Mortgage Policies and their Effects on Racial Segregation and Upward Mobility

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ABSTRACT

Increasing homeownership has long been a major policy goal in the U.S. We argue that two primary policy tools since the 1990s, (i) eased access to mortgages and (ii) targeting underserved neighborhoods, have increased racial segregation and hampered upward mobility for Black families. First, while mortgage policies where effective in increasing overall homeownership, only Black homeownership increased in geographically targeted neighborhoods, while white homeowners decreased. This result is strongest in cities (commuting zones) with improved access to mortgages, making it easier for white families to move to other neighborhoods. Second, eased access to mortgage financing predicts reduced upward mobility among low-income Black families. For low-income white families, we estimate a negative effect for those remaining in the targeted neighborhood, but a significantly positive effect overall. We then show directly that the mortgage policies predict increased racial segregation, with in turn a strong negative upward-mobility effect for Black families (and little or no effect for white families). Finally, we investigate the underlying channel. We show that both house values and school quality in targeted neighborhoods decline, likely due to the resulting decline in property taxes and reduced education spending. Additionally, stringent land-use housing restrictions perpetuate racial segregation and prevent Black children from moving to better neighborhoods when adult.

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Increasing homeownership has been a major policy goal of the U.S. since the early twentieth century. The benefits attributed to homeownership include wealth creation, consumption smoothing, and financial stability for families (Dietz and Haurin, 2003; Sodini et al., 2016), higher educational attainment and fewer teenage pregnancies among their children (Green and White, 1997), as well as positive externalities for the surrounding neighborhood (DiPasquale and Glaeser, 1999). Two milestones in implementing this policy goal were the creation of the Government Sponsored Enterprises (GSEs) Fannie Mae in 1938 and Freddie Mac in 1970, who assume a key role in the US housing finance system. They are the two largest sources of housing finance in the secondary mortgage market, and their policies largely determine who gets access to credit in the residential mortgage market and eventually becomes a homeowner.

Since the 1990s, federal housing policy has focused on the dual goals of increasing aggregate homeownership rates and narrowing the persistent socio-economic and racial gap in homeownership (Gabriel and Rosenthal, 2008). The Federal Housing Enterprise Safety and Soundness Act of 1992 (also referred to as the 1992 GSE Act) formalizes the GSEs' responsibility for assisting low- and moderate-income families as well as underserved neighborhoods. It mandates that the GSEs devote a percentage of their business to underserved groups and underserved areas and to target underserved census tracts (neighborhoods) under the "Underserved Area Goals" (UAG). These policies have strong political support across the aisle. Both President Clinton's administration in the 1990s and President Bush's administration in the early 2000s strongly emphasized their goal to overcome the homeownership gap among minority and low-income families.[1]

[1]President Clinton in a letter to HUD Secretary Henry Cisneros on November 3rd, 1994 wrote: "Homeownership strengthens families and stabilizes communities. ... Today, I am requesting that you lead an effort to dramatically increase homeownership in our nation over the next six years.... Your program should include strategies to ensure that families currently underrepresented among homeowners — particularly minority families, young families, and low-income families — can partake of the American Dream." President George Bush on June 18, 2002 noted that "The goal is that everybody who wants to own a home has got a shot at doing so. The problem is we have what we call a homeownership gap in America. Three-quarters of Anglos own their homes, and yet less than 50 percent of African Americans and Hispanics own homes. That ownership gap signals that something might be wrong in the land of plenty. And we need to do something about it." (see http://www.whitehouse.gov/news/releases/2002/06/20020618-1.html)

This paper analyzes the impact of the homeownership policies of the 1990s on the racial geographic pattern in homeownership and its impact on children's upward mobility. We focus on (i) the increased access to mortgage credit in the 1990s and (ii) the geographically targeted policy goals (UAG) encouraging homeownership in disadvantaged and minority neighborhoods (census tracts). We document a positive effect on homeownership rates overall; but, while Black homeownership increased in geographically targeted neighborhoods, these areas witnessed an outflow of white homeowners, especially if the larger city (commuting zone) also benefitted from improved access to mortgage financing. As a result, racial segregation increased. In a second step of the analysis, we show that the mortgage policies of the 1990s therefore worsened low-income children's upward mobility, especially among Black households. These negative effects of homeowning are not due to the increase in homeownership itself, but due to the increase in racial segregation of homeowners. White families who did not move out but remained in the targeted neighborhoods also saw a negative impact on their children's upward mobility. Homeownership *segregation* also increased in the 1990s, despite the intended policy goal of decreasing the geographic disparity in homeownership. Third, we identify low school quality as a driver of this decline in upward mobility. As we show, house price values in targeted neighborhoods decreased, resulting in lower property tax revenues and reduced education spending. Finally, we document that these areas also see more stringent land-use housing regulations in subsequent years, perpetuating racial segregation and preventing Black children from moving to better (low-poverty) neighborhoods when adult. Overall, our paper reveals how homeownership policies, particularly geographically targeted homeownership policies, can inadvertently increase racial segregation within cities, worsening Black children's upward mobility.

Our main sources of data are the 1990 and 2000 Census and the upward-mobility data provided by Chetty and Hendren (2018a,b) and Chetty et al. (2015), which covers the entire United States. Their upward-mobility measure is based on confidential federal-

income tax records of nearly 40 million children and their parents. Chetty et al. (2015) estimates the effect of growing up in a commuting zone (CZ) on upward-mobility in terms of income percentile rank of the children relative to that of their parents, and they identify the causal component from variation in exposure (length of time lived in a commuting zone) from families that move.

We merge the upward-mobility data with 1990 and 2000 Census data, which provides information on homeownership and mortgaged homeowners. The main analysis at the CZ-level. For census-tract level analysis, we combine the merged data with classification of census tract as underserved or targeted provided by the Department of Housing and Urban Development. We also use the census data to construct a new measure of homeownership segregation. We calculate racial segregation as the two-group entropy index similar to the racial segregation measures in Theil (1972). The measure captures how segregated Black households are from white households. For the analysis on the mechanisms driving our results, we combine with data provided by Derenoncourt (2019).

Our research design exploits two types of identifying variation. First, we use the nationwide variation in the conforming loan limit (CLL) to generate CZ-level variation in access to mortgage credit. The CLL limits the origination balance of loans eligible to be purchased by the GSEs. Over time, it has increased from $33,000 in the 1970s to more than $500,000 in the 2020s (for single-family one-unit properties). Since conforming loan mortgages are easier to obtain for borrowers, we can use CLL increases to capture improved access to mortgage financing. Specifically, we calculate the average fraction of houses in a block that become conforming by 2000 based on the 1990 house price values and a loan-to-value ratio of 80%.[2] Since the changes in conforming loan limit are determined at the national-level and are exogenous to the local blocks, we make the assumption that

[2]We focus on the 1990 house price values to avoid the confounding effect of house price increases induced by the ease in credit access. The loan-to-value of 80% is another cutoff above which loans become more difficult to finance with GSE-eligible loans (Green and Wachter, 2005). See Loutskina and Strahan (2009), Adelino et al. (2015), and Kaufman (2014) for identification based on a similar strategy exploiting the CLL threshold.

the change in ease of obtaining a mortgage loan in a region is quasi-exogenous. Second, we use tract-level variation under the UAG. The UAG target census tracts with a tract-to-MSA median-income ratio weakly smaller than 0.9 and tracts with a minority share weakly larger than 0.3 (and tract-to-MSA median-income ratio weakly smaller than 1.2).

We start by examining the impact on homeownership. We first show that CZs with improved access to mortgage financing saw significant growth homeownership, but white homeownership rate grew almost 20 times more than Black homeownership rates. Further, the growth in Black homeownership rate was entirely concentrated in the targeted tracts. Thus, mortgage policies were somewhat successful in achieving their intended goal, but failed to decrease the racial gap. Strikingly, white homeownership in targeted census tracts declined, particularly in CZs with easier access to mortgages overall. That is, increased ease of access to mortgage financing at the CZ-level allowed white homeowners to move out of targeted neighborhoods, increasing racial segregation. This sorting of Black and white homeowners due to increased mortgage access forms the basis of our analysis. It extends the discussion about the effects of the credit boom of the 2000s and the increase in access to mortgage credit in low-income neighborhoods (Mian and Sufi, 2009), potentially to the high-income households in these neighborhoods (Adelino et al., 2016). Ouazad and Rancière (2016) have documented a similar outflow of white households from Black and racially mixed neighborhoods after the 2000–2006 credit boom.

In the second step, we examine the impact of improved mortgage access on upward mobility. We focus on children from of low-income families. We find that a 1 SD higher fraction of mortgaged homeowners is associated with 0.55 SD lower average upward mobility. Using the ease in credit access as an instrument for mortgaged homeowners, we show that a 1 SD increase in mortgage access decreases upward mobility by 1.12 SD. This translates to an economic magnitude of 1.71 percentile decline in income rank, corresponding to a $1,402 decline in annual income or 5.37% decline in income.[3] To distinguish

[3]Mean income of children with below-median income parents is $26,091.

between effects driven by selection and location-based effects — such as due to greater investment in public goods or in neighborhood quality —, we utilize the causal upward mobility measure provided by Chetty and Hendren (2018b). We show that a child growing up in a CZ that has 1 SD higher access to mortgages, witnesses a 0.61 SD decline in upward mobility. We find that place-based effects drive nearly 96% of the total effect, and this is the primary mechanism through which the homeownership policies of the GSEs affect low-income children's upward mobility.

Returning to the heterogeneity in impact by race, we then show that CZs with greater access to mortgages see a decline in upward mobility of Black children. That is, a 1 SD increase in mortgage access causes a 0.59 SD decline in the upward mobility of the children in low income Black families. We see no similar decline for the children of low income white families. Overall the race-gap increases by 0.02 SD. The negative effects of upward mobility are concentrated among the low income Black men.

Next, using the ease of mortgage access as an instrument for (mortgaged) homeownership, we show that there is no statistically significant *direct* effect of homeownership on upward mobility of children. Using the ease in mortgage access instead as an instrument for racial segregation, we estimate a highly significant effect. In the first stage, ease of access to mortgage credit is a strong predictor of racial segregation. In the second stage, instrumented racial segregation predicts a 0.27 SD decline in children's upward mobility from low income Black families and no similar effect on corresponding children from white families.

As a complementary outcome, we also construct a measure of "homeownership segregation." One of the goals of the GSE policies was to decrease the geographic disparity in homeownership through the UAG goals. We build a new entropy-based "homeownership segregation" measure to capture geographic disparity in homeownership. We show that while the increase in homeownership between 1980–1990 led to a decline in homeownership segregation, the increase in homeownership between 1990-2000 led to

an *increase* in homeownership segregation. This is contrary to the intended GSE goal of decreasing geographic differences in homeownership. Using the ease in mortgage access as an instrument for homeownership segregation, we show that upward mobility of the children of low income Black families declined by 0.47 SD. There was no similar effect on the children of low income white families. These results confirm that the negative effects on homeownership are driven by the increased segregation as opposed to the direct effect of homeownership and reduced residential mobility.

Before turning to the mechanisms, we also examine the tract-level variation. We find that at the neighborhood level, children of low income Black families in targeted census tracts see a 0.38 SD lower upward income mobility. Unlike the CZ-level effects, children of low income white families see a 0.54 SD lower upward mobility. These effects on upward mobility are 0.19 SD lower for children of low income Black families in CZs with greater access to mortgages. Strikingly, even the children of low income white families see a 0.29 SD lower upward mobility, pointing to detrimental effects from neighborhood characteristics. To examine whether, there are difference even within the census tracts for the children of low income Black and white families, we look at the effect on the race gap in the upward income mobility of white children relative to the Black children. Overall the race gap between white and Black families increases by 0.08 SD in targeted neighborhoods and almost doubles in areas with 1% higher fraction of mortgaged homeowners. Together with the CZ-level effects, our results indicate that place-based effects within the targeted neighborhoods are important in determining the negative effects on families. In addition, the persistence of within-census tract increases in the racial gaps indicate that factors other than neighborhood-level mechanisms are needed to explain for the within-census tract racial gaps.

As a last step, we examine the mechanisms driving the results. While it is difficult to pinpoint the exact mechanisms driving our results without access to additional instruments for each mechanism, we provide suggestive evidence for the impact of school

quality. CZs with easier credit access see a decline in school quality (as proxied by average scores of 3rd to 8th graders), largely due to a decline in school quality in targeted neighborhoods. We also observe a similar trend in decline in house prices and hence we hypothesize that the decline in property taxes due to lower house prices explains the decline in school quality. Indeed, CZs with greater access to credit saw a decline in spending on education.

We supplement this last analysis with other outcomes such as incarceration, high school attainment, health outcomes, and ability to move to low-poverty neighborhoods. The gender differences and negative impact of homeownership on Black men further allow us to narrow down the possible mechanisms through which homeownership has deleterious effects on upward mobility. We find that Black men are less likely to graduate high school indicating that the primary mechanism affecting upward income mobility is through education. Indeed, Katz (2015) argues that impact on income largely works through quality of education and schools. Autor et al. (2016) and Derenoncourt (2019) argue that public finance investment has more of an impact on Black men compared to Black women, explaining the differences across gender. Thus, these different outcomes point to a decline in the quality of education as the primary factor adversely impacting upward mobility of Black children, especially Black boys.

We next show that these homeownership policies also resulted in more stringent land-use housing regulation, perpetuating racial segregation. Mechanisms such as higher local political pressure, higher stringency in project approval, density restrictions, and higher approval delay (as measured in 2006) are the main factors driving the increase in stringent land-use. This could potentially reinforce the effects of growing up in bad neighborhoods as postulated by Chetty and Hendren (2018b) by perpetuating the effect of bad neighborhoods on these children whern they are adults. To further examine this channel we look at whether the children (when adult) move out of the neighborhood or CZ they grew up in. While both Black and white children in CZs with easier access to mortgages are more

(but equally) likely to stay in the same CZ they grew up in, they are both less likely to remain in the same neighborhood (census-tract). Black and white children (when adult) are both more likely to move out of the neighborhoods (census tracts) they grew up in, especially in CZs with greater mortgage access, but white children are twice as likely to do so. Strikingly, only the white children are more likely to move to low-poverty (good) neighborhoods when adult but Black children are not able to do the same. This is despite similar (and higher) propensities for both Black and white children (when adult) to remain in the same CZ. Potentially, the increased homeownership policies if the 1990s further perpetuated racial segregation when the children were adult.

Finally, we find that contrary to the increased police spending and incarceration post the Great Migration (1940-1970) (Derenoncourt, 2019), the ease in credit access did not increase incarceration rates for Black men. Consistent with this, we find no impact on CZ-level police spending. Though the increase in homeownership decreased spending in public health, we do not see a corresponding effect on the health outcomes of low income children indicating that lower investment in public health is not driving the decline in upward mobility. Glaeser and Sacerdote (2000) and DiPasquale and Glaeser (1999) find that there are social benefits to homeownership and homeowners invest more local amenities. However, this does not explain our findings since we find no decrease in social capital. Overall, our results are consistent with Katz (2015) who argues that neighborhood effects drive health outcomes, whereas school quality has a more direct impact on income. Alternate channels for decrease in upward mobility such as differences in labor market outcomes when the children are adult (Rothstein, 2019) do not explain our findings. We also rule out a wealth channel effect stemming from the differences in wealth accumulation of white and Black homeowners. Alternative channels such as migration and white flight patterns from previous decades do not explain our results. We also show that our results are robust to alternative channels such as suburbanization (Baum-Snow, 2007), tipping (Card and Rothstein, 2007), Black migration (Derenoncourt, 2019), deindustrial-

ization (Charles et al., 2019), European immigrant labor (Sequeira et al., 2020), and white southern migration (Derenoncourt, 2019).

Our paper is organized as follows. Section II explains the data and homeownership segregation measures used in our analysis. Section III describes our empirical strategy. Section V examines the relationship between racial segregation and upward mobility. Section VI looks at the mechanism through which racial segregation affects upward mobility. Section VII concludes.

I. Institutional Details

In this section, we briefly discuss the institutional details of the residential mortgage market and the homeownership policies of the GSEs in the 1990s. The GSEs — Fannie Mae and Freddie Mac — are the two largest sources of housing finance in the secondary mortgage market. The GSEs operate under congressionally conferred charters. The Federal National Mortgage Association Charter Act in 1968 established Fannie Mae as a GSE.[4] Although the charter does not explicitly state homeownership as a goal, it clearly states that the primary Fannie Mae's goal is to establish secondary market facilities for residential mortgages by providing stability in the secondary market for residential mortgages and by appropriately responding to the private capital market. Importantly, the charter states that the GSE should provide ongoing assistance to the secondary market for residential mortgages, specifically for activities related to residential mortgages for low- and moderate-income families through their activities in the secondary mortgage markets, and also promote access to mortgage credit particularly in underserved areas. The charter also authorizes the Secretary of the Department of Housing and Urban Development (HUD) to set goals to ensure that a portion of Fannie Mae's purchases of home mortgages satisfy these goals.

The GSEs thus support the secondary mortgage market through two distinct busi-

[4]See SEC. 301. in https://www.sec.gov/Archives/edgar/data/310522/000031052215000179/fanniemaecharteractexhibit.htm.

ness activities, which include: (i) acting as a conduit and issuing mortgage-backed securities that can be further sold to investors in the capital markets, or (ii) holding these mortgages and mortgage-backed securities in their on-balance-sheet retained mortgage portfolios (Jaffee and Quigley, 2007). The GSEs do not directly lend to borrowers, in fact their charters prohibit them from doing so. Instead, they are obligated to support the secondary market for residential mortgages and purchase loans from primary market mortgage originators such as mortgage bankers and depository institutions. Originators make loans and the mortgages that pass standards of a "conforming loan" can be purchased by the GSEs in the secondary mortgage market. One important criteria for a mortgage to be conforming is regulatory restrictions on loan size: the conforming loan limit or CLL. Conforming loan size is required to be lower than the CLL in order to be eligible to be held or guaranteed by the GSEs. Mortgages that do not meet this criteria can only be purchased by private securitizers. The underlying principle behind the conforming loan limit is to ensure that the GSEs satisfy the goal of promoting access to mortgage credit for low- and middle-income households who likely invest in smaller value homes, which assuming the standard loan-to-value of 80% would also correspond to smaller-sized loans. Up until 2007, the loan limit was the same at the national level.[5] Based on a survey of major lenders by the Federal Housing Finance Board, the loan limit is updated (this has always increased in the past two decades) every year and reflects the national average change in single-family house prices during the prior year. While the CLL was only $33,000 in the early 1970s, it increased to $417,000 in 2006-2008. We use these national-level changes in CLL from 1990 to 2000 as the first source of variation to measure ease of credit access at the CZ-level (see Section III for detail on the variable construction). In 1990, the GSEs could only purchase or securitize loans below $187,450 ($360,150 for four-family homes) for loans secured by single-family homes. In 2000 this limit increased to $252,700 (and $ 485,800 for four family homes). The CLL thus can be used to determine houses or ar-

[5]Conforming loan limit is 50 percent higher for Hawaii and Alaska during the period.

eas that can be purchased with GSE-conforming loans and are thus “cheap" to finance (Adelino et al., 2013; Loutskina and Strahan, 2015).

GSE-eligibility based on CLL were in place even before the 1990s and while the regulations requiring that a fixed portion of GSE purchases be directed towards low- and middle-income housing were in place since the 1970s, they became mandatory only after the passage of the Financial Institutions Reform, Recovery, and Enforcement Act (FIREA) of 1989 (Jaffee and Quigley, 2007). It was the enactment of “The Federal Housing Enterprise Safety and Soundness Act of 1992" (also referred to as the 1992 GSE Act) that formalized the GSE responsibility for assisting low- and moderate-income families and underserved geographic regions. The GSEs Act specified certain housing goals satisfy that ensuring that a requisite share of conventional, conforming loans purchased by Fannie Mae and Freddie Mac pass criteria for the affordable housing goals.

Broadly, the GSE housing goals criteria include loans to lower-income borrowers, loans to borrowers residing in lower-income neighborhoods/high-minority neighborhoods — known as the “geographically targeted” or “underserved areas” goals — and loans to very-low-income borrowers and low-income borrowers living in low-income areas (the “special affordable” goals). The GSE Act also authorisized the HUD to oversee whther the GSEs satisfied these goals. Under the 1992 GSE Act, after a two-year transition period, the Housing and Urban Department (HUD) could establish annual affordable housing goals for the GSEs that stipulated that the a certain HUD-determined proportion of mortgages satisfy each of these goals. In 1996 the numerical goals for low- and moderate-income households was at 40 percent, for the underserved areas goal at 21 percent, and for the “special affordable” goals at 12 percent Gabriel and Rosenthal (2005). The criteria for the specific mandates for the GSEs are[6]:

1. Low- and moderate-income goal: A HUD-determined proportion of mortgages purchased by the GSEs should be either owned or rented by households with incomes

[6]See Subpart B and Sec. 1331, Sec. 1332, Sec. 1333, and Sec. 1334 in the original 1992 GSE Act in https://www.govtrack.us/congress/bills/102/hr5334/text

less than or equal to the median income of the area (usually metropolitan areas or defined non-metropolitan areas) in which the property is located.

2. Geographically targeted or underserved areas goal: A certain HUD-determined proportion of mortgages purchased by the GSEs should be mortgaged by households located in (a) low income areas, defined as metropolitan-area census tracts with median family income less than or equal to 90 percent of area median, or (b) high minority neighborhoods, defined as metropolitan-area census tracts with minority population at least 30 percent and with tract median income less than or equal to 120 percent of area median.[7]

3. Special affordable goals: Mortgages with household family income less than or equal to 60 percent of area median or less than or equal to 80 percent of area median and located in low-income areas (defined as in bullet 2 above).

A single loan can can count towards GSE credit under multiple goal categories. Our analysis for the neighborhood-level (census tract) analysis relies on the classification of census tracts as "targeted" or underserved (provided by the HUD) to identify the affordable housing goals that targeted geographical disparity in homeownership.[8] This classification of loans as targeted is the second source of variation we use in our empirical strategy.

The 1990s federal housing policy thus focused on the two complementary goals of (i) increasing aggregate homeownership rates, and (ii) narrowing the persistent racial gaps in homeownership (Gabriel and Rosenthal, 2008). The GSE Act achieved these goals through the low- and middle-income housing goals and decreased racial disparity through the underserved area goals. Both President Clinton's administration in the

[7]The criteria for non-metropolitan areas varies slightly with eligible counties required to have median family income less than 95 percent of the greater of the state or national non-metropolitan area median income.

[8]Since the special affordable goals also rely on the low-income area classification, we also capture households targeted by these goals. Prior research has found strongest (though overall muted) effects of the underserved areas goals compared to other mandates of the GSEs (Bhutta, 2009, 2008).

1990s[9] and President Bush's administration[10] in the early 2000s, before the global financial crisis, emphasized these dual goals. Both administrations, through the GSE affordable goals focused on the homeownership rates among underrepresented and disadvantaged groups such as minorities and low-income families.

II. Data and Summary Statistics

This section describes the various data sources used in our analysis and discusses the baseline summary statistics.

A. Sample and data sources

Data for our analysis is from the Decennial Census (1980, 1990 and 2000). The data on upward mobility are from Chetty et al. (2015) and subsequent papers. Additional data used and their sources are described below.

B. Upward mobility measures

Our upward mobility measures come from Chetty et al. (2015), Chetty and Hendren (2018a), Chetty and Hendren (2018b), and Chetty et al. (2019). Chetty et al. (2015) use administrative records on the incomes of around 40 million children and their parents to describe features of upward mobility in the United States. The main focus of their paper is on the geographical or spatial variation in upward mobility. In subsequent papers, Chetty and Hendren (2018a) and Chetty and Hendren (2018b), the authors build on this

[9] President Clinton in a letter to HUD Secretary Henry Cisneros on November 3rd, 1994 wrote: "Homeownership strengthens families and stabilizes communities. . . . Today, I am requesting that you lead an effort to dramatically increase homeownership in our nation over the next six years.. . . Your program should include strategies to ensure that families currently underrepresented among homeowners — particularly minority families, young families, and low-income families — can partake of the American Dream."(Gabriel and Rosenthal, 2005)

[10] President George Bush in June 18, 2002 noted that "The goal is that everybody who wants to own a home has got a shot at doing so. The problem is we have what we call a homeownership gap in America. Three quarters of Anglos own their homes, and yet less than 50 percent of African Americans and Hispanics own homes. That ownership gap signals that something might be wrong in the land of plenty. And we need to do something about it." (see http://www.whitehouse.gov/news/releases/2002/06/20020618-1.html, (Gabriel and Rosenthal, 2005))

measure and provide causal estimates of growing up in a neighborhood, which they refer to as the childhood exposure effect of growing up in a neighborhood. We use both the raw upward mobility measures and causal estimates of upward mobility of a CZ in our analysis.

For the baseline mobility measures, Chetty et al. (2015) tracks children born between 1980–91 birth cohorts. Parent income is measured as the average family income from 1996 to 2000. For the estimates we use, cohort (children) income is recorded when the child is 26 years old. The children's age when the parents' income is measured will thus vary across cohorts. The authors then then rank parents based on their position in the *national* income distribution. Similarly, they rank children — within a cohort — at the national level. They find that the rank-rank relationship between parents' income rank and children's income rank to be almost perfectly linear. Chetty et al. (2015) first showed that the rank-rank is almost perfectly linear. Since we are interested in the impact on children from low-income families, we focus on the children with parents in the 25th income percentile, which also corresponds to the average for he children of parents below the median income given the linearity of the rank-rank relationship. We refer to this as the average upward mobility of the children of low-income parents. Chetty et al. (2019) uses a similar procedure to measure the average upward mobility measures by race and we focus on the upward mobility measures for Black and white children for low-income families. As before these measures are the estimated mean household income rank of Black and white children, conditional on parent household income rank at the 25^{th} and the 75^{th} percentiles of the parent income distribution. Children's income is measured in 2015 when they are between 32 to 37 years of age. Chetty et al. (2019) also provides measures by gender and race. which we use in supplementary analysis.

The average upward mobility measure in Chetty et al. (2015) incorporates both the causal effect of growing up in a CZ and the sorting effect due to differences in unobservable characteristics of families that reside in a given CZ. Chetty and Hendren (2018a) and

Chetty and Hendren (2018b) build on the analysis in Chetty et al. (2015) to get the causal effect of growing up in a neighborhood/commuting zone. Intuitively, the procedure can be described as follows. They first focus on the population of residents who move across CZs to determine μ_{pc}. Second, they use a exposure-time identification strategy to identify the fixed effects using the movers in the sample. The intuition of how the estimates are constructed is clearer from the following example from the papers. Consider families who move from Phoenix to Oklahoma. If children of families who moved at younger ages had higher outcomes when adult compared to children who moved later, then one can posit that this is due to the causal effect of growing up in Oklahoma is higher relative to Phoenix. To claim that the effect is causal we need to assume that the timing of the moves is orthogonal to the children's potential outcomes. They are then able to estimate the causal effect of growing up in a neighborhood, (μ_{pc}), which is the focus of our analysis. To get the sorting component, they focus on the permanent residents, that is, families that never move. The upward mobility measures for the permanent residents represents both the causal effect of growing in a neighborhood and a sorting component, that is, differences in the characteristics of the families that reside in these CZs.

To determine the upward mobility measures for the permanent residents (the sorting component), y_{pc}, first, they rank at national level child i (in cohort s) based on their income, y_i. Similarly, they rank at the national level parents of these children based on their incomes, p_i. The upward mobility measure is then the rank-rank relationship between parents' income rank and children's income rank for each CZ. Thus, they estimate the relationship between child rank (y_i) and parents' rank (p_i) as:

$$y_i = \alpha_{cs} + \psi_{cs} p_i + \epsilon_i \tag{1}$$

They find that this rank-rank relationship is almost perfectly linear in all CZs (c). Expected rank of a child in cohort s whose parents' national income rank is p and are permanent

residents of CZ c is then given by:

$$\hat{y}_{pcs} = \hat{\alpha_c} + \hat{\psi}_{cs} p \tag{2}$$

Thus, the above is an estimate of the upward mobility for permanent residents which comprises of both the sorting and causal effect of growing up in a CZ. To decompose the observed outcome of permanent residents into a sorting and causal component, they make an assumption of the total relevant exposure time, T_C. The selection component of the permanent residents is then $\hat{\theta}_{pc} = \bar{y}_{pc} - T_C * \hat{\mu}_{pc}$. The mean selection effect depends on the assumption about T_C. We use $T_C = 20$ year exposure as in Chetty and Hendren (2018a) and Chetty and Hendren (2018b). In our analysis, we focus on the upward mobility measure for children of parents with below (above) median income distribution, which corressponds to the 25^{th} (75^{th}) percentile. Using a variety of tests ,Chetty and Hendren (2018a) show that indeed this is the causal effect of growing up in a neighborhood. They compare the outcomes of siblings within families, study moves triggered by displacement shocks, and exploit variation in across birth cohorts, gender, and quantiles in overidentification tests to establish the causal effect of neighborhoods on upward mobility.

For our analysis, we use three measures of upward mobility from the above papers. First is the non-causal estimate of income upward mobility for children who were born in the 1980s. Second, we use the causal impact of growing up in a neighborhood, namely, the childhood exposure effects of commuting zones. Lastly, we use the upward mobility measures for race provided by Chetty and Hendren (2018b). Note, the upward mobility measures by race correspond to the non-causal estimates of growing up in a neighborhood and childhood exposure effects by race are not available.

C. Homeownership, house prices, and other covariates

We use the Census 1990 and 2000 to measure the homeownership rate at the CZ-level and tract-level. The census data also contains information on the percentage of homeowners with mortgages. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. For weighting the data we use the population in each CZ from the Census 2000. Data to construct the instrument comes from block-level data from the 1990 Census and the variable construction is detailed in Section III.

D. Racial and Homeownership Segregation

We use two measures of segregation in our analysis, racial and homeownership segregation. Racial segregation is measured as in Theil (1972). Since homeownership policies of the 1990s also aimed to decrease geographic dispersion in homeownership, we also define an analogous homeownership segregation measure.

The two-group entropy based segregation measure as in Theil (1972) is as follows. Let $\phi(t)$ be the fraction of individuals of race t in a CZ where race refers to the two groups: white [$\phi(h)$] and Black [$\phi(r)$]. At the CZ level, the entropy index for each race is

$$E = \sum_t \phi_t log_2 \frac{1}{\phi_t}. \tag{3}$$

For each tract j, across race t, the level of racial diversity is given by the entropy index:

$$E_j = \sum_t \phi_{tj} log_2 \frac{1}{\phi_{tj}}. \tag{4}$$

The degree of racial segregation at the CZ-level is then given by

$$H = \sum_j \frac{population_j}{population_{CZ}} \frac{E - E_j}{E}, \tag{5}$$

where $population_j$ and $population_{CZ}$ respectively refer to the tract and CZ level population. Intuitively the racial segregation here measures how different the racial distribution of each census tract is from the CZ. $H = 1$ corresponds to the highest level of racial segregation and $H = 0$ corresponds to when there is no racial segregation at all.

We also define a homeownership segregation measure, which is similarly calculated. Let $\phi(t)$ be the fraction of individuals of tenure t in a CZ where tenure refers to the two groups: homeowners [$\phi(h)$] and renters [$\phi(r)$]. At the CZ-level, the entropy index for each tenure (homeowners or renters) is

$$E = \sum_t \phi_t log_2 \frac{1}{\phi_t}. \tag{6}$$

For each tract j, across tenure t, the level of racial diversity is given by the entropy index:

$$E_j = \sum_t \phi_{tj} log_2 \frac{1}{\phi_{tj}}. \tag{7}$$

The degree of homeownership segregation at the CZ-level is then given by

$$H = \sum_j \frac{population_j}{population_{CZ}} \frac{E - E_j}{E}, \tag{8}$$

where $population_j$ and $population_{CZ}$ respectively refer to the tract and CZ-level population. Intuitively the homeownership segregation here measures how different the homeownership (tenure) distribution of each census tract is from the CZ. $H = 1$ corresponds to the highest level of homeownership segregation and $H = 0$ corresponds to when there is no homeownership segregation at all.

E. Data for mechanisms

Data on mechanisms for local public finance and impact on education comes from Derenoncourt (2019). Data on housing regulation stringency index comes from Gyourko et al. (2008). To examine social capital, we use county-level measures from Rupasingha and Goetz (2008). The social capital index is constructed based on voter turnout rates, fraction of people who return their census forms, and other measures of participation in community organizations at the county level. This measure is then aggregated up to the CZ level. School segregation measures the exposure of students to minority groups within their schools and calculated as in Card and Rothstein (2007) using the Integrated Postsecondary Education Data System (IPEDS) data. Data on additional outcomes on health, incarceration, and children's mobility when adult come from Chetty et al. (2019).

CZs for which all the above data is available were used in our analysis. The main data limitation is imposed by the number of CZs for which the causal effect of upward mobility measure from Chetty and Hendren (2018a) and Chetty and Hendren (2018b) is available. Hence our analysis restricts to the 551 commuting zones for which all data is available.

F. Summary Statistics

Table I gives the summary statistics of the variables used in our analysis. Data are at the CZ level and there are 551 CZs for which all data is available.

The average upward mobility of low-income children, which given the linear rank-rank relationship between children and parents' income corresponds to the 25^{th} income percentile, was 45.67. For children with high-income parents, corresponding to the 75^{th} percentile of income distribution, this is a higher 59.30. That is, on average across CZs, the children of low-income parents had an income rank 13.63 percentile (when adult) below the income rank of high-income parents. The causal component of upward mobility, childhood exposure measure, is the income rank of the children in percentiles — relative

to the mean across all CZ — of the children of parents at the 25^{th} and 75^{th}. For a child with parents at the 25th percentile of the national income distribution, we find that spending 20 years of childhood in a one SD better CZ (population-weighted) increases household income at age 26 by 1.53 percentile points. To interpret the magnitude of these effects, it is useful to translate these percentile changes into dollar values. To do so, we follow Chetty and Hendren (2018a) and Chetty and Hendren (2018b) who find that a 1 percentile increase in income translates to an additional $818 at age 26 on average. The mean income of children with below-median income parents is $26,091; therefore, a 1 percentile increase corresponds to approximately a $818/$26,091 = 3.14 percent increase in income. Therefore a 1.53 percentile increase corresponds to a 4.8 percent increase in income of the below median income. For a child with parents at the 75^{th} percentile, spending 20 years in a one SD better CZ increases household income by 1.03 percentiles, equivalent to 1.93 percent increase in income suggesting that neighborhood effects matter less for rich families. Similarly Black upward mobility for the children of Black families at the 25th percentile of the income distribution is 34.14 percentile in the income rank when adult. Black children from from families at the 75th percentile have a a higher 44.86 percentile income rank when adult. White upward mobility for the children of white families at the 25th percentile of the income distribution is 46.41 percentile income rank. White children from from families at the 75th percentile of the income distribution have a a higher 60.16 percentile income rank when adult. Note, across both income groups Black and white children have higher upward mobility (income is measured when adult the children are adult between 26 to 32 years of age).

For the large part of the analysis we restrict our analysis to children from low-income families. Figure II, shows the spatial variation of upward mobility of Black children from low-income families in Panel A and for white families in Panel B. We see a high degree of correlation between the children of below-median income families Black and white families. Thus, the improvement in the outcomes of the Black families in regions with

high upward mobility is not coming at the expense of white children. However, there is some variation in upward mobility of white and Black children. For example, in the northeast Black children have higher upward mobility compared to white children. Note, the variation captured in these graphs capture the differences in upward mobility for Black (white) children across CZs.

On average the fraction of mortgaged homeowners was at 1.25 percent with a standard deviation of 2.90 percent. Average homeownership rate in 2000 was at 69.4 percent with a SD of 4.77 percent. The minimum and maximum homeownership rates are between 62.95 percent to 75.31 percent displaying a range of variation across US CZs similar to the upward mobility measure. Homeownership rate of the above median homeowners was 86 percent compared to a much lower homeownership rate of 60 percent for the below median income homeowners.

The racial segregation index in 2000 is -0.55 witha standard deviation of 0.71. Homeownerhsip segregation On average the CZs in our sample have around 11 percent Black populations, 4 percent Hispanic and other minority population, 13 percent below poverty level, 5 percent with single mother, 25 percent divorced, 66 percent single-family homes and have 5 percent unemployment rate. The average social capital index is -0.06. This measure from Rupasingha and Goetz (2008) is constructed based on voter turnout rates, fraction of people who return their census forms and other measures of participation in community organizations. Low values of the index correspond to low social capital.

To measure school quality we use high school dropout rate, teacher to pupil ratio and school score which are provided by Chetty and Hendren (2018a) and Chetty and Hendren (2018b) and constructed based on data from Integrated Postsecondary Education Data System (IPEDS). School quality takes a binary variable which takes a value of 1 if the CZ has below median high school dropout rate, or has above below median teacher to pupil ratio, or has above median test scores. On average 13 percent of the CZs were classified as having had high school quality. School segregation measures the exposure of students

to minority groups within their schools and calculated as in Card and Rothstein (2007) and had an average value of 0.03.

We weight all our regressions using the total number of housing units in 2000. On average the CZs in our analysis had 223,602 housing units. The size of the counties captured in our analysis varies widely as can be seen from fact that total number of housing units in the CZ varied from 60,384 housing units at the 10^{th} percentile to CZs with 466,109 housing units at the 90^{th} percentile.

III. Empirical Strategy

The broad goal of our analysis is to examine the impact of the increase in mortgage availability induced by the homeownership policies of the 1990s on racial homeownership patterns and upward mobility. We first describe the measure capturing the ease of mortgage access (our main instrumental variable) and then describe our empirical strategy.

A. Measuring ease of mortgage access

To measure the ease of mortgage access at the commuting zone-level, we exploit a regulatory cutoff in the size of loans (also known as the conforming loan limit/CLL) above which the GSEs cannot purchase or guarantee loans. Mortgages below (above) the conforming loan limit are referred to as non-jumbo (jumbo) loans. The underlying principle behind the conforming loan limit is to ensure that the GSEs satisfy the goal of promoting access to mortgage credit for low and moderate-income households who likely invest in smaller value homes, which assuming the standard loan-to-value of 80% would also correspond to smaller-sized loans. Up until 2007, the loan limit was the same at the national level. The loan limit is updated (this has always increased in the past two decades) every year and reflects the national average change in single-family house prices during the prior year. The conforming loan limit is determined at the national level and thus it is reasonable to assume that changes in *local* housing supply and demand conditions in a

given CZ are not individually driving national-level conforming limits.

We look at the change in weighted average share of houses in a block in 1990 that became eligible for GSE-eligible loans in 2000 to measure ease of mortgage access in a CZ. The idea is that it became cheaper to finance (due to GSE-eligibility) relatively more expensive houses just above the conforming loan limit in 2000 compared to 1990 as the CLL threshold increased from 1990 to 2000. Thus, the increase in the conforming loan limit targeted the relatively rich households. We calculate the percentage of houses that were eligible for conforming loans in 2000 but not 1990 at the block level. We measure house prices are as of 1990 to avoid the confounding effects of the increase in house prices due to the increased credit supply. The idea is to capture areas where change in GSE eligibility from 1990 to 2000 resulted in cheap financing of the relatively more expensive houses in 2000. We take the average of this measure across blocks as our measure in ease of mortgage access at the CZ-level.

In 1990 the GSEs could only purchase or securitize loans below $187,450 ($360,150 for four-family homes) for loans secured by single-family homes. In 2000 this limit increased to $252,700 (and $ 485,800 for four family homes). Similar to Adelino et al. (2013) and Loutskina and Strahan (2009) we define houses that are “cheap" to finance with a conforming or non-jumbo loan in a given year by dividing the conforming loan limit by 0.8 as mortgages with loan-to-value ratio below 80% qualify for purchase by the GSEs. Mortgages above this loan-to-value require private mortgage insurance to qualify as GSE-eligible. Thus, houses with prices below 125 percent of the conforming loan limit can be financed through non-jumbo mortgages, whereas houses above this limit cannot. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. We determine the fraction of houses that would become GSE-eligible based on the median house price value in a block in 1990 and then calculate the weighted

average across blocks within a CZ using the total number of housing units within a block as the weight. This measure then gives us an estimate of how easy it is to finance home purchase in a CZ with GSE-eligible houses.

Functional form: Because the distribution of ease in credit access is highly right-skewed, we use the quantile (percentile) function of the variable.[11] Figure III shows the weighted average of the fraction of houses in 1990 that become eligible for non-jumbo loans between 1990 and 2000 based on the 1990 house price values on the y-axis. The y-axis shows the quantile or the percentile function of the y-axis variable. To home in on the relationship between the two, in the inline figure, we restrict to CZs between the 0 and 60^{th} percentile of the raw ease in mortgage access variable. The median corresponds to a 0.34 pp increase in the ease of access to mortgages at the CZ-level. At the 95^{th} percentile this corresponds to a much higher 5.5 pp increase in ease of mortgage access.

B. Impact on Black and white homeownership rates

We start our empirical analysis by first documenting the impact of the higher mortgage access due to the 1992 GSE Act on homeownership for Black and white households. We are interested in two main aspects of the 1992 GSE Act (i) greater ease in overall mortgage access, (ii) greater ease in mortgage access for households in targeted or underserved neighborhoods. Hence, we analyze effects (i) across CZs, (ii) in targeted or underserved neighborhoods (census tracts), and (iii) the sorting within CZs as a result of the interaction between the two using census tract-level data.

To analyze the impact on Black and white homeownership growth across CZs with differing ease in mortgage access, we use the specification:

$$\Delta y_{ct,1990-2000} = \alpha_s + \gamma \times X_{ct} + \rho * \text{Ease in mortgage access}_{CZ} + \epsilon_c \tag{9}$$

where ct is a census tract in state s and commuting zone CZ. The dependent variable

[11] See Derenoncourt (2019) and Sequeira et al. (2020) for a similar scaling of highly right-skewed variables.

is the change in Black homeowners between 1990 to 2000 to the total homeowners and renters in 1990. The dependent variable for change in white homeowners is analogously defined. α_s is the state fixed effect and X_{ct} includes the census tract-level control variables poor share and fraction of single mothers in 1990. The Ease in mortgage access$_{CZ}$ variable is as described in Section A. The coefficient of interest, ρ, measures the average growth in the dependent variable across census tracts in a CZ with 1 percentile higher ease in mortgage access.

We then examine the impact on homeownership rates in census tracts targeted under the underserved area goals using the specification:

$$\Delta y_{ct,1990-2000} = \alpha_s + \gamma \times X_{ct} + \eta \times \text{Targeted tract}_{ct} + \epsilon_c \tag{10}$$

where ct is a census tract in state s and commuting zone CZ. The dependent variable is the change on Black (white) homeowners between 1990 to 2000 to the total homeowners and renters in 1990. Targeted tract$_{ct}$ is 1 if a census tract is classified as underserved by HUD. Remaining variables are as defined in Equation 9. α_s is the state fixed effect and X_{ct} includes the census tract level control variables poor share and fraction of single mothers in 1990. The coefficient of interest, β, measures the overall average growth in the dependent variable in targeted census tracts in CZs with a 1 percentile higher ease of mortgage access. The coefficient η measures the average of the dependent variable in the targeted census tracts. In some specifications, we also show robustness to including CZ-level fixed effects since the variation of interest (targeted) varies at the census tract-level as compared to Equation 9 where the variation of interest is at the CZ-level.

Finally, we examine how the CZ-level ease in mortgage access interacts with the in-

creased mortgage access to targeted census tracts using the specification:

$$\begin{aligned}\Delta y_{ct,1990-2000} = \alpha_s + \gamma \times X_{ct} + \eta \times \text{Targeted tract}_{ct} \\ + \beta \times \text{Ease in mortgage access}_{CZ} \\ + \gamma \times \text{Ease in mortgage access}_{CZ} \times \text{Targeted tract}_{ct} + \epsilon_c\end{aligned} \tag{11}$$

where ct is a census tract in state s and commuting zone CZ. The dependent variable is the change on Black (white) homeowners between 1990 to 2000 to the total homeowners and renters in 1990. Targeted tract_{ct} is 1 if a census tract is classified as underserved by HUD. Remaining variables are as defined in Equation 9. α_s is the state fixed effect and X_{ct} includes the census tract level control variables poor share and fraction of single mothers in 1990. The coefficient of interest, γ, measures the overall average growth in the dependent variable in targeted census tracts in CZs with a 1 percentile higher ease of mortgage access. The coefficient η measures the average of the dependent variable in the targeted census tracts. In some specifications, we also show robustness to including CZ-level fixed effects since the variation of interest (targeted) varies at the census tract-level as compared to Equation 9 where the variation of interest is at the CZ-level.

C. Examining the Impact on Upward Mobility

We are interested in the impact of the homeownership policies of the 1990s on children's upward mobility. The homeownership policies of the 1990s were operationalized through the 1992 GSE Act, which through their activities in the secondary mortgage markets, influenced the ease of mortgage access to potential homeowners. Since we are interested in looking at the impact of these policies on children's upward mobility, we first examine the relationship between the fraction of mortgaged homeowners and children's upward

mobility using the following specification:

$$\text{Upward Mobility}_{CZ} = \alpha_s + \gamma \times X_{CZ} + \beta \times \%\text{ of homeowners with mortgages} + \epsilon_{CZ} \quad (12)$$

for commuting zone CZ in state s. Upward Mobility_{CZ} is the upward mobility of the children of the families with income distribution at the 25^{th} percentile and given the linearity of the rank-rank condition corresponds to the average upward mobility for all children of parents with below-median income in the national income distribution. We use the raw upward mobility in the baseline as described in Section II. We also use a similar specification to analyze the impact on upward mobility of the children of Black and white households at the 25^{th} percentile of the income distribution, which are analogously defined and provided in Chetty et al. (2019). We also use the childhood exposure measure of upward mobility, which captures the causal effect on income rank of growing up in a CZ and provided in Chetty and Hendren (2018b). For ease of interpretation we standardize the upward mobility measures. We include state fixed effects (α_s) and control variables included are the percentage below poverty level, the fraction of single mothers, the unemployment rate, and the percentage of population over 55 years of age in 2000 and the level of homeownership rate in 1990. All regressions are clustered at the state level. All regressions are weighted by the number of housing units in a CZ in 2000 to get representative estimates of the US population.

D. Instrumenting for the Percentage of Homeowners with Mortgages

We now examine the impact of the homeownership policies of the 1990s — that increased mortgage access — on upward mobility of children. We use the ease in mortgage access between 1990–2000 based on whether houses within a CZ can be mortgaged with GSE-eligible mortgages to instrument for the fraction of homeowners with mortgages in 2000. We use both the reduced form specification that directly examines the impact of the ease

in GSE-eligible loans on upward mobility and also use a 2SLS instrumental variable (IV) strategy. The empirical specification for the reduced form specification is:

$$\text{Upward Mobility}_{CZ} = \alpha_s + \gamma \times X_{CZ} + \beta \times \text{Ease in mortgage access}_{CZ} + \epsilon_{CZ} \tag{13}$$

For the 2SLS IV strategy, the first stage is:

$$\begin{aligned} \%\text{ of homeowners with mortgages}_{CZ} = \alpha_s + \delta \times X_{CZ} + \\ \rho \times \text{Ease in mortgage access}_{CZ} + \epsilon_{CZ} \end{aligned} \tag{14}$$

For the 2SLS IV strategy, the second stage is:

$$\begin{aligned} \text{Upward Mobility}_{CZ} = \alpha_s + \gamma \times X_{CZ} + \beta \times \%\text{ of homeowners with mortgages}_{CZ} \\ + \epsilon_{CZ} \end{aligned} \tag{15}$$

for commuting zone CZ. Upward Mobility$_{CZ}$ is the upward mobility of the children of the families with income distribution at the 25^{th} percentile and given the linearity of the rank-rank condition corresponds to the average upward mobility for all children of parents with below-median income in the national income distribution. We use the raw upward mobility in the baseline as described in Section II. We also use a similar specification to analyze the impact on upward mobility of the children of Black and white households at the 25^{th} percentile of the income distribution, which are analogously defined and provided in Chetty et al. (2019). We also use the childhood exposure measure of upward mobility, which captures the causal effect on income rank of growing up in a CZ and provided in Chetty and Hendren (2018b). For ease of interpretation we standardize the upward mobility measures. We include state fixed effects (α_s) and control variables included are the percentage below poverty level, the fraction of single mothers, the unemployment rate, and the percentage of population over 55 years of age in 2000 and the level

of homeownership rate in 1990 in a given CZ to account for effects apart from the mortgaged homeowners in 2000. All regressions are clustered at the state level. All regressions are weighted by the number of housing units in a CZ in 2000 to get representative estimates of the US population. Equation 14 represents the first stage. Equation 13 represents the second stage using the instrumented percentage of homeowners with mortgages.

A valid instrument for the fraction of mortgaged homeowners requires that first, the instrument be able to explain variation in homeownership (rank condition). Second, the instrument needs to affect upward mobility through homeownership and not through any other channel (exclusion restriction). First we require that homeowners actually increased in CZs where relatively more expensive houses became cheaper to finance. Figure IV shows that the percentage increase in the houses which were eligible for non-jumbo loans in 2000 but not in 1990 (with the percentile/quantile functional form) was a strong predictor of the fraction of homeowners with mortgages. The regression estimate yields a coefficient of 9.7 (s.e = 0.66). While we cannot test for the exclusion restriction criteria, we will show robustness to alternate channels through which ease of mortgage access affects upward mobility of children. Our empirical strategy relies on the ease in access to cheaper mortgage credit across CZs based on changes in *national*-level cutoffs in the conforming loan limit and hence we can be assured that these changes are not driven by local supply and demand changes. Adelino et al. (2015) use a similar strategy at the transaction-level to trace out how GSE subsidies (through CLL) affect house prices and Loutskina and Strahan (2015) use a similar strategy based on credit supply subsidies to trace the economic impact on housing price changes.

IV. Ease in Credit Access and Homeownership Patterns

As a precursor to the impact on upward mobility, we examine how the homeownership policies of the 1990s, specifically the increased access to mortgage credit as a result of the 1992 GSE Act, affected homeownership rates of Black and white households. Based on the

specific homeownership mandates of the 1992 GSE Act described in Section I, we focus on two primary policy tools (i) the increase in ease of mortgage access for all households within a CZ, and (ii) increase in ease of access for households in targeted/underserved neighborhoods. Corresponding to these policies, we examine the impact of these two policies on homeownership rates of Black and white homeowners for CZs with easier mortgage access and then also examine the within-CZ sorting across census tracts in underserved/targeted relative to remaining census tracts.

Before we turn to the formal regression analysis, Figure I shows the racial homeownership gap, measured as the white homeownership rate minus the Black homeownership rate for 1870–2019 using data from **?** and updated to 2019 with data from the American Consumer Survey using IPUMS. The figure shows that Black and white homeownership rates increased from 1870 to 2019 with Black homeownership rate increasing by 36 pp, and white homeownership increased by 17 pp indicating a narrowing of the homeownership gap from 46 pp to 27 pp over the period. As **?** note, most of the reduction in the homeownership gap occurred during the early part of this period between 1870–1910 when the homeownership gap fell from 46 pp to 28 pp. Though the homeownership rate increased between 1990–2000, the racial homeownership gap barely changed. This is consistent with prior literature that has found that the homeownership policies of the 1990s did not decrease the racial homeownership gap (Gabriel and Rosenthal, 2005). However, these national trends mask significant cross-sectional heterogeneity. Panel B in Figure I examines the change in white and Black homeownership rates between 1990–2000 against the ease of mortgage access, at the CZ-level. We see that through the greater ease in mortgage access was accompanied by increased homeownership rates for both Black and white households, the effects were much larger for white households compared to Black households. A 1 percentile increase in the ease of mortgage access is associated with a 0.2% increase in white homeownership rate (red line; coefficient=0.20, s.d.=0.04). In contrast, the increase in Black homeownership rates is 20 times smaller and small in

economic magnitude but statistically significant (blue line; coefficient=0.01, s.d.=0.01).

We next turn to more formal analysis using the census tract level data in Table II and examine the impact of the ease in mortgage access on homeownership rates of Black and white households. Columns 1 and 2 show the results using the specification in Equation 9 for the growth in Black and white homeowners. An increase in ease of mortgage access by 1 percentile at the CZ-level increased average census-tract level growth in white homeowners by 0.10 pp (column 1), but by a much smaller 0.01 pp for Black homeowners, consistent with the CZ- and national-level trends in Figure I.

The remaining columns examine within-CZ heterogeneity in homeownership rates. Columns 3–6 examine the impact on the census tracts targeted by the underserved areas goals. Surprisingly, there is a 4.7 pp decline in white homeownership rate in the targeted census tracts (column 3) and the effects are similar when we include CZ-level fixed effects (coefficient=4.89, s.d.= 1.24 in column 5). We see, however, that Black homeowners increased in the targeted census tracts by 0.59 pp (column 4) and effects are similar when we include CZ-level fixed effects (coefficient=0.56, s.d.= 0.14 in column 6). Two things stand out. First, the increase in Black homeownership rate in targeted census tracts is much higher compared to overall homeownership rates. To get a sense of the economic magnitude, an increase in ease of mortgage access from the 25^{th} percentile to the 75^{th} in the ease of mortgage access corresponds to a 0.56% growth [(79-23)*0.01] in average Black homeownership rate (close to the 0.59% in column 4). Second, the decline in white homeownership rate far exceeds the increase in Black homeownership rate in the targeted census tracts. This is a striking fact considering that the GSE underserved area goals were specifically meant to address geographic disparity in homeownership rates, but ended up possibly driving the white homeowners out of the targeted census tracts.

We next examine the sorting within CZs using the specification in Equation 11. The interaction term on ease of mortgage access and targeted census tracts (column 7) suggest that the decline in white homeownership in targeted census tracts is concentrated

in CZs where mortgages were easily available, allowing the white homeowners to move out of targeted neighborhoods. The coefficient on targeted census tracts suggests an increase in white homeownership rate in targeted census tracts (though the coefficient is significant only at the 10% level), consistent with prior literature that has suggested that homeownership ties households to neighbourhoods (Goodman and Mayer, 2018). Only when mortgage access is easier at the CZ-level, white homeowners are able to move out of the poorer (targeted) neighborhoods. The coefficient on the uninteracted term, ease of mortgage access is similar in magnitude (coefficient = 0.16, s.d.=0.05) to column 1. In column 9, we also include CZ-level fixed effects and results are similar. While targeted areas see a 4.48 pp increase in homeownership rate in targeted neighborhoods (effects are significant only at the 10 percent level), there is a 0.12 pp decline in white homeownership rate when mortgage access increases by 1 percentile in a given CZ. In sharp contrast, there is no direct impact of the CZ-level ease in mortgage access on Black homeownership rates as seen in the coefficient for the interaction term. Targeted neighbourhoods see a 1.14 pp (column 8) increase in Black homeownership rate. Effects are similar when we include CZ-level fixed effects (coefficient= 1.01, s.d.=0.46 in column 9). The coefficient on the uninteracted term on ease of mortgage access in column 8 is similar in magnitude to column 2 (coefficient= 0.014, s.d.=0.005). Importantly, we do not see an increase in Black homeownership rates in non-targeted neighborhoods as shown by the interaction term in column 8 (coefficient= -0.007, s.d.=0.005) and column 10 (coefficient= -0.006, s.d.=0.007).

To summarize, CZs with greater ease of mortgage access saw an increase in both white and Black homeowners, but with white homeownership growth far exceeding that of Black homeowners. Importantly, we see within-CZ sorting. The increase in Black homeowners was driven by targeted neighborhoods. Targeted neighborhoods witness a decline in white homeowners *especially* in CZs with greater mortgage access. This is similar to Card et al. (2008) who find that social interactions in white preferences can lead to similar white population outflows once when the minority share in neighborhoods ex-

ceeds a threshold ("tipping point") leading to segregation. Consistent with our findings of sorting across neighborhoods, Ouazad and Rancière (2016) analyze the subsequent credit boom between 2000–2006 and show a similar outflow of white households from Black and racially mixed neighborhoods. The results indicate that the ease in mortgage access between 1990–2000 increased homeownership rates of both Black and white households, as well as within-CZ sorting of white and Black homeowners between 1990–2000.

V. Impact on Children's Upward Mobility

We now turn to the impact of the homeownership policies on upward mobility, with a particular focus on children of Black and white families. We then differentiate between the direct effect of the GSE homeownership policies on homeownership level and the within-CZ sorting of Black and white homeowners as documented in Section III. We conclude with analysis at the census tract level.

A. Impact on Children's Upward Mobility from Low-income Families

The homeownership policies of the 1990s were operationalized through the 1992 GSE Act, which through the GSE activities in the secondary mortgage markets influenced the ease of mortgage access to potential homeowners. We examine the relationship between the fraction of mortgaged homeowners and children's upward mobility to analyze the impact of these homeownership policies. First, we focus on the average upward mobility measure at the CZ-level from Chetty and Hendren (2018a). This measure is defined as the mean expected household income rank when adult (age 26) of children born between 1980–1986 by their childhood commuting zone, and whose parents were in the 25^{th} percentile of national income. Table III, columns 2–5 show the results using the specification in Equation 12.

Column 2 in Table III examines this more formally using a simple OLS. The dependent variable is normalized for ease of interpretation. A 1 SD increase in the fraction of

mortgaged homeowners is associated with a 0.56 SD decrease in low-income children's upward mobility.

We next turn to the causal estimates of the impact of the homeownership policies using the CZ-level ease of mortgage access (defined in Section III) as the instrument. We present both the reduced form and the 2SLS IV results. Before turning to the more formal regression analysis, in Figure V we show the binned scatterplot of the relationship between ease of mortgage access and low-income children's upward mobility. Each dot in the binned scatter plot represents the average y-axis variable (upward mobility across CZs) within 5-percentile bins of the x-axis variable (ease of mortgage access). There is a strong negative relationship between this ease of mortgage access and average upward mobility for children from low-income families in the CZs today. Column 3 in Table III shows the reduced-form impact of our main instrument on upward mobility using the specification in Equation 13. A 1 percentile increase in ease of mortgage access decreases average upward mobility by 0.015 SD. To get a sense of the economic magnitude of the effect, moving from the 25^{th} to the 75^{th} percentile of ease of mortgage access corresponds to a 0.82 SD decline [=(23-79) * -0.0146] in low-income children's upward mobility.

We now turn to the 2SLS IV estimates. Section III already discussed the validity of the instrument, ease of mortgage access based on GSE-eligible mortgages. Column 1 shows the first stage results of Equation 14 and assures us that the instrument has sufficient explanatory power (F-Stat=178.6). Column 4 shows the 2SLS instrumented second stage results using Equation 13. A 1 SD higher fraction of mortgaged homeowners as instrumented by GSE-driven ease of mortgage access leads to a 1.125 SD decline in low-income children's upward mobility. From Table I we see that the a 1 SD corresponds to a 4.85 increase in percentile rank of the income of the low-income children when adult. This corresponds to $3,976 decline in annual income. The mean income of children with below-median income parents of $26,091, which translates to a 15.24% decline in income.

The 2SLS IV estimate is twice as large in magnitude as the OLS estimate in column 1,

which may occur if the omitted or unobservable characteristics positively correlate with the fraction of mortgaged homeowners and upward mobility. For example, mortgaged homeowners may move to CZs with better upward mobility. If these CZs have better schools or more investment in public infrastructure, then this could explain why the OLS estimate of the relationship between the fraction of mortgaged homeowners and upward mobility is biased towards zero.

B. Impact on Childhood Exposure Effects

The raw upward mobility measure captured in columns 2 and 4 include effects due to growing up in a particular CZ as well as the selection effects determined by a sorting component, such as differences in family characteristics. Section II explains this more clearly. The impact on permanent residents is comprised of effects arising from place-based effects (causal impact of growing up in a CZ) as well as a sorting component — unobservable characteristics of the residents of a CZ, say if CZs with greater mortgage access also see a change in the composition of families. Chetty and Hendren (2018b) provide childhood exposure measures of upward mobility by exploiting the length of time in childhood in a particular CZ of families that move across CZs. In columns 5–7, we look at the childhood exposure measure of upward mobility. Column 5 shows that the causal impact of growing up in a CZ with a higher percentage of homeowners is a 0.38 SD decline in upward mobility. Instrumenting for the percentage of homeowners using the ease in mortgage access shows that upward mobility declined by 0.61 SD (Column 7). This translates to an economic magnitude of 1.71 percentile decline in income rank, corresponding to a $1,402 decline in annual income or 5.37% decline in income.

Prior literature hypothesizes that the impact of homeownership policies can occur either through a direct effect by changing the nature of the homeowners themselves or alternatively by changing the characteristics of the places in which the homeowners reside through homeownership externalities. The effects on average upward mobility and

childhood exposure effects allow us to delineate which of the two effects dominate. The direct effects of homeownership could be positive, say by allowing homeowners to create wealth, smooth consumption, and providing residential stability (Dietz and Haurin, 2003; Sodini et al., 2016) or could be negative through reduced mobility during periods of falling house prices (Goodman and Mayer, 2018). The indirect effects of homeownership include the positive externalities of homeownership, say through greater homeowner investment in social capital (DiPasquale and Glaeser, 1999) and by homeowners better maintaining their properties in turn leading to increases in housing wealth through higher house prices. The indirect effect could also occur through place-based effects due to resulting differences in investment in schools, as we will document in the Section VI.

To get an estimate of the causal impact of growing up in a CZ, we need to scale the 2SLS estimated effect on 1 year of childhood exposure to a CZ to reflect the total impact of growing up in a CZ on children's outcomes. Chetty and Hendren (2018b) scales this estimate by 20 years to reflect the place-based effect of spending one's entire childhood in a given CZ. This scaling makes the assumption that there is a linear effect of spending an extra year in a CZ on children's outcomes. However, in a subsequent paper, Chetty et al. (Forthcoming) using a similar movers strategy shows that there is a kink in the relationship between the age at which the family moves and the children's predicted income rank in the destination CZ at age 13. That is, place-based effects are greater in teenage and post-teenage years compared to pre-teen years. Based on this kink, Derenoncourt (2019) argues that the scaling parameter should be 15.525 years.

Using the scaling of 15.525 years, the total impact of ease in mortgage credit on children's income is a -5.25 (=0.55*-0.615*15.525) change in income rank using the coefficient of -0.615 from column 7 in Table III and that 1 SD corresponds to 0.55 percentiles from Table I. The average upward mobility has a -5.46 (=-1.125*4.85) change on children's outcomes using the estimate in column 4 in Table III and that 1 SD corresponds to 4.85 percentile from Table I. Thus, almost 96% (=-5.25/-5.46) of the upward mobility is explained

by the causal impact of growing up in a CZ. Hence, almost the entire effect of the ease in mortgage credit operates through place-based effects. Using the scaling of 20 years, the total impact of ease in mortgage credit on children's income is a -6.77 (=0.55*-0.615*20) change in income rank using the coefficient of -0.615 from column 7 in Table III and that 1 SD corresponds to 0.55 percentiles from Table I. This corresponds to 124%(=-6.77/-5.46) of the effect on upward mobility stemming from place-based effects.

The above analysis suggests that the indirect effects of homeownership policies through place-based effects impact the childhood environment and is the primary mechanism affecting children's upward mobility. Changes in family characteristics or differences in families' investment in children's human capital as a result of the improved homeownership policies are not the main channel affecting children's upward mobility.

C. Impact on Children from Black and White Families

Given the historical context preceding the 1992 GSE Act and its dual focus on increasing homeownership and decreasing the racial disparity in homeowning, we now examine the impact on race-specific upward mobility. The race-specific upward mobility measure is from Chetty et al. (2019) and is defined as the mean expected household income rank when adult (age 26) of Black (or white) children born between 1980–1986 by their childhood commuting zone and whose parents were in the 25^{th} percentile of national income. Chetty et al. (2019) only provides these average mobility measures, but not the childhood exposure measures by race. White population refer to non-Hispanic white population as defined in Chetty et al. (2019). While the previous Section A focuses on average upward mobility of children of all races belonging to below-median income parents and also the childhood exposure effects, we restrict to average upward mobility of black and white children. However, note Chetty et al. (2019) does not provide race-specific childhood exposure effects.

Figure VI examines the impact on the upward mobility of the children of low-income

Black families and the children of low-income white families. Panel A shows that greater ease in mortgage access is associated with lower upward mobility for children from low-income Black families. In contrast, panel B shows a positive relationship for children from low-income white families. In Table IV, we examine this more formally. In Column 1, using an OLS, we see a 0.36 SD decline in the upward mobility of the children of Black families in CZs with 1% higher fraction of mortgaged homeowners. Column 2 shows the reduced-form effects of the homeownership policies and indicates that a one percentile rank increase in ease of mortgage access resulted in a 0.008 SD decline in Black children's upward mobility. This estimate corresponds to an economically meaningful decline of 0.43 SD [=(79-23)*0.008] in upward mobility when the ease of mortgage access increases from the 25^{th} percentile to the 75^{th}. On instrumenting for mortgaged homeowners using the ease in mortgage access at the CZ-level, we see that upward mobility of low-income Black families declined by 0.59 SD (Column 3). This translates to a 2.7 percentile (=0.592*4.53) decline in income rank of Black children when adult and corresponds to $2,199 or approximately 8.43% decline in income.

While column 4 suggests that upward mobility of white children declines by 0.25 SD in CZs with higher mortgaged homeowners, the effect disappears in the instrumented specification with the reduced form (column 5) and 2SLS (column 6) specification. On instrumenting for homeownership in Column 6, we see a statistically *insignificant* (economically small 0.07 SD) decline in the upward mobility of children of low-income while families.

The significant adverse effect on the upward mobility of low-income Black children in column 3, combined with the lack of an effect on white children's upward mobility, suggests that the homeownership policies of the 1992 GSE Act increased the racial gap between white and Black children. Columns 7–9 examine the racial gap between upward mobility of children from white and Black families. Though the results are noisy using OLS, using our instrumented 2SLS IV regression in column 9 suggests a 0.023 SD increase

in the race gap when the fraction of mortgaged homeowners increases by 1 SD or a 4 percentile widening in income rank of between white and Black children.

Heterogeneity by gender: Figure VIII shows the heterogeneity in impact across gender. The specification corresponds to columns 3 and 6 in Table IV for the Black/white men/women with low/high income (corresponding to the 25th/75th income percentile of parents). Figure VIII suggests that the negative effects of racial segregation are driven by Black men. There is no discernible effect on Black women, white men, and white women. For completeness, we also show the effect on the men and women from high-income families. Although there is statistically significant negative effect on the high income families, the effect is minuscule compared to the negative effect on the Black men. While the results on average upward mobility and childhood exposure effects point to place-based mechanisms as the main driver of the impact of homeownership policies on upward mobility, we also rely on the heterogeneity in effects by gender to narrow down amongst competing alternative channels in Section VI.

D. Distinguishing between Homeownership Rate and Homeownership Segregation Channel

We use the ease in mortgage credit access in 1990-2000 as an instrument for the number of mortgaged homeowners in 2000 at the CZ-level. Note, we use the level of mortgaged homeowners as opposed to the change because it also captures mortgagors who refinanced during the 1990s as opposed to a simple difference in mortgaged homes between 1990–2000. The ease in mortgage credit access in the 1990s increased homeownership as we showed in Figure I and also increased the sorting within-CZs as shown in Table II. We now try to distinguish between whether it was the direct effect of home-owning or the indirect effect of the resulting sorting of white and Black families that drives the negative effects on upward mobility. Prior literature finds that homeownership has positive effects on households by allowing them to create wealth, smooth consumption, and by provid-

ing stability to families (Dietz and Haurin, 2003; Sodini et al., 2016). As a result, children of homeowners who are also likely to drop out of high school and have lower teenage pregnancies (Green and White, 1997) and homeowenrship can also have positive effects due to increase in social capital (DiPasquale and Glaeser, 1999). However, an opposing strand questions both the positive effect on children's outcomes (Rossi-Hansberg et al., 2010; Rossi and Weber, 1996; Haurin et al., 2002) and on homeowners well-being (Barker and Miller, 2009; Holupka and Newman, 2012). Particularly, the rise in foreclosures during the Great Recession of 2009 highlights a negative effect of home-owning: reduced residential mobility preventing families from moving to better opportunities (Goodman and Mayer, 2018). This reduced residential mobility can possibly explain the lower upward mobility of Black families.

In Table V we examine the impact of the change in homeownership rates between 1990–2000 on upward mobility of the children from low income Black households. The ease of credit access is a good predictor of increase in homeownership rate between 1990 to 2000, which is to be expected (column 1, top panel). A 1 percentile higher ease in mortgage access corresponds to a 1 pp increase in homeownership rate between 1990–2000. The F-statistic is 27.43. The OLS estimate in Column 1 in the middle panel suggests that there is no impact of the increase in homeownership rate on the upward mobility of children from low income Black families. The 2SLS specification does show a slight 0.02 SD decline (only significant at the 10% level). Similarly, the bottom panel shows no impact on the children of low income white families (columns 1 and 2). These results confirm that there was very limited impact on upward mobility through this direct channel of increased homeownership levels.

Since the geographically targeted areas were specifically aimed at reducing geographic disparity in homeownership, we examine the impact on *homeownership* segregation. Column 2 in Table V in the top panel shows that the ease in credit access is a good predictor of homeownership segregation in 2000. The OLS estimate in column 3, Table V

shows that there was a 0.13 SD decline in upward mobility of children from low income Black families when homeownership segregation was 1 SD higher. The instrumented 2SLS regression in Column 4 shows a 0.47 decline in upward mobility of children from low income Black families. However, there is no similar decline in upward mobility of the children of low income white families as shown by columns 3 and 4 in the bottom panel. The increase in homeownership segregation in CZs with easier access to mortgages highlights the increasing geographic disparity in homeownership as highlighted in Table II. There is a significant decline in white homeownership rates, but a correspondingly much lower increase in Black homeownership rates in targeted census tracts, especially in CZs with greater access to mortgages. In Figure VII we look at the relationship between homeownership rate and homeownership segregation for 1980–1990 (panel A) and 1990–2000 (panel B). Panel A shows that CZs that witnessed higher homeownership rates in 1980–1990 also saw a decline in homeownership segregation. In contrast, Panel B shows that the CZs that witnessed higher homeownership rates in 1990–2000 saw an increase in homeownership segregation. This is consistent with Table II where we saw that while both Black and white homeownership increased in CZs with greater credit access, Black homeownership increased only in underserved/targeted census tracts and was also accompanied by significant within-CZ sorting of Black and white homeowners.

To explore this racial sorting, we turn to the impact due to racial segregation as a result of the increased mortgage access. Column 3 in the top panel shows that the ease of credit access also corresponds to higher racial segregation. Higher racial segregation results in a 0.12 SD decline in upward mobility of children from low income Black families (columns 5 and 6 in the middle panel). However, there is no such decline in upward mobility of the children from low income white families (columns 5 and 6 in the bottom panel).

E. Tract-level impact on upward mobility

The tract-level analysis in Table VI further elucidates the negative impact on the upward mobility through the sorting of white and Black households within neighborhoods. Column 1 shows that on average there is no statistically significant relationship between ease of access to mortgages and upward mobility of Black children from low income families. For brevity, where applicable, we show the instrumented regressions. Columns 1–2 show that the CZ-level analysis masks significant variation across tracts. There is a 0.34 SD decline in upward mobility of low-income Black children in targeted neighborhoods. Column 3, further shows that there is the decline is almost twice as high in CZs with easier mortgage access. Column 4–6, look at the impact on upward mobility of children from low-income white families. We see that on average there is an increase in upward mobility in CZs with easier mortgage access (column 4), but there is a decline in upward mobility for these children in targeted neighborhoods (column 5). The decline in upward mobility in targeted neighborhoods is twice as high in CZs with easier mortgage access (column 6). Column 6 also illustrates how the decline in upward mobility is tied to neighborhood-level effects as opposed to other factors specifically affecting Black children but not white children. White children from low-income families see a 0.25 SD decline in upward mobility in targeted tracts, and an increase of 0.34 SD in upward mobility in CZs with easier mortgage access. However, in CZs where access to mortgage is easier, targeted tracts see a 0.19 SD decline in upward mobility. These patterns line up exactly with the trends in Black and white homeownership rates observed in Table II: an increase in Black homeownership rates in targeted neighborhoods, but was accompanied by a decrease in white homeownership rates especially in CZs with easier mortgage access. Particularly, columns 4–6 have a negative effect even when we look at differences across white families. In columns 7–9 examine the impact on the racial gap between upward mobility of white children relative to Black children. While the overall CZ-level racial gap declines in CZs with greater mortgage access (column 7), there is a widening

of the racial gap in targeted census tracts (column 8), particularly when there is greater ease in mortgage access at the CZ-level. Thus, even though the ease in mortgage access affected both Black and white children in targeted neighborhoods (arguably due to place-based effects), the negative impact was much higher for Black children as indicated by the widening in the racial gap in upward mobility.

VI. Channels affecting upward mobility

We now examine the potential channels through which ease in mortgage access impacts upward mobility. While it is difficult to pinpoint the exact mechanisms driving our results without access to additional instruments for each mechanism, we provide evidence for the possible suggestive evidence for possible mechanisms. We show that the channel that we postulate is able to explain the observed heterogeneity in upward mobility across race and gender; patterns in alternate outcomes such as high-school attainment, incarceration outcomes, and life expectancy; and within-CZ variation in upward mobility using census-tract level data. We examine four potential channels through which homeownership decreased upward mobility: (i) more stringent housing regulation, (ii) education, (iii) investment in public finance, and (iv) crime.

A. Restrictive Housing Regulation

We examine the impact of easier mortgage access on stringency of housing regulation for children when adult. Figure IX shows the coefficient for the instrumented mortgage access between 1990–2000 on the stringency of housing regulation in the decade after in 2006 (when the children are adult). The bars represent the 5% confidence interval. The housing stringency regulation data is from Gyourko et al. (2008). Gyourko et al. (2008) also provide the componenets driving the stringency regulation such as local political pressure, state political involvement, state court involvement, local zoning approval index, local project approval index, supply restrictions, density restrictions, extractions index, and

approval delay index. We normalize the restrictions indices for ease of interpretation. There is a 0.4 SD increase in housing restrictions in CZs withe asier access to mortgages. We hypothesize that this is driven by the increased sorting of homeowners within CZs in targeted and non-targeted neighborhoods. Indeed CZ-level factors such as local political pressure, local project approval, density restrictions, and approval delay drive the increase in stringent housing regulation. Areas with greater ease of mortgage access as a direct result of the homeownership policies in the 1990s saw more stringent land-use housing regulation.

Stringent housing regulation possibly perpetuates racial segregation in the 1990s, potentially reinforcing the effect of bad neighborhoods. To examine these effects we examine residential mobility of children when adult in Figure X by focusing on whether the children (when adult) move out of the neighborhood or CZ they grew up in. Both Black and white children in CZs with easier access to mortgages are more (but equally) likely to stay in the same CZ they grew up in, however they both are less likely to remain in the same neighborhood (panel A). Black and white children (when adult) are both more likely to move out of the neighborhoods (census tracts) they grew up in CZs with greater mortgage access, but white children are twice as likely to do so (Panel B). Strikingly, only the white children are more likely to move to low-poverty (good) neighborhoods when adult but Black children are not able to do the same (Panel B). This is despite similar (and higher) propensities for both Black and white children (when adult) to remain in the same CZ. Potentially, the increased homeownership policies of the 1990s further perpetuated racial segregation when the children were adult.

B. Homeownership channel: Impact on house prices, school quality, and housing wealth

Table VII examines the main ways through which homeownership can impact upward mobility. We examine the impact on (i) house price growth between 1990-2000, (ii) school

quality, and (iii) racial housing wealth gap. Prior literature has posited that homeownership acts as a way for households to store and build wealth, also allowing them to smooth consumption. Hence, we examine median house price growth between 1990–2000. Given the patterns in homeownership growth in the poorer targeted neighborhoods and remaining neighborhoods, we also examine differences in the racial housing wealth gap measured as the total housing wealth for white homeowners minus the white homeowners. We analyze these factors at the CZ and the neighborhood level to pinpoint the mechanism.

Columns 1–3 in Table VII show, surprisingly, that there is a decline in median house price growth between 1990–2000 in areas with easier mortgage access. Due to space constraints we focus on the instrumented regression. The decline in house prices is surprising considering Adelino et al. (2015) and Loutskina and Strahan (2015) who document an increase in house prices and economic outcome after the increase in mortgage credit in the early 2000s. To explore why, we turn to census-tract analysis in Table VIII. Columns 1–3 in Table VIII show that this is entirely attributable to the decline is house prices in targeted neighborhoods, especially in CZs with easier mortgage access. While the coefficient on percentage of homeowners is positive (column 1 and 3), it is noisy and statistically insignificant. In unreported results, we show that on sub-setting to neighborhoods with a low fraction of Black population, we see the familar increase in house prices.

CZs with easier mortgage access also have lower quality schools, as proxied by average scores of 3rd to 8th graders (Columns 4–6 in Table VII). We examine whether this is driven by neighborhood-level differences in school quality. Indeed, targeted census tracts have lower quality schools, particularly those in CZs with greater mortgage access have lower school quality (Columns 4–6 in Table VIII). While this retains all the census tracts for which the respective data on the dependent variable is available, in Table B1 we retain only observations for which data on the upward mobility measures in Table VI are available. Results are noisy because of limitations in data availability for tract-level upward

mobility measures but qualitatively similar to Table VIII).

Both the impact on house prices and school quality emphasize that deterioration in neighborhood level mechanisms could potentially drive a decline in upward mobility of children. Since we find a relatively stronger decline in the outcomes at the CZ-level for Black children, we examine racial gap in housing wealth for white and Black families within CZs. Column 1–3 in Table VII seems to suggest that CZs with easier mortgage access saw an increase in racial housing wealth gap between white and Black homeowners. However, at the neighborhood-level there is decline in the racial gap in housing wealth in targeted neighborhoods, especially in CZs with greater mortgage access. Thus, it is unlikely that declines in upward mobility of Black children is driven by a difference in housing wealth. These findings together with the decline in upward mobility of white children in targeted neighborhoods (see Section V) suggest that the decline in upward mobility of Black children is due to (i) confining Black families to the poorer targeted neighborhoods, and (ii) channels operating through the neighborhood-level factors, common to both white and Black families as opposed to within-tract racial differences in input in children. We posit that the decline in house prices, especially in targeted census tracts leads to a deterioration in school quality due to a reduction in property taxes.

To link the mortgage access to decline in school spending, we examine the impact on house prices. We find that greater mortgage access at the CZ-level resulted in a decline in house prices in the targeted census tracts. Plausibly, the decline in house prices results in lower property taxes, explaining the reduced school spending. Figure XI shows that indeed CZs with easier access to mortgages saw a decline in education spending. Further, effects are not due to increased school segregation.

C. Other Channels

Figure XI shows the 2SLS IV coefficients for the respective variables indicated, as of 2000. The regressions also control for pre-period values measured as of 1990. Data for teh de-

pendt variables is from Derenoncourt (2019). Figure XI shows that there was an increase in crime (as proxied by murder rates) in CZs with greater mortgage access, and a decline in public health spending. Glaeser and Sacerdote (2000) and DiPasquale and Glaeser (1999) find that there are social benefits to homeownership and homeowners invest more in local amenities. However, this does not explain our findings since we find an increase in social capital.

D. Discussion of Channels

Given competing channels through which homeownership can affect upward mobility, exploring alternative outcomes may allow us to pinpoint the primary channel. We narrow down the mechanisms by supplementing the main analysis by examining alternate outcomes variables: incarceration, high school attainment, and health outcomes.

The gender differences and negative impact of homeownership, particularly on Black men (Figure VIII), allow us to further narrow down the possible mechanisms through which homeownership has deleterious effects on upward mobility. Figure XII, Panel A shows that Black men are less likely to graduate high school indicating that the primary mechanism affecting upward income mobility is through education. There are no similar effects on incarceration rates (Panel B) consistent with no increased police spending in Figure XI. In contrast to the increased police spending and incarceration post the Great Migration (1940-1970) (Derenoncourt, 2019), the ease in credit access and resulting segregation did not increase incarceration rates for Black men. We also find no effect on health outcomes[12] (Panel C in Figure XII) despite the decline in health spending observed in Figure XI.

Katz (2015) argues that the impact on income largely works through the quality of education and schools. Autor et al. (2016) and Derenoncourt (2019) argue that public finance investment has more of an impact on Black men compared to Black women, explaining the differences across gender. Thus, it is the decline in school quality that explains differ-

[12]Data is not available by race.

ences in upward mobility on Black men from low-income families. The results all point to one main critical channel lowering upward mobility: a decline in school quality, which might disproportionately affect Black men more than their white peers and Black women.

VII. Conclusion

In this paper we relate the homeownership policies of the 1990s that increased homeowners access to mortgages to children's upward mobility. While policy has focused on increasing homeownership rates for decades, especially in low-income areas the benefits of homeownership has been difficult to determine. We show that while Black homeownership increased in targeted neighborhoods, commuting zones with easier access to mortgage credit also witnessed an outflow of white homeowners from targeted neighborhoods, increasing overall racial segregation. Further, despite the intent of the policy to decrease geographic disparity in homeownership, homeownership segregation increased. Using across-city variation in access to mortgage credit to instrument for racial segregation, we show that the homeownership policies of the 1990s worsened poor children's upward mobility, especially among Black households. The mechanism driving the decline in upward mobility are increased crime, low health investment, and more stringent land-use housing regulation that perpetuates racial segregation. Our paper highlights how geographically targeted homeownership policies can inadvertently increase geographic disparity in homeownership within commuting zones, worsening children's upward mobility.

This paper also emphasises a novel aspect of segregation, namely, homeownership segregation. The homeownership segregation is important for outcomes of children, especially for Black children from low-income families. The results in this paper challenges, to some extent, the promotion of homeownership in low-income census tracts. Perhaps alternate policies that encourage investment in human capital and "moving out" to better neighborhoods have higher marginal value in achieving the "American Dream" in the

sense of opportunity for children, their education, and their careers. Thus, the analysis suggests bans on exclusionary zoning are necessary and perhaps even the introduction of inclusionary zoning requirements, such as those implemented in New Jersey and Massachusetts would be more beneficial for improving children's outcomes. Additionally, as Rothstein (2017) suggests homeownership policies should explicitly subsidize homeownership in the suburbs from which they were once banned. Note however, our findings do not necessarily imply that policy should not target low homeownership among Black households. Instead government policies should be aimed at increasing homeownership, but in addition also commit to making the necessary investment in infrastructure and public finance, particularly in education since our results show that this has the largest impact on upward mobility of Black children. Indeed, preliminary evidence from the creation of "Opportunity Zones" from the "Tax Cuts and Jobs Act of 2017" that created tax advantages for investing in business or real estate targeted low-income Census tracts have shown promising results on employment Arefeva et al. (2020). Such concurrent investment in underserved neighborhoods could also possibly diminish the adverse effects on children's upward mobility that we observe.

References

Adelino, Manuel, Antoinette Schoar, and Felipe Severino, 2013, Credit Supply and House Prices: Evidence from Mortgage Market Segmentation, *WP No.17832, NBER* .

Adelino, Manuel, Antoinette Schoar, and Felipe Severino, 2015, House prices, Collateral, and Self-employment, *Journal of Financial Economics* 117, 288–306.

Adelino, Manuel, Antoinette Schoar, and Felipe Severino, 2016, Loan Originations and Defaults in the Mortgage Crisis: The Role of the Middle Class, *The Review of Financial Studies* 29, 1635–1670.

Arefeva, Alina, Morris A. Davis, Andra C. Ghent, and Minseon Park, 2020, Job Growth from Opportunity Zones, *SSRN Working Paper 3645507* .

Autor, David, David Figlio, Krzysztof Karbownik, Jeffrey Roth, and Melanie Wasserman, 2016, School Quality and the Gender Gap in Educational Achievement, *American Economic Review* 106, 289–295.

Barker, David, and Eric Miller, 2009, Homeownership and Child Welfare, *Real Estate Economics* 37, 279–303.

Baum-Snow, Nathaniel, 2007, Did Highways Cause Suburbanization?, *The Quarterly Journal of Economics* 122, 775–805.

Bhutta, Neil, 2008, Giving Credit where Credit is Due? The Community Reinvestment Act and Mortgage Lending in Lower-income Neighborhoods, Finance and Economics Discussion Series 2008-61.

Bhutta, Neil, 2009, Regression Discontinuity Estimates of the Effects of the GSE act of 1992, Finance and Economics Discussion Series 2009-03.

Card, David, Alexandre Mas, and Jesse Rothstein, 2008, Tipping and The Dynamics of Segregation, *The Quarterly Journal of Economics* 123, 177–218.

Card, David, and Jesse Rothstein, 2007, Racial Segregation and the Black-White Test Score Gap, *Journal of Public Economics* 91, 2158–2184.

Charles, Kerwin Kofi, Erik Hurst, and Mariel Schwartz, 2019, The Transformation of Manufacturing and the Decline in US Employment, *NBER Macroeconomics Annual* 33, 307–372.

Chetty, Raj, and Nathaniel Hendren, 2018a, The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects, *The Quarterly Journal of Economics* 133, 1107–1162.

Chetty, Raj, and Nathaniel Hendren, 2018b, The Impacts of Neighborhoods on Intergenerational Mobility II: County-level Estimates, *The Quarterly Journal of Economics* 133, 1163–1228.

Chetty, Raj, Nathaniel Hendren, Maggie R Jones, and Sonya R Porter, 2019, Race and Economic Opportunity in the United States: an Intergenerational Perspective*, *The Quar-*

terly Journal of Economics 135, 711–783.

Chetty, Raj, Nathaniel Hendren, and Lawrence Katz, Forthcoming, The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment, *American Economic Review* .

Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez, 2015, Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States, *The Quarterly Journal of Economics* 129.4, 1553–1623.

Collins, William J., and Robert A. Margo, 2011, Race and Home Ownership from the End of the Civil War to the Present, *American Economic Review* 101, 355–359.

Derenoncourt, Ellora, 2019, Can you Move to Opportunity? Evidence from the Great Migration, *University of California, Berkeley Working Paper* .

Dietz, Robert D., and Donald R. Haurin, 2003, The Social and Private Micro-level Consequences of Homeownership, *Journal of Urban Economics* 54, 401–450.

DiPasquale, Denise, and Edward L. Glaeser, 1999, Incentives and Social Capital: Are Homeowners Better Citizens?, *Journal of Urban Economics* 45, 354–384.

Gabriel, Stuart A, and Stuart Rosenthal, 2008, The GSEs, CRA, and Homeownership in Targeted Underserved Neighborhoods, *Conference on Built Environment: Access, Finance, and Policy* 202–229.

Gabriel, Stuart A., and Stuart S. Rosenthal, 2005, Homeownership in the 1980s and 1990s: aggregate trends and racial gaps, *Journal of Urban Economics* 57, 101 – 127.

Glaeser, Edward L., and Bruce Sacerdote, 2000, The Social Consequences of Housing, *Journal of Housing Economics* 9, 1–23.

Goodman, Laurie S., and Christopher Mayer, 2018, Homeownership and the American Dream, *The Journal of Economic Perspectives* 32, 31–58.

Green, R. K., and M. White, 1997, Measuring the Benefits of Homeowning: Effects on Children, *Journal of Urban Economics* 41, 441–461.

Green, Richard K, and Susan M Wachter, 2005, The American Mortgage in Historical and

International Context, *The Journal of Economic Perspectives* 19, 93–114.

Gyourko, Joseph, Albert Saiz, and Anita Summers, 2008, A New Measure of the Local Regulatory Environment for Housing Markets: The Wharton Residential Land Use Regulatory Index, *Urban Studies* 45, 693–729.

Haurin, Donald R, Toby L Parcel, and R Jean Haurin, 2002, Does Homeownership affect Child Outcomes?, *Real Estate Economics* 30, 635–666.

Holupka, Scott, and Sandra J. Newman, 2012, The Effects of Homeownership on Children's Outcomes: Real Effects of Self Selection?, *Real Estate Economics* 40, 566–602.

Jaffee, Dwight M., and John M. Quigley, 2007, Housing Subsidies and Homeowners: What Role for Government-Sponsored Enterprises? [with comment], *Brookings-Wharton Papers on Urban Affairs* 103–149.

Katz, Lawrence F, 2015, Reducing Inequality: Neighborhood and School Interventions, *Focus* 31, 2014–15.

Kaufman, Alex, 2014, The Influence of Fannie and Freddie on Mortgage Loan Terms, *Real Estate Economics* 42, 472–496.

Loutskina, Elena, and Philip E Strahan, 2009, Securitization and the Declining Impact of Bank Finance on Loan Supply: Evidence from Mortgage Originations, *The Journal of Finance* 64, 861–889.

Loutskina, Elena, and Philip E. Strahan, 2015, Financial Integration, Housing and Economic Volatility, *Journal of Financial Economics* 115, 25–41.

Mian, Atif, and Amir Sufi, 2009, The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis, *The Quarterly Journal Of Economics* 124, 1449–1496.

Ouazad, Amine, and Romain Rancière, 2016, Credit Standards and Segregation, *Review of Economics and Statistics* 98, 880–896.

Rossi, Peter H, and Eleanor Weber, 1996, The Social Benefits of Homeownership: Empirical Evidence from National Surveys, *Housing Policy Debate* 7, 1–35.

Rossi-Hansberg, Esteban, Pierre-Daniel Sarte, and Raymond Owens III, 2010, Housing Externalities, *Journal of Political Economy* 118, 485–535.

Rothstein, Jesse, 2019, Inequality of Educational Opportunity? Schools as Mediators of the Intergenerational Transmission of Income, *Journal of Labor Economics* 37, 85–123.

Rothstein, Richard, 2017, *The Color of Law: A Forgotten History of How Our Government Segregated America* (Liveright Publishing).

Rupasingha, Anil, and Stephan Goetz, 2008, US County-level Social Capital Data, 1990–2005, *The Northeast Regional Center for Rural Development, Penn State University* .

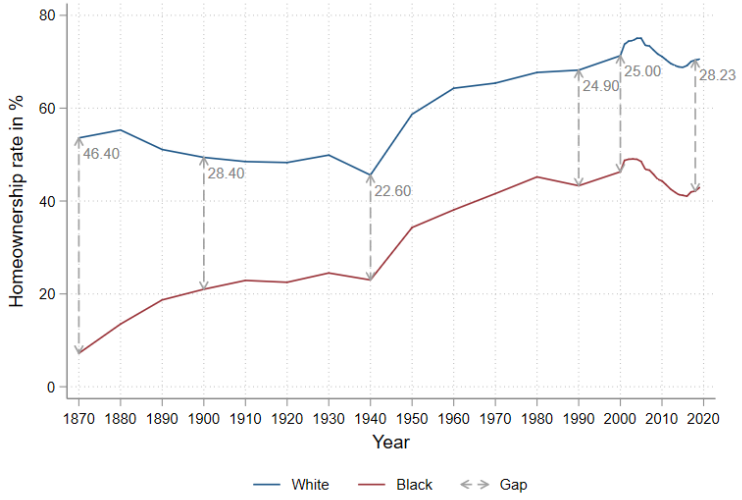
Sequeira, Sandra, Nathan Nunn, and Nancy Qian, 2020, Immigrants and the Making of America, *The Review of Economic Studies* 87, 382–419.

Sodini, Paolo, Stijn Van Nieuwerburgh, Roine Vestman, and Ulf von Lilienfeld-Toal, 2016, Identifying the Benefits from Home Ownership: A Swedish Experiment, *WP No. 22882, NBER* .

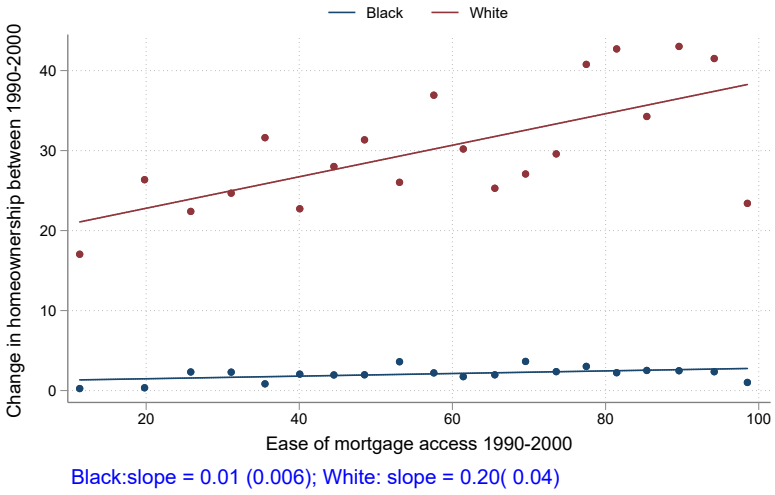
Theil, Henri, 1972, Statistical Decomposition Analysis: With Applications in the Social and Administrative Sciences (Studies in Mathematical and Managerial Economics), *North-Holland Pub. Co.* .

FIGURE I
RACIAL HOMEOWNERSHIP GAP

Panel A shows the homeownership rates of Black and white households between 1870–2019. The arrows represent the gap between homeownership rates for Black and white households. Data from 1870 to 2000 is from Appendix Table 2 of Collins and Margo (2011). Data from 2001 to 2019 is from the American Consumer Survey (ACS), downloaded using IPUMS. Panel B shows the CZ-level binscatter plot of the change in homeownership rate for 1990–2000 against the CZ-level ease of mortgage access for 1990–2000. The binscatter plots show the average of the y-axis for each 5 percentile bin of the data along the x-axis. The y-axis variable is the change in homeowners between 1990–2000 for white (Black) households divided by the total renters and homeowners in 1990. The x-axis variable is the CZ-level ease of mortgage access between 1990–2000. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. Data are weighted by the number of housing units in each CZ in 2000.



Panel A: Time-trend in racial gap in homeownership rate

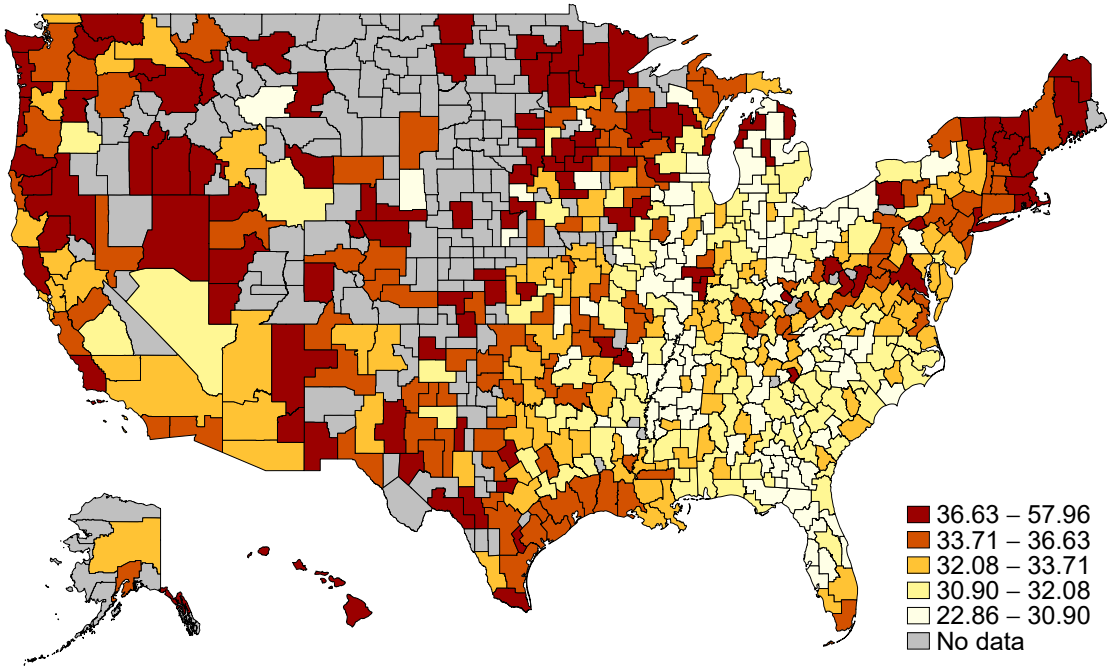


Panel B: CZ-level change in homeownership for 1990–2000

FIGURE II
MAP OF UPWARD MOBILITY

The figures below show the heat maps the average upward mobility for Black (Panel A) and white (Panel B) households at the CZ level. Data are divided into 5 quintiles for each racial group as shown. The upward mobility measure for Black households is from from Chetty et al. (2019) and is the mean household income rank (between 0-100) for Black children (when adult) with parents at the 25th percentile of the parent income distribution. Chetty et al. (2019) measure income based on IRS tax returns for cohorts and parents of cohorts born between 1978 and 1983. The upward mobility for white households is analogously defined in Panel B.

Panel A: Black Households



Panel B: White Households

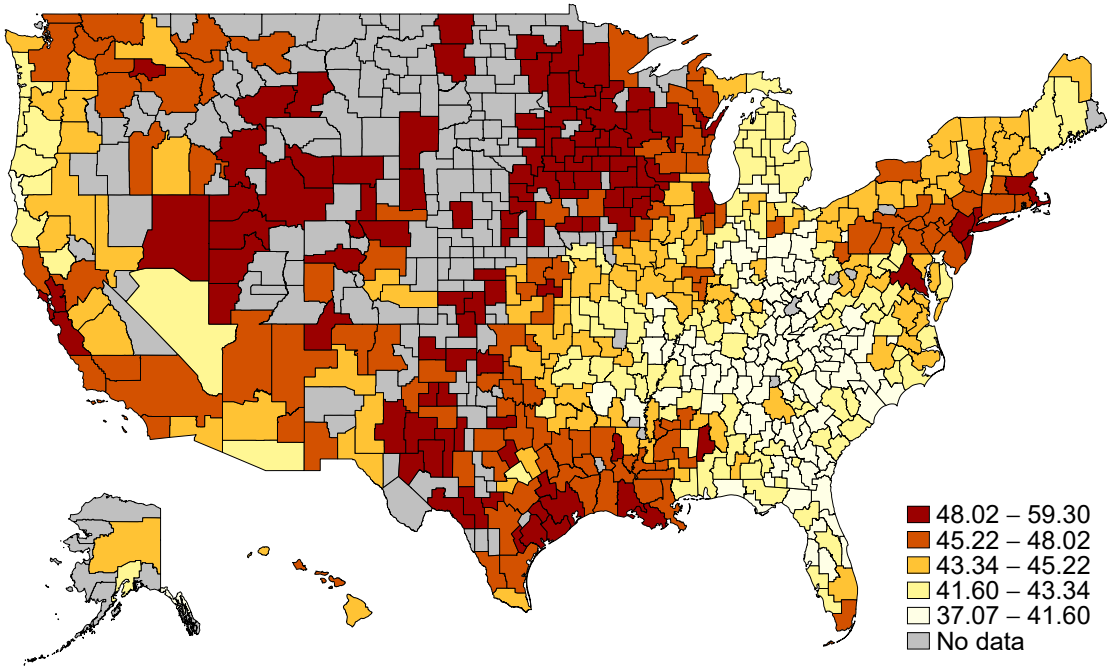


FIGURE III
PERCENTILES OF EASE OF MORTGAGE ACCESS VARIABLE

This figure plots the quantile function of the ease of mortgage access between 1990–2000 at the CZ-level. The raw ease of mortgage access between 1990–2000 (x-axis) at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. Our variable of interest on the y-axis is the percentile function (between 0 to 100) for the raw ease of mortgage access between 1990–2000 on the x-axis. The inline graph zooms into the CZs corresponding to the 1–60th percentile of the y-axis values.

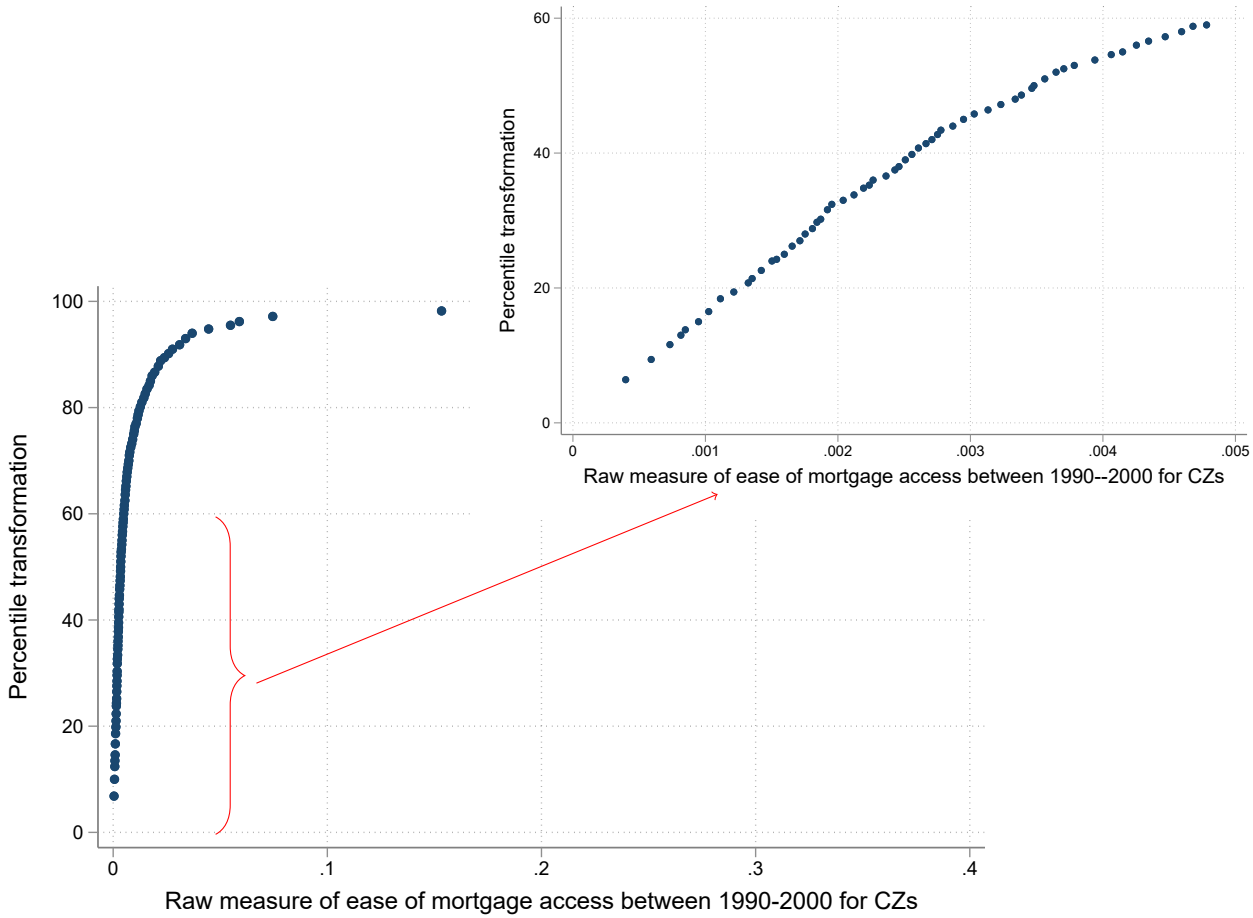


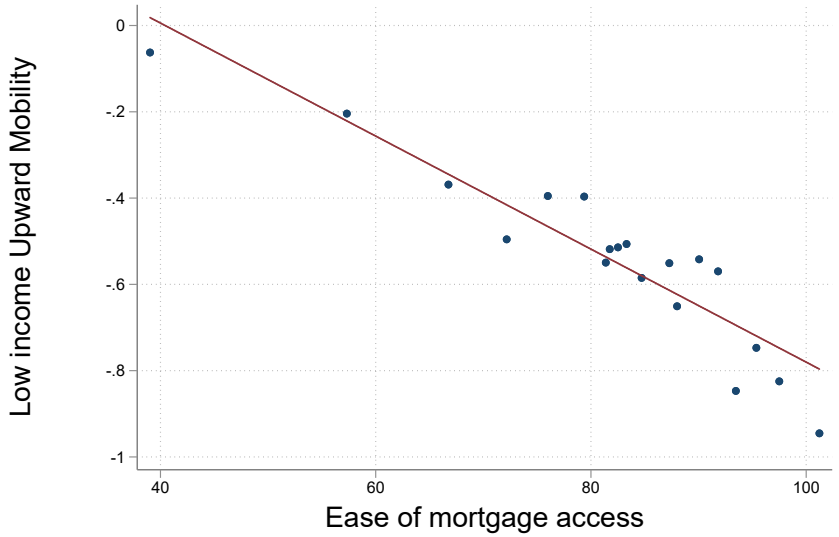
FIGURE IV
FIRST STAGE: EASE OF MORTGAGE ACCESS AND MORTGAGED HOMEOWNERS

This figure presents the binscatter plots between the fraction of homeowners with mortgages in 20000 and the ease of mortgage access between 1990–2000. The binscatter plots show average of the y axis for each 5 percentile bin of the data along the x-axis. The y-axis plots the fraction of homeowners with mortgages in 2000. The x-axis plots the ease of access to mortgages at the CZ-level and the y-axis plots the fraction of mortgaged homeowners in percentage. Data are weighted by the number of housing units in each CZ. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. The fraction of mortgaged homeowners in 2000 is calculated at the CZ-level based on data from the 2000 Census.

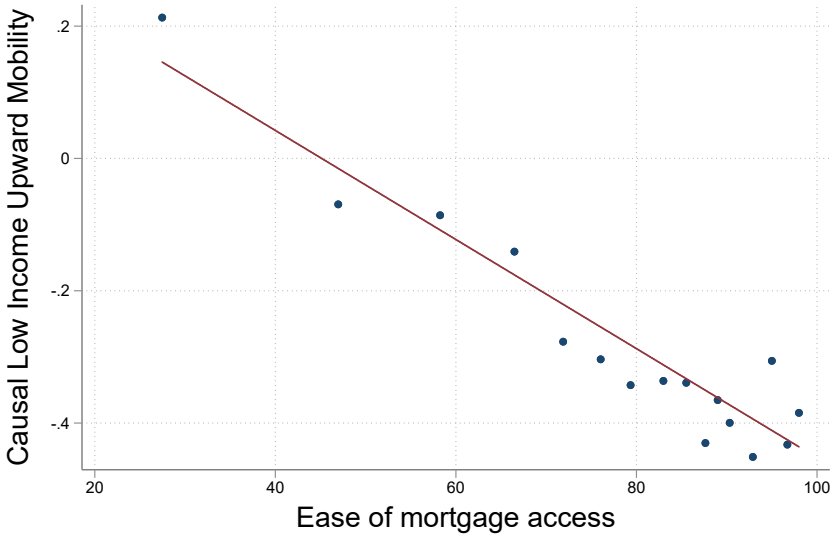


FIGURE V
IMPACT ON UPWARD MOBILITY OF LOW-INCOME HOUSEHOLDS

Panel A presents the binscatter plots for the average predicted upward mobility of the children (when adult) of families with parents' income in the 25th percentile of income distribution on the y-axis against the ease of mortgage access between 1990–2000 on the x-axis. The average upward mobility measure is from Chetty et al. (2015). The binscatter plots show the average of the y-axis for each 5 percentile bin of the data along the x-axis. The x-axis plots the ease of access to mortgages at the CZ level. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from \$187,450 in 1990 to \$252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between \$234,312 to \$315,872 and we use the closest \$200,0000–\$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. Panel B replaces the y-axis variable with the causal effect of spending an additional year in a CZ for a child with parents' income in the 25th percentile of income distribution. The childhood exposure mobility measure is from Chetty and Hendren (2018a). The y-axis variables in both panels have been standardized (z-scored) for ease of interpretation and both panels include state fixed effects. Data are weighted by the number of housing units in each CZ.



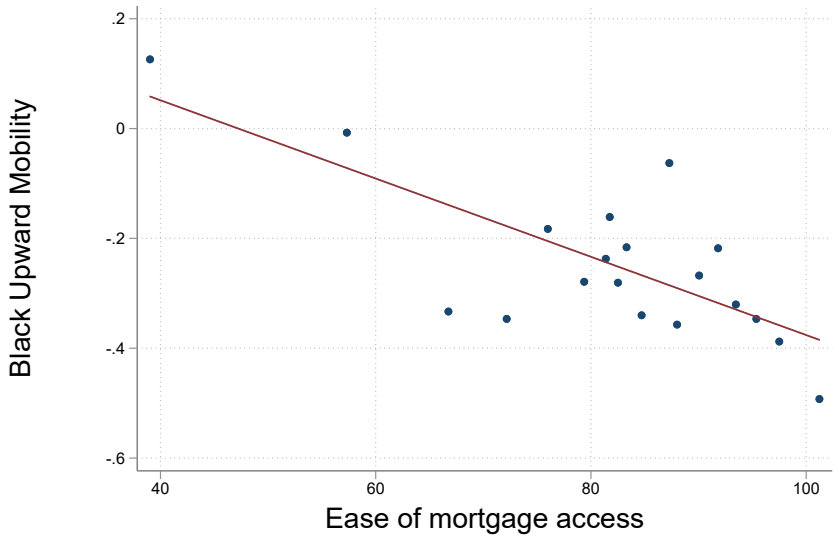
(A) Average Upward Mobility



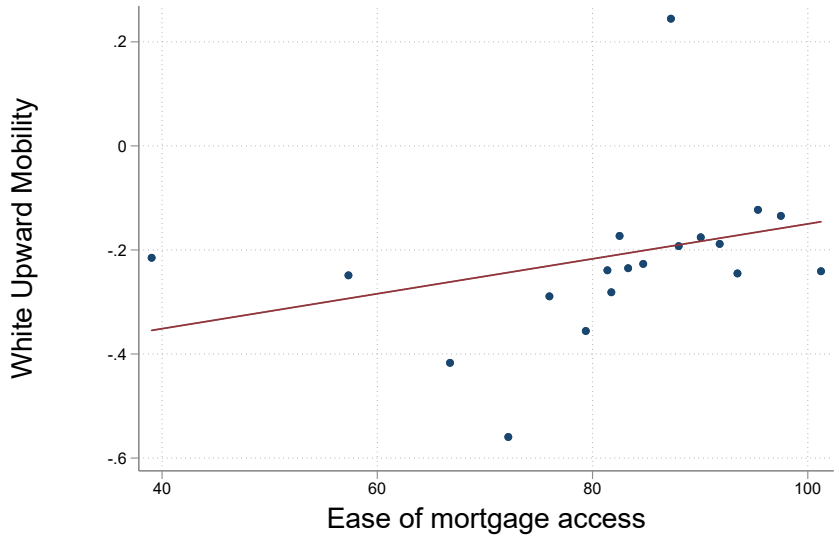
(B) Childhood Exposure Mobility Measure

FIGURE VI
IMPACT ON UPWARD MOBILITY OF LOW INCOME HOUSEHOLDS BLACK AND WHITE HOUSEHOLDS

Panel A (B) presents the binscatter plots between the predicted average upward mobility of the children of Black (white) families with parents' income in the 25th percentile of income distribution against the the ease of mortgage access. The childhood exposure mobility measure is from Chetty et al. (2019). The binscatter plots show average of the y axis for each 5 percentile bin of the data along the x-axis. The x-axis plots the ease of access to mortgages at the CZ-level. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. The binscatter controls for state fixed effects. Data are weighted by the number of housing units in each CZ.



(A) Black households



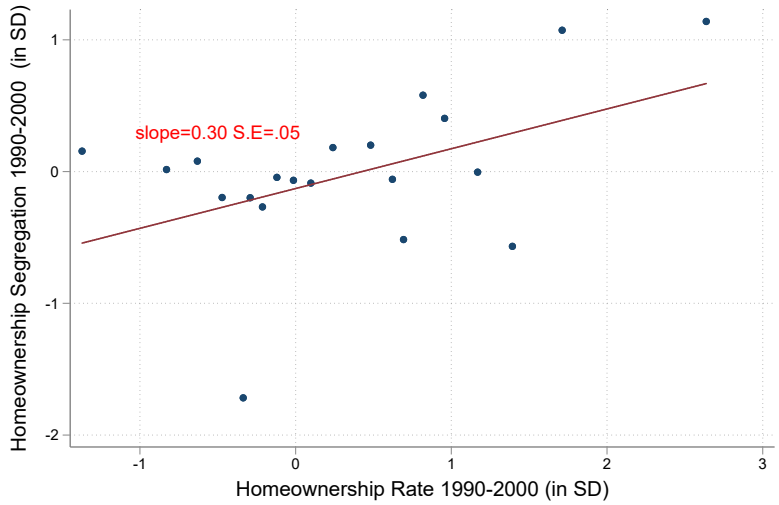
(B) White households

FIGURE VII
HOMEOWNERSHIP AND HOMEOWNERSHIP SEGREGATION FROM 1980–2000

This figure shows the evolution of homeownership segregation with increase in homeownership rate between 1980–1990 (Panel A) and between 1990–2000 (Panel B). The binscatter plots show the average of the y-axis for each 5 percentile bin of the data along the x-axis. The y-axis variable is the change in homeownership segregation. Segregation of homeowners is an entropy-based measure calculated at the CZ-level using 2000 Census data and measures the segregation of homeowners from renters. The x-axis variable is the change in homeownership rate between 1980-1990 (Panel A) and between 1990-200 (Panel B). Homeownership rates are calculated from the respective decennial census data. Variables have been standardized (z-scored) for ease of interpretation. Data are weighted by the number of housing units in each CZ.



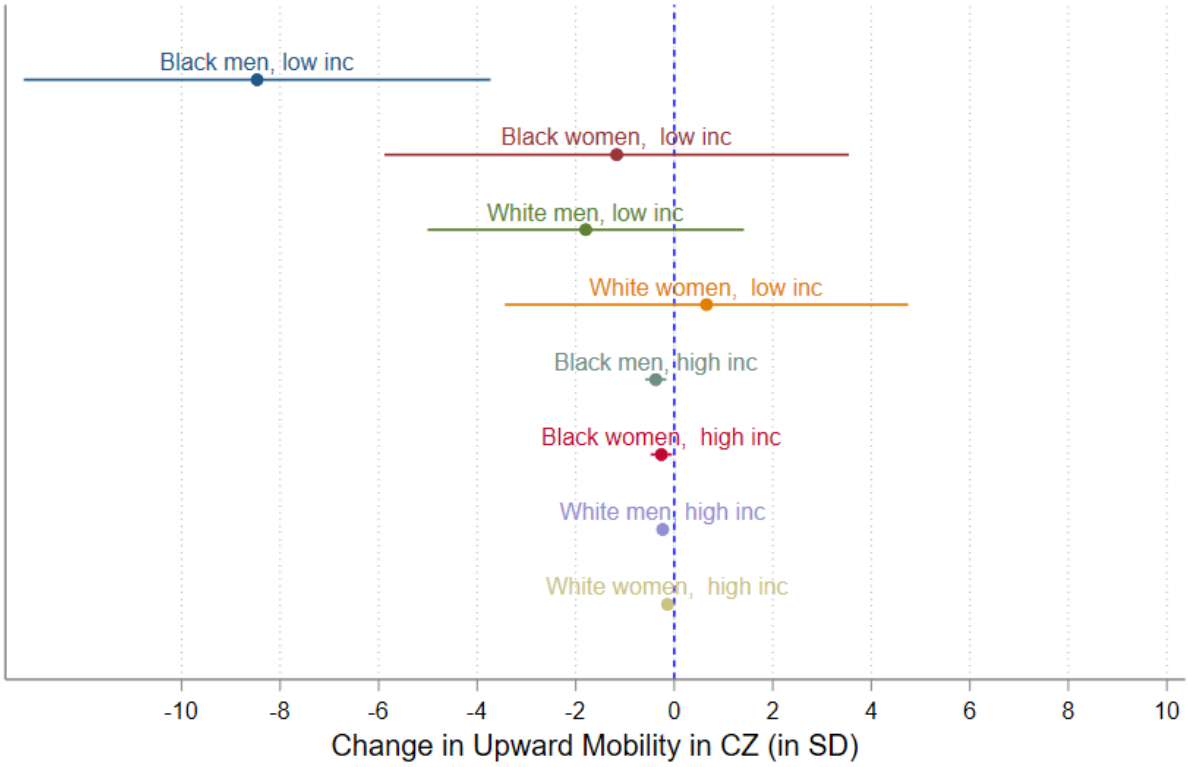
(A) 1980-1990



(B) 1990-2000

FIGURE VIII
HETEROGENEITY IN IMPACT BY RACE AND GENDER ON UPWARD MOBILITY OF LOW INCOME HOUSEHOLDS

This figure plots the instrumental variable estimates obtained from 2SLS regressions with upward mobility by gender, race, and income against the fraction of mortgaged homeowners as instrumented with the ease of mortgage access variable at the CZ-level. The dependent variable, upward mobility, is from Chetty et al. (2019) and measures the expected mean household income rank for individuals with parents with below-median income (25th percentile) of the parent income distribution. Corresponding high-income refers to parents at the 75th percentile of income. Income is measured from IRS tax returns for cohorts and parents of cohorts born between 1978 and 1983. Each point on the graph represents the coefficient for each of these upward mobility measures for the particular race, gender, and income group. The dependent variable is at the CZ level and is standardized. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. All regressions include the state fixed effects. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. Standard errors are clustered by state.



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FIGURE IX
MECHANISMS PERPETUATING SEGREGATION: IMPACT ON HOUSING REGULATION

This figure plots the instrumental variable estimates obtained from 2SLS regressions with the housing regulation index measured as of 2006 against the fraction of mortgaged homeowners as instrumented with the ease of mortgage access variable at the CZ-level. The regulation index is calculated as of 2006 and is from Gyourko et al. (2008). Remaining variables are the components of the combined regulation index as indicated. The dependent variable is at the CZ level and is standardized. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. All regressions include the state fixed effects. Standard errors are clustered by state.

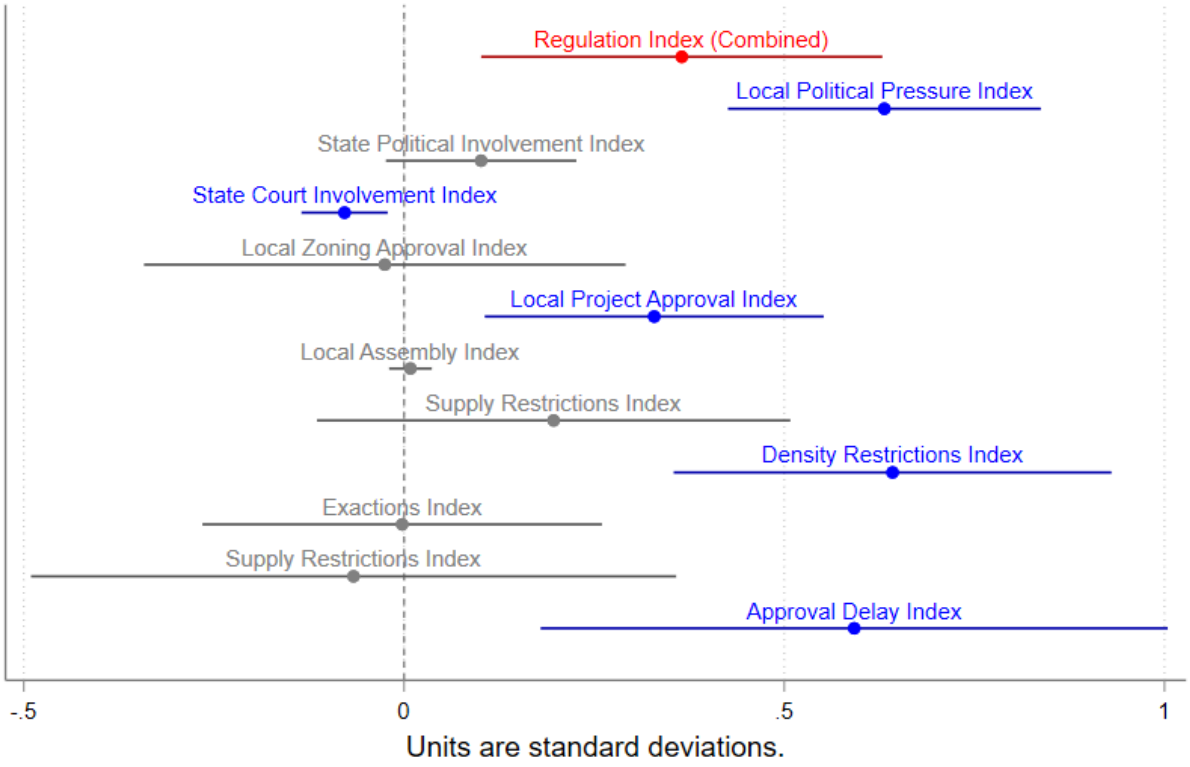
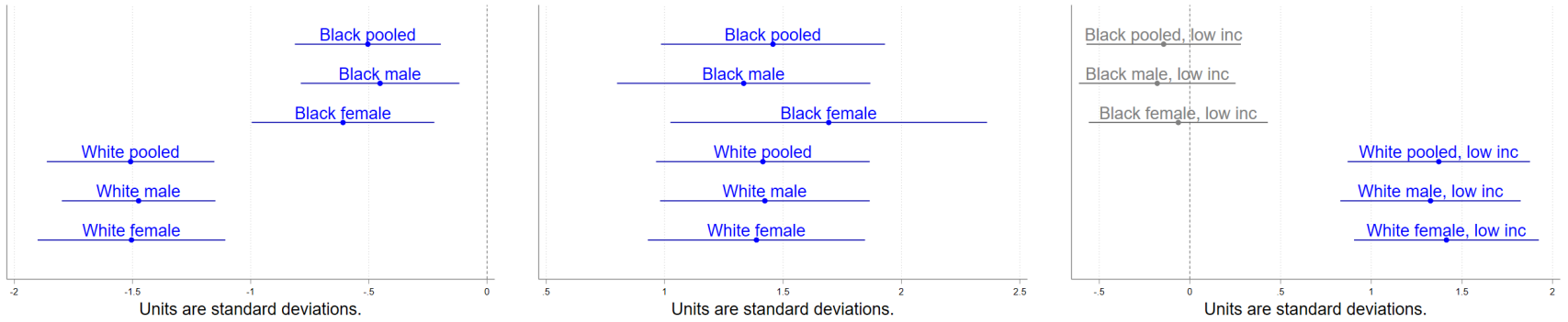


FIGURE X
EXPLORING MECHANISMS THROUGH ALTERNATE CHILDREN'S OUTCOMES: RESIDENTIAL MOVEMENT

This figure plots the instrumental variable estimates obtained from 2SLS regressions with residential mobility of children when adult for against the fraction of mortgaged homeowners as instrumented with the ease of mortgage access variable at the CZ-level. The dependent variables in panel a is from Chetty et al. (2019) and measures the expected probability that an individuals (Black/white,male/female) with parents with below-median income (25th percentile) of the parent income distribution remains in their childhood census-tract. The dependent variables in panel b is from Chetty et al. (2019) and measures the expected probability that an individuals (Black/white,male/female) with parents with below-median income (25th percentile) of the parent income distribution remains in their childhood commuting zone (CZ). The dependent variables in panel c is from Chetty et al. (2019) and measures the expected probability that an individuals (Black/white,male/female) with parents with below-median income (25th percentile) of the parent income distribution moves to a low-poverty (poverty below 10%) census-tract. Income is measured from IRS tax returns for cohorts and parents of cohorts born between 1978 and 1983. Each point on the graph represents the coefficient for each of these upward mobility measures for the particular race, gender, and income group. The dependent variable is at the CZ level and is standardized. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. All regressions include the state fixed effects. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. Standard errors are clustered by state.



(A) Stay in same neighborhood

(B) Stay in same CZ

(C) Move to good (low-poverty) neighborhoods

FIGURE XI
LOCAL MECHANISMS: SOCIAL CAPITAL, CRIME, PUBLIC FINANCE, AND SCHOOL QUALITY

This figure plots the instrumental variable estimates obtained from 2SLS regressions with the respective measures of social capital, crime, public finance, and school quality at the CZ0-level against the fraction of mortgaged homeowners as instrumented with the ease of mortgage access variable at the CZ-level. The dependent variables is from Derenoncourt (2019) at the CZ level and is standardized (z-scored). The dependent variables are the respective measures as of 2000 and also include the pre-period measure as of 1990 as the control variable. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. All regressions include the state fixed effects. Standard errors are clustered by state.

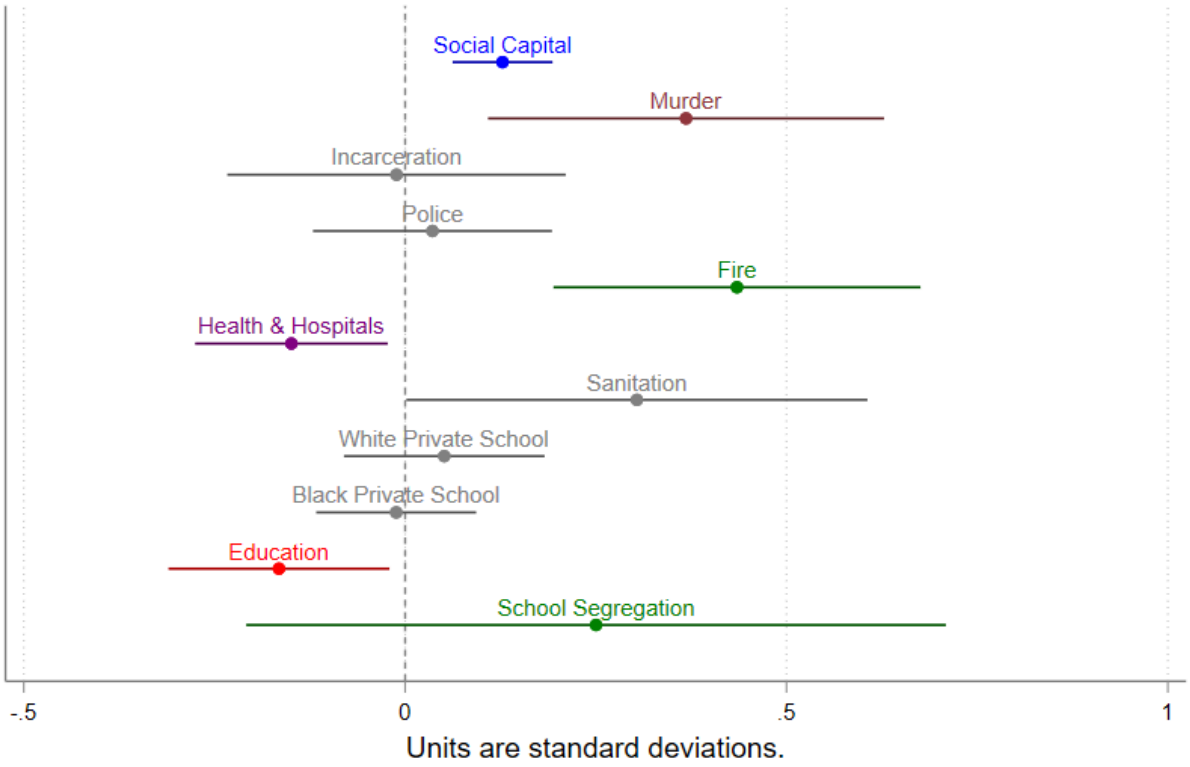
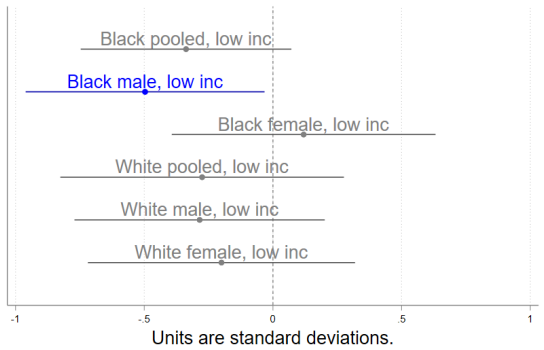
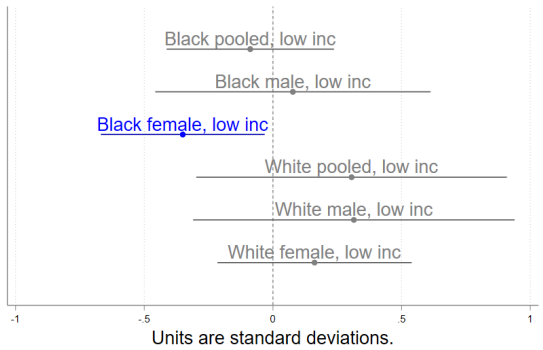


FIGURE XII
ALTERNATE CHILDREN'S OUTCOMES ESTABLISHING LOCAL MECHANISMS: HIGH SCHOOL ATTAINMENT, INCARCERATION, AND LIFE EXPECTANCY

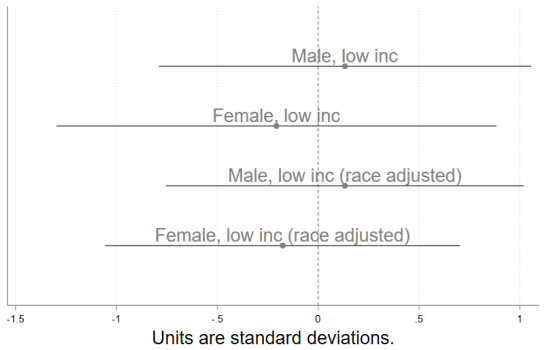
This figure plots the instrumental variable estimates obtained from 2SLS regressions for residential mobility of children when adult for high school attainment, incareceration, and life expectancy against the fraction of mortgaged homeowners as instrumented with the ease of mortgage access variable at the CZ-level. The dependent variables are available from https://www.opportunityatlas.org/. The dependent variable in panel a is the high school attainment of an individual (Black/white,male/female) with parents with below-median income (25th percentile) of the parent income distribution remains in their childhood commuting zone (CZ). The dependent variable in panel b whether an individual (Black/white,male/female) was incarcerated with parents with below-median income (25th percentile) of the parent income distribution remains in their childhood commuting zone (CZ). The dependent variables in panel c is measures the life-expectancy an individuals (Black/white,male/female) with parents with below-median income (25th percentile) of the parent income distribution remains in their childhood commuting zone (CZ). Each point on the graph represents the coefficient for each of these alternate outcome measures for the particular race, gender, and income group. The dependent variable is at the CZ level and is standardized (z-scored). Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. All regressions include the state fixed effects. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. Standard errors are clustered by state.



(A) High School Attainment



(B) Incarceration Outcomes



(C) Life Expectancy Outcomes

TABLE I
SUMMARY STATISTICS

This table shows the summary statistics for select variables in our analysis. Average Upward mobility is the predicted adult income rank of children growing up in a CZ and from Chetty et al. (2015), measured separately for the 25^{th} percentile and 75^{th} percentile of the parents' income distribution. Causal Upward mobility measure is the causal component of growing up in a neighborhood for one additional year in a CZ years on upward mobility from Chetty and Hendren (2018a) and Chetty and Hendren (2018b), separately for the 25^{th} percentile and 75^{th} percentile of the parents' income distribution. Black (white) upward mobility analogously defined as the average upward mobility of the children (when adult) of Black (white) families with parents' income in the 25^{th} percentile of income distribution and are from Chetty et al. (2019). Racial and homeownership segregation are entropy-based measures calculated at the CZ level using Census 2000 data. Overall homeownership rate, percentage aged above 55, percentage with less than high school education, percentage of Black households in a CZ, fraction of single family units in 1990, the percentage below poverty level, percentage divorced, the percentage of other minority households, unemployment rate and percentage of single mothers in a CZ are from the 2000 Census. Income adjusted college graduation rate is provided by Chetty and Hendren (2018a) and Chetty and Hendren (2018b) and constructed based on data from Integrated Postsecondary Education Data System (IPEDS). Social capital index as of 1997 is from Rupasingha and Goetz (2008). High school dropout rate, teacher to pupil ratio and school score are provided by Chetty and Hendren (2018a) and Chetty and Hendren (2018b) and constructed based on data from Integrated Postsecondary Education Data System (IPEDS). School quality is an indicator equal to 1 if the CZ has below median high school dropout rate, or has above below median teacher to pupil ratio, or has above median test scores.

	Mean	SD	p10	p50	p90
Raw Average Upward mobility (25^{th} percentile)	45.67	4.85	39.68	45.42	52.12
Raw Average Upward mobility (75^{th} percentile)	59.30	3.32	55.23	59.05	63.85
Childhood Exposure mobility (25^{th} percentile)	0.14	0.55	-0.39	0.05	0.77
Childhood Exposure mobility (75^{th} percentile)	0.10	0.64	-0.46	0.05	0.81
Black Upward mobility (25^{th} percentile)	34.14	4.53	30.14	32.86	39.75
Black Upward mobility (75^{th} percentile)	44.86	3.94	40.49	44.06	50.19
White Upward mobility (25^{th} percentile)	46.41	6.32	41.04	45.14	54.00
White Upward mobility (75^{th} percentile)	60.16	3.07	56.47	59.81	64.56
Fraction mortgaged homeowners (2000)	1.25	2.90	0.06	0.35	2.62
Homeownership rate	69.44	4.77	62.95	69.97	75.31
Racial segregation	-0.55	0.71	-1.42	-0.62	0.40
Homeownership segregation (standardized)	0.00	1.00	-1.10	-0.28	1.50
% Black	10.97	11.73	0.71	5.92	30.94
% Hispanics and Other Minority	4.47	5.08	1.07	2.49	11.84
% Below poverty level	13.20	4.40	8.49	12.24	18.78
% Single mothers	4.69	1.27	3.32	4.54	6.19
% Age above 55	25.22	3.02	21.45	25.32	28.89
% Divorced	21.01	2.36	18.22	20.88	24.03
% Single-family units	66.11	6.51	57.89	67.14	73.86
Unemployment Rate	4.85	1.44	3.48	4.57	6.39
Graduation Rate (Income adjusted)	0.01	0.12	-0.13	-0.01	0.16
All Housing Units	223,602	225,105	60,384	147,839	466,109
Observations	551				

TABLE II
IMPACT OF MORTGAGE ACCESS ON BLACK AND WHITE HOMEOWNERSHIP GROWTH

The table presents the tract-level impact of ease of mortgage availability on Black and white home ownership rates. The dependent variables in columns columns 1, 3, 5, 7, and 9 (and columns 2, 4, 6, 8, and 10) are the change in homeowners between 1990–2000 for white (Black) households divided by the total renters and homeowners in 1990. The control variables included are census tract level variables poor share and fraction of single mothers in 1990. All regressions include the state fixed effects. CZ fixed effects are as specified. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. Targeted tract is 1 if the tract is classified as being under the "Underserved Areas Goal" based on Housing and Urban (HUD) classification as of 2000. The dependent variables are winsorized at the 1% level. All columns are weighted by the population in each CZ in 2000. Standard errors are clustered by CZ.

Dependent variable:	Change in homeowners between 1990–2000									
	White	Black	White	Black	White	Black	White	Black	White	Black
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ease of mortgage access$_{CZ}$ × Targeted tract$_{CT}$							-0.125***	-0.007	-0.118***	-0.006
							(0.034)	(0.005)	(0.037)	(0.007)
Ease of mortgage access$_{CZ}$	0.103**	0.010**					0.159***	0.014***		
	(0.044)	(0.004)					(0.050)	(0.005)		
Targeted tract$_{CT}$			-4.683***	0.590***	-4.894***	0.563***	4.995*	1.138***	4.476*	1.077**
			(1.204)	(0.136)	(1.241)	(0.143)	(2.666)	(0.349)	(2.618)	(0.455)
No. of Obs.	36394	36394	36394	36394	36394	36394	36394	36394	36394	36394
R^2	0.113	0.148	0.114	0.150	0.166	0.204	0.115	0.150	0.166	0.204
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CZ FE	N	N	N	N	Y	Y	N	N	Y	Y

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE III
IMPACT ON UPWARD MOBILITY OF LOW-INCOME HOUSEHOLDS

The table presents the effect of mortgage access on upward mobility of the children of low-income households on ease of mortgage access. The instrument used is the ease of credit access between 1990 to 2000. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. In columns 2–4, the dependent variable is the predicted average upward mobility of the children (when adult) of families with parents' income in the 25th percentile of income distribution and from Chetty et al. (2015). In columns 5–7, the dependent variable is the causal effect of spending an additional year in a CZ for a child with parents' income in the 25th percentile of income distribution and from Chetty and Hendren (2018a) and Chetty and Hendren (2018b). The dependent variables have been standardized (z-scored). The fraction of mortgaged homeowners in 2000 is calculated at the CZ-level based on data from the 2000 Census. Column 1 presents the first stage regression, columns 2 and 5 the OLS regression, columns 3 and 6 the reduced form (RF) estimates, and columns 4 and 7 present the two-stage least squared instrumental variable (2SLS IV) estimates. All regressions include the state fixed effects. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. All columns are weighted by the population in each CZ in 2000. All variables have been standardized (z-scored) for ease of interpretation. Standard errors are clustered by state.

Dependent variable:	% of Homeowners with Mortgages	Low Income Upward Mobility					
		Average			Childhood Exposure		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
% of Homeowners with Mortgages$_{CZ}$		-0.558***		-1.125***	-0.378***		-0.615***
		(0.111)		(0.175)	(0.0792)		(0.103)
Ease of mortgage access$_{CZ}$	0.0129***		-0.0146***			-0.00796***	
	(0.00158)		(0.00165)			(0.00156)	
No. of Obs.	551	551	551	551	551	551	551
R^2	0.931	0.763	0.781	0.701	0.379	0.372	0.362
Controls	Y	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y	Y
No. of Clusters	51	51	51	51	51	51	51
Type	1st Stage	OLS	RF	2SLS IV	OLS	RF	2SLS IV
F-statistic	178.6	51	51	51	51	51	51

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE IV
IMPACT ON UPWARD MOBILITY BY RACE OF LOW INCOME HOUSEHOLDS

The table presents OLS, reduced form, and two-stage least squared instrumental variable effect of mortgaged homeowners on upward mobility of low-income households against access to mortgages for low-income Black and white families. The instrument used is the ease of credit access between 1990 to 2000. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. In columns 1–3 (4–6), the dependent variable is the average upward mobility of the children (when adult) of Black (white) families with parents' income in the 25th percentile of income distribution. The dependent variable in columns 7–9, the dependent variable is the relative difference between the average upward mobility of the children in low income white families relative to the average upward mobility of the children in low income Black families. Race-specific upward mobility meaures are from Chetty et al. (2019). The fraction of mortgaged homeowners in 2000 is calculated at the CZ-level based on data from the 2000 Census. Columns 1, 4, and 7 present the OLS regression, columns 2, 5, and 8 the reduced form (RF) estimates, and columns 3, 6, and 9 present the two-stage least squared instrumental variable (2SLS IV) estimates. The dependent variables have been standardized (z-scored). All regressions include the state fixed effects. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. All columns are weighted by the population in each CZ in 2000. All variables have been standardized (z-scored) for ease of interpretation. Standard errors are clustered by state.

Dependent variable:	Low Income Upward Mobility								
	Black			White			Racegap=White-Black		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
% of Homeowners with Mortgages$_{CZ}$	-0.361***		-0.592***	-0.254**		-0.0739	0.00328		0.0229**
	(0.133)		(0.218)	(0.114)		(0.208)	(0.00610)		(0.0107)
Ease of mortgage access$_{CZ}$		-0.00767**			-0.000957			0.000296**	
		(0.00290)			(0.00288)			(0.000141)	
No. of Obs.	551	551	551	551	551	551	551	551	551
R^2	0.574	0.572	0.567	0.824	0.817	0.820	0.613	0.622	0.592
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. of Clusters	51	51	51	51	51	51	51	51	51
Type	OLS	RF	2SLS IV	OLS	RF	2SLS IV	OLS	RF	2SLS IV

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE V
IMPACT OF HOMEOWNERSHIP-LEVEL AND SEGREGATION

The table presents the effect of homeownership-level, homeownership segregation, and racial segregation on upward mobility of low-income households upward mobility of children of low-income Black and white families using the ease of mortgage access as the instrumental variable. The top panel presents the first stage results using ease of credit access between 1990 to 2000 as the instrument for growth in homeownership rate between 1990–2000 (column 1), homeownership segregation (column 2) and racial segregation (column 3). Homeownership and racial segregation are entropy-based measures calculated at the CZ level. Ease of mortgage access is as defined in Table IV. In the middle (bottom) panel, the dependent variable is the average upward mobility of the children when adult of Black (white) families with parents' income in the 25^{th} percentile of income distribution and from Chetty et al. (2019). The dependent variables have been standardized (z-scored). The fraction of mortgaged homeowners in 2000 is calculated at the CZ-level based on data from the 2000 Census. All regressions include the state fixed effects. Odd (even) numbered columns in the bottom two panels present the OLS (2SLS IV) results. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. All columns are weighted by the population in each CZ in 2000. All variables have been standardized (z-scored) for ease of interpretation. Standard errors are clustered by state.

	First Stage		
Dependent variable:	Δ HO rate 1990–2000	Homeownership seg.	Racial seg.
	(1)	(2)	(3)
Ease of mortgage access$_{CZ}$	0.384***	0.0161***	0.0288***
	(0.115)	(0.00266)	(0.00444)
R^2	0.652	0.869	0.713
F-statistic	27.43	17.90	58.96

Dependent variable:	Low Income Upward Mobility					
	Black households					
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Homeownership rate 1990–2000	0.000226	-0.0200*				
	(0.00137)	(0.0102)				
Homeownership segregation			-0.131**	-0.477**		
			(0.0613)	(0.204)		
Racial segregation					-0.121***	-0.266***
					(0.0403)	(0.0984)
R^2	0.557	0.293	0.564	0.513	0.570	0.551
	White households					
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Homeownership rate 1990–2000	-0.000567	-0.00249				
	(0.00134)	(0.00718)				
Homeownership segregation			0.0647	-0.0595		
			(0.0580)	(0.173)		
Racial segregation					0.0740*	-0.0332
					(0.0435)	(0.0953)
No. of Obs.	551	551	551	551	551	551
R^2	0.817	0.815	0.818	0.813	0.821	0.812
Controls	Y	Y	Y	Y	Y	Y
Type	OLS	2SLS IV	OLS	2SLS IV	OLS	2SLS IV

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE VI
TRACT-LEVEL IMPACT OF MORTGAGE ACCESS ON BLACK AND WHITE UPWARD MOBILITY

The table presents the impact of the fraction of mortgaged homeowners on tract-level upward mobility. The dependent variable in columns columns 1 – 3 is the average upward mobility of children in low-income Black households and in columns 4 – 6, it is that of children in low-income white households and from Chetty et al. (2015). Low-income families are those with parents' incomes in the 25th percentile of the income distribution. The dependent variable in columns 7–9 is the relative difference between the average upward mobility of the children in low income white families relative to the average upward mobility of the children in low income Black families. Dependent variables have been standardized (z-scored). The fraction of mortgaged homeowners in 2000 is calculated at the CZ-level based on data from the 2000 Census. Odd (even) numbered columns in the bottom two panels present the OLS (2SLS IV) results. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. All regressions include state fixed effects. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from \$187,450 in 1990 to \$252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between \$234,312 to \$315,872 and we use the closest \$200,0000–\$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. Targeted tract is 1 if the tract is classified as being under the "Underserved Areas Goal" based on Housing and Urban (HUD) classification as of 2000. All columns are weighted by the total housing units in 1990. Standard errors are clustered by state.

Dependent variable:	Low Income Upward Mobility								
	Black			White			Racegap=White-Black		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
% of Homeowners with Mortgages$_{CZ}$ × Targeted tract$_{CT}$			-0.191***			-0.268***			0.090**
			(0.048)			(0.043)			(0.036)
% of Homeowners with Mortgages$_{CZ}$	0.065		0.117	0.273**		0.344***	-0.199**		-0.222**
	(0.092)		(0.100)	(0.107)		(0.115)	(0.087)		(0.092)
Targeted tract$_{CT}$		-0.379***	-0.175***		-0.544***	-0.252***		0.190***	0.089**
		(0.032)	(0.049)		(0.033)	(0.047)		(0.023)	(0.044)
No. of Obs.	16161	16161	16161	16161	16161	16161	16161	16161	16161
R^2	0.092	0.126	0.130	0.168	0.267	0.268	0.053	0.067	0.063
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. of Clusters	51	51	51	51	51	51	51	51	51
Type	2SLS IV	OLS	2SLS IV	2SLS IV	OLS	2SLS IV	2SLS IV	OLS	2SLS IV

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE VII
THE HOMEOWNERSHIP CHANNEL:
HOUSE PRICES, SCHOOL QUALITY, AND AGGREGATE HOUSING WEALTH

This table presents the impact of the fraction of mortgaged homeowners on house prices, school quality and housing wealth. The dependent variable in columns 1 – 3 is the growth in house prices from 1990 to 2000. In columns 4 – 6, it is school quality. In columns 7 – 9 it is the aggregate housing wealth gap, which is the relative difference between the average housing wealth of white families relative to that of Black families. Dependent variables have been standardized (z-scored). The fraction of mortgaged homeowners in 2000 is calculated at the CZ-level based on data from the 2000 Census. Odd (even) numbered columns in the bottom two panels present the OLS (2SLS IV) results. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. All regressions include state fixed effects. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. Targeted tract is 1 if the tract is classified as being under the "Underserved Areas Goal" based on Housing and Urban (HUD) classification as of 2000. All columns are weighted by the total housing units in 1990. Standard errors are clustered by state.

Dependent variable:	House Price Growth 1990-2000			School Quality			Agg. Housing Wealth Gap (White-Black)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
% of Homeowners with Mortgages$_{CZ}$	-0.092**		-0.193***	-0.550***		-1.211***	35,835		84,166**
	(0.036)		(0.060)	(0.189)		(0.249)	(23006)		(35778)
Ease of mortgage access$_{CZ}$		-0.002***			-0.016***			1,089**	
		(0.001)			(0.003)			(470)	
No. of Obs.	551	551	551	547	547	547	551	551	551
R^2	0.899	0.901	0.893	0.849	0.859	0.823	0.727	0.730	0.717
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. of Clusters	51	51	51	51	51	51	51	51	51
Type	2SLS IV	OLS	2SLS IV	2SLS IV	OLS	2SLS IV	2SLS IV	OLS	2SLS IV

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE VIII
TRACT-LEVEL IMPACT ON HOUSE PRICES, SCHOOL QUALITY, AND RACIAL HOUSING WEALTH GAP

This table presents at the tract-level the impact of the fraction of mortgaged homeowners on house prices, school quality and racial housing wealth gap. The dependent variable in columns 1 – 3 is the growth in house prices from 1990 to 2000. In columns 4 – 6, it is school quality. In columns 7 – 9 it is the aggregate housing wealth gap which is the relative difference between the average housing wealth of white families relative to that of Black families. Dependent variables have been standardized (z-scored). The fraction of mortgaged homeowners in 2000 is calculated at the CZ-level based on data from the 2000 Census. Odd (even) numbered columns in the bottom two panels present the OLS (2SLS IV) results. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. All regressions include state fixed effects. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. Targeted tract is 1 if the tract is classified as being under the "Underserved Areas Goal" based on Housing and Urban (HUD) classification as of 2000. All columns are weighted by the total housing units in 1990. Standard errors are clustered by state. The sample for which the data is available are retained.

Dependent variable:	House Price Growth 1990-2000			School Quality			Agg. Housing Wealth Gap (White-Black)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
% of Homeowners with Mortgages$_{CZ}$ × Targeted tract$_{CT}$			-0.673*			-0.261***			-0.073***
			(0.359)			(0.071)			(0.012)
% of Homeowners with Mortgages$_{CZ}$	0.139		0.348	-0.270**		-0.197	0.050**		0.077***
	(0.392)		(0.380)	(0.118)		(0.120)	(0.020)		(0.020)
Targeted tract$_{CT}$		-0.960***	-0.261**		-0.442***	-0.177***		-0.069***	0.007
		(0.323)	(0.115)		(0.051)	(0.047)		(0.013)	(0.008)
No. of Obs.	41556	41556	41556	41496	41496	41496	41749	41749	41749
R^2	0.161	0.180	0.187	0.274	0.326	0.330	0.060	0.082	0.085
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. of Clusters	51	51	51	51	51	51	51	51	51
Type	2SLS IV	OLS	2SLS IV	2SLS IV	OLS	2SLS IV	2SLS IV	OLS	2SLS IV

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Homeownership and The American Dream – An Analysis of upward Mobility Effects

Online Appendix

Nirupama Kulkarni Ulrike Malmendier

TABLE B1
TRACT-LEVEL IMPACT ON HOUSE PRICES, SCHOOL QUALITY, AND RACIAL HOUSING WEALTH GAP

This table presents at the tract-level the impact of the fraction of mortgaged homeowners on house prices, school quality and racial housing wealth gap. The dependent variable in columns 1 – 3 is the growth in house prices from 1990 to 2000. In columns 4 – 6, it is school quality. In columns 7 – 9 it is the aggregate housing wealth gap which is the relative difference between the average housing wealth of white families relative to that of Black families. Dependent variables have been standardized (z-scored). The fraction of mortgaged homeowners in 2000 is calculated at the CZ-level based on data from the 2000 Census. Odd (even) numbered columns in the bottom two panels present the OLS (2SLS IV) results. Controls included are percentage of below poverty level in 2000, percentage unemployed in 2000, fraction of single mothers in 2000, percentage aged above 55 in 2000 and the homeownership rate in 1990 in a CZ. All regressions include state fixed effects. Ease of mortgage access between 1990–2000 at the CZ-level is the percentile of the weighted average of the fraction of houses in a block within a CZ (weighted by the total number of housing units in a block) that become eligible to be financed by GSE-conforming loans due to the change in the conforming loan limit (CLL) from $187,450 in 1990 to $252,700 in 2000. Assuming a loan-to-value of 80%, this change in CLL corresponds to houses price values between $234,312 to $315,872 and we use the closest $200,0000–$400,000 bucket from the 1990 Census to calculate the fraction of houses at the block-level that become GSE-eligible from 1990–2000. Targeted tract is 1 if the tract is classified as being under the "Underserved Areas Goal" based on Housing and Urban (HUD) classification as of 2000. All columns are weighted by the total housing units in 1990. Standard errors are clustered by state. The sample for which the data is available for the dependent variable in Table VI are retained.

Dependent variable:	House Price Growth 1990-2000			School Quality			Agg. Housing Wealth Gap (White-Black)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
% of Homeowners with Mortgages$_{CZ}$ × Targeted tract$_{CT}$			-0.964			-0.112			-0.014**
			(0.692)			(0.069)			(0.006)
% of Homeowners with Mortgages$_{CZ}$	0.486		0.837	-0.254**		-0.245*	0.030***		0.036***
	(0.601)		(0.727)	(0.120)		(0.127)	(0.011)		(0.012)
Targeted tract$_{CT}$		-1.413**	-0.378*		-0.333***	-0.224***		-0.014***	0.001
		(0.618)	(0.212)		(0.044)	(0.058)		(0.004)	(0.005)
No. of Obs	16104	16104	16104	16101	16101	16101	16161	16161	16161
R^2	0.195	0.219	0.229	0.290	0.323	0.327	0.022	0.027	0.023
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
State FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. of Clusters	51	51	51	51	51	51	51	51	51
Type	2SLS IV	OLS	2SLS IV	2SLS IV	OLS	2SLS IV	2SLS IV	OLS	2SLS IV

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$