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RACIAL DISCRIMINATION AND COMPETITION

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ABSTRACT

This paper assesses the impact of competition on racial discrimination. The dismantling of inter- and intrastate bank restrictions by U.S. states from the mid-1970s to the mid-1990s reduced financial market imperfections, lowered entry barriers facing nonfinancial firms, and boosted the rate of new firm formation. We use bank deregulation to identify an exogenous intensification of competition in the nonfinancial sector, and evaluate its impact on the racial wage gap, which is that component of the black-white wage differential unexplained by Mincerian characteristics. We find that bank deregulation reduced the racial wage gap by spurring the entry of non-financial firms. Consistent with taste-based theories, competition reduced both the racial wage gap and racial segregation in the workplace, particularly in states with a comparatively high degree of racial prejudice, where competition-enhancing bank deregulation eliminated about one-quarter of the racial wage gap after five years.

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1 Introduction

More than four decades after the Civil Rights Act, large disparities in wage rates persist between black and white Americans (Smith and Welch, 1989, Donohue and Heckman, 1991, Altonji and Blank, 1999, and Neal, 2006). Yet, researchers have not fully determined the degree to which blacks earn less than whites with the same observable skills because of differences in unobserved skills or because of racial wage discrimination, whereby blacks are paid less than identically productive whites.

Becker (1957) argues that taste-based discrimination, the disutility that white employers attach to hiring black workers, can produce racial wage discrimination and that intensified product market competition can reduce this wage gap between identically productive workers. With lower entry barriers, firms with less of a taste for discrimination can initiate profitable operations by hiring equally productive black workers at lower wage rates than their white counterparts, boosting the relative demand for black workers. Thus, like any inefficiency, competition erodes racial wage discrimination.

Rather than emphasizing racial biases and competition, Arrow (1972) and Phelps (1972) stress that a gap in skills and imperfect information can explain racial wage differentials. If black workers are on average less productive than white workers due to characteristics that are unobserved by employers, those employers will use the observable characteristic – race – as a signal of productivity. In turn, employers will pay blacks a lower wage rate than whites with identical observable skills.

In this paper, we evaluate the causal impact of intensified competition on blacks' relative wages and assess whether the mechanisms linking competition and the racial wage gap are consistent with a taste-based explanation of the racial wage gap. In particular, Becker's (1957) theory suggests that competition will increase the relative demand for black workers only in economies where employers have a taste for discrimination. We examine this. Indeed, we provide the first evaluation of whether the impact of competition on blacks' labor market opportunities varies positively with the economy's taste for discrimination. This provides information on whether competition diminishes the manifestation of racial prejudices in labor markets.

Specifically, we use bank deregulation to identify an exogenous intensification of competition among nonfinancial firms, and evaluate its impact on the racial wage gap in the overall economy. From the mid-1970s to 1994, individual states of the United States relaxed restrictions on both the entry of banks from other states and the branching of banks within states. The resultant intensification of competition among banks reduced financial market imperfections and lowered entry barriers facing nonfinancial firms. Black and

Strahan (2002), Kerr and Nanda (2009), and our own estimates demonstrate that bank deregulation substantively spurred the entry of new firms. We assess whether this greater competition among firms boosted blacks' relative wages. That is, we exploit the cross-state, cross-time variation in bank deregulation to identify exogenous changes in entry barriers facing nonfinancial firms and then estimate whether the resultant intensification of competition increases blacks' relative wages. Critically, we do not focus on black's relative wages *within* the banking industry. Rather, we evaluate whether bank deregulation that spurred competition in the entire economy reduced the racial wage gap in the state's *overall* economy.

Our estimation strategy requires that bank deregulation is exogenous to competition and blacks' labor market outcomes. Geographic restrictions on banking protected local banks from competition for much of the 20th century (White, 1982). By the mid-1970s, however, technological innovations reduced the economic advantages of these restrictions, weakening the ability and desire of banks to fight deregulation and triggering the dismantling of these statutes over the next two decades. Kroszner and Strahan (1999) show that (1) the invention of automatic teller machines weakened the geographical bond between customers and banks; (2) checkable money market mutual funds facilitated banking by mail and telephone; and, (3) improvements in data processing, telecommunications, and credit scoring techniques weakened the informational advantages of local bankers. These national innovations interacted with preexisting state characteristics to produce considerable variation in the timing of bank deregulation across states. In states where probable losers from deregulation, such as small banks, were politically powerful, deregulation occurred later, while in states where probable winners from deregulation, such as small firms, were relatively powerful, deregulation occurred sooner. The timing of deregulation was neither associated with competition in the nonfinancial sector (Black and Strahan, 2002), nor, as we demonstrate below, with the racial wage gap. Hence the history of bank deregulation and its impact on entry barriers facing nonfinancial firms provides a natural laboratory for evaluating the causal impact of competition on blacks' relative wages.

Our approach provides information on the mechanisms linking competition and relative wages by evaluating whether the impact of competition on the racial wage gap varies by the degree of racial bias. According to Becker (1957), competition will boost blacks' relative wages only when the marginal employer receives disutility from hiring black workers. Thus, we use interracial marriage rates prior to deregulation to proxy for cross-state differences in the taste for discrimination. Using the 1970 census, we compute the predicted rate of intermarriage based on individual and state characteristics. We interpret the difference between the predicted rate of intermarriage and the actual rate as positively

related to the taste for discrimination. Although imperfect, this racial bias index is (1) measured prior to bank deregulation, (2) uncorrelated with the timing of bank deregulation, and (3) strongly associated with recent survey measures of racial prejudices employed by Charles and Guryan (2008). We use the racial bias index to evaluate whether the impact of competition on blacks' relative wages varies positively with the economy's taste for discrimination, as suggested by the taste-based view of racial wage discrimination. Econometrically, differentiating by year, state, and taste for discrimination yields a quasi-triple difference estimation framework that, as we explain below, allows us to relax standard identification assumptions.

Employed with this framework, we turn to the data. Using individual-level data from the Current Population Survey for survey years 1977 to 2007, state-level data on new incorporations per capita to proxy for competition in the nonfinancial sector from Black and Strahan (2002), data on married couples from the 1970s Census, and the dates of bank deregulation from Kroszner and Strahan (1999), we evaluate the impact of deregulation and competition on blacks' relative wages.

The findings suggest that intensified competition substantially reduced racial wage discrimination by ameliorating the manifestation of racial prejudices in labor markets. We first find that bank deregulation increased the rate of new incorporations across states with different values of the racial bias index. Dynamically, the impact of deregulation on the rate of new incorporations grows over time. Second, bank deregulation increased blacks' relative wage rates, but only in "high racial bias" states. In states with above the median level of the racial bias index, deregulation eliminated about one-third of the initial racial wage gap after five years. Furthermore, the dynamic impact of deregulation on blacks' relative wages mirrors that of deregulation on new incorporations, with blacks' relative wages rising for many years following bank deregulation. Third, blacks' relative wages are positively associated with the rate of new incorporations in high racial bias states. Thus, while bank deregulation boosted the rate of new incorporations in high and low racial bias, there is a positive association between blacks' relative wages and both bank deregulation and new incorporations only in high racial bias states.

Moreover, the two-stage least squares results indicate that an exogenous intensification of competition only boosted blacks' relative wages in states with a sufficiently high taste for discrimination. Using inter- and intrastate bank deregulation as instrumental variables to identify exogenous shocks to the rate of new incorporations, we find that increases in the rate of new incorporations only reduced the racial wage gap in high racial bias states, such that a ten percent increase in the rate of new incorporations reduced the black-white wage differential by 2.5 percent. Furthermore, exogenous increases in the rate of new

incorporations also increased the relative working hours of black workers in high racial bias states, consist with the interpretation that intensified competition boosted the relative demand for black workers.

The findings do not simply imply that states with a high degree of racial bias converge toward low racial bias states, nor that blacks' relative wages increase over time. Rather, among high racial bias states, exogenous increases in competition reduce the wage gap while accounting for state and year fixed effects. The results, therefore, cannot be attributed to convergence of blacks' relative wages in high racial bias states toward those in other states nor to any common time effects (business-cycles) among high racial bias states. Indeed, by conditioning on state and year effects, we control for all national influences, such as federal statutes, as well as state-specific factors. The results imply that competition boosts blacks' relative wages by eroding the adverse effects of racial prejudices on the relative demand for black workers.

To provide additional information on how competition shapes the impact of racial prejudices on labor markets, we also examine segregation. Becker's (1957) theory predicts that when employers are heterogeneous in both quality and taste for discrimination, black workers will be hired by employers with the weakest racial prejudices, creating segregation in the workforce. Moreover, the taste-based theory predicts that an intensification of product market competition will reduce segregation. A lowering of entry barriers that allows new employers with less of a taste for discrimination to enter the market increases the employment opportunities of black workers, reducing segregation. Thus, if our findings on blacks' relative wages reflect the causal impact of competition on how racial prejudices affect labor markets, then we should also observe greater integration following an intensification of competition.

We examine this additional testable implication and find that an exogenous increase in the rate of new incorporations reduced racial segregation across industries. To proxy for the degree of segregation, we construct several measures of the degree to which each industry is disproportionately composed of white workers or run by white managers. In high racial bias states, we find that an increase in the rate of new incorporations sparked by bank deregulation induced more blacks to work in industries that historically were composed disproportionately of white workers or had a high proportion of white managers. These findings are fully consistent with the view that intensified competition reduced the effects of racial prejudices on blacks' relative wages and racial segregation.

This paper's findings are robust to several potentially confounding influences. First, the intensification of competition from bank deregulation could have increased blacks' relative wages by disproportionately helping occupations and industries with a comparatively high

proportion of blacks, not by reducing the manifestation of racial prejudices on labor markets (Black and Spitz-Oener, 2007). However, we find that blacks' wages rise relative to comparable white workers within the same occupation and industry. Second, bank deregulation could trigger changes in the skill composition of the labor force through the selection of workers into the labor force, interstate migration, and changes in self-employment (Butler and Heckman, 1977; Mulligan and Rubinstein, 2008). We find no evidence that deregulation substantively affected the relative skill composition of black workers. Third, bank deregulation could have changed the prices of unobserved skills in which average black and white workers are differentially endowed. Following Juhn, Murphy, and Pierce (1991), however, we find that bank deregulation improved black workers' location throughout white workers' residual wage distribution, indicating that competition boosted blacks' relative wages in particular, not the relative wages of comparatively low income workers in general.

We are not the first to examine competition and discrimination. Becker (1957), Shepherd and Levin (1973), and Oster (1975) compare market concentration and relative wages across industries, obtaining mixed results. Ashenfelter and Hannan (1986), however, stress the importance of examining labor market integration, not relative wages, when comparing industries or when examining an industry over time because relative wages are primarily established in the overall economy, not in separate industries. Consistent with Becker's theory, they find a negative association between market concentration and the share of female employees across several banking markets in Pennsylvania and New Jersey. In contrast to the Ashenfelter and Hannan (1986) approach, several studies trace the impact of competition on relative wages within a single industry. Heywood and Peoples (1994) and Peoples and Talley (2001) find that the deregulation of trucking increased the relative wages of black workers. Black and Strahan (2001) find that bank deregulation increased competition between banks, disproportionately reducing the rents paid to male workers relative to female bank employees. Within manufacturing, Black and Brainerd (2004) find that globalization intensified competition and thereby reduced the gender wage gap.

Our major contribution is that we provide the first evaluation of whether the impact of an exogenous intensification of product market competition on blacks' relative wages and racial integration varies positively with the economy's taste for discrimination. That is, we not only assess whether competition boosts the relative demand for black workers in general, we examine whether competition boosts blacks' relative wages and integration only in those environments in which the taste-based theory suggests that competition will enhance blacks' labor market opportunities. Toward this end, we use the rate of new incorporations per capita as a measure of product market competition, rather than market concentration, because Becker (1957) identifies the entry of new firms as the mechanism through

which lower entry barriers changes the relative demand for black workers. Our results are fully consistent with the central implication of the taste-based theory: An intensification of product market competition diminishes the manifestation of racial prejudices in labor markets.

Our work complements Charles and Guryan's (2008) study of the relation between racial prejudices and blacks' relative wages. Using state-level survey measures of racial prejudices to gauge relative demand for black workers and the share of black workers in the labor force, they provide the first empirical support for Becker's (1957) hypothesis that a stronger taste for discrimination by the marginal firm reduces blacks' relative wage rates. Rather than evaluating the relation between racial prejudices at the margin and relative wages, we examine the impact of changes in competition on changes in relative wage rates, while distinguishing states by the taste for discrimination.

This paper also relates to research on finance and income inequality (Levine, 2005; Beck, Levine, and Levkov, 2009; Demirguc-Kunt and Levine, 2009). We show that exogenous improvements in the functioning of banks substantively enhanced the economic opportunities of an historically disadvantaged group by diminishing the impact of racial prejudices on labor market opportunities.

Our findings do not reject, and might even complement, statistical discrimination explanations of racial wage differentials. Differences in productive skills might play an additional role in explaining the racial wage gap. Indeed, Neal and Johnson (1996) explain a large proportion of the racial wage gap using a measure of cognitive achievement. Heckman, Stixrud, and Urzua (2006), however, warn that gaps in cognitive achievement scores could reflect the historical ramifications of racial prejudices, highlighting potential interactions between statistical and taste-based theories. For example, competition that boosts blacks' relative wages might enhance incentives for blacks to acquire more skills. This would increase the average skill level of blacks, potentially reducing statistical discrimination and triggering self-reinforcing dynamics that reduce disparities in wages, education, and health (Coate and Loury, 1993; Benabou, 1996; Card and Krueger, 1992; Durlauf, 1996, 2006; Durlauf and Fafchamps, 2006; Jencks and Phillips, 1998; Altonji and Pierret, 2001; Fryer and Levitt, 2004; Almond, Chay, and Greenstone, 2006).

In what follows, section 2 discusses the use of bank deregulation as an exogenous source of variation in competition. Section 3 outlines the conceptual and statistical framework. Section 4 describes the data and econometric design. Section 5 presents the core results on relative wages, while Section 6 provide the results on racial integration. After providing robustness tests in Section 7, Section 8 concludes.

2 Bank Deregulation and Competition

2.1 A Brief History of Bank Branch Regulation

Geographic restrictions on banks have their origins in the U.S. Constitution, which limited states from taxing interstate commerce and issuing fiat money. In turn, states raised revenues by chartering banks and taxing their profits. Since states received no charter fees from banks incorporated in other states, state legislatures prohibited the entry of out-of-state banks through interstate bank regulations. To maximize revenues from selling charters, states also effectively granted local monopolies to banks by restricting banks from branching within state borders. These intrastate branching restrictions frequently limited banks to operating in one city.

By protecting inefficient banks from competition, geographic restrictions created a powerful constituency for maintaining these regulations even after the original fiscal motivations receded. Indeed, banks protected by these regulations successfully lobbied the government to prohibit interstate banking and intrastate branching (Southworth, 1928; White, 1982; Economides, Hubbard, and Palia, 1996).

In the last quarter of the 20th century, however, technological, legal, and financial innovations diminished the economic and political power of banks benefiting from geographic restrictions. In particular, a series of innovations lowered the costs of using distant banks. This reduced the monopoly power of local banks and weakened their ability and desire to lobby for geographic restrictions. For example, the invention of automatic teller machines (ATMs), in conjunction with court rulings that ATMs are not bank branches, weakened the geographical link between banks and their clientele. Furthermore, the creation of checkable money market mutual funds made banking by mail and telephone easier, thus further weakening the power of local bank monopolies. Finally, the increasing sophistication of credit scoring techniques, improvements in information processing, and the revolution in telecommunications reduced the informational advantages of local bankers, especially with regards to small and new firms.

These national developments interacted with preexisting state characteristics to shape the timing of bank deregulation across the states. As shown by Kroszner and Strahan (1999), deregulation occurred later in states where potential losers from deregulation (small, monopolistic banks) were financially stronger and had a lot of political power. On the other hand, deregulation occurred earlier in states where potential winners of deregulation (small firms) were relatively numerous. Most states deregulated geographic restrictions on banking between the mid-1970s and 1994, when the Riegle-Neal Act effectively eliminated these restrictions.

The forces driving bank deregulation were exogenous to competition in the non-financial sector and the racial wage gap. The timing of deregulation was not shaped by new firm formation (Black and Strahan, 2002, Kerr and Nanda, 2009), nor by the strength of labor unions (Black and Strahan, 2001), nor by the degree of earnings inequality (Beck, Levine, and Levkov, 2009) in each state. Moreover, we show below that the racial wage gap does not explain the timing of bank deregulation.

2.2 Bank Deregulation and Competition in the Non-Financial Sector

An extensive literature examines the ramifications of bank deregulation. For example, Jayaratne and Strahan (1998) find that removing geographic restrictions improved banking efficiency by reducing interest rates on loans, raising them on deposits, lowering overhead costs, and shrinking loan losses. Beyond banking, deregulation accelerated a state's rate of economic growth (Jayaratne and Strahan, 1996; and Huang, 2008), lowered economic volatility (Demyanyk, Ostergaard, and Sorensen, 2007), improved the self-employment opportunities of disadvantaged groups (Demyanyk, 2008), and reduced income inequality (Beck, Levine, and Levkov, 2009).

More specifically for the purposes of this paper, inter- and intrastate bank deregulation intensified competition among firms in the non-financial sector by reducing barriers to entry. Black and Strahan (2002) find that deregulation helped entrepreneurs start new businesses, with the rate of new incorporations per capita in a state increasing by six percentage points following deregulation. Kerr and Nanda (2009) find that interstate deregulation increased the number of new start-ups by six percentage points and expanded the number of facilities of existing firms by four percentage points across all sectors in the economy. Furthermore, they find a dramatic increase in both the entry and exit of firms, suggesting that deregulation increased contestability throughout the economy.¹ Below, we confirm that inter- and intrastate bank deregulation boosted the rate of new incorporations per capita and we use this to identify an exogenous, positive shock to competition in our analysis of racial discrimination.

¹Several interrelated factors explain the impact of deregulation on competition in the overall economy. First, deregulation fueled competition among banks and reduced lending rates. This facilitated the expansion of existing firms and the entry of new ones. Furthermore, the country's more innovative banks were developing better techniques for evaluating firms. Sophisticated credit-scoring techniques in conjunction with dramatic advances in information processing enhanced the ability of banks to evaluate and finance new and small businesses. By easing the acquisition of banks across and within state boundaries, deregulation helped spread these superior techniques for evaluating firms (Hubbard and Palia, 1995). Deregulation also permitted the formation of larger, more geographically diversified banks. Diamond's (1984) theory of intermediation suggests that greater diversification reduces the monitoring costs of lending to riskier, more opaque firms. Indeed, Berger et al. (1998) shows that small business lending increases after small banks are acquired.

3 Conceptual and Statistical Framework

3.1 Conceptual Framework

Becker’s (1957) seminal analysis of racial discrimination and competition motivates our empirical analysis. In Becker’s model, employers are heterogeneous in both quality and ‘taste for discrimination,’ which is defined as the degree to which they suffer "disutility" from employing minority workers.² In equilibrium, minority workers must ‘compensate’ employers either by being more productive at a given wage or by accepting a lower wage for identical productivity. In turn, market pressures cause blacks to be hired by the least racially biased employers. Thus, the joint distribution of employer taste for discrimination and employer quality combine with the proportion of black workers in the economy to influence the racial wage gap. For example, the racial wage differential will be larger when all employers have a greater taste for discrimination, holding other things constant. Similarly, the racial wage differential vanishes if employers receive no disutility from hiring blacks. As a final example, an increase in the relative supply of black workers, holding the distribution of existing firms constant, will tend to widen the racial wage differential as firms with a stronger taste for discrimination are induced to hire black workers through lower relative wage rates.

Define racial discrimination as the percentage difference in the wage rates of identical black and white workers, so that, the log hourly wage rates of black workers W_{st}^B in economy s during period t differ from those of identical white workers W_{st}^W by a racial discrimination premium d_{st} :

$$W_{st}^B - W_{st}^W \equiv -d_{st}. \tag{1}$$

In anticipation of examining the states of the United States, we use the subscript s to designate an economy. Racial discrimination is not defined as an economy’s attitude toward minorities, though these tastes – these racial prejudices – influence the wage gap between identical black and white workers.

In this framework, an increase in competition – a reduction in entry barriers – can reduce the black-white wage rate differential. With lower entry barriers, new employers with less of a taste for discrimination than incumbents can earn greater profits than existing firms by hiring equally productive black workers at lower wage rates than their white counterparts. Thus, the lowering of entry barriers boosts the relative demand for black workers, eroding

²Bertrand and Mullainathan (2004) find that resumes with traditionally white names receive 50 percent more calls for interviews than identical resumes with distinctively black names.

the manifestation of racial prejudices on relative wage rates.³ Competition does not change any individual’s preferences toward hiring minority workers. Rather, competition makes racial wage discrimination more costly by facilitating the entry of employers with less of a taste for discrimination.

The model further suggests that the marginal impact of competition on blacks’ relative wage rates varies positively with the degree of racial prejudice in the economy. At the most basic level, if employers have no taste for discrimination, then the racial wage gap equals zero in the model. Under these conditions, competition does not affect black’s relative wage rates. Competition only increases the relative wage rates of black workers in the model when employers have a taste for discrimination.⁴

In turning toward an empirical assessment of the relationship between competition and racial discrimination, we use the entry of new firms as a proxy measure of competition. One key advantage of new firm entry as a proxy for competition, rather than more traditional measures based on market share, is that Becker’s (1957) theory focuses on the actual entry of new firms: The entry of new firms with different tastes toward hiring minorities from those of existing firms reduces racial discrimination.

Furthermore, we (1) explicitly account for cross-state differences in the taste for discrimination and (2) control for state and year fixed effects to hold other factors constant that theory suggests affect the racial wage gap, such as cross-state differences in the racial composition of the workforce. Thus, we evaluate whether the impact of competition on the racial wage gap varies positively with the degree of racial bias in the economy.

3.2 Statistical Framework

We now outline a statistical framework for assessing the impact of competition on the racial wage gap. Below, we define the construction of the actual data series and provide details on the econometric methods.

Let W_{ist}^B equal the log hourly wage rate of black worker i in state s in time t . Further, define R_{ist} as the relative wage rate of black worker i in state s in time t , which equals the difference between the log hourly wage rate of black worker i (W_{ist}^B) with observable characteristics (X_{ist}^B) and the wage rate of a white worker with identical observable traits $\mu_{st}^W(X_{ist}^B)$. We call $\mu_{st}^W(X_{ist}^B)$ the conditional wage rate of black worker i , where the condi-

³Note, perfect competition does not necessarily eliminate the black-white wage differential as argued by Becker (1957). Depending on the joint distribution of firm quality and taste for discrimination, an equilibrium racial wage gap might still obtain with zero entry costs.

⁴One can conceive of distributions of existing employer quality and racial prejudices inconjunction with particular distributions of the quality, racial prejudices, and entry barriers of shadow firms, such that an increase competition will not boost blacks’ relative wages. We evaluate this below.

tioning is done on black worker i receiving the same wage rate as the average white worker with identical observed characteristics in state s in time t (X_{ist}^B).

For simplicity of illustration, yet without loss of generality, assume that states can be divided into those with a high taste for discrimination and those where people do not receive as much disutility from working and interacting with minorities. We allow the impact of deregulation and competition on blacks' relative wages to vary by a state's degree of taste for discrimination. Let T_s be a binary variable which is equal to one if the taste for discrimination in state s is high and zero if it is low. We define the construction of this racial bias index below.

Thus, we begin with a standard relative log hourly wage equation given by a linear-in-the-parameters specification:

$$R_{ist} \equiv W_{ist}^B - \mu_{st}^W(X_{ist}^B) = \beta_0 N_{st} + \beta_1 N_{st} T_s + \delta_s + \delta_{0t} + \delta_{1t} + \varepsilon_{ist}, \quad (2)$$

where N_{st} denotes the entry of new firms, which serves as a proxy for competition, in state s in time t , T_s is zero-one racial bias index, δ_s is a vector of state fixed effects, δ_{0t} and δ_{1t} are vectors of time effects in low and high racial bias states respectively, and ε_{ist} is an error term composed of a person specific idiosyncratic shock and any unobserved state-year fixed effects. Note, this specification allows time effects to vary across high and low racial bias states, so that δ_{0t} measures the time effect in low racial bias states and δ_{1t} measures the time effect in high racial bias states. In terms of the parameter estimates on competition, β_0 is the causal impact of competition on the relative wage rates of black workers in low racial bias states, while $\beta_0 + \beta_1$ is the effect of competition on the black-white wage gap in high racial bias states.

Becker's theory predicts that (1) competition boosts the relative wages of black workers in states with a sufficiently high degree of racial bias, i.e., $\beta_0 + \beta_1 > 0$, and (2) the impact of competition on blacks' relative wages is larger in states with a higher degree of racial bias, i.e., $\beta_1 > 0$. Since the marginal employer might have a nonzero taste for discrimination even in low racial bias states, our specification does not necessarily imply that $\beta_0 = 0$, only that $\beta_0 + \beta_1 > 0$ and $\beta_1 > 0$.

4 Data and Econometric Design

4.1 Data

In this study we use micro-level and state aggregate data sources. For the micro-level data on labor market characteristics, we use the Integrated Public Use Microdata Series

(IPUMS) from the U.S. Current Population Survey (CPS), March Supplements for the survey years 1977 to 2007 and the Census of Population for 1970, Form 1 State, and Form 2 State one-percent samples. These are combined with aggregate state level data on bank deregulation, taken from Kroszner and Strahan (1999), and new incorporations as a proxy for competition in the nonfinancial sector, which we obtained from Black and Strahan (2002).

4.1.1 CPS Samples for the Years 1977 to 2007

The CPS March Annual Demographic Supplements provide information on earnings, along with weeks and hours worked in the calendar year preceding the March survey so that the 1991 survey provides information on earnings in 1990. We start in Survey year 1977 because that is when the CPS reports information on each person’s state of residence. To enhance comparability and connect our analyses to the literature, we restrict our sample to non-Hispanic white and black adult civilian males between the ages of 18 and 65 during the working year, and exclude persons living in group quarters or with missing data on relevant demographics. Our main wage sample further excludes the self-employed, persons in the military, agricultural, or private household sectors, persons with inconsistent reports on earnings, and individuals with allocated earnings.

We classify the adult population into six educational categories: (i) persons with 0–8 years of schooling completed; (ii) high school dropouts; (iii) high school graduates, 12 years of schooling; (iv) some college; (v) college graduate; and (vi) advanced degree. Potential work experience is constructed as the maximum between zero and age (in year of survey) minus years of schooling completed minus seven.

Wage rates are defined as real annual earnings divided by the product of weekly working hours and annual working weeks. We use the Consumer Price Index to deflate earnings to 2000 dollars and set hourly earnings to missing if any of these components is missing or zero. Following Autor, Katz, and Kearney (2008), workers with top coded earnings have their annual earnings set to 1.5 times the annual top-code amount. We trim outliers with hourly wages below the 1st percentile and above the 97th percentile of the year-specific distribution of hourly earnings of full-time, full-year workers. This trimming virtually eliminates individuals with top-coded annual earnings. The results are robust to altering the definition of outliers. Finally, in accord with previous research on bank deregulation, we drop Delaware and South Dakota from our analyses due to large concentration of credit card banks in these states. Appendix Table 2 provides more details on the construction of our sample.

4.1.2 *The 1970 Census*

We use the 1970 Census to construct information on the rate of racial intermarriage in each state. The Census samples are the largest microdata set containing detailed marriage and demographics information. Our primary sample includes married whites and blacks between that ages of 18 to 65, and excludes couples in which at least one person is living in group quarters or has missing data on race, gender, state of residence, marital status and educational attainment.

4.1.3 *State level data on bank deregulation and new incorporations*

We obtain the dates of interstate and intrastate bank deregulation from Kroszner and Strahan (1999) and Amel (2008). Most states removed these geographic restrictions on banking between the mid-1970s and 1994, when they were eliminated by federal legislation. Appendix Table 1 provides the deregulation dates for each state.

To measure new firm entry, we use the rate of new incorporations per capita from Black and Strahan (2002), who obtain these data from Dun and Bradstreet. Specifically, we use the log of new business incorporations per capita for each state over the period 1977-1994.

4.2 **Generating Relative Wages and the Racial Bias Indexes**

4.2.1 *Relative wages*

We first compute the estimated relative wage rate for each black worker i in the sample (\hat{R}_{ist}), which equals the worker's actual wage rate minus the estimated wage rate that the average white worker with identical characteristics would earn.

We follow a two-step procedure for computing the log hourly wage rate that a white worker with identical characteristics as his black counterpart would earn. We first estimate the following Mincerian log hourly wage equation using the sample of white workers:

$$W_{ist}^W = X'_{ist}\theta_t^W + e_{ist}, \quad (3)$$

where W_{ist}^W is the log hourly wage of white worker i in state s during time t , X_{ist} is a vector of person-specific observable determinants of log hourly wages (e.g., quartic in potential experience, and six education categories), X_{ist} also includes state fixed effects, e_{ist} captures the component of wages idiosyncratic to white worker i . Equation (3) is estimated separately for every year between 1976 and 2006. This yields time-varying returns, or “prices” to observable characteristics, i.e., θ_t^W . Further, the average value of unobservable traits among white workers in state s during time t are incorporated into the estimation of

(3) by the inclusion of state fixed effects in each of the 31 separate regressions. Below, we analyze the potential biases induced by unobservable traits.

This first step has two noteworthy and crucial properties. First, given the changes in the structure of wages in the United States since the mid 1970s (Katz and Autor, 1999), we allow the Mincerian returns to observable skills (θ_t^W) to vary by year. This is crucial for our analyses due to the well-documented skill gap between black and white workers. Failure to account for time-varying returns to observables will lead to erroneous estimates of the dynamic pattern of relative wages, potentially biasing our assessment of the impact of competition on the black-white wage gap.

Second, by allowing state fixed effects to vary by year, we control for all time-varying, state-specific characteristics that might affect the wage rates of white workers including the effect of bank deregulation. Specifically, we include a vector of state dummy variables in (3), which is estimated separately for each year. Thus, we control for the state’s unemployment rate, its gross state product, changes in the industrial composition of production, the racial composition of each state, state-level productivity differences, and regulatory reforms on the wage rates of white workers. By controlling for these wage rate determinants in general, we can more precisely focus on the impact of bank deregulation on blacks’ relative wages in particular.

In some extensions, we also control for time-varying occupation- and industry-specific effects. To do this, we add a vector of occupation and/or industry dummy variables to (3), which is estimated separately for each year. We use the three digit occupation and industry codes recorded in the CPS, which are based on the 1950 Census Bureau classification system to provide a consistent set of industry and occupation codes throughout the sample. This means including 408 additional dummy variables each year (144 industries and 262 occupations). While a worker’s occupation and industry could reflect racial wage discrimination, we condition on occupation and industry in robustness tests to assess whether blacks’ wages change relative to white workers with the same observable skills, who are working in the same occupation and industry.

In the second step, we generate the estimated relative wage rate of each black worker i in state s during time t as the worker’s actual wage rate (W_{ist}^B) minus the estimated wage rate that a white worker with the same characteristics would earn ($X_{ist}^{B'} \hat{\theta}_t^W$), using the estimated parameters from (3):⁵

$$\hat{R}_{ist} = W_{ist}^B - X_{ist}^{B'} \hat{\theta}_t^W, \quad (4)$$

⁵To connect this to equation (2) of the statistical model, note that the estimated conditional wage rate of black worker i is $\hat{\mu}_{st}^W(X_{ist}^B) = X_{ist}^{B'} \hat{\theta}_t^W$.

where $(X_{ist}^{Bt} \hat{\theta}_t^W)$ is computed based on the following conditions: (1) each black worker's observable Mincerian characteristics (X_{ist}^B) are rewarded at the same estimated prices $(\hat{\theta}_t^W)$ as his white counterpart and (2) each black worker in state s during year t receives as part of his wage rate the value of the unobservable traits of the average white worker in that state and year.

4.2.2 *Racial Bias Indexes*

Becker's (1957) theory implies that the impact of an intensification of competition on the relative demand, and hence the relative wage rates, of black workers depends positively on the taste for discrimination, holding other factors constant. We do not directly observe the taste for discrimination. Consequently, we compute and use several estimates of the degree of racial bias in each state.

We develop two types of racial bias indices based on the accumulated stock of racial intermarriage in 1970. The "simple" racial bias index equals the difference between the rate of intermarriage that would exist if married people were randomly matched and the actual intermarriage rate. The random rate equals $2P * (1 - P)$, where P is the proportion of blacks among the married population. Larger values of the simple racial bias index indicate that intermarriage occurs less in practice than if marriage pairings were random. We interpret larger values as (partially) reflecting racial bias.

In the second type of racial bias index, we account for other factors that might induce the actual rate of intermarriage to deviate from the random rate. Intermarriage depends on the opportunities for interracial social contacts, so that the relative sizes of the black-white populations might independently affect intermarriage (Blau, 1977). Furthermore, since the odds of interethnic unions increase with couples' educational attainment (Massey and Denton, 1987; Qian, 1997; Rubinstein and Brenner, 2009), we also control for education and age. Specifically, based on the 1970s census, we estimate the following equation for all married couples (excluding couples in which either the husband or wife is neither white nor black) in the United States:

$$I_{is} = bH_{is} + cW_{is} + dS_s + \tau_{is}, \quad (5)$$

where I_{is} equals one if couple i in state s is racially mixed and zero otherwise, H_{is} and W_{is} are vectors of age and education characteristics for the two spouses respectively, S_s are state characteristics, τ_{is} is the unexplained component of intermarriage, while b , c , and d are coefficients. Our benchmark specification conditions on nine categories of education, along with age entered as a quartic. For state characteristics, we include the random inter-

marriage rate defined above along with the percentage of blacks among married couples. We experimented with numerous specifications, including and excluding the random intermarriage rate and the percentage of blacks, changing the specification of education and age controls, and conditioning on metropolitan and urban locations. These combinations produce the same conclusions.

From equation (5), we compute the intermarriage racial bias index for each state. Let τ_s equal the average value of τ_{is} across couples in state s . Recognizing that $\min\{\tau_s\} < 0$, we compute the racial bias index as $\tilde{T}_s = -\tau_s + \max\{\tau_s\}$, so that \tilde{T}_s equals zero for the state with the largest τ_s . We interpret large values as signaling a stronger taste for discrimination. Appendix Table 3 provides the value of the racial bias index, \tilde{T}_s , for each state and the District of Columbia. Furthermore, $T_s = 1$ if $\tilde{T}_s \geq \text{median}\{\tilde{T}_s\}$, and $T_s = 0$ if $\tilde{T}_s < \text{median}\{\tilde{T}_s\}$.

The intermarriage racial bias index is positively correlated with survey-based measures of racial prejudice. Table 1 (Panel A) shows that the intermarriage racial bias index is positively related to three survey-based measures of racial prejudice used by Charles and Guryan (2008) in their study of relative wages and racial prejudices: (1) the fraction of whites supporting a law against interracial marriage, (2) the fraction of whites would not vote for a black president, and (3) the fraction of whites supporting the right to segregate neighborhoods by race. Thus, the racial bias index based on intermarriage in 1970 is closely associated with subjective measures of racial attitudes measured over the period 1972 to 2004.

The intermarriage racial bias index is negatively correlated with the relative wage rates of black workers. Panel B of Table 1 shows that the intermarriage racial bias index is strongly, negatively associated with black's relative wage rates in the years prior to both inter- and intrastate bank deregulation, suggesting that the racial bias index captures cross-state differences in the relative demand for black workers.

As emphasized by Becker (1957), the relative supply of blacks in the workforce should also affect the relative wage rate of black workers. We assess this prediction by including the proportion of blacks in the workforce in 1970 in the relative wage rate regression. As shown in Panel B of Table 1, states in which black workers compose ten percent or more of the labor force tend to have low relative wage rates for black workers. The intermarriage racial bias index, however, remains negatively and significantly associated with the relative wage rate of black workers.

We also use the Charles and Guryan (2008) survey-based estimates of the degree of racial prejudice of the marginal firm in each state to categorize high- and low-racial bias states. As shown in Panel B of Table 1, states with above the median levels of this marginal

racial prejudice indicator have significantly lower relative wages of black workers. Nonetheless, the racial bias index based on racial intermarriage remains negatively and significantly associated with blacks' relative wages even when controlling for the marginal racial prejudice indicator and when controlling for both the marginal racial prejudice indicator and the proportion of blacks in the workforce.

For the purposes of this paper, there are advantages to using the intermarriage racial bias index rather than survey-based measures of racial attitudes. The intermarriage racial bias index is based on actual choices made prior to deregulation not survey responses made during the period of deregulation. Moreover, our empirical strategy requires that the measure of racial bias is invariant to bank deregulation and the resultant change in competition. If we differentiate states based on a measure of racial bias that itself reflects the effects of deregulation on the relative demand and supply of black workers, this will confound our strategy of identifying the causal impact of product market competition on the relative demand for black workers. The racial attitude surveys, however, are conducted during the period of bank deregulation. Thus, the Charles and Guryan (2008) estimate of the degree of racial prejudice of the marginal firm, which is based on the racial attitude surveys and the relative supply of black workers, includes the effects of bank deregulation on product market competition. Although this is not a problem for their study of the connection between the taste for discrimination of the marginal firm and relative wage rates, these survey-based measures are inappropriate for our purposes.

Furthermore, when assessing the impact of competition on blacks' relative wages, Becker's (1957) framework advertises the advantages of our intermarriage racial bias index rather than an estimate of the taste for discrimination of the marginal firm, which incorporates both the relative demand for and supply of black workers. Theory does not necessarily predict that an increase in competition will increase blacks' relative wages *more* in states with initially low relative black wage rates because low relative wage rates reflect both demand and supply. Rather, theory implies that an intensification of competition will increase the relative demand for black workers only in states with a sufficient taste for discrimination. Holding the relative supply of black workers constant, therefore, theory predicts that an intensification of competition will increase blacks' relative wages in states with a sufficiently high taste for discrimination. This is what we evaluate. We distinguish states by their overall taste for discrimination, and assess whether competition boosts blacks' relative wage rates while conditioning on other state and year characteristics, including the relative supply of black workers.

In sum, we include state and year fixed effects and evaluate whether an exogenous increase in competition boosts the relative demand for black workers more in states with

larger values of the intermarriage racial bias index. Measuring racial bias with error will bias the results against finding a statistically significant connection between racial bias, competition, and the black-white wage gap. We do not require that the racial bias index is a perfect measure of racial attitudes. We simply require that it provides some information on racial prejudices across states.

4.3 Econometric Design

4.3.1 *The impact of competition on blacks' relative wages*

To obtain a consistent estimate of the impact of competition, as measured by the rate of incorporations, on relative wages, we need an instrumental variable that is correlated with the rate of new incorporations but not independently correlated with blacks' relative wages. It is important to use instrumental variables because blacks' relative wages could affect the actual entry of firms. For example, firms could enter to exploit the opportunity to hire less expensive labor in states with a large racial wage gap. If this occurs, OLS will underestimate the causal impact of competition on blacks' relative wages. Thus, to assess the causal impact of competition on racial wage discrimination while differentiating economies by their tastes for discrimination, our identifying strategy assumes that (i) banking deregulation is exogenous to blacks' relative wages, (ii) new incorporations per capita is a fair proxy for competition, (iii) the racial bias index reflects tastes for discrimination, and (iv) bank deregulation does not affect the racial wage gap beyond its impact on the rate of new incorporations.

From equations (2) and (4), the following second stage regression captures the causal relationship of interest,

$$\hat{R}_{ist} = \beta_0 N_{st} + \beta_1 N_{st} T_s + \delta_s + \delta_{0t} + \delta_{1t} + \epsilon_{ist}, \quad (6)$$

where the predicted value of the log of new incorporations per capita (N_{st}) is obtained from the first stage regression using bank deregulation as an instrument:⁶

$$N_{st} = D'_{st} \gamma_0 + D'_{st} \gamma_1 T_s + \pi_s + \pi_{0t} + \pi_{1t} + \eta_{st}, \quad (7)$$

where D_{st} is a vector indicating years since bank deregulation, T_s equals one in high racial bias states and zero in low racial bias states, γ_0 and γ_1 are corresponding coefficients, π_s is a vector of state-specific effects, π_{0t} and π_{1t} represent time effects in low and high racial

⁶The first stage regression is conducted at the individual level, so it is weighted by the proportion of black workers in each state.

bias states respectively, ϵ_{ist} is an error term composed of a person specific idiosyncratic shock to relative wages and any unobserved state-year fixed effects, and η_{st} is an error term. The standard errors are clustered at the state-year level throughout the analyses. As emphasized, we assess whether the impact of competition on the racial wage gap depends on the degree to which states have a stronger or weaker taste for discrimination.

Our estimation strategy allows us to relax the standard exclusion restriction that bank deregulation only affects blacks' relative wages through its affect on the rate of new incorporations. We conduct a quasi triple difference estimation by including state and year fixed effects and by separately analyzing states with above and below the median value of the racial bias index. This yields an estimate of the differential impact of an increase in the rate of new incorporations on blacks' relative wages in high and low racial bias states, i.e., we assess whether $\beta_1 > 0$. To obtain a consistent estimate of this differential impact using 2SLS, we do not require the standard exclusion restriction to hold. Rather, we simply require that any bias arising from bank deregulation affecting blacks' relative wages beyond its impact through the rate of new incorporations is the same in high and low racial bias states, which we assess empirically below.⁷

4.3.2 *Reduced form estimator*

We also assess the reduced form impact of banking deregulation on black workers' relative wages by estimating the following wage equation using OLS:

⁷More formally with regard to the exclusion restriction, consider a modified version of equation (6) that allows bank deregulation to affect blacks' relative wages beyond new firm entry (N_{st}):

$$\hat{R}_{ist} = \beta_0 N_{st} + \beta_1 N_{st} T_s + \delta_s + \delta_{0t} + \delta_{1t} + D'_{st} \alpha + \epsilon_{ist}$$

where α reflects the direct impact of bank deregulation on blacks' relative wages. Using equation (7), it is straightforward to show that:

$$p \lim (\beta_0)^{2SLS} = \beta_0 + \frac{\alpha}{\gamma_0}; \quad p \lim (\beta_0 + \beta_1)^{2SLS} = \beta_0 + \beta_1 + \frac{\alpha}{\gamma_0 + \gamma_1}$$

and

$$p \lim \beta_1^{2SLS} = p \lim (\beta_0 + \beta_1)^{2SLS} - p \lim (\beta_0)^{2SLS} = \beta_1 + \frac{\alpha}{\gamma_0 + \gamma_1} - \frac{\alpha}{\gamma_0} = \beta_1 - \frac{\alpha \gamma_1}{\gamma_0 (\gamma_0 + \gamma_1)}$$

Under the standard exclusion restriction, bank deregulation has no direct impact on blacks' relative wages, $\alpha = 0$, so that 2SLS provides consistent estimates for β_0 and β_1 .

However, even if bank deregulation influences blacks' relative wages directly, 2SLS provides a consistent estimate of β_1 as long as the impact of bank deregulation on the entry of new firms is the same in high and low racial bias states, i.e., if $\gamma_1 = 0$.

Moreover, if both $\gamma_1 > 0$ and $\alpha > 0$. 2SLS will *underestimate* the differential impact of competition on blacks' relative wages in high racial bias states, so that $p \lim \beta_1^{2SLS} < \beta_1$. We evaluate both of these conditions below.

$$\hat{R}_{ist} = D'_{st}\alpha_0 + D'_{st}\alpha_1T_s + \delta_s + \delta_{0t} + \delta_{1t} + \nu_{ist}, \quad (8)$$

where α_0 and α_1 are coefficients, δ_s is a vector of state fixed effects, δ_{0t} and δ_{1t} are vectors of time effects in low and high racial states respectively, and ν_{ist} is an error term. For simplicity, we use δ_s , δ_{0t} , and δ_{1t} as generic representations of state and year fixed effects, while recognizing that the actual values will differ across equations. In extensions of equation (8), we assess the dynamic effects of deregulation on black workers' relative wages by allowing the relationship between relative wages and deregulation to vary by each year before and after bank deregulation.

Although OLS produces unbiased estimates of the impact of bank deregulation on the racial wage gap under standard identifying assumptions, including the assumption that deregulation is uncorrelated with ν_{ist} , OLS does not necessarily identify a channel running from competition to blacks' relative wages. Identifying this channel motivates our use of the two-stage least squares (2SLS).

Examining both the 2SLS and reduced form specifications provides a more comprehensive assessment of the determinants of racial wage discrimination than using only one method. If the rate of new incorporations is a sound proxy for competition and bank deregulation is a valid instrument, then the 2SLS estimator provides information on the causal impact of competition on blacks' relative wage rates, putting aside for now the complexities associated with accurately measuring the relative wage rates of equivalent black and white workers. Yet, the reduced form analysis is independently valuable. It provides information on whether bank deregulation disproportionately benefited an historically disadvantaged group in the economy, expanding our understanding of the impact of financial sector policies on the economy.

5 Results

5.1 Preliminaries

Our empirical analysis rests on the assumption that the cross-state timing of bank deregulation was not affected by the racial wage gap. Figure 1 shows that neither the *level* of the estimated wage gap before deregulation (Panel A) nor its rate of *change* prior to deregulation (Panel C) explains cross-state differences in the timing of interstate bank deregulation. Panels B and D of Figure 1 confirm these findings for the case of intrastate deregulation. The size of the "bubbles" in the figures represent the size of the black workforce in each state, which corresponds to the weighting in the relative wage regressions below.

Our strategy also requires that bank deregulation increases the rate of new incorporations in the overall economy. In Table 2, we show that both interstate bank deregulation and intrastate branch deregulation exert a strong, positive impact on the log of new incorporations per capita over time. In columns (1) – (3), we use simple dummy variables that equal zero before a state deregulates and one afterwards. Interstate deregulation enters significantly and positively, but intrastate does not, which is consistent with the findings in Black and Strahan (2002).

The results in Table 2 emphasize that the positive impact of deregulation on the rate of new incorporations grows over time. In columns (4) – (6), we include the number of years since deregulation and its quadratic. *Interstate* and *Intrastate* equal the number of years since interstate and intrastate bank deregulation respectively, and equal zero before deregulation. Both linear terms enter positively and significantly, while the quadratic terms are negative, but the coefficients are an order of magnitude smaller.⁸ Economically, the coefficients in columns (4) and (5) indicate that five years after either inter- or intrastate deregulation the rate of new incorporations is about 10 percent greater than before deregulation. Furthermore, simultaneously deregulating inter- and intrastate restrictions boosts the rate of new incorporations by 18 percent after five years as shown in column (6).

Figure 2 more fully illustrates the positive, dynamic impact of both interstate and intrastate deregulation on the rate of new incorporations. In Figure 2, we trace out the year-by-year relationship between both interstate and intrastate deregulation and the logarithm of new incorporations. We do this for two samples of states, those with above the median level of the racial bias index and those with below median levels. Specifically, we report estimated coefficients from the following regression:

$$N_{st} = \alpha + \beta_1 Inter_{-9} + \dots + \beta_{18} Inter_{+9} + \gamma_1 Intra_{-9} + \dots + \gamma_{18} Intra_{+9} + \delta_s + \delta_t + \varepsilon_{st}, \quad (9)$$

where $Inter_{-j}$ equals one for the j^{th} year before interstate deregulation, and $Inter_{+k}$ equals one for the k^{th} year after interstate deregulation, while $Intra_{-j}$ equals one for the j^{th} year before intrastate deregulation, and $Intra_{+k}$ equals one for the k^{th} year after intrastate deregulation. These dummy variables equal zero in other years. We present results starting 9 years before each form of bank deregulation and trace out the year-by-year dynamics of the relationship between deregulation and the wage gap until 9 years after each type of bank deregulation. The year of deregulation is omitted and the regressions include state (δ_s) and year (δ_t) fixed effects. After detrending the series, Figure 2 illustrates the level and trend of the logarithm of new incorporations following each type of bank deregulation

⁸The impact of each form of deregulation on competition grows over time, reaching a maximum about a decade after interstate deregulation, and over two decades after intrastate deregulation.

relative to the level and trend before deregulation.⁹

There are three critical observations from Figure 2. First, interstate and intrastate bank deregulation boost the rate of new incorporations. This is crucial since we use bank deregulation to identify an exogenous intensification of competition.

Second, the impact of bank deregulation on the rate of new incorporations is not immediate. The effect of bank deregulation on the rate of new incorporations is still growing after five years. If bank deregulation affects blacks' relative wages by increasing the rate of new incorporations, therefore, we should also find that the dynamic impact of deregulation on black's relative wages materializes over time.

Third, the positive impact of inter- and intrastate bank deregulation on the rate of new incorporations occurs in both states with above the median level of the racial bias index and in states with below the median level of the racial bias index. The the marginal impact of intrastate deregulation on the rate of new incorporations in low racial bias states is less pronounced than in high racial bias states.¹⁰ Though the impact of bank deregulation on new incorporations does not have to be identical in high and low racial bias states, our empirical strategy requires that deregulation boosts the rate of new incorporations in both high and low racial bias states because we propose to evaluate whether the marginal impact of an exogenous increase in competition is greater in high racial bias states.

5.2 Bank Deregulation and Blacks' Relative Wages

5.2.1 Reduced Form Analyses of Bank Deregulation

We next assess the reduced form impact of *Interstate* and *Intrastate* on the relative wage rates of black workers (\hat{R}_{ist}). For each form of deregulation, we present three specifications. First, blacks' relative wages are regressed on bank deregulation using the full sample. Second, we add an interaction term of deregulation and the racial bias dummy for each state, which equals one if the value of the racial bias index is greater than or equal to the sample median and zero otherwise. As suggested by theory, the impact of competition-enhancing bank deregulation on blacks' relative wages should be greater in more racially biased states. Third, rather than include an interaction term, we split the sample by the median value of the racial bias index, which allows the coefficients on state and year fixed

⁹Specifically, we compute the trend in the coefficients on the dummy variables on bank deregulation prior to deregulation. We then detrend the entire series of estimated coefficients based on the pre-deregulation trend. The resulting figure illustrates the level and trend of the logarithm of new incorporations after bank deregulation relative to the patterns before deregulation.

¹⁰As developed in footnote (7), when bank deregulation has a larger effect on the rate of new incorporations in high racial bias states, the 2SLS estimator will tend to *underestimate* the differential impact of the rate of new incorporations on blacks' relative wages in high versus low racial bias states.

effects to differ across the two subsamples. Throughout the analyses, we include state and year fixed effects.

Table 3 shows that bank deregulation has a large, significant impact on the relative wage rates of black workers in states with sufficiently high values of the racial bias index. In the regressions including the interaction of deregulation with the racial bias dummy, the impact of deregulation on blacks' relative wages is increasing in the state's racial bias index. The results hold for both inter- and intrastate bank deregulation. When splitting the sample between high and low racial bias states, the results indicate that a drop in entry barriers triggers a bigger increase in the relative demand for black workers in more racially biased economies.

Furthermore, by splitting the sample between high and low racial bias states, we employ a quasi-triple difference specification. In particular, there might be concerns that even though bank deregulation differs in its timing across states, there might be a confounding factor that reduces racial discrimination and is coincident with the state-specific timing of bank deregulation. By showing that bank deregulation only increases blacks' relative wages in high racial bias states as predicted by theory, this reduces the possibility that an unobserved state-year effect is driving the results, and it is fully consistent with the view that intensified competition reduces the manifestation of racial prejudices in labor market outcomes.

The estimated reduction in the racial wage gap from bank deregulation is economically meaningful. Consider column (4) of Table 3, which provides the regression results for states with above the median value of the racial bias index. Among these states, deregulation boosts the wage rates of black workers by 6 percentage points more than their white counterparts after five years ($6 = 0.012 * 5 * 100$). Since the average racial wage gap in these high-bias states was 20 percent in 1976, the results suggest that interstate deregulation eliminates almost 30 percent of the initial racial wage gap. The results are virtually identical when using *Intrastate*, as shown in column (8).

5.2.2 *Dynamic Analysis of the Effect of Bank Deregulation*

We next illustrate the dynamic relation between bank deregulation and the relative wages of blacks. In Figure 3, we trace out the year-by-year relationship between deregulation and the wage gap by including a series of dummy variables in equation (8) for inter- and intrastate deregulation respectively. Specifically, D_{-j} equals one for the j^{th} year before deregulation, and D_{+k} equals one for the k^{th} year after deregulation. These dummy variables equal zero in other years. The year of deregulation is omitted and the regressions include state and year fixed effects.

In examining the dynamic impact of deregulation on the racial wage gap, we use two samples of states. In Panel A of Figure 3, the subsample includes states with above the median values of the racial bias index. Panel B reports the dynamic relation between the relative wage rates of black workers and bank deregulation for the subsample of states with below the median values. The dashed line reports the estimated coefficients on the interstate deregulation dummy variables, while the solid line provides the estimated coefficients on the intrastate deregulation dummy variables.

Three crucial messages emerge from Figure 3. First, the impact of both interstate and intrastate bank deregulation on blacks' relative wages is much greater in states where the racial bias index is above the median than in states with lower values of the racial bias index. For example, the impact of interstate bank deregulation on blacks' relative wages rises over time in states with high values of the racial bias index, while interstate bank deregulation has virtually no effect on relative wage rates in states with low values of the racial bias index. Second, there is no evidence that trends or innovations in the wage gap precede either interstate or intrastate bank deregulation. Rather, blacks' relative wages rise after bank deregulation for an extensive period in states with high values of the racial bias index. Third, the impact of deregulation on black's relative wages grows over time. This is consistent with the dynamics of the relationship between deregulation and the rate of new incorporation documented in Figure 2 and Table 2.

While demonstrating the powerful impact of bank deregulation on the racial wage gap, these results do not provide direct evidence on the underlying causal mechanisms. We now examine the relationship between the rate of new incorporations and blacks' relative wages to assess whether, and under which conditions, an exogenous increase in the rate of new incorporations reduces the black-white wage gap.

5.3 Competition and Blacks' Relative Wages

5.3.1 *Reduced Form Analyses of Competition*

In examining the relationship between competition and the racial wage gap, we begin with reduced form OLS regressions. In Table 4, the dependent variable is blacks' relative wages (\hat{R}_{ist}). The key regressor is the log of new incorporations per capita, which we use as a proxy for competition. The estimation is conducted on the full sample, and we also split the sample into states with below and above the median level of the racial bias index. In Panel A, we use the benchmark measure of blacks' relative wages, which is computed while conditioning on the standard Mincerian characteristics, education and potential work experience. In Panel B, we use an alternative measure of blacks' relative wages that also

conditions on occupation, as discussed above.

There is a strong, positive association between the rate of new incorporations and the relative wages of black workers in states with above the median values of the racial bias index (column 3). The OLS estimates indicate that ten percent increase in the rate of new incorporations is associated with a 1.4 percent increase in blacks' relative wages in high racial bias states. In contrast, there is no relationship between the wage gap and our proxy for competition in states with low values of the racial bias index (column 2). These results hold both when using the benchmark, Mincerian measure of blacks' relative wages (Panel A) and also when conditioning on occupation (Panel B).

5.3.2 2SLS Analyses of Competition

The final six columns of Panel A and Panel B of Table 4 report 2SLS estimates, where two different sets of instrumental variables are used to identify changes in the rate of new incorporations. First, the "linear" instruments simply include *Interstate* and *Intrastate*. Second, the "Non-Parametric" instruments included dummy variables for each year before and after both interstate and intrastate deregulation. These instruments are drawn from the analyses reported above in Table 2 and Figure 3. Furthermore, in reported robustness tests, we find that using *Interstate* and *Intrastate* plus their quadratic terms as instruments produces similar results.

As shown, the instrumental variables pass the validity tests. They significantly explain new incorporations as shown by the F-test of the excluded instruments. Furthermore, the instruments pass the test of the over-identifying restrictions (OIR test), meaning that the hypothesis that the instruments only affect blacks' relative wages through their effect on new incorporations is not rejected.¹¹

The exogenous increase in the rate of new incorporations dramatically boosted the wage rates of black workers relative to their white counterparts in states with above the median values of the racial bias index. As reported in columns (6) and (9) of both Panels A and B, an acceleration of the rate of new incorporations increased blacks' relative wages in high racial bias states. In contrast, the results in columns (5) and (8) indicate that a faster rate of new incorporations did not increase blacks' relative wages in states with below the median values of the racial bias index.

¹¹In unreported robustness tests, we also show that the results are not driven by states in which deregulation did not induce an increase in competition, which would run counter to theory and our identification strategy. Thus, we run the first-stage regression while omitting each state one-at-a-time. We then find which states are "flattening" the estimated relationship between competition and deregulation in the first stage. When we eliminate these states, the results strengthen. This robustness test suggests that the effects of deregulation on racial discrimination are driven by states in which the "treatment" is affecting product market competition, not by some spurious channel.

The economic impact the rate of new incorporations on blacks' relative wages is large in states with above the median level of the racial bias index. With either set of instrumental variables, the estimates indicate that a ten percent acceleration in the rate of new incorporations increases blacks' relative wages by about 2.5 percent in high racial bias states.¹² Combining these results with those in Figure 2, the results suggest that bank deregulation boosted the rate of new incorporations by over 20% after five years in high racial bias states, which in turn increased blacks' relative wages by about five percent in these same states. These estimates indicate that by increasing competition, bank deregulation boosted blacks' relative wages by one-quarter of the initial racial wage gap in these states, which equaled, on average, 20 percent in the years before bank deregulation.

5.3.3 Competition and Blacks' Relative Wages: Sensitivity Analyses

The results are robust to using either the Charles and Guryan (2008) measure of racial prejudices (*CG*) or the intermarriage racial bias index (*LLR*) to categorize states as high- or low-racial bias states. Table 5 presents the OLS and 2SLS analyses of the relation between the racial wage gap and the rate of new incorporations. We use the linear instrument set and compute blacks' relative wages conditional on standard Mincerian traits and occupation. We use a common sample of states that is slightly smaller than in Table 4 because the *CG* measure is unavailable for Hawaii, Idaho, Maine, Nebraska, Nevada, and New Mexico.

The strong positive impact of the rate of new incorporations on blacks' relative wages is robust to using the *CG* racial prejudice indicator to classify states. In states with above the median values of the two racial bias indicators, the log of new incorporations per capita is positively associated with blacks' relative wages.

Figure 4 shows that the results are robust to considering the full range of possible combinations of (1) estimation strategy (OLS and 2SLS), (2) method for computing blacks' relative wages (either conditioning on standard Mincerian controls (*R*) or also conditioning on occupation (*Ro*)), (3) method for categorizing states by taste for discrimination (*LLR* or *CG*), and (4) using linear or non-parametric instrumental variables (*Linear* or *Non-param*). Figure 4 plots each point estimate along with its 95% confidence interval. As shown, the results are robust. In terms of the instrumental variable results, there is only one specification in which the rate of new incorporation does not enter positively and significantly at the five percent level, and instead enters with a p-value of (0.10). This exception involves using the *CG* indicator to define racial attitudes, and we have already

¹²The 2SLS parameter estimate is larger than the OLS estimate. This is consistent with the reverse causality argument made above. Specifically, if firms are attracted to states where blacks' relative wages are particularly low, OLS will underestimate the impact of a lowering of entry barriers on blacks' relative wages.

discussed the advantages, in the context of our particular study, of using the intermarriage racial bias measure (LLR).

6 The Effect of Competition on Segregation

6.1 Racial Prejudices, Competition, and Segregation

Besides making predictions regarding relative wages, Becker's (1957) taste-based theory of discrimination also predicts that when employers are heterogeneous in both productive quality and the "disutility" they receive from employing black workers, there will be racial segregation as black workers are hired by the least racially biased employers. Indeed, if firms are similar except for the racial prejudices of employers, segregation will reduce racial wage differentials as workers sort according to the racial preferences of employers. This led Welch (1975) to emphasize the segregation prediction of the taste-based theory of discrimination. While racial wage differentials are a fundamental measure of labor market discrimination and the focus of our examination, segregation offers an additional margin along which to assess whether the relations between competition and the racial characteristics of labor markets are consistent with the taste-based theory.

More specifically, the taste-based theory suggests that an intensification of competition will reduce segregation. Lowering entry barriers allows new employers with less of a taste for discrimination than existing employers to enter. This increases the number of employers willing to hire black workers at prevailing wage rates. By expanding the employment opportunities of blacks, competition will reduce segregation. If our earlier results on blacks' relative wages reflect the causal impact of intensified competition on how racial prejudices affect labor markets, then we should also observe a reduction in segregation following an intensification of competition.

6.2 The Effect of Competition on Segregation: Results

In light of this testable implication, we turn back to the data and evaluate the impact of an intensification of competition on the racial allocation of workers while differentiating states by the degree of racial prejudice. To analyze the same time period and workers used in our examination of blacks' relative wages, we study the racial composition of workers at the industry level, using data on the 144, 3-digit industry categories in the CPS. If there are cross-industry differences in the racial prejudices of employers, then the taste-based theory predicts that competition will expand the cross-industry labor market opportunities available to black workers and induce blacks to move to industries that were previously

dominated by whites. While one may question whether the racial prejudices of employers differ by industry, Becker (1957) provides an economic rationale for examining segregation at the industry level: competition may differ by industry. If there are cross-industry differences in entry barriers, and hence competition, employers with stronger racial prejudices will have comparatively greater success in less competitive industries holding other factors constant. Thus, while the keystone of our analysis is blacks' relative wages, racial integration across industries provides additional evidence on the mechanisms linking competition and racial discrimination in labor markets.

Consequently, we construct and use several measures of the extent to which an industry is particularly "white." First, we calculate the share of white workers by industry. Second, since the racial composition of workers in an industry might simply reflect the human capital needs of the industry in conjunction with the differential racial composition of human capital skills, we also estimate the degree to which the proportion of white workers in an industry is greater than the proportion explained by the underlying characteristics of workers. To do this, we regress (for each year) the proportion of white workers in each of the 144 industries on the characteristics of the white workers in that industry, including education, a quartic in potential experience, as well as occupation and state fixed effects, i.e., the same set of regressors that we employ to generate wage residuals. We collect the average residuals in each industry. These provide crude and residual ("unexplained") measures of the "whiteness" of each industry. Third, motivated by Ashenfelter and Hannan (1986), we calculate the proportion of white managers in each industry and use this proportion as a measure of the degree to which an industry is dominated by whites. Fourth, we also construct the unexplained proportion of white managers, using the same conditioning regressors.

We next estimate the impact of competition on the racial composition of the industry in which each black worker is employed. We use the same specification employed in our relative wage regressions, except the dependent variable is one of the measures of the "whiteness" of the industry in which each black works. Thus, we regress industry whiteness on the log of new incorporations per capita, controlling for state and year fixed effects. We do this using OLS and 2SLS. We divide states by the degree of racial bias, using both the *LLR* and *CG* measures of racial bias to categorize states. Thus, we evaluate whether an exogenous increase in competition induces black workers to move to "white" industries, while differentiating states by racial bias. In the analyses, we obtain the same results whether we use the crude or residual measures of the degree to which an industry is composed of white workers or managers. For simplicity, we present the results for the unexplained proportion of white workers and the crude measure of the fraction of white

managers.

Consistent with the taste-based theory, Table 6 indicates that an acceleration of the rate of new incorporations in high racial bias states induced blacks to work in "whiter" industries. These results hold when examining (1) the unexplained proportion of white workers and (2) the proportion of white managers. The results hold when using OLS or 2SLS, and whether we divide states by the *LLR* or the *CG* indicator of racial prejudices. The sizes of the estimated coefficients suggest that the impact of new incorporations on the reallocation of black workers across industries is economically small, but not inconsequential. For instance, consider the sample of high racial bias states based on the racial bias index (*LLR*) and the results using the proportion of white managers. The estimated coefficient indicates that a one standard deviation increase in the log of new incorporations per capita (0.4) boosts the proportion of white managers in which the average black worker is employed by 0.0032 (0.4×0.08), which is almost one-tenth of the cross-industry standard deviation of white managers (0.04). In sum, the findings are consistent with the view that intensified competition reduced racial segregation in the workforce.

6.3 Competition and Blacks' Relative Wages Within Industries

Given this finding on the movement of black workers to historically white industries, we were concerned that the earlier results on blacks' relative wages could reflect a shift of black workers to better paying industries, rather than an increase in blacks' relative wages within industries. To assess whether the shift of black workers to white industries accounts for the increase in blacks' relative wages, we evaluate the impact of an increase in the rate of new incorporations on blacks' relative wages, where we not only compute blacks' relative wages by conditioning on education, potential experience, and occupation, but also by conditioning on industry. As noted above, we recognize the problems with this conditioning since an individual's industry could be endogenously explained by the rate of new incorporations. Nonetheless, as a robustness check, we compare the wages of black workers with the same observable traits as their white counterparts who are working in the same industry and the same occupation to see whether the relation between the rate of new incorporations and blacks' relative wages is accounted for by the movement of black workers to higher paying industries.

The results in Table 7 suggest that the intensification of competition boosted blacks' wages relative to comparable white workers within the same industry and occupation. Increased racial integration does not fully account for the increase in blacks' relative wages following the boost in the rate of new incorporations. Both results – the increase in blacks' relative wages and the increase in racial integration in the workplace – are consistent with

the taste-based view of racial discrimination.

7 Robustness Checks

In this section, we address concerns about several factors that could confound our ability to draw accurate inferences about the impact of competition on racial wage discrimination. Some of these factors work against the reported findings, leading us to *underestimate* the beneficial effects of bank deregulation and the rate of new incorporations on blacks' relative wages. In these cases, we simply discuss our robustness tests without presenting tables. Other factors either play a central role in Becker's (1957) theory or potentially lead us to *overestimate* the impact of competition on racial discrimination. In these cases, we present correspondingly more information.

7.1 Relative Hours Worked

We were concerned that blacks' relative wages could also rise if deregulation induced the labor supply curve of black males to shift leftward. If this occurs, the working hours of blacks could actually fall after deregulation relative to those of whites.

Table 8 reports the effects of bank deregulation and the log of new incorporations per capita on the relative working hours of blacks in high racial bias states using two approaches. We examine high racial bias states because this is where the rate of new incorporations increased blacks' relative wages. In the first approach, we trace the impact of bank deregulation, through the rate of new incorporations, to blacks' relative wages. We then examine the impact of these projected relative wages on blacks' relative annual hours worked. If an outward shift in the demand curve is causing the increase in blacks' relative wages, then we expect to find a positive coefficient on blacks' relative wages in the relative working hours regression.

In the second approach, we examine the impact of the log of new incorporations per capita on the relative working hours of blacks without tracing the effect through relative wages. Specifically, we reproduce the 2SLS analyses in Table 4 except that the dependent variable is the difference between the actual number of hours worked of each black worker and the projected annual hours worked of a white worker with identical traits. The difference between the actual and projected hours worked reflects the racial gap in hours. We use bank deregulation to identify an exogenous increase in new incorporations and assess the impact on this gap in working hours.

To compute relative working hours, we first estimate a labor supply equation every year on a sample of white males, while conditioning on state fixed effects and the same

Mincerian characteristics used in the wage equation. Then, we use the resulting coefficient estimates to calculate the predicted number of hours worked of a white worker with each black worker’s characteristics. Finally, we compute the relative working hours of each black worker as the difference between his actual and predicted working hours.

Since there is a meaningful kink in the labor supply curve between working and not working, we use both OLS and Tobit specifications and also examine the subsample of blacks with positive working hours. We use a standard bootstrapping procedure to correct the standard errors since the regressors are estimated.

We find that bank deregulation that increased the rate of new incorporations and boosted blacks’ relative wages also increased the relative working hours of blacks. The evidence suggests that bank deregulation increased the relative demand for black workers. As shown, the impact is particularly pronounced among workers. This suggests that while deregulation increased the relative demand for black workers, bank deregulation did not significantly attract new black workers into the workforce. Most important given the focus of this paper, the Table 8 results clearly demonstrate that bank deregulation and competition did not shift black’s labor supply curve to the left.

7.2 Selection, Migration, and Self-Employment

We were concerned that changes in the skill composition of black males in the economy could affect our evaluation of blacks’ relative wages. Consequently, we calculate the projected wage rates for all working age (non-institutionalized) blacks in each state, whether they are working or not. We do this using the estimated returns to observable traits from equation (3) and using the actual traits of each black male. In this way, we compute the value of observable traits of all black males. Then, we evaluate the impact of bank deregulation on the composition of skills in the workforce.

Table 9 provides regression results of the projected wage rates of all relevant black males on a dummy variable if the person works, *Interstate*, and the interaction between *Interstate* and the dummy variable for working or not, as well as state and year fixed effects. There are similar regressions for *Intrastate*. The summation of the coefficients on *Interstate* and the interaction term provide information on whether the average value of the traits of workers changes after deregulation. The coefficient on *Interstate* provides information on the change in the average value of the traits of individuals who are not working following deregulation.

Deregulation did not have a significant effect on the average value of the traits of black workers. There is no evidence that bank deregulation substantively affected the skill composition of black workers. To the extent that observable traits are correlated with un-

observable characteristics, these results further imply that the composition of unobservable traits did not change much following bank deregulation.

Deregulation could also affect migration across states. To assess this, we estimate the effect of deregulation on the fraction of black males within states. We find that the share of black males within states increased slightly after deregulation. This is consistent with a situation in which deregulation boosted the rate of new incorporations, reduced the racial wage gap, and attracted blacks from other states. Yet, as shown in Table 9, the net compositional changes of blacks in the economy due to deregulation did not have much of an effect on the skill composition of working blacks. There is no indication that migration leads us to overstate the beneficial effects of deregulation.

Similarly, the boost in blacks' relative wages could attract black males with comparatively low unobserved skills into the labor force, leading us to underestimate the degree to which the rate of new incorporations reduces racial wage differentials. A quantile regression at the median helps in assessing the importance of this potential bias by putting less weight on entrants of black workers with low unobserved skills.

We find no evidence that selection based on unobservables is causing us to underestimate the true effect of the rate of new incorporations. While the log of new incorporations per capita increases the relative demand for black workers, the number of new black males pulled into the labor force is relatively small, such that the median regression yields virtually identical results to the OLS coefficient estimates.

7.3 Swimming Upstream

Biases could arise from changes in the "prices" of unobserved skills. Although national trends in returns to unobserved skills will not affect our results because we control for year fixed effects, the intensification of competition when a state deregulates could increase returns to unobservable traits. If the average white worker has more of these unobserved traits than the average black worker, the average wage rate of whites will rise relative to that of blacks. This effect will cause the estimated value of blacks' relative wages to fall, even though racial discrimination is not rising.

Under these conditions, we will underestimate the true, positive effect of deregulation on the relative wages of blacks. This is sometimes called "swimming upstream" (Juhn Murphy and Pierce, 1991; Blau and Kahn, 1997; Blau and Kahn, 2000; and Mulligan and Rubinstein, 2008). To assess the importance of swimming upstream, we follow the literature and use quantile regressions. The goal is to compare black and white workers that are more similar in unobserved skills than when using OLS, which compares averages from both groups.

In unreported regressions, we confirm the existence of swimming upstream, suggesting that we are underestimating the beneficial effects of bank deregulation on blacks' relative wages when using OLS. The median regressions produce similar coefficient estimates to those from OLS. Moreover, in moving from lower quantiles to higher quantiles, we find that deregulation reduced a larger proportion of the racial wage gap. Under the assumption that the average white has more unobserved skills than the average black, these findings are consistent with the view that the racial wage gap closed more among white and black workers with comparable unobserved skills.

7.4 Racial Discrimination or the Poor

Since bank deregulation exerts a disproportionately positive impact on the poor and blacks are on average comparatively poor (Beck, Levine, and Levkov, 2009), the current paper's analyses could reflect this income distributional effect, rather than the impact of bank deregulation and competition on blacks in particular.

Three observations, however, suggest that this is not the case. First, bank deregulation and the rate of new incorporations boosted blacks' relative wages in states with a high degree of racial bias. This is difficult to reconcile with the view that our results simply reflect a tightening of the distribution of income. Second, the results hold when computing relative wages conditional on occupation and industry. Thus, our findings indicate that even within low-paying (and high-paying) occupations and industries, blacks' relative wages rose with competition.

Third, and most directly, we perform a rank analysis and compare the change in blacks' relative wages with those of comparable whites across the full distribution of relative wage rates. If deregulation is simply helping the poor, we should not see that blacks converge toward whites at each point in the wage distribution.

The results show that bank deregulation, and the accompanying boost in the log of new incorporations per capita, disproportionately helped black workers across the full distribution of wages. Figure 5 shows the rank plot for the high racial bias states, and for the sample of states with below the median level of the racial bias index. The solid and dashed lines represent the location of blacks within the conditional log hourly wage distribution of whites before and after deregulation respectively. The median black among the high racial bias states, for example, corresponds to the 28th percentile white worker prior to deregulation and the 32nd percentile white work after deregulation. The median black, therefore, gained four ranks in the white wage distribution as a result of deregulation, but only in high racial bias states. Consistent with the earlier results, there is little change in relative wage rates in the low racial bias states. These results suggest that deregulation exerted a

particularly pronounced effect on black workers.

8 Conclusions

In this paper, we examine whether an increase in product market competition reduced the manifestation of racial prejudices in labor markets. As Becker (1957) argued, taste-based discrimination by employers can (1) produce an equilibrium gap between the wages of identical black and white workers and (2) produce racial segregation in the workforce. He further stressed that greater competition could erode the racial wage gap by reducing the impact of racial prejudices on the relative demand for black workers and reduce racial segregation by increasing the number of employers willing to hire black workers. A central implication of the taste-based discrimination theory is that greater competition will reduce the black-white wage differential and increase racial segregation only in economies where employers have a sufficiently strong "taste for discrimination."

Our results indicate that an exogenous intensification of competition substantively boosted blacks' relative wages and reduced racial segregation in states with a sufficiently high degree of racial bias. In reduced form specifications, bank deregulation that lowered entry barriers facing nonfinancial firms reduced the racial wage gap. In 2SLS, we use bank deregulation to identify an exogenous intensification of competition. We find that the resultant increase in competition eliminated more than one-fifth of the preexisting black-white wage differential in high racial bias states over a five year period. Furthermore and critically, we find that intensified competition reduced racial segregation, especially in high racial bias states. These findings suggest that competition reduced the impact of racial prejudices on blacks' relative wages and enhanced the opportunities of black workers.

Looking forward, much work remains. The paper emphasizes the powerful role of competition in expanding the economic opportunities of minorities. By reducing racial wage differentials, competition could also increase the incentives for blacks to acquire skills. Thus, future research might merge and extend taste-based and statistical-based explanations of racial discrimination. This paper also advertises the need for additional research on finance and economic opportunity. In this paper, we show that improvements in the functioning of banks substantively enhanced the economic opportunities of a disadvantaged group. These improvements materialize not because banks make more loans to black entrepreneurs, but because improvements in banking disproportionately enhanced the labor market opportunities of blacks.

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Table 1

THE RACIAL BIAS INDEX, SURVEY MEASURES OF RACIAL PREJUDICE, AND RELATIVE WAGES

	Fraction whites who support law against interracial marriage	Fraction whites who would not vote for black president	Fraction whites who support right to segregate neighborhoods
Panel A: Correlation Coefficients Between the Different Measures of Taste for Discrimination	(1)	(2)	(3)
Racial bias index	0.36	0.35	0.31
	{0.02}	{0.02}	{0.04}
Observations	43	43	43

Panel B: Taste for Discrimination and Relative Wages of Blacks	Dependent Variable: Relative Wages of Blacks			
	(1)	(2)	(3)	(4)
Racial bias index > median	-.079***		-.072***	-.065***
	(.013)		(.014)	(.012)
Marginal racial prejudice > median		-.058***	-.042***	-.002
		(.015)	(.015)	(.017)
Share of blacks in 1970 \geq 10%				-.082***
				(.013)
Observations	10,076	10,076	10,076	10,076

NOTE – Panel A reports correlation coefficients between (1) The racial bias index, which is based on interracial marriages in 1970, and (2) three recent survey-based indicators of racial prejudice from Charles and Guryan (2008). Panel B reports estimated coefficients from four regressions, where the dependent variable is blacks' relative wage rates. Relative wages are conditional on five indicators of years of completed education (0-8, 9-11, 12, 13-15, and 16+) and a quartic in potential experience. Estimates are weighted by sampling weights provided by the Current Population Survey. In column (1), the regressor is an indicator which equals one if the racial bias index above the median and zero otherwise. In column (2) the regressor is an indicator which equals one if the marginal racial prejudice above the median and zero otherwise. The marginal racial prejudice index is the p^{th} percentile of the distribution of an aggregate index of racial prejudice, where p is the percentile of workforce that is black. The marginal racial prejudice index is taken from Charles and Guryan (2008). Column (3) includes simultaneously the regressors from columns (1) and (2). In column (4) we also control for an indicator which equals one if the proportion of blacks in the workforce in 1970 is above 10%. The regressions include black workers prior to interstate and intrastate bank deregulation, so that the reported number of observations equals 10,076. All regressions include year fixed effects. We do not include state fixed effects because the regressors are fixed for each state and do not change over time. Standard errors are clustered at the state-year level and appear in parentheses; p-values are in brackets. *, **, and *** indicate significance at the 10%, 5%, and 1% respectively.

Table 2

BANK DEREGULATION AND LOG NEW INCORPORATIONS PER CAPITA

	(1)	(2)	(3)	(4)	(5)	(6)
Interstate dummy	.084*** (.031)		.082** (.031)			
Intrastate dummy		.040 (.041)	.038 (.041)			
Interstate				.032** (.015)		.029** (.014)
Interstate squared				-.002 (.001)		-.002 (.001)
Intrastate					.021*** (.008)	.019** (.008)
Intrastate squared					-.0004* (.0002)	-.0004* (.0002)
Observations	882	882	882	882	882	882

NOTE - The table shows the impact of various measures of bank deregulation on log new incorporations per capita. Robust standard errors are adjusted for state-level clustering and appear in parentheses. Intrastate dummy equals one in the years after a state permits branching via mergers and acquisitions and zero otherwise. Interstate dummy equals one in the years after a state permits interstate banking and zero otherwise. *Interstate* is equal to years since interstate deregulation and is equal to zero before interstate deregulation. *Intrastate* is equal to years since intrastate deregulation and is equal to zero before intrastate deregulation. New incorporations are from Dun and Bradstreet. Dates of intrastate and interstate bank deregulations are from Kroszner and Strahan (1999) and Amel (2008). The sample is for the years 1977-1994 and excludes Delaware and South Dakota. All regressions include state and year fixed effects. There are no other covariates. *, **, and *** indicate significance at the 10%, 5%, and 1%, respectively.

Table 3

BANK DEREGULATION AND RELATIVE WAGE RATES

	Interstate Deregulation				Intrastate Deregulation			
	All States		Racial Bias Index:		All States		Racial Bias Index:	
			Below Median	Above Median			Below Median	Above Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Years since deregulation	.001 (.003)	.004 (.003)	.003 (.003)	.012* (.007)	.005*** (.001)	.005*** (.001)	.004*** (.002)	.011*** (.002)
(Years since deregulation) x (Racial bias index > median)		.003*** (.001)				.004*** (.001)		
Impact after five years	.006 (.015)	.037** (.016)	.013 (.016)	.061* (.034)	.023*** (.006)	.044*** (.007)	.022*** (.007)	.057*** (.012)
Impact after five years as a share of sample's initial wage gap	3%	21%	9%	29%	13%	25%	15%	27%
Observations	73,801	73,801	48,367	25,434	73,801	73,801	48,367	25,434

NOTE - The dependent variable is the relative wage rates of blacks. Relative wages are conditional on five indicators of years of completed education (0-8, 9-11, 12, 13-15, and 16+) and a quartic in potential experience. Estimates are weighted by sampling weights provided by the Current Population Survey. Standard errors are adjusted for state-year clustering and appear in parentheses. All regressions include state and year fixed effects. The reported number of observations is for blacks only. Details about sample construction are in Appendix Table 2. In columns (1)-(4), "years since deregulation" stands for years since interstate deregulation; in columns (5)-(8), "years since deregulation" stands for years since intrastate deregulation. In columns (2) and (6), years since deregulation is interacted with an indicator which equals one if the racial bias index is above the median and zero otherwise. In columns (1), (2), (5), and (6) we include the entire sample. In columns (3) and (7) we include only states with racial bias index below the median. In columns (4) and (8) we include only states with racial bias index above the median. The racial bias index is based on rate of interracial marriages using the 1970 Census of Population. Appendix Table 3 lists the racial bias index for each state. The average initial racial wage gap is 17% for all states, 15% for states with a racial bias index below the median, and 21% for states with a racial bias index above the median. *, **, and *** indicate significance at the 10%, 5%, and 1% respectively.

Table 4

THE IMPACT OF LOG NEW INCORPORATIONS PER CAPITA ON RELATIVE WAGE RATES: OLS AND 2SLS ESTIMATES

	OLS			2SLS: Linear			2SLS: Non-Parametric		
	All States	Racial Bias Index:		All States	Racial Bias Index:		All States	Racial Bias Index:	
		Below Median	Above Median		Below Median	Above Median		Below Median	Above Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Relative Wage Rates are Conditional on Education and Potential Experience									
Log new incorporation per capita	.018 (.022)	-.038 (.023)	.137*** (.038)	.042 (.064)	-.080 (.071)	.267*** (.071)	.019 (.048)	-.122** (.054)	.235*** (.062)
F-test of excluded instruments				21.8	8.2	26.8	3.0	2.3	113.5
OIR test (p-value)				.003	.174	.134	.608	.518	.086
Observations	37,876	24,754	13,122	37,876	24,754	13,122	37,876	24,754	13,122
Panel B: Relative Wage Rates are Conditional on Education, Potential Experience, and Occupation									
Log new incorporation per capita	.016 (.020)	-.029 (.023)	.122*** (.037)	.023 (.064)	-.026 (.071)	.214*** (.068)	.020 (.046)	-.079 (.053)	.198*** (.058)
F-test of excluded instruments				21.8	8.2	26.8	3.0	2.3	113.5
OIR test (p-value)				.046	.358	.123	.845	.683	.082
Observations	37,876	24,754	13,122	37,876	24,754	13,122	37,876	24,754	13,122

NOTE - The dependent variable is the relative wage rates of blacks. In panel A, relative wages are conditional on five indicators of years of completed education (0-8, 9-11, 12, 13-15, and 16+) and a quartic in potential experience. In panel B, relative wages are conditional on five indicators of years of completed education (0-8, 9-11, 12, 13-15, and 16+), a quartic in potential experience, and occupation fixed effects. Estimates are weighted by sampling weights provided by the Current Population Survey. Standard errors are adjusted for state-year clustering and appear in parentheses. All regressions include state and year fixed effects. The reported number of observations is for blacks only. Details about sample construction are in Appendix Table 2. The sample is limited to the years 1977-1994 due to availability of log new incorporations per capita data. In columns (1), (4), and (7) we include the entire sample. In columns (2), (5), and (8) we include only states with racial bias index below the median. In columns (3), (6), and (9) we include only states with racial bias index above the median. The racial bias index is based on rate of interracial marriages using the 1970 Census of Population. Appendix Table 3 lists the racial bias index for each state. Columns (1)-(3) report Ordinary Least Squares estimates of the impact of log new incorporations per capita on the relative wage rates of blacks. Columns (4)-(9) report Two Stage Least Squares estimates of the impact of log new incorporations per capita on the relative wage rates of blacks. In columns (4)-(6), log new incorporations per capita are instrumented by years since interstate deregulation and years since intrastate deregulation. In columns (7)-(9), log new incorporations per capita are instrumented by dummy variables for each year before and after interstate deregulation and dummy variables for each year before and after intrastate deregulation. The F-test of excluded instruments reports the F-statistic from the first-stage. The OIR test reports the p-value of a J-statistic that test over-identifying restrictions. *, **, and *** indicate significance at the 10%, 5%, and 1% respectively.

Table 5

THE IMPACT OF LOG NEW INCORPORATIONS ON THE RELATIVE WAGES OF BLACKS: OLS AND 2SLS ESTIMATES
LEVINE-LEVKOV-RUBINSTEIN AND CHARLES-GURYAN MEASURES OF RACIAL PREJUDICE

	OLS				2SLS			
	Racial Bias Below Median		Racial Bias Above Median		Racial Bias Below Median		Racial Bias Above Median	
	LLR (1)	CG (2)	LLR (3)	CG (4)	LLR (5)	CG (6)	LLR (7)	CG (8)
Log new incorporation per capita	-.029 (.023)	-.029 (.030)	.124*** (.037)	.039 (.028)	-.024 (.071)	-.051 (.057)	.224*** (.068)	.165** (.076)
F-test of excluded instruments					8.1	32.8	26.8	16.2
OIR test (p-value)					.375	.264	.259	.571
Observations	24,272	8,093	12,942	29,121	24,272	8,093	12,942	29,121

NOTE - The dependent variable is the relative wage rates of blacks. Relative wages are conditional on five indicators of years of completed education (0-8, 9-11, 12, 13-15, and 16+), a quartic in potential experience, and occupation fixed effects. Estimates are weighted by sampling weights provided by the Current Population Survey. Standard errors are adjusted for state-year clustering and appear in parentheses. All regressions include state and year fixed effects. The reported number of observations is for blacks only. Details about sample construction are in Appendix Table 2. The sample is limited to the years 1977-1994 due to availability of log new incorporations per capita data. "LLR" stands for the racial bias index and is based on rate of interracial marriages using the 1970 Census of Population. Appendix Table 3 lists the racial bias index for each state. "CG" stands for the marginal racial prejudice which is obtained from Charles and Guryan (2008). In columns (1) and (5) we include only states with racial bias index below the median. In columns (3) and (7) we include only states with racial bias index above the median. In columns (2) and (6) we include only states with marginal racial prejudice below the median. In columns (4) and (8) we include only states with marginal racial prejudice above the median. Columns (1)-(4) report Ordinary Least Squares estimates of the impact of log new incorporations per capita on the relative wage rates of blacks. Columns (5)-(8) report Two Stage Least Squares estimates of the impact of log new incorporations per capita on the relative wage rates of blacks. Log new incorporations per capita are instrumented by dummy variables for each year before and after interstate deregulation and dummy variables for each year before and after intrastate deregulation. The F-test of excluded instruments reports the F-statistic from the first-stage. The OIR test reports the p-value of a J-statistic that test over-identifying restrictions. *, **, and *** indicate significance at the 10%, 5%, and 1% respectively.

Table 6

THE IMPACT OF LOG NEW INCORPORATIONS PER CAPITA ON EMPLOYMENT OF BLACKS IN “WHITE” INDUSTRIES: OLS AND 2SLS ESTIMATES

	Dependent variable: working in a white industry				Dependent variable: working for a white manager			
	OLS		2SLS		OLS		2SLS	
	Racial Prejudice: Below Median (1)	Racial Prejudice: Above Median (2)	Racial Prejudice: Below Median (3)	Racial Prejudice: Above Median (4)	Racial Prejudice: Below Median (5)	Racial Prejudice: Above Median (6)	Racial Prejudice: Below Median (7)	Racial Prejudice: Above Median (8)
Panel A: Racial Bias Index								
Log new incorporation per capita	.001 (.001)	.004** (.002)	-.001 (.003)	.012*** (.004)	.002 (.002)	.007*** (.002)	-.000 (.004)	.008* (.004)
Observations	24,754	13,122	24,754	13,122	24,687	13,064	24,687	13,064
Panel B: Marginal Racial Prejudice								
Log new incorporation per capita	.000 (.002)	.004** (.001)	-.001 (.002)	.007** (.003)	.000 (.003)	.009*** (.002)	.000 (.003)	.015*** (.004)
Observations	8,093	29,121	8,093	29,121	8,064	29,034	8,064	29,034

NOTE - The dependent variable in columns (1)-(4) is proportion of “excess” whites in an industry, where the proportion of “excess” whites is the proportion of whites that is unexplained by years of completed education (0-8, 9-11, 12, 13-15, and 16+), a quartic in potential experience, and occupation fixed effects. The dependent variable in columns (5)-(8) is proportion of white managers in an industry. Estimates are weighted by sampling weights provided by the Current Population Survey. Standard errors are adjusted for state-year clustering and appear in parentheses. All regressions include state and year fixed effects. The reported number of observations is for blacks only. Details about sample construction are in Appendix Table 2. The sample is limited to the years 1977-1994 due to availability of log new incorporations per capita data. In columns (1), (3), (5), and (7) we include only states with racial prejudice below the median. In columns (2), (4), (6), and (8) we include only states with racial prejudice above the median. In panel A, racial prejudice is the racial bias index which is based on rate of interracial marriages using the 1970 Census of Population. Appendix Table 3 lists the racial bias index for each state. In panel B, racial prejudice is the marginal racial prejudice which is obtained from Charles and Guryan (2008). Columns (1), (2), (5), and (6) report Ordinary Least Squares estimates, while columns (3), (4), (7), and (8) report Two Stage Least Squares. Log new incorporations per capita are instrumented by dummy variables for each year before and after interstate deregulation and dummy variables for each year before and after intrastate deregulation. *, **, and *** indicate significance at the 10%, 5%, and 1% respectively.

Table 7
 THE IMPACT OF LOG NEW INCORPORATIONS PER CAPITA ON RELATIVE WAGE RATES: OLS AND 2SLS ESTIMATES
 RELATIVE WAGES ARE CONDITIONAL ON EDUCATION, EXPERIENCE, OCCUPATION, AND INDUSTRY

	OLS			2SLS: Linear			2SLS: Non-Parametric		
	Racial Bias Index:			Racial Bias Index:			Racial Bias Index:		
	All States	Below Median	Above Median	All States	Below Median	Above Median	All States	Below Median	Above Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log new incorporation per capita	.018 (.020)	-.024 (.022)	.123*** (.035)	-.012 (.061)	.010 (.070)	.190*** (.067)	.005 (.042)	-.043 (.048)	.172*** (.056)
F-test of excluded instruments				21.8	8.2	26.8	3.0	2.3	113.5
OIR test (p-value)				.316	.813	.051	.814	.638	.122
Observations	37,876	24,754	13,122	37,876	24,754	13,122	37,876	24,754	13,122

NOTE - The dependent variable is the relative wage rates of blacks. Relative wages are conditional on five indicators of years of completed education (0-8, 9-11, 12, 13-15, and 16+), a quartic in potential experience, occupation fixed effects, and industry fixed effects. Estimates are weighted by sampling weights provided by the Current Population Survey. Standard errors are adjusted for state-year clustering and appear in parentheses. All regressions include state and year fixed effects. The reported number of observations is for blacks only. Details about sample construction are in Appendix Table 2. The sample is limited to the years 1977-1994 due to availability of log new incorporations per capita data. In columns (1), (4), and (7) we include the entire sample. In columns (2), (5), and (8) we include only states with racial bias index below the median. In columns (3), (6), and (9) we include only states with racial bias index above the median. The racial bias index is based on rate of interracial marriages using the 1970 Census of Population. Appendix Table 3 lists the racial bias index for each state. Columns (1)-(3) report Ordinary Least Squares estimates of the impact of log new incorporations per capita on the relative wage rates of blacks. Columns (4)-(9) report Two Stage Least Squares estimates of the impact of log new incorporations per capita on the relative wage rates of blacks. In columns (4)-(6), log new incorporations per capita are instrumented by years since interstate deregulation and years since intrastate deregulation. In columns (7)-(9), log new incorporations per capita are instrumented by dummy variables for each year before and after interstate deregulation and dummy variables for each year before and after intrastate deregulation. The F-test of excluded instruments reports the F-statistic from the first-stage. The OIR test reports the p-value of a J-statistic that test over-identifying restrictions. *, **, and *** indicate significance at the 10%, 5%, and 1% respectively.

Table 8
RELATIVE LOG HOURLY WAGES AND ANNUAL WORKING HOURS IN HIGH RACIAL BIAS STATES

	Annual Hours				Log(Annual Hours)	
	All	All	Hours>0	All	All	All
	OLS	Tobit	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Projected relative log hourly wage	377*	376*	424*		.658**	
	(223)	(223)	(223)		(0.285)	
Log new incorporations per capita				59		.271***
				(105)		(.106)
Instruments:						
Years since deregulation	Yes	Yes	Yes	Yes	Yes	Yes
Years since deregulation squared	Yes	Yes	Yes	Yes	Yes	Yes
F-test of excluded instruments	21.5	21.5	21.5	21.7	21.5	21.3
OIR test (p-value)	.19	.19	.19	.39	.19	.49
Observations	20,556	20,556	16,951	20,556	16,951	16,951

NOTE - The dependent variable is either hours worked or the log of hours worked. Thus, some specifications include all working-age black males, while others include only working black males. Estimates are weighted by sampling weights provided by the Current Population Survey. Standard errors are adjusted for state-year clustering and appear in parentheses. In regressions (1) - (3) and (4), the standard errors are bootstrapped. All regressions include state and year fixed effects. The analysis excludes states with below the median values of the racial bias index. Data on new incorporations per capita are available for the period 1977-1994. "Years since deregulation" includes both years since interstate deregulation and years since intrastate deregulation. The F-test of excluded instruments reports the F-statistic from the first-stage. The OIR test reports the p-value of a J-statistic that test over-identifying restrictions. *, **, and *** indicate significance at the 10%, 5%, and 1%, respectively.

Table 9

BANK DEREGULATION AND SELECTION ON OBSERVABLE CHARACTERISTICS

	All States		Racial Bias Index Below Median		Racial Bias Index Above Median	
	(1)	(2)	(3)	(4)	(5)	(6)
1 if person reports wages	.066*** (.003)	.075*** (.003)	.064*** (.003)	.070*** (.004)	.069*** (.005)	.082*** (.005)
Interstate		-.004*** (.001)		-.005*** (.001)		-.001 (.003)
Interstate x (1 if person reports wages)		.002*** (.000)		.002*** (.000)		.002*** (.000)
Intrastate						
		-.001 (.000)		-.001 (.001)		-.000 (.001)
Intrastate x (1 if person reports wages)						
		.001*** (.000)		.001*** (.000)		.000 (.000)
Impact of deregulation on observable skills of black workers	-.002 (.001)	.0001 (.0005)	-.003* (.001)	.0003 (.0006)	.001 (.002)	-.0002 (.0008)
H ₀ : (Years since deregulation) x (1 if person reports wages) = 0						
Observations	116,593	116,593	77,301	77,301	39,292	39,292

NOTE - The dependent variable is the predicted relative wages of blacks. Relative wages are conditional on five indicators of years of completed education (0-8, 9-11, 12, 13-15, and 16+) and a quartic in potential experience. Estimates are weighted by sampling weights provided by the Current Population Survey. Standard errors are adjusted for state-year clustering and appear in parentheses. All regressions control for state and year fixed effects. The reported number of observations is for blacks only. Details about sample construction are in Appendix Table 2. The sample is limited to the years 1977-1994 due to availability of log new incorporations per capita data. In columns (1) and (2) we include the entire sample. In columns (3) and (4) we include only states with racial bias index below the median. In columns (5) and (6) we include only states with racial bias index above the median. The racial bias index is based on rate of interracial marriages using the 1970 Census of Population. Appendix Table 3 lists the racial bias index for each state. *, **, and *** indicate significance at the 10%, 5%, and 1% respectively.

Appendix Table 1

DATES OF INTRASTATE AND INTERSTATE DEREGULATIONS, BY STATES

State	State code	Type of deregulation:		State	State code	Type of deregulation:	
		Intra-state	Inter-state			Intra-state	Inter-state
Alabama	AL	1981	1987	Montana	MT	1990	1993
Alaska	AK	1960	1982	Nebraska	NE	1985	1990
Arizona	AZ	1960	1986	Nevada	NV	1960	1985
Arkansas	AR	1994	1989	New Hampshire	NH	1987	1987
California	CA	1960	1987	New Jersey	NJ	1977	1986
Colorado	CO	1991	1988	New Mexico	NM	1991	1989
Connecticut	CT	1980	1983	New York	NY	1976	1982
District of Columbia	DC	1960	1985	North Carolina	NC	1960	1985
Florida	FL	1988	1985	North Dakota	ND	1987	1991
Georgia	GA	1983	1985	Ohio	OH	1979	1985
Hawaii	HI	1986	1997	Oklahoma	OK	1988	1987
Idaho	ID	1960	1985	Oregon	OR	1985	1986
Illinois	IL	1988	1986	Pennsylvania	PA	1982	1986
Indiana	IN	1989	1986	Rhode Island	RI	1960	1984
Iowa	IA	1999	1991	South Carolina	SC	1960	1986
Kansas	KS	1987	1992	Tennessee	TN	1985	1985
Kentucky	KY	1990	1984	Texas	TX	1988	1987
Louisiana	LA	1988	1987	Utah	UT	1981	1984
Maine	ME	1975	1978	Vermont	VT	1970	1988
Maryland	MD	1960	1985	Virginia	VA	1978	1985
Massachusetts	MA	1984	1983	Washington	WA	1985	1987
Michigan	MI	1987	1986	West Virginia	WV	1987	1988
Minnesota	MN	1993	1986	Wisconsin	WI	1990	1987
Mississippi	MS	1986	1988	Wyoming	WY	1988	1987
Missouri	MO	1990	1986				

NOTE - Dates of intrastate and interstate deregulations are taken from Kroszner and Strahan (1999).

Appendix Table 2

SUMMARY STATISTICS: NUMBER OF OBSERVATIONS

Restriction / Selection Rule	Observations
All observations in sample years 1977 to 2007	5,085,135
Civilian adults, not in group quarters, with positive sampling weight and non-missing demographics such as: age, gender, state and region of residence, marital status, and education	3,805,475
Excluding:	
Observations in Delaware and South Dakota	3,712,856
Women	1,749,618
Younger than 18 or older than 65	1,392,503
More than 50 years of potential experience	1,337,897
Hispanics or other race groups but Whites or Blacks	1,149,855
Main sample:	
Whites	1,033,262
Blacks	116,593
Wage sample:	
All	756,996
Whites	683,195
Blacks	73,801

NOTE - March Current Population Survey data were obtained from <<http://cps.ipums.org/cps/>>. We start in Survey year 1977 because that is when the CPS reports information on each person's exact state of residence. The 2007 Survey is the latest Survey available. We exclude Delaware and South Dakota due to large concentration of credit card banks in these two states. The 'wage sample' differs from the 'main sample' in that we drop self-employed and agricultural workers, workers in private household sector, those with wages below the 1st and above the 97th percentile of year-specific wage distribution of full-time, full-year workers (i.e., those who work at least 50 weeks per year and at least 35 hours per week). Finally, we include in the 'wage sample' only wage and salary workers.

Appendix Table 3

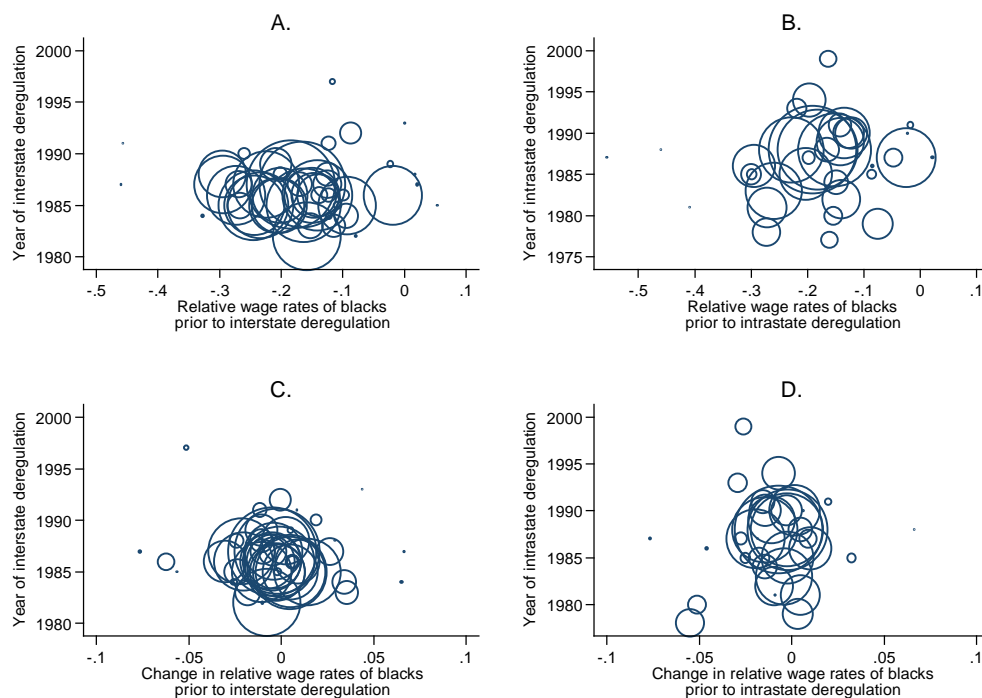
RACIAL BIAS INDEX BY STATES, 1970

States with racial bias index < median		States with racial bias index > median	
State	Racial Bias Index	State	Racial Bias Index
Alaska	0.00	Arkansas	0.30
Hawaii	0.07	Virginia	0.30
Washington	0.10	South Dakota	0.30
New York	0.11	Colorado	0.30
Nevada	0.12	North Carolina	0.32
California	0.15	Texas	0.32
District of Columbia	0.18	Nebraska	0.32
Delaware	0.24	Minnesota	0.32
South Carolina	0.24	Mississippi	0.33
New Jersey	0.25	Oregon	0.33
Pennsylvania	0.25	Louisiana	0.33
Michigan	0.26	Georgia	0.34
Kentucky	0.26	Oklahoma	0.35
Illinois	0.26	Indiana	0.35
Maryland	0.27	Alabama	0.35
Connecticut	0.27	Wisconsin	0.36
Rhode island	0.27	Vermont	0.36
New Mexico	0.27	Utah	0.37
Kansas	0.28	Idaho	0.37
Massachusetts	0.28	Tennessee	0.39
Ohio	0.28	Iowa	0.39
Missouri	0.28	Montana	0.40
Arizona	0.29	North Dakota	0.43
Florida	0.29	West Virginia	0.45
		Maine	0.45
		Wyoming	0.46
		New Hampshire	0.46

NOTE - The racial bias index is based on inter-racial marriage data obtained from the 1970 Census of Population. The sample includes married whites and blacks between that ages of 18 to 65, and excludes couples in which at least one person is living in group quarters or has missing data on race, gender, state of residence, marital status, or educational attainment. The racial bias index is based on the difference between the estimated rate of inter-racial marriage in 1970, where the estimation is based on each state's racial composition along with each individual's education and age characteristics, and the actual rate of inter-racial marriage. Larger values of the racial bias index signify that the actual rate of inter-racial marriage is correspondingly smaller than the estimated rate.

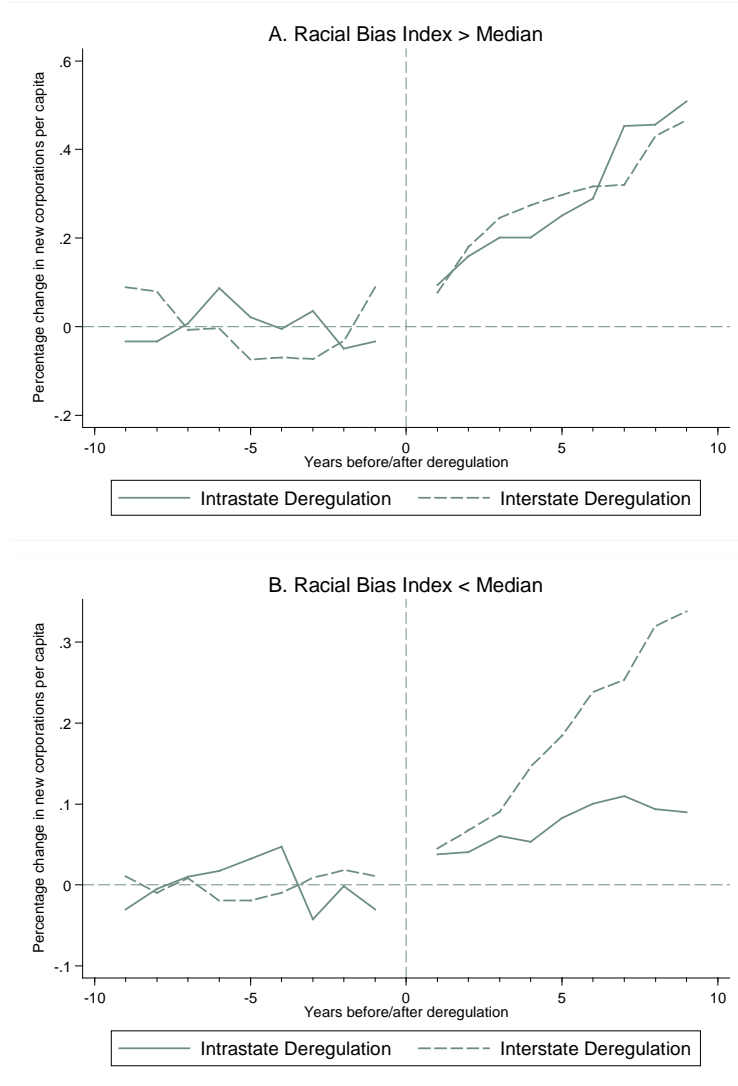
Figure 1

TRENDS AND INNOVATIONS IN THE RELATIVE WAGE RATES OF BLACKS PRIOR TO BANK DEREGULATION



NOTE - Figures A and B plot the year of bank deregulation against the average black-white wage differential prior to deregulation. In Figure A we consider years prior to interstate deregulation. In Figure B we consider years prior to intrastate deregulation. Figures C and D plot the year of bank deregulation against the change in the black-white wage differential prior to deregulation. In Figure C we consider years prior to interstate deregulation. In Figure D we consider years prior to intrastate deregulation. All statistics are weighted by the number of black workers.

Figure 2
THE IMPACT OF DEREGULATION ON ENTRY OF FIRMS



SOURCES - Data on new corporations per capita are taken from Black and Strahan (2002). Dates of intrastate and interstate deregulations are taken from Kroszner and Strahan (1999).

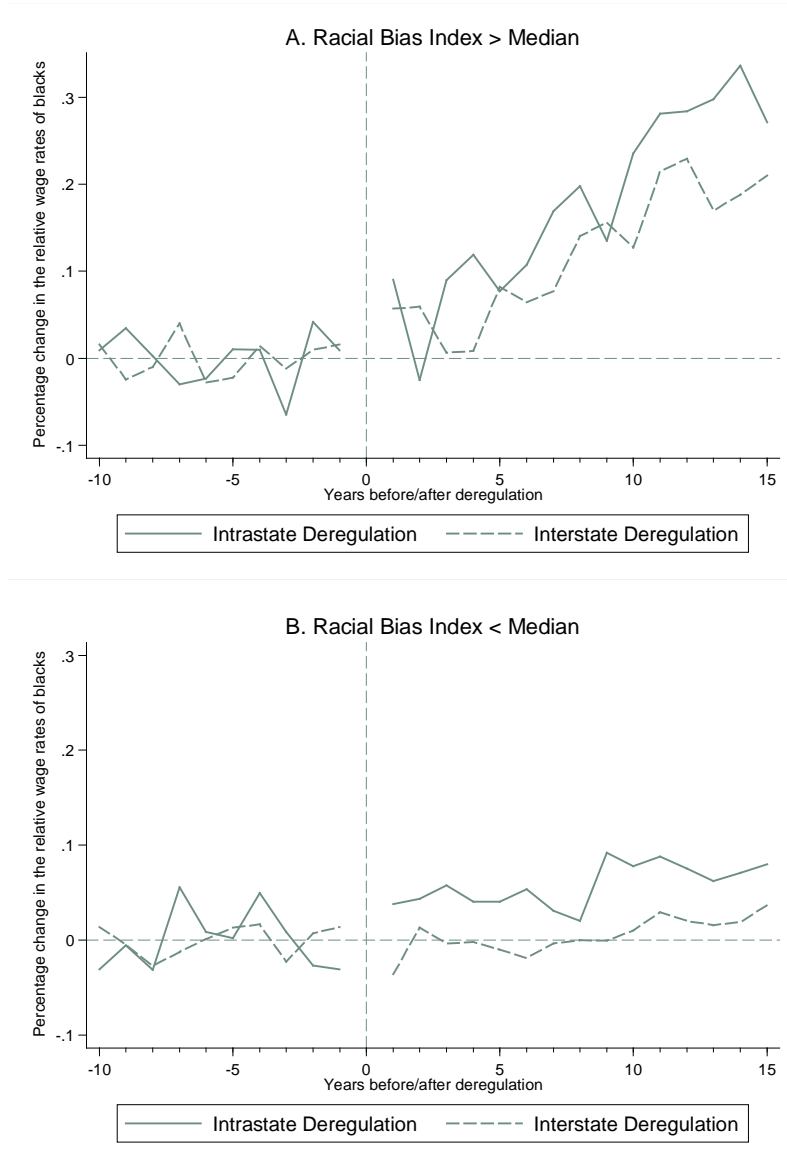
NOTE - The figures plot the impact of interstate and intrastate bank deregulations on log new corporations per capita. The upper figure is for states with racial bias index above the median. The lower figure is for state with racial bias index below the median. We consider an 18 years window spanning from 9 years before deregulations until 9 years after deregulations. The solid lines represent the impact of intrastate deregulation on log new per capita. The dashed lines represent the impact of interstate deregulation on log new corporations per capita. Specifically, we report estimated coefficients from the following regression:

$$Y_{st} = \alpha + \beta_1 \text{Intra}_{-9} + \gamma_1 \text{Inter}_{-9} + \beta_2 \text{Intra}_{-8} + \gamma_2 \text{Inter}_{-8} + \dots + \beta_{18} \text{Intra}_{+9} + \gamma_{18} \text{Inter}_{+9} + \delta_s + \delta_t + \varepsilon_{st}$$

Y_{st} is log new corporations per capita in state s and year t . Intra_{-j} equals one for states in the j^{th} year before intrastate deregulation and equals zero otherwise. Intra_{+k} equals one for states in the k^{th} year after intrastate deregulation and equals zero otherwise. Similarly, Inter_{-j} equals one in states in the j^{th} year before interstate deregulation and equals zero otherwise. Inter_{+k} equals one in states in the k^{th} year after interstate deregulation and equals zero otherwise. δ_s and δ_t are state and year fixed effects, respectively. We exclude the year of intrastate and interstate deregulation, thus estimating the dynamic effect of deregulation on log new corporations per capita relative to the corresponding year of deregulation. We de-trend the coefficients by prior trends and normalize their average prior to deregulation to be zero. The estimates are weighted by the number of black workers.

Figure 3

THE IMPACT OF DEREGULATION ON THE RELATIVE WAGE RATES OF BLACKS

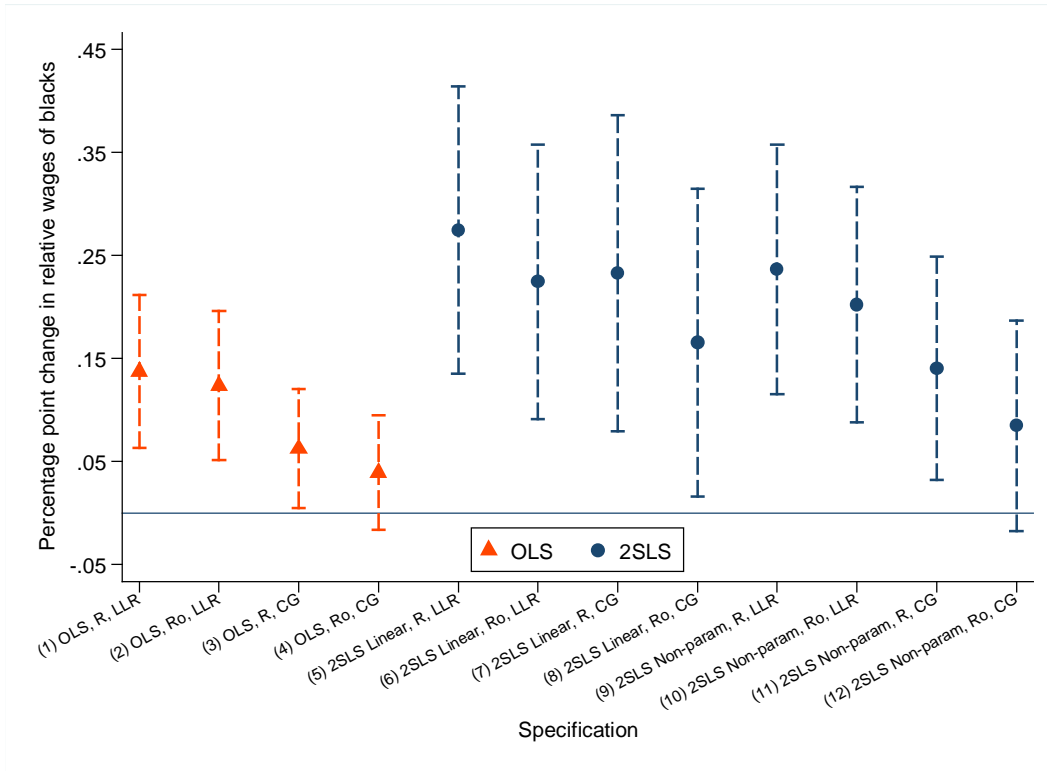


NOTE - The figures plot the impact of interstate and intrastate bank deregulations on the relative wage rates of blacks. The upper figure is for states with racial bias index above the median. The lower figure is for state with racial bias index below the median. We consider a 25 year window, spanning from 10 years before deregulation until 15 years after deregulation. The solid lines represent the impact of intrastate deregulation on the relative wage rates of blacks. The dashed lines represent the impact of interstate deregulation on the relative wage rates of blacks. Specifically, we report estimated coefficients from the following regression:

$$\hat{R}_{ist}^B = \alpha + \beta_1 D_{st}^{-10} + \beta_2 D_{st}^{-9} + \dots + \beta_{25} D_{st}^{+15} + \delta_s + \delta_t + v_{ist}$$

The D 's equal zero, except as follows: D_{-j} equals one for states in the j^{th} year before deregulation, while D_{+j} equals one for states in the j^{th} year after deregulation. We exclude the year of deregulation, thus estimating the dynamic effect of deregulation on the relative wage rates of blacks relative to the year of deregulation. We de-trend the coefficients by prior trends and normalize their average prior to deregulation to be zero. The estimates are weighted by the number of black workers.

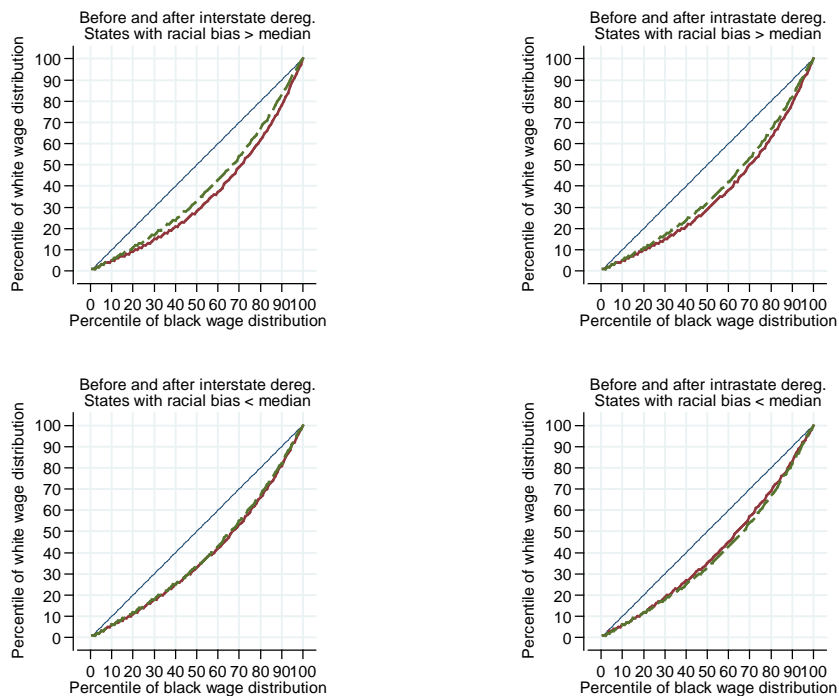
Figure 4
 THE IMPACT OF LOG NEW INCORPORATIONS PER CAPITA ON THE RELATIVE WAGE RATES OF BLACKS
 DIFFERENT OLS AND 2SLS SPECIFICATIONS
 (DASHED LINES REPRESENT 95% CONFIDENCE INTERVALS)



NOTE – The circles represent the estimated impact of log new incorporations per capita on the relative wages of blacks. The dashed lines represent the corresponding 95% confidence intervals, adjusted for state and year clustering. The estimated coefficients and the confidence intervals are from twelve different specifications. The notation in the specifications is as follows: OLS – Ordinary Least Squares; 2SLS Linear – Two-Stage Least Squares with Interstate and Intrastate entering linearly; 2SLS Non-param – Two-Stage Least Squares with Interstate and Intrastate entering non-parametrically; R – relative wages of blacks, where the relative wages are conditional on years of completed education and quartic in potential experience; Ro – relative wages of blacks, where the relative wages are conditional on years of completed education, a quartic in potential experience, and occupation fixed effects; LLR – states with racial bias index above the median; CG – states with marginal racial prejudice (From Charles and Guryan, 2008) above the median. The different specifications are: (1) OLS, with relative wages conditional on education and experience, in states below the median racial bias index, (2) OLS, with relative wages conditional on education, experience, and occupation, in states below the median racial bias index, (3) OLS, with relative wages conditional on education and experience, in states below the median marginal racial prejudice, (4) OLS, with relative wages conditional on education, experience, and occupation, in states below the median marginal racial prejudice, (5) 2SLS with linear instruments, relative wages conditional on education and experience, in states below the median racial bias index, (6) 2SLS with linear instruments, relative wages conditional on education, experience, and occupation, in states below the median racial bias index, (7) 2SLS with linear instruments, relative wages conditional on education and experience, in states below the median marginal racial prejudice, (8) 2SLS with linear instruments, relative wages conditional on education, experience, and occupation, in states below the median marginal racial prejudice, (9) 2SLS with non-parametric instruments, relative wages conditional on education and experience, in states below the median racial bias index, (10) 2SLS with non-parametric instruments, relative wages conditional on education, experience, and occupation, in states below the median racial bias index, (11) 2SLS with non-parametric instruments, relative wages conditional on education and experience, in states below the median marginal racial prejudice, (12) 2SLS with non-parametric instruments, relative wages conditional on education, experience, and occupation, in states below the median marginal racial prejudice. Measures of marginal racial prejudice are obtained from Charles and Guryan (2008). All estimates are weighted by sampling weights provided by the Current Population Survey.

Figure 5

THE LOCATION OF BLACKS IN THE WHITE WAGE DISTRIBUTION BEFORE AND AFTER DEREGULATION



NOTE - The figures provide rank analyses and compare the change in black workers' relative wages with those of comparable whites across the full distribution of wage rates, before and after bank deregulation. The results in the plots were obtained using the following procedure: First, we calculate residuals for black and white workers from equation (7). We keep 100 black workers, each corresponding to a different percentile of black workers' relative log hourly wage distribution. Next, we calculate their position in the white workers' log hourly wage distribution. We repeat this procedure before (solid line) and after (dashed line) inter- and intrastate deregulations. The upper figures refer to states with racial bias index above the median. The lower figures refer to states with racial bias index below the median. We use sampling weights in all estimations.