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Geographic Banking Discrimination in the United States

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ABSTRACT

Financial institutions in the United States have historically discriminated against Black Americans in a multitude of ways. One potential dynamic of unequal access that remains understudied is geographic in nature. That is, are commercial banks less likely to locate in neighborhoods with more Black people? Using a fixed effects and selection on observables model, I find that a 1 percentage point increase in an area's Black population is related to a 0.11 decrease in the number of commercial banks in that area. This effect is localized primarily in urban areas, particularly in cities in the Mid-Atlantic, Upper Midwest, and Pacific Coast regions. I also find that this disparity between whiter and Blacker neighborhoods has reversed and widened since 2000. In 2000, a 1 percentage point increase in an area's Black population was associated with 0.19 more banks; by 2020, an increase in the Black population of the same magnitude was related to 0.14 percent fewer banks. These results suggest that bank closures and relocations in the aftermath of the Great Recession disproportionately affected Black neighborhoods. More broadly, policymakers should expand the scope of what banking discrimination entails, even if my results do not reveal a specific policy prescription that could undo this disparity.

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I. Introduction

Leading up to the height of the Great Recession, commercial banks appeared to target Black neighborhoods with high-risk loans to cover mortgages or other methods of consumption. In Memphis, Wells Fargo's actions were especially noticeable. With employees testifying that their managers instructed them to push high-interest loans in predominantly Black neighborhoods, it was no surprise that by the onset of the mortgage default crisis, the bank's foreclosure rate in Black neighborhoods was seven times that in white neighborhoods (Powell 2010). According to mere observation, it would appear that Black people in Memphis would be better off with banks like Wells Fargo courting less of their business.

Yet anecdotes like these ignore the broader importance of commercial banking in alleviating wealth inequality. Financial institutions fail Black Americans by providing fewer products and services, not merely by hawking worse products. As recently as 2019, McKinsey reported that there were roughly 50 percent more financial institutions per capita in white neighborhoods than in Black ones, with it being more expensive to take out loans and more difficult to cash checks in majority non-white neighborhoods (Moise 2019).

This disparity has far-reaching ramifications for how individuals make optimal decisions. On a fundamental level, the ability to transfer resources across time is crucial for personal finance or business creation. Commercial banks are central to that endeavor–they exist to provide those services in a minimally frictionless manner.

Access to credit is vital for both efficiency's sake and distributive matters. Few examples encapsulate how important it is better than the wave of banking deregulation that occurred in the United States during the 1980s. For instance, increased competition among commercial banks increases incorporation of new banks that serve previously underserved customers. Such reforms also decrease the racial wage gap and racial segregation (Levine, Levkov, and Rubinstein 2009). These results replicate when applied to groups who previously had less access to credit–young people, lower income households, for instance–as well as Black households (Tewari 2014). These examples all point to one primary result: one's ability to patronize commercial financial institutions is linked to better economic outcomes.

That patronage, however, has rarely been as easy for Black Americans as it has been for their white counterparts. Sander, Kucheva, and Zasloff (2018) identify three types of discrimination lending institutions perpetuated against Black people. First, lenders would refuse to offer credit in predominantly Black neighborhoods. This practice, termed redlining, put Black Americans in a financial bind: if they wanted a mortgage, they would have to settle for a larger down payment or for interest rates well above what white people with similar levels of wealth and income paid. The second form of discrimination was even less subtle and more pervasive before the Civil Rights Movement: banks would refuse to lend to Black households attempting to purchase property in majority white neighborhoods.

These forms of discrimination inspired the passage of the Community Reinvestment Act (CRA) in 1977. This legislation mandates that the Federal Reserve, the Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (OCC) evaluate how well commercial banks do in responding to the needs of underserved communities. The CRA, however, has not been a panacea. The law is riddled with issues–from bureaucratic redundancy between the three enforcement agencies to the redefinition of commercial banks into ostensibly communitarian institutions rather than strictly private market actors (Overby 1995). The law also had unintended consequences: it encouraged riskier lending which ultimately caused an increase in defaults in the areas the law targeted (Agarwal et al. 2012).

Despite its intended goal, the CRA also did not end all forms of disparities in lending. The third type of commercial banking discrimination Sander, Kucheva, and Zasloff (2018) find proliferated after commercial banking deregulation and the enactment of the CRA, an environment that was historically preferable for Black homebuyers compared to the first three quarters of the 20th century. During this period, banks continued to discriminate via prima facie race-blind underwriting criteria that overestimated Black Americans' loan risk. Still, as Sander, Kucheva, and Zasloff note, by 1990 lending had become fairer. This analysis of fair lending, although thorough within the confines of the 20th century, may miss a more subtle form of discrimination that persists to the present.

The goal of this thesis is to better understand the contemporary situation of commercial banking discrimination from a geographic perspective in three distinct ways. First, this paper quantifies potential barriers to commercial bank access based on immutable characteristics (i.e., race) and identifies specific regional trends in those barriers. Second, this paper updates the literature on commercial bank placement by focusing on the 21st century, whereas much of the literature has focused on bank access during a period of banking deregulation in the 1980s and 1990s. Finally, I propose a fourth type of possible banking discrimination that Sander et. al. overlook: banks undeserving Black communities by locating fewer branches in Blacker areas, even when other characteristics that determine bank placement are the same between neighborhoods.

II. Previous Literature on Access to Credit and Wealth Distribution

Income and wealth gaps between white and Black Americans are well-documented. As income and wealth are both metrics that could reasonably determine access to credit–and, in turn, where banks choose to locate–understanding the evolution of the racial disparities along those dimensions informs an analysis of the discrepancy this paper is interested in. According to Wolff (2018), the ratio of Black wealth to non-Hispanic white wealth fell from 0.19 to 0.14 over the course of the Great Recession, with Blacks undertaking 2.5 times more debt relative to wealth than whites. This gap in net worth diminished when accounting for Social Security and pension wealth. However, the benefactors of this tighter wealth distribution were primarily elderly Blacks, not a population who rely upon commercial banks for new mortgages or small business loans.

The current situation with respect to income inequality by race is also far from ideal. Akee, Jones, and Porter (2019) find that Blacks remain at the bottom of the income distribution relative to non-Hispanic whites. They uncover that Blacks' position at the lowest rung of the income distribution has remained persistent throughout the first decade and a half of the 21st century. After the Great Recession, Blacks were also less likely to be upwardly mobile relative to whites, despite there being much income mobility within the group. These discrepancies cannot merely be attributed to differences in effort or hours worked (Ravallion 2017). In short, these results paint a grim picture of income inequality and immobility within post-2008 America.

Disparities in access to credit follow a predictable pattern: majority Black census tracts not only had fewer bank branches than non-majority Black tracts, but the rate of decrease in bank branches in those majority Black tracts was faster from 2010 to 2020 (Ouazad, Broady, and McComas 2021). Within that same period, the number of physical bank branches dwindled as online banking became common. Still, differences in services are not a function of mere differences in demand for in-person banking services: unbanked or underbanked people substitute conventional financial mechanisms with payday loan services when they cannot access traditional banking services. As Ouazad, Broady, and McComas note, this substitution demonstrates that demand for physical banking remains prevalent across the income distribution, even when access is not equal. However, it is not clear that this difference is caused strictly by discrimination. The income and wealth disparities discussed above could potentially account for the differences in bank location as banks cater to higher earners or wealthier clients.

Conditions for Blacks can nevertheless be improved, as happened during intrastate banking reform in the 1980s. Tewari (2014) and Beck, Levine, and Levkov (2007) each use a difference-in-difference strategy to determine that state-level commercial banking deregulation led to an increase in access to credit for low-income Americans, and Blacks in particular. These new rules–which applied only to commercial banks and allowed more banking institutions to open branches within states they had previously not been allowed to operate in–effectively lowered wealth requirements for obtaining mortgage, business, or personal loans. These loosened rules also had positive downstream effects for wage inequality. In states where there was both a high degree of taste-based discrimination and a deregulation of commercial banking, competition erased roughly one-fifth of the wage gap between Blacks and whites (Levine, Levkov, and Rubinstein 2008).

One objection to emphasizing the importance of bank location in the 21st century is that online banking has decoupled physical banking from a neighborhood's financial well-being. Alternatively put, with banking functionality transferred to the internet, the closeness of bank branches matters significantly less for would-be borrowers. Still, Ergugnor (2010) finds that in-person banking significantly increases mortgage originations in low-income communities. Moreover, Erel and Liebersohn (2020) uncover evidence that the rise of online services for basic financial functions expands overall access to credit rather than substitute for lines of credit afforded to banking customers. Put together, these results indicate that online and physical banking are complements and that in-person banking remains a vital option for would-be borrowers. Understanding where banks locate therefore has important distributive implications, even if online banking has increased credit access.

A notable potential downside to such an increase in the flow of credit is that it has the potential to spur a new wave of resegregation. While research on banking deregulation from the 1970s to the 1990s argues that increased competition can lead to increased credit and in turn reduce inequalities, that is not a universal dynamic. For instance, the expansion of credit with respect to mortgages from 2000 to 2006 led to patterns of white exit from predominantly nonwhite neighborhoods (Ouazad and Rancière 2016). As Blacks enjoy access to more credit and the relatively higher wealth and income that comes with it, there remains a tradeoff with crime and education in a more segregated neighborhood. This result has been replicated previously: as Black neighborhoods become richer and more educated, they enter a feedback loop in which the quality of public goods declines due to white exit from that neighborhood (Bayer, Fang, and McMillan 2014, Bayer, McMillan, and Rueben 2005). In short, because there are few neighborhoods that are both middle or upper class and predominantly Black and because white residents tend to leave areas with increasing proportion of Black residents, higher socioeconomic status Blacks have to choose between living in areas that are majority Black with fewer amenities and areas that are majority white but have more resources.

III. Model

By finding the relationship between commercial bank branch placement and tract racial composition using a selection on observables model, this paper situates itself snugly within the literature on banking location decisions and race. Specifically, the results of this paper will update the literature on credit access by redescribing the nature of bank location disparities. Beyond that, this model will provide insight into the heterogeneity of such effects. The United States is a geographically and institutionally diverse country, so it would be an extraordinary coincidence if any differences between neighborhoods this paper uncovers remained constant across states or regions. Moreover, as banks open or close branches in new areas, one would expect Black Americans' relative access to credit to fluctuate as well. This model captures these fluctuations as well.

The model at the center of this thesis attempts to limit the selection bias present when analyzing an unconstrained regression model of bank branches within a given entity and the relative size of the Black population within that entity. The simple model would fail to capture important effects on bank location that would otherwise be overlooked (for instance, banks tend to locate in neighborhoods with higher property values and higher income). It would also fail to internalize nationwide trends in commercial banking placement.

Two sources comprise the unique dataset used in this analysis: Decennial Census summary files and Federal Deposit Insurance Corporation (FDIC) microdata on commercial bank location. Collected at the ZIP Code Tabulation Area (ZCTA) level, these data include observations from 2000, 2010, and 2020. Notably, the FDIC data contains the ZIP codes of each branch, not the ZCTA in which each bank is located. The United States Census Bureau provides a relationship file for each ZIP code into ZCTA for each year in this sample, so the data for bank branch location are translated into ZCTA form.

A simple regression with the natural log of branches as the dependent variable illustrates the shortcomings of OLS for this research. Using the following model:

$$ln\ \ Branch_{it} = \beta_o + \beta_1 PercentBlack_{it} + \varepsilon_i\ for\ t = 2000, 2010, and\ 2020$$

I estimate the log of branches by ZCTA for each year in the panel, only constrained by the majority demographic. ZCTAs with majority Black populations in 2000 had roughly the same number of branches as tracts without a majority Black population. In 2010, majority-Black tracts had 6.5 percent fewer bank branches than non-majority-Black tracts, with that gap widening to 8.9 percent fewer branches by 2020. Perhaps a surprise at first glance, in all three years in the sample, neighborhoods with a majority white population had fewer bank branches than their counterparts. However, as we will see in the complete model, disparities in total population and urbanicity between majority white tracts and majority nonwhite tracts account for much of this effect.

The primary model employed to investigate the relationship between bank location and racial composition uses an entity and time fixed effects strategy to reduce selection bias. By including tract level fixed effects, the model eliminates bias stemming from time invariant characteristics at the ZCTA level. Moreover, by including year fixed effects, the model captures nationwide variation in the total amount of bank branches for each year in the panel. However, the within transformation model cannot yield precise results because not all selection bias is removed. For time variant variables, there still may be unobserved variables that are the primary driver of bank location. In this scenario, I cannot simply accept the conditional independence assumption and determine racial composition as the cause of branch geography. I can, however, reduce selection bias by including relevant covariates that are both correlated with the explanatory variable and the outcome variable.

For the sake of normalizing our dependent variable and simplifying interpretation, I transform the total amount of bank branches in each tract to the natural logarithm of the total amount of bank branches per tract. This transformation means that observations where the number of branches in a tract must be omitted. I will address this potential issue in a robustness check. I also use the natural log of total population, median home value, and median income as control variables.

Of the three main control variables used in this model, the first is log median income in each tract. The reasoning behind this inclusion is simple: banks likely target higher-earning households who put more resources into bank accounts and have more income to leverage when applying for a loan. Income is heavily correlated with race, so median income is a clear choice of an observed confounder that should be included (Akee, Jones, and Porter 2019).

The next covariate is the log of total population in a given ZCTA. The reasoning in support of inclusion is just as sturdy as the last: institutions will put more branches in areas with more people. From the data around which this study is based, the relationship between population and bank location is statistically significant and economically important: for every 1000 more residents in a given tract, the total number of bank branches increases by 3.1 percent.

One crucial variable that would be ideal to include in the regression is wealth. Banks want to target wealthier areas where residents have more collateral when applying for different loans. The Decennial Census survey does not collect such data, but it does include a useful metric heavily related to overall wealth, particularly in the American context: housing value. As Case, Quigley, and Shiller (2001) show, housing value is a strong indicator of both overall wealth and consumption. Furthermore, increasing home values that come with home ownership positively affects net worth at a higher rate compared to non-housing wealth (e.g., financial assets) across the socioeconomic spectrum (Boehm and Schlottman 2008). One possible issue including this control is that it may open a new backdoor path, as easier access to credit may cause higher home values rather than the reverse (Adelino, Schoar, and Severino 2011). Still, banks tend to open up credit more in areas with rising housing values (Adelino, Schoar, and Severino 2018). Thus, including median home value in a given ZCTA at least partially accounts for unobserved wealth and is a justified control in this model.

In sum, I represent the central regression as follows:

$$ln\ Branch_{it} = c_i + \gamma_t + \beta_1 PercentBlack_{it} + X_{it}^{'}\beta + \varepsilon_i$$

where c_i is an ZCTA-level fixed effect, γ_t is a year fixed effect, and X_{it}' is a vector of all control variables. I also add interaction terms between percent Black and year observed to see how racial composition is associated with bank location over time. This model is as follows:

$$ln\ Branch_{it} = c_i + \gamma_t + \beta_1 PercentBlack_{it} + \beta_2 PercentBlack_{it} \times 2010 + \beta_3 PercentBlack_{it} \times t = 2020 + X_{it}^{'}\beta + \varepsilon_i$$

Because this model uses tract-level fixed effects, two problems in understanding the heterogeneity of the effect of racial composition on bank location arise. An entity fixed effect model cannot include any other time invariant variables, such as dummy variables for states, region, or urbanicity. Thus, to understand how the relative size of a tract's Black population varies across regions, I complete a fixed effect regression for each state and region and for both urban and rural areas with the same specifications as the general model. In doing so, I observe the granularity of the model and identify where racial disparities with respect to commercial bank location are most pronounced. These specifications can be written as:

$$ln\ Branch_{itru} = c_{iru} + \gamma_{tru} + \beta_1 PercentBlack_{itru} + X_{itru}^{'}\beta + \varepsilon_{iru}\ \forall\ regions\ r\ and\ \forall\ urbanicities\ u$$

$$ln\ Branch_{itsu} = c_{isu} + \gamma_{tsu} + \beta_1 PercentBlack_{itsu} + X_{itsu}^{'}\beta + \varepsilon_{iru} \forall\ states\ s\ and\ \forall\ urbanicities\ u$$

The Census Bureau delineates each region used in this model, splitting the country into 9 divisions: Pacific, Mountain, West South Central, East South Central, South Atlantic, West North Central, East North Central, Middle Atlantic, and New England. I therefore complete 18 total regressions according to division, examining the relationship between percent Black in a ZCTA and bank branch location.

Another worthy question involves the symmetry of any trends. That is, does a relative increase in Blacks in a given neighborhood yield the opposite response in an area in which the relative population of Black individuals decreases? It is not clear that this exact symmetry would be the case, nor is it given that inverse responses to changes in demographic characteristics would be of the same magnitude. I estimate this effect with a simple t-test, testing whether the change in number of bank branches by ZCTA is different for ZCTAs in which the proportion of Black residents grew in the last period compared to ZCTAs in which that proportion decreased. Because this sample is dependent on observing if the relative size of the Black population grew since the last period observed, this model only includes the years 2010 and 2020.

The final test I conduct checks results from two aforementioned papers and examines whether their broad results on segregation, socioeconomic status, and access to public services applies to commercial banking in particular. Bayer, Fang, and McMillan (2014) find that Black households upwardly moving into the middle class increases segregation and leads to a cycle of inequality. Similarly, Bayer, McMillan, and Rueben (2005) note that high socioeconomic status Black households choosing where to live face a significant tradeoff between access to public services and living with neighbors of the same race. Since very few neighborhoods have both high-quality public services and a relatively high population of Black people, Black households with the flexibility of where to live have to decide between these two qualities, which ultimately yields a sorting effect. I represent this regression as:

$$ln\, Branch_{it} = c_i + \gamma_t + \beta_1 MajorityBlack_{it} + \beta_2\, ln\, ln\, MedianBlackIncome_{\,it} + \beta_3\, ln\, ln\, MedianBlackIncome_{\,it} \times MajorityBlack_{it} + X'_{it}\beta + \varepsilon_i$$

If this sorting effect occurs with respect to access to credit, then we would expect that majority-Black neighborhoods to have fewer banks relative to non-majority-Black neighborhoods with the same level of Black income. In this case, the coefficient on the interaction term is of main interest, as it should be negative if there is indeed lower access to commercial banking services in higher income Black neighborhoods.

IV. Results

We can draw some important conclusions that inform the rest of the paper by looking at the descriptive statistics of the dependent and explanatory variables within the model by year. As per Table 1, in 2000, the average ZCTA contained 4.186 commercial bank branches, with that average peaking in 2010 with 4.863 branches per ZCTA. By 2020, that average dwindles to 4.526 branches per tract. In 2000, 3.8 percent of ZCTAs were majority Black, whereas in both 2010 and 2020, 4.7 percent of ZCTAs were majority Black. The percentage of majority non-Hispanic white ZCTAs fell from 91.1 percent to 81.9 percent from 2000 to 2020.

The simple regression by year yields strange results, given my hypothesis and the previously discussed literature. Without entity-level fixed effects or any other controls, it appears as if banks especially target areas with higher relative populations of Black people. Indeed, according to this unconstrained model, a 1 percentage point increase in the Black population of a tract is associated with a 0.61 percent increase in the number of branches in that tract. There are other interesting regional results contained in Table 2, such as the sizable coefficient for the

Mountain region. A 4.6 percent increase in bank branches for every 1 percent increase in the Black population of a given ZCTA is suspect. The significantly positive coefficients for the Mid-Atlantic and East North Central division are also of note, as we shall see later in the results.

We can also observe unconditional trends in brank location by the racial majority of a neighborhood. At first, as Table 3 suggests, these results seem reasonable: majority Black neighborhoods were no more or less likely to have commercial banks as non-majority Black neighborhoods in 2000, with that difference widening by 2020, where majority Black neighborhoods had 8.9 percent fewer banks than non-majority Black neighborhoods. However, from these results, it would appear that majority non-Hispanic white neighborhoods had fewer banks relative to areas where non-Hispanic whites were not the majority.

The issue with both of these unconditional models is that they do not compare ZCTAs with similar housing values, population, urbanicity, and income, which are heavily correlated with race. Overall, these results are highly likely to be contaminated by selection bias. They tell us very little about how bank location is related to racial composition because of this failure to compare areas with similar characteristics.

When I control for income, housing value, and population while also employing two-way fixed effects, the results become much less biased. Examining Table 4, we see that throughout the United States, a 1 percentage point increase in the Black population in a given area is correlated with a 0.11 percent decrease in the number of banks in that area. This effect occurs almost entirely in urban settings: when controlling for all variables of interest, we see that a 1 percentage point increase in the relative size of the Black population in a ZCTA is associated with 0.26 percent fewer commercial bank branches.

Notably, when I control for all those same covariates in a rural setting, this disparity vanishes. This result shows that commercial banks, by targeting areas with higher income, housing value, and population, do not disproportionately impact Black people with respect to credit access in rural areas. The same cannot be said for urban areas, where there are fewer banks in neighborhoods with more Black people.

This result still does not tell a complete story. Looking at Table 5, we can see that the disparity between neighborhoods with a larger share of Blacks and those with fewer Blacks changed over time. This partially saturated model suggests that in all levels of urbanicity, a 1 percentage point increase in the relative size of an area's Black population is associated with 0.19 percent more banks in 2000. By 2010, this difference became effectively zero. By 2020, areas with 1 percentage point more Black people had 0.14 percent fewer banks, conditioned on observed controls. We observe this trend for both rural and urban areas, with the disparity being particularly pronounced in the latter. This result intimates that differences in geographic banking access have worsened for Blacks since the Great Recession.

When separating this overall effect by region and urbanicity, a few counterintuitive wrinkles arise. One could be forgiven for conjecturing that if there were ever a place for geographic banking discrimination to arise, it would be the South. After all, that is the region in which the most explicit forms of discrimination proliferated throughout American history. The data do not validate this conjecture. In fact, none of the divisions in which Black people are most underserved are in the southern part of the United States. Referencing Table 6, we can see that in urban areas in the Pacific division (which comprises California, Oregon, Washington, Hawaii, and Alaska), a 1 percentage point increase in the Black population is associated with 0.64 percent fewer banks in a ZCTA. The trend in the East North Central division (Wisconsin, Illinois, Indiana, Michigan, and Ohio) is similar: there is no significant difference in rural areas, but a 1 percentage point increase in the Black population yields 0.74 percent fewer banks in an area. Even worse is the Mid-Atlantic division (New York, Pennsylvania, and New Jersey). Urban areas in that division have 1.16 percent fewer banks for every 1 percentage point increase in the Black population.

Surprisingly, considering the history of racial discrimination in these areas, there is a small but significant disparity in the West South Central division (Texas, Oklahoma, Arkansas, and Louisiana) that runs contrary to the expected outcome and the rest of the country. That is, in that division, a 1 percentage point increase in the Black population is related to a 0.31 percent and 0.37 percent increase in the number of banks in a rural and urban area, respectively.

A myriad of specific states account for these region-based trends. An examination of Table 7 illustrates such standouts. Urban banks in Alabama, Connecticut, Illinois, Ohio, Michigan, New York, Pennsylvania, and Washington significantly underserve Blacker areas, with the worst offenders being theformer four. The only states in which there are significantly fewer banks in rural areas with higher relative Black populations are Mississippi and Delaware (the effect in the latter is likely due to few observations). Banks in Texas and Oklahoma both significantly overserve Blacker areas, which helps explain the previously mentioned result with respect to the West South Central Division.

Another notable result involved the symmetry of the relationship between neighboring racial composition and bank branch location. The data show that the effect of interest is not symmetrical with respect to how the proportion of Blacks within a ZCTA changes. Grouping by a binary variable indicating whether or not a given ZCTA's proportion of Blacks increased, the t-test shown in Table 8 shows that we can be 92 percent confident that banks move into neighborhoods with an increasing number of Blacks at a lower rate than they move into neighborhoods where the proportion of Blacks is decreasing. This result holds for both rural and urban areas, although it is roughly 50 percent more pronounced in urban areas. Urban areas see an increase in banks for ZCTAs in which Blacks are both increasing and decreasing in relative size, but banks move into the latter ZCTAs at a significantly higher clip. In rural areas, however, areas where Blacks are decreasing in relative size see the number of banks stay roughly constant, while rural areas that see an increase in the proportion of Blacks experience an outmigration of commercial banking branches.

The final result demonstrates a fuller dynamic of how banks tend to underserve Black Americans. We can see from Table 9 that banks tend to locate less in Black neighborhoods with higher Black income than Black neighborhoods with lower income, conditioned on property values, overall income, and population. For all ZCTAs, as the median Black income increases by 1 percent in a majority Black neighborhood, banks are 0.14 percent less likely to locate in that area relative to non-majority Black ZCTAs with the same income levels. Banks are still generally sensitive to Black income: as it increases by 1 percent, there are 0.03 percent more commercial banks in the ZCTAs that see that increase in income This result confirms the findings of Bayer et al. (2014) and Bayer et al. (2005) regarding commercial banks. Much like with publicly available goods, higher income Blacks face a tradeoff between living in a majority Black neighborhood and having more access to credit.

V. Robustness Checks

Although I cannot definitively check to see if the relationships described in the Results section are causal, I can replicate my findings with a few augmentations of the original models.

The first main check involves using non-log transformed control and dependent variables. In this case, as we can see from Table 10, the relationship shown in Table 4 remains despite this difference in variables. More specifically, we observe a negative relationship between the proportion of the Black population in a tract and the amount of bank branches overall, with that effect occurring entirely in urban areas.

I also replace the log transformed median income and median home value controls included in the primary model with more granular distribution controls. Each variable is the percent of households earning within a given range or percent of occupied housing valued within a given range. This substitution can be written as:

$$Branch_{it} = c_i + \gamma_t + \beta_1 PercentBlack_{it} + X_{it}^{'}\beta + \varepsilon_i$$

where all of the covariates in the control vector $X_{it}'$are not log-transformed. Again, we observe the same effect. As per Table 11, we see the same negative relationship between the relative size of a tract's Black population and the number of banks it contains.

Another robustness check involves turning the explanatory variable, which is a percentage, into a binary variable. Using the same binary variable specified in Table 9–an indicator of whether a given ZCTA is majority Black or not–I estimate the effect of a neighborhood's majority race on the number of bank branches it contains. Consulting Table 12, we see the same effect: urban areas with a higher percentage of Blacks have fewer banks. Alternatively, in ZCTAs with a majority non-Hispanic white population, there is no relationship between being majority white and having more banks. Similarly, majority Latino areas do not have any more or less banks according to this check. From these results, it becomes apparent that banks are particularly undeserving primarily urban Black neighborhoods.

The final robustness check I complete involves a difference-in-differences design. Exploiting neighborhoods that went from being non-majority Black to majority Black or vice versa between 2000 and 2020 as the treatment, I can test if a neighborhood changing its racial majority is related to bank location. Using a two-way fixed effects model, I find that the results obtained in my heterogeneous fixed effects model illustrated in Tables 4 through 6 are consistent. This difference-in-differences model can be written as follows:

$$\ln Branch_{it} = c_i + \gamma_t + \delta^{DD} MajorityBlack_{it} + X_{it}^{'}\beta + \varepsilon_i$$

As Table 13 shows, an urban ZCTA going from non-majority Black to majority Black is associated with 12.7 percent fewer banks on average. There is no similar effect for ZCTAs becoming majority non-Hispanic White.

However, I cannot draw a causal relationship from this difference-in-differences check. It is quite possible that there is some unobserved variable affecting only areas that are transitioning between being non-majority Black and majority Black, in which case selection bias is still occurring. Similarly, this model–much like the main fixed effects model discussed above–cannot rule out reverse causality. That is, Blacks on average may choose to locate in areas with fewer banks, albeit this result is merely plausible, not likely. A more complete discussion of possible areas of remnant selection bias will take place in the next section.

VI. Discussion

The basic results of my model are fourfold. In general, conditioned on income, home value, population, and time and entity fixed effects, the Blacker a neighborhood is the fewer banks it is likely to have. Second, these effects are not uniformly distributed over region or time. In particular, the discrepancy in banking location is concentrated in cities in the upper Midwest, the Mid-Atlantic, and the West. Moreover, this discrepancy seems to widen over time, as shown in Table 5. Finally, I show that as Blacks' income rises, they are faced with a tradeoff between living in a majority Black neighborhood and enjoying the same access to commercial banking institutions as people living in non-majority Black neighborhoods. These results confirm the findings of Bayer, Fang, and McMillan (2014) and Bayer, McMillan, and Rueben (2005) with respect to credit as opposed to public services in general.

From my results, we can conclude that the banking discrimination framework Sander, Kucheva, and Zasloff (2018) propose is insufficient for contemporary analyses. Beyond the three forms of historical banking discrimination they identify–not lending to Blacks moving to white areas, redlining, and spurious lending criteria–there may exist a fourth type of discrimination: geographic barriers to accessing commercial banking institutions. This phenomenon does not necessarily satisfy the conditions of racial discrimination, but it at least indicates some level of disparate impact from decisions regarding bank location. In short, Black people experience distinct friction to accessing credit.

However, my results still do not eliminate selection bias perfectly or establish a causal relationship between an area's racial composition and the amount of commercial banking institutions it contains. To start, there may be a few unobserved variables that could affect my results. Despite work done by Case, Quigley, and Shiller (2001) and Boehm and Schlottman (2008) that show that home value is a valid predictor of household wealth, overall wealth is still a worthy covariate in this model. Another unobserved variable in this model would be business origination. If, all else equal, more businesses started in whiter neighborhoods (and hence applied for business loans in those neighborhoods), banks may be sensitive to locating in areas with more new businesses.

Banks may have other reasons to locate less in a neighborhood that has little to do with possible clientele and more with potential costs associated. For instance, banks might locate less in neighborhoods with more crime because of perceived higher security costs. However, Garmaise and Moskowitz (2005) show that the opposite trend may be a better description of reality. Namely, they show that bank mergers reduce overall extension of credit, which leads to an influx of poorer households and an increase in crime, all while ruling out reverse causality. The mechanism for this result is intuitive: as banks merge, the consolidated bank will remove redundant branches in the same area, yielding fewer overall branches in a neighborhood. Nevertheless, including an analytical dimension focusing on crime may still be useful in the context of my research.

Finally, I cannot rule out the case in which reverse causality at least partially explains the trends I identify. In short, Black Americans may on average demand banking services less. This story is less convincing. As Ouazad, Broady, and McComas (2021) argue, Blacks ultimately end up substituting traditional financial services with higher interest products like payday loans when banks desert their neighborhood. Findings of this nature suggest that there remains steady demand for credit relative to whiter areas in predominantly Black neighborhoods, which would rule out reverse causation.

However, while it is clear Black consumers still seek lines of credit however they can, the same cannot be said definitively for Black entrepreneurs. Fairlie, Robb, and Robinson (2020) find that Black startup owners apply for loans at lower rates than their white counterparts, even when they have equal credit histories and are located in areas favorable to new business development. This disparity occurs because Black entrepreneurs tend to doubt that they will be extended credit. Thus, while it is easier to eliminate lower household demand for commercial banking as a reason banks locate less in predominantly Black neighborhoods, it is harder to rule out lower demand on the part of Black-owned businesses as a driver of banking disparities.

VII. Conclusion

Throughout the course of this paper, I establish that, conditioned on notable observed variables, commercial banks tend to locate less in neighborhoods with a higher proportion of Blacks; that this disparity has increased consistently throughout the 21st century; that these differences primarily occur in urban areas in the Midwest, West Coast, and Mid-Atlantic regions; and that there exists a tradeoff between residing in a majority Black neighborhood and living in a neighborhood with more banks, even when controlling for Black-specific income. These results show that banks systemically underserve Black clients, suggesting that the fourth type of banking discrimination I propose better describes the current state of unequal credit access in the United States.

This thesis's explanatory power is strictly descriptive: that is, it can only present trends that are ongoing without identifying a causal mechanism of how banks decide to locate based on racial composition. A study exploiting an exogenous variable that affects racial composition could establish that causal relationship. As I found during the research and data collection phases of this paper, finding such an instrument is easier said than done. A good starting point may be some randomly assigned banking regulation introduced during the timespan this paper covers. Such an approach would essentially be a replication of the design used by Levine, Levkov, and Rubinstein (2008) and Tewari (2014) with newer data.

Still, one can glean important insights regarding public policy designs made today. For one, reconfiguring the Community Reinvestment Act to better address geographic concerns may be a worthy cause. Governments in the Mid-Atlantic, the Midwest and the Pacific Coast can also work to broaden credit access in the areas that are most clearly underserved. As a general policy, banks can identify the areas–specifically the urban areas that see the largest disparities in services–that have the most unmet needs, even when conditioned on variables like income and property values. Specific interventions, however, do not arise neatly from the results of this paper. Rather, my results provide a motivation for policymakers to reconsider the nature of unequal credit access. Still, there remains potential for marginal improvements in how financial institutions are geographically distributed. As we can recall, the disparities I identified in this paper were once quite miniscule. With the right business practices and public policies, those differences can dwindle away yet again.

VIII. Appendix

Table 1
Summary Statistics of Commercial Banks by Year and Majority Race

	(1) All	(2) Majority Black	(3) Majority White (Non-Hispanic)
y2010	0.677***	0.145	0.574***
	(0.050)	(0.178)	(0.053)
y2020	0.340***	-0.160	0.208***
	(0.048)	(0.173)	(0.052)
Constant	4.186***	3.877***	4.150***
	(0.032)	(0.130)	(0.034)
Observations	58,018	2,547	50,071
R-squared	0.003	0.001	0.002

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2

Unconditional Model by Region and Year

	United States			Pacific			Mountain			West North Central			East North Central		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Year	2000	2010	2020	2000	2010	2020	2000	2010	2020	2000	2010	2020	2000	2010	2020
Percent Black	0.607***	0.038	0.003	0.127	0.253	0.398	4.623***	1.073	-0.369	1.925***	0.138	0.291	0.867***	0.113	0.023
	(0.042)	(0.059)	(0.059)	(0.232)	(0.406)	(0.416)	(1.119)	(1.381)	(1.270)	(0.317)	(0.441)	(0.433)	(0.109)	(0.151)	(0.150)
Observations	57,886			5,161			3,298			9,402			10,421		
R-squared	0.014			0.004			0.050			0.043			0.024		

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2 (cont.)

	West South Central			East South Central			South Atlantic			Mid Atlantic			New England		
	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
Year	2000	2010	2020	2000	2010	2020	2000	2010	2020	2000	2010	2020	2000	2010	2020
Percent Black	0.393**	0.004	0.030	0.037	-0.083	-0.096	-0.046	-0.079	-0.138	0.637**	-0.003	-0.102	1.171**	0.505	0.732
	(0.112)	(0.164	(0.163	(0.105	(0.146	(0.147	(0.085)	(0.117	(0.119	(0.124)	(0.170	(0.172	(0.371)	(0.527	(0.545)
Observations	6,632			4,054			8,630			7,295			2,993		
R-squared	0.013			0.003			0.004			0.010			0.026		

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3
Commercial Bank Branches by Racial Majority

	(1) Majority Black	(2) Majority White (non-Hispanic)
Majority Black	-0.044***	
	(0.017)	
y2010	0.118***	0.103***
	(0.010)	(0.010)
y2020	0.079***	0.054***
	(0.010)	(0.010)
Majority White (non-Hispanic)		-0.266***
		(0.011)
Constant	0.973***	1.214***
	(0.007)	(0.012)
Observations	58,018	58,018
R-squared	0.003	0.012

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4

Log of Bank Branches by Racial Composition Conditioned on Observables with Two-Way Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All	Rural				Urban			
Percent Black	-0.109*	0.031	0.042	-0.089	-0.007	0.119	0.079	-0.082	-0.259***
	(0.064)	(0.094)	(0.094)	(0.094)	(0.096)	(0.075)	(0.076)	(0.073)	(0.077)
Log (Median Income	-0.005***	0.011***	0.010***		0.004***	0.036***	0.029***		-0.021***
	(0.001)	(0.001)	(0.001)		(0.001)	(0.002)	(0.002)		(0.003)
Log (Median Property Value)	-0.022***			-0.009***	-0.007***			-0.035***	-0.043***
	(0.001)			(0.000)	(0.001)			(0.001)	(0.002)
Log (Population)	0.008***		-0.011***	-0.001	-0.002*		-0.023***	0.029***	0.037***
	(0.001)		(0.001)	(0.001)	(0.001)		(0.001)	(0.002)	(0.003)
Constant	1.251***	0.287***	0.369***	0.489***	0.443***	1.165***	1.460***	1.650***	1.886***
	(0.015)	(0.009)	(0.013)	(0.010)	(0.015)	(0.022)	(0.030)	(0.016)	(0.037)
Observations	56,931	25,172	25,114	24,959	24,934	32,597	32,427	32,032	31,997
R-squared	0.042	0.013	0.016	0.022	0.023	0.018	0.025	0.063	0.066
Groups	20,757	9,669	9,666	9,664	9,646	11,773	11,770	11,765	11,734

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5

Partially Saturated Model with Two-Way Fixed Effects

	(1) All	(2) Rural	(3) Urban
Percent Black	0.185**	0.308***	0.021
	(0.072)	(0.102)	(0.086)
Percent Black x	-0.195***	-0.096***	-0.262***
Year = 2010	(0.020)	(0.023)	(0.027)
Percent Black x	-0.326***	-0.136***	-0.419***
Year = 2020	(0.026)	(0.035)	(0.032)
Observations	56,931	24,934	31,997
R-squared	0.061	0.040	0.084
Groups	20,757	9,646	11,734

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6

Bank Branches by Racial Composition, Region, and Urbanicity Conditioned on Observables with Two-Way Fixed Effects

		Pacific		Mountain		West North Central		East North Central		West South Central		East South Central	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Main	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Percent Black	-0.109*	-0.884	-0.638**	0.435	0.961	0.154	-0.293	0.139	-0.737***	0.311*	0.374*	-0.248	-0.392
	(0.064)	(0.913)	(0.310)	(0.557)	(0.600)	(0.227)	(0.266)	(0.282)	(0.156)	(0.185)	(0.218)	(0.203)	(0.247)
Observations	56,931	772	4,240	1,115	2,122	6,568	2,744	4,915	5,393	3,003	3,510	2,469	1,510
R-squared	0.042	0.068	0.054	0.033	0.088	0.017	0.095	0.044	0.091	0.026	0.137	0.038	0.070
Number of Groups	20,757	329	1,549	439	813	2,411	991	1,888	1,942	1,155	1,300	961	565

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6 (cont.)

	South Atlantic		Mid Atlantic		New England	
	(14)	(15)	(16)	(17)	(18)	(19)
	Rural	Urban	Rural	Urban	Rural	Urban
Percent Black	0.096	0.069	0.478	-1.164***	-0.007	0.102
	(0.204)	(0.170)	(0.304)	(0.193)	(0.673)	(0.370)
Observations	3,115	5,344	1,989	5,161	988	1,973
R-squared	0.070	0.098	0.045	0.108	0.046	0.041
Number of Groups	1,274	1,980	793	1,875	396	720

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7
Log of Bank Branches by State and Urbanicity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
		Arkansas		Alabama		Alaska		Arizona		California		Colorado		Connecticut		Delaware	
	Main	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Percent Black	-0.109*	0.086	0.433	-0.337	-0.669*	-1.754	0.568	-2.172	1.197	0.018	-0.324	0.825	0.755	-0.424	-1.061*	-4.554**	-1.355
	(0.064)	(0.505)	(0.640)	(0.510)	(0.357)	(2.170)	(3.337)	(4.983)	(1.500)	(0.908)	(0.355)	(1.707)	(0.656)	(2.606)	(0.585)	(1.670)	(1.233)
Observations	56,931	577	279	644	417	50	64	84	531	246	2,931	274	525	140	486	26	97
R-squared	0.042	0.036	0.145	0.027	0.062	0.029	0.085	0.026	0.104	0.088	0.058	0.045	0.142	0.179	0.079	0.523	0.138
Groups	20,757	229	105	255	158	23	26	44	215	107	1,065	102	196	58	179	11	34

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 (cont.)

	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)
	Florida		Georgia		Hawaii		Iowa		Idaho		Illinois		Indiana		Kansas	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Percent Black	0.185	0.035	0.110	0.464	0.000	-3.390	0.386	-0.870	-10.796	5.591	0.127	-0.479*	1.114	0.477	0.099	-0.000
	(0.929)	(0.297)	(0.291)	(0.378)	(0.000)	(3.702)	(0.362)	(0.955)	(7.422)	(4.976)	(0.395)	(0.281)	(0.789)	(0.505)	(0.187)	(1.160)
Observations	258	1,868	593	712	20	120	1,468	496	173	166	1,275	1,564	709	744	945	454
R-squared	0.139	0.117	0.058	0.139		0.129	0.020	0.108	0.093	0.148	0.004	0.130	0.101	0.132	0.018	0.102
Groups	115	681	248	265	10	46	544	175	70	60	467	556	293	272	348	166

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 (cont.)

	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)	(51)
	Kentucky		Louisiana		Massachussets		Maryland		Maine		Michigan		Minnesota		Missouri		Mississippi	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Percent Black	0.139	-0.888	0.403	-0.518	-0.614	0.610	1.065	-0.404	0.247	4.314	0.503	-1.190***	-0.059	-0.075	-0.182	-0.480	-0.374*	-0.197
	(1.164)	(1.054)	(0.266)	(0.449)	(0.889)	(0.450)	(1.038)	(0.336)	(1.535)	(2.887)	(0.910)	(0.328)	(1.023)	(0.487)	(0.674)	(0.368)	(0.201)	(0.678)
Observations	667	352	394	534	126	1,010	192	595	314	136	976	1,011	1,234	675	1,023	689	523	232
R-squared	0.043	0.111	0.042	0.071	0.033	0.083	0.094	0.134	0.073	0.154	0.103	0.092	0.016	0.128	0.037	0.066	0.033	0.031
Groups	260	129	151	201	51	367	86	222	124	50	385	371	449	243	388	250	200	89

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 (cont.)

	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)	(62)	(63)	(64)	(65)	(66)	(67)	(68)	(69)
	Montana		North Carolina		North Dakota		Nebraska		New Hampshire		New Jersey		New Mexico		Nevada		New York	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Percent Black	3.087	8.311	0.405	-0.454	0.714	1.487	0.417	0.298	-1.137	-3.383	1.086	-0.406	0.374	-5.684	0.177	0.662	0.562	-1.138***
	(2.267)	(5.029)	(0.530)	(0.494)	(0.680)	(1.925)	(0.820)	(0.960)	(1.639)	(2.058)	(2.423)	(0.548)	(0.946)	(3.570)	(0.359)	(1.375)	(0.478)	(0.315)
Observations	266	112	723	707	503	59	894	270	195	156	88	1,332	115	194	36	225	905	1,995
R-squared	0.042	0.052	0.140	0.091	0.027	0.128	0.062	0.136	0.036	0.070	0.146	0.095	0.055	0.052	0.105	0.104	0.030	0.129
Groups	92	39	295	263	184	22	319	97	79	57	41	472	45	75	16	91	354	722

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 (cont.)

	(70)	(71)	(72)	(73)	(74)	(75)	(76)	(77)	(78)	(79)	(80)	(81)	(82)	(83)	(84)	(85)	(86)	(87)
	Ohio		Oklahoma		Oregon		Pennsylvania		Rhode Island		South Carolina		South Dakota		Tennessee		Texas	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Percent Black	0.068	-0.635**	0.333	2.200**	-5.760	-0.391	0.359	-1.490***	4.561	-1.061	0.333	0.445	0.165	0.324	-0.032	0.039	0.386	0.989***
	(0.651)	(0.249)	(0.915)	(0.858)	(4.661)	(0.855)	(0.391)	(0.270)	(3.481)	(1.214)	(0.503)	(0.721)	(1.205)	(1.945)	(0.425)	(0.467)	(0.313)	(0.276)
Observations	869	1,381	666	427	182	436	996	1,834	19	126	350	358	501	101	635	509	1,366	2,270
R-squared	0.065	0.091	0.022	0.278	0.084	0.159	0.060	0.113	0.409	0.043	0.102	0.105	0.013	0.108	0.068	0.082	0.038	0.167
Groups	330	496	248	161	75	155	398	681	7	45	135	136	179	38	246	189	527	833

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 (cont.)

	(88)	(89)	(90)	(91)	(92)	(93)	(94)	(95)	(96)	(97)	(98)	(99)	(100)	(101)	(102)
	Utah		Virginia		Vermont		Wisconsin		Washington		West Virginia		Wyoming		Washington D.C
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	
Percent Black	-5.576	-2.927	-0.092	-0.746	3.236*	-1.067	-0.279	-2.173***	-2.444	-2.663*	-1.030	-0.597	1.155	7.309	-0.194
	(6.096)	(2.304)	(0.333)	(0.638)	(1.893)	(4.285)	(0.501)	(0.517)	(2.929)	(0.768)	(0.850)	(0.720)	(1.290)	(9.242)	(1.113)
Observations	79	287	625	702	194	59	1,086	693	274	689	348	246	88	82	59
R-squared	0.052	0.077	0.066	0.087	0.098	0.135	0.053	0.168	0.122	0.095	0.043	0.051	0.083	0.284	0.096
Groups	36	107	252	261	77	22	413	248	114	257	132	96	34	30	22

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8

Test of Symmetry of Change in Number of Banks by ZCTA

					95% Confidence Interval	
Group	Observations	Mean	Standard Error	Standard Deviation	Lower Bound	Upper Bound
Decrease in Blacks	10,686	0.0743	0.0158	1.630	0.0434	0.1052
Increase in Blacks	26,265	0.0362	0.0146	2.370	0.0076	0.0649
Difference		0.0380*	0.0215		-0.0041	0.0802

Rural

					95% Confidence Interval	
Group	Observations	Mean	Standard Error	Standard Deviation	Lower Bound	Upper Bound
Decrease in Blacks	6,545	0.0070	0.0070	0.564	-0.0066	0.0207
Increase in Blacks	9,151	-0.0535	0.0075	0.714	-0.0682	-0.0389
Difference		0.0606***	0.0102		0.0406	0.0806

Urban

					95% Confidence Interval	
Group	Observations	Mean	Standard Error	Standard Deviation	Lower Bound	Upper Bound
Decrease in Blacks	4,141	0.1806	0.0391	2.518	0.1039	0.2573
Increase in Blacks	17,114	0.0843	0.0221	2.888	0.0410	0.1275
Difference		0.0964**	0.0449		0.0083	0.1844

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 9
Bank Branches by Black Majority
Black Income

	(1) All	(2) Rural	(3) Urban
Log (Median Black Income)	0.026***	0.005	0.029***
	(0.006)	(0.009)	(0.008)
Log (Median Black Income) x Majority Black	-0.163***	-0.080	-0.166***
	(0.034)	(0.058)	(0.042)
Income, Property Value, and Population Controls?	Yes	Yes	Yes
Observations	33,412	8,104	25,308
R-squared	0.073	0.040	0.086
Groups	14,909	4,676	10,528

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10
Non-Log Transformations Robustness Check

	(1) All	(2) Rural	(3) Urban
Percent Black	-1.096***	-0.254	-2.368***
	(0.365)	(0.222)	(0.456)
Median Income	-0.076***	0.005**	-0.239***
	(0.004)	(0.002)	(0.015)
Median Value	-0.134***	-0.020***	-0.300***
	(0.003)	(0.001)	(0.009)
Population	0.008	-0.016***	0.197***
	(0.008)	(0.003)	(0.016)
Constant	6.654***	2.104***	10.611***
	(0.079)	(0.039)	(0.195)
Observations	56,931	24,934	31,997
R-squared	0.044	0.024	0.074
Groups	20,757	9,646	11,734

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11
Percentile Control Robustness Check

	(1) All	(2) 0	(3) 1
Percent Black	-0.275***	0.007	-0.267***
	(0.063)	(0.093)	(0.078)
Income Percentile Controls	Yes	Yes	Yes
Property Value Percentile Controls	Yes	Yes	Yes
Population Controls	Yes	Yes	Yes
Observations	57,373	25,098	32,275
R-squared	0.062	0.025	0.088
Groups	20,758	9,657	11,723

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12
Racial Majority as Treatment Robustness Check

	(1) All	(2) Rural	(3) Urban	(4) All	(5) Rural	(6) Constant
Majority Black	-0.088***	0.007	-0.122***			
	(0.023)	(0.034)	(0.028)			
Log (Median Income)	-0.005***	0.004***	-0.017***	-0.004***	0.004***	-0.016***
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.003)
Log (Median Value)	-0.022***	-0.007***	-0.042***	-0.022***	-0.007***	-0.042***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log (Population)	0.008***	-0.002*	0.036***	0.008***	-0.002*	0.035***
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.003)
Majority White (non-Hispanic)				-0.009	0.024	-0.003
				(0.011)	(0.017)	(0.013)
Observations	56,933	24,934	31,997	56,933	24,934	31,997
R-squared	0.042	0.023	0.067	0.041	0.024	0.065
Groups	20,759	9,646	11,734	20,759	9,646	11,734

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13
Differences-in-Differences by Black Majority Robustness Check

	(1) All	(2)	(3) Rural	(4)	(5) Urban	(6)
Treatment = Majority Black	-0.091***		0.021		-0.127***	
	(0.029)		(0.043)		(0.035)	
Income, Property Value, Population Control	Yes		Yes		Yes	
Constant		0.885***		0.522***		1.400***
		(0.040)		(0.060)		(0.076)
Observations	56,933	56,933	24,934	24,934	31,997	31,997

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13 (cont.)
Differences-in-Differences by White Majority Robustness Check

	(1) All	(2)	(3) Rural	(4)	(5) Urban	(6)
Treatment = Majority White (non-Hispanic)	0.001		0.011		0.013	
	(0.014)		(0.021)		(0.016)	
Income, Property Value, Population Control	Yes		Yes		Yes	
Constant		0.883***		0.510***		1.375***
		(0.044)		(0.064)		(0.078)
Observations	56,933	56,933	24,934	24,934	31,997	31,997

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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