



# Racial differences in mortgage denials over the housing cycle: Evidence from U.S. metropolitan areas



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## ABSTRACT

The cyclical movement of housing prices likely affects the supply of and demand for credit for home purchases, but little is known about how this process might influence differential access to credit between minority and non-minority borrowers. This paper uses data reported through the Home Mortgage Disclosure Act (HMDA) over the period 1990–2013 to estimate the relationship between annual metropolitan area-level house price inflation and the extent to which Black borrowers are denied relative to ‘comparable’ White borrowers on their loan applications. The results indicate that, on average, Black borrowers are denied more frequently than White borrowers, but this difference in denial rates decreases significantly as house prices rise more rapidly. Such results demonstrate the importance of considering local housing market conditions when using HMDA data to assess lender compliance with fair lending laws.

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## 1. Introduction

Discrimination in mortgage lending has been the subject of a large academic literature and continues to be a primary focus of government agencies responsible for enforcing the nation’s fair lending laws. The overarching goal of this work is straightforward: determining whether individuals have been treated differently with respect to their access to credit based upon some ‘prohibited’ characteristic, such as age, race, or gender.

One aspect of the mortgage lending process that studies of discrimination have largely overlooked, however, is the

natural variation in loan activity over the course of the housing cycle (i.e., the cyclical movements in the rate of house price inflation). A large literature, of course, has established the presence of a general credit cycle, in which the supply of loanable funds changes as the economy moves between periods of growth, when lending increases, and decline, when it contracts. The volume of mortgage lending shows a similar tendency to fluctuate as conditions in the housing market change.<sup>2</sup>

Although fluctuations in credit may have a number of underlying causes, it is likely that they are at least partly the product of changes in lending standards. That is, in response to a slowing economy, lenders tighten their underwriting criteria, which, holding loan demand and the distribution of borrower risk profiles fixed, results in fewer loans extended in equilibrium. As the economy expands, in turn, standards fall, leading to an increase in loan activity. Evidence drawn from surveys of bank officers indicates that

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<sup>2</sup> Avery et al. (2010) provide summaries of mortgage activity over time.

the criteria underlying commercial and industrial loans tend to vary systematically over the business cycle.<sup>3</sup> A large literature suggests there is a similar phenomenon among mortgage lenders with respect to changes in both aggregate measures of default risk as well as the state of the housing market.<sup>4</sup>

Systematic changes in the criteria with which lenders evaluate mortgage applications, however, may influence the differential lending outcomes that government regulators measure in the process of monitoring the mortgage industry for potential violations of fair lending laws. Consider, for example, differences between loan applicants who belong to a minority racial group and those who do not. A housing boom may sharply increase the supply of mortgage credit as lenders ease their underwriting standards. Because racial and ethnic minorities tend to have lower average measures of borrower quality, such as credit scores, than White borrowers, minority denial rates may fall more than non-minority rates during a period of rapidly rising house prices. In this case, periods of strong house price appreciation may be associated with less apparent discrimination.<sup>5</sup>

Of course, the opposite outcome is also plausible. Housing booms may draw greater fractions of borrowers with especially weak credit histories – i.e., those that do not meet even extremely generous underwriting standards – into the market, as the demand for housing rises. If this happens to a larger degree among minorities than White borrowers, minority denial rates may rise relative to White approval rates, even though lending standards have been relaxed.

This paper explores whether measured differentials between White and Black borrowers show any variation over the housing cycle. To this end, we use annual data reported through the Home Mortgage Disclosure Act (HMDA) covering the period 1990–2013 to estimate how racial disparities in denial rates vary with the state of the housing market in which a lender is located.

The analysis is based upon the estimation of a simple screening model, similar to what government agencies that enforce fair lending laws might estimate in the process of identifying mortgage lenders for further scrutiny, to determine the difference in the probability of denial between Black and White borrowers. Because we carry out this estimation separately for each lender in each metropolitan area in every year, this process generates a set of metropolitan area-specific time series of Black–White differentials for each HMDA reporter institution.

The results indicate that increases in house price inflation are indeed significantly associated with Black–White differentials in loan denials. As the rate of inflation within a metropolitan area increases, the gap between Blacks and Whites shrinks, suggesting that, in times (or places) in which real estate is booming, mortgage lending appears to be more

equal across individuals of these two racial groups than in times (or places) in which real estate is declining. A 10 percentage point increase in the rate of house price inflation, for example, tends to be accompanied by a 0.5 to 1 percentage point decrease in the gap between the Black denial rate and the White denial rate, on average. These magnitudes amount to approximately 5–10% of the overall mean Black–White denial differential in the data.

This somewhat modest average association, interestingly, masks a much larger (negative) association among the top half of the distribution of denial differentials. In particular, the estimated magnitude is approximately twice as large as this ‘average effect’ at the 75th percentile of the denial differential distribution. As demonstrated below, this feature induces substantial variation over the housing cycle in the fraction of lenders that are likely to be deemed worthy of further investigation by government regulators (i.e., those that exhibit especially large differentials).

A follow-up exercise that examines the geographic distribution of lending activity (applications, originations, and denials), offers similar conclusions. As a metropolitan area’s rate of house price inflation increases, the fraction of denials within that metro area associated with properties in majority Black Census tracts decreases among locally situated lenders. Assuming that mortgage applications coming from majority Black neighborhoods are largely filed by Black applicants, this result merely suggests that Black denial rates fall relative to White denial rates. Yet, it also indicates that an additional gauge of fair lending compliance – redlining (i.e., the systematic avoidance of lending to certain neighborhoods) – also appears to be countercyclical, at least when measured by neighborhood denial shares.

We believe these findings raise an important consideration for agencies engaged in fair lending enforcement, as well as mortgage lenders that attempt to monitor their own fair lending compliance. The (apparent) systematic variation of underwriting standards with local house price inflation implies that perceived inequality in lending outcomes between races also varies over the housing cycle. This may naturally lead to greater enforcement activity by regulatory agencies, as well as the perception of a greater need for underwriting modification by lenders that self-monitor, during downturns in the real estate market.

The question is whether fluctuations in lending differentials over the housing cycle truly involve changes in discriminatory behavior, or whether they are merely the product of changing (but fair) lending standards interacted with the distribution of applicant risk by race. If the former explanation holds, agencies and lenders may wish to focus their fair lending analysis on areas or time periods in which housing markets are weak. If the latter holds, agencies and lenders should consider explicitly taking into account the state of the local housing market when gauging compliance with the nation’s fair lending laws rather than employing standards that are constant over time. Both cases argue for the consideration of local house price inflation in the study of differential mortgage lending outcomes.

The remainder of the paper proceeds as follows. The next section describes how the present analysis relates to the extant literature. Section 3 then describes the data, empirical methods, and results. Section 4 discusses some of

<sup>3</sup> See, for example, Schreft and Owens (1991), Asea and Blomberg (1998), Lown et al. (2000), and Lown and Morgan (2006).

<sup>4</sup> See, for example, Duca and Rosenthal (1991), Ambrose et al. (2002), and Dell’Ariccia et al. (2008).

<sup>5</sup> Note, this assumes that the estimation of discrimination does not fully account for applicant risk, which is typical of the initial stages of fair lending enforcement.

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