Bank Deregulation and Racial Inequality in America

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Abstract

We use the cross-state, cross-time variation in bank deregulation across the U.S. states to assess how improvements in banking systems affected the labor market opportunities of black workers. Bank deregulation from the 1970s through the 1990s improved bank efficiency, lowered entry barriers facing nonfinancial firms, and intensified competition for labor throughout the economy. Consistent with Becker's (1957) theory of racial discrimination, we find that in economies where employers have sufficiently strong racial biases, deregulation-induced improvements in the banking system boosted blacks' relative wages by facilitating the entry of new firms and reducing the manifestation of racial prejudices in labor markets.

Financial systems shape economic opportunities through direct and indirect channels. For example, the degree to which financial systems ameliorate information and transactions costs influences the nature of credit rationing, the cost of raising capital, and hence the barriers to starting or expanding businesses. Furthermore, more efficient financial systems can lower entry barriers in nonfinancial industries, fostering the entry of new more efficient firms with potentially large effects on the demand for labor and the competitiveness of labor markets. For example, Beck, Levine, and Levkov (2010) show that more efficient financial systems reduce unemployment and income inequality among salaried workers in nonfinancial industries. Thus, by affecting the entry of new firms and labor market conditions, finance can shape the economic opportunities available to individuals–even people who never receive a loan or issue a security.

In this paper, we contribute to research on how finance shapes economic opportunities by evaluating the impact of a deregulation-induced improvement in the U.S. banking system on racial inequality. Research documents that black workers earn less than their white counterparts after controlling for differences in education and experience. Yet, researchers have neither determined the degree to which this racial wage gap reflects differences in unobserved skills or racial discrimination, whereby blacks are paid less than identically productive whites, nor have researchers examined the role of financial sector policies in influencing racial wage inequality. We provide the first assessment of how the financial system affects the racial wage gap; and, in conducting this assessment we provide novel evidence on the role of racial discrimination in influencing blacks' relative wages.

Our research strategy is structured by Becker's (1957) seminal theory of racial discrimination, which holds that (1) taste-based discrimination, the disutility that white employers attach to hiring black workers, can produce an enduring racial wage gap and (2) lowering barriers that impede the entry of new firms can reduce this racial wage gap between identically productive workers. Becker argues that with lower entry barriers, firms with less of a taste for discrimination can enter the market and initiate profitable operations by hiring equally productive black workers at lower wage rates than their white counterparts, boosting the relative demand for black workers and reducing the racial wage gap. Becker did not argue that new firms would reduce racial prejudices. Rather, he argued that lower entry barriers would erode the manifestation of racial prejudices on labor market outcomes. Accordingly, Becker's (1957) model predicts that lower entry barriers will reduce the racial wage gap but only if racial prejudices had been contributing to the black-white wage differential. If racial attitudes

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were not depressing blacks' relative wages, then reducing entry barriers will not reduce the manifestation of those prejudices on the racial wage gap within the context of Becker's taste-based theory of discrimination.

Thus, to assess the impact of finance on racial inequality, we build both on research in finance and labor economics. From finance, Black and Strahan (2002), Cetorelli and Strahan (2006), Kerr and Nanda (2009), show that policy-induced improvements in the U.S. banking system lowered entry barriers in nonfinancial industries and intensified product market competition. From labor, Becker (1957) argues that intensified product market competition will reduce the manifestation of racial prejudices in labor markets. We test whether regulatory-induced improvements in banking system efficiency reduced the racial wage gap by intensifying product market competition in a manner consistent with Becker's (1957) taste-based theory of discrimination.

Specifically, we use interstate and intrastate bank deregulation across the U.S. states to identify an exogenous lowering of entry barriers impeding the entry of nonfinancial firms, and evaluate the impact on the racial wage gap while differentiating among U.S. state economies with stronger and weaker racial prejudices. From the mid-1970s to 1994, individual states relaxed restrictions on the entry of banks from other states and the branching of banks within states, boosting bank competition, efficiency, and the effectiveness of credit allocation (Jayaratne and Strahan, 1998; Hubbard and Palia, 1995). These improvements in the banking industry lowered barriers to the entry of new firms throughout the economy (Black and Strahan, 2002; Kerr and Nanda, 2009), spurring competition in nonfinancial industries. Thus, we evaluate whether bank deregulation reduced a state's overall racial wage gap by spurring the entry of new firms (new incorporations), which is the key mechanism suggested by the taste-based theory of discrimination.

To assess whether bank deregulation reduced racial inequality by reducing the impact of racial prejudices on labor markets, we use several state-specific measures of racial attitudes. First, from the 1970 U.S. census, we compute the predicted rate of racial 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 captures decisions made far before our sample period since the 1970 census contains the accumulated stock of marriages in 1970 and we begin our analyses in 1976. Furthermore, we confirm the results using survey-based measures of racial attitudes from

Charles and Guryan (2008).[1]

We find that bank deregulation that intensified product market 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 both 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 lowering of entry barriers triggered by bank deregulation 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.

The results are robust to several potentially confounding influences. First, one might be concerned that these results simply reflect the observation that bank deregulation exerted a disproportionately positive effect on the poor (Beck, Levine, and Levkov, 2010) and the poor are disproportionately black. But, three observations suggest that this is not the case: (a) bank deregulation increased blacks' relative wages only in high racial bias states, but there is no evidence the income inequality fell more in high racial bias states, (b) the results hold when conditioning on occupation,

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[1] 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.

suggesting that blacks' relative wage rose in higher- and lower-income jobs, and (c) blacks' relative wages rose across the full distribution of relative wage rates. Second, deregulation could have shifted blacks into higher paying occupations and industries rather than boosting blacks' relative wages. Or, deregulation might have disproportionately boosted wage rates with a comparatively high proportion of black workers, not by reducing the manifestation of racial prejudices. But, we find that deregulation boosted blacks' wages relative to white workers in the same industry and occupation. Third, bank deregulation could have reduced labor force participation by low ability black workers and thereby boosted observed relative wage rates. However, we find that bank deregulation increased the relative working hours of black workers in high racial bias states, consistent with the interpretation that intensified competition boosted the relative demand for black workers. Fourth, 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 bank deregulation substantively affected the relative skill composition of black workers. Fifth, 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. Sixth, there might be concerns that states with a high degree of racial bias converge toward low racial bias states, or that blacks' relative wages increase over time, or that business cycles somehow account for the findings. But, the results hold after accounting for state and year fixed effects, which control for all time-varying national influences, as well as state-specific factors.

Our major contribution is showing that exogenous improvements in the functioning of banks substantively enhanced the economic opportunities of an historically disadvantaged group. Financial deregulation reduced racial inequality by diminishing the impact of racial prejudices on labor market opportunities. We also contribute to a large literature on racial discrimination.[2] We provide the first evaluation of whether

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[2] We are obviously not the first to examine competition and discrimination. Becker (1957), Shepard and Levin (1973), and Oster (1975) compare market concentration and relative wage rates across industries, obtaining mixed results. Ashenfelter and Hannan (1986) find a negative association between market concentration and the share of female employees across several banking markets in Pennsylvania and New Jersey. Heywood and Peoples (1994) and Peoples and Talley (2001) find that the deregulation of trucking increased the relative wage rates of black workers. Black and Strahan

the impact of an exogenous lowering of entry barriers facing nonfinancial firms on blacks' relative wages varies positively with the economy's taste for discrimination. That is, we not only assess whether lowering entry barriers increases blacks' relative wages in general, we examine whether it increases blacks' relative wages only in those environments in which the taste-based theory of discrimination suggests that competition will enhance blacks' labor market opportunities. Our results are fully consistent with the central implication of the taste-based theory of discrimination: lowering entry barriers so that new firms can contest and compete with existing firms diminishes the manifestation of racial prejudices on labor markets.

1   Bank Deregulation and New Firm Entry

1.1   Bank Branch Deregulation

The history of geographic restrictions on banking–along with standard econometric evidence–supports a key requirement of our estimation strategy: Namely, that bank deregulation is exogenous to competition and blacks' labor market outcomes. As described by White (1982), geographic restrictions on banking protected local banks from competition for much of the 20th century. By protecting inefficient banks, geographic restrictions created a powerful constituency for maintaining these regulations.

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

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(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.

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.

Research also indicates that 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), the strength of labor unions (Black and Strahan, 2001; Levkov, 2010), or the degree of earnings inequality (Beck, Levine, and Levkov, 2010). Moreover, we show below that the racial wage gap does not explain the timing of bank deregulation.

1.2 Bank Deregulation and New Firm Entry in Non-Financial Sectors

Deregulation increased competition within the banking sector by making it possible for banks to (a) open branches across markets within a state and (b) open subsidiaries in other states. By increasing competition, deregulation improved bank performance. It reduced interest rates on loans, raised them on deposits, lowered overhead costs, and shrunk the proportion of bad loans (Jayaratne and Strahan, 1998). And, by enhancing the contestability of banking markets, deregulation expedited the development of better techniques for evaluating firms (Hubbard and Palia, 1995).

In boosting banking sector performance, bank deregulation reduced entry barriers facing firms in nonfinancial sectors. Improvements in banking—lower lending rates, better screening of borrowers, etc.—lowered financial barriers facing new firms, intensifying competition in the overall economy. 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. Kerr and Nanda (2009) also find a dramatic increase in both the entry and exit of firms, suggesting that deregulation increased contestability throughout the economy.

2 Data

2.1 State-level data on deregulation and new firm entry

The dates of interstate and intrastate bank deregulation are 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.

Since the taste-based theory of discrimination focuses on the actual entry of new firms, we use the rate of new incorporations to measure competition. Specifically, we use the log of new business incorporations per capita for each state over the period 1977-1994, where the new incorporations data are from Black and Strahan (2002), who obtain them from Dun and Bradstreet.

2.2 Generating Relative Residual Wages

2.2.1 CPS

Data on wages and worker characteristics are from the Integrated Public Use Microdata Series (IPUMS) from the U.S. Current Population Survey (CPS, March Supplements for the survey 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. For much of the paper's analyses, the sample only included data through1994 since that is the end of the intra- and interestate deregulation period.

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; (iv) some college; (v) college graduate; and (vi) advanced degree. Potential work experience is constructed as the maximum between zero and age minus years of schooling

completed minus seven. In some specifications, we differentiate workers by industry and occupation (144 industries and 262 occupations).

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. Following Autor, Katz, and Kearney (2008), workers with top coded earnings have their earnings set to 1.5 times the annual top-code. We trim outliers with 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 earnings. The results are robust to altering the definition of outliers. Consistent with previous research on bank deregulation, we drop Delaware and South Dakota due to large concentration of credit card banks in these states. Appendix Table 2 provides more details on the sample.

2.2.2 Relative residual wages: Framework

We decompose the black-white wage differential into "explained" and "residual" components, where the residual component is the "racial wage gap." In particular, assume that log hourly wages for a white individual i in state s at time t can be written as:

$$W_{ist}^W = X_{ist}\theta_t^W + R_{ist}^W, \tag{1}$$

and log hourly wages for a black individual i in state s at time t can be written as:

$$W_{ist}^B = X_{ist}\theta_t^B + R_{ist}^B, \tag{2}$$

where X_{ist} represents individual characteristics associated with log hourly wages in state s in year t, including Mincerian characteristics, such as education and experience, and state-year fixed effects. The parameters, θ_t^W and θ_t^B, are defined so that $E\left(R_{st}^W \mid X_{st}^W\right) = 0$ and $E\left(R_{st}^B \mid X_{st}^B\right) = 0$, where X_{st}^W (X_{st}^B) is the mean X_{ist} of white (black) workers in state s in year t, and R_{st}^W (R_{st}^B) is the mean value of R_{ist}^W (R_{ist}^B) across white (black) workers s in year t. Thus, the mean wage across white workers in state s in year t is defined as $W_{st}^W = X_{st}^W\theta_t^W$ and the corresponding value for black workers is $W_{st}^B = X_{st}^B\theta_t^B$.

We can then define the mean black-white wage differential in state s in year t as:

$$W_{st}^B - W_{st}^W = \Delta X_{st}\theta_t^W + X_{st}^B\Delta\theta_t = \Delta X_{st}\theta_t^W + R_{Bst}, \tag{3}$$

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where $\Delta X_{st} = X_{st}^B - X_{st}^W$, $\Delta\theta_t = \theta_t^B - \theta_t^W$, and $X_{st}^B\Delta\theta_t = R_{Bst}$.

The "explained" component of the black-white wage differential is $\Delta X_{st}\theta_t^W$. It represents the mean wage differential explained by the mean observed "skill" differential between black and white workers ΔX_{st}, where these skill differences are valued or "priced" using the returns that the average white worker gets for these skills (θ_t^W).

The "residual" (racial wage gap) component, $X_{st}^B\Delta\theta_t$, which we designate as R_{Bst} for simplicity, is that part of the mean black-white wage differential unaccounted for by mean skill differentials. The residual component represents the average wage gap between black and white workers with identical characteristics that emerges because of racial differences in the returns to these characteristics $(\Delta\theta_t = \theta_t^B - \theta_t^W)$. Recall, these characteristics include standard, observable Mincerian traits as well as unobservable differences in the average productive characteristics of black and white workers at the state-year level.[3]

Thus, the racial wage gap (R_{Bst}) captures both the effects of labor market discrimination and unobserved productivity differences between black and white workers. A large literature focuses on identifying the role of these two sources. For example, Neal and Johnson (1996) attribute much of the unexplained gap in wages to differences in cognitive abilities. In this paper we focus on evaluating the effect of competition on labor market discrimination, i.e., the effect of competition on racial differences in the "prices" of skills. We use the differential timing of bank deregulation across states and differences in the taste for discrimination across states to identify the effect of competition on labor market discrimination against black workers. Furthermore, even when we allow these prices to differ

2.2.3 Relative residual wages: Estimation

First we estimate equation (1) separately for each year. Thus, we allow the Mincerian returns to observable skills (θ_t^W) to vary by year. This is crucial because of the the well-documented skill gap between black and white workers. Failure to account for time-varying returns to skills will lead to erroneous estimates of the dynamic pattern of relative wages, potentially biasing our assessments.

Then, employed with θ_t^W, we compute residual wages (R_{ist}) for all workers, white

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[3]Although the formal specification here indicates that the differential returns to traits between black and white workers $(\Delta\theta_t = \theta_t^B - \theta_t^W)$ differs only across time, we allow for much greater flexibility below. Indeed, blacks' residual relative wages are constructed while allowing for a full set of interactions between all individual traits with state fixed effects, we allow the price of skills to differ by occupation and industry.

and black:

$$R_{ist} = W_{ist} - \theta_t^W X_{ist}, \tag{4}$$

By construction, the mean value of R_{st} for white workers, R_{Wst}, equals zero in each state-year. For black workers the average relative residual wage, R_{Bst}, can differ from zero.

Since X_{ist} effectively includes state-year effects (and state-industry-year effects in some specifications), relative residual wages already account for state-year (or state-year-industry) effects on white workers' wages, including the effect of *banking deregulation* on the wage rates of white workers.

By controlling for these wage rate determinants, we account for the impact of bank deregulation on white workers' wages. If bank deregulation affects wages but does not affect labor market discrimination or the unobservable differences in the mean productive characteristics of black and white workers in a state, then we should find no association between deregulation and blacks relative residual wages.

From a methodological perspective, an equivalent approach to this two-step procedure is to run a single wage regression that includes sufficient interaction terms based on race, year, state, and demographics to capture the properties mentioned above. This yields identical results, but the two-step approach is computationally faster.

2.3   Racial Bias Indexes

Throughout our analyses, we explicitly account for cross-state differences in the taste for discrimination. This is both novel and essential for drawing accurate inferences because competition should have a larger impact on blacks' relative wages in states with a greater taste for discrimination (all other things equal).

We develop two types of racial bias indexes based on the accumulated stock of racial intermarriage in 1970. 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 demographic information. Our primary sample includes married whites and blacks between the ages of 18 and 65, and excludes couples in which at least one person is living in group quarter or has missing data on race, gender, state of residence, marital status and educational attainment.

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 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). Also, since the odds of interethnic unions increase with couples' educational attainment (Massey and Denton, 1987; Qian, 1997; Rubinstein and Brenner, 2009), we control for education and age. We estimate the following equation for married couples:

$$I_{is} = bH_{is} + cW_{is} + dS_s + \tau_{is}, \tag{5}$$

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. For state characteristics, we include the random intermarriage 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 $\widetilde{T}_s = -\tau_s + \max\{\tau_s\}$, so that $\widetilde{T}_s$ 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, $\widetilde{T}_s$, for each state and the District of Columbia. Appendix Table 4 shows the mean characteristics of workers in all state, in states with below the median level of the racial bias index, and in states with above the median level of the racial bias index.

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

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of whites that would not vote for a black president, and (3) the fraction of whites supporting the right to segregate neighborhoods by race.

The intermarriage racial bias index is negatively correlated with blacks' relative wages. Table 1 (Panel B) shows that the intermarriage racial bias index is negatively associated with blacks' relative wage rates in the years prior to deregulation, even when controlling for the supply of blacks in the workforce, suggesting that the racial bias index captures cross-state differences in the relative demand for black workers.

We also use the Charles and Guryan (2008) survey-based estimates of the degree of racial prejudice of the marginal firm. As shown, states with above the median levels of this marginal racial prejudice indicator have significantly lower blacks' relative wages. Nonetheless, the intermarriage racial bias index remains negatively and significantly associated with blacks' relative wages even when controlling for 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, though we draw consistent conclusions with either racial bias indicator. 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. Furthermore, unlike Charles and Guryan (2008), we do not want to measure the racial preferences of the marginal employer. This will incorporate influences of both the relative demand for and supply of black workers. Rather, theory predicts that an intensification of competition will increase the relative demand for black workers and hence boost blacks' relative wages in states with a sufficiently high taste for discrimination, while holding the relative supply of black workers fixed. We test this.

In summary, we evaluate whether an exogenous lowering of entry barriers boosts the relative demand for black workers more in states with larger values of the racial bias indices. Measuring racial bias with error will bias the results against finding statistically significant results. We do not require that the racial bias measures are perfect; rather, we simply require that they provide information on racial prejudices

across states.

3 Results

3.1 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.

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. The impact of each form of deregulation on new firm entry grows over time, reaching a maximum about a decade after interstate deregulation, and over two decades after intrastate deregulation. 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 state s in period t (N_{st}). 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:

$$N_{st} = \alpha + \beta_1 Inter_{-9} + ... + \beta_{18} Inter_{+9} + \gamma_1 Intra_{-9} + ... + \gamma_{18} Intra_{+9} + \delta_s + \delta_t + \varepsilon_{st}, \quad (6)$$

where $Inter_{-j}$ equals one for the jth year before interstate deregulation, and $Inter_{+k}$ equals one for the kth year after interstate deregulation, while $Intra_{-j}$ equals one for the jth year before intrastate deregulation, and $Intra_{+k}$ equals one for the kth year after intrastate deregulation. These dummy variables equal zero in other years. We present results starting nine 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 nine 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 relative to the level and trend before deregulation. Specifically, 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.

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, though 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. 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

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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.

3.2 Bank Deregulation and Blacks' Relative Wages

3.2.1 Reduced Form Analyses of Bank Deregulation

We next assess the reduced form impact of bank deregulation on the relative wage rates of black workers $\left(\hat{R}_{ist} \right)$. We use a "Deregulation index" that equals the number of years since the state first engaged in either intra- or interstate deregulation. For example, from Appendix Table 1, Alabama initiated intrastate deregulation in 1981 and interstate deregulation in 1987, so we use 1981 in computing the value of the Deregulation index for Alabama. We obtain similar results when separately examining intra- and interstate deregulation; that is, the results hold independently for intra- and interstate 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 effects to differ across the two subsamples. Throughout the analyses, we include state and year fixed effects. We present the results for both the period 1976 to 1994 and the period 1976 to 2006 to show that the results are robust to extending the period of analysis to allow for the dynamic impact of bank deregulation on competition and blacks' relative wages.

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. 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.[4]

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[4]The results also hold when examining only those states that did not have unit banking regulatory restrictions before intrastate deregulation.

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 over the 1976-1994 period. Among these states, deregulation boosts the wage rates of black workers by about 7.5 percentage points more than their white counterparts after five years $(6 = 0.015 * 5 * 100)$. Since the average racial wage gap in these high-bias states was 21 percent in 1976, the results suggest that interstate deregulation eliminates about one-third of the initial racial wage gap.

3.2.2 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 racial wage gap by following the same methodology that we used to examine the dynamic relation between deregulation and new incorporations (Cf. equation (6) and Figure 2). 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. In creating Figure 3, we use the full sample period (1976-2006), but obtain a similar figure when using the period from 1976 to 1994.

Three crucial messages emerge from Figure 3. First, the impact of both interstate

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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.

3.3   New Firm Entry and Blacks' Relative Wages

3.3.1   Reduced Form Analyses of New Firms Entry

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 $\left(\hat{R}_{ist}\right)$. The key regressor is the log of new incorporations per capita. 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).

3.3.2   2SLS Analyses of New Firm Entry

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 include *Interstate*, *Intrastate*, a dummy variable that equals one for the post interstate deregulation period (and zero otherwise), and a dummy variable that equals one for the post intrastate deregulation period (and zero otherwise). 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 p-value of the test of the null hypothesis that the excluded instruments do not explain new incorporations. In unreported robustness tests, we also show that the results are not driven by states in which deregulation failed to induce an increase in new firm entry 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 new firm entry 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 new firm entry, not through some spurious channel.

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.

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 over 2.5 percent in high racial bias states.

The 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. 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 between four and five percent in these same states. These estimates indicate that by increasing competition, bank deregulation boosted blacks' relative wages by 20 to 25% of the initial racial wage gap in these states, which equaled, on average, 20 percent in the years before bank deregulation.

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

4 Robustness Checks

In this section, we address concerns about several factors that could confound our ability to draw accurate inferences about the impact of bank deregulation that lowers entry barriers 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.

4.1 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, 2010), 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.

4.2 Blacks' Relative Wages Within Industries

Bank deregulation and its impact on the rate of new incorporations might induce 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 higher-paying 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. Thus, 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.

The results in Table 6 suggest that the intensification of competition boosted blacks' wages relative to comparable white workers within the same industry and occupation. Increased racial integration in the workplace 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.

4.3 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 7 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

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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 7 results clearly demonstrate that bank deregulation and competition did not shift blacks' labor supply curve to the left.

4.4   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 (4) 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 8 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 unobservable 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 8, 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 un-

derestimate 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.

4.5 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.

5 Conclusions

In this paper, we examined the relationship between bank deregulation and racial inequality in America. As Becker (1957) argued, taste-based discrimination by employers can produce an equilibrium gap between the wages of identical black and white workers. He further stressed that lowering barriers to the entry of new firms could erode the

racial wage gap by reducing the impact of racial prejudices on the relative demand for black workers. A central implication of the taste-based discrimination theory is that lowering entry barriers will reduce the black-white wage differential *only* in economies where employers have a sufficiently strong "taste for discrimination."

We find that bank deregulation across the U.S. states boosted blacks' relative wages by lowering barriers to the entry of new firms but *only* in states with a 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 lowering of entry barriers. We find that the resultant increase in new incorporations eliminated more than one-fifth of the preexisting black-white wage differential in high racial bias states over a five-year period.

The paper emphasizes the powerful role of finance in shaping the economic opportunities of an historically oppressed group in the United States. Banking sector policies that facilitated competition materially enhanced blacks' relative wages. Our research shows that these improvements materialized through indirect channels: bank deregulation enhanced the functioning of labor markets throughout the economy, reducing racial inequality and boosting the economic opportunities of African Americans.

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Figure 1

TRENDS AND INNOVATIONS IN THE RELATIVE WAGE RATES OF BLACKS PRIOR TO BANK DEREGULATION
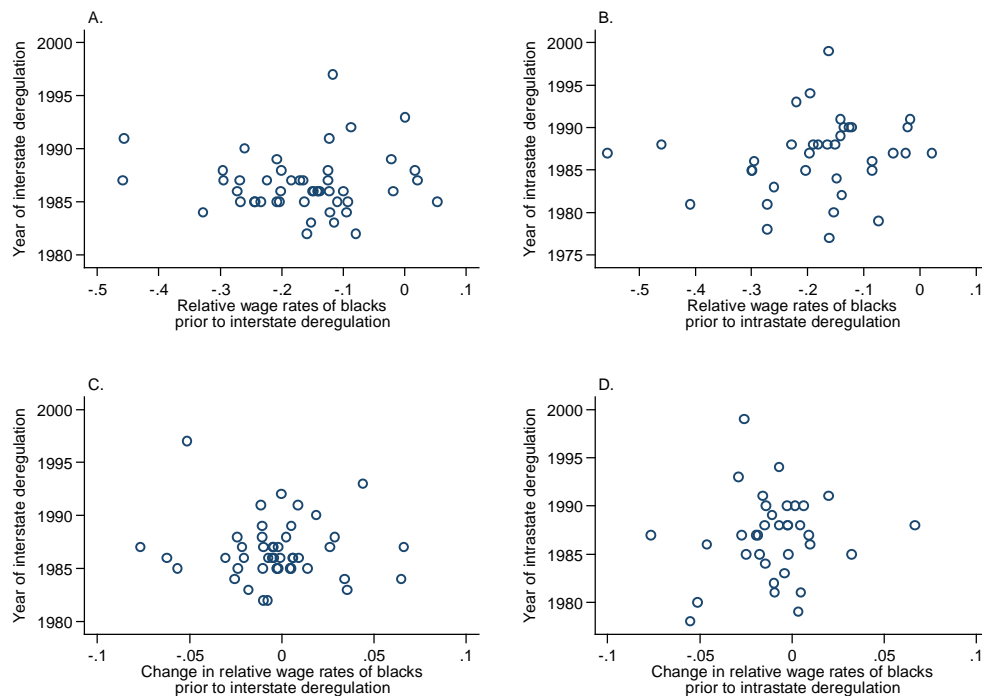
NOTE – Figures A and B plot the year of bank deregulation against the average black-white wage differential prior to deregulation. In Figure A we consider years prior to interstate deregulation. In Figure B we consider years prior to intrastate deregulation. Figures C and D plot the year of bank deregulation 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.

Figure 2

THE IMPACT OF DEREGULATION ON ENTRY OF FIRMS
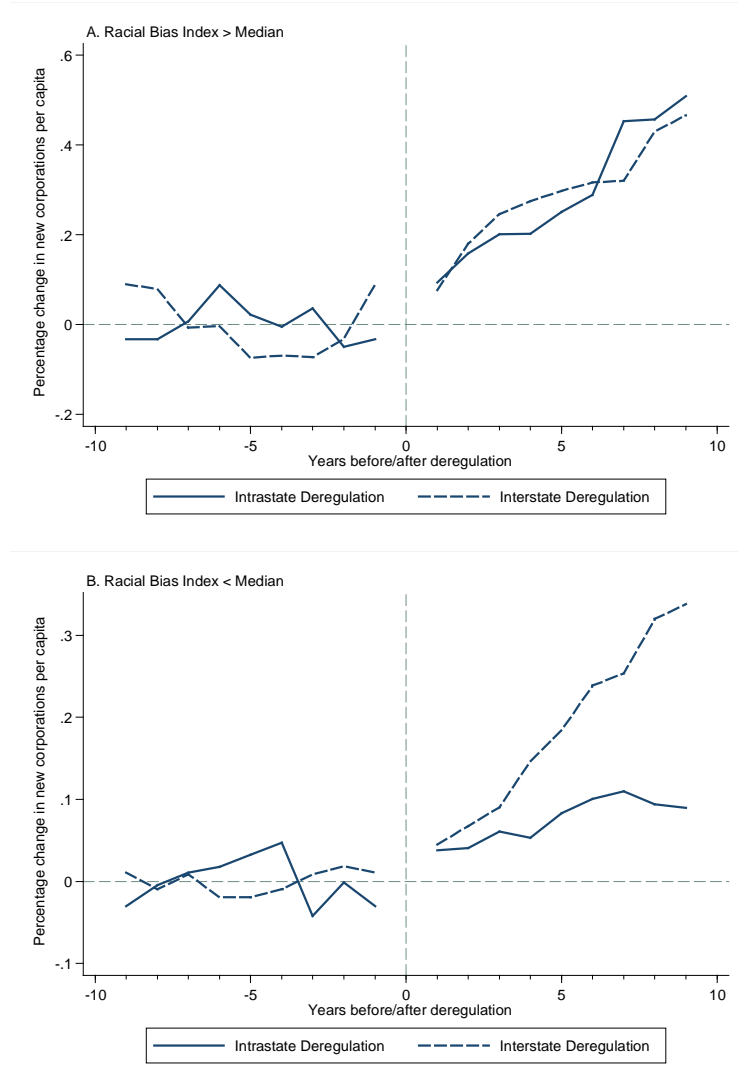
SOURCES – Data on new corporations per capita are taken from Black and Strahan (2002). Dates of intrastate and interstate deregulations are taken from Kroszner and Strahan (1999).

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:

$$Y_{st} = \alpha + \beta_1 Intra_{-9} + \gamma_1 Inter_{-9} + \beta_2 Intra_{-8} + \gamma_2 Inter_{-8} + \ldots + \beta_{18} Intra_{+9} + \gamma_{18} Inter_{+9} + \delta_s + \delta_t + \varepsilon_{st}$$

Y_{st} is log new corporations per capita in state s and year t. $Intra_{-j}$ equals one for states in the jth year before intrastate deregulation and equals zero otherwise. $Intra_{+k}$ equals one for states in the kth year after intrastate deregulation and equals zero otherwise. Similarly, $Inter_{-j}$ equals one in states in the jth year before interstate deregulation and equals zero otherwise. $Inter_{+k}$ equals one in states in the kth 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

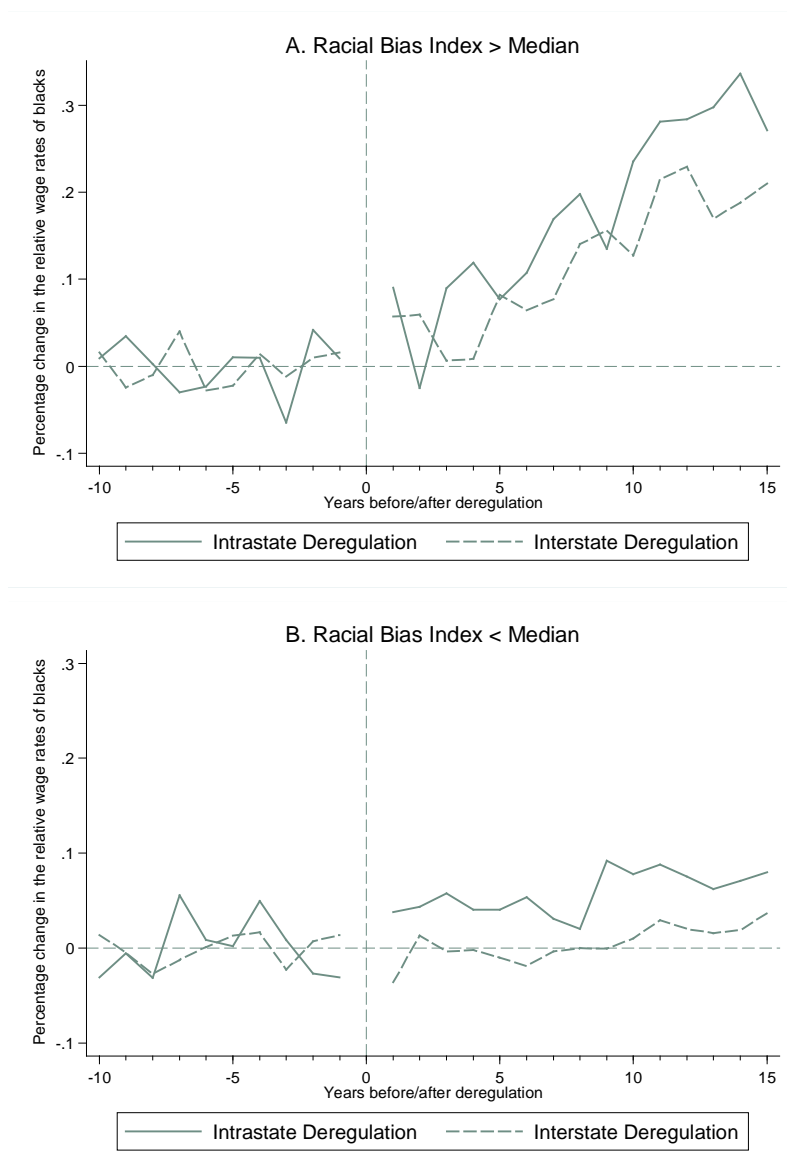THE IMPACT OF DEREGULATION ON THE RELATIVE WAGE RATES OF BLACKS

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:

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

The D's equal zero, except as follows: D_{-j} equals one for states in the jth year before deregulation, while D_{+j} equals one for states in the jth 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.
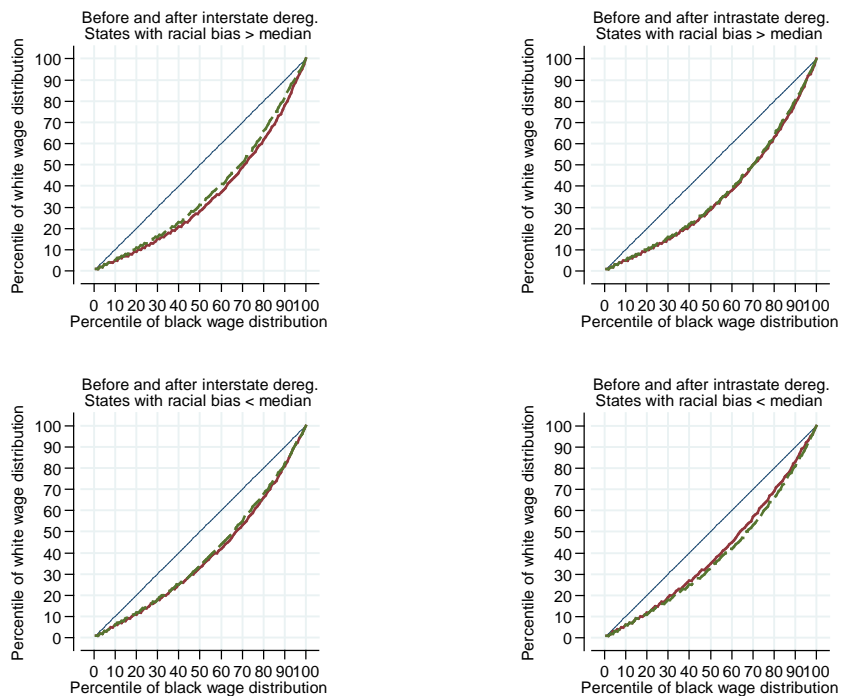
Figure 4

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)
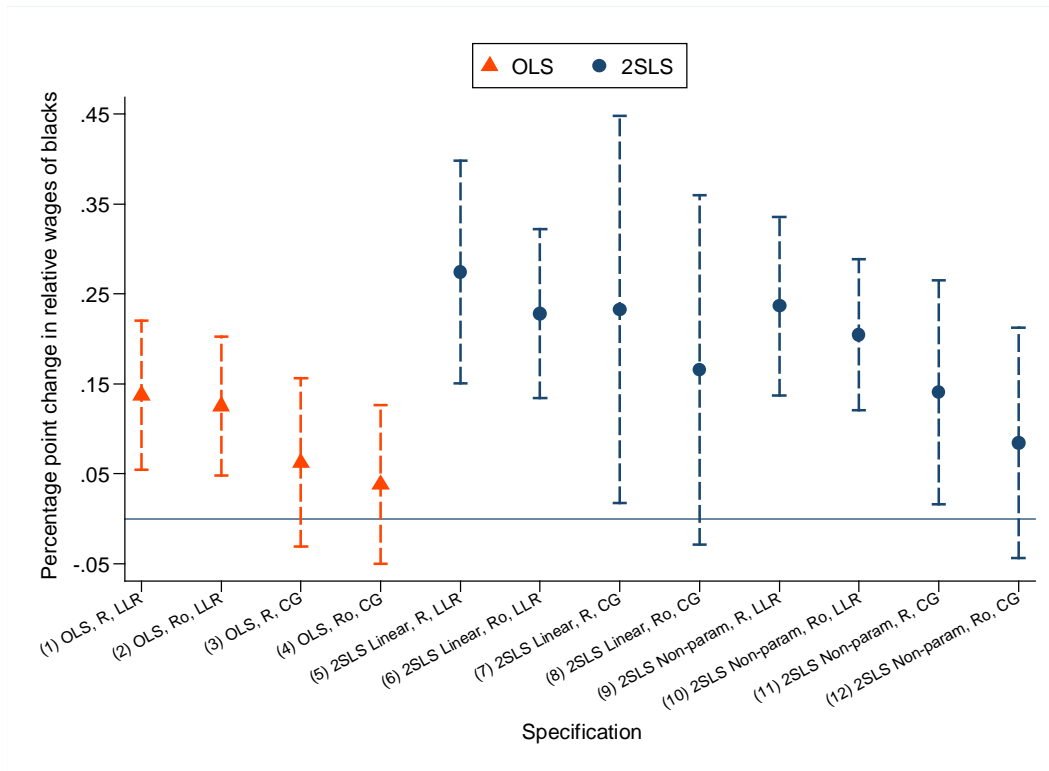
NOTE – The circles represent the estimated impact of log new incorporations per capita on the relative wages of blacks. The dashed lines represent the corresponding 95% confidence intervals, adjusted for state and year clustering. The estimated coefficients and the confidence intervals are from twelve 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.

Table 1

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

Panel A: Correlation Coefficients Between the Different Measures of Taste for Discrimination	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
	(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***
	(.026)		(.028)	(.020)
Marginal racial prejudice > median		-.058**	-.042*	-.002
		(.024)	(.025)	(.027)
Share of blacks in 1970 ≥ 10%				-.082***
				(.022)
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 pth 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 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***		.082**			
	(.031)		(.031)			
Intrastate dummy		.040	.038			
		(.041)	(.041)			
Interstate				.032**		.029**
				(.015)		(.014)
Interstate squared				-.002		-.002
				(.001)		(.001)
Intrastate					.021***	.019**
					(.008)	(.008)
Intrastate squared					-.0004*	-.0004*
					(.0002)	(.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 INDEX AND RELATIVE WAGE RATES

	1976-1994				1976-2006			
			Racial Bias Index:				Racial Bias Index:	
	All States		Below Median	Above Median	All States		Below Median	Above Median
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Deregulation index	.005*	.005**	.003	.015***	.005*	.006**	.006	.013**
	(.003)	(.002)	(.003)	(.003)	(.003)	(.003)	(.004)	(.005)
(Deregulation index) x		.005***				.004***		
(Racial bias index > median)		(.002)				(.001)		
Impact after five years	.025*	.048***	.014	.076***	.023*	.049***	.028	.063**
	(.013)	(.013)	(.016)	(.017)	(.014)	(.014)	(.020)	(.023)
Impact after five years								
as a share of sample's initial wage gap	14%	28%	9%	36%	13%	28%	19%	29%
Observations	39,899	39,899	26,021	13,878	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 clustering and appear in parentheses. All regressions include state and year fixed effects. The reported number of observations is for blacks only. Columns (1)-(4) are limited to the years 1976-1994; Columns (5)-(8) include the years 1976-2006. Details about sample construction are in Appendix Table 2. "Deregulation index" stands for years since the first deregulation. In columns (2) and (6), deregulation index 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		
	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)
Panel A: Relative Wage Rates are Conditional on Education and Potential Experience									
Log new incorporation per capita	.018	-.038	.137***	.050	-.036	.247***	.019	-.122*	.235***
	(.043)	(.027)	(.042)	(.069)	(.076)	(.075)	(.055)	(.065)	(.050)
F-test of excluded instruments (p-value)				.001	.009	.000	.000	.000	.000
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	-.030	.124***	.045	-.001	.210***	.021	-.079	.201***
	(.033)	(.019)	(.040)	(.054)	(.068)	(.061)	(.052)	(.052)	(.043)
F-test of excluded instruments (p-value)				.001	.009	.000	.000	.000	.000
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 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, years since intrastate deregulation, and two dummy variables for post-intrastate and post-interstate 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 p-value of the F-statistic from the first-stage. *, **, 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	CG	LLR	CG	LLR	CG	LLR	CG
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log new incorporation per capita	-.030	-.028	.125***	.038	.000	.005	.218***	.135
	(.020)	(.029)	(.039)	(.045)	(.069)	(.067)	(.062)	(.090)
F-test of excluded instruments (*p*-value)					.013	.000	.001	.012
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 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 years since interstate deregulation, years since intrastate deregulation, and two dummy variables for post-intrastate and post-interstate deregulation. The F-test of excluded instruments reports the *p*-value of the F-statistic from the first-stage. *, **, and *** indicate significance at the 10%, 5%, and 1% respectively.

Table 6

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	-.024	.123***	.020	.037	.181**	.005	-.043	.172***
	(.031)	(.019)	(.043)	(.054)	(.062)	(.067)	(.049)	(.040)	(.049)
F-test of excluded instruments (*p*-value)				.001	.009	.000	.000	.000	.000
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 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, years since intrastate deregulation, and two dummy variables for post-intrastate and post-interstate 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 *p*-value of the F-statistic from the first-stage. *, **, and *** indicate significance at the 10%, 5%, and 1% respectively.

Table 7

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*	
	(275)	(326)	(325)		(0.331)	
Log new incorporations per capita				59		.271**
				(80)		(.126)
Instruments:						
Years since interstate deregulation	Yes	Yes	Yes	Yes	Yes	Yes
Years since interstate deregulation squared	Yes	Yes	Yes	Yes	Yes	Yes
Years since intrastate deregulation	Yes	Yes	Yes	Yes	Yes	Yes
Years since intrastate deregulation squared	Yes	Yes	Yes	Yes	Yes	Yes
F-test of excluded instruments (*p*-value)	.000	.000	.000	.000	.000	.000
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 in parentheses. In columns (1) – (3) and (5), the standard errors are block-bootstrapped by state. In columns (4) and (6), the standard errors are clustered by state. 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. The F-test of excluded instruments reports the *p*-value of the F-statistic from the first-stage. * and ** indicate significance at the 10% and 5%, respectively.

Table 8

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 works	.067***	.069***	.063***	.066***	.070***	.071***
	(.004)	(.005)	(.005)	(.004)	(.006)	(.008)
Years since interstate deregulation	-.001		.001		-.001	
	(.001)		(.004)		(.002)	
(Years since interstate deregulation) x (1 if person works)	.001		-.0001		.001	
	(.001)		(.0021)		(.001)	
Years since intrastate deregulation		.0004		.001		.0004
		(.0006)		(.001)		(.0008)
(Years since intrastate deregulation) x (1 if person works)		-.0000		-.0007*		.0000
		(.0001)		(.0003)		(.0004)
Impact of deregulation on observable skills of black workers	-.0001	.0003	.0006	.0001	-.0002	.0004
H_0: (Years since deregulation) x (1 if person works) = 0	(.0012)	(.0004)	(.0051)	(.0013)	(.0016)	(.0005)
Observations	65,185	65,185	21,736	21,736	43,449	43,449

NOTE - The dependent variable is the predicted relative wages of blacks. We predict relative wages for all working-age blacks, whether they are working or not. 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, industry fixed effects, and occupation fixed effects. Estimates are weighted by sampling weights provided by the Current Population Survey. Standard errors are adjusted for state 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. 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: Intra-state	Inter-state	State	State code	Type of deregulation: 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
Blacks (working years 1976-1994)	39,899

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 was the latest survey available at the time of writing this paper. Most of the analyses in the paper are restricted to survey years 1977-1995 (working years 1976-1994). 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.

Appendix Table 4

MEAN CHARACTERISTICS OF THE SAMPLE, 1976-1994

	All States	Racial Bias Index Below Median	Racial Bias Index Above Median
	(1)	(2)	(3)
Age	35.4	35.8	34.8
Percent with high school diploma	42%	41%	43%
Years of potential experience	16.4	16.6	15.9
Relative log hourly wages, conditional on…			
education, experience, and state fixed effects	-.189	-.171	-.218
education, experience, state fixed effect, and industry and occupation fixed effects	-.116	-.102	-.141
education, experience, state fixed effects, and all the interactions	-.183	-.165	-.213
Observations	39,899	26,021	13,878

NOTE – The table reports mean characteristics of the sample of black workers in the working years 1976-1994. The values in the table are weighted by the sampling weights provided by the Current Population Survey. Potential experience is constructed as the maximum between zero and age minus years of completed schooling minus seven. Hourly wages are defined as real annual earnings (in the previous year) divided by the product of usual weekly working hours and annual working weeks (in the previous year). Workers with top-coded earnings have their earnings multiplied by 1.5. We trim outliers with wages below the 1st and above the 97th percentile of year-specific distribution of hourly wages of full-time, full-year workers (those who work at least 50 weeks per year and at least 35 hours per week). Relative wages are calculated using equation (2).