portfolios. Expanding the secondary market for home-only loans, while ensuring that borrowers can afford repayment, could benefit consumers by encouraging more lenders to participate in this market. The Federal Housing Administration (FHA) recently proposed changes to its Title I program to improve its utility for home-only loan borrowers (HUD Department of Public Affairs, 2022). Given that the FHA insures about half of all manufactured home mortgages recorded in HMDA, these proposed changes could significantly impact the home-only loan market. Many nonbank lenders, who use an originate-to-distribute business model and hold little capital relative to loan volume, likely find the lack of a secondary market for home-only loans unattractive. Our estimates suggest that new policies lowering the cost of home-only loans would benefit Native borrowers more than White borrowers, given their disproportionate reliance on using home-only loans to finance new home purchases.

References

Agarwal, S., G. Amromin, I. Ben-David, and D. D. Evanoff (2016). Loan product steering in mortgage markets. Technical report, National Bureau of Economic Research.

Akee, R. (2009). Checkerboards and Coase: The effect of property institutions on efficiency in housing markets. *The Journal of Law and Economics 52*(2), 395–410.

Akee, R. and M. Jorgensen (2014). Property institutions and business investment on American Indian reservations. *Regional Science and Urban Economics 46*, 116–125.

Ambrose, B. W., J. N. Conklin, and L. A. Lopez (2021). Does borrower and broker race affect the cost of mortgage credit? *The Review of Financial Studies 34*(2), 790–826.

Anderson, T. L. and D. P. Parker (2009). Economic development lessons from and for north American Indian economies. *Australian Journal of Agricultural and Resource Economics 53*(1), 105–127.

Aragón, F. M. and A. S. Kessler (2020). Property rights on First Nations reserve land. *Canadian Journal of Economics 53*(2), 460–495.

Bartlett, R., A. Morse, R. Stanton, and N. Wallace (2022). Consumer-lending discrimination in the FinTech era. *Journal of Financial Economics 143*(1), 30–56.

Bauer, A., D. L. Feir, and M. T. Gregg (2022). The tribal digital divide: Extent and explanations. *Telecommunications Policy 46*(9), 102401.

Bayer, P., F. Ferreira, and S. L. Ross (2018). What drives racial and ethnic differences in high-cost mortgages? the role of high-risk lenders. *The Review of Financial Studies 31*(1), 175–205.

Berthrong, D. J. (1979). Legacies of the dawes act: Bureaucrats and land thieves at the cheyenne-arapaho agencies of oklahoma. *Arizona and the West 21*(4), 335–354.

Bhutta, N. and A. Hizmo (2021). Do minorities pay more for mortgages? *The Review of Financial Studies 34*(2), 763–789.

Bhutta, N., A. Hizmo, and D. Ringo (2025). How much does racial bias affect mortgage lending? evidence from human and algorithmic credit decisions. *The Journal of Finance 80*(3), 1463–1496.

Canner, Glenn, W. P. and E. Laderman (1999). The role of specialized lenders in extending mortgages to lower-income and minority homebuyers. https://www.federalreserve.gov/pubs/bulletin/1999/1199lead.pdf. Accessed April 13, 2023.

Capozza, Dennis, R. I. and T. Thomson (2005). Appraisal, agency and atypicality: Evidence from manufactured homes. *Real Estate Economics 33*(3), 509–537.

Cattaneo, L. and D. Feir (2021). The price of mortgage financing for Native Americans. *Journal of Economics, Race, and Policy 4*(4), 302–319.

CFPB (2023). Report on the home mortgage disclosure act rule voluntary review. Technical report, Consumer Financial Protection Bureau.

Cheng, P., Z. Lin, and Y. Liu (2015). Racial discrepancy in mortgage interest rates. *The Journal of Real Estate Finance and Economics 51*, 101–120.

Columbe, J. (2020). *Shortening the TSR Timeline: A proposal to end delays that hinder Native homeownership*. Minneapolis, MN: Federal Reserve Bank of Minneapolis.

Community Development Financial Institutions [CDFI] Fund (2001). *The Report of the Native American Lending Study*. US Department of the Treasury Washington, DC.

Cookson, J. A. (2010). Institutions and casinos on American Indian reservations: An empirical analysis of the location of indian casinos. *The Journal of Law and Economics 53*(4), 651–687.

Cotroneo, R. R. and J. Dozier (1974). A time of disintegration: The coeur d'alene and the dawes act. *The Western Historical Quarterly 5*(4), 405–419.

Council, F. F. I. E. Rate spread calculator. urlhttps://ffiec.cfpb.gov/tools/rate-spread.

Cyree, K. B., K. D. Harvey, and M. R. Melton (2004). Bank lending to Native American applicants: an investigation of mortgage flows and government guarantee programs on Native American lands. *Journal of Financial Services Research 26*(1), 29.

Dimitrova-Grajzl, V., P. Grajzl, A. J. Guse, and R. M. Todd (2015a). Consumer credit on American Indian

reservations. *Economic Systems 39*(3), 518–540.

Dimitrova-Grajzl, V., P. Grajzl, A. J. Guse, and R. M. Todd (2015b). Consumer credit on american indian reservations. *Economic Systems 39*(3), 518–540.

Doerr, S. and A. Fuster (2024). Affordable housing, unaffordable credit? concentration and high-cost lending for manufactured homes. Technical report.

Dymski, G. (1999). *The bank merger wave: The economic causes and social consequences of financial consolidation*. Routledge.

Fannie Mae (2023a). Duty to serve underserved markets plan, 2022-2024. urlhttps://www.fhfa.gov/sites/default/files/2023-05/Fannie-Mae-2022-2024-UMP-Jan2023.pdf.

Fannie Mae (2023b). "titling requirements for manufactured homes". https://singlefamily.fanniemae.com/media/18186/display.

Fannie Mae (2024). Loan-level price adjustment matrix. url-https://singlefamily.fanniemae.com/media/9391/display.

Feir, D. L., M. E. Jones, and A. Redish (2024). American indian wealth in the early twentieth century. In *AEA Papers and Proceedings*, Volume 114, pp. 210–214. American Economic Association 2014 Broadway, Suite 305, Nashville, TN 37203.

Firpo, S., N. M. Fortin, and T. Lemieux (2009). Unconditional quantile regressions. *Econometrica 77*(3), 953–973.

Freddie Mac and UNC (2020). The loan shopping experiences of manufactured homeowners: Survey report. https://sf.freddiemac.com/resources/manufactured-homeowners-survey-and-report-on-loan-shopping-experiences. Accessed May 31, 2023.

Fund, C. D. F. I. (2001). *The Report of the Native American Lending Study*. U.S. Department of the Treasury.

GAO (2021). *Home Disclosure Mortgage Act: Reporting Exemptions Had a Minimal Impact on Data Availability, but Additional Information Would Enhance Oversight*. Washington, D.C.: U.S. Government Printing Office.

GAO (2023). *Bureau of Indian Affairs Should Take Additional Steps to Improve Timely Delivery of Real Estate Services*. Washington, D.C.: U.S. Government Printing Office.

Gerardi, K., P. S. Willen, and D. H. Zhang (2023). Mortgage prepayment, race, and monetary policy. *Journal of Financial Economics 147*(3), 498–524.

Ghent, A. C., R. Hernandez-Murillo, and M. T. Owyang (2014). Differences in subprime loan pricing across races and neighborhoods. *Regional Science and Urban Economics 48*, 199–215.

Guiso, L., A. Pozzi, A. Tsoy, L. Gambacorta, and P. E. Mistrulli (2022). The cost of steering in financial markets: Evidence from the mortgage market. *Journal of financial economics 143*(3), 1209–1226.

Hagerty, J. (2004). Mobile-home industry tries to haul itself out of big slump. *The Wall Street Journal*.

Haughwout, A., C. Mayer, J. Tracy, D. M. Jaffee, and T. Piskorski (2009). Subprime mortgage pricing: The impact of race, ethnicity, and gender on the cost of borrowing. *Brookings-Wharton Papers on Urban Affairs*, 33–63.

Heimer, R., E. Yu, and M. Giacoletti (2021). Using high-frequency evaluations to estimate discrimination: Evidence from mortgage loan officers. *Federal Reserve Bank of Philadelphia Research Department Working Papers* (WP 21-04).

Holmes, A. and P. Horvitz (1994). Mortgage redlining: Race, risk, and demand. *The Journal of Finance 49*(1), 81–99.

HUD Department of Public Affairs (2022). Federal housing administration proposes to adjust title i manufactured home loan program loan limits annually. urlhttps://archives.hud.gov/news/2022/pr22-215.cfm.

Hurtado, A. and J. Sakong (2024). Racial disparities in the us mortgage market. *AEA Papers and Proceedings, George J. Stigler Center for the Study of the Economy & the State Working Paper No. 342*.

Jensen, M. (2023). Manufactured housing and market foreclosure. https://marisjensen.com/static/current/MarisJensen_VF.pdf. Accessed December 23, 2024.

Jorgensen, M. (2016). *Access to capital and credit in Native communities*. Tucson, University of Arizona: Native Nations Institute. https://nni.arizona.edu/application/ files/89. Accessed 20 June 2019.

Jorgensen, M. and R. K. Akee (2017). Access to capital and credit in native communities: A data review. *Tucson, AZ: Native Nations Institute, The University of Arizona*.

Kokodoko, M. (2017). Findings from the 2017 native cdfi survey: industry opportunities and limitations. *Federal Reserve Bank of Minneapolis CICD Working Paper 4*.

Kunesh, P. H. (2018). Navigating land issues. In P. H. Kunesh (Ed.), *Tribal Leaders Handbook on Homeownership*, Chapter 7, pp. 78–87. Minneapolis, Minnesota: Federal Reserve Bank of Minneapolis, Center for Indian Country Development.

Laderman, E. and C. Reid (2010). Mortgage lending on Native American reservations: Does a guarantee matter? *Journal of Housing Economics 19*(3), 233–242.

Leonard, B. and P. Dominic (2021). Ownership fragmentation and natural resource use: Evidence from the Bakken. *Economic Journal 131*(635), 1215–1249.

Leonard, B., D. P. Parker, and T. L. Anderson (2020). Land quality, land rights, and Indigenous poverty. *Journal of Development Economics 143*, 102435.

Munnell, A. H., G. M. Tootell, L. E. Browne, and J. McEneaney (1996). Mortgage lending in Boston: Interpreting HMDA data. *The American Economic Review*, 25–53.

Native Lands Information System (2019). Native lands advocacy project. urlhttps://data.nativeland.info/organization/native-lands-advocacy-project.

Pindus, N., T. Kingsley, J. Biess, D. Levy, J. Simington, and C. Hayes (2017). Housing needs of American Indians and Alaska Natives in tribal areas: a report from the assessment of American Indian, Alaska Native, and Native Hawaiian housing needs. *US Department of Housing and Urban Development, Office of Policy Development and Research*.

Quillian, L., J. J. Lee, and B. Honoré (2020). Racial discrimination in the US housing and mortgage lending markets: A quantitative review of trends, 1976–2016. *Race and Social Problems 12*, 13–28.

Ramakrishnan, K. and F. Z. Ahmad (2014). State of asian americans and pacific islanders series: A multifaceted portrait of a growing population. *Center for American Progress 23*.

Russell, J., N. O'Reilly, K. Schneider, N. Melton, N. Schwartz, and S. Leitner (2021). Manufactured housing finance: New insights from the home mortgage disclosure act data. *Consumer Financial Protection Bureau Office of Research Reports Series* (21-5).

Schmitz, J. (2020). Monopolies inflict great harm on low- and middle-income americans. https://www.minneapolisfed.org/research/working-papers/solving-the-housing-crisis-will-require-fighting-monopolies-in-construction. Accessed April 13, 2023.

Schumacher, J. B. et al. (2006). *Redlining in Montana*. Ph. D. thesis, Montana State University-Bozeman, College of Agriculture.

United States Congress Senate Committee on Indian Affairs (2015, June). *Accessing Capital in Indian Country Hearings*. One Hundred Fourteenth Congress. Government Publishing Office Internet. https://www.govinfo.gov/content/pkg/CHRG-114shrg97306/html/CHRG-114shrg97306.htm, Accessed 2 July 2019.

Wei, B. and F. Zhao (2022). Racial disparities in mortgage lending: New evidence based on processing time. *The Review of Corporate Finance Studies 11*(3), 775–813.

Wellhausen, R. L. (2017). Sovereignty, Law, and Finance: Evidence from American Indian Reservations. *Quarterly Journal of Political Science 12*(4), 405–436.

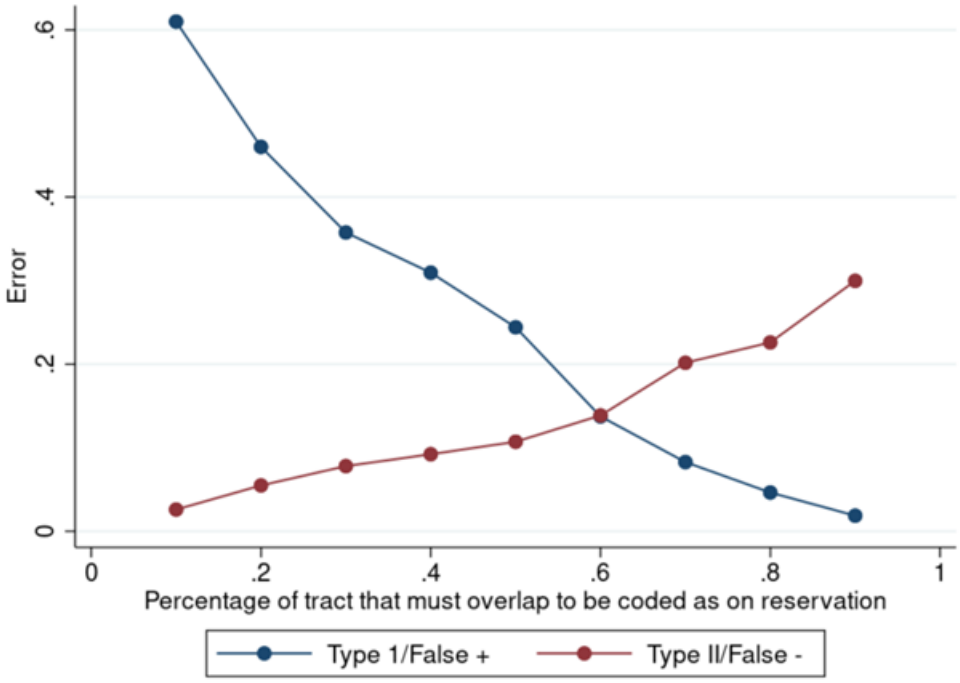


Figure 1: **Comparing address-based and tract-based American Indian reservation measures**

Notes: The Type 1 Error (False Positive) rate shows the proportion of observations classified as on-reservation by the tract overlap percentage rule, but not actually on reservation according to the address-based geocoded data. The Type 2 Error (False Negative) rate shows the proportion of observations that are on reservation based on address-based data but not classified as on-reservation using the tract-based rule. This figure uses data from the 2021 HMDA only.

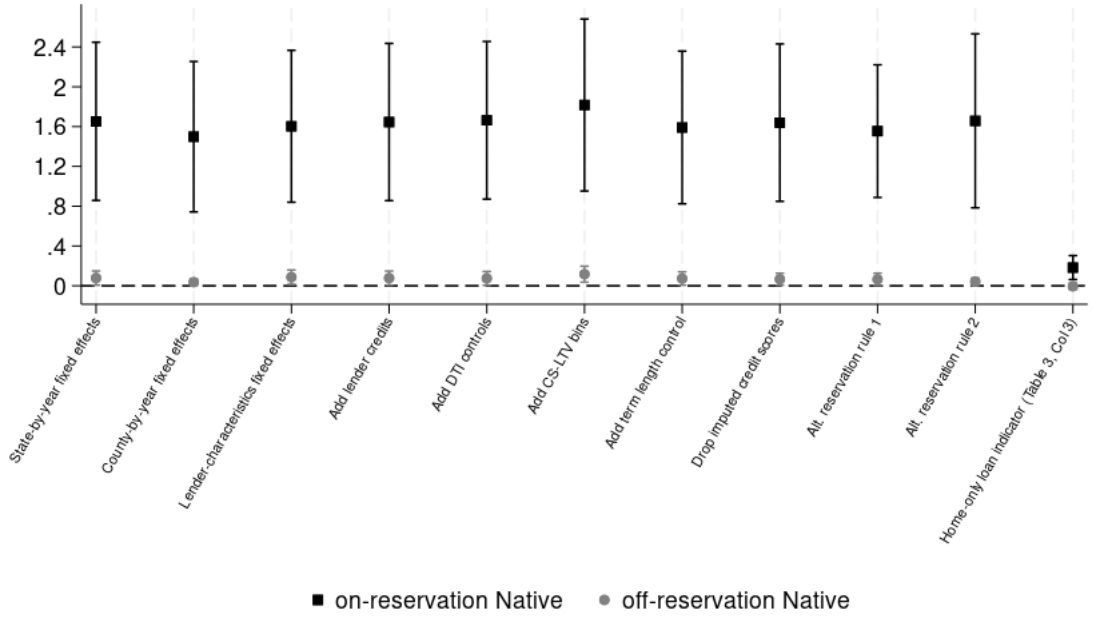
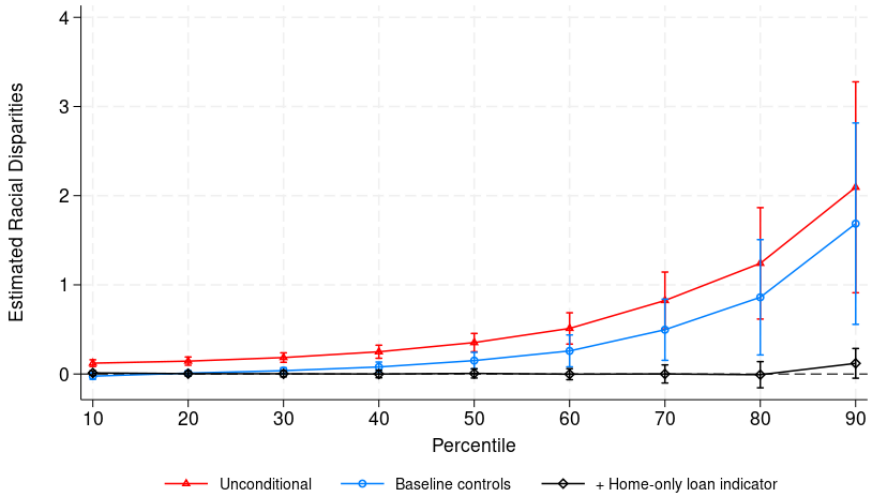
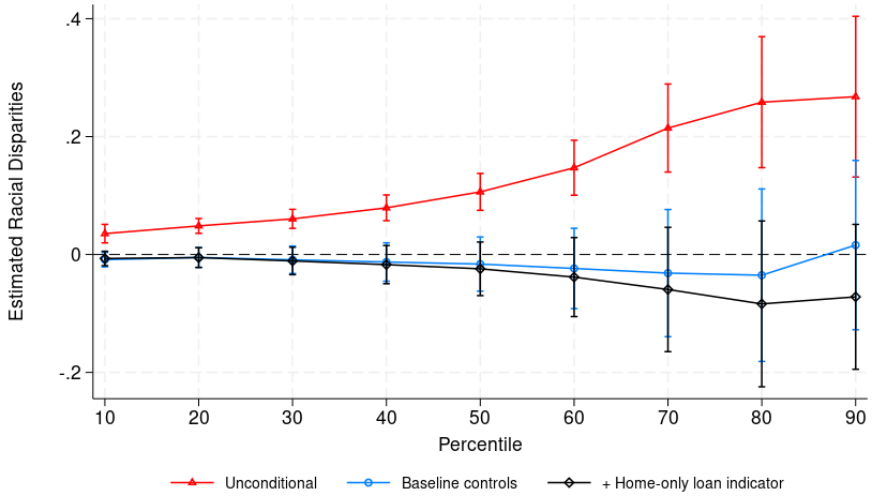


Figure 2: **Robustness Checks, rate spread disparities**

Notes: The 95 percent confidence intervals for the coefficients for on- and off-reservation Native borrowers in various model specifications are displayed above. "State-by-Year Fixed Effects" uses state-by-year fixed effects instead of state fixed effects, "County-by-Year Fixed Effects" uses county-by-year fixed effects, "Lender Characteristics Fixed Effects" bins lenders into credit score deciles based on the average credit score of their applicants and computes the within-lender-credit group racial disparities, "Add lender credits" includes a dummy if lender credits were given to the borrower, "Add DTI controls" adds debt-to-income bins as controls, "Add CS-LTV bins" includes interactions between discretized bins of credit scores and LTV, "Add term length control" adds logged term length as a control, "Drop imputed values" drops all observations with imputed credit scores, "Alt. Reservation Rule 1" assign Native borrowers to reservations if at least 10 percent of the home's census tract area overlaps with reservation land, "Alt. Reservation Rule 2" assigns Native borrowers to reservation if at least 90 percent of the home's census tract overlaps with reservation land, "Home-only Loan Indicator" is the same coefficients as Table 3, Panel A, Col 3.



(a) Rate Spread Gaps on On-Reservation Native American Loans



(b) Rate Spread Gaps on Off-Reservation Native American Loans

Figure 3: **Unconditional Quantile Regressions**

Notes: Each quantile regression is the rate spread. Panels A and B display the 95 percent confidence intervals for the coefficients on the on-reservation and off-reservation Native indicators from three separate quantile regressions. The red points represent a model with only state and year fixed effects, the blue points represent a model that includes applicant characteristics, and the black points represent a model that additionally includes the home-only loan indicator.

Table 1: **Summary Statistics, group averages**

	on-Reservation Native	off-Reservation Native	White	Statistical Differences		
	(1)	(2)	(3)	(1)-(3)	(2)-(3)	(1)-(2)
rate spread	2.572	0.793	0.529	***	***	***
	(2.574)	(1.197)	(1.716)			
	[1292]	[65033]	[4455323]			
interest rate	5.400	3.913	3.817	***	***	***
	(2.434)	(1.917)	(1.158)			
	[1501]	[68208]	[4455312]			
credit score	688.630	713.406	737.360	***	***	***
	(62.325)	(58.226)	(54.951)			
	[1401]	[62964]	[4074472]			
age	40.678	39.137	41.150		***	***
	(13.943)	(12.859)	(13.826)			
	[1675]	[69546]	[4544490]			
co-applicant	0.427	0.437	0.481	***	***	
	(0.495)	(0.496)	(0.500)			
	[1675]	[69546]	[4544490]			
female	0.470	0.396	0.332	***	***	***
	(0.499)	(0.489)	(0.471)			
	[1675]	[69546]	[4544490]			
income (in $000s)	77.472	92.825	113.705	***	***	***
	(103.081)	(85.510)	(121.001)			
	[1667]	[68516]	[4490285]			
loan amount (in $000s)	160.563	270.582	329.095	***	***	***
	(111.615)	(177.513)	(273.800)			
	[1675]	[69545]	[4544264]			
property value (in $000s)	181.521	310.674	407.535	***	***	***
	(135.548)	(227.976)	(365.687)			
	[1498]	[67760]	[4436773]			

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. Applicant income, interest rate and property value are winsorized at the top and bottom 0.1 percentile. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 2: **Summary Statistics for Loan Types and Manufactured Home Loans**

	on-reservation Native	off-reservation Native	White	Statistical Differences		
	(1)	(2)	(3)	(1)-(3)	(2)-(3)	(1)-(2)
Panel A: All Loans						
FHA	0.281	0.310	0.157	***	***	*
	(0.450)	(0.462)	(0.364)			
	[1675]	[69546]	[4544490]			
VA	0.056	0.135	0.095	***	***	***
	(0.229)	(0.342)	(0.293)			
	[1675]	[69546]	[4544490]			
RHS/FSA	0.059	0.035	0.022	***	***	***
	(0.235)	(0.185)	(0.147)			
	[1675]	[69546]	[4544490]			
manufactured home	0.389	0.069	0.033	***	***	***
	(0.488)	(0.254)	(0.180)			
	[1675]	[69546]	[4544490]			
Panel B: Manufactured Home Loans						
home-only loan	0.801	0.472	0.299	***	***	***
	(0.400)	(0.499)	(0.458)			
	[633]	[4684]	[146877]			
property interest (1=owned, 0=leased)	0.303	0.642	0.723	***	***	***
	(0.460)	(0.480)	(0.448)			
	[633]	[4684]	[146877]			

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. ***, **, *: significant at the 1%, 5%, 10% levels.

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

	Dependent Variable: Rate Spread					
	(1)	(2)	(3)	(4)	(5)	(6)
on-reservation Native	1.967***	1.650***	0.183***	0.426***	0.364***	0.155**
	(0.434)	(0.405)	(0.061)	(0.111)	(0.106)	(0.061)
off-reservation Native	0.231***	0.077**	-0.005	0.019	0.013	-0.006
	(0.042)	(0.036)	(0.016)	(0.023)	(0.021)	(0.016)
home-only loan			4.041***			3.154***
			(0.051)			(0.067)
property interest				-3.878***	-3.238***	-0.516***
				(0.071)	(0.075)	(0.077)
manufactured home					0.673***	0.475***
					(0.037)	(0.031)
Adjusted R^2	0.009	0.080	0.129	0.121	0.125	0.131
Observations	4462087	4462087	4462087	4462087	4462087	4462087
state fixed effects	✓	✓	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓	✓	✓
baseline controls		✓	✓	✓	✓	✓

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 substitutes the property interest dummy for the home-only loan indicator. Column 5 adds a manufactured home dummy to model 4. Column 6 adds back in the home-only loan indicator to model 5. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 4: **The Role of Home-Only Loans on Rate Spread Disparities (Only Rural Tracts)**

	Dependent Variable: Rate Spread					
	(1)	(2)	(3)	(4)	(5)	(6)
on-reservation Native	1.943***	1.615***	0.189***	0.356***	0.311***	0.131**
	(0.465)	(0.422)	(0.070)	(0.113)	(0.108)	(0.064)
off-reservation Native	0.311***	0.151*	0.012	0.057	0.046	0.010
	(0.093)	(0.077)	(0.031)	(0.049)	(0.043)	(0.029)
home-only loan			3.868***			2.929***
			(0.052)			(0.054)
property interest				-3.831***	-3.222***	-0.699***
				(0.066)	(0.075)	(0.059)
manufactured home					0.692***	0.496***
					(0.045)	(0.041)
Adjusted R^2	0.005	0.040	0.071	0.063	0.067	0.073
Observations	1285943	1285943	1285943	1285943	1285943	1285943
state fixed effects	✓	✓	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓	✓	✓
baseline controls		✓	✓	✓	✓	✓

Notes: This sample only contains rural census tracts as classified by the USDA's ERS. 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 substitutes the property interest dummy for the home-only loan indicator. Column 5 adds a manufactured home dummy to model 4. Column 6 adds back in the home-only loan indicator to model 5. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 5: **On-Reservation Whites as Comparison Group**

	Dependent Variable: Rate Spread					
	(1)	(2)	(3)	(4)	(5)	(6)
on-reservation Native	1.838***	1.571***	0.130**	0.356***	0.332***	0.126**
	(0.438)	(0.407)	(0.061)	(0.113)	(0.109)	(0.061)
off-reservation Native	0.103	-0.002	-0.059**	-0.050	-0.019	-0.036*
	(0.063)	(0.045)	(0.023)	(0.032)	(0.026)	(0.020)
off-reservation White	-0.129***	-0.080***	-0.054***	-0.070***	-0.032**	-0.030**
	(0.049)	(0.027)	(0.017)	(0.022)	(0.015)	(0.013)
home-only loan			4.040***			3.154***
			(0.051)			(0.067)
property interest				-3.878***	-3.238***	-0.517***
				(0.071)	(0.075)	(0.077)
manufactured home					0.673***	0.475***
					(0.037)	(0.031)
Adjusted R^2	0.009	0.080	0.129	0.121	0.125	0.131
Observations	4462087	4462087	4462087	4462087	4462087	4462087
state fixed effects	✓	✓	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓	✓	✓
baseline controls		✓	✓	✓	✓	✓

Notes: This Table complements Table 3 by using loans originated to on-reservation White borrowers as the omitted category. 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 substitutes the property interest dummy for the home-only loan indicator. Column 5 adds a manufactured home dummy to model 4. Column 6 adds back in the home-only loan indicator to model 5. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 6: **Racial Differences in Fees Paid and Interest Rates**

	Dependent Variable:	
	log(Total Fees)	Interest Rate
	(1)	(2)
on-reservation Native	-0.191***	1.371***
	(0.047)	(0.333)
off-reservation Native	-0.045***	0.093***
	(0.005)	(0.029)
mean dependent variable	5570	3.82
Adjusted R^2	0.299	0.563
Observations	4360246	4427928
Adjusted R^2	0.299	0.563
Observations	4360246	4427928
state fixed effects	✓	✓
year fixed effects	✓	✓
baseline controls	✓	✓

Notes: This sample contains all originated loans for either stick-built or manufactured homes containing data on the interest rate and fees paid. Columns 1 and 2 include state and year fixed effects and the applicant characteristics used in Table 3. To remove potential outliers, we winsorize the interest rate at the top and bottom 0.1 percentile. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 7: **OLS Estimates Predicting Likelihood of Applying for a Home-Only Loan**

	Manufactured Homes Only				
	(1)	(2)	(3)	(4)	(5)
on-reservation Native	0.492***	0.306***	0.347***	0.293***	0.317***
	(0.072)	(0.038)	(0.063)	(0.051)	(0.059)
off-reservation Native	0.142***	0.067***	0.033***	0.026***	0.030***
	(0.035)	(0.020)	(0.009)	(0.007)	(0.011)
property interest			-0.683***	-0.649***	-0.635***
			(0.012)	(0.013)	(0.013)
trust in banks			-0.146**	-0.0377	-0.146*
			(0.069)	(0.031)	(0.076)
log(distance to nearest dealer)			-0.008***	-0.003	-0.006***
			(0.001)	(0.002)	(0.002)
log(distance to nearest city)			0.003*	0.001	0.002
			(0.002)	(0.002)	(0.002)
Adjusted R^2	0.180	0.539	0.773	0.784	0.716
Observations	295846	295846	295846	295846	206312
state fixed effects	✓	✓	✓		✓
year fixed effects	✓	✓	✓	✓	✓
baseline controls		✓	✓	✓	✓
county fixed effects				✓	

Notes: Columns 1 through 5 contain only manufactured home loan applications that were either approved or denied with complete information on how the loan was/would have been financed (either as a home-only loan or a manufactured home mortgage). Each regression predicts the probability of applying for a home-only loan given that the loan was for a manufactured home. Column 1 shows the estimated differences after controlling for state and year fixed effects. Column 2 adds the baseline applicant characteristics. 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 8: **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***	0.451***	0.432***	0.676***	0.566***	0.546***
	(0.109)	(0.106)	(0.105)	(0.085)	(0.069)	(0.076)
off-reservation Native	0.022***	0.021***	0.012***	0.136***	0.109***	0.081***
	(0.006)	(0.006)	(0.003)	(0.031)	(0.026)	(0.019)
trust in banks			-0.062**			-0.137
			(0.026)			(0.099)
log(distance to nearest dealer)			0.003***			-0.007***
			(0.000)			(0.002)
log(distance to nearest city)			0.001***			0.005**
			(0.000)			(0.002)
Adjusted R^2	0.037	0.053	0.056	0.165	0.261	0.261
Observations	4992082	4992082	4992082	163539	163539	163539
state fixed effects	✓	✓	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓	✓	✓
baseline controls		✓	✓		✓	✓

Notes: Columns 1 through 3 contain all loans whose main applicant has direct or indirect ownership in the land where the home sits. Columns 4 through 5 contains all manufactured home loans whose main applicant has direct or indirect ownership in the land where the home sits. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 9: **Loan Processing Times**

	All Originated Loans		
	(1)	(2)	(3)
on-reservation Native	31.656***	27.521***	23.183***
	(5.024)	(4.431)	(5.188)
off-reservation Native	4.547***	4.262***	4.002***
	(0.521)	(0.471)	(0.456)
home-only loan		15.071***	14.562***
		(1.268)	(1.289)
home-only loan × on-reservation Native			14.833*
			(8.593)
home-only loan × off-reservation Native			8.482***
			(2.038)
Adjusted R^2	0.041	0.042	0.042
Observations	4615711	4615711	4615711
state fixed effects	✓	✓	✓
year fixed effects	✓	✓	✓
baseline controls	✓	✓	✓

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. ***, **, *: significant at the 1%, 5%, 10% levels.

Table 10: **Loan Approval Rates, Descriptive Statistics**

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

Notes: We measure approval rates by dividing the number of approved and originated loans by the total number of completed applications. "Approval rates, home-only loans" is the mean approval rate of home-only loan applications by group. "Approval rates, manufactured homes" is the mean approval rate of manufactured home mortgage loan applications by group. "Approval rates, all" is the mean approval rate of all mortgage loan applications (either for stick-built or manufactured homes) by group. 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 11: **Racial Disparities in Loan Approvals**

	All Loans	Manufactured Home Loans
	(1)	(2)
on-reservation Native	-0.147***	-0.136***
	(0.046)	(0.042)
off-reservation Native	-0.161***	-0.104***
	(0.015)	(0.007)
home-only loan	-0.306***	-0.221***
	(0.008)	(0.008)
home-only loan × on-reservation Native	0.0432	0.118***
	(0.043)	(0.041)
home-only loan × off-reservation Native	0.108***	0.117***
	(0.027)	(0.019)
stick-built loan	0.131***	
	(0.005)	
stick-built loan× on-reservation Native	0.0828	
	(0.051)	
stick-built loan × off-reservation Native	0.135***	
	(0.015)	
property interest	-0.0767***	-0.0320***
	(0.010)	(0.008)
Adjusted R^2	0.135	0.243
Observations	5130417	297656
state fixed effects	✓	✓
year fixed effects	✓	✓
baseline controls	✓	✓

Notes: Column 1 contains all loan applications and Column 2 contains only manufactured home loan applications. In both Columns, manufactured home mortgage loan applications are the reference group. Each model contains state fixed effects, year fixed effects, the property interest indicator and the baseline controls. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Appendix

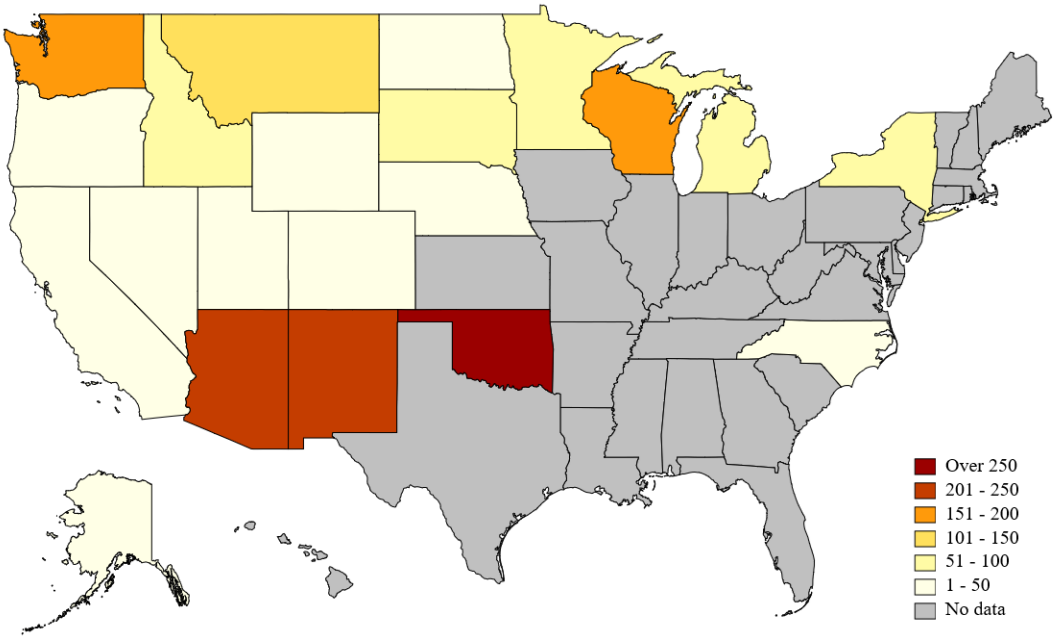
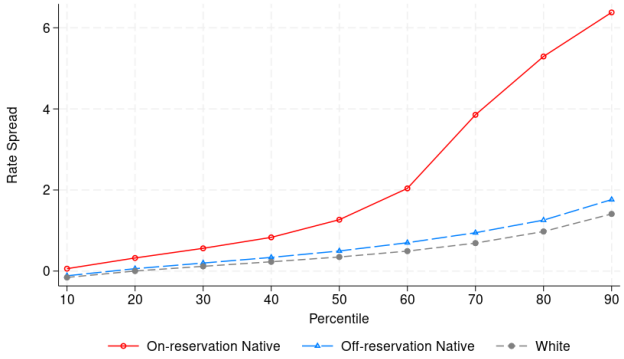
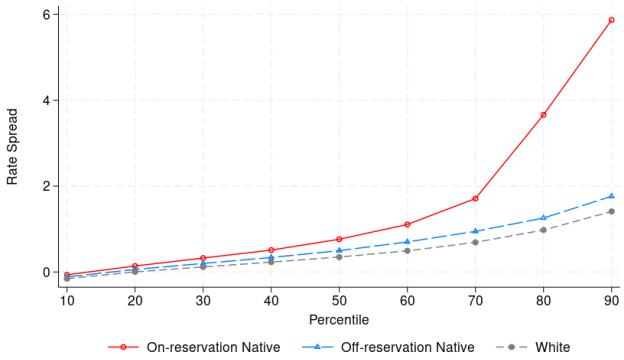


Figure A1: **Concentration of Originated Loans in Indian Country**

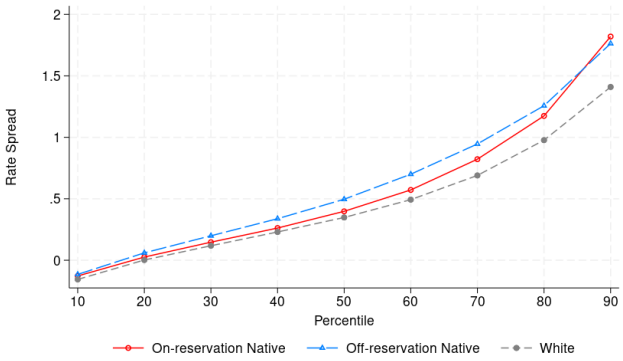
Notes: This figure maps the number of on-reservation Native-originated loans by state. Data from the 2018–2021 confidential HMDA.



(a) Adding 100 loans



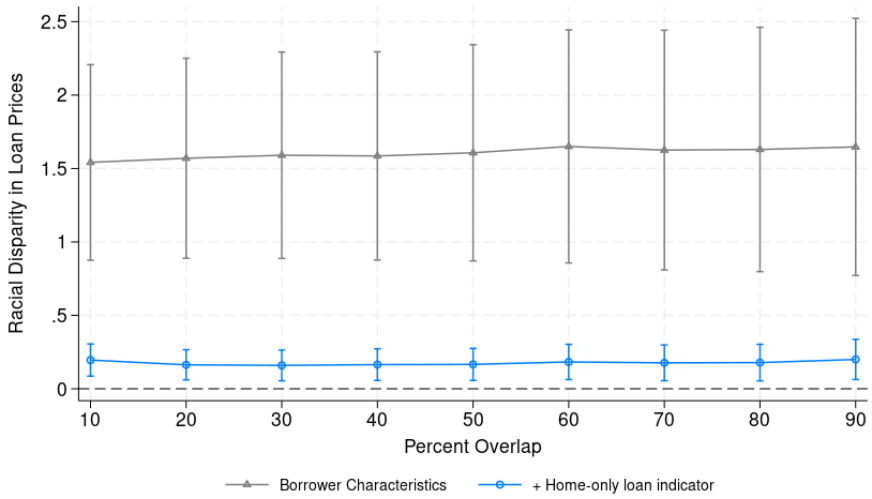
(b) Adding 1,000 loans



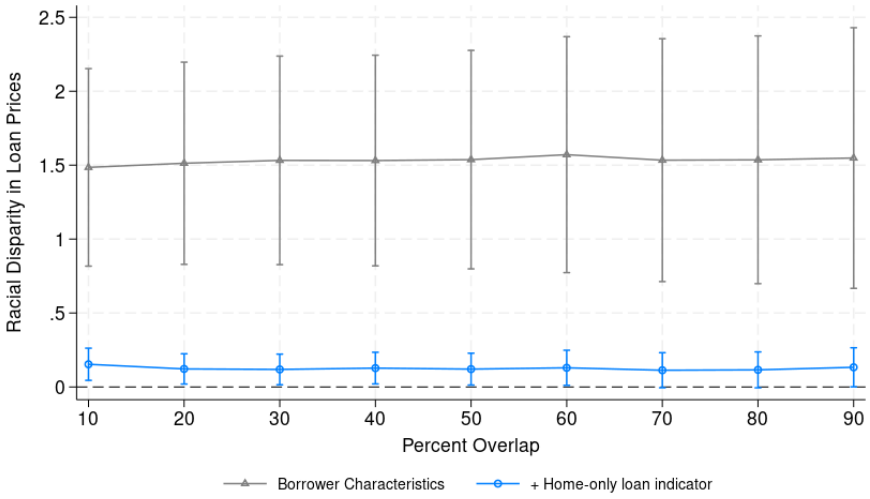
(c) Adding 10,000

Figure A2: **Rate Spread Disparities Under Three Scenarios of Missing Loans Due to HMDA Underreporting**

Notes: Panel A adds 100 loans randomly sampled with replacement from the White loan distribution to the on-reservation Native American loan sample. Panel B adds 1,000 loans randomly sampled with replacement from the White loan distribution to the sample of on-reservation Native American loans. Panel C adds 10,000 loans randomly sampled with replacement from the White loan distribution to the sample of on-reservation Native American loans.



(a) Omitted Group - All White Originated Loans



(b) Omitted Group - On-Reservation White Originated Loans

Figure A3: **Racial Price Disparities across tribal land assignment rules**

Notes: Both panels show the 95 percent confidence interval for the on-reservation Native loan coefficient from Columns 2 (black) and 3 (blue) in Table 3, under nine different assignment rules that define whether the loan occurred within a federal Indian reservation. The top panel uses White-originated loans as the omitted category, while the bottom panel uses on-reservation White-originated loans as the omitted category. Given that the average rate spread on loans to White borrowers inside and outside reservations is similar, the estimated racial disparities do not vary significantly across panels.

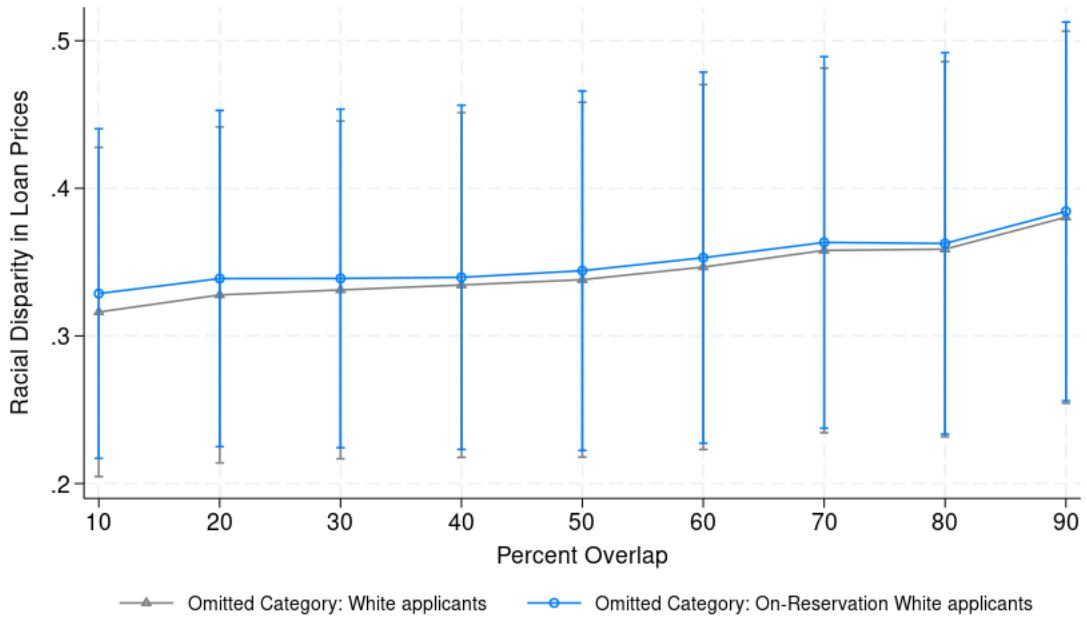


Figure A4: **Racial Disparities in Home-Only loan Application Rates across tribal land assignment rules**

Notes: This figure displays two 95 percent confidence intervals for the on-reservation Native loan coefficient from Table 7, Column 3, under nine different assignment rules that define whether the loan occurred within a federal Indian reservation. The gray 95 percent confidence interval compares the mean home-only loan application rate between on-reservation Native and White applicants while the other 95 percent confidence intervals compares the mean home-only loan application rate between on-reservation Native applicants and on-reservation White applicants.

Table A1: **Alternative Sample Sizes of White Borrowers**

	Random Sample: 1,600 White originated loans		67,000 White originated loans	
	(1)	(2)	(3)	(4)
Panel A				
on-reservation Native	1.956***	1.312***	1.941***	1.494***
	(0.403)	(0.297)	(0.407)	(0.337)
off-reservation Native	0.275***	0.094***	0.254***	0.106***
	(0.044)	(0.027)	(0.046)	(0.032)
Adjusted R^2	0.089	0.393	0.085	0.355
Observations	67887	67887	131127	131127
state fixed effects	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓
baseline controls		✓		✓

Notes: In this table, we show that the statistically significant unexplained gaps in rate spread for Native borrowers is not driven by the large sample of White borrowers. Columns 1 and 2 compare on- and off-reservation Native originated loans to a random sample of 1,600 White originated loans, which is approximately equal to the number of on-reservation Native originated loans. Columns 3 and 4 compares on- and off-reservation Native originated loans to a random sample of 67,000 originated loans, which is approximately equal to the total number of off-reservation Native originated loans. Each column follows the same sequence as in Table 3, columns 1 and 2. In both panels, conditional on applicant characteristics, we still see a statically significant difference in loan prices between Native and White borrowers. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.

Table A2: **Removing the Influence of Outliers**

	Dependent Variable: Rate Spread					
	(1)	(2)	(3)	(4)	(5)	(6)
on-reservation Native	1.926***	1.611***	0.168***	0.408***	0.344***	0.140**
	(0.428)	(0.399)	(0.054)	(0.107)	(0.102)	(0.055)
off-reservation Native	0.227***	0.073**	-0.008	0.016	0.009	-0.009
	(0.041)	(0.035)	(0.016)	(0.023)	(0.020)	(0.015)
home-only loan			3.974***			3.095***
			(0.047)			(0.062)
property interest				-3.810***	-3.147***	-0.476***
				(0.067)	(0.066)	(0.072)
manufactured home					0.697***	0.502***
					(0.027)	(0.016)
Adjusted R^2	0.040	0.354	0.565	0.530	0.546	0.574
Observations	4462087	4462087	4462087	4462087	4462087	4462087
state fixed effects	✓	✓	✓	✓	✓	✓
year fixed effects	✓	✓	✓	✓	✓	✓
baseline controls		✓	✓	✓	✓	✓

Notes: We winsorize the dependent variable at the top and bottom 0.1 percentile. The models mirror those in Table 3. Standard errors are clustered at the county level. By reducing the influence of outliers, the R^2 for each model increases substantially compared to those in Table 3; however, the OLS coefficients in each model remain qualitatively similar. ***, **, *: significant at the 1%, 5%, 10% levels.

Table A3: **Racial Disparities in Loan Prices among Property Owners**

	All Loans	Manufactured Home Loans	Stick-Built Loans
	(1)	(2)	(3)
on-reservation Native	0.396***	1.039***	0.028
	(0.137)	(0.295)	(0.071)
off-reservation Native	0.002	0.384**	-0.038***
	(0.020)	(0.162)	(0.011)
Adjusted R^2	0.072	0.010	0.163
Observations	4421511	107089	4314422
state fixed effects	✓	✓	✓
year fixed effects	✓	✓	✓
baseline controls	✓	✓	✓

Notes: Column 1 contains only originated loans associated with borrowers with direct or indirect ownership in the underlying land. Column 2 contains all manufactured home loans associated with borrowers with direct or indirect ownership. Column 3 contains only stick-built home loans. Each model contains applicant characteristics along with state and year fixed effects. Standard errors are clustered at the county level. ***, **, *: significant at the 1%, 5%, 10% levels.