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SCHOOL DESEGREGATION AND BLACK TEACHER EMPLOYMENT

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ABSTRACT

Prior to the racial integration of schools in the southern United States, predominantly African American schools were staffed almost exclusively by African American teachers as well, and teaching constituted an extraordinarily large share of professional employment among southern blacks. The large-scale desegregation of southern schools occurring after passage of the 1964 Civil Rights Act represented a potential threat to this employment base, and this paper estimates how student integration affected black teacher employment. Using newly assembled archival data from 781 southern school districts observed between 1964 and 1972, I estimate that a school district transitioning from fully segregated to fully integrated education, which approximates the experience of the modal southern district in this period, led to a 31.8% reduction in black teacher employment. A series of tests indicate that these employment reductions were not due to school district self-selection into desegregation or unobserved district characteristics associated with desegregation. Additional analyses estimate changes in the occupational distribution by race in the 1960 and 1970 Decennial Censuses and indicate that displaced southern black teachers either entered lower skill occupations within the South or migrated out of the region to continue teaching, and that southern school districts compensated for reduced black teacher employment by employing fewer total teachers and by increasing their recruitment of white teachers, especially less experienced white teachers and white male teachers.

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A data appendix is available at http://www.nber.org/data-appendix/w25990

1 Introduction

From Reconstruction through the mid-1960s, the vast majority of schools in the southern United States were segregated on the basis of race. One feature of the segregated southern school systems from this period was that schools enrolling African American students were staffed almost exclusively by African American teachers as well. This practice was largely unique to the South, and in other regions predominantly black schools were often staffed by white teachers, with these regional differences reflecting the broader set of southern segregationist institutions designed to minimize social and professional contact between African Americans and whites (Foster 1997).

In conjunction with the exclusion of African Americans from nearly all other high-skill occupations in the South, the practice of staffing black schools with black teachers led teaching to constitute an extraordinarily important component of middle-class southern black employment in this period. As of 1960, 45% of southern African Americans who had completed any post-secondary education reported "teacher" as their occupation, with no other occupation reaching a 5% employment share in this population.[1]

In the years following passage of the 1964 Civil Rights Act (CRA), the southern system of de-jure school segregation was rapidly dismantled. In the fall of 1964 - notably a full decade after the landmark *Brown vs. Board of Education* ruling declared segregated schools unconstitutional - fewer than 5% of African American students in the eleven states of the former Confederacy were attending school with whites, but by the fall of 1970 this figure had grown to over 90% (Cascio et al. 2008, 2010). This fundamental reorganization of the southern public education system was a potential threat to the employment of black teachers. In principle student desegregation could have been achieved with minimal negative employment effects for black teachers by simultaneously integrating faculties, but in practice there was substantial uncertainty as to how many of the black teachers previously employed at segregated schools would be absorbed into newly integrated institutions.

The historical record contains numerous reports of black teachers being overtly fired as a result of post-CRA student desegregation. For instance a 1965 letter from a southern superintendent to the principal of a black school reads "Schools will be integrated beginning with the 1965-1966 school year in order to comply with the Civil Rights Law...and I must request you inform your teachers that [their] positions will be terminated on May 25" (US Office of Education 1965). Likewise, a trade publication from this period noted in its August 1965 issue that "The increased desegregation this fall under the new Civil Rights legislation will cause the dismissal of teachers no longer needed because of consolidated schools or classrooms. Estimates of the number of Negro teachers affected ranged from about 400 to 5,000" (Southern Education Report 1965). Reports of layoffs among black teachers were sufficiently widespread that in remarks at the National Education Association annual conference, President Lyndon Johnson promised to direct the Commissioner of Education to "pay special attention, in reviewing desegregation plans, to guard against any pattern of dismissal based on race" (National Education Association 1965).

While this anecdotal evidence makes it clear that at least some black teaching positions were eliminated following integration, it is not well understood whether the desegregation process itself systematically reduced the employment of black teachers, or how large any such negative employment effects were. Student

[1] Author's calculations using Ruggles (2015). The most common non-teaching occupations among college educated southern blacks in 1960 were private household workers (4.0%), clerical workers (3.9%), proprietors (2.6%) and nurses (2.1%). Despite the colloquialism that educated African Americans in the Jim Crow South could either "teach or preach" just 1.7% of college educated southern blacks reported clergy as their occupation in 1960, and virtually all were men.

desegregation occurred during a period of rapidly changing social and economic policy in a variety of areas that could have plausibly affected black teacher employment levels, and to a substantive extent individual school districts self-selected into particular integration paths by deciding how quickly and completely they complied with federal mandates. These factors make it difficult to reliably infer causal effects from simple associations between student integration and black teacher employment.

Furthermore, little is known about the broader educational and labor market impacts of integration-induced reductions in black teacher employment. The consequences of eliminating significant numbers of African American held teaching positions are potentially far-reaching, and include spillovers into other occupations and regions where displaced southern black teachers may have sought employment, as well as changes in the operations and white teacher recruitment practices of thousands of school districts.

To help address these outstanding questions, the current paper estimates the effect of student desegregation on the employment of black teachers in a manner that accounts for unobserved school district characteristics and non-random district selection into integration, and also quantifies various secondary consequences of reduced black teacher employment in the South during this period. Drawing on multiple archival data sources, I assemble information on student desegregation levels and the racial composition of teaching staffs for 781 southern school districts observed between 1964 and 1972. I then estimate difference-in-difference style specifications that model black teacher employment as a function of student desegregation, while accounting for time-invariant district characteristics, general year effects, and various district-year specific factors.

The primary finding is that the post-CRA desegregation process caused systematic and qualitatively large reductions in the employment of African American teachers in the South. My preferred estimates find that transitioning from fully segregated to fully integrated education, which approximates the experience of the modal southern school district during the study period, reduced black teacher employment by an average of 31.8%. A series of tests indicate that these reductions were a causal result of the student desegregation process itself: Student desegregation in future years is uncorrelated with current black teacher employment levels, the findings are robust to the inclusion of district-specific linear time trends, and the results are similar after controlling for district-year specific funding from federal, state and local sources. Observed heterogeneous treatment effects with respect to various baseline district characteristics are also consistent with a causal interpretation.

To better understand the full consequences of these employment reductions, I take advantage of the fact that student desegregation occurred primarily between the 1960 and 1970 Decennial Censuses and analyze the race-specific distributions of employment outcomes before and after desegregation. These analyses indicate that approximately one half of the southern blacks who would have held teaching positions in the absence of desegregation entered lower skill professions within the South, while the other half migrated out of the region to continue or pursue teaching. There is no evidence that displaced southern black teachers were able to readily enter other forms of professional employment within the region. I also use Census data to provide some evidence that any earnings impacts of reduced teaching employment among high-skill southern blacks were small. Additional results suggest that southern school districts both increased their recruitment of white teachers after eliminating large numbers of black held teaching positions, and also reduced their overall (all race) teacher employment levels, with these overall teacher employment reductions facilitated by white student enrollment declines and operational efficiencies from operating unified school systems. Among newly recruited white teachers, there was a notable decrease in their average age and experience level, and a notable increase in the proportion who were men.

Before proceeding, one aspect of interpreting the analysis presented below warrants clarification. While the paper finds that student integration reduced the employment of African American teachers, this does not imply that such reductions were a necessary or inevitable result of integration. Indeed, evidence from the historical record discussed below strongly indicates that the displacement of black teachers was a conscious policy choice made by the relevant school administrators, boards of education, state officials, and even federal level courts and policy makers. The presented estimates therefore correspond to the employment impacts of desegregation *as implemented in practice*, and it seems likely that student integration could have been achieved without disproportionately adverse impacts on black teacher employment had this been deemed a priority.

2 Background

Historical Context

Prior to 1954 schools throughout the southern United States maintained explicit and legally required segregation of students by race. In 1954 the US Supreme Court ruled in *Brown v. Board of Education of Topeka Kansas* that racially segregated schools violated the Equal Protection clause of the Fourteenth Amendment. However, while a subsequent 1955 case (*"Brown II"*) ordered segregated districts to integrate "with all deliberate speed" the *Brown* rulings lacked strong enforcement mechanisms and meaningful compliance only occurred in "border" states such as Oklahoma, Missouri, Kentucky, West Virginia, Maryland, Delaware and Washington DC.

Available evidence indicates that the student integration occurring in border states during this period caused substantial reductions in black teacher employment, and legal protections for displaced black teachers were virtually non-existent. In a critical test case, a suit was brought by 11 black teachers dismissed after the integration-induced closure of the sole black school in Moberly, Missouri. All 125 white teachers in the district were retained, some of whom were manifestly less qualified than the dismissed black teachers. A District Court judge refused to reinstate the black teachers, with the ruling upheld by the 8th Circuit Court of Appeals and an appeal declined by the Supreme Court, and the *Moberly* precedent was subsequently used to dismiss virtually all legal cases involving black teacher employment reductions for the next decade.[2] Calculations by a researcher at the National Education Association estimated that at least 3,000 black teachers were dismissed in the Border Region between 1954 and 1964 (Ethridge 1979) .

Despite the clear presence of black teacher dismissals in the immediate post-*Brown* period, the aggregate employment impacts of these initial desegregation efforts were ultimately limited by the fact that southern black students and teachers were heavily concentrated in the 11 states of the former Confederacy, where only token integration occurred prior to the 1964 implementation of the CRA. In contrast to the *Brown* rulings, the CRA authorized the US attorney general to bring suits directly against districts failing to desegregate, and allowed federal agencies to withhold funds from non-compliant school districts, a threat which took on new importance after passage of the 1965 Elementary and Secondary Education Act greatly expanded federal educational funding. As noted above, these policy changes led to the virtual elimination of de-jure student segregation in the South by the early 1970s, but in doing so raised the potential for larger scale reductions in black teacher employment than those experienced in the post-*Brown* period.

[2] *Brooks v. School District of Moberly, Missouri.* See accounts in Ethridge (1979) and Fultz (2004).

While the legislative language and enforcement mechanisms detailed in the CRA were very clear and effective with respect to student desegregation, they were far more ambiguous with respect to teacher employment practices or the desegregation of teaching faculties. Indeed the Act's critical Title VI, which empowered federal agencies to withhold funds to non-compliant local governments, also had language stating that "Nothing contained in this Title shall be construed to authorize action...with respect to any employment practice" and some southern school districts argued that this precluded the termination of federal funds due to district practices related to the demotions, firing or non-hiring of black teachers.

The first set of Title VI compliance guidelines issued by the Department of Health, Education and Welfare (HEW) in April 1965, which provided school districts with the conditions they needed to meet in order to receive federal education funds, were also very weak with respect to desegregating teaching faculties or protecting black teachers from unjust dismissals. A regional trade journal noted in 1965 that "faculty desegregation is...a problem on which federal officials have allowed a great deal of leeway" (Southern Education Report 1965), while Orfield (1969) describes the guidelines as "merely paying lip service to the need for equitable faculty hiring and staffing policies." In a striking statement of federal indifference towards black teachers during this initial phase of CRA enforcement, an HEW attorney told the Washington Post in 1965 that "in a war there must be some casualties, and perhaps the black teachers will be the casualties in the fight for equal education of black students (Washington Post, September 21 1965)." Court rulings in this period were also generally unsupportive of black teachers fired as part of the student desegregation process, with a federal judge commenting in a 1965 suit brought by three dismissed black teachers in Arkansas that "the Fourteenth Amendment...is not a teacher tenure law" (Detweiler 1969).

The positions of the federal government and courts on issues of faculty desegregation and employment protections for black teachers did strengthen through the late 1960s and early 1970s. The 1966 HEW compliance guidelines required districts to begin integrating their teaching staffs, on the grounds that segregated faculties restricted the rights of students to receive an education free of racial consideration (Southern Education Report 1966; Fultz 2004), although specific numerical requirements were not detailed and Cascio et al. (2010) find that the 1966 guidelines led to only token levels of faculty desegregation. A significant 1970 legal decision, *Singleton v. Jackson Municipal School District,* required districts to apply an "objective and reasonably nondiscriminatory standard" in teacher employment practices and established concrete guidelines for achieving this, and similar guidelines were adopted by HEW in 1971 (Ethridge 1979; Fultz 2004).[3] Unfortunately, the analysis reported below indicates that large-scale reductions in black teacher employment had already occurred by the early 1970s, when these stronger federal protections were put into place.

It is also noteworthy that many of the institutions which could have potentially provided employment protections for black teachers during the desegregation process had been intentionally weakened during the period of "massive resistance" that followed the *Brown* rulings. Likely the most important such institutions were state teacher tenure laws, with a trade publication reporting in 1955 that in the 18 months following the *Brown* ruling Alabama, Florida, Tennessee, South Carolina, North Carolina, Kentucky and Virginia had all made efforts to modify the state tenure laws applicable to black teachers (Southern School News 1955), and a 1965 report noted that "where tenure laws do exist, they are differentially effective in safeguarding employment rights of Negro teachers" (US Office of Education 1965). Several southern states went even further, by abolishing state constitutional requirements for public education, modifying compulsory attendance laws,

[3]Specifically, the *Singleton* ruling established the so-called "Singleton Ratio" requiring that the ratio of black and white teachers in any individual school must be "substantially the same" as in the district overall.

passing laws revoking the license of any teacher belonging to the NAACP, or closing school districts that were under federal orders to integrate (Fultz 2004; Tillman 2004).

Teacher's unions were also largely passive in representing the interests of black teachers until relatively late in the desegregation process. The main national teachers union, the National Education Association (NEA), declined to even approve any resolution supporting the *Brown* ruling until 1961, and did not desegregate its own southern affiliate organizations until 1966 (Schultz 1970). Ironically, the integration of the NEA led to the dissolution of African American teacher's unions in the South, which had been organized under the umbrella American Teachers Association, leaving black educators without a dedicated organizational voice during the height of the integration and displacement process (Fultz 2004).

On balance, the historical record can be described as indicating that throughout the southern desegregation process, African American teachers faced fierce antagonism and resistance from relevant state and local policy makers, received only modest and belated assistance from federal officials and courts, who were focused strongly on southern African American students, and received minimal support from legal and organizational institutions with the potential ability to protect their interests. These institutional features reduced the chances that student desegregation would be implemented in a manner that substantially considered its impacts on black teachers.

Existing Literature

School desegregation is the subject of a large interdisciplinary literature, with reviews provided by Rivkin & Welch (2006) and Reardon & Owens (2014). Existing empirical research has primarily focused on overall desegregation trends and differences in desegregation patterns across school districts (e.g. Logan et al. 2004; Clotfelter 2011; Cascio et al. 2008, 2010); on the extent to which integration was followed by white enrollment declines, or "white flight" (e.g. Welch 1987; Rivkin 1994; Reber 2005; Baum-Snlow & Lutz 2011; Boustan 2012); and on how exposure to desegregated schools impacted the academic, labor market and crime related outcomes of students (e.g. Guryan 2004; Vigdor & Ludwig 2008; Reber 2010; Johnson 2011; Billings et al. 2013). Overall, research on these topics indicate that segregation levels declined rapidly between 1965 and 1980 before stabilizing or moderately increasing thereafter; that desegregation led to significant declines in white enrollments, especially in large urban districts; and that attending desegregated schools improved the outcomes of African American students.

Relative to evaluations of desegregation's impacts on students, there has been very little work on integration's effects on teacher labor markets in general or on black teachers specifically. The only research I am aware of that directly evaluates post-CRA desegregation activity and black teacher employment is an early study by Ethridge (1979), which contains a table "projecting" the number of black teaching positions that would have existed in southern states as of 1972 in the absence of desegregation, then comparing these projections with the actual number of black teachers employed.[4] Ethridge (1979) concludes that "31,584 teaching positions [have] been lost by black teachers...as a result of desegregation."

Research on more recent desegregation efforts and teacher labor markets includes Oakley et al. (2009), who examine Metropolitan Statistical Areas (MSAs) undergoing court-ordered desegregation between 1970 and 2000. Using Decennial Census data aggregated to the MSA level (in many cases spanning several school

[4]While the method for projecting the number of black teaching positions are not described in detail, they appear to be calculated as the total number of black students in 1972 divided by the overall student-teacher ratio, and therefore give the number of black teachers that would have been needed if black teachers were employed in constant proportion to black student enrollments.

districts), the authors find that the desegregation of elementary schools reduced black teacher employment in southern MSAs, but increased black teacher employment in non-Southern MSAs. Additionally, Jackson (2009) studies changes in teacher characteristics following the 2002 termination of race-based busing in the Charlotte-Mecklenburg school district, which led to sharp increases in black student shares in some schools, and finds that high quality teachers were more likely to leave schools experiencing a policy-induced increase in the number of black students, suggesting important effects of student demographic composition on teacher sorting in a contemporary context of increasing segregation.

I complement these studies by implementing a research design that accounts for potential district selection into integration, by using newly assembled school-level data for a large sample of southern districts, and by focusing specifically on the South in the post-CRA period, the historical context with the most intensive desegregation activity and highest baseline levels of black teacher employment. The current paper is also novel in investigating the secondary impacts of black teacher employment reductions, such as what happened to African American teachers displaced during integration, and how school districts compensated for their decision to reduce black teacher employment levels.

3 Theoretical Framework

Before turning to estimation, I develop a simple theoretical model of school district's race-specific teacher employment decisions to help guide the empirical analysis. Two key features of the local political economy during the study period are relevant for modeling these employment choices.

First, although the Voting Rights Act of 1965 greatly reduced barriers to African American political participation and strongly affected state education financing (Cascio & Washington 2013), actual black representation on elected school boards was vanishingly small well into the 1970s (Joint Center for Political Studies 1977). Given this, I model black teacher employment choices from the perspective of white school boards and administrators with segregationist preferences.

Second, many dimensions of school district decision making in this period were heavily restricted by the legal environment. Most importantly, within five years of the CRA's implementation, districts were unable to maintain student segregation, or at a minimum faced exceedingly high costs for doing so. Conversely, prior to *Brown,* state laws actually *required* school districts to maintain complete student segregation. Given this, I consider the student desegregation level as being dictated to school districts, rather than itself being a choice variable as in the theoretical models from Margo (1990) or Cascio et al. (2010). Additionally, as early as the 1950s successful litigation campaigns by the NAACP Legal Defense Fund had largely eliminated the ability of school districts to vary class sizes or teacher salaries by race (Card & Krueger 1992a, 1992b; Carruthers & Wanamaker 2017), and I therefore treat these factors as parameters rather than choice variable as well.[5]

Given these considerations, I model school districts as choosing the racial composition of their teacher labor force in order to minimize a loss-function that is increasing in cross-racial pairings of students and teachers.[6]

[5] While teacher pay and class sizes were close to parity by 1964, it is important to note that this was not fully and universally true. For instance Reber (2010) finds a significant increase in per-pupil funding between 1965 and 1970 in the schools attended by black students in Louisiana, while Card & Krueger (1992a) find that class sizes in segregated black schools were still approximately 10% larger than those in segregated white schools as of 1964.

[6] Districts can equivalently be viewed as maximizing a utility function that is increasing in own-race teacher pairings.

This approach reflects an assumption that in the absence of full student segregation, segregationist school officials still preferred for white students to be taught by white teachers, and for black students to be taught by black teachers. Letting $Exposure_B^W$ denote the fraction of a district's student-teacher pairings that consist of white students and black teachers, and similarly letting $Exposure_W^B$ denote the rate of pairing black students with white teachers, districts minimize the following:

$$Loss = \gamma_1 Exposure_B^W + \gamma_2 Exposure_W^B. \tag{1}$$

Note that while districts are assumed to have a distaste for all cross-racial exposures, this function allows districts to place different weight on avoiding exposure of white students to black teachers than on avoiding exposure of black students to white teachers. In practice it is highly likely that the former typically took precedent, so that for most districts $\gamma_1 > \gamma_2$.

Under full student segregation, cross-racial student-teacher pairings would only need to occur to the extent that there were deviations between the racial compositions of teachers and students: If the share of white students was greater than the share of white teachers, then the excess white students would need to be assigned to black teachers, and conversely if the share of black students was greater than the share of black teachers. Therefore, under full student segregation, school districts could minimize Equation 1 (at a value of zero) simply by setting black and white teacher shares equal to black and white student shares. Such a solution conforms closely to observed pre-integration empirical patterns: Among the districts analyzed in this paper, the simple correlation between black student share and black teacher share in 1964 was .988.

In contrast, under the type of full student integration that prevailed by the early 1970s, cross-racial exposures would depend on the *overall* racial composition of students and teachers, rather than being fully avoidable by eliminating *deviations* between the racial compositions of students and teachers. In particular, let ω and β respectively denote the share of a school district's student body that is white and black, and let W and B respectively denote the share of a school district's teaching staff that is white and black. With fully integrated students, the fraction of student-teacher pairings consisting of a white student and a black teacher ($Exposure_B^W$) is simply ωB, while the fraction of student-teacher pairings consisting of a black student and a white teacher ($Exposure_W^B$) is simply βW.[7] In this case Equation 1 can be written as

$$Loss = \gamma_1(\omega B) + \gamma_2(\beta W). \tag{2}$$

Districts choose W and B to minimize this function, constrained by the identity that $W + B = 1$ (and by the non-negativity of W and B). Substituting $W = (1 - B)$ into this function and reducing produces:

$$Loss = B(\gamma_1\omega - \gamma_2\beta) + K \tag{3}$$

where $K = \beta\gamma_2$. In this equation the marginal effect of a unit increase in a district's black teacher share (B) is given by the expression in parentheses. The first term in the parentheses indicates that when a school district increases their black teacher share by one unit, their loss function increases by an amount equal to

[7] For example consider a district where both the student body and teacher labor force are 50% black and 50% white. If students and teachers are matched without regard to race, $.5 \times .5 = 25\%$ of student-teacher pairings will consist of white students and black teachers, and $.5 \times .5 = 25\%$ of student-teacher pairings will consist of black students and white teachers.

the product of their white student share (ω) and the weight that the district places on avoiding such pairings (γ_1). The second term in the parentheses indicates that a district's loss function will also fall by an amount equal to the product of their black student share (β) and the weight that the district places on avoiding pairings of black students and white teachers (γ_2).

Since the expression $\gamma_1\omega - \gamma_2\beta$ consists only of parameters that are not dependent on black teacher employment levels, it has a fixed value for each district, and this value leads districts to adopt one of two possible corner solutions: If $\gamma_1\omega > \gamma_2\beta$ the loss function is minimized at $B = 0$ and the district employs no black teachers, while if $\gamma_1\omega < \gamma_2\beta$ then the loss function is minimized at $B = 1$ and the district employs only black teachers. Given that the white elected school boards in the studied context likely placed a greater weight on avoiding exposure of white students to black teachers than vice-versa ($\gamma_1 > \gamma_2$), and that African American students were the minority in approximately 80% of the studied districts ($\omega > \beta$), it seems likely that for a large majority of the studied districts $\gamma_1\omega > \gamma_2\beta$ and the preferred level of black teacher employment after desegregation was zero.

In summary, a simple theoretical framework predicts that most school districts would have set the black teacher employment share approximately equal to the black student share prior to integration, and then reduced black teacher shares as close to zero as possible after student integration. These predicted reductions in black teacher employment are generally consistent with the main empirical findings presented below, although in practice districts rarely reduced their black teacher employment level all the way to zero. This likely reflects additional constraints not included in this simple theoretical framework such as the need to comply with HEW desegregation guidelines and with Title VII of the CRA, which prohibited race-based employment discrimination, or simply the practical short-term need to staff schools at some minimum level.

Secondary predictions of the model are that the incentive to reduce black teacher employment levels after integration was weaker in districts with larger black student shares, since in such districts employing an additional black teacher under integration led to a relatively small increase in the number of white students with black teachers (and a relatively large increase in the number of black students with black teachers), as well as in districts with a relatively low aversion to pairing white students and black teachers. These predictions are broadly consistent with heterogeneous treatment effect estimates presented in Section 5.4.

4 Data

I draw on multiple archival sources to assemble a data set with information on student desegregation levels and race-specific teacher employment levels for a panel of southern school districts in the 1960s and early 1970s. This section provides an overview of the utilized data, with additional details reported in Online Appendix A.

For the 1968, 1970 and 1972 school years I utilize surveys conducted by the US Office of Civil Rights (OCR).[8] The OCR surveys were part of the federal government's efforts to monitor compliance with the CRA, and collected school-level counts of students and teachers, disaggregated by race. The OCR sample for the 1968, 1970 and 1972 school years was quite comprehensive, and included approximately 75,000 individual schools

[8] These surveys were generously converted from the original binary files and made publicly available by Ben Denckla and Sarah Reber of UCLA, who are gratefully acknowledged. Note that throughout the paper "school years" refer to the calendar year in which an academic year began, so that for instance the "1968 school year" refers to the academic year beginning in the fall of 1968 and ending in the spring of 1969.

located in 8,000 school districts nationwide. All school districts with enrollment greater than 3,000 were included in the sample, and districts with enrollment between 300 and 3,000 were subject to probability sampling proportionate to their enrollment totals. Additionally, school districts of "special interest" to the OCR were included irrespective of size, typically those with histories of compliance failure, which in practice meant that a large majority of southern school districts were included. Once a school district was selected, all of the schools within the district were surveyed.

The main shortcoming of the OCR surveys is that no data collection occurred prior to the 1968 school year, when the southern student desegregation process was well underway.[9] I therefore draw on two additional data sources to extend the series back to the beginning of the desegregation process.

First, for the 1967 school year, I have transcribed information contained in a print publication of the National Center for Education Statistics titled *Directory, Public Schools in Large Districts with Enrollment and Staff, by Race, Fall 1967* (NCES 1967). The foreword of this directory indicates that it was "a single-time publication, developed to meet a specific, timely need for information" and was "conducted for administrative purposes rather than for research, [but] the statistics were deemed to be of sufficient general interest for publication." The directory contains school-level information on the number of students and instructional staff, disaggregated by race, for a sample of school districts very similar to the districts contained in the OCR surveys from 1968, 1970 and 1972.

Second, for the 1964 school year, which was the last school year before large scale student desegregation occurred, I have transcribed data from print copies of annual reports issued by state departments of education and state superintendent's offices, which contain race-specific counts of students and teachers at the district level.[10] The required information was contained in reports issued by eight states from the former Confederacy, specifically Alabama, Georgia, Louisiana, Mississippi, South Carolina, Tennessee, Texas and Virginia.

Districts employing no black teachers in 1964 are excluded, as are districts not observed in any of the five available years. After applying these restrictions the working data set is a balanced panel of 781 school districts from eight states. As a robustness check I demonstrate that the results are similar when using a larger sample of 1,263 school districts from all eleven states of the former Confederacy (which includes the states listed above plus Arkansas, Florida, and North Carolina), but with the data series necessarily restricted to the 1967, 1968, 1970 and 1972 school years.

One issue with the state reports used for the 1964 school year is that race-specific enrollment totals are reported at the district level, rather than the school level, so that the number of black students attending school with whites is not directly observable. For 1964 I instead assign each district the level of student desegregation which occurred at the state level using transcriptions of a print publication titled *A Statistical Summary, State by State, of School Segregation Desegregation in the Southern and Border Area from 1954 to the Present, 14th Revision* (Southern Education Reporting Service 1964).[11] These imputations will have

[9] In addition to the utilized 1968, 1970 and 1972 waves, OCR surveys were conducted in 1969, 1971, 1973, 1974, 1976, 1978 and 1980, but in most of these years the number of surveyed districts was much smaller than the 1968, 1970 and 1972 samples, and no surveys were fielded prior to 1968. Additionally, data collection on teachers was not included after 1972 because responsibility for collecting this information was transferred to the Equal Employment Opportunity Commission.

[10] The utilized publications are Alabama Department of Education (1964); Georgia State Department of Education (1964); State Department of Education of Louisiana (1965); Mississippi State Department of Education (1963); South Carolina State Department of Education (1964); Tennessee Department of Education (1963); Virginia State Board of Education (1965); and Texas Education Agency (1965). For some states 1964 data was not available because only biennial reports were issued or because race-specific reporting was discontinued in the lead-up to CRA implementation, and in these cases I use the latest available data prior to 1964, which in practice came from either 1962 or 1963. See Online Appendix A.

[11] While later revisions of this publication reported district level desegregation data, the smallest geographic units available in 1964 are states.

minimal practical impact, however, because virtually no student desegregation had taken place at this point within the former Confederacy, with less than 3% of black students attending desegregated schools during the 1964 school year.

I use the described data sources to construct district-year level measures of student desegregation and black teacher employment. Specifically I measure a district's student desegregation level as the percentage of its black students attending a school where 5% or more of the enrolled students were white, and measure a district's black teacher employment level using both the share of all teachers in the district that were black and the natural log of the number of black teachers in the district.[12] I also calculate, for each district-year, the total number of students (of all races), the fraction of students who are black, and the total number of teachers (of all races), and use these measures as control variables or weights in some specifications.

Basic descriptive statistics are presented in Table A1 of Online Appendix A, which shows that the average district in the working sample employed 301 teachers (75 of whom were black) and enrolled 7,006 students (2,115 of whom were black). Table A1 also reports the standard deviation, 10th and 90th percentiles of these variables, which indicate a large amount of variation around the reported means, reflecting the fact that there are a relatively small number of both very large districts (typically in urban areas) and very small districts (typically in rural areas). The share of observations from each state are also reported, and show that Texas has the largest share of districts in the working sample at 32.1%, with Georgia, Virginia and Alabama each representing more than 10% of the districts in the sample. Descriptive statistics for the larger 11-state sample (observed beginning in 1967) are also reported, and the districts in this expanded sample have basic characteristics very similar to those observed in the 8-state sample.

Figures 1 and 2 present descriptive evidence on the relationship between student desegregation and black teacher employment in the working sample.

Figure 1 plots the mean student desegregation level and the mean share of teachers who were black for the studied districts in each year. The figure documents a clear, negative time-series association between student desegregation and the black teacher employment share during the study period. Specifically, the share of black students attending desegregated schools in the average district increases from less than 5% in 1964 to just under 40% in 1968, then accelerates after 1968 and reaches approximately 90% by 1970 and is stable thereafter. Trends in the share of black teachers in the studied districts follow a very similar but inverse pattern, falling from 30.6% in 1964, to 28.2% in 1968, to 24.2% in 1972, a total decline of 6.4 percentage points or 21%.

Figure 2 examines cross sectional associations between student integration and black teacher employment for the 1964 school year (before substantive desegregation began), the 1968 school year (when desegregation was approximately half complete) and the 1972 school year (when the vast majority of southern black students attended desegregated schools). The figures indicate that at all stages of the desegregation process, there was a strong cross-sectional association between student desegregation and black teacher employment shares, with more integrated districts employing a smaller share of black teachers. This was the case even in 1964, when only token desegregation had occurred, with districts from states engaging in higher levels of token integration (e.g. 7.2% in Texas rather than .02% in Alabama) also having a lower fraction of black teachers.

[12] The use of a 5% threshold prevents large numbers of black students from being classified as attending desegregated schools in cases where a very small number of white students entered a predominantly black school, although desegregation patterns of this kind were exceedingly rare in practice. In Online Appendix B I show that the results are not sensitive to alternative student integration measures, such as the dissimilarity or exposure index.

In the next section, I utilize difference-in-difference specifications to study the extent to which the descriptive evidence of negative black teacher employment impacts from student desegregation displayed in Figures 1 and 2 reflect a systematic causal relationship.

5 Empirical Strategy and Main Findings

5.1 Empirical Strategy

The paper's primary research question is how the implementation of student desegregation impacted the employment of black teachers. Figures 1 and 2 provided suggestive evidence of negative employment impacts by examining aggregate trends over time (Figure 1) and cross-sectional associations within particular years (Figure 2). However, standard omitted-variable and selection bias concerns prevent these relationships from having credible causal interpretations.

In particular, the nature of student desegregation varied systematically with numerous school district characteristics (Cascio et al. 2008), some of which may be unobserved, and school districts exercised substantial local autonomy in deciding how quickly and completely they implemented the student desegregation required by the CRA. These factors may cause districts with different student desegregation levels or trends to also differ with respect to unobserved characteristics that affected teacher employment practices, for instance the prejudicial attitudes of a school district's parents and administrators, the intensity of real or anticipated federal scrutiny, or the levels of state and local tax revenues and other school funding sources, among other possible confounders. These potential issues are exacerbated by the rapidly evolving social and economic policy environment of the study period.

To help address these issues and isolate the impact of student desegregation on the employment of black teachers, I estimate regression models of the following form:

$$ln(BlackTeachers_{dy}) = \beta StudentDesegregation_{dy} + \gamma_d + \delta_y + X'_{dy}\rho + \varepsilon_{dy} \quad (4)$$

where $ln(BlackTeachers_{dy})$ denotes the natural log of the total number of black teachers in school district d and year y; $StudentDesegregation_{dy}$ denotes the fraction of black students in district d and year y who are attending desegregated schools; γ_d and δ_y are district and year fixed-effects, respectively; and X'_{dy} is a vector of time-varying school district level characteristics.[13] The primary coefficient of interest is β, which estimates the conditional percent change in the size of a school district's black teacher labor force that is associated with a school district's student body going from fully segregated to fully integrated.

Equation 4 is a difference-in-difference specification with a continuous treatment variable, where the included district fixed-effects account for unobserved time invariant district characteristics and the included year fixed-effects account for unobserved determinants of black teacher employment affecting all school districts in a given year. The main identifying assumption for this model is the so-called common trends assumption, which in the current context requires that school districts executing different student desegregation paths

[13] To preserve district observations that employed a positive number of black teachers in 1964 but zero black teachers in a subsequent sample year, the dependent variable is transformed as $ln(BlackTeachers_{dy} + 1)$. This transformation preserves observations from 14 districts, and in Online Appendix B I show that the results are virtually identical if these districts are instead excluded.

over the study period would have had similar black teacher employment levels in the absence of these policy differences. Below I conduct several tests that probe the accuracy of this identifying assumption, and the results generally support its validity.

5.2 Baseline Results

My preferred estimate of Equation 4 is reported in Column 1 of Table 1. This baseline specification does not include any controls in the X_{dy} vector and gives equal weight to each school district. Standard errors are clustered at the district level and reported in parentheses.

The estimated coefficient for the student desegregation variable in the model reported in Column 1 is -.382, which after exponentiation indicates that a school district going from fully segregated to fully integrated reduced black teacher employment by 31.8%, conditional on time-invariant district characteristics and year-specific determinants of black teacher employment. This estimate is highly statistically significant (P<.01).

In interpreting the results in Column 1 of Table 1, it is important to note that the estimated 31.8% reduction in black teacher employment is relative to a counterfactual environment in which student desegregation did not take place, and does not directly imply that 31.8% of existing southern black teachers lost their positions. While school districts did face substantially less scrutiny of their employment practices than their student integration practices, in most cases they were still constrained in their ability to simply fire the totality of their black teachers immediately after student integration, for instance due to Title VII requirements, HEW compliance guidelines, and basic minimum staffing needs. Furthermore, below I document that the total number of teachers (of all races) employed by southern districts declined with student integration, both because of white-flight induced student enrollment declines and because of operational efficiencies associated with administering a single unified school system, for instance operating fewer school buildings and having higher aggregate student-teacher ratios. These factors would reduce the need for districts to directly terminate existing black teachers.

Historical accounts also indicate that while outright firings did occur, less overt mechanisms of reducing black teacher employment were common as well. Changing the racial composition of new hires appears to have been at least as important as outright dismissals, with a 1970 report prepared by the Race Relations Information Center noting that "it is in the [non] hiring of black teachers - rather than the firing - that the biggest catastrophe for blacks probably lies" (Hooker 1970). Accounts of policies designed to hasten the departure of black teachers after integration are common as well. For instance Fultz (2004) notes that many black teachers faced various forms of demotion after integration, such as downgrading veteran black teachers to substitute teacher or subordinate "co-teacher" positions and re-assigning black high school teachers to the elementary level. These demotions led some black teachers to resign, while others protested and were dismissed for insubordination, and their positions could then be filled by white teachers or simply left vacant as operations were scaled down. The use of the National Teacher Examination expanded in southern states in this period as well, and was sometimes used as a pretext for dismissing or not hiring black teachers. This occurred to a sufficient extent that in the early 1970s courts ruled against school districts in Louisiana and Mississippi that had dismissed black teachers on the basis of NTE scores.[14]

[14] The relevant cases were *Carter v School Board of West Feliciana Parish* and *Baker v. Columbus*. See discussion in Ethridge (1979).

The specification in Column 1 did not include any time varying district characteristics as covariates. Column 2 of Table 1 reports results where the X_{dy} vector contains a variable measuring the log of total teacher employment (of all races) in each district year. This covariate was excluded from the baseline specification because it is itself likely to have been affected by the student desegregation process via the discussed mechanisms of reduced enrollments and improved operational efficiency. As a result, controlling for total teacher employment arguably abstracts away from important aspects of how the desegregation process affected black teacher employment, leading me to prefer the more parsimonious specification reported in Column 1. These points notwithstanding, the extent to which student desegregation reduced black teacher employment above and beyond any general teacher disemployment effects is of potential interest as well, and Column 2 shows that the estimated coefficient on the student desegregation variable declines only slightly to -.346 after the inclusion of the total teacher employment control. This indicates that the baseline estimate in Column 1 did not simply reflect race-neutral reductions in total teacher employment during desegregation, but rather that a highly disproportionate share of the teaching positions eliminated during desegregation were held by black teachers.[15]

Another potentially important modeling choice in the baseline specification was that it gave each school district in the sample equal weight. This choice reflected the fact that each district is a distinct entity making decisions about its levels of student desegregation and black teacher employment, such that unweighted results estimate how the *average* school district responded to student desegregation, and follows previous work in this area (e.g. Cascio et al. 2010). However, since school districts are of highly variable sizes and racial compositions, it is arguably preferable to give greater weight to districts with a larger potential impact on total black teacher employment. Column 3 of Table 1 reports results that weight districts by the number of black teachers they employed in 1964, prior to substantive student desegregation, and when these weights are applied the estimated effect of full student integration is reduced to .317 log points, or 27.2%, which is moderately smaller than the baseline estimate of 31.8%. While both the unweighted and weighted estimates are of interest, the baseline unweighted estimates are a better measure of how the typical school district responded to integration, while the weighted estimates are preferable if the objective is to assess the effect of integration on total black teacher employment. With respect to the latter, the studied districts employed 56,364 black teachers in the 1964 school year, so that a 27.2% reduction represents the elimination of over 15,000 black held teaching positions. Since the current sample includes only eight of the eleven states in which intensive student desegregation activity was occurring in this period, and has less than full coverage within these eight states, this is a lower bound for the actual number of eliminated black held teaching positions in the region.

A series of additional robustness and specification checks are presented in Online Appendix B. These include specifications that use alternative measures of black teacher employment; specifications that use a Negative Binomial estimator to account for the over-dispersion of black teacher counts; specifications that utilize the eleven state sample available from 1968-1972 rather than the eight state sample from 1964-1972; specifications that exclude districts that may have undergone a split or a merger during the study period and specifications that aggregate to the county level to account for possible district reorganizations; and specifications that use dissimilarity and exposure indices to measure student desegregation levels. In all cases the qualitative findings from the preferred specification in Column 1 of Table 1 are unchanged.

[15] A similar conclusion can be drawn from the estimated coefficient on the total teacher employment variable reported in Column 2, which indicates that within the studied context a 1% increase in total teacher employment was associated with just a .77% increase in black teacher employment.

5.3 The Validity of the Identifying Assumptions

As noted, the main identifying assumption of the reported analyses is the so-called common trends assumption, which in the current context holds that school districts with different student desegregation paths would have had similar black teacher employment levels in the absence of these differences in student integration. Columns 4-6 of Table 1 present the results of several tests that evaluate the validity of this key assumption.

One method of allowing for limited departures from the common trends assumption is to add interactions between a linear year variable and school district indicators to the baseline specifications. The inclusion of these interactions allows any underlying trends in black teacher employment to vary linearly across each individual school district. This flexibility comes at the cost reduced precision, since much of the variation in student desegregation within school districts will be absorbed by the linear trends.

The results of a specification with district specific linear time trends are reported in Column 4 of Table 1, and are very similar to the baseline results in Column 1, with complete student integration estimated to reduce black teacher employment by .409 log points. As expected, the standard errors in this specifications increase substantially, but the estimate remains statistically significant at the 1% level. These results suggest that the main findings in Column 1 are not an artifact of different underlying trends in black teacher employment practices for school districts implementing different student desegregation policies.[16]

The validity of the identifying assumptions can also be tested by examining the extent to which the timing of changes in black teacher employment levels corresponded to changes in student desegregation. In particular, if reductions in the employment of black teachers are a causal effect of student desegregation, then current period levels of black teacher employment are likely to be (conditionally) independent of student desegregation occurring in future periods. For instance black teacher employment levels during the 1968 school year are expected to be influenced by student desegregation levels during the 1968 school year, and perhaps more weakly by student desegregation levels in earlier school years, but not by student desegregation levels in school years *after* 1968. While it is plausible that some districts reduced black teacher employment in anticipation of more stringent desegregation requirements, it would have been difficult for a particular district to precisely determine the degree of scrutiny it may face and in which specific year that scrutiny may occur. As a result, anticipatory black teacher employment reductions, to the extent that they existed, would likely not be strongly correlated with actual future desegregation activity. Given this, any substantively or statistically significant relationships between black teacher employment outcomes and leading values of student desegregation would raise concerns that the estimates reported in Column 1 reflect unobserved characteristics of desegregating districts rather than student integration itself.

Column 5 of Table 1 reports the results of a model that contains two leading values of the student desegregation variable in addition to its contemporaneous value. Note that the inclusion of each leading value eliminates one year of data, so that the model in Column 5 excludes the teacher employment data from 1970 and 1972, with a corresponding reduction in sample size.[17] The estimated effect of the contemporaneous

[16] A limitation of district specific linear time trends is that any underlying district trends are only allowed to vary in a linear fashion, which is a restrictive assumption in a context of highly discontinuous change such as the Civil Rights era South. An alternative approach is to include state-year interactions, which allows for geographically specific and non-linear time effects, but only at a state (rather than school district) level of aggregation. When state-year interactions are added to the baseline specification (not shown), the coefficient on the student desegregation variable is virtually unchanged at -.40, with a standard error of .036.

[17] Also note that given the data structure, the number of actual calendar years contained in a two period lead varies. Specifically, the model in Column 5 estimates how black teacher employment in 1964 is influenced by student desegregation in 1967 and 1968; how black teacher employment in 1967 is influenced by student desegregation in 1968 and 1970; and how black

student desegregation variable remains negative and statistically significant, while the coefficients on the leading values are small and statistically insignificant. (The increased magnitude of the contemporaneous desegregation coefficient in Column 5 is due to the different composition of the sample, and when a specification with only contemporaneous effects is estimated using the same sample as Column 5 the coefficient on student desegregation is -.633). This lack of conditional associations between current black teacher employment levels and future levels of student desegregation suggests that the baseline results in Column 1 reflect causal relationships rather than the effects of unobserved district characteristics. These findings also suggest that any anticipatory reductions in black teacher employment were not strongly correlated with the timing of future desegregation in particular districts, although to the extent to which there were any general anticipatory reductions in black teacher employment prior to the actual implementation of student desegregation, the baseline results underestimate the effect of integration on black teacher employment.[18]

Additional threats to identification come from the fact that school desegregation took place within a rapidly changing policy environment, most notably the introduction of War on Poverty and Great Society programs such as Medicare, Medicaid, Head Start, and the Food Stamp program, many of which were rolled out in 1964 or 1965. This raises the potential concern that the effects of student desegregation on black teacher employment reported above may partially reflect these other policy changes rather than school integration itself. However, for concurrent policies to confound the impacts of school desegregation, the timing of their implementation would need to corresponded with the timing of desegregation *within school districts*, and the other policies would also need to have a negative impact on the employment of black teachers specifically, both of which seem unlikely for the listed policy changes.[19]

The concurrent policy change which appears to have the most potential to confound the estimated effects of school desegregation is Title I of the 1965 Elementary and Secondary Education Act (ESEA), which allocated approximately $7 billion of new federal funds (in current dollars) for distribution to local school districts. The funding formula used to allocate Title I funds sent more dollars to school districts located in counties with higher numbers of low income 5-17 year-olds as of the 1960 Census, which in practice favored more heavily African American districts. Additionally, Title I funds could be denied to school districts not meeting desegregation requirements, and previous research indicates that districts did indeed change their desegregation policies in response to these funding incentives (Cascio et al. 2008, 2010).[20] These features of Title I funding policy cumulatively led to significant associations between the desegregation policies of southern school districts and their levels of Title I funds, raising the possibility that the impacts of student desegregation identified above actually reflect the impacts of federal education funding levels.

One ex-ante reason to be skeptical of this explanation is that because desegregating districts and districts with higher black enrollment shares typically received *more* Title I funding, if anything Title I funds would be expected to have *positive* effects on black teacher employment, as additional funding flowed to districts with

teacher employment in 1968 is influenced by student desegregation in 1970 and 1972.

[18] Models that include two *lagged* values of the student desegregation variable (not shown) find that the contemporaneous effect of student desegregation was -.141 log points (P<.01), the effect of student desegregation in the previous period was -.093 log points (P<.01), and that student desegregation two periods prior has a statistically insignificant point estimates of .026 log points. Because a one period lag in the current data structure in many cases represents two school years, these results suggest that the full effect of student desegregation on black teacher employment took 1-4 years to fully materialize.

[19] The estimated effects of school desegregation may also be confounded by other provisions of the CRA, most importantly Title VII, which prohibited racial discrimination in employment settings, and changing regional migration patterns in this period are also a potential issue. These possibilities are discussed and analyzed further in Section 6 below.

[20] The withholding of Title I funds for noncompliance with the CRA's school desegregation provisions ended when President Nixon took office in 1969, but by this time a great deal of desegregation activity had already taken place and federal courts had established more vigorous and enforceable desegregation requirements (Cascio et al. 2013).

more progressive desegregation policies and higher black enrollment shares. This point notwithstanding, it is possible to evaluate the potential role of Title I more directly by including controls for district financing levels from various sources, with the required data collected and generously made available by Cascio et al. (2013) for a subset of the districts and years studied here.[21] Column 6 of Table 1 uses this school finance data to estimate a model that includes controls for total district revenue from federal, state and local sources, and the estimates are almost identical to the baseline estimates in Column 1.[22] This suggests that the estimated impacts of student desegregation from Column 1 were not an artifact of the introduction of Title I.

5.4 Heterogeneity

Additional insight into the nature of black teacher displacement due to integration can be gained from examining the extent to which this displacement varied across different types of school districts.

The theoretical framework developed above suggested that one potentially important dimension of heterogeneity is a district's black student share, since in school districts with larger white student shares there is a greater marginal effect of black teacher employment on the exposure of white students to black teachers. Figure 3A reports the results of estimating the model reported in Column 1 of Table 1 separately within each quintile of the initial (1964) share of black students (with the absolute values of the student desegregation variable plotted). The figure indicates that the relative level of displacement was indeed weaker in districts with a relatively large share of black students prior to desegregation. For instance in districts from the first quintile of 1964 black student share distribution, where on average just 6% of the students were black prior to integration, desegregation resulted in a .48 log point reduction in black teacher employment. In contrast, for districts in the fifth quintile of 1964 black student share, where on average 64% of the students were black prior to integration, the analogous reduction was approximately .19 log points.[23]

Another potentially relevant dimension of heterogeneity is a district's overall size. For instance very large urban districts that were already operating both black and white systems at very large scales (e.g. Atlanta, Dallas, Memphis or New Orleans) may have experienced minimal gains in labor efficiency from transitioning to a single integrated system, whereas for smaller rural districts integration may have substantially reduced the total number of necessary teachers, with a disproportionate share of any layoffs falling on black teachers. Differing racial attitudes among parents and elected school boards in larger, more urban districts could have plausibly led to lower levels of aversion to cross-racial student teacher pairings as well (reflected in the γ terms in the model above), implying smaller reductions in black teacher employment after integration, and large urban districts may have also been under greater federal and judicial scrutiny.

Figure 3B reports the results of estimating the baseline specification separately for each quintile of the pre-integration total student distribution. The figure indicates that within the smallest quintile of districts, enrolling an average of 970 students in 1964, complete student desegregation resulted in a .48 log point reduction in black teacher employment. The magnitude of black teacher disemployment falls as progressively

[21] Cascio et al. (2013) entered these data by hand from print reports by state departments of education. The most important differences in the utilized samples of school districts is that the school finance data is not available for Texas or for the 1972 school year.

[22] Measures of state and local revenue are included in addition to federal revenues because state and local funding levels may have changed in response to increased federal revenue under Title I.

[23] In practice, district level black student shares were very closely correlated with black teacher shares prior to integration. Given this, an alternative but not mutually exclusive interpretation of the results in Figure 3A is that districts with relatively large numbers of black *teachers* prior to integration found it logistically or politically difficult to fill the necessary teaching positions without absorbing substantial numbers of existing black teachers into the integrated schools.

larger districts are analyzed, and for districts in the top quintile of total enrollment, enrolling over 21,000 students on average in 1964, black teacher employment was reduced by .27 log points due to integration.

6 Secondary Impacts of Black Teacher Displacement

The large scale of the reductions in black teacher employment documented above imply that the impacts of displacement were unlikely to be confined specifically to southern African American teachers, but instead engendered a significant overall restructuring of the teacher labor market in the South, with potential spillovers into other labor markets and regions as well.

From the perspective of school districts, hiring white additional teachers to compensate for reduced black teacher employment was one possibility, but the combination of efficiencies from operating a unified school system and white-flight induced enrollment reductions also may have allowed districts to instead simply reduce their overall teacher employment levels. Conversely, from the perspective of high-skill southern black workers, the elimination of large numbers of black-held teaching positions presumably led some individuals to enter other fields, and the employment outcomes of these individuals have important implications both for the welfare of displaced teachers and the extent to which displacement generated spillovers into other labor markets and regions.

In this section I use the administrative data from the baseline models, as well as data from the Decennial Censuses, to quantify the broader impacts of the documented elimination of black held teaching positions in the South. I first examine changes in school district operations and staffing practices during the desegregation process, then turn to the question of what alternative employment outcomes offset the reduction in teaching employment among southern African Americans, and finally provide evidence on the earnings impacts of reduced teaching employment among high-skill southern blacks.

6.1 Changes in District Operations and White Teacher Recruitment

To better understand how districts modified their operations after student desegregation, Table 2 reports the results of estimating models that are similar to the preferred specification in Column 1 of Table 1, but that replace black teacher employment levels with various other district characteristics as the dependent variable. The most important finding is reported in Column 1, which uses the log of total teacher employment (of all races) as the dependent variable and finds that student integration caused a statistically significant reduction in total teacher employment of 4.7%.

A district's total teacher employment level is mechanically equal to the product of its total student enrollments and its student-teacher ratio. Columns 2 and 3 of Table 2 report results that use the log of total student enrollment and the log of the student-teacher ratio as dependent variables, and find that both margins were likely important in accounting for the overall reduction in teacher employment. The results in Column 2 indicate that going from fully segregated to fully integrated education reduced total student enrollment by 3%. Notably, this overall enrollment decline is driven at least in part by relative reductions in white enrollment, with the share of students in the studied districts who were white falling from 71.4% to 68.7% between 1964 and 1972, which is consistent with previous work (e.g. Reber 2005; Baum-Snlow & Lutz

2011). The results in Column 3 indicate that desegregation was also associated with a 1.8% increase in the student-teacher ratio, although this estimate is not statistically significant at conventional levels (P=.142).

The final column of Table 2 uses the log of total operational school buildings as the dependent variable, since the closure of previously all-black school buildings is commonly reported in historical accounts, although I caution that this variable is only available from 1967 onward, with a corresponding sample size reduction. The results indicate that a statistically significant 17.4% reduction in the total number of schools occurred during integration, and the resulting operational efficiencies may partially explain the documented changes in student-teacher ratios and total teacher employment.

Given the reductions in overall teacher labor demand documented in Column 1 of Table 2, a significant portion of the eliminated teaching positions previously held by African Americans could have simply gone unfilled. However, in many cases the black teacher employment reductions documented above would have still necessitated the recruitment of substantial numbers of new white teachers. Specifically, as of 1964 the average district in the working sample had a teacher labor force that was 31% black, so that the baseline estimate of a 32% reduction in black teacher employment would have reduced total teacher employment by $.31 \times .32 \approx 10\%$. The fact that the actual reduction in total teacher employment from Table 2 was only 4.7% implies that some additional hiring of white teachers occurred, and the overall impacts of integration-induced black teacher employment reductions therefore include a corresponding increase in white teacher recruitment. One important question is what the characteristics of these new white teachers were, for instance their qualifications, age and gender composition, and region of origin.

Table 3 explores this issue by reporting mean changes in these characteristics among southern white teachers between the 1960 and 1970 Decennial Censuses (Columns 1-3) and among southern white professionals who were not teachers over the same period (Columns 4-6).[24] The final column of Table 3 reports the change in each studied characteristic between 1960 and 1970 among southern white teachers relative to other southern white professionals. Comparing trends across these two groups will help distinguish any changes that were specific to southern white teachers from broader demographic and labor market trends occurring over this period. However, changes in the characteristics of southern white professionals are unlikely to fully capture the counterfactual changes in the characteristics of southern white teachers that would have occurred in the absence of desegregation, and these comparisons are therefore best interpreted as being primary descriptive

With respect to southern white teachers themselves, Columns 1-3 indicates that the average age of this population fell from 42.13 in 1960 to 39.39 in 1970, a decrease of 2.74 years, and additionally that in 1970 the average southern white teacher was 2.8 percentage points more likely to be male, 5.8 percentage points more likely to have been born outside of the South, and had completed .075 more years of education than the average southern white teacher in 1960. However, Columns 4-6 of Table 3 indicate that these changes in part reflect more general trends occurring among all southern white professionals over this period, particularly the increases in southern white professionals not born in the region and the increases in educational attainment.

The final column of Table 3 calculates the change in each characteristic among southern white teachers over this period relative to other southern white professionals. These estimates indicate that the largest relative changes in white teacher characteristics occurred with respect to age and gender, with the average southern white teacher 2.82 years younger (P<.01) and 5.4 percentage points more likely to be a male (P<.01) in 1970 than in 1960. A small and statistically insignificant increase in non-southern birth is observed, as is a

[24] Here and in the analyses reported below "professionals" are defined using occupational codes 0-99 of the 1950 Census Bureau occupational classification system, which indicate "Professional and Technical occupations."

statistically significant but qualitatively modest reduction of .119 years of educational attainment (P<.05). The substantial relative reduction in the average age of white teachers, in conjunction with modest relative reductions in their educational attainment, implies that the potential experience of southern white teachers decreased significantly between 1960 and 1970 as well.

Overall, the results in Table 3 provide suggestive evidence that southern school districts filled teaching positions which would have been held by African Americans in the absence of student integration by recruiting younger and less experienced white teachers, and by recruiting white male teachers. There is also some evidence that southern districts may have modestly increased their recruitment of less educated white teachers and white teachers born outside of the region.

6.2 Employment Outcomes of Displaced Black Teachers

The main estimates from Table 1 are not informative with respect to the subsequent labor market outcomes of southern blacks who would have been teachers in the absence of desegregation, but this question is critical for understanding the full impacts of integration-induced displacement, including spillovers into other labor markets and the welfare of displaced black teachers.

For instance, it is possible that some southern African Americans who would have held teaching positions in the absence of integration instead readily entered into other types of professional employment in the South. Indeed, it is plausible that some of the documented black teacher employment reductions were voluntary, given that the concurrent implementation of Title VII led to general improvements in the employment opportunities of southern blacks. Alternatively, displaced southern black teachers may have entered non-professional occupations within the South, may have been forced to migrate out of the region in order to pursue or continue their teaching careers, or may have become unemployed or withdrawn from the labor force, and these possibilities have substantially different implications for the welfare of displaced teachers and the broader labor market effects of the documented black teacher employment reductions. Below I use Decennial Census data and two distinct empirical approaches to better understand what types of labor market outcomes corresponded to the documented reductions in teaching employment among southern blacks.

Race-Specific Occupational Distributions

While no existing data sets track a large sample of southern black workers before and after school desegregation longitudinally, the bulk of southern desegregation activity occurred between the Decennial Censuses of 1960 and 1970, which allows me to observe cross-sections of employment outcomes before and after integration within large racially and regionally diverse samples. My main approach for estimating the outcomes of displaced southern black teachers simply compares changes in the occupational distribution of high-skill southern blacks between 1960 and 1970 to changes among high-skill southern whites over the same period.

Specifically, I first draw a sample of non-Hispanic black and white respondents from the 1960 and 1970 Censuses who were (1) born in one of the eleven states of the former Confederacy; (2) had completed at least one year of post-secondary education and; (3) were from the 1904-1935 birth cohorts, such that they were ages 25-55 in 1960 and ages 35-65 in 1970. These sample restrictions were chosen to focus on a population that was likely to have been directly affected by changes in the southern teacher labor market during desegregation. I next classify each individual into one of six exhaustive and mutually exclusive employment categories based on their employment status, occupation, and region of residence, with the six categories

chosen to capture to the broad classes of employment outcomes that could have occurred among individuals who were southern teachers prior to student desegregation or would have entered teaching in the absence of desegregation. The six utilized categories are (1) southern teachers; (2) southern professionals other than teachers; (3) southern non-professionals; (4) teachers outside of the South; (5) non-teachers outside of the South and; (6) unemployed or out of the labor force.

I then analyze which employment categories became more and less common between 1960 and 1970 for high-skill southern-born blacks relative to high-skill southern-born whites by estimating regressions of the following form:

$$EmploymentCategory_{iy} = \beta_1 Black_i + \beta_2 Y1970 + \beta_3 (Black_i \times Y1970) + \gamma_s + \mu_c + \delta_m + \lambda_e + \varepsilon_{iy}. \quad (5)$$

In this specification $EmploymentCategory_{iy}$ is an indicator of the employment category of individual i that occurred in year y; $Black_i$ and $Y1970$ are respectively indicators of whether individual i was blacks (rather than white) and whether they were observed in 1970 (rather than 1960); and the remaining terms are fixed effects for state of birth, birth cohort, male, and educational attainment. These covariates are included to reduce confounding and improve precision, and estimates that exclude all controls are reported in Table A3 of the Online Appendix and are qualitatively similar to those reported below. The main parameter of interest in this specification is the coefficient on the interaction of the black indicator and the 1970 indicator, β_3, which estimates the change in the fraction of African Americans in each employment category occurring between 1960 and 1970, relative to the change in the same employment category among whites over the same time period.

While Equation 5 has the structure of a difference-in-difference specification, the resulting estimates should be viewed as primarily descriptive in nature. In particular, a causal interpretation of these estimates would require the common-trends assumption to hold, which in this case consists of the strong assumption that changes in the occupations of southern blacks between 1960 and 1970 would have been the same as the changes in the occupations of southern whites over the same period if not for school desegregation. To the extent that trends among southern whites do not constitute a valid counterfactual for trends of southern blacks absent integration, which seems likely, Equation 5 will not recover the causal effect of school desegregation on high skill southern blacks.

Despite this limitation, it is informative to descriptively observe relative changes in the occupational distributions of these two populations, and consider the extent to which the observed patterns are consistent with various possible impacts of student integration on the labor market for high skill southern blacks, and the results of estimating Equation 5 for each of the utilized employment categories are reported in the top panel of Table 4. The results in Column 1 of Table 4 indicate that the share of African Americans in the utilized sample who were teachers within the South declined by 2.8 percentage points between 1960 and 1970, relative to whites. The 1960 prevalence of southern teachers among African Americans in the utilized sample is 21.4%, so that a 2.8 percentage point reduction represents a decline of $2.8/21.4 \approx 13.1\%$, which is broadly consistent with the 27.1% aggregate decline estimated using administrative school district records with weights applied in Column 3 of Table 1, although somewhat smaller in magnitude. Unlike the analysis using administrative records, the current approach is also able to observe which employment categories experienced corresponding relative increases among southern blacks (note that because the utilized employment

outcomes are exhaustive and mutually exclusive, the coefficients on the interaction term of interest in Table 4 sum to zero by construction). Estimates for the other employment outcomes are reported in the remaining columns of Table 4.

Column 2 reports the results of a specification that uses the prevalence of non-teaching professional employment within the South as the dependent variable. The results provide no evidence that displaced southern black teachers were readily able to enter other professional occupations within the region, with a statistically insignificant coefficient of *negative* .011. The models in Columns 3 and 4 respectively use the prevalence of *non*-professional employment within the South and the prevalence of teaching employment *outside* of the South as dependent variables. The results suggest that displaced southern black teachers transitioned into these other categories in approximately equal shares. Specifically, the relative share of African Americans in non-professional occupations within the South increased by 1.6 percentage points, and the relative share of African Americans employed as teachers outside of the South increased by 2.1 percentage points, although the former effect is not statistically significant at conventional levels (P=.133).

The increase in southern-born African Americans working as teachers outside of the region is especially notable given that net black migration into the South was actually positive between 1964 and 1970, reversing decades of large-scale out-migration (see Wright 2013). The results in Column 4 suggest that regional out-migration continued among African American *teachers* between 1960 and 1970, even as it reversed for the African American population overall. This finding is also consistent with the black teacher employment trends outside of the South that are observed in the Office of Civil Rights surveys used in the baseline analysis above, with the number of non-southern black teachers in this data increasing from 67,264 (1.7%) in 1968, to 74,439 (1.8%) in 1970, and to 80,269 (1.9%) in 1972.

The final two columns of Table 4 Panel A use the prevalence of non-teaching employment outside of the South and the prevalence of being unemployed or out of the labor force as dependent variables. The results indicate that there were no statistically significant changes in the relative share of African Americans within these employment categories between 1960 and 1970.

A potential concern is that the results in Panel A of Table 4 reflect longer-term trends in the employment outcomes of high-skill southern-born black workers, which would make them uninformative on the possible effects of student desegregation. To investigate this possibility, Panel B of Table 4 reports results of estimating Equation 5 using data from the 1950 and 1960 Decennial Censuses, rather than the 1960 and 1970 Censuses. The results indicate that there were virtually no relative changes in the prevalences of the studied occupational outcomes among blacks between 1950 and 1960, with all of the estimated coefficients close to zero and statistically insignificant. These results are reassuring in that they suggest the findings in Panel A reflect unique circumstances occurring between 1960 and 1970, rather than the continuation of pre-existing race-specific employment trends, even if school desegregation is not the only major change occurring between 1960 and 1970 in this context.[25]

In addition to observing a broader set of employment outcomes, an advantage of the analyzing occupational distributions by race across the 1960 and 1970 Censuses is that it allows for the estimation of heterogeneous

[25]The results of estimating Equation 5 using data from the 1970 and 1980 Decennial Censuses are reported in Table A3 of the Online Appendix, and show that relative reductions in southern teaching employment among blacks continued between 1970 and 1980. One explanation for these continued reductions is that desegregation activity continued into the early 1970s, and that its negative employment effects often occurred with a lag of several years. Additionally, Table A3 finds evidence of large scale withdrawals from the labor force and large increases in northern non-teaching employment among blacks between 1970 and 1980, suggesting that the labor market for high-skill southern-born blacks was generally volatile in this period, making it hard to attach a strong interpretation to continued reductions in southern teaching employment.

effects by demographic characteristics such as gender and age, and the remaining panels of Table 4 re-estimate Equation 5 separately by gender (Panels C and D) and by whether respondents were older or younger than age 40 in 1964 (Panels F and G).

The gender specific estimates in the first column of Panels C and D indicate that there were larger absolute reductions in teacher employment among southern black females than among southern black males. In particular, the results in the first column of Panel C estimate that the relative share of African American females who were teachers within the South declined by 3.9 percentage points between 1960 and 1970, while the analogous decline among African American males was only 2.5 percentage points. However, a test of the hypothesis that the coefficients are equal across genders indicates that this difference is not statistically significant at conventional levels (P=.449), and the baseline prevalence of southern teaching employment in the utilized sample was higher among black females (28.2%) than among black males (12.9%), so that the reported percentage point declines translate into a smaller percent reduction for females.

With respect to the other studied employment outcomes, the gender specific results from Columns 3 and 4 indicate that African American females were significantly *less* likely than males to enter non-professional employment within the South (female coefficient of -.031 versus male coefficient of .045, P-value of difference <.01), but were significantly *more* likely than males to migrate outside of the South and remain in teaching (.031 versus .006, P=.027). Speculatively, these differences could reflect more extensive non-teaching labor market opportunities for African American men in the South, especially after 1964, leading black men to exit teaching but remain in the region when their positions were eliminated, while African American women had few desirable non-teaching options in the region and were therefore more likely to migrate.

Column 5 of Panels C and D indicates that there were also substantial gender differences in the prevalence of non-work within the studied African American population. Specifically, there was a large *increase* in the fraction of African American women who were unemployed or out of the labor force between 1960 and 1970, but a large *decrease* in the fraction of African American men in this category over the same period, and the difference in these coefficients by gender is statistically significant (P<.01). The increase in non-work among African American females is consistent with a lack of labor force opportunities for high-skill black women outside of teaching, while the relative decrease among black men could plausibly reflect general improvements in employment opportunities associated with reduced discrimination in blue-collar labor markets over this period (see Wright 2013). More generally, declines in labor force participation among southern African American women and corresponding increases among southern African American men could reflect changing household labor supply choices associated with post-CRA changes in the southern labor market.

Turning to the age specific estimates in Panels E and F, the results in Column 1 indicate that among African Americans who were ages 40 or below in 1964, the proportion who were teachers in the South declined by 4.0 percentage points between 1960 and 1970, relative to whites, while the analogous decline among African Americans who were over age 40 in 1964 was 1.8 percentage points. These differences may reflect greater job security for more senior teachers, but the estimated difference is again below conventional levels of statistical significance (P=.256), warranting a cautious interpretation.

As was the case for gender, there are also statistically and qualitatively significant differences by age with respect to changes in the fraction of individuals working as teachers outside of the South and working in non-professional occupations within the South. Specifically, African Americans who were over age 40 in 1964 were substantially more likely to transition to non-professional occupations within the South between 1960 and 1970 than were younger African Americans (.030 versus -.006, P=.106). Conversely, African Americans

who were ages 40 or below in 1964 were substantially more likely to transition to being a teacher outside of the South between 1960 and 1970 than were older African Americans (.033 versus .005, P=.011). These differences may reflect the greater willingness of younger workers to migrate for economic reasons, relative to older workers with stronger ties to their current community and fewer working years remaining in their careers.

In summary, the results in Table 4 corroborate the baseline finding that large-scale reductions in black teacher employment occurred within the South over the course of the integration process, and suggest that approximately half of the southern blacks who would have held teaching positions in the South instead entered lower skill occupations within the South, while the other half migrated from the region to work as teachers. Women and younger teachers appear to have experienced the most severe employment reductions, and were also more likely to have left the region to continue or pursue teaching, while men and older individuals were more likely to transition to non-professional occupations within the South.

Direct Employment Transitions

In addition to comparing occupational outcomes over time in the Decennial Censuses, Form 2 of the 1970 Census (also known as the 15% sample) included a question asking respondents their primary occupation five years ago. This question allows occupation to be observed for the same individuals in both 1965 and 1970, a period that incidentally spans much of the student integration activity studied here. It is important to note that this data can only be used to analyze individuals who transitioned directly out of teaching between 1965 and 1970, and not a more general counterfactual population of individuals who plausibly *would have* held teaching positions in the South in the absence of student desegregation. In contrast, the baseline estimates using district-level data and the overall occupational distribution estimates both included individuals who were *not hired* as a result of student integration, rather than only those who were directly fired. This point withstanding, the five year occupation question does allow for the direct observation of employment transitions between 1965 and 1970 at the individual level, which provides valuable complementary evidence to the analyses above.

I begin by restricting the 1970 Form 2 Census sample to individuals who either exited the teaching occupation entirely between 1965 and 1970, or were teachers in both 1965 and 1970 but had also migrated across regions over this period. I then observe the distribution of 1970 employment outcomes within this sub-population, disaggregated by race and 1965 region of residence.[26] Column 1 of Table 5 reports 1970 labor market outcomes among African Americans who were teachers in the South in 1965, but were no longer teachers in the South by 1970. The results indicate that 22% of such individuals had entered other professional occupations, 26% had entered non-professional occupations, 14% were teachers outside of the South, and 38% were unemployed or out of the labor force.

To quantify the extent to which this distribution of 1970 labor market outcomes was unique, Column 2 of Table 5 reports the prevalence of the same labor market outcomes among white Census respondents who were teachers in the South in 1965 but not in 1970, while Column 3 of Table 5 reports outcomes for African Americans who were teachers outside of the South in 1965 but not in 1970. Finally, Columns 4 and 5 report the *differences* in the prevalence of each outcome between Southern black teachers and these other two groups, as well as the standard errors of these differences.

[26] Respondents were also asked their state of residence five years ago, which allows me to identify migrants, and for present purposes I consider individuals to have migrated across regions in they left the South or entered the South between 1965 and 1970.

The most clear and consistent pattern in Table 5 is that African Americans who were southern teachers in 1965 but not in 1970 were much more likely to have migrated across regions and continued teaching than the other groups. Specifically the third row of Table 5 shows that this type of transition was 9.3 percentage points more common among former southern black teachers than former southern white teachers (P<.01) and 9.5 percentage points more common among former southern black teachers than among former northern black teachers (P<.01). For other employment outcomes, the relative prevalences among former southern black teachers typically depend on the comparison group. For instance relative to northern blacks, former southern black teachers were much less likely to enter professional occupations (22% versus 33%, P<.05), and relative to southern whites, former southern black teachers were much less likely to be unemployed or out of the labor force (38% versus 57%, P<.01). Table 5 does find reasonably consistent evidence that former southern black teachers were more likely to enter non-professional occupations than the other two groups, with a difference of 6.6 percentage points (P<.05) between southern black and southern whites, and a statistically insignificant difference of 2.5 percentage points between southern blacks and non-southern blacks.

On balance, the results in Table 5 strongly indicate that African Americans who directly exited teaching positions in the South between 1965 and 1970 were disproportionately likely to transition to being teachers in a new region, and more weakly indicates that transitions to non-professional employment were also disproportionately common. Both of these findings are generally consistent with the estimates in Table 4. Speculatively, the smaller and less precisely estimated increase in non-professional occupations in Table 5 relative to Table 4 may be because southern blacks who directly left teaching were more likely to migrate and continue teaching, while southern blacks who did not become teachers due to desegregation were more likely to enter non-professional occupations.

Finally, the five year occupation question in the 1970 Census can also be used to corroborate the baseline finding of overall reductions in the number of teaching positions held by southern blacks after desegregation. In particular, I have estimated regressions using the full 1970 Form 2 sample (not shown) in which the dependent variable is an indicator of either exiting the teaching profession entirely or moving across regions while remaining a teacher, and the independent variables are a black indicator, an indicator of southern residence in 1965, and their interaction. The coefficient on the interaction term in this specification is equal to .0019 (P<.01), which indicates that African Americans residing in the South in 1965 were .19 percentage points more likely to have had a teaching career disrupted between 1965 and 1970 than other race-by-region groups. The mean of the dependent variable for groups other than southern blacks in this sample is .0069, so that the estimated effect of .19 percentage points indicates that southern blacks were .0019/.0069 $\approx$ 27.5% more likely than other race-by-region groups to have had a teaching career disrupted between 1965 and 1970, which is in line with the findings in Tables 1 and 4. Complete results are available upon request.

Earnings Impacts of Black Teacher Displacement

The qualitatively large magnitudes of the black teacher employment reductions estimated above suggest that desegregation engendered a significant overall negative shock to the demand for high-skilled black labor after 1964. An important related question is whether this demand shock translated into negative impacts on the earnings of high-skilled black workers. Importantly, this demand shock occurred within a broader context of rapid black-white earnings convergence between 1965 and 1970, especially in the South (Donohue & Heckman 1991; Wright 2013). But if reduced teaching employment was simultaneously exerting a negative impact on black earnings, then the observed convergence was actually smaller than it could have been in the

absence of desegregation-induced black teacher employment reductions.

To help evaluate this possibility, I first estimate a specification similar to Equation 5, but which uses log earnings rather than occupational outcomes as the dependent variable, with the results reported in Column 1 of Table 6. The interaction between black and the 1970 indicator is highly significant in this specification, and has an estimated coefficient of .179, indicating that the black-white earnings gap fell by .179 log points among high-skill southern-born workers between 1960 and 1970. The second column of Table 6 adds a control variable for being a southern teacher to the specification.[27] This model estimates black-white earnings convergence between 1960 and 1970 while holding constant the level of southern teaching employment, and to the extent that reduced southern teaching employment slowed black-white earnings convergence, the addition of this covariate will increase the magnitude of the coefficient on the interaction term. The magnitude of the coefficient on the interaction term in Column 2 does indeed grow to .185, and a hypothesis test indicates that this increase is statistically significant (P=.032). But the size of this increase is qualitatively small, suggesting that reduced teaching employment among blacks did not substantively slow racial wage convergence among high-skill southern-born workers between 1960 and 1970.[28]

To better understand why reduced teaching employment among blacks appears to have had such a small effect on wage convergence, Columns 3 and 4 of Table 6 report the results of regressing log wages onto an indicator of being a southern teacher among black workers in 1960 and in 1970, respectively. The results in Column 3 show that southern black teachers enjoyed a large earnings premium in 1960, earning approximately 16% more than other types of southern-born black workers with at least a year of post-secondary education. However, the results in Column 4 indicate that this earnings premium is wholly absent by 1970. While this elimination of a teacher earnings premium among southern blacks is plausibly itself due to integration-induced reductions in black teacher demand, supplementary analyses indicate that the elimination of a teaching premium among southern blacks was driven primarily by rapid earnings growth among college-educated southern blacks who were not teachers, rather than reductions in the growth or levels of earnings among southern black teachers.[29] These patterns are more consistent with post-1964 reductions in discrimination within non-teaching occupations, for instance due to Title VII of the CRA, than they are with negative teacher wage impacts of student desegregation. In any case, the findings in Table 3 suggest that maintaining 1960 levels of teaching employment would not have significantly altered the 1970 wage distribution of high-skill southern-born black workers, simply because by 1970 southern black teachers earned no more than other types of high-skill southern black workers.

7 Discussion and Conclusion

The present paper has been primarily concerned with changes in the teacher labor market occurring in the 1960s and early 1970s, but the findings additionally have some relevance for more contemporary issues in education research and policy.

[27] To allow the wage effect of being a southern teacher to vary by race, the model in Column 2 additionally includes an interaction between the southern teacher indicator and a black indicator.

[28] As before, a causal interpretation of the coefficients in Table 6 would require the strong assumption that changes in the earnings of southern blacks between 1960 and 1970 would have been the same as the changes in the earnings of southern whites over the same period if not for school desegregation, and should therefore be viewed as primarily descriptive.

[29] Specifically, the earnings of black teachers grew by .37 log points between 1960 and 1970 while the earnings of black college-educated non-teachers grew by .50 log points over the same period. The analogous changes for white teachers and non-teachers were .31 log points and .32 log points, respectively.

One such area is the effects of own-race teachers on student outcomes, with a growing literature indicating that exposure of black students to black teachers has positive impacts on academic and behavioral outcomes. For instance Dee (2004) exploits the random assignment of students to classrooms in Tennessee's Project STAR experiment to estimate that being assigned to an own-race teacher increased the math and reading test scores of black students by approximately 5 percentile points, with larger cumulative effects for students having own-race teachers for multiple years. Likewise, Lindsay & Hart (2017) use administrative data from North Carolina and student fixed-effects models and find that full exposure to own-race teachers reduced the probability that black students were suspended or expelled by 18%.

In an historically salient anecdote on the potential benefits of own-race teachers even in the segregation era, Leola Brown, the named plaintiff in *Brown v. Board*, described the teachers at the segregated school she was suing to integrate as "Qualified...fantastic teachers. [And] they were good to us, more like an extended family, like mothers and so forth, because they took an interest in you" (Kansas State Historical Society 1991).[30] Likewise Everett Dawson, an African American teacher in North Carolina during the desegregation process, noted that "I got disillusioned with integration because... I could not get to my people and tell them all the things that they needed to know" (Foster 1997).

Since black students in segregated southern schools had virtually all black teachers, a substantial decline in black student's exposure to own-race teachers was an unavoidable consequence of student desegregation, and few would argue that it was desirable for African American students to have exclusively own-race teachers. However, the magnitude of the reductions in exposure of black students to black teachers was clearly increased by the disproportionate elimination of black held teaching positions documented above, with potentially deleterious impacts on African American students.

A related point relevant to contemporary policy debates is that there is currently a widespread perception among educational practitioners and many academics that African Americans and other racial and ethnic minorities are problematically underrepresented within the teaching profession. For instance Villegas & Davis (2008) report that 36 states have adopted policies intended to increase the recruitment of minority teachers since the 1990s, a recent report from the National Education Association (Dilworth & Coleman 2014) is devoted to examining "the compelling need to recruit and retain teachers of color" and Villegas & Irvine (2010) review a large interdisciplinary academic literature arguing that increased recruitment of minority teachers would be beneficial to students and communities.

While the data and methodology of the current study do not allow for the direct estimation of how desegregation-induced black teacher employment reductions affected the subsequent recruitment of black teachers, presumably eliminating large numbers of black held teaching positions had at least some negative effect on the choice of subsequent cohorts of African Americans to enter the teaching profession. An unscientific 1968 survey of placement directors at seven predominantly black teacher training programs in the South found that the number of education graduates at these institutions had declined by more than 10% between 1965 and 1968 (Southern Education Report 1968), and Hudson & Holmes (1994) report a 66% decline in the number of African American students majoring in education nationwide between 1975 and 1985. While it is difficult to distinguish the effects of displacement on the entry of new black teachers from the effects of expanded professional employment opportunities outside of teaching, at a minimum the large-scale elimination of black held teaching positions during desegregation did not encourage young African

[30] More precisely, Leola Brown was the *mother* of the student named in *Brown v. Board*, but is speaking here in the first-person here because she had attended the same elementary school herself as a child, when it was fully segregated.

Americans to enter the profession.

The dismantling of de-jure segregation in southern schools was arguably the signature accomplishment of the Civil Rights Movement, and a generational victory for the cause of racial equality in the United States. Desegregation generated large benefits for many groups, ranging from students in the South who received an education formally free of racial considerations, to the broader population that gained the ability to live in a society that better reflected democratic principles of equal citizenship. But such a fundamental reform of a major institution also inevitably comes with disruption and costs. The results of the present study indicate that the costs associated with transitioning to a more equitable educational system were in large part paid by African American teachers.

References

Alabama Department of Education (1964). Statistical and financial data, annual report for the scholastic year ending June 30, 1964*Quarterly Journal of Economics* and for the fiscal year ending September 30, 1964.

Baum-Snow, N., & Lutz, B. (2011). School desegregation, school choice, and changes in residential location patterns by race. *American Economic Review*, 101(7), 3019-3046.

Billings, S., Deming, D., & Rockoff, J. (2013). School segregation, educational attainment, and crime: Evidence from the end of busing in Charlotte-Mecklenburg. *Quarterly Journal of Economics*, 129(1), 435-476.

Boustan, L. (2012). School desegregation and urban change: Evidence from city boundaries. *American Economic Journal: Applied Economics*, 4(1), 85-108.

Card, D., & Krueger, A. (1992a). Does school quality matter? Returns to education and the characteristics of public schools in the United States. *Journal of political Economy*, 100(1), 1-40.

Card, D., & Krueger, A. (1992b). School quality and black-white relative earnings: A direct assessment. *Quarterly Journal of Economics*, 107(1), 151-200.

Carruthers, C., & Wanamaker, M. (2017). Separate and unequal in the labor market: Human capital and the Jim Crow wage gap. *Journal of Labor Economics*, 35(3), 655-696.

Cascio , E., Gordon, N., & Reber, S. (2013). Local responses to federal grants: Evidence from the introduction of Title I in the South. *American Economic Journal: Economic Policy*, 5(3), 126-159.

Cascio, E., & Washington, E. (2013). Valuing the vote: The redistribution of voting rights and state funds following the Voting Rights Act of 1965. *Quarterly Journal of Economics*, 129(1), 379-433.

Cascio, E., Gordon, N., Lewis, E., & Reber, S. (2008). From Brown to busing. *Journal of Urban Economics*, 64(2), 296-325.

Cascio, E., Gordon, N., Lewis, E., & Reber, S. (2010). Paying for progress: Conditional grants and the desegregation of southern schools. *Quarterly Journal of Economics*, 125(1), 445-482.

Clotfelter, C. (2011). After Brown: The rise and retreat of school desegregation. Princeton University Press, Princeton, NJ.

Dee, T. (2004). Teachers, race, and student achievement in a randomized experiment. *Review of Economics and Statistics*, 86(1), 195-210.

Detweiler, J. (1967). The negro teacher and the Fourteenth Amendment. *Journal of Negro Education*, 36(4), 403-409.

Dilworth, M., & Coleman, M. (2014). Time for a change: Diversity in teaching revisited. National Education Association Report, Washington, DC.

Donohue, J., & Heckman J. 1991. Continuous versus episodic change: The impact of Civil Rights policy on the economic status of blacks. *Journal of Economic Literature* 29 : 1603-43.

Ethridge, S. (1979). Impact of the 1954 Brown vs. Topeka Board of Education decision on black educators. *Negro Educational Review*, 30(4), 217.

Foster, M. (1997). Black teachers on teaching. New Press, New York, NY.

Fultz, M. (2004). The displacement of black educators post-Brown: An overview and analysis. *History of Education Quarterly*, 44(1), 11-45.

Georgia State Department of Education (1964). Annual report of the Department of Education to the General Assembly of the State of Georgia.

Guryan, J. (2004). Desegregation and black dropout rates. *American Economic Review*, 94(4), 919-943.

Hooker, R. (1970). Special Report: Displacement of black teachers in the eleven southern states. Race Relation Information Center, Nashville, TN.

Hudson, M., & Holmes, B. (1994). Missing teachers, impaired communities: The unanticipated consequences of Brown v. Board of Education on the African American teaching force at the pre-collegiate level. *Journal of Negro Education,* 63(3), 388-393.

Jackson, C. (2009). Student demographics, teacher sorting, and teacher quality: Evidence from the end of school desegregation. *Journal of Labor Economics*, 27(2), 213-256.

Johnson, R. (2011). Long-run impacts of school desegregation & school quality on adult attainments. *NBER Working Paper* 16664.

Joint Center for Political Studies (1977). National roster of black elected officials, Vol. 7, Washington, DC.

Kansas State Historical Society (1991). Brown v. Topeka Board of Education oral history collection, Topeka KS.

Lindsay, C., & Hart, C. (2017). Exposure to same-race teachers and student disciplinary outcomes for black students in North Carolina. *Educational Evaluation and Policy Analysis*, 39(3), 485-510.

Logan, J., Stults, B., & Farley, R. (2004). Segregation of minorities in the metropolis: Two decades of change. *Demography*, 41(1), 1-22.

Margo, R. (1990). Race and schooling in the South, 1880-1950: An economic history. University of Chicago Press, Chicago, IL.

Mississippi State Department of Education (1963). Biennial report and recommendations of the state superintendent of public education to the legislature of Mississippi for the scholastic year 1962/1963.

National Center for Educational Statistics (1967). Directory: Public schools in large districts with enrollment and staff, by race, fall 1967. Washington, DC.

National Education Association (1965). Addresses and proceedings of the National Education Association, Volume 103.

Oakley, D., Stowell, J., & Logan, J. (2009). The impact of desegregation on black teachers in the metropolis, 1970–2000. *Ethnic and Racial Studies*, 32(9), 1576-1598.

Orfield, G. (1969). The reconstruction of southern education: The schools and the 1964 Civil Rights Act. Wiley & Sons, New York, NY.

Reardon, S., & Owens, A. (2014). 60 years after Brown: Trends and consequences of school segregation. *Annual Review of Sociology*, 40, 199-218.

Reber, S. (2005). Court-ordered desegregation successes and failures integrating American schools since Brown versus Board of Education. *Journal of Human Resources*, 40(3), 559-590.

Reber, S. (2010). School desegregation and educational attainment for blacks. *Journal of Human Resources*, 45(4), 893-914.

Rivkin, S. (1994). Residential segregation and school integration. *Sociology of Education*, 67(4), 279-292.

Rivkin, S., & Welch, F. (2006). Has school desegregation improved academic and economic outcomes for blacks? *Handbook of the Economics of Education*, 2, 1019-1049.

Ruggles, S. (2015). Integrated public use microdata series: Version 6.0. University of Minnesota.

Schultz, M. (1970). The National Education Association and the black teacher: The integration of a professional organization. University of Miami Press, Miami, FL.

South Carolina State Department of Education (1964). Ninety-sixth annual report of the state superintendent of education, state of South Carolina, 1963-1964.

Southern Education Report (1965). August 1965: "Desegregation."

Southern Education Report (1966). August 1966: "Desegregation: Legal backing for the guidelines."

Southern Education Report (1968). December 1968: "How are the new negro teachers faring?"

Southern Education Reporting Service (1964). A statistical summary, state by state, of segregation-desegregation activity affecting southern schools from 1954 to present. Fourteenth revision.

Southern School News (1955). November 1955: "Negro teacher tenure is surveyed."

State Department of Education of Louisiana (1965). Bulletin No. 1049: One hundred and sixteenth annual report for the session 1964-65.

Tennessee Department of Education (1963). Annual statistical report of the Department of Education for the scholastic year ending June 30, 1963.

Texas Education Agency (1965). Biennial report of the Texas Department of Education.

Tillman, L. (2004). (Un)intended consequences? The impact of the Brown v. Board of Education decision on the employment status of black educators. *Education and Urban Society*, 36(3), 280-303.

US Office of Education. (1965). Task force survey of teacher displacement in seventeen states. Department of Health, Education and Welfare, Washington, DC.

Vigdor, J., & Ludwig, J. (2008). Segregation and the test score gap. In *Steady Gains and Stalled Progress: Inequality and the Black-White Test Score Gap*, 181-211. Magnuson, K. & Waldfogel, J., eds. Russel Sage Foundation, New York, NY.

Villegas, A., & Davis, D. (2008). Preparing teachers of color to confront racial/ethnic disparities in educational outcomes. *Handbook on Research in Teacher Education*, 583-605.

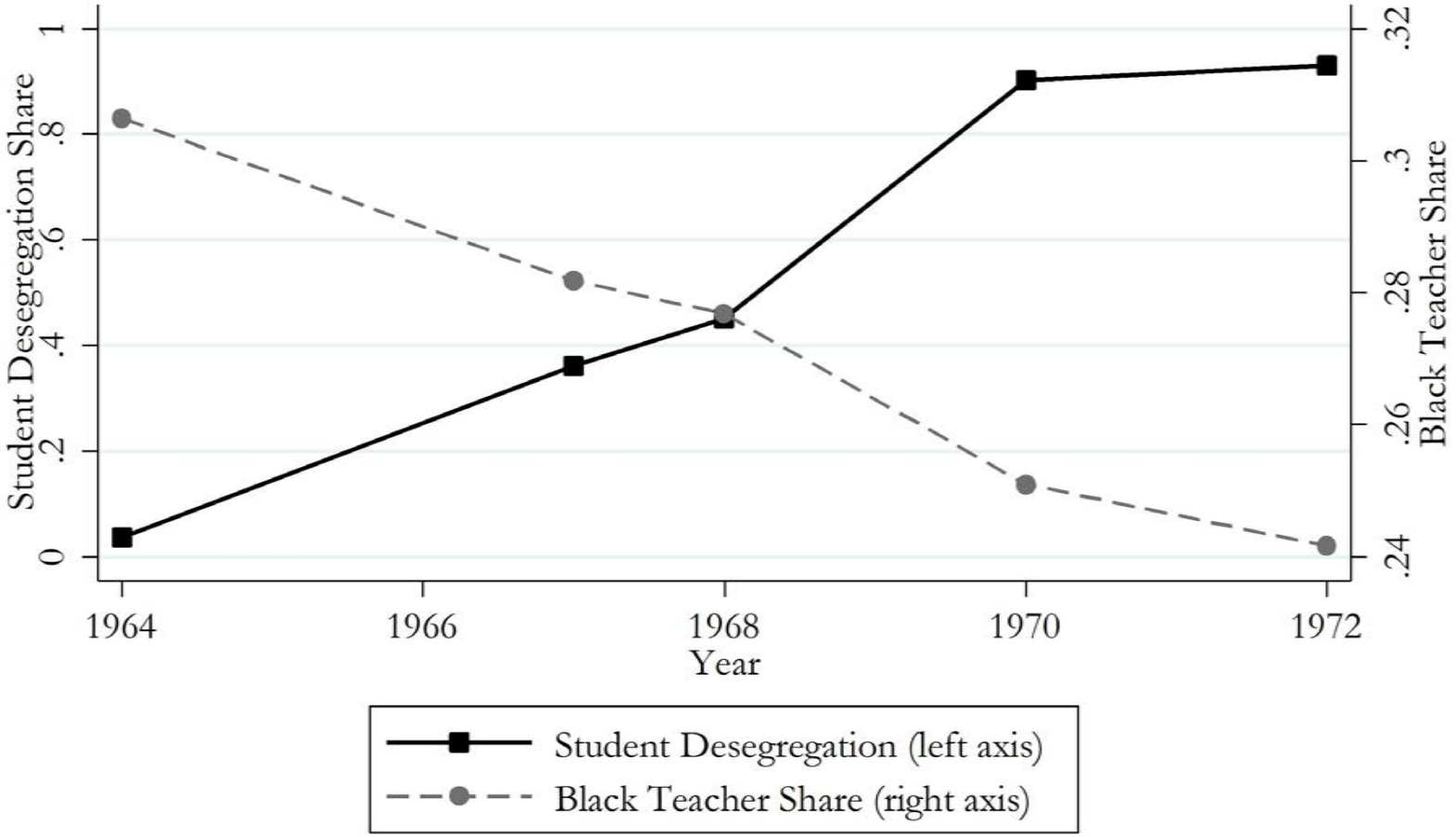
Villegas, A., & Irvine, J. (2010). Diversifying the teaching force: An examination of major arguments. *Urban Review*, 42(3), 175-192.

Virginia State Board of Education (1965). Annual report of the superintendent of public instruction of the Commonwealth of Virginia, school year 1964-65.

Welch, F. (1987). New evidence on school desegregation. Commission on Civil Rights, Washington, DC.

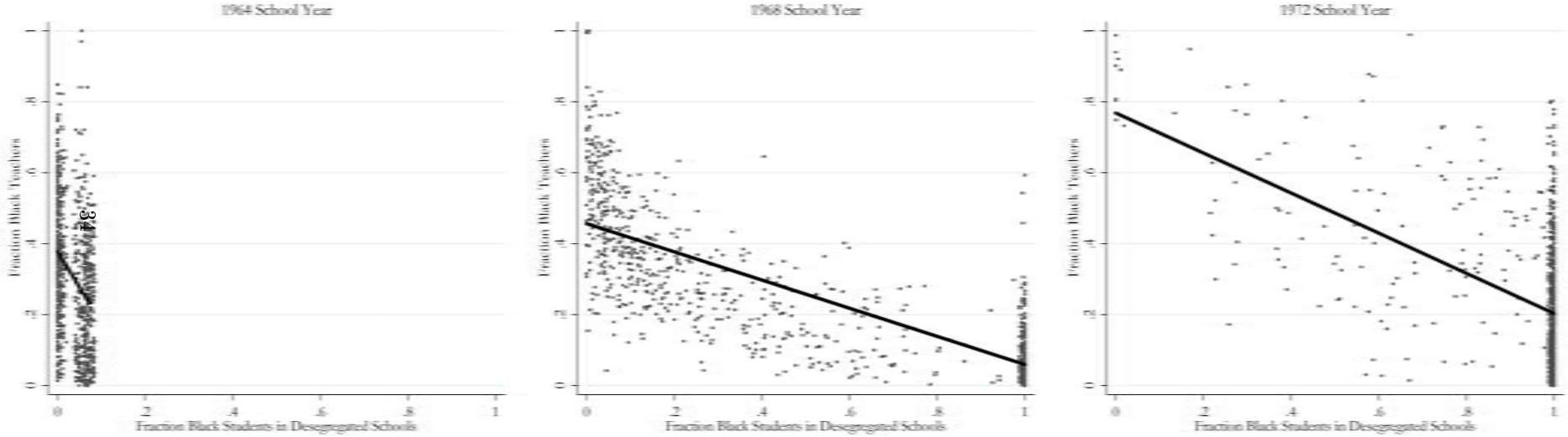
Wright, G. (2013). Sharing the prize. Harvard University Press, Cambridge, MA.

Figure 1: Trends in Student Desegregation and Black Teacher Employment



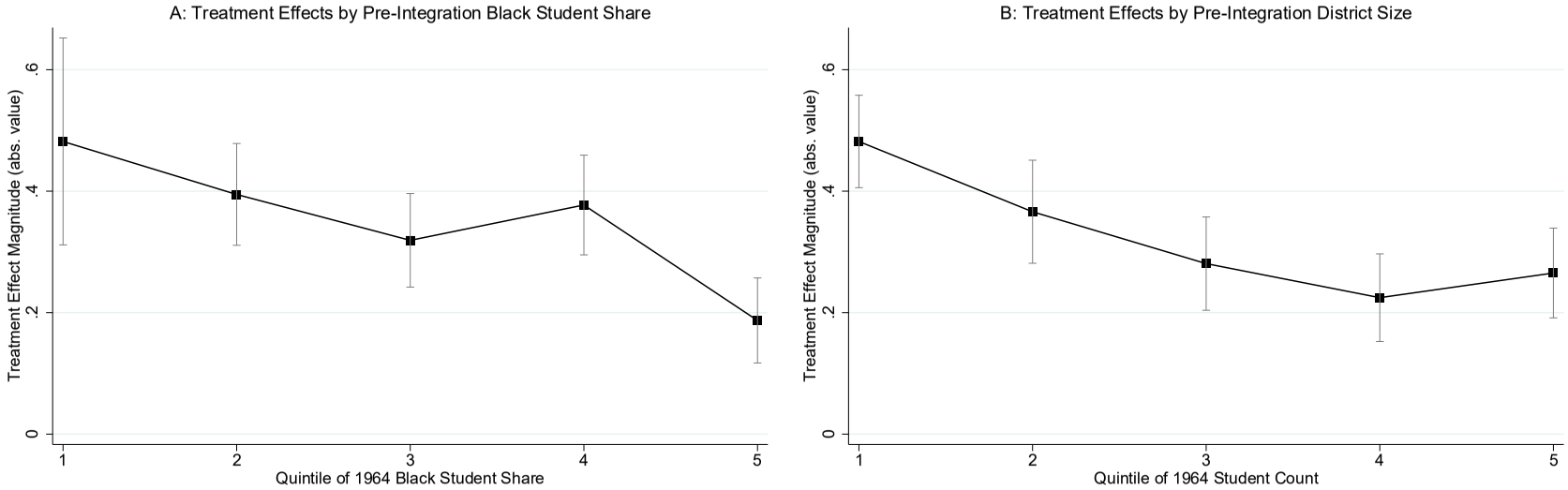
Notes: The student desegregation share is the district level mean of the fraction of black students attending a school where 5% or more of the enrolled students were white. The black teacher share is the district level mean of the fraction of all teachers in the district that were black. Means are calculated within a sample of 781 school districts in eight Southern states. See Section 4 of the text for a detailed description of the utilized data.

Figure 2: Student Desegregation and Black Teacher Employment by Year



Notes: Each scatterplot displays student desegregation and black teacher employment shares for the indicated school year across 781 school districts in eight southern states, as well as a linear fit line. The horizontal axes measure the fraction of black students attending a school where 5% or more of the enrolled students were white. The vertical axes measure the share of teachers in each district that were black.

Figure 3: Treatment Effect Heterogeneity



Notes: Reported treatment effect magnitudes are the absolute values of the coefficient on the student desegregation variable when Equation 4 is estimated using a sample consisting of the districts within the specified quintile of black student share as of 1964 (Panel A) or total number of students as of 1964 (Panel B). 90% confidence intervals also shown.

Table 1: The Effect of Student Desegregation on Black Teacher Employment

	(1) Baseline	(2) Total Teacher Control	(3) Weighted	(4) District Trends	(5) Leads	(6) Finance Controls
Fraction of Black Students in Desegregated Schools	-0.382***	-0.346***	-0.317***	-0.409***	-0.620***	-0.353***
	(0.031)	(0.032)	(0.036)	(0.038)	(0.081)	(0.034)
Ln(All Teacher Count)		0.766***				
		(0.064)				
Fraction Students Desegregated, 1-period lead					0.005	
					(0.035)	
Fraction Students Desegregated, 2-period lead					0.015	
					(0.068)	
District-Year Observations	3,905	3,905	3,905	3,905	2,343	1,586
Number of Unique Districts	781	781	781	478	781	781

Notes: The dependent variable is the natural log of the number of African American teachers. All models contain school district and year fixed-effects. The model in Column 2 also controls for the natural log of total district teacher employment (of all races) and the model in Column 6 also controls for district revenues from federal, state and local sources. Additionally, the model in Column 4 contains interactions of school district indicators and a linear year variable, while the model in Column 5 contains two leading values of the student desegregation variable. All observations are given equal weight, except for in the model in Column 3, where each observation is weighted by the number of black teachers the district employed during the 1964 school year. Standard errors, clustered at the school district level, are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 2: The Effect of Student Desegregation on District Operations

	(1) Log Teachers	(2) Log Students	(3) Log Student-Teacher Ratio	(4) Log School Buildings
Fraction of Black Students in Desegregated Schools	-0.047***	-0.030*	0.018	-0.174***
	(0.015)	(0.018)	(0.012)	(0.022)
District-Year Observations	3,905	3,905	3,905	3,124
Number of Unique Districts	781	781	781	781

Notes: The dependent variables in Columns 1-4 are respectively the log of total teacher employment (of all races), the log of total student enrollments (of all races), the log of the ratio of the district's total student count to its total teacher count, and the log of total operational school buildings. All models contain school district and year fixed-effects. All observations are given equal weight. Standard errors, clustered at the school district level, are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 3: Relative Changes in the Characteristics of Southern White Teachers

	Southern White Teachers			All Southern Professionals			Relative
	1960	1970	Change	1960	1970	Change	Changes
Age	42.13	39.39	-2.74***	39.30	39.39	0.08	-2.82***
			(0.300)			(0.169)	(0.344)
Male	0.229	0.258	0.028***	0.713	0.687	-0.026***	0.054***
			(0.010)			(0.006)	(0.011)
Born Outside of South	0.181	0.24	0.058***	0.302	0.35	0.048***	0.010
			(0.009)			(0.006)	(0.011)
Years of Education	15.96	16.04	0.075*	14.30	14.49	0.194***	-0.119**
			(0.044)			(0.039)	(0.059)
Observations	3,004	5,122	8,126	9,298	16,663	25,961	34,087

Notes: Columns 1 and 2 report the mean of the indicated characteristic among southern whites reporting "teacher" as their primary occupation in the 1960 and 1970 Decennial Censuses, respectively, and Column 3 reports the difference in each characteristic between 1960 and 1970 within this population. Columns 4-6 repeat this exercise among southern whites reporting professional occupations other than teacher. The final column reports the difference between the change in each characteristics among southern white teachers between 1960 and 1970 and the change in that characteristic among southern whites in other professional occupations over the same period. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 4: Relative Changes in Employment Categories between 1960 and 1970

	(1) Southern Teacher	(2) Other Southern Professional	(3) Southern Non-Professional	(4) Teacher Outside of South	(5) Non-Teacher Outside of South	(6) Not Working
A: Baseline						
Black × Y1970	-0.028***	-0.011	0.016	0.021***	0.007	-0.006
	(0.010)	(0.008)	(0.011)	(0.006)	(0.012)	(0.009)
Observations	43,128	43,128	43,128	43,128	43,128	43,128
B: Trends from 1950-1960						
Black × Y1960	0.001	-0.001	0.001	0.002	-0.001	-0.002
	(0.021)	(0.015)	(0.023)	(0.010)	(0.024)	(0.011)
Observations	18,568	18,568	18,568	18,568	18,568	18,568
C: Females						
Black × Y1970	-0.039***	-0.007	-0.031**	0.031***	-0.003	0.051***
	(0.014)	(0.010)	(0.014)	(0.009)	(0.015)	(0.015)
Observations	18,321	18,321	18,321	18,321	18,321	18,321
D: Males						
Black × Y1970	-0.025**	-0.012	0.045**	0.006	0.014	-0.028***
	(0.012)	(0.012)	(0.018)	(0.006)	(0.019)	(0.010)
Observations	24,807	24,807	24,807	24,807	24,807	24,807
E: Age ≤ 40 in 1964						
Black × Y1970	-0.040***	-0.015	-0.006	0.033***	0.007	0.020
	(0.013)	(0.011)	(0.015)	(0.008)	(0.017)	(0.013)
Observations	20,552	20,552	20,552	20,552	20,552	20,552
F: Age >40 in 1964						
Black × Y1970	-0.018	-0.005	0.030*	0.005	0.005	-0.016
	(0.014)	(0.011)	(0.016)	(0.008)	(0.018)	(0.013)
Observations	22,576	22,576	22,576	22,576	22,576	22,576

Notes: Sample is drawn from 1960 and 1970 Decennial Censuses, except in Panel B where the sample is drawn from the 1950 and 1960 Decennial Censuses. All samples are restricted to non-Hispanic black or white respondents who were born in one of the eleven states of the former Confederacy, had completed one or more years of college, and were from the 1904-1935 birth cohorts. The dependent variable for each specification is an indicator of the employment category listed in the column titles. All models include controls for birth cohort, state of birth, gender, and educational attainment. Robust standard errors are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 5: Employment Outcomes of Disrupted Teachers by Race and Region

	(1) Southern Black	(2) Southern White	(3) Northern Black	(4) (Southern Black) - (Southern White)	(5) (Southern Black) - (Northern Black)
Professional Occupation	0.22	0.19	0.33	0.032	-0.107**
				(0.028)	(0.043)
Non-Professional Occupation	0.26	0.19	0.23	0.066**	0.025
				(0.028)	(0.042)
Teacher in New Region	0.14	0.05	0.04	0.093***	0.095***
				(0.016)	(0.029)
Not Working	0.38	0.57	0.39	-0.191***	-0.013
				(0.034)	(0.048)
Observations	245	1,317	181		

Notes: Sample consists of respondents to Form 2 of the 1970 Decennial Census who either (1) reported teacher as their primary occupation for 1965 but not for 1970, or (2) reported teacher as their primary occupation in both 1965 and 1970 but had also migrated into or out of the South over this period. Columns 1-3 report simple means for the indicated population and employment category; Columns 4 and 5 report mean differences across the indicated populations. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Table 6: Southern Teaching Employment and Relative Black Earnings

	(1) Pooled 1960 and 1970 Samples	(2) Pooled 1960 and 1970 Samples	(3) Black Workers, 1960	(4) Black Workers, 1970
Black	-0.252***	-0.306***		
	(0.018)	(0.020)		
Y1970	0.315***	0.316***		
	(0.010)	(0.010)		
Black × Y1970	0.179***	0.185***		
	(0.024)	(0.024)		
Southern Teacher		0.049***	0.164***	-0.009
		(0.015)	(0.037)	(0.034)
Black × Southern Teacher		0.211***		
		(0.024)		
Observations	34,483	34,483	2,702	2,883

Notes: Sample is drawn from 1960 and 1970 Decennial Censuses and restricted to non-Hispanic black or white respondents who were born in one of the eleven states of the former Confederacy, had completed one or more years of college, and were from the 1904-1935 birth cohorts. The dependent variable in all specifications is the log of total labor market earnings. Column titles indicate the sample composition. All models include controls for birth cohort, state of birth, gender, and educational attainment. Robust standard errors are in parentheses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.