

Consumer Credit on American Indian Reservations*

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Abstract

Access to consumer credit on American Indian reservations has been a longstanding concern and yet measurement of consumer credit on reservations is scarce and incomplete. This paper draws on a unique large-scale consumer credit database to provide the first encompassing quantitative picture of consumer credit in Indian country. We find that credit files on reservations are somewhat more likely to lack a credit risk score; in our data the Equifax Risk Score. Furthermore, Equifax Risk Scores and the use of certain forms of credit, especially mortgages, are low on reservations. However, usage of other forms of credit is not always low on reservations. Moreover, the gaps in credit usage on versus off reservations differ significantly across states and can change notably over time. Finally, race, age, education, unemployment, income, and the allocation of jurisdiction over legal matters are important predictors of consumer credit outcomes.

Keywords: American Indian reservations, consumer credit, credit conditions, credit usage

JEL Classifications: G21, P43, O16, R11

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1. Introduction

American Indian reservations are "islands of poverty in a sea of wealth" (Anderson and Parker 2008: 641) and "America's domestic emerging market" (Clarkson 2009: 287). A comprehensive explanation of why all but a few reservations are economically underdeveloped remains elusive (Anderson and Parker 2008). Among the many potential barriers to economic growth and prosperity on the reservations, undersupply of consumer credit has been a particularly pervasive concern.¹

In 2001, the Native American Lending Study (Community Development Financial Institutions Fund 2001), relying on a one-time survey and interviews with experts, expressed widespread views that a general lack of capital and financial services impedes economic opportunity on American Indian reservations. The study reported frequent difficulty in obtaining mortgages and using land as collateral; a dearth of financial institutions located on or near reservations; discrimination against or stereotyping of American Indian borrowers; lack of understanding by reservation residents of credit standards and credit reports; limited or poor credit histories among reservation residents; high loan default rates among reservation residents; and significant need for personal finance education on reservations.² Similar concerns about credit on reservations were voiced during a series of recent "Growing Economies in Indian

¹ The United States federal government has concerned itself with consumer credit in American Indian territories since at least the time of President Jefferson, who encouraged federal officials to promote consumer credit to tribal leaders so as to get them sufficiently indebted that they would agree to sell tribal lands to the U.S. government (Miller 2012: 35).

² Other smaller-scale studies provide further evidence of significant use of high-cost consumer credit products (Smith 2003, Pickering and Mushinski 1999), limited access to banks and formal credit, real or perceived discrimination (Pickering and Mushinski 1999), and high mortgage denial rates on reservations (Schumacher 2006).

Country" workshops held by the Federal Reserve System and several federal agency partners (Board of Governors of the Federal Reserve System 2012) and a recent Senate hearing.³

Despite these persistent concerns, our knowledge about credit on reservations remains highly incomplete. Data on consumer credit conditions on reservations are particularly scarce (Todd 2012). An exception is data on mortgage credit, due to the availability of the Home Mortgage Disclosure Act (HMDA) data. The HMDA dataset, however, has noteworthy limitations, such as incomplete coverage in rural areas and the imperfect match of Census tract and reservation boundaries. Comparably extensive data on the use of other forms of consumer credit on reservations have simply not been available up to this point.

This paper contributes to the sparse existing empirical literature on credit in Indian country (Cyree et al. 2004, Laderman and Reid 2010, Parker 2012, Angadjivand et al. 2012) by providing a first encompassing empirical characterization of consumer credit on American Indian reservations.⁴ What are the basic patterns in consumer credit usage and conditions on versus off the reservations, across states, and over time? How do credit outcomes vary with demographic, socio-economic, and institutional factors? To address these questions, we draw on a unique and in the context of Indian country thus far unutilized large-scale sample of consumer credit histories: the Federal Reserve Bank of New York/Equifax Consumer Credit Panel (CCP). There are three major advantages of the CCP dataset over previously used datasets for examining credit in Indian country. First, the CCP dataset provides information for mortgage and non-mortgage loans, enabling us to fill a gap in the existing literature on consumer credit in Indian

³ North Dakota Senator Byron L. Dorgan opened the 2010 Hearing before the Committee on Indian Affairs noting that "[t]he urgent need for job creation on Indian reservations is apparent to everybody... We have a lack of access to capital that has stunted economic growth".

⁴ Other studies about credit in Indian country, which either maintain a narrower focus or are primarily descriptive in character include Listokin (2001), Pickering and Mushinski (1999), Manchester (2001), Jorgensen (2004), Angadjivand et al. (2012).

country, which has focused primarily on mortgage loans (see, e.g., Cyree et al. 2004, Laderman and Reid 2010). Second, CCP records include Census block codes allowing us to use Census geographic data to determine whether credit files originate from reservations, areas adjacent to reservations or other nearby areas. The stratification into these geographic groups allows us to analyze patterns in consumer credit on and off reservations in a cross section as well as over time. Third, the Census block codes allow us to link the CCP data with the corresponding socio-economic and demographic data from the Census as well as with information on the allocation of jurisdiction over legal matters which has been suggested to affect credit (Anderson and Parker 2008, Parker 2012).

Our examination of the CCP data reveals that credit files on reservations are more likely to lack a credit risk score (specifically, the Equifax Risk Score), an indicator that a higher percentage of reservation consumers have little or no experience with credit. Moreover, the Equifax Risk Scores on reservations are relatively low, a finding that substantiates concerns about relatively high loan default rates among reservation residents.

Consistent with the recent findings of Cyree et al. (2004) and Laderman and Reid (2010), we find that the use of mortgages is low on reservations. However, the use of other forms of credit is only sometimes lower on reservations, and the degree and even the direction of the gap in credit usage on reservations relative to nearby off-reservation areas differs significantly across states and, to a lesser but nontrivial degree, over time. This finding indicates that there may be substitution between different types of loans on reservations.

We also conduct block-group level, multivariate regression analysis to explore the role of a range of demographic, socio-economic, and institutional covariates of consumer credit outcomes. We find, for instance, that the mean Equifax Risk Scores are negatively associated

with the percentage of block group population that self-identifies as American Indian, a result that is robust to controlling for the block-group's geographic location relative to a reservation and a number of demographic and socio-economic covariates.

Block group's location relative to a reservation, average population age, educational attainment, unemployment, and income are all individually statistically significant and collectively important predictors of consumer credit volume. The precise impact of specific covariates, such as block group's geographic location relative to a reservation, percent of population that self-identifies as American Indian, and mean age, however, varies substantially by loan type. We further find that mean past due credit balance as percentage of total credit balance—our measure of delinquency in consumer credit—is positively associated with the percent of block group population that self-identifies as American Indian and negatively associated with age, educational attainment, employment, and income.

Finally, we examine the relationship between our measures of consumer credit outcomes and state jurisdiction over criminal and civil matters granted by Public Law 280 (PL280), the impact of which has been widely debated among scholars of Indian country.⁵ We focus on the sample of block groups that are fully contained in a reservation, where the law's impact was likely greatest. Regardless of whether we identify the law's effect off of cross-state or within-state variation, we find a statistically significant positive association between the application of PL280 and mean total consumer credit balance. This particular result echoes recent findings of Parker (2012) who, while relying on different data (aggregate historical data from the Bureau of Indian Affairs as well as HMDA mortgage loan application data), finds that the adoption of PL280 is positively associated with on-reservation per capita credit. One plausible interpretation

⁵ See, e.g., Goldberg-Ambrose (1997), Goldberg and Champagne (2006), Goldberg et al. (2008), Anderson and Parker (2008), Cookson (2010, 2013), Parker (2012), and Dimitrova-Grajzl et al. (2014).

of this positive association is that adjudication in state courts (as opposed to tribal courts) ensures greater stability in contract enforcement. However, due to the likely endogenous nature of PL280, we caution against readily interpreting our results as causal.

Financial development has been shown to be robustly positively associated with economic growth (see, e.g., Levine 1997, Levine et al. 2000, Bangake and Eggoh 2011). By examining the conditions and usage of consumer credit on American Indian reservations, our paper therefore contributes to the scant, but growing, empirical literature on various aspects of economic development in Indian country (see, e.g., Anderson and Lueck 1992, Vinje 1996, Cornell and Kalt 2000, Jorgensen and Taylor 2000, Pickering and Mushinski 2001, Evans and Topoleski 2002, Anderson 2013, Dippel 2013, Anderson and Parker 2008, Cookson 2010, 2013; Parker 2012, Dimitrova-Grajzl et al. 2014, Akee et al. 2012, Frye 2014).

The paper proceeds as follows. Section 2 provides a detailed description of our data. Section 3 offers a descriptive analysis of Equifax Risk Scores and per capita credit file counts by loan type, on and off reservations. Section 4 explores the determinants of consumer credit outcomes using block-group-level multivariate regression analysis. Section 5 concludes.

2. Data

The Federal Reserve Bank of New York/Equifax Consumer Credit Panel (CCP) is an anonymous, nationally representative sample of the credit history files of U.S. residents. In total, the CCP includes primary files covering about 12 million randomly chosen consumers, plus additional householder files for non-randomly selected individuals who have the same address as

a randomly selected individual.⁶ We analyze consumer credit data from the CCP for the years 2002-2012, using observations from December of each year.

The credit information in the CCP is extensive. It tracks each file's number of tradelines, in total and by type (first mortgages, home equity lines of credit, home equity loans, bank cards, bank auto loans, finance company auto loans, consumer finance, retail credit, student loans, and other) and repayment status (current; 30, 60, 90, and 120 days past due; severely derogatory; and in bankruptcy).⁷ Total balances due are reported for the same categories. Data are also available on credit limits (or proxies, such as highest previous balance) and the number of consumer-initiated credit history inquiries (such as for a loan application) within the past 3, 12, and 24 months. The CCP dataset does not include consumers' addresses but provides a code for the Census block of the address that the bureau assigns to each file.⁸

Credit files with sufficient information include the *Equifax Risk Score* which ranges from 280 to 850, with a lower score indicating a higher level of estimated credit risk. Consumers whose credit histories are 'thin', in the sense that they contain too little information to estimate debt repayment probability and therefore do not have an Equifax Risk Score.

Strictly speaking, the CCP's primary files are representative only of individuals with Social Security numbers. The estimated 10 percent of adults who lack a Social Security number are excluded. Lee and van der Klaauw (2010) assess the representativeness of the CCP with

⁶ The full CCP is based on credit files maintained by Equifax. The primary files are a 5 percent random sample of Equifax files that include a Social Security number. The householder files cover individuals not in the primary sample who live at the same address as a primary file individual. Equifax uses Social Security numbers to randomly select files for the CCP, but the CCP itself does not include Social Security numbers or any other personally identifying information. It uses randomly assigned identification numbers to track individual files over time. Over time, files are removed from the panel when the consumer dies or no longer has a file (and, in a small share of cases, for other reasons). The primary files are augmented each quarter by a 5 percent random sample of all the new files created that quarter that contain a Social Security number.

⁷ A tradeline refers to a single credit relationship, such as one mortgage or one auto loan. A bank card refers to a general purpose credit card issued by a bank.

⁸ Credit files also include the individuals' year of birth but no other demographic information.

respect to the full population of adults by comparing the data in the 2008 CCP primary files with corresponding estimates from the 2008 American Community Survey (ACS) for select geographies and from the Survey of Consumer Finance (SCF).⁹ Their findings suggest that the CCP is generally representative of the U.S. population of adults over 20 and their credit usage.¹⁰

Our unit of analysis is the Census block group, defined as a statistical division within Census tracts. Block groups typically have population between 600 and 3,000 individuals. Since block groups are a subdivision of tracts they do not cross tract, county or state borders. However, they may straddle Indian Reservation borders. The credit files we focus on are from Census block groups that lie within 10 miles (16 km) of any of the 317 Indian reservations in the 48 contiguous U.S. states.¹¹ Figure 1 illustrates visually the geographic sampling process.¹² Our analysis focuses on block groups that have at least 10 credit files and non-zero adult (25 years or older) population.

⁹ Lee and van der Klaauw (2010: 7) find that the CCP's age distribution "is very similar...especially when [the ACS sample] is restricted to individuals 20 years of age or older. The [CCP] panel generally has a slightly higher proportion of individuals 85 and older, and a slightly lower proportion under age 25....The population counts estimated from both samples are similar." Lee and van der Klaauw also use primary plus householder files to compare estimates of the total number of households and the distribution of households by size to ACS estimates. They find that the "total number of households...corresponds reasonably closely" (p. 8) and that CCP estimates of the distribution of household sizes differ about as expected, given that the CCP (but not the ACS) omits most minors. Finally, Lee and van der Klaauw compared estimates of total debt outstanding from the CCP to data from the Flow of Funds Accounts and found them "surprisingly similar" (p. 14). A separate comparison of debt reports between the CCP and the Survey of Consumer Finance (SCF) found that they "are strikingly similar, with one noteworthy exception: the aggregate credit card debt implied by SCF borrowers' reports" is lower by 34 to 50 percent (Brown et al. 2011).

¹⁰ However, there are caveats with respect to the representativeness of the CCP for reservation populations. First, the percentage of adults with no credit file or thin credit file may be higher on reservations, given widespread reports that credit is hard to access there. Second, Lee and van der Klaauw (2010) do not examine small rural geographies and thus provide no direct assessment of the accuracy of address information (and thus the accuracy of the CCP's Census block data) for these geographies. Third, accurate address information also could be problematic for reservations that include a large share of seasonally or intermittently mobile households moving frequently between the reservation and regional urban areas.

¹¹ An Indian reservation for our purposes is any area in the United States with a tribal area Census code between 1 and 4999 and at least some land recognized by the Census as reservation land. This excludes tribal statistical areas (e.g., Oklahoma Tribal Statistical Areas and State Designated Tribal Statistical Areas) which are assigned tribal area Census codes above 5000. It also leaves out tribal areas whose codes have values below 5000 but whose territory consists entirely of trust land.

¹² A detailed description of the dataset assembly process is available upon request from the authors.

We combine data on consumer credit from the CCP with socio-economic and demographic data available in the 2000 Census. Because our primary sources include detailed geographic information, we can compare and analyze consumer credit, economic, and demographic statistics on reservations, in areas adjacent to reservations, and in areas outside reservation borders.

3. Equifax Risk Scores and Credit File Counts On and Off Reservations

We examine how basic credit statistics compare between block groups fully contained within reservations (labeled 'Within'), block groups straddling borders of reservations (labeled 'Straddle'), block groups adjacent to reservations (labeled 'Adjacent') and block groups that are nearby (within 16 km) but neither contain nor border reservation land (labeled 'Nearby'). Because the CCP dataset is geographically less precise prior to year 2002 (Wardrip and Hunt 2013), we focus on the period from 2002 to 2012.

Table 1 reports data on the number of block groups and credit files, aggregated at the state level, for the year 2002. Although our dataset includes Census block groups in 35 states, we focus on the 19 states that have a non-trivial number of Within block groups and credit files. These 19 states collectively account for 386 of the 388 Within block groups and 19,365 of the 19,416 credit files in those block groups.

3.1. Equifax Risk Scores

Our first variable of interest is the mean block-group Equifax Risk Score. The risk scores are indicative of the likelihood that an individual will repay his/her debts without defaulting. The scores range from 280 to 850, with a lower score indicating a higher level of credit risk. If a file contains a risk score, it reflects past credit experience. If a file does not contain a risk score, then the file is thin (see Section 2): it contains too little information for a score to be calculated.

Table 2 shows the percentage of thin files, for the four block group types. In 2002, 12.4 percent of the credit files in our Within block groups lacked an Equifax Risk Score, as compared to 9.9 percent in the Nearby block groups. This gap widened a bit over the next 10 years, due to a greater increase in the percentage of thin files in Within than in Nearby block groups. A number of factors could explain the higher share of thin files on reservations. First, American Indian reservations have on average younger populations and thus, by default, less experience with credit markets. Second, limited access to banks on American Indian reservations slows the accumulation of credit experiences needed to produce an Equifax Risk Score. Finally, the unique status of trust land on American Indian reservations makes it difficult for individuals on reservations to obtain mortgages. Since mortgages play a significant role in building credit history, the absence of mortgage credit might lead to more thin files.

Among the files with an Equifax Risk Score, those from Within block groups generally have lower scores, on average, than those from Straddle, Adjacent, and Nearby block groups, as shown for our group of 19 states in Figure 2. In the Within block groups, mean Equifax Risk Scores in December 2012 were about 30 points lower than in the Nearby block groups and more than 35 points lower than in the Adjacent block groups. The December 2002 mean Equifax Risk Score of about 650 in the Within block groups is also below the threshold of 660 commonly used to demarcate subprime borrowers.¹³ During the 2002-2012 period, the mean Equifax Risk Score rose somewhat faster in the Within block groups, slightly narrowing their deficit relative to Straddle, Adjacent, and Nearby block groups. The lower average Equifax Risk Scores on reservations indicate a higher incidence of negative experiences with debt repayment in the past. Lower scores also make it hard to borrow and thus limit future access to credit.

¹³ See, for example, Office of the Comptroller of the Currency, Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, and Office of Thrift Supervision. Supervision and Regulation Letter 01-4 (GEN): Guidance on Supervision of Subprime Lending, January 31, 2001.

Table 3 provides a more detailed picture of Equifax Risk Scores across states and geographies for the years 2002 and 2012, focusing on Within and Nearby block groups only. The gap in mean Equifax Risk Scores holds, to varying degrees, in most of the 19 individual states. In 2002, mean Equifax Risk Scores in Within block groups were lower than in Nearby block groups in 17 of the 19 states, and 10 of these gaps were statistically significant. Four states had statistically significant gaps of more than 50 points (Arizona, North Dakota, New Mexico, and South Dakota). A reverse gap (Within higher than Nearby) in California was also statistically significant. By 2012, the mean Within block group Equifax Risk Score had risen somewhat in each of the 19 states, but the same is true for the Nearby block groups. The overall gap pattern remained the same, but the number of statistically significant negative gaps increased to 13 in 2012. The considerable state-by-state variation in the gaps invites a deeper analysis of the factors that may be associated with this variation; we address this in Section 4.

3.2. Credit File Counts

The lower mean Equifax Risk Scores in the Within block groups in most states suggest a reduced ability to qualify for loans. As a first simple characterization of credit volume, we next explore per capita credit file counts in Within and Nearby block groups by type of credit for the years 2002 and 2012. Table 4 reports the mean number of credit files for which a balance is currently being reported, by credit type and block group type, on a per capita basis for December 2002 (Panel A) and December 2012 (Panel B).¹⁴ The dataset allows us to examine six distinct types of consumer credit: first mortgage, home equity, auto loans, bank card credit, retail credit, and consumer finance.

¹⁴ The denominator used here is again the block group population 25 years old or older. Partly because this measure omits young adults who may have credit files and balances, some of the per capita measures in Table 4 exceed 1.

The first mortgage columns in panels A and B appear to strongly support concerns expressed in the Native American Lending Study and other sources that mortgage credit is scarce on reservations. In 2002 (Panel A), in 12 of the 19 states, the percentage of the population with a first mortgage balance reported in the CCP was statistically significantly lower in the Within block groups than in the Nearby block groups. In 8 states, the per capita number of files with first mortgage balances in the Within group was less than 50 percent of the per capita number of files with balances in the Nearby group, and the deficit in 3 other states was slightly above 50 percent. A potential explanation for these large differences, as already noted in the Native American Lending Study and elsewhere, is that mortgage credit can be especially difficult to obtain on reservations where significant amounts of land is held in trust; trust lands cannot readily be pledged as collateral.

Interestingly, Panel A also shows that the per capita number of files with first mortgage balances was higher (although not statistically significant) in the Within block groups in three states (Michigan, Wisconsin, and Wyoming) and on par in one more (Colorado). Two of these four states, Colorado and Wisconsin, also had relatively high mean Equifax Risk Scores in their Within block groups.

Similar first mortgage patterns are observed in 2012 (Panel B), although only 11 Within block group deficits are statistically significant; moreover, the relative position of the Within to Nearby block groups had slipped in the 4 previous exception states. Overall, however, Panel B echoes Panel A's evidence that first mortgage credit is significantly less common on reservations than in areas near, but containing, reservations. This evidence is bolstered by the fact that, across all 19 states combined, the mean per capita rate of files with first mortgage balances in 2002

(2012) was 0.20 (0.23) in Within block groups and a statistically significantly higher 0.36 (0.39) in Nearby block groups.

Both panels also generally show significantly lower access to home equity credit in the Within block groups, as measured by the per capita rate of CCP files with home equity balances (either installment or revolving, which are combined in Table 4). The state-by-state deficits also broadly resemble those for first mortgages. The 19-state mean per capita rate of files with home equity balances in 2002 is statistically significantly lower in the Within block groups (0.08) than in the Nearby block groups (0.12). The corresponding figures for 2012, 0.09 and 0.14 respectively, are also statistically significantly different from each other.

However, the comparison of other forms of credit, on and off reservations, reveals a pattern quite different from that on mortgages. For example, the only statistically significant difference between the Within and Nearby block groups with respect to the per capita number of files with an auto loan balance in 2002 is in Arizona, where files with auto loan balances are more common in the Within areas. The mean per capita number of files with auto loan balances is higher, although not statistically significant, in the Within block groups as compared to the Nearby groups in 14 other states in 2002. Across the 19 states combined the mean per capita rate of files with auto loan balances in 2002 is statistically significantly higher in the Within block groups (0.43) than in the Nearby block groups (0.36).

Among the 19 individual states, the per capita rates of files with bank cards, retail credit, and consumer finance balances also show few statistically significant differences in 2002. For retail and consumer finance the few significant state-level differences go in opposite directions, and for these two credit types and bank cards, the combined 19-state means for the Within and Nearby block groups are not statistically different in 2002.

In 2012, there are still few statistically significant Within-versus-Nearby differences for individual states in the mean per capita rates of files with auto, bankcard, retail, and consumer finance balances, but the combined 19-state means shows sharper results than in 2002. The 19-state mean for auto loans remains statistically significantly higher in Within block groups (0.53) than in the Nearby block groups (0.40). However, the mean per capita rate of files with bank card balances becomes statistically significantly lower in the Within block groups (0.68) than in the Nearby block groups (0.88). The same is true for files with retail balances, whose mean per capital rates were 0.49 in Within block groups and 0.55 in Nearby block groups. In both cases, the wider difference in the year 2012 19-state mean rate reflects a steeper drop in the rate for Within block groups over the decade.¹⁵ The Within versus Nearby difference in the per capita rate of files with consumer finance balances remains statistically insignificant in 2012.

We note that the ranking of states is somewhat different across the six credit categories. In Panel A of Table 4, the Within block groups are consistently near or above parity with the Nearby block groups in a few states, mainly Michigan (except for home equity), Wisconsin, and Wyoming. Some states consistently rank at least somewhat below parity, such as Idaho, Minnesota and Oklahoma. Other states would rank consistently low if not for auto loans (Nevada, South Dakota, and Washington), and other states are below and above parity in multiple categories. A somewhat similar pattern holds in Panel B, although the set of consistently high-ranking states is smaller (Wisconsin and Wyoming).

¹⁵ For bankcards, the 2002 19-state mean rates for bankcards were 0.89 in Within block groups and 0.94 in Nearby block groups. The corresponding figures for retail were 0.63 and 0.66.

4. The Determinants of Credit Outcomes: Regression Analysis

4.1. Outcome Variables and Samples

In this section, we further our descriptive analysis of credit conditions and credit usage in Section 3 by employing block-group-level regression analysis. We first examine the determinants of mean Equifax Risk Scores, discussed in Section 3.1, and consumer credit volume by credit type. To measure credit volume, we use block-group mean total credit balances (i.e. sum of current and past due credit balances in the block group divided by the number of credit files in the block group) for the following consolidated groups of loans: Home Loans (sum of first mortgage and home equity loan balances in Table 4), Auto Loans (sum of auto bank loans and auto finance loans), Consumer Loans (sum of bank card, retail, and consumer finance loan balances in Table 4 plus other consumer loans), and All Loans (sum of credit balances across all the listed loan types). In addition, we examine the determinants of one simple measure of delinquency in borrowing: block-group mean past due credit balance as percentage of mean total credit balance for All Loans.

Our full sample consists of more than 15,000 block-groups of all geographic categories vis-à-vis a reservation (i.e. Within, Straddle, Adjacent, and Nearby) for which there are at least 10 files with an Equifax Risk Score. We also examine results based on a subsample of nearly 400 block groups that are fully contained in a reservation (Within block groups). We pool the data on Equifax Risk Scores and measures of credit volume across four time periods: December of years 2002-2005. The choice of the year 2005 as the final year in which we measure our outcome variables reflects the fact that our socio-economic and demographic covariates are drawn from the 2000 Census; results (not reported) using the entire 2002-2012 time span of data are very similar.

Table 5 gives variable descriptions. Table 6 presents summary statistics for both the full sample of all block groups and the smaller sample of block groups fully contained in a reservation (Within). In comparison with the full sample, mean Equifax Risk Scores, mean total credit balances for All Loans, Home Loans, and Consumer Loans, and mean past due credit balance for All Loans are smaller in the Within sample. In contrast, the mean total credit balance for Auto Loans is greater in the Within sample both in absolute terms and as proportion of All Loans. The mean past due balance for All Loans as proportion of the mean total (sum of current and past due) credit balance is also greater in the Within sample than in the full sample. Regardless of the sample, however, mean past due balance is a relatively small proportion of mean total credit balance (about 3.6% in the sample of all block groups and about 5.5% in the Within sample). In the Within sample, the average age, educational attainment, and household income are all lower, while the percentage of residents self-identified as American Indians and unemployment are greater than in the full sample.

4.2. Explanatory Variables

We examine the role of a number of explanatory variables identified by previous descriptive and smaller-scale empirical studies as potentially important determinants of credit patterns on reservations (see, e.g., Listokin 2001, Pickering and Mushinski 1999, Manchester 2001, Jorgensen 2004, Parker 2012, Angadjivand et al. 2012). We include a set of dummies for block-group type; as discussed in Section 3, credit outcomes vary by a geographic area's location relative to a reservation. We include average age to allow for life-cycle effects in credit-related behavior. To explore the hypothesis that there is discrimination in lending against American Indian residents (Pickering and Mushinski 1999) and, at the same time, to allow for differences in cultural norms related to credit behavior ("Providing Financial Services to Native Americans",

1997), we include the percentage of residents self-identified as American Indian. We further include measures of male and female educational attainment, unemployment rate, and household income.

In a subset of regressions, we also control for whether adjudication of criminal and civil cases on the reservation is subject to Public Law 280 (PL280). PL280 transferred jurisdiction over criminal and civil matters away from the federal government and the tribes and established concurrent jurisdiction of state and tribal courts in selected parts of Indian country (see, e.g., Jiménez and Song 1998). The law's impact in Indian country has been subject to debate. One set of recent contributions finds a positive association between PL280 and credit conditions and economic development on reservations, perhaps because adjudication in state courts provides for greater stability in contract enforcement (Anderson and Parker 2008, Parker 2012). A complementary set of evidence, however, shows that PL280 has been associated with elevated levels of crime and lawlessness (Goldberg-Ambrose 1997, Goldberg et al. 2008, Dimitrova-Grajzl et al. 2014), possibly due to confusion about law enforcement responsibilities and a lack of additional funding for the PL280 states despite their expanded jurisdiction. Greater criminality in PL280 areas could have in turn adversely impacted financial development in these areas.

PL280 was passed at the height of the Termination Period, allegedly to combat lawlessness on reservations. Historical sources, however, reveal that the selection of areas where the new law would apply was an outcome of political bargaining involving the federal government, the states, and the tribes (see, e.g., Jiménez and Song 1998, Dimitrova-Grajzl et al. 2014: 134-135). The law was initially imposed on reservations in the 'mandatory' states of California, Minnesota, Nebraska, Oregon, and Wisconsin, except for three whose tribes

successfully lobbied against the law.¹⁶ Between 1953 and 1968, a number of 'optional' states adopted PL280 to a varying extent.

In 1968, an amendment (included in the Indian Civil Rights Act) was passed requiring states to obtain tribal consent before adopting PL280. This amendment also allowed states to initiate retrocession of jurisdiction back to the federal government (Goldberg 2010: 1046). "Although Indian nations were not given control over this process, they have been in a position to lobby their state legislatures to support this 'retrocession' of jurisdiction" (ibid.: 1046-1047). The process of lobbying with the state for retrocession presented many political obstacles and was quite "formidable" for the tribes (Goldberg and Champagne 2006: 723). By December 2005 (the end date of our estimating samples), retrocessions had occurred in several tribes and no tribe consented to adopting state jurisdiction under PL280 after the 1968 amendments (Goldberg 2010: 1047).

During the time period of our study, geographic area can therefore be one of three types with regard to PL280 status: PL280 applies; PL280 applied in the past but does not currently apply due to retrocession; and PL280 never applied. We, thus, include two different dummies: PL280 and Retroceded PL280. The omitted category is PL280 never applied.

4.3. Empirical Approach

To assess the role of the variables discussed in Section 4.2 above, we estimate a series of ordinary-least-squares (OLS) regressions. We include various sets of fixed effects to control for the confounding effect of any time-varying unobserved factors which may affect our measures of credit outcomes and, at the same time, correlate with our explanatory variables. Specifically,

¹⁶ The exceptions were the Red Lake Reservation in Minnesota, the Warm Springs Reservation in Oregon, and the Menominee Reservation in Wisconsin. The Menominee Reservation was terminated in 1954 and placed under effective state jurisdiction. It was then reinstated in 1973 but did not consent to PL280 and hence effectively retroceded (see Herzberg 1977, 1978). We code the Menominee Reservation as a retroceded PL280 area.

when examining the predictive power of block group location relative to a reservation, demographic, and socio-economic variables, we include a full set of reservation-by-year fixed effects, where 'reservation' is the reservation most closely associated with the block group.¹⁷ Reservation-by-year fixed effects capture any reservation-level policies, attitudes, and socio-economic conditions, as well as their changes over time, which might impact credit outcomes. Some salient factors of this type include reservation land ownership features (see, e.g., Anderson and Lueck 1992, Laderman and Reid 2010, Russ and Stratmann 2014), tribal culture and governance (see, e.g., Cornell and Kalt 2000, Pickering and Mushinski 2001, Dippel 2011, Akee et al. 2012), and the presence or absence of casinos (see, e.g., Evans and Topoleski 2002, Cookson 2010, Anderson 2013).

The remaining explanatory variable of interest—PL280 status—does not vary within reservations. When examining the association between credit outcomes and PL280 status, we thus explore specifications with either year-only fixed effects or state-by-year fixed effects. The inclusion of year-only fixed effects identifies the association between credit outcomes and the law from the ample cross-state variation in the adoption of the law. Year-only fixed effects, however, fail to control for state-level factors possibly correlated with the law and credit outcomes. In contrast, the inclusion of state-by-year fixed effects addresses the problem of state-level confounding factors but identifies the association between credit outcomes and PL280 exclusively off of the few within-state exceptions to the law (see, e.g., Goldberg et al. 2008). Given the benefits and shortcomings of the two approaches, we present the results based on both.

¹⁷ The reservation most closely associated with the block group was determined, first, based on shared territory. If the block group does not intersect any reservation, then the most closely associated reservation was determined, secondly, on adjacency. If the block group was not adjacent to any reservation then the most closely associated reservation was determined, thirdly, on population weighted distance.

Moreover, because PL280's impact was likely greatest on the reservations, we conduct our analysis using only the sample of block groups fully contained in a reservation (Within).¹⁸

Year-only, reservation-by-year, and state-by-year fixed effects all absorb changes in the aggregate price level, allowing us to interpret the effects of covariates on different measures of credit balances as real effects. We base statistical inference on heteroskedasticity-robust standard errors, clustered at the state level. Clustering at the state level allows for the plausible non-zero correlation between error terms for block groups from the same state.

Despite the inclusion of a wide range of block-group-level covariates and fixed effects, we emphasize that our OLS results primarily intend to identify associations between variables and should not be readily interpreted as capturing causal effects. This warning is particularly important to keep in mind in the case of the effect of PL280 since both the adoption of the law and retrocessions were likely endogenous to socio-economic conditions prevailing in the relevant geographic areas (Goldberg 2010, Dimitrova-Grajzl et al. 2014).¹⁹

4.4. Results: Equifax Risk Scores

Table 7 displays the results from two OLS regressions with block-group mean Equifax Risk Score as the dependent variable. Both the full sample (column (1)) and the Within sample (column (2)) estimation results are based on a specification that includes reservation-by-year fixed effects. The percentage of residents that self-identify as American Indians, age, and female educational attainment, are all statistically significant predictors of mean Equifax Risk Scores, regardless of the sample. All else equal, mean Equifax Risk Scores increase with average age

¹⁸ With the inclusion of state-by-year fixed effects, the effect of PL280 is identified off of altogether 15 block groups: one block group in Warm Springs Reservation, OR (an exception to PL280 adoption in mandatory PL280 states) and 14 block groups in Montana that are not part of the Flathead Reservation (the only reservation in Montana that agreed to PL280-induced jurisdiction). The effect of PL280 retrocessions is identified off of 11 block groups in the retroceded reservations in MN, NE, and OR (in NV, all reservations retroceded by 1988). See Table 5.

¹⁹ See, however, Anderson and Parker (2008), Parker (2012), and Cookson (2013) for an argument about exogeneity of PL280.

and female educational attainment, and decrease with the percentage of self-identified American Indians.

In the full sample (column (1)), mean Equifax Risk Scores statistically significantly increase with household income (at a decreasing rate) and male educational attainment, and decrease with unemployment. Relative to the nearby block groups, only block groups fully contained in a reservation feature statistically significantly different (higher) mean Equifax Risk Scores. In contrast to the results based on the full sample, in the Within sample (column (2)), male educational attainment and household income are not statistically significantly associated with mean Equifax Risk Scores. In addition, while only marginally statistically significant, the effect of unemployment in the Within sample is, curiously, positive.

To highlight the magnitude of some of these effects, based on the full sample results (column (1)), a 1 percentage point increase in the American Indian population is associated with a 0.48 point decrease in the mean Equifax Risk Score, an effect roughly equivalent to a 3 percentage point increase in unemployment or a 1 percentage point decrease in the percent of residents that have completed high school. Meanwhile living in a block group fully contained in a reservation (Within) is associated with a modest but non-trivial increase in the mean Equifax Risk Score compared to living in Nearby block groups (the excluded category). This would seem to suggest that the Equifax Risk Score deficits in Within block-groups discussed in Section 3.1 (see Table 3) are tied to American Indian racial identity and show up on reservations because of the correlation between individuals self-identifying racially as American Indian and living on a reservation.

However, it is premature to interpret the observed negative association between race and mean Equifax Risk Score as evidence of racial discrimination or to conclude that living on a

reservation per se has no negative effect on Equifax Risk Scores. In particular, reservations are often checkered patterns of trust land and fee-simple parcels. It is plausible that American Indians tend to live on trust land, while whites and other races tend to live on fee-simple land, and that trust status is the true underlying causal factor explaining the negative association between block-group mean Equifax Risk Scores and percent of American Indian population. Future work should investigate this question further.²⁰

The estimates on the effect of PL280 status are summarized in Panel A of Table 10. Both underlying regressions in Panel A feature the full set of demographic and socio-economic controls included in column (2) of Table 7 (coefficients not reported). The association between PL280 status and mean Equifax Risk Score is positive and marginally statistically insignificant in both the case when the law's effect is identified off of cross-state variation (column (1); p -value equals 0.152) and in the case when the law's effect is identified off of within-state variation (column (2); p -value equals 0.104). All else equal, relative to areas where PL280 never applied, mean Equifax Risk Score is also (statistically significantly) higher in block groups that retroceded from PL280. The difference between the coefficient on the PL280 dummy and the coefficient on the dummy variable indicating whether an area has retroceded from PL280 is statistically significant for the specification in column (2) (p -value is less than 0.001), but not in the case of specification in column (1) (p -value equals 0.256). Given the likely endogenous nature of an area's PL280 status (see Section 4.3), we view these results as capturing associations rather than pure causal effects.

²⁰ There are data limitations, however. The land-status flags in the TIGER-Line data only distinguish trust land from non-trust land outside of reservation boundaries. Inside reservation boundaries, one cannot tell from TIGER-Line data what percentage of a Census block group lies on trust land.

4.5. Results: Total Credit Balances

Table 8 presents multivariate regression results by type of mean total loan balance as the dependent variable for both full and Within samples. All specifications use reservation-by-year fixed effects. The results based on the full sample suggest that block group's geographic location matters, albeit in a somewhat surprising way. When it comes to All Loans and Home Loans (where Home Loans constitute the largest component of All Loans; see Table 6), we do not find a statistically significant difference between either the mean credit balance in block groups that are fully contained in a reservation (Within) or the mean credit balance in block groups that straddle a reservation (Straddles) and the average credit balances in the nearby off-reservation (Nearby) block groups (the excluded category). The coefficients on the Within and Straddles Reservation dummies are positive, but statistically insignificant (see columns (1) and (3)). The mean credit balance for All Loans and Home Loans in Adjacent block groups, however, is statistically significantly larger than the corresponding mean credit balance in the Nearby block groups.

In contrast, for Auto and Consumer Loans, the block groups that are contained in a reservation, straddle a reservation, or are adjacent to a reservation have a statistically significantly greater mean credit balance than the block groups in the nearby off-reservation areas (see columns (5) and (7)).²¹ The result that the usage of some forms of credit (auto and consumer loans) may be greater in Within than in Nearby block groups, noted in Section 3.2, is hence robust to measuring credit usage with total credit balance and, at the same time, controlling for a range of other covariates and reservation-by-year fixed effects.

²¹ Pairwise differences in the coefficients on the Within Reservation, Straddle Reservation, and Adjacent Reservation dummies are statistically insignificant both in the case of Auto and in the case of Consumer Loans.

Holding all else equal, the association between average credit balances and the percentage of individuals self-identified as American Indians is negative and robustly statistically significant in the case of All Loans, Home Loans, and Consumer Loans. This relationship holds both in the full and in the Within sample, although the implied magnitude of the effect is somewhat larger in the Within sample (see columns (1)-(4), (7)-(8)). In the case of Auto Loans, the association between the race variable and mean credit balance is positive and statistically significant based on the estimates from the full sample (column (5)), but statistically insignificantly different from zero based on the Within sample estimates (column (6)). The variation in the effect of the race variable is suggestive of the presence of substitution effects between different loan types among American Indians.

Among the remaining demographic and socio-economic covariates, the pattern of statistical significance on coefficients is generally stronger when estimation is carried out using the full sample of all block groups than when we rely on the Within block groups only. We thus highlight the full sample results. The association between mean credit balance and age is positive and statistically significant for Home Loans and Consumer Loans, and positive but statistically insignificant for All Loans. In contrast, for Auto Loans, the effect of age is negative and statistically highly significant. High school completion rates are robustly positively associated with mean credit balance. The coefficient on male high school completion rate is larger in magnitude than the corresponding coefficient on female high school completion rate for all types of loans. The association between mean credit balance and unemployment is negative and statistically significant for Auto and Consumer Loans (columns (5) and (7)), and insignificant for All Loans and Home Loans. Household income is consistently positively associated with average credit balances for all loan types.

Finally, to highlight the effect of PL280, we focus on the mean credit balance for All Loans as a comprehensive measure of total consumer credit volume. Panel B of Table 10 summarizes our results. The underlying regressions include the full set of demographic and socio-economic controls presented in column (2) of Table 8 (coefficients not reported). The association between mean credit balance for All Loans and application of PL280 is statistically significant both in the case when the law's effect is identified off of cross-state variation (column (3)) and when it is identified off of within-state variation (column (4)). Based on the estimate in column (4), the implied effect of PL280 is non-trivial in magnitude (one third of the standard deviation of the dependent variable). In contrast, the sign and statistical significance of the coefficient on the Retroceded PL280 variable varies across specifications. Based on the results in column (4), all else equal, exposure to PL280 followed by a retrocession is associated with a larger total consumer credit balance than never being subject to PL280. For the specification in column (4), the difference between the (relatively large) coefficient on the PL280 dummy and the (relatively small) coefficient on the dummy variable indicating whether an area has retroceded from PL280 is highly statistically significant (p -value is smaller than 0.001).

For reasons already stipulated, these results should not be readily interpreted as capturing the causal effect of PL280. However, our finding of a positive association between total consumer credit volume and PL280 does resonate with the results of Parker (2012) who argues that PL280 provides for a source of exogenous variation in *civil* jurisdiction in Indian country and that the adoption of PL280 positively affected per capita credit on the reservations.

4.6. Results: Past Due Credit Balance as Percentage of Total Credit Balance

Table 9 presents regression results using mean past due credit balance as a percentage of total credit balance across all loans as the dependent variable. Specification (1) includes the full

sample of block groups while specification (2) focuses on Within block groups. Both specifications feature the same set of demographic and socio-economic covariates along with a full set of reservation-by-year fixed effects. The predictive power of the regressions based on either the full sample or the sample of Within block groups is somewhat lower than in the case of the regressions explaining the variation in mean Equifax Risk Score and mean total (current plus past due) credit balance for All Loans discussed in Sections 4.3 and 4.4. In Table 9, R^2 equals 0.24 for the full sample specification in column (1) and 0.51 for the specification in column (2).

Based on the full sample estimates (column (1)), all else equal, mean past due balance as percentage of mean total credit balance is somewhat lower in the Within and Straddle block groups than in the block groups in the nearby off-reservation areas, though only the coefficient on Straddle block groups is statistically significant. Mean past due balance as the percentage of mean total credit balance statistically significantly increases with the percentage of the block group population that self-identifies as American Indian and unemployment, and decreases with income and educational attainment. The direction of the association between mean past due balance as percentage of mean total credit balance and individual demographic and socio-economic covariates is the same in the Within sample (column (2)), albeit the results are statistically less significant than in the full sample.

Panel C of Table 10 summarizes the results on the association between PL280 status and mean past due balance as percentage of mean total credit balance for All Loans. The underlying regressions include the full set of demographic and socio-economic controls presented in column (2) of Table 9 (coefficients not reported). All else equal, we find that the mean past due balance as percentage of mean total credit balance is lower in the areas where PL280 applies relative to the areas where PL280 never applied. This result obtains regardless of whether we identify the

law's effect off of cross-state (column (5)) or within-state (column (6)) variation. Based on the estimates in column (6), the implied effect of PL280 is non-negligible (27% of the standard deviation of the dependent variable). In contrast, both the sign and the statistical significance of the coefficient on the PL280 retrocession dummy vary across specifications. The overall explanatory power of the regressions underlying the results in Panel C of Table 10 is somewhat lower than in the case of regressions that underpin the results summarized in Panels A and B: for the regressions underlying the results in Panel C, the R^2 (not reported) ranges between 0.33 (column (5)) and 0.37 (column (6)).

5. Conclusion

This paper paints a first encompassing quantitative picture of consumer credit conditions and usage on American Indian reservations, gleaned from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel. We find evidence of deficits in several, though not all, types of credit usage and relatively limited or poor credit histories among reservation residents. We show that the degree of reservation differences in credit usage varies significantly by type of credit. We also document important interstate variability in the direction and extent of the credit-usage deficit on reservations as well as changes over time.

Using block-group-level multivariate regression analysis, we find that a block group's location relative to a reservation as well as demographic and socio-economic factors such as average age, percent of population that self-identifies as American Indian, educational attainment, unemployment, and household income are individually and collectively important predictors of mean Equifax Risk Scores and mean past due credit balance as percentage of total credit balance for the sum of all loan types. In contrast, when examining the determinants of mean total credit balances, the precise effect of individual variables varies across loan types.

Finally, we find that Public Law 280-granted state jurisdiction over criminal and civil matters in Indian country is positively associated with total consumer credit volume and Equifax Risk Scores (albeit the latter relationship is marginally statistically insignificant), and negatively associated with consumer loan delinquency. However, we also note that it is too early to make causal inferences based on the statistical relationships we uncover. Future work will aim to offer a causality-oriented assessment of specific socio-economic and institutional factors impacting reservation credit patterns.

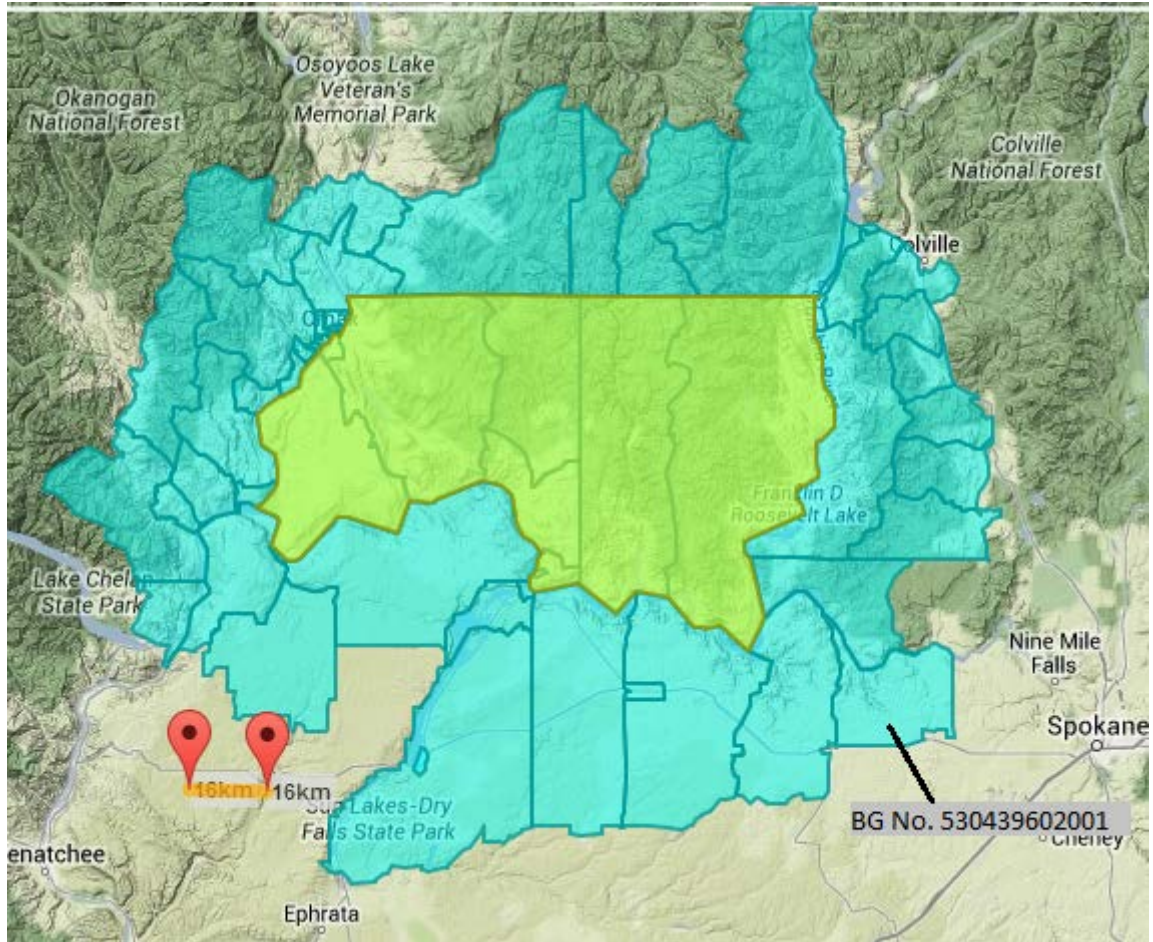
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Figure 1: Block groups within 16 km of the Colville Reservation (WA)



Notes: The reservation itself is highlighted in light green. All of the block groups in both the light green and blue highlighted areas are included in our sample. Note that many of the included block groups in our sample are like block group no. 530439602001; they do not lie in the reservation, nor do they even touch the boundary of the reservation, but they do have at least one point that is less than 16 km from at least one point on the boundary of the reservation. The orange line between the two markers represents 16 km for reference.

Table 1: Number of Block Groups and Files in Sample, by State and Location

Location→	Within		Straddle		Adjacent		Nearby		Total	
State ↓	Block Groups	Files	Block Groups	Files	Block Groups	Files	Block Groups	Files	Block Groups	Files
AZ	45	3,331	20	1,319	138	12,424	1,945	119,704	2,148	136,778
CA	23	1,585	112	8,028	81	6,421	1,785	119,601	2,001	135,635
CO	6	382	1	17	15	1,114	39	1,753	61	3,266
ID	22	738	4	132	33	1,516	136	6,623	195	9,009
MI	16	713	22	1,093	17	874	185	8,096	240	10,776
MN	14	490	69	2,836	35	1,310	456	25,123	574	29,759
MT	33	1,749	6	330	36	1,876	129	7,164	204	11,119
ND	8	208	1	31	15	819	25	1,036	49	2,094
NE	2	74	28	1,878	34	2,616	982	74,933	1,046	79,501
NM	35	1,956	10	1,092	99	6,908	629	37,477	773	47,433
NV	13	464	1	30	44	2,057	700	33,434	758	35,985
NY	9	339	4	123	27	1,008	24	735	64	2,205
OK	17	682	0	0	44	2,135	392	22,862	453	25,679
OR	5	206	26	1,375	18	640	270	12,624	319	14,845
SD	37	1,243	7	209	42	1,415	53	2,158	139	5,025
UT	8	576	13	445	18	1,081	93	4,951	132	7,053
WA	60	3,245	78	3,997	101	5,561	2,460	132,219	2,699	145,022
WI	9	487	51	2,765	32	1,746	610	30,308	702	35,306
WY	24	897	0	0	11	791	7	397	42	2,085
19 State Subtotal	386	19,365	453	25,700	840	52,312	10,920	641,198	12,599	738,575

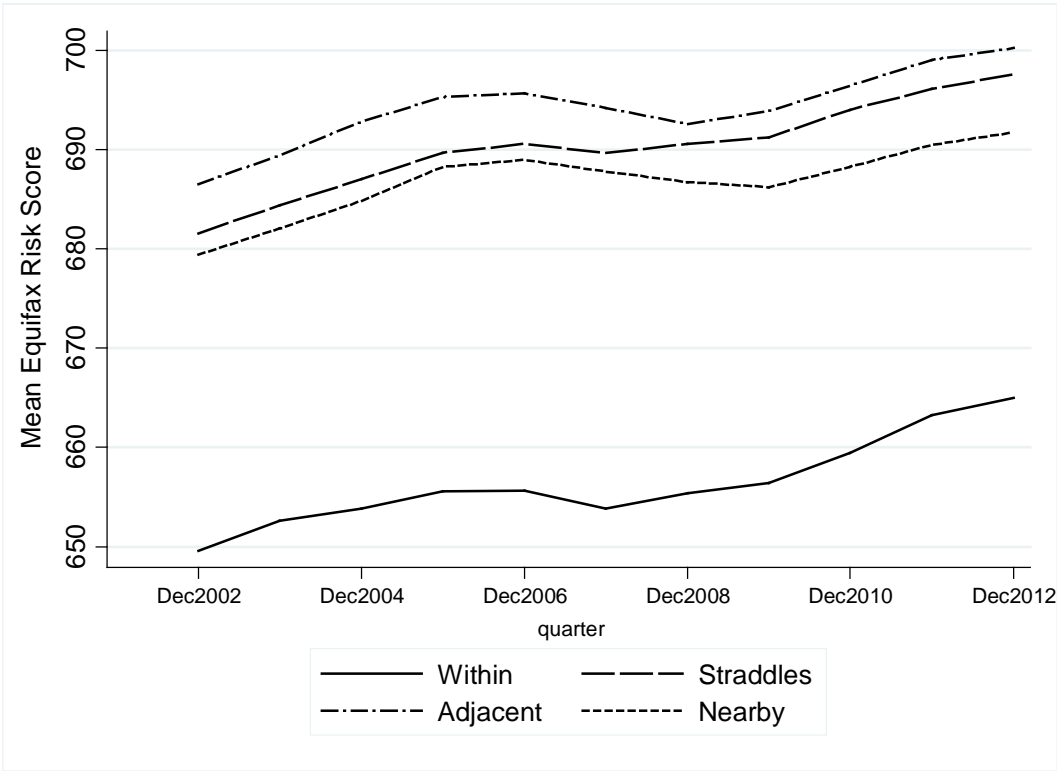
Notes: Block group categories are defined as follows: Within: Block group lies entirely within a reservation. Straddle: Block group has area on both sides of a reservation boundary. Adjacent: Block group area touches a reservation boundary but has no area within a reservation. Nearby: All other block groups within 16 km of a reservation (as defined in the Data section). Block groups with zero adult population and with fewer than 10 files were dropped in generating this and all subsequent tables. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

**Table 2: Percentage of Files with No Equifax Risk Score,
by Block Group Location**

Files Without Risk Score		
(19 States, by Block Group Location)		
2012	Within	13.1%
	Straddle	10.6%
	Adjacent	9.3%
	Nearby	10.2%
2002	Within	12.4%
	Straddle	10.5%
	Adjacent	9.3%
	Nearby	9.9%

Note: Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

Figure 2: Mean Equifax Risk Scores, 2002-2012, by Block Group Location



Notes: Mean Equifax Risk Score by block group location. Weighted by the number of files with an Equifax Risk Score in each block group in the 19 states in Table 1. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

Table 3: Mean Equifax Risk Score Comparison for 19 States, December of 2002 and 2012

Mean Equifax Risk Score by State and Block Group Location, 2002 and 2012								
State	2002				2012			
	Within	Nearby	Within as % of Nearby	Point Gap	Within	Nearby	Within as % of Nearby	Point Gap
AZ	586	679	86%	94	609	688	89%	79
CA	708	685	103%	-22	710	693	102%	-17
CO	683	692	99%	8	701	717	98%	16
ID	680	689	99%	8	699	707	99%	7
MI	684	701	98%	17	687	713	96%	25
MN	668	711	94%	42	677	727	93%	49
MT	652	689	95%	38	679	708	96%	29
ND	617	705	87%	88	650	725	90%	74
NE	669	697	96%	28	686	722	95%	36
NM	615	676	91%	61	635	692	92%	57
NV	622	661	94%	39	635	673	94%	38
NY	655	693	94%	38	663	705	94%	43
OK	653	663	99%	10	660	680	97%	20
OR	632	691	91%	59	638	705	91%	67
SD	638	696	92%	58	655	721	91%	66
UT	675	691	98%	16	686	710	97%	24
WA	674	693	97%	19	688	710	97%	22
WI	714	712	100%	-2	723	725	100%	2
WY	671	703	95%	32	691	738	94%	47

Notes: Point Gap cells are shaded grey if the 95% confidence bands of the *Within* mean and the *Nearby* mean do not overlap. Means are weighted by the number of files with an Equifax Risk Score in each block group. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

Table 4, Panel A: Means of Files with Balances as a Percentage of Block Group Population, by Location and Type of Credit (December 2002)

Panel A																		
State	First Mortgage			Home Equity			Auto			Bank Card			Retail			Consumer Finance		
	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby
AZ	0.09	0.38	24.1%	0.10	0.14	68.6%	0.87	0.38	226.0%	1.20	0.94	128.5%	1.02	0.65	157.1%	0.66	0.37	182.0%
CA	0.30	0.37	81.4%	0.10	0.12	81.2%	0.30	0.39	77.1%	1.11	0.96	115.2%	0.89	0.71	126.2%	0.35	0.38	91.8%
CO	0.31	0.32	97.2%	0.07	0.07	95.9%	0.37	0.26	143.3%	0.82	0.89	91.7%	0.38	0.48	79.2%	0.38	0.37	103.9%
ID	0.18	0.35	50.6%	0.07	0.13	54.5%	0.31	0.37	85.6%	0.62	0.94	65.9%	0.44	0.69	63.6%	0.26	0.49	53.9%
MI	0.33	0.27	122.4%	0.05	0.12	44.8%	0.34	0.26	130.6%	1.02	0.84	120.4%	0.55	0.49	113.3%	0.47	0.39	120.5%
MN	0.22	0.42	53.2%	0.07	0.14	50.6%	0.30	0.34	88.9%	0.82	0.98	83.2%	0.48	0.68	70.6%	0.41	0.42	96.1%
MT	0.18	0.33	53.1%	0.06	0.09	70.2%	0.39	0.25	155.6%	0.94	0.91	103.3%	0.53	0.58	92.0%	0.43	0.39	108.2%
ND	0.03	0.12	29.1%	0.05	0.06	83.0%	0.33	0.27	120.4%	0.78	0.81	95.8%	0.45	0.47	95.4%	0.33	0.41	81.4%
NE	0.06	0.13	46.6%	0.04	0.04	86.8%	0.25	0.21	115.2%	0.70	0.75	92.3%	0.45	0.42	107.6%	0.40	0.39	101.2%
NM	0.18	0.38	47.9%	0.10	0.11	91.1%	0.55	0.37	147.7%	0.78	0.92	84.4%	0.64	0.64	100.3%	0.64	0.41	153.2%
NV	0.02	0.38	6.1%	0.03	0.10	33.5%	0.42	0.40	104.8%	0.51	0.97	52.8%	0.28	0.65	42.8%	0.26	0.41	62.7%
NY	0.07	0.29	26.0%	0.08	0.15	52.0%	0.36	0.34	107.4%	0.82	0.91	89.8%	0.65	0.65	100.1%	0.42	0.43	97.6%
OK	0.12	0.28	43.2%	0.08	0.11	70.6%	0.29	0.32	91.6%	0.57	0.88	65.5%	0.35	0.57	61.9%	0.33	0.43	77.2%
OR	0.15	0.29	50.9%	0.03	0.10	32.4%	0.65	0.33	197.8%	0.95	0.87	108.8%	0.81	0.61	133.4%	0.46	0.37	126.7%
SD	0.06	0.18	32.6%	0.03	0.08	40.8%	0.39	0.30	128.4%	0.77	0.84	91.3%	0.36	0.42	85.9%	0.34	0.46	74.4%
UT	0.26	0.36	71.0%	0.09	0.09	101.9%	0.31	0.35	88.1%	1.00	1.02	97.4%	0.55	0.64	85.4%	0.48	0.45	107.6%
WA	0.31	0.41	75.9%	0.10	0.13	77.6%	0.37	0.35	107.1%	0.84	0.98	85.8%	0.67	0.73	91.1%	0.36	0.39	91.6%
WI	0.39	0.29	135.2%	0.12	0.09	135.9%	0.32	0.24	134.4%	1.08	0.88	123.8%	0.77	0.53	146.9%	0.45	0.38	115.8%
WY	0.23	0.21	111.2%	0.07	0.07	102.5%	0.34	0.33	102.0%	0.91	0.92	99.1%	0.51	0.43	117.9%	0.46	0.38	123.9%

Notes: Cells are shaded grey if the 95% confidence bands of the *Within* mean and the *Nearby* mean do not overlap. Means are weighted by the population 25-years-old or more in each block group. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

Table 4, Panel B: Means of Files with Balances as a Percentage of Block Group Population, by Location and Type of Credit (December 2012)

Panel B																		
First Mortgage				Home Equity			Auto			Bank Card			Retail			Consumer Finance		
State	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby	Within	Nearby	Within as % of Nearby
AZ	0.09	0.36	26.1%	0.08	0.13	60.3%	1.22	0.40	308.1%	0.65	0.82	79.0%	0.58	0.48	119.4%	0.41	0.21	198.5%
CA	0.26	0.40	64.5%	0.09	0.13	74.0%	0.29	0.42	67.5%	0.81	0.91	89.3%	0.55	0.62	87.5%	0.17	0.24	69.2%
CO	0.31	0.40	77.4%	0.10	0.12	88.0%	0.46	0.35	131.9%	0.69	0.87	80.1%	0.39	0.40	97.9%	0.19	0.21	87.7%
ID	0.22	0.41	52.9%	0.14	0.15	93.5%	0.36	0.43	85.4%	0.71	0.86	82.9%	0.49	0.59	83.6%	0.21	0.25	81.0%
MI	0.31	0.34	91.1%	0.08	0.14	58.4%	0.37	0.33	114.2%	0.72	0.75	95.8%	0.45	0.48	92.7%	0.18	0.18	95.5%
MN	0.29	0.49	58.7%	0.09	0.22	42.6%	0.33	0.41	81.3%	0.70	1.00	69.4%	0.42	0.66	64.3%	0.18	0.21	89.0%
MT	0.24	0.40	60.1%	0.06	0.12	47.7%	0.41	0.36	113.8%	0.67	0.93	72.1%	0.43	0.52	82.8%	0.12	0.20	61.6%
ND	0.08	0.18	47.3%	0.04	0.07	51.4%	0.32	0.29	110.5%	0.44	0.72	60.3%	0.30	0.46	66.8%	0.09	0.13	68.8%
NE	0.14	0.19	76.2%	0.05	0.05	93.2%	0.30	0.27	110.7%	0.48	0.64	74.6%	0.39	0.43	90.4%	0.10	0.10	107.0%
NM	0.20	0.43	46.0%	0.09	0.12	74.7%	0.73	0.46	158.1%	0.62	0.86	72.8%	0.51	0.50	101.8%	0.67	0.30	221.5%
NV	0.06	0.39	15.0%	0.02	0.11	21.2%	0.45	0.44	104.0%	0.63	0.90	70.1%	0.66	0.55	120.4%	0.26	0.23	113.1%
NY	0.07	0.30	24.8%	0.05	0.16	28.7%	0.46	0.43	105.8%	0.53	0.79	66.9%	0.43	0.56	76.6%	0.15	0.20	76.0%
OK	0.17	0.31	56.4%	0.08	0.08	104.9%	0.33	0.38	84.9%	0.44	0.66	66.7%	0.36	0.43	82.8%	0.29	0.24	120.6%
OR	0.13	0.30	44.3%	0.05	0.12	39.7%	0.53	0.32	163.7%	0.62	0.75	82.5%	0.66	0.50	132.5%	0.14	0.17	84.2%
SD	0.10	0.35	29.2%	0.04	0.13	31.5%	0.41	0.37	112.6%	0.51	0.83	61.4%	0.36	0.46	77.6%	0.09	0.12	77.5%
UT	0.37	0.49	76.5%	0.09	0.14	62.8%	0.72	0.55	131.3%	0.91	1.15	79.2%	0.47	0.57	83.2%	0.31	0.31	99.3%
WA	0.35	0.45	78.2%	0.11	0.16	72.5%	0.40	0.38	104.0%	0.76	0.94	80.1%	0.57	0.58	97.6%	0.18	0.19	93.4%
WI	0.43	0.38	111.9%	0.14	0.11	124.5%	0.37	0.31	118.5%	0.90	0.85	105.4%	0.60	0.56	106.9%	0.19	0.18	108.0%
WY	0.29	0.27	107.3%	0.08	0.05	150.4%	0.45	0.35	126.2%	0.79	0.71	110.9%	0.44	0.28	155.5%	0.21	0.18	118.0%

Notes: Cells are shaded grey if the 95% confidence bands of the *Within* mean and the *Nearby* mean do not overlap. Means are weighted by the population 25-years-old or more in each block group. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

Table 5: Variable Names and Description

Variable Name	Variable Description	Source
Equifax Risk Score	Block group per file average Equifax Risk Score.	CCP
All Loans Total	Block group per file average of the sum of total (current and past due) balances across all loans types (Home, Auto, Consumer), in USD.	CCP
Home Loans Total	Block group per file average of the sum of total (current and past due) balances across mortgages, home equity installment loans, and home equity lines of credit, in USD.	CCP
Auto Loans Total	Block group per file average of the sum of total (current and past due) balances across auto bank loans and auto finance loans, in USD.	CCP
Consumer Loans Total	Block group per file average of the sum of total (current and past due) balances across bank cards, consumer finance loans, and retail credit, in USD.	CCP
All Loans Past Due	Block group per file average of the sum of past due balances across all loan types, in USD.	CCP
All Loans Past Due as Percent of All Loans Total	All Loans Past Due divided by All Loans Total and multiplied by 100.	CCP
Within Reservation	Dummy variable equal to 1 if the block group is entirely contained within the boundaries of reservation associated with it.	2000 Census, TIGER/Line
Straddles Reservation	Dummy variable equal to 1 if the block group lies partially within the boundaries of the reservation associated with it.	2000 Census, TIGER/Line
Adjacent to Reservation	Dummy variable equal to 1 if the block group shares a border with its associated reservation but does not have any area inside the reservation.	2000 Census, TIGER/Line
Nearby Reservation	Dummy variable equal to 1 if the block group has any territory within 16 km (10 miles) of a reservation, but has no land inside the boundary of the reservation and does not share a border with the reservation.	2000 Census, TIGER/Line
% American Indian	Respondents can claim up to six races in the 2000 Census. The variable % American Indian is percent of the population in the block group who declare 'American Indian and Alaska Native' either alone or along with up to five other racial identities.	2000 Census, Summary File 1, Table P3.
Age	Block group average age. Calculated using aw counts for each range of age, multiplied by the mid-point of the age range, summed, and divided by the total population count	2000 Census, Summary File 3, Table P8.
% Completed HS, Men	Percent of the male population aged 25 and older who have completed a high school degree (includes equivalency) or higher level of education.	2000 Census, Summary File 3, Table P37.
% Completed HS, Women	Percent of the female population aged 25 and older who have completed a high school degree (includes equivalency) or higher level of education.	2000 Census, Summary File 3, Table P37.
% Unemployed	Percent unemployed calculated as the number of unemployed divided by the number in labor force among population age 16 years and older, and multiplied by 100.	2000 Census, Summary File 3, Table P43.
Median HH Income	Median household income, in USD1,000.	2000 Census, Summary File 3, Table 53.
PL280	Dummy variable equal to 1 if block group lies in one of Public Law 280 'mandatory' states (CA, MN, NE, OR, and WI) or 'optional' states in which state jurisdiction applies broadly to criminal and civil matters (NV, FL, WA, and MT), subject to the following exceptions: PL280 equals 0 for block groups that lie in Red Lake Reservation, MN; Warm Springs Reservation, OR; and Menominee Reservation, WI; as well as for block groups in MT that do not lie in Flathead Reservation.	Goldberg et al. (2008); U.S. Code Title 18, Section 1162.
Retroceded PL280	Dummy variable equal to 1 if block group lies in a reservation that retroceded PL280 prior to year 2000: Bois Forte, MN; Omaha and Winnebago, NE; Umatilla and Burns Paiute, OR; Menominee, WI (see fn. 16); and all reservations in NV. A number of WA reservations experienced partial retrocessions during the period 1969 to 2000. However, given the ambiguities surrounding the retrocession process (see Leonhard 2012), we code all WA reservations as PL280 reservations.	Goldberg et al. (2008)

Notes: CCP stands for Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

Table 6: Summary Statistics

Panel A: All Block Groups					
Variable Name	No. Obs.	Mean	Std. Dev.	Min.	Max.
Equifax Risk Score	62,137	682.3	43.7	510.3	802.6
All Loans Total	62,579	50,717.5	40,654.6	12.0	594,502.3
Home Loans Total	62,579	41,015.1	38,107.2	0	573,195.8
Auto Loans Total	62,579	4,099.2	2,269.3	0	40,688.5
Consumer Loans Total	62,579	5,603.2	3,790.2	0	293,591.1
All Loans Past Due	62,579	1,822.8	2,400.4	0	110,068.1
All Loans Past Due as Percent of All Loans Total	62,579	5.57	7.71	0	100
Within Reservation	62,579	0.025	0.156	0	1
Straddles Reservation	62,579	0.036	0.187	0	1
Adjacent to Reservation	62,579	0.059	0.236	0	1
Nearby Reservation	62,579	0.884	0.321	0	1
% American Indian	62,579	4.0	10.1	0	99.7
Age	62,579	37.2	6.9	15.9	84.6
% Completed HS, Men	62,579	39.0	8.3	0	100
% Completed HS, Women	62,579	42.0	8.6	0	100
% Unemployed	62,579	6.5	5.8	0	100
Median HH Income (in USD1,000)	62,579	42.992	18.951	0	200.001
Panel B: Within Block Groups					
Variable Name	No. Obs.	Mean	Std. Dev.	Min.	Max.
Equifax Risk Score	1,504	661.0	51.5	530.2	788.4
All Loans Total	1,559	29,500.7	27,946.9	373.6	294,024.7
Home Loans Total	1,559	19,832.5	26,046.2	0	263,056.7
Auto Loans Total	1,559	4,395.3	2,508.3	0	20,823.6
Consumer Loans Total	1,559	5,272.9	3,519.8	148.5	40,338.0
All Loans Past Due	1,559	1,619.1	2,246.1	0	26,790.4
All Loans Past Due as Percent of All Loans Total	1,559	8.98	11.08	0	87.58
% American Indian	1,559	38.7	35.5	0.2	99.7
Age	1,559	35.4	7.4	19.6	67.3
% Completed HS, Men	1,559	36.7	8.2	9.8	61.7
% Completed HS, Women	1,559	39.4	7.8	0	56.8
% Unemployed	1,559	11.9	9.2	0	60.0
Median HH Income (in USD1,000)	1,559	31.362	12.618	4.583	95.399
PL280	1,559	0.326	0.469	0	1
Retroceded PL280	1,559	0.037	0.188	0	1

Notes: The table presents summary statistics for the estimating samples for results reported in Tables 7-10. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

Table 7: Regression Results, Mean Equifax Risk Score

Explanatory Variables	All	Within
	Block Groups	Block Groups
	(1)	(2)
Within Reservation	4.63*** (1.61)	
Straddles Reservation	1.62 (0.98)	
Adjacent to Reservation	1.20 (1.15)	
% American Indian	-0.48*** (0.05)	-0.68*** (0.09)
Age	2.39*** (0.09)	2.35*** (0.32)
% Completed HS, Men	0.45*** (0.14)	0.03 (0.35)
% Completed HS, Women	0.44*** (0.07)	0.96*** (0.28)
% Unemployed	-0.15** (0.07)	0.47* (0.27)
Median HH Income (in USD1,000)	1.63*** (0.08)	0.17 (1.04)
Median HH Income Squared	-0.01*** (0.00)	0.01 (0.01)
Fixed Effects	Reservation	Reservation
	by Year	by Year
R-squared	0.72	0.79
No. Obs.	62,137	1,504

Notes: The table reports results based on OLS regressions using block-group data. The dependent variable is mean Equifax Risk Score. The omitted category is Nearby Reservation. Reservation in 'reservation by year fixed effects' denotes the reservation most closely associated with the block group (see fn. 17). Heteroskedasticity-robust standard errors clustered at state level in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

Table 8: Regression Results, Mean Total Credit Balance by Loan Type

Explanatory Variables	All Loans		Home Loans		Auto Loans		Consumer Loans	
	All Block Groups (1)	Within Block Groups (2)	All Block Groups (3)	Within Block Groups (4)	All Block Groups (5)	Within Block Groups (6)	All Block Groups (7)	Within Block Groups (8)
Within Reservation	993.42 (1,347.25)		85.68 (1,176.57)		387.61** (179.18)		520.13** (205.58)	
Straddles Reservation	1,047.99 (911.98)		219.26 (856.92)		220.45*** (66.70)		608.27*** (202.29)	
Adjacent to Reservation	2,258.90*** (826.75)		1,570.21** (701.60)		398.37*** (78.79)		290.32** (116.04)	
% American Indian	-100.06*** (23.14)	-172.90** (75.40)	-96.09*** (24.02)	-138.37* (73.02)	11.50*** (3.91)	-4.15 (7.29)	-15.47*** (5.26)	-30.38*** (9.13)
Age	64.59 (41.78)	18.69 (326.25)	98.04** (41.44)	72.06 (303.57)	-50.75*** (5.52)	-21.49 (29.43)	17.30*** (4.50)	-31.89 (31.54)
% Completed HS, Men	241.58*** (68.57)	128.86 (117.79)	191.80*** (65.89)	97.72 (121.73)	11.81*** (3.34)	-12.56 (23.00)	37.98*** (6.88)	43.71* (23.48)
% Completed HS, Women	169.67*** (49.05)	143.40 (206.90)	141.62*** (43.95)	97.74 (201.53)	13.66** (5.30)	9.88 (24.46)	14.39** (5.58)	35.78 (33.14)
% Unemployed	13.35 (82.24)	46.39 (226.52)	56.66 (81.03)	68.20 (192.76)	-24.04*** (3.49)	17.19 (23.51)	-19.27*** (3.00)	-39.00* (22.28)
Median HH Income (in USD1,000)	1,062.15*** (116.83)	-852.48 (804.47)	891.34*** (119.71)	-886.43 (798.97)	84.92*** (3.55)	89.33** (42.32)	85.89*** (7.88)	-55.38 (37.37)
Median HH Income Squared	2.67*** (0.95)	23.30** (11.05)	3.23*** (0.97)	22.62* (10.94)	-0.37*** (0.03)	-0.45 (0.34)	-0.19*** (0.06)	1.13** (0.50)
Fixed Effects	Reservation by Year	Reservation by Year	Reservation by Year	Reservation by Year	Reservation by Year	Reservation by Year	Reservation by Year	Reservation by Year
R-squared	0.66	0.64	0.66	0.64	0.35	0.49	0.24	0.49
No. Obs.	62,579	1,559	62,579	1,559	62,579	1,559	62,579	1,559

Notes: The table reports results based on OLS regressions using block-group data. The dependent variable is All Loans Total in columns (1) and (2); Home Loans Total in columns (3) and (4); Auto Loans Total in columns (5) and (6); and Consumer Loans Total in columns (7) and (8). The omitted category is Nearby Reservation. Reservation in 'reservation by year fixed effects' denotes the reservation most closely associated with the block group (see fn. 17). Heteroskedasticity-robust standard errors clustered at state level in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

**Table 9: Regression Results,
Mean Past Due Credit Balance as Percentage of Mean Total Credit Balance, All Loans**

Explanatory Variables	All	Within
	Block Groups	Block Groups
	(1)	(2)
Within Reservation	-0.49 (0.43)	
Straddles Reservation	-0.58*** (0.20)	
Adjacent to Reservation	-0.16 (0.26)	
% American Indian	0.08*** (0.02)	0.10*** (0.03)
Age	-0.12*** (0.02)	-0.16 (0.10)
% Completed HS, Men	-0.09*** (0.03)	0.03 (0.10)
% Completed HS, Women	-0.06*** (0.01)	-0.19** (0.07)
% Unemployed	0.09*** (0.02)	0.02 (0.16)
Median HH Income (in USD1,000)	-0.16*** (0.02)	-0.22 (0.17)
Median HH Income Squared	0.00*** (0.00)	0.00 (0.00)
Fixed Effects	Reservation	Reservation
	by Year	by Year
R-squared	0.24	0.51
No. Obs.	62,579	1,559

Notes: The table reports results based on OLS regressions using block-group data. In both specifications, the dependent variable is All Loans Past Due as Percent of All Loans Total. Results in column (1) are based on all block groups. Results in column (2) are based on the sample of Within block groups only. For specifications in column (1), the omitted category is Nearby Reservation. Reservation in 'reservation by year fixed effects' denotes the reservation most closely associated with the block group (see fn. 17). Heteroskedasticity-robust standard errors clustered at state level in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.

**Table 10: Summary of Results on PL280 Status,
Within Block Groups**

Panel A: Dependent Variable: Equifax Risk Score		
	Year FE	State by Year FE
	(1)	(2)
PL280	7.61 (5.12)	5.12 (3.01)
Retroceded PL280	16.07** (6.91)	19.77*** (2.99)
Panel B: Dependent Variable: All Loans Total		
	Year FE	State by Year FE
	(3)	(4)
PL280	5,283.86* (2,725.73)	9,243.21*** (1,018.3)
Retroceded PL280	-4,202.96 (2,626.82)	3,444.30** (1,382.16)
Panel C: Dependent Variable: All Loans Past Due as Percent of All Loans Total		
	Year FE	State by Year FE
	(5)	(6)
PL280	-2.05** (0.86)	-3.01*** (0.98)
Retroceded PL280	2.25 (3.08)	-2.31* (1.29)

Notes: The table reports selected coefficients based on OLS regressions using block-group data for the sample of Within block groups. The dependent variable is listed in the name of each panel. Regressions control for the full set of demographic and socio-economic variables featured in Tables 7-9, as well as either year-only (columns (1), (3), and (5)) or state-by-year (columns (2), (4), and (6)) fixed effects. Heteroskedasticity-robust standard errors clustered at state level in parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively. Computed using data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.