A Dynamic Framework for Earnings Inequality between Black and White Men

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The present study conceptualizes earnings inequality between black and white men as a three-stage dynamic process: the pre-market human capital acquisition, the labor-market entry, and the longitudinal career progression. Based on the Panel Study of Income Dynamics (PSID), this framework is put to an empirical test that leads to two major conclusions. First, overall patterns of black-white earnings inequality are shaped primarily at labor-market entry as opposed to developing within the labor market. Second, the longitudinal progression of earnings inequality exhibits distinctive trajectories across different pre-market groups. Less-educated black men face a wider earnings gap at labor-market entry, but the gap stays relatively stable over time. Highly educated black men face a narrower earnings gap at labor-market entry, but the gap widens over time. I attribute these patterns to the temporal-specific interplays between race and a series of labor-market mechanisms.

Introduction

Labor-market discrimination against black workers, particularly black men, has long been a subject of debate among sociologists and economists. At the core of the dispute is whether the observed black-white earnings gap is a result of discriminatory practices within the labor market, or it reflects differential productive abilities that workers bring to the market. Both sides typically rely on human capital theories (Becker 1993; Mincer 1974) for conceptual framing and use cross-sectional data for empirical testing (Huffman 2004; Neil and Johnson 1996; O'Neil 1990; Pais 2011; Smith 1997; Thomas 1993; Western and Pettit 2005). The idea is to assess how much wage inequality remains after controlling for workers' human capital attributes that are conceptually exogenous to the labor market, which supposedly captures the effect of discrimination (Reskin 2005).

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This standard approach has generated evidence in support of both sides. Many studies demonstrated significant residual wage gaps as evidence of discrimination (Grodsky and Pager 2001; Ren 2019; Thomas 1993; Thomas and Moye 2015; Bound and Freeman 1992; Cancio, Evans, and Maume 1996). The validity of these findings, however, is undermined by the fact that it is almost impossible to control for all productive traits, and overestimation of discrimination would occur if productive traits were under-controlled (Heckman 1998). By the same approach, some researchers did manage to substantially reduce black-white wage gaps through extensive human capital controls (Farkas et al. 1997; Neal and Johnson 1996; O'Neill 1990), giving rise to a once-popular claim that "labor market discrimination is no longer a first-order quantitative problem in America" (Heckman 1998). However, this claim suffers from the same conceptual flaw, though from the opposite direction—overcontrolling for human capital might lead to underestimated market discrimination (Tomaskovic-Devey, Thomas, and Johnson 2005). This double bind situation can be exemplified by the subtle influence of racial stereotypes such as black men being portrayed as lazy and unreliable (Wilson 2011a). These stereotypes undermine employers' assessment of worker productivity (Lang and Manove 2011), creating earnings inequality through statistical discrimination, which, in turn, discourages African Americans' human capital investment (Coate and Loury 1993), reinforcing negative stereotypes. In a circular mode of causality, therefore, it would be problematic to attribute subtle effects of covert racism to either pre-market (e.g., education) or within-market practices (e.g., hiring), not to mention the near impossibility of measuring such effects in an empirical model.

Unsurprisingly, the debate has reached stagnation, as both sides become increasingly aware of these limitations. An essential cause for this dilemma, based on my assessment and pointed out by others (Tomaskovic-Devey, Thomas, and Johnson 2005), lies in previous analyses' single-point temporal horizon that compresses earnings inequality from a dynamic process into a static phenomenon. Namely, there is no hard line to conceptually distinguish between the exogenous effects of pre-market determinants and the endogenous effects of those within the labor market, except for a simple temporal delineation—the former precedes the latter. After all, both pre-market resources and market practices contribute to earnings inequality only at different times. That said, by tracking earnings differentials between black and white men across different pre-market groups (stage one), through labor-market entry (stage two), and along their career paths (stage three), this study seeks to restore black-white earnings inequality as a three-stage dynamic process.

Based on the Panel Study of Income Dynamics (PSID), I put the three-stage framework to an empirical test. Two major findings stand out. First, instead of developing within the labor market, overall patterns of black-white earnings inequality are shaped primarily at workers' career outsets. Second, the longitudinal progression of earnings inequality exhibits distinctive trajectories across different pre-market groups. At labor-market entry, black-white inequality in baseline earnings becomes less salient as one moves up the ladder of educational attainment. When it comes to earnings growth, the pattern is reversed, as the

gap widens disproportionately among college graduates but remains relatively constant among less-educated groups. I attribute these patterns to the temporal-specific interplays between race and a range of labor-market mechanisms as elaborated below. As such, this study expands the existing literature by offering a dynamic framework, wherein past and future developments from various disciplinary areas (e.g., sociology of education, labor economics, and organizational studies) can be synthesized to draw a holistic picture on how black-white earnings inequality is cultivated and maintained over time.

Before moving to details, it is worth noting that this study is designed to explore the earnings disparity between black and white men—a specific race-gender intersection. Hispanic/Latino and other racial/ethnic groups are not included in view of their distinctive labor-market experiences (Duncan, Hotz, and Trejo 2006). Female workers are also excluded, because gender difference in labor norms and its interaction with race create a situation, wherein black female workers are subject to significantly different dynamics than their male counterparts. Indeed, many racial stereotypes and discriminatory practices that are essential to labor-market outcomes apply disproportionately to black males. These include racial disparities in school-based disciplinary actions (Riddle and Sinclair 2019), incarceration of black youths (Pettit and Western 2004), and stigmas attached to black job applicants (Mandel and Semyonov 2016). That said, the conceptual framework of this study is established primarily based on the experiences of black men, although it is certainly not irrelevant to those of black women.

Theoretical Framework

A Three-Stage Process

Black workers' labor-market challenges can be traced back long before they were born. Stewart (2008) vividly portrayed black-white socioeconomic relations as an unfairly structured swimming meet, in which one group always swims upstream while the other group always swims downstream. His point is not that this game is still ongoing, but that even after the unfair structure is corrected, prior conditions of the game alongside people's reactions to these conditions, have already been institutionalized. Indeed, historically cultivated and contemporarily sustained racial biases set up a variety of institutional obstacles, ranging from explicit rejection from quality public schools (Reardon and Owens 2014) to implicit exclusion from information networks (Royster 2003), which undeniably hinder young African Americans' pre-market acquisition of human capital skills (Altonji and Pierret 2001). Therefore, a substantial portion of the black-white earnings gap has been pre-developed even before workers enter labor markets.

Besides pre-market disparities, African Americans and Whites are also subject to differential labor-market treatments. Through audit and correspondence studies, sociologists have discovered direct evidence of discrimination, as African Americans' job applications are less likely to result in interview invitations

than those of comparable Whites (Bertrand and Mullainathan 2004; Quillian et al. 2017). In the meantime, economists have found that employers are less capable of assessing black applicants' productive potentials and tend to rely on group membership to fill the information gap, creating conditions for statistical discrimination even if there is no discriminatory intent. The two lines of research lead to the same conclusion that discrimination does exist during the hiring process, be it intentional or unintentional (Lang and Lehmann 2012).

Cultivated through pre-market barriers and exacerbated by discriminatory hiring, black-white earnings inequality becomes tangible at job-market entry and begins to evolve over time. The existing literature shows no dispute on African Americans' diminished chance of career ascendance, and a variety of perspectives are adopted to analyze the phenomenon. For example, attention has been paid to occupational segregation that concentrates black workers in lower-paying jobs (Tomaskovic-Devey 1993), racialized career tracks that assign black managers to serve minority communities only (Collins 1997; Wilson 1997), the discriminatory structure within firms and organizations (Ray 2019; Wingfield and Alston 2014), and homosocial reproduction whereby African Americans' low representation in positions of authority hurts their chance of promotion (Elliott and Smith 2004). These proposals are widely supported by empirical evidence that demonstrates flatter earnings growth curves for African Americans (Cheng 2014; Cheng et al. 2019; Tomaskovic-Devey, Thomas, and Johnson 2005).

Overall, prior research indicates that race-based discriminatory treatments, be it intentional or unintentional, accompany the entire course of African Americans' professional lives, from pre-market preparation, through labor-market entry, and during career progression. The purpose of this study, accordingly, is to explore how the earnings effect of discrimination develops and evolves across black workers' three life stages. To that end, I seek to address two questions that remain unclear in the existing literature.

Overall Pattern of Progression

The first question is about black-white earnings equality's overall pattern of progression. Although African Americans certainly face obstacles to upward mobility, it is unclear whether their flat earnings trajectories are caused by discriminatory practices encountered during career growth, or they are more of a continuation of black workers' low beginning positions? Based on the analysis of three scenarios, I propose that black-white earnings inequality is determined more by early- than later-career dynamics. First, if the employer is prejudiced, excluding black job seekers when hiring is simply more convenient than giving differential treatments in workplace situations (Moore 2010; Petersen, Saporta, and Seidel 2000). Second, for non-prejudiced employers who misplace and/or underpay black employees due to incomplete information, they should be able to better assess productivity over time and adjust wage rewards accordingly (Altonji and Pierret 2001). Obviously, this overly optimistic expectation ignores many socioeconomic mechanisms that, regardless of the employer's racial attitudes,

foment black workers' initial disadvantage and hinders its effective correction thereafter, and these constitute the third scenario. For example, African Americans are commonly deprived of employment opportunities due to physical and information isolation (Royster 2003), which prolongs job search and increases the risk of misplacement. Once hired, undervalued black workers are often assigned to less-demanding tasks (Collins 1997) and/or placed onto racialized career tracks (Mong and Roscigno 2010), dampening their prospect of promotion from the start.

These scenarios are not to imply that discrimination only occurs at the time of hiring, but to highlight the particular importance of the career outset in black workers' long-term earnings outcomes. As such, they bring up a test-worthy hypothesis that racial dynamics at labor-market entry play a primary role in shaping overall patterns of earnings inequality.

Distinctive Trajectories of Growth

The second question takes stage-one dynamics into account, focusing on black-white earnings inequality's heterogenous trajectories across different pre-market groups. Addressing this question entails an operationalization of the human capital theory in temporal-dynamic settings, as I seek to assess the degree to which black workers' possession/deprivation of pre-market productive assets facilitate/hinder their career advancement. It is worth noting that a volume of sociological theories has been developed to supplement the human capital explanation of earnings inequality, covering a range of perspectives such as market structure (Bonacich 1972; Kornrich 2009), de-unionization (VanHeuvelen 2018), overincarceration (Western and Pettit 2005), segregation and sorting (Sorensen and Kalleberg 1981; Tomaskovic-Devey 1993), and racialized organizations (Ferguson and Koning 2018; Ray 2019). Targeting either a specific market mechanism (e.g., sorting) or the labor impact of a specific institution (e.g., incarceration), however, none of these theories is comprehensive enough to independently explain the longitudinal process of earnings divergence. For that reason, I go back to the fundamentals, concentrating on the labor market's time-varying interpretation of race and human capital information to lay the conceptual foundation, which is supplemented by other theoretical perspectives wherever their relevance becomes evident.

In doing so, I differentiate between two types of broadly defined human capital characteristics: those that are highly visible when hiring (e.g., education) and those that are relatively invisible (e.g., family background) (Lang and Manove 2011). Hypotheses are formed based on the temporal-specific interplays between race and the labor market' interpretation of these two types of human capital information.

To address black-white inequality in baseline earnings, I draw on the core idea of screening/signaling theories, which conceptualizes labor-market outcomes as a result of workers' signaling of productivity and employers' screening for such signals (Cornell and Welch 1996). At labor-market entry, the existence of racial prejudice/stereotypes leads to conditions, under which black job seekers,

particularly black men, are demanded for stronger productivity signals than Whites (Lang and Manove 2011), creating an overall disparity between the two groups. The same mechanism will also cause within-group heterogeneity among African Americans as long as their productivity signals are not homogenous. That said, since black job seekers' signaling ability is unevenly distributed in favor of those with higher educational attainment, through either the visibility of education-based productive skills or their stronger ability to communicate such skills to the employer, I anticipate diminished earnings inequality facing highly educated African Americans. That is, higher education, the most important type of visible human capital, is expected to play a protective role against hiring discrimination.

When it comes career progression, however, racial dynamics become too complex to be conceptualized by any single theory. Accordingly, I evaluate pre-market groups' distinctive earnings trajectories from three perspectives, which, as elaborated below, all point to elevated challenges facing highly educated African Americans.

The first perspective continues along the lines of a human capital explanation. As the effect of visible human capital fades off after labor-market entry, invisible human capital begins to materialize. These include so-called "soft skills" such as communicative ability, confidence, and the ability to make professional connections (Hall and Farkas 2011). Because of deeply institutionalized racial obstacles, not only disadvantaged but relatively well-off African Americans are highly deprived of the avenues of acquiring such skills/resources, which are particularly important for their career advancement in a predominantly white professional environment (Ray 2019). Indeed, a sizable literature exists on African Americans' diminished returns to their socioeconomic resources in terms of residential achievement and network building (Feagin and Sikes 1994; Lacy 2007; Ren 2020). Thus, although highly educated black workers enjoy relative protection by their visible productivity signals, in the long run, the deprivation of invisible human capital might incur and exacerbate earnings disparities with their privileged white competitors (Witteveen and Attewell 2017).

To supplement a human capital explanation is the second perspective that focuses on racial obstacles during career progression. Indeed, despite recent progresses toward equal treatment of workers, a color-blind work environment is far from a reality. Black workers' initial earnings disadvantages can accumulate and grow, as fueled by various racial biases in terms of training (Tomaskovic-Devey 1993), task assignments (Collins 1997; Wingfield and Alston 2014), and performance evaluation (Wilson 1997). Particularly noteworthy is the subtle impediments (net of human capital traits) to African Americans' prospect for authority attainment in high-status professions such as lawyers (Payne-Pikus, Hagan, and Nelson 2010) and college football coaches (Day 2015)—the concept of "particularistic manipulation" is used to describe these vague and hard-to-measure criteria for senior-level promotions that tend to disfavor minority candidates. I should point out that even without discriminatory intent, rational business decisions, functioning in the existing racial landscapes (e.g., residential

segregation and economic disparities), can still hinder black professionals' career advancement.

Finally, it shall be emphasized that above-discussed mechanisms all operate in the large context of labor-market bifurcation, which constitutes the third perspective. Specifically, technological innovation, globalization, and manufacturing decline have greatly elevated the importance of higher education (Leicht 2008). An increasingly bifurcated labor market ensues, wherein highly educated African Americans and Whites compete for credentialed and high-reward positions, whereas those of less educational attainment are confined to a stagnating blue-collar sector. In the credentialed segments of the market, as workers' overall earnings capacity expands with accumulated experience, so does the scope of inequality. As such, it will not be surprising to see highly educated black professionals facing growing earnings disadvantages, considering the above-discussed racial barriers to their upward mobility. In the lower segments of the market, on the other hand, whereas less-educated black workers face the same challenges, the stagnating nature of this market sector itself is likely to set up a ceiling that restricts the further growth of earnings inequality. In that sense, black and white workers of less educational attainment are both subject to limited prospects for career advancement, despite white workers' advantage in beginning positions—they are not scrutinized for racial stereotypes during labor-market entry.

All these considered, I expect to see distinctive earnings trajectories for different pre-market groups of African Americans. For less-educated black men, I hypothesize that they experience a relatively wide gap in baseline earnings due to the low visibility of their productivity signals, but the gap stays relatively constant over time. For highly educated black men, I hypothesize that they face a relatively narrow gap in baseline earnings, but the gap widens over time.

Longitudinal Studies on Black-White Earnings Inequality

Tomaskovic-Devey et al.' (2005) study remains perhaps the most influential empirical work in this area. Using the National Longitudinal Survey of Youth (NLSY), the authors tracked wage trajectories of a group of young men across twenty years of their work careers and reached two major conclusions: (1) black-white wage inequality starts little at the career outset but develops over time within the labor market; (2) black-white wage divergence is more pronounced among highly educated workers. Several other longitudinal studies can be found too, although they tend to have more specialized focuses. Cotter et al.' (2001) study tracked racial and gender differences in earnings trajectories to assess glass-ceiling effects. Using the PSID, the authors set three percentile benchmarks based on the earnings distribution of white males (twenty-fifth, fiftieth, and seventy-fifth) and evaluated minority groups' odds of surpassing these benchmarks during career progression. Their findings, which contradict those of Tomaskovic-Devey, Thomas, and Johnson (2005), show that black men's earnings curves parallel those of white men at all three levels—the gaps remain

constant over time. With a combined dataset between the Survey of Income and Program Participation and the Social Security Administration, Cheng et al. (2019) compared different cohorts of black men' education-specific courses of earnings growth.[1] They found that black-white inequality in earnings trajectories increased across recent generations, at both the top and bottom of the education ladder. Cheng and Song (2019) used the PSID to explore intergenerational income association by measuring both generations' earnings as time-varying trajectories. Despite including findings on racial inequality, the study was not race-specific but designed to assess the general population.

Similar works can be found in the literature of labor economics. Based on the NLSY, Oettinger (1996) employed several longitudinal models to explore the evolution of black-white wage inequality during early-career years. Oettinger reached a similar conclusion as Tomaskovic-Devey, Thomas, and Johnson (2005) that the wage gap does not exist at the outset but develops along the career path. Other researchers also utilized the NLSY's longitudinal data, although their analyses were based on OLS rather than dynamic modeling. These works can be represented by Altonji and Pierret's (2001) study, which discovered a significantly positive interaction between race and experience, indicating that black men face widening earnings gaps as experience accumulates.

The above-reviewed studies (Table 1), despite their respective contributions, still constitute an insufficient empirical foundation for the three-stage framework. To begin with, there is conflicting evidence regarding black-white earnings inequality's overall pattern of progression. Although Tomaskovic-Devey, Thomas, and Johnson (2005) and Oettinger (1996) found that the wage gap develops within the work career, Cotter et al. (2001) reported the opposite pattern—the gap begins wide but stays constant over time. Evidence that supports the conclusion of Cotter et al. (2001) can be also seen in Cheng (2014) and Cheng et al. (2019), though not explicitly discussed.

Based on my assessment, this contradiction lies in previous works' discrepancy in defining the career outset. Both Tomaskovic-Devey, Thomas, and Johnson (2005) and Oettinger (1996) begin to observe respondents' wage trajectories as soon as earnings information becomes available, which prepones the starting point of the work career into pre-market years. Cotter et al. (2001) and Cheng et al. (2019), on the other hand, wait until respondents turned 25, when most had completed formal education, to begin monitoring wage trajectories. The latter approach apparently fits better the three-stage conceptualization, because blurring the line between pre-market preparation and within-market competition would ignore racial dynamics at labor-market entry, which play a pivotal role in shaping long-term patterns of earnings inequality. Moreover, without a clear definition of full-time labor-force entry, patterns of earnings trajectories would be perfectly predictable. On the one hand, there is predictably little wage inequality in part-time jobs, simply because required productive skills are low and racial inequality in such skills has yet to develop. On the other hand, racial wage divergence is bound to occur during career progression that covers indiscriminately pre-market processes, hiring practices, and career development dynamics. Given this study's three-stage conceptualization, my hypothesis is

Table 1. Summary of Previous Longitudinal Studies on Black-White Earnings Inequality

Studies	Longitudinal modeling	Human capital modeling	Temporal span[a] (years)	Gap in baseline earnings	Gap during earning growth	Pre-market × baseline	Pre-market × growth
Altonji and Pierret (2001)	No	Yes	13	No[b]	Yes	N/A	N/A
Bratberg and Terrell (1996)	No	Yes	12	N/A	Yes	N/A	N/A
Cheng et al. (2019)	Yes	No[c]	20	Yes	Yes	Negative[d]	Positive
Cotter et al. (2001)	Yes	Yes	17	Yes	No	N/A	N/A
Hall and Farkas (2011)[e]	Yes	Yes	27	N/A	N/A	N/A	N/A
Oettinger (1996)	Yes	Yes	10	No	Yes	N/A	N/A
Tomaskovic-Devey et al. (2005)	Yes	Yes	20	No	Yes	N/A	Positive
Hypotheses of this study	Yes	Yes	47	Yes	Yes	Negative	Positive

[a] It refers to the maximum temporal window of the data set used.
[b] Since Altonji and Pierret's cross-sectional model excludes zero-earners, the baseline earnings do not reflect black workers' job-finding challenges.
[c] Cheng and colleagues' study describes earnings inequality from a demographic perspective, instead of modeling it as a human capital process.
[d] It stands for a negative relationship between pre-market resources and racial inequality—the higher the education the narrower the gap. These are based on my interpretation of Table 1 in Cheng et al. (2019). With the original focus on cohort comparisons, the authors did not explicitly analyze different education groups' heterogenous earnings trajectories.
[e] Hall and Farkas (2011) focused on race-specific mechanisms of cognitive and behavioral traits without explicitly exploring racial wage gaps.

consistent with Cotter et al. (2001) that the black-white earnings gap begins wide at the career outset.

Another limitation of the existing literature lies in its incompleteness. As summarized in Table 1, most studies focused on the aggregated black-white earnings gap, with little consideration of intragroup diversity. Although Tomaskovic-Devey, Thomas, and Johnson (2005) discovered a positive relationship between education and black-white earnings divergence (i.e., the higher the education, the wider the divergence), the authors did not explore patterns of racial dynamics at labor-market entry, nor were the findings based on targeted theoretical framing.[2] Cheng et al. (2019) contain empirical evidence that is mostly consistent with my hypotheses, but the study was conducted from a demographic perspective, describing how African Americans' education-specific earnings trajectories evolve across cohorts, instead of modeling earnings inequality as a human capital process. The present study focuses on the temporal-specific interplays between race and a series of labor-market mechanisms. At labor-market entry, the screening/signaling mechanisms provide more protection for black men of visible human capital traits (i.e., higher education), who are hypothesized to experience less inequality in baseline earnings. When it comes to career progression, as the effects of a series of mechanisms (i.e., invisible human capital, racialized work environment, and labor-market bifurcation) materialize over time, I hypothesize that highly educated black men face intensified competition with their white counterparts. The whole process, therefore, points to two distinctive trajectories of earnings inequality—the gap among highly educated workers begins narrow but widens over time, whereas the gap among less-educated workers follows the opposite path.

Research Design

Data and the Sample

This study is based on the PSID. The PSID began to survey a nationally representative group of American families in 1968 and have followed up with them and their split-off families through annual (biennial since 1997) interviews. By 2015, rich information had been collected from multiple generations of respondents. Based on the 2015 PSID wave, I identify respondents' longitudinal courses of detailed socioeconomic history ever since they became household heads—as a household survey, the PSID does not consistently collect information on non-head members.

As discussed above, findings on the earnings trajectory hinge on how the career outset is defined. In the present study, I assume that the work career begins at full-time labor-force entry, which is defined as the next full year after the respondent permanently left school.[3] The first observed annual earnings after labor-force entry, therefore, are demarcated as the start of the earnings trajectory. Using the labor-force entry time as a reference, I include the respondent's annual earnings in the next twelve years for longitudinal modeling. The reason for the

12-year restriction is that both prior evidence (Thomas, Herring, and Horton 1994) and my analyses indicate that black-white earnings inequality develops primarily within early-to-middle career stages.[4] Thus, mixing later records into the sample would underexpose black-white inequality by artificially flattening the slopes of earnings curves. All historical earnings are standardized into 2017 dollars.

Since cross-sectionally measured wage inequality automatically excludes those without observed earnings at a given time point, it overlooks minority workers' difficulty in finding employment (Neil and Johnson 1996). By contrast, my approach utilizes the PSID's longitudinal structure and waits until the first post-education earnings appear to include the respondent. Thus, black men' market-entry challenges, including unemployment and nonparticipation, can be reflected in two components: the baseline earnings and the length of post-education joblessness (i.e., the time spell between labor-force entry and the first observed earnings). It should be noted that since the respondent would not have earnings recorded until splitting off to form an independent household, for those whose labor-force entry precedes becoming a household head, the first observed earnings might not be actual baseline earnings—the actual baseline earnings occurred in pre-head years. For that reason, I calculate the length of time that the respondent's labor-force entry prepones into pre-head years, which is included as a key control variable (i.e., the variable of split-off time).

Three restrictions are imposed to create the final analytical sample. First, I only include non-Hispanic black and non-Hispanic white male household heads. On top of that, I drop the respondents whose first post-education earnings are observed either later than eight years after permanently leaving school or when they are older than 35. Their observed earnings trajectories begin too late to reflect their actual career courses. Finally, I exclude the cases with fewer than three earnings records to ensure estimation accuracy on the growth curve. After dropping cases with missing values, the final analytical sample includes 1,976 black and white men's 19,321 person-year observations.[5,6,7] Each respondent is also assigned a decadal cohort identity based on the timing of labor-force entry: Cohort 1 (before 1980), Cohort 2 (1980–1989), Cohort 3 (1990–1999), Cohort 4 (2000–2009), and Cohort 5 (2010–2015).[8,9]

Model and the Variables

The growth curve model, a random-coefficient model that focuses on changes over time, is the obvious choice for this study, for its unique strength of simultaneously modeling baseline earnings and earnings growth. Its general form is shown below.

$$\text{Log Earnings}_{it} = \beta_{0i} + \beta_{1i}\,(\text{Year}) + \beta_{2i}\left(\text{Year}^2\right) + \beta_{3i}\,(\text{TVC}_{it}) + \varepsilon_{it} \quad (1)$$

$$\beta_{0i} = \lambda_{00} + \lambda_{01}\,(\text{Race}_i) + \lambda_{02}\left(\text{Edu}_i\right) + \lambda_{03}\left(\text{Race}_i \times \text{Edu}_i\right) + \lambda_{04}\,(\text{TIC}_i) + \mu_{0i} \quad (2)$$

$$\beta_{1i} = \lambda_{10} + \lambda_{11}\,(\text{Race}_i) + \lambda_{12}\left(\text{Edu}_i\right) + \lambda_{13}\left(\text{Race}_i \times \text{Edu}_i\right) + \lambda_{14}\,(\text{TIC}_i) + \mu_{1i} \quad (3)$$

Equation (1) describes an individual's earnings growth curve, where the logged annual earnings of individual i in career year t are explained by the baseline earnings (β_{0i}) and the linear growth over time (β_{1i}), controlling for the non-linear adjustment (β_{2i}) and a vector of time-varying covariates (TVC_{it}) with ε_{it} being a normally distributed error term. Unlike Ordinary Least Square (OLS) regression, β_{0i} and β_{1i} are random coefficients standing for between-individual variation in the intercept and slope of the earnings curve, which are estimated by two separate equations with multi-normally distributed error terms μ_{0i} and μ_{1i}. Equation (2) estimates the random intercept β_{0i}, where λ_{01} captures the mean black-white gap in baseline earnings and λ_{03} captures the mediating effects of education on the gap. Equation (3) estimates the random slope, where λ_{11} captures the mean black-white gap in the slope of the earnings trajectory and λ_{13} captures the mediating effects of education on the gap. I hypothesize λ_{03} to be positive and λ_{13} negative.

I choose natural time (in years) to measure temporal progression, so that black workers' employment instability is reflected in earnings. Three time-varying variables are used as general controls for demographic and geographic changes: marital status, number of children, and regional location.[10] As pointed out by Tomaskovic-Devey, Thomas, and Johnson (2005), "The use of high-quality panel surveys such as the NLSY or the PSID allows us to observe race/ethnic or other inequalities as they develop across the career, but not the mechanisms that produce them." Because of the absence of detailed information on training and job performance, this study is not capable of evaluating the workplace mechanisms whereby earnings divergence is produced. Instead, I focus on time-invariant variables that measure pre-market human capital characteristics.

Three variables are created to capture visible human capital. Educational attainment, as the key predictor, is measured by four levels: less than High school, High school degree/GED, some college/Associate degree, and Bachelor's/Graduate degree. Graduate/Professional degree holders are merged into the category of college graduates because of the low black representation in the sample. Also, college graduates are coded 0 for the convenience of assessing their earnings dynamics (i.e., the main effect of any education-based interaction will automatically apply to college graduates), and the rest three levels are coded −3, −2, and − 1. The second variable is work experience, which is measured by the number of years the respondent had worked between 18 and labor-force entry. The third variable is the age at labor-force entry, which proxies for other (unmeasured) age-related productive attributes.

Two variables are created to capture relatively invisible human capital characteristics. As a commonly tested variable in signaling models, health is measured by a four-level variable based on self-perceived growing-up health conditions, with higher values indicating better health. Parental education is used as a proxy for a variety of invisible attributes, including cognitive/attitudinal traits, school quality, and other resources embedded in family background. The variable is coded in the same manner as the respondent's education (i.e., −3, −2, −1, and 0). Better measures for cognitive traits and school quality might reduce residual race gaps (Farkas and Vicknair 1996). In that case, it would indicate that attention

should be shifted from within-market discrimination to pre-market barriers to acquiring such traits (Neal and Johnson 1996). Similarly, because of the criminal justice system's well-known racial biases that dampen black men's labor-market prospect, reduced earnings gaps would be expected, had criminal records been controlled. It should be noted that all these scenarios are consistent with this study's main thesis that highlights the importance of pre-market racial disparities in perpetuating earnings inequality. Table 2 presents descriptive statistics of the sample.

The final sample includes 19,321 longitudinal records drawn from 1,976 men, of whom 516 (4,594 person-years) are black and 1,460 (14,727 person-years) are white. Earnings differentials between the two groups are apparent. At the baseline, African Americans on average had annual earnings of $26,189, about 71% of average annual earnings for Whites ($37,098). Both groups experienced earnings growth, but the gap substantially widened at the highest point of their respective trajectories ($63,995 vs $119,870). African Americans tend to be younger at labor-force entry, and it takes longer for them to find a job. Although the two sub-samples are similar on some measures (e.g., work experience and health), their differences are more salient. Particularly, Whites have significant advantages in terms of both the current and previous generation's educational attainment. Overall, substantial gaps exist between black and white men in their career earnings trajectories, so do racial differences in human capital attributes. Analyses will be performed below to explore how black-white earnings gaps longitudinally evolve.

Results[11]

Observed Earnings Trajectories

Using an unrestricted sample, I begin the analyses by drawing observed earnings trajectories for black and white men over their thirty-four years of post-education careers. As shown in figure 1, workers generally experience earnings growth until around middle-career stages, and, after that, earnings begin to stabilize and eventually decline as some reach retirement ages. When it comes to black-white comparison, unlike prior studies that found little wage inequality at the career outset, a substantial gap in baseline earnings appears. This pattern can be explained by two distinctive features of this sample that highlight black men' disadvantages in formal job-market entry: (1) the focus on post-education earnings and (2) the inclusion of the respondents with weak labor-market attachment. Also, although black and white earnings curves both peak around eighteen to twenty years after labor-force entry, their gap stops widening around ten to twelve years into the trajectory, demarcating the ideal temporal range for modeling the development of black-white inequality.

The two lower charts demonstrate earnings inequality's heterogenous courses of progression across different sub-groups. The two gaps among the college-educated (≥Bachelor) and non-college-educated start at similar levels, but the

Table 2. Sample Descriptive Statistics, Black and White Men, PSID 1968–2015

	All		White		Black	
	Mean	SD	Mean	SD	Mean	SD
Time-invariant characteristics						
Baseline earnings	$34,249	$26,068	$37,098	$27,581	$26,189	$19,047
% Black	26.1%		N/A		N/A	
Time to split off (in years)	1.9	2.3	1.7	2.2	2.6	2.5
Age at labor-force entry	23.3	4.1	23.6	4.1	22.4	3.9
Length of post-education joblessness (in years)	2.3	2.4	1.9	2.3	3.0	2.5
% less than high school	5.1%		3.7%		18.6%	
% High school degree/GED	33.5%		29.2%		45.5%	
% Some college	27.6%		26.8%		20.4%	
% Bachelor's degree	24.4%		28.4%		13.4%	
% Graduate/Professional degree[a]	9.4%		11.9%		2.1%	
Work experience since 18 (in years)	5.7	3.6	5.7	3.6	5.6	3.6
Self-perceived health status	4.4	0.8	4.5	0.8	4.3	0.9
% Less than high school (parent)	4.3%		3.1%		7.5%	
% High school degree/GED (parent)	19.5%		16.4%		28.5%	

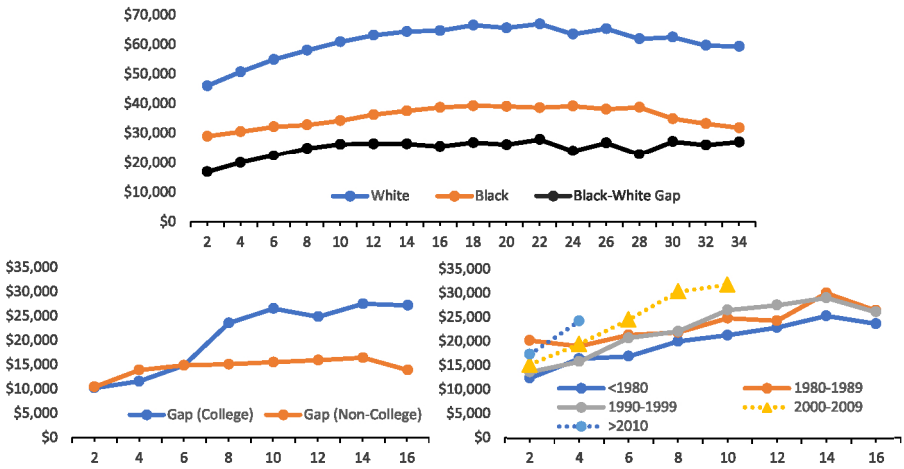
(*Continued*)

Table 2. Continued

	All		White		Black	
	Mean	SD	Mean	SD	Mean	SD
% Some college (parent)	55.9%		55.8%		56.0%	
% Bachelor's degree (parent)	12.4%		14.4%		6.8%	
% Graduate/Professional degree[a] (parent)	7.9%		10.3%		1.2%	
Time-varying characteristics						
Highest observed annual earnings	$105,280	$151,382	$119,870	$172,052	$63,995	$41,348
% Northeast (location at labor-market entry)	16.3%		19.1%		8.4%	
% Northcentral (location at labor-market entry)	30.7%		35.4%		17.4%	
% South (location at labor-market entry)	36.5%		25.6%		67.4%	
% West (location at labor-market entry)	16.5%		19.9%		6.8%	
Number of children (at labor-market entry)	1.0	1.4	0.7	1.1	1.6	1.9
% Single (at labor-market entry)	21.6%		20.5%		24.7%	
% Married (at labor-market entry)	64.9%		70.4%		49.4%	
% Separated/widowed/divorced (at labor-market entry)	13.5%		9.1%		25.9%	
Number of respondents	1,976		1,460		516	
Number of person-years	19,321		14,727		4,594	

Note: Data source: Panel Study of Income Dynamics. SD = standard deviation.
[a]This category is combined with Bachelor's degree holders in the analytical sample.

Figure 1. Observed earnings trajectories, black and white men, PSID 1968–2015



Note: After excluding thirty-seven outlier respondents with the highest annual earnings exceeding $520,000 ($250 per hour), the sample is based on all black and white male household heads with at least one record of post-education earnings, including 37,758 person-year observations drawn from 3,832 respondents. Also, because of the PSID's post-1997 biennial survey frequency, I take two-year averages for all pre-1997 records to make data consistent throughout.

former exhibits a much steeper slope of growth than the latter. Heterogenous courses are also observed for the decadal cohorts. For example, black workers who entered the market during the 2000s underwent the most salient trend of racial earnings divergence, which is likely contributed by the great recession. Overall, the observed earnings trajectories suggest that black-white earnings inequality is a multi-dimensional dynamic process, wherein black men are subject to different patterns of racial dynamics contingent on their educational attainment, their timing of labor-force entry, and, most importantly, the temporal position of their career paths.

Findings of the Growth-Curve Model

The analyses proceed through three nested models. Findings are presented in Table 3, where the upper portion contains time-invariant components that explore the random intercept of the earnings trajectory, whereas the lower portion contains time-varying components, in the form of either time-varying controls (e.g., martial status) or time-invariant variables' interactions with time (e.g., education × year), to explore its random slope. Model 1 describes black and white men' raw earnings trajectories, where the two race coefficients can be interpreted that: (1) African Americans' mean baseline earnings are significantly lower by 0.482 log units than (or 61.8 percent of) those of Whites; (2) African Americans' mean slope of earnings growth is significantly lower by 0.01 than that for Whites. Consistent with observed earnings trajectories,

Model 1 indicates that black men face significant earnings inequality in both the beginning and development of their work careers.

Model 2 includes a complete set of explanatory variables, which all work as expected. As shown in the table, only visible productive traits exhibit significant effects on baseline earnings. The two invisible traits (i.e., health and parental education) both have significant effects on the slope of earnings growth. These patterns are consistent with my expectation on how the labor market interprets visible and invisible human capital over time. Another significant predictor for earnings growth is the length of post-education joblessness, which implies that difficulty encountered at labor-market entry, while not lowering starting wages, undermines workers' chance of career ascendance. As for the two race coefficients, the gap in baseline earnings remains significant after it is reduced by about 20 percent (−0.484 to −0.385), but the race coefficient on the slope becomes statistically non-significant. Overall, findings of Model 2, alongside those of figure 1, support the hypothesis that racial dynamics at the career outset play a significant role in shaping long-term patterns of earnings inequality.

Finally, Model 3 allows race to interact with education, to assess how patterns of earnings inequality vary across pre-market groups. With interaction terms in the model, the race coefficient now stands for the main effect of race on baseline earnings when the education variable takes the value zero (i.e., college graduates). The race coefficient of −0.197, a 48.8 percent drop from that in Model 2, indicates that the residual gap in baseline earnings is at the lowest level among college-educated workers. As demonstrated by the race-education interaction, the reduced gap is the result of a narrowing trend of 0.139 log units per unit ascending on the education ladder. In the lower portion of Model 3, the coefficient on race-year interaction now stands for the black-white difference in earnings growth among the highest educated group, and its significantly negative value (−0.014) suggests that the explained black-white earnings divergence reappears among college graduates. And this resurfaced gap, as demonstrated by the three-way interaction (−0.011), is the result of a widening trend moving up the education ladder. These findings are consistent with my hypothesis that although the visibility of educational attainment helps protect highly educated black workers from hiring discrimination, over time, as a series of labor-market mechanisms materialize, black college graduates face increasingly intensified challenges.

Cumulative Disadvantages

To present a more intuitive image, I use Model 3 to generate a series of predicted annual earnings by the intersection of race (black vs white) and education (college vs non-college), holding other covariates constant. The left section of figure 2 depicts temporal progression of the two education-specific racial gaps in annual earnings, whereas the right section focuses on two corresponding gaps in accumulated earnings.

The left chart is essentially a visualization of Model 3, as the gap among college graduates starts relatively narrow, but it widens over time and quickly surpasses

Table 3. Black-White Inequality in the Career Earnings Trajectory, Black and White Men, PSID 1968–2015

	Model 1 (Raw)	Model 2 (Full)	Model 3 (Final)
	Coefficient (SE)	Coefficient (SE)	Coefficient (SE)
Time-invariant components (Equation 2)			
Intercept	10.456***(.017)	9.614***(.155)	9.570***(.154)
Race (1 = Black)	−0.484***(.033)	−0.385***(.031)	−0.197***(.055)
Education	—	0.210***(.019)	0.177***(.021)
Work experience		0.015** (.005)	0.014* (.006)
Age	—	0.025***(.005)	0.026***(.005)
Health status	—	0.030 (.016)	0.032* (.016)
Parents' education	—	−0.015 (.018)	−0.002 (.018)
Split-off time	—	0.095***(.028)	0.092***(.028)
Length of joblessness	—	−0.041 (.027)	−0.036 (.027)
Race × education	—	—	0.139***(.034)
Time-varying components (Equation 3)			
Year	0.083***(.003)	0.162***(.017)	0.165***(.017)
Year square	−0.004***(.001)	−0.004***(.001)	−0.004***(.001)
Race (× year)	−0.010** (.003)	−0.001 (.004)	−0.014* (.006)

(*Continued*)

Table 3. Continued

	Model 1 (Raw)	Model 2 (Full)	Model 3 (Final)
Region (change over year)	—	0.008 (.010)	0.008 (.010)
Marital status (change over year)	—	0.025***(.005)	0.025***(.005)
Number of children (change over year)	—	0.010* (.005)	0.011* (.005)
Education (× year)	—	0.014**(.002)	0.017***(.002)
Work experience (× year)	—	0.001 (.001)	0.001 (.001)
Age (× year)	—	−0.003***(.001)	−0.003***(.001)
Health status (× year)	—	0.004* (.002)	0.004* (.002)
Parents' education (× year)	—	0.004* (.002)	0.004* (.002)
Split-off time (× year)	—	0.004 (.003)	0.005 (.003)
Length of joblessness (× year)	—	−0.008* (.003)	−0.008* (.003)
Race × education (× year)	—	—	−0.011**(.004)
Number of persons (person-years)	1,976 (19,321)	1,976 (19,321)	1,976 (19,321)

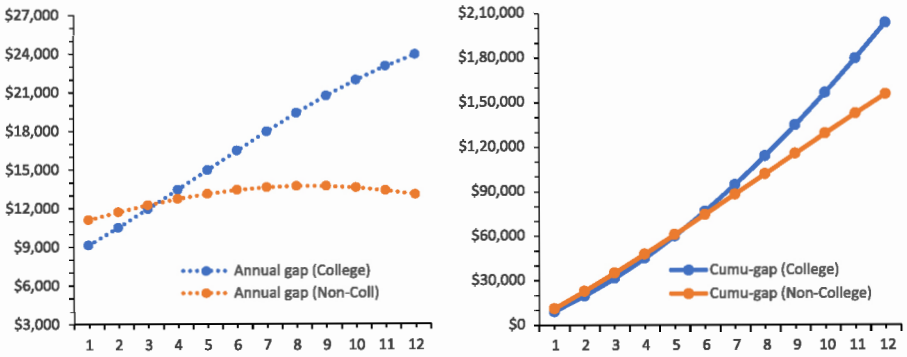
Note: Education variables are coded: less than high school (−3), high school (−2), some college (−1), and college and above (0). Model 3 explains about 37% of the raw random intercept and about 52% of the raw random slope. SE = standard error.

* stands for "$P < .05$."

** stands for "$P < .01$."

*** stands for "$P < .001$" (two-tailed tests).

Figure 2. Predicted annual earnings, black and white men, PSID 1968–2015



Note: Based on Model 3, annual earnings are predicted for the next twelve years upon labor-force entry. The left chart displays the trend of black-white inequality in annual earnings (year after year), and the right chart displays the trend of black-white inequality in cumulative earnings over time.

that among less-educated workers. From left to right across the figure, the steady gap in annual earnings translates into a linear curve of accumulated differentials facing less-educated black workers. In the meantime, the widening gap in annual earnings translates into an exponential curve of accumulated differentials facing black college graduates. By the end of the 12-year window, the two accumulated earnings gaps reach around $150,000 and $200,000, respectively. When measured cumulatively, apparently, black men' earnings disadvantages become more pronounced. College-educated black workers face challenges that not only accumulate but exacerbate over time. Even for their less-educated peers who are subject to non-widening gaps, steady year-by-year earnings differentials will accumulate into sizable disadvantages. It shall be emphasized that an earnings gap of the same size would in general indicate a more serious problem among the less educated, for (1) its lower base earnings (e.g., $20,000–$10,000 vs $90,000–$80,000) and (2) its broader coverage of the labor market.

Sensitivity Analyses

Analyses conducted so far have established that black-white earnings divergence occurs disproportionately among highly educated men. Without detailed information on labor-market structure and workplace dynamics, I cannot evaluate how this phenomenon is produced by specific mechanisms. Nonetheless, these mechanisms all point to the process whereby educated black and white professionals compete in a high-reward and high-inequality market sector. This inspires me with a thesis that racial earnings divergency, as the outcome of the competition, is determined by not only black disadvantage but white advantage. As such, I intend to assess the extent to which findings are sensitive to the presence of a small group of privileged Whites.

Borrowing from Cotter et al. (2001), I define college-educated workers as an income-based heterogeneous group. The purpose of sensitivity analyses, accordingly, is to find out how the unexplained racial gap in earnings growth, among college graduates, responds to sample restrictions on upper-bound earnings. I create three scenarios by limiting the analytical sample to those whose observed annual earnings never exceeded the ninety-ninth percentile ($300,577), ninety-eighth percentile ($225,786), and ninety-seventh percentile ($195,100) of the distribution of US individual incomes in 2017 (US Census Bureau 2017). I then re-estimate Model 3 separately using the three restricted samples and report the resulting coefficients on race-year interaction, which stand for black-white differences in the slope of earnings growth among college graduates, in the upper portion of Table 4.

The coefficient from Model 3 is used as a reference, which signifies that college-educated black men face a residual gap in the slope of earnings growth (−0.014) that is statistically significant at the 0.05 level. When the sample is restricted at $300,577 (ninety-ninth percentile), the coefficient goes down to −0.011 and becomes non-significant at the 0.05 level. The gap continues to narrow as more top earners are dropped. This trend of changes reflects the socioeconomic characteristics of the excluded respondents. As shown in the lower portion of Table 4, the percentages of college-educated Whites in the three percentiles of top earners are 74.2 percent (49/66), 77.9 percent (81/104), and 75.2 percent (115/153), respectively, when their overall representation in the unrestricted sample is only 29.8 percent (588/1976). Thus, it is not surprising that with the exclusion of very high-income respondents who are disproportionately white college graduates, the black-white earnings divergence becomes much less salient.

Finally, I single out these top earners and re-plot observed earnings trajectories. As illustrated in figure 3, ">ninety-seventh" stands for top earners whose highest annual earnings exceeded the ninety-seventh percentile. For those below the ninety-seventh percentile, they are categorized into two groups: those with at least a Bachelor's degree and those without. The left section of figure 3 illustrates observed earnings trajectories, whereas the right section illustrates the corresponding racial gaps. The two charts point to the same conclusion that the black-white earnings gap remains largely constant over time among both college-educated and non-college-educated workers, as long as the top earners are excluded.

Overall, the sensitivity analyses verified the existence of a small group of privileged Whites, though their defining characteristics are not observable with the available data.[12] Nevertheless, these findings indicate that black-white earnings divergence, to a noticeable extent, is caused by college-educated black men's diminished chance of becoming top earners. In the meantime, had the small number of top earners not been the central concern, it could be reasonably concluded that early-stage racial dynamics (i.e., pre-market preparation and job-market entry) play a dominant role in shaping long-term patterns of earnings inequality. These findings also provide a plausible reconciliation for the conflicting reports between Tomaskovic-Devey, Thomas, and Johnson (2005) who

Table 4. Black-White Differences in Earnings Growth across Restricted Samples, and Selected Socioeconomic Characteristics of the Excluded Top Earners, Black and White Men, PSID 1968–2015

	Unrestricted (model 3)		Ninety-ninth percentile		Ninety-eighth percentile		Ninety-seventh percentile	
Coefficient: race × year (SE)	−0.014* (0.006)		−0.011^{+} (0.006)		−0.010 (0.006)		−0.008 (0.006)	
	Black	White	Black	White	Black	White	Black	White
Number of respondents	516	1,460	2	64	3	101	6	148
Education breakdown								
≥Bachelor's degree	80	588	1	49	2	81	3	115
Some college	155	391	0	10	0	14	2	22
High school	235	426	1	5	1	6	1	10
<High school	46	55	0	0	0	0	0	1
Highest earnings (average)	$63,995	$119,870	$405,555	$639,589	$353,703	$499,880	$279,518	$407,181

Note: The upper portion reports the coefficients of race-year interaction across the four samples, which capture the degree to which black college graduates experience earnings divergence with their white counterparts. The lower portion reports education breakdowns of the excluded top earners. SE = standard error.

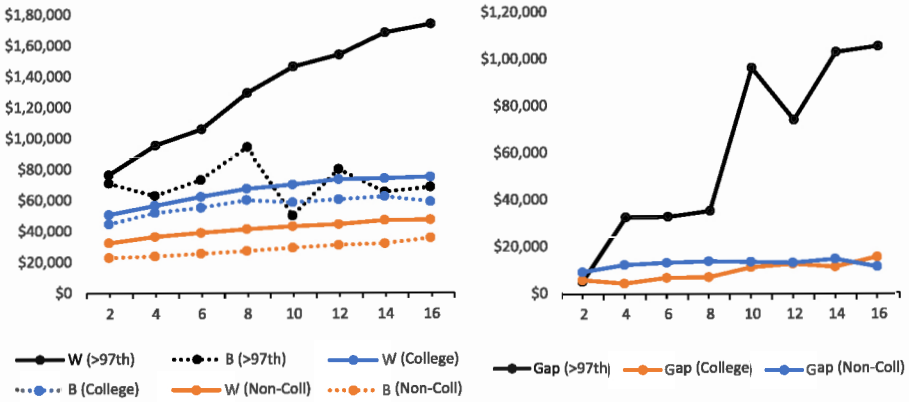
$^{+}$stands for "$P < .1$."

*stands for "$P < .05$."

**stands for "$P < .01$."

***stands for "$P < .001$" (two-tailed tests).

Figure 3. Observed earnings trajectories by education and income, black and white men, PSID 1968–2015



Note: Observed black-white earnings inequality is measured separately among three groups: top earners (above the ninety-seventh percentile), college-educated workers, and non-college-educated workers. The charts are drawn based on the same unrestricted sample (3,832 respondents' 37,758 person-year observations) as used for figure 1.

discovered a trend of black-white wage divergence among college graduates, and Cotter et al. (2001) who found parallel earnings growth curves at three intermediate points of the earnings distribution (i.e., twenty-fifth, fiftieth, and seventy-fifth) but did not test it on extreme points (e.g., ninety-seventh).

Conclusion and Discussion

The above-presented analyses have led me to draw temporal-specific conclusions on earnings inequality between black and white men. The gaps in baseline earnings indicate that African Americans experience substantial disadvantages at the career outset. Those with less educational attainment face augmented challenges due to the low visibility of productivity signals, which is often exacerbated by diminished policy protection and their lack of resources to seek legal assistance (Holzer and Neumark 2000). Even for highly educated black professionals, the initially small gaps can evolve and accumulate into sizable earnings disadvantages. Overall, the importance of early dynamics in shaping long-term patterns of earnings inequality helps locate the temporal segment that is key to addressing the issue. This naturally points at pre-market racial barriers to the acquisition of productive assets, highlighting the link between labor-market outcomes and various institutional failures that disrupt and undermine young African Americans' educational experiences, such as residential segregation (Thomas and Moye 2015) and the school-to-prison pipeline (Owens and McLanahan 2020). Furthermore, it is not just education per se but racialized market mechanisms (e.g., signaling) whereby productivity information is processed, that place black men onto disadvantaged positions for career progression.

Thus, findings of this study are in support of continuing investigations on the subtle interaction between race, schooling, and job assignment, as pursued by scholars in both labor economics (Lang and Manove 2011) and sociology of education (Bills 2003).

When it comes to career progression, three mechanisms materialize over time, as black and white men of differential skill sets compete in a racialized work environment that is embedded in the broad context of labor-market bifurcation. All these point to intensified challenges facing highly educated African Americans, which indicates a serious issue because of college graduates' growing share in the black labor force (Bloome and Western 2011). In that regard, findings of this study highlight two previously underexplored perspectives.

First, Although organizational scholars have done an excellent job exploring racialized workplace dynamics that restrict minority workers' chance of upward mobility (Ferguson and Koning 2018; Ray 2019; Smith 2002; Wingfield and Alston 2014; Wilson and Roscigno 2010), increasing efforts are needed to reveal how workplace discrimination is connected to the assessment of hard-to-observe productive traits. For example, if the deprivation of networking resources turns out to be a major problem, attention needs to be paid to the institutional processes wherein racial gaps in such resources are fostered. As such, I am in the hope that the source of black-white earnings divergence among highly educated professionals, alongside that of differential access to authority attainment, both of which remain largely intangible (Day 2015), can be located onto more specific and more concrete institutional processes.

The other perspective points to the increasingly stratified market structure, as findings of this study indicate both the existence of a bifurcated labor market and the challenges facing black professionals competing in it. The sensitivity analyses push this line of reasoning further by linking the observed black-white earnings divergence to the presence of a tiny group of white top-earners. Explaining this phenomenon requires better understanding of the relationship between intragroup and intergroup inequalities, which calls for race scholars' attention to the rising overall earnings polarization that concentrates income gains to the top (Atkinson, Piketty, and Saez 2011; Keister 2014; Wilson 2011b). For example, an exacerbated within-group stratification between top and non-top white earners will likely lead to a growth in observed black-white earnings inequality, which certainly cannot be fully explained by between-group comparisons. Apparently, addressing black-white earnings inequality takes efforts that go beyond both the labor market and race itself (Reskin 2012).

Besides substantive findings, the longitudinal framework can be used to reinterpret previous evidence from a temporal-dynamic perspective. For example, past conclusions on the non-existence of racial gaps in starting wages (Oettinger 1996; Tomaskovic-Devey, Thomas, and Johnson 2005) do not hold when the career outset is defined as post-education labor-market entry. On a related point, the wide black-white gaps in baseline earnings, partially resulting from the inclusion of zero-earners, strengthen the argument that it is essentially biased to assess market discrimination after the primary victims of discrimination are excluded (Western and Pettit 2005).

The major limitation of this study lies in the flip side of its major strength. That is, despite the strength in explaining general patterns of black-white earnings divergence by synthesizing large-scale dynamics across multiple institutional domains, this framework is not capable of evaluating any specific mechanism that directly produces differential outcomes. For example, I expect improved STEM education (Xie, Fang, and Shauman 2015) and diminished contact with the criminal justice system to reduce black men' disadvantages in initial job placement, which then might help prevent earnings divergence over time. I also suspect that African Americans' disproportionate burden of student loan debt might undermine their long-term career prospect by modifying job preferences—that is, overemphasizing short-term financial rewards (Houle and Addo 2019). These hypotheses can be better explored with targeted conceptual framing and specialized empirical data. Behinds, a longitudinal examination on alternative scenarios of race/ethnicity-gender intersection, especially incorporating minority women's experiences, would broaden this framework that exclusively focuses on black and white men. I will leave these explorations to future research. The bottom line is that earnings inequality is fundamentally a longitudinal process, which makes it essential to keep a temporal-dynamic perspective for designing future works and interpreting past findings.

Notes

1. Cheng (2014) also examined African Americans' longitudinal earnings trajectories, although the analyses were based on an aggregated sample without separating workers by gender or education.
2. The authors proposed a theoretical model that highlights black-white earnings inequity as being caused by accumulated discrimination within the labor market. The model, however, does not explain why highly educated African Americans encounter more discrimination than their less-educated peers.
3. The earnings made while in school are by definition from part-time jobs. In fact, previous studies routinely set age restrictions on the sample to ensure that most respondents had completed formal education (Cheng et al. 2019).
4. I also experimented with alternative cut-off points (i.e., 8, 10, and 16), which do not lead to any change in major findings (Appendix A).
5. Originally, 3,336 cases meet the basic selection standards—black and white male household heads with at least a 12-year window of observed earnings trajectories. The three-record requirement is the primary cause for sample attribution (3,297–2,354), in combination with the age requirement (2,354–2,149), and missing values (2,149–1,957). I examined potential resampling biases on three key variables: race, education, and cohort. The results indicate that the final analytical sample is largely representative of the original sample (Appendix B).
6. I also experimented alternative scenarios of sample restriction. These include an unrestricted sample and partially restricted samples by different combinations of the 12-year, age, and three-record constraints. None of these scenarios leads to major changes in findings (Appendix C).

7. African Americans account for 26.1% of the final sample, doubling their representation in the US population. National surveys (e.g., the PSID) purposely oversample African Americans to enhance the analytical reliability on issues where black representation is low (Wilson, Roscigno, and Huffman 2015). For that reason, it is a common practice for PSID-based empirical analyses to not apply weights (Altonji and Pierret 2001; Tomaskovic-Devey, Thomas, and Johnson 2005; Wilson and Roscigno 2010), which is also the choice for this study.
8. The impacts of historical context on black economic progress have been extensively documented (Bloome and Western 2011; Ren 2019). Altohough I include multiple cohorts of respondents to ensure temporal generalizability of the findings, cohort comparison is not my focus, considering that adding another analytical dimension might complicate this study's already complex temporal scheme and further exhaust the limited sample. Nevertheless, findings based on cohort-based sub-samples are provided in Appendix D.
9. Those who entered the market after 2003 (Cohort 5 and part of Cohort 4) are not included in the main analysis, due to their shorter-than-12-year earnings trajectories. But their labor-market experiences can be seen from the earnings trajectories (Figure 1), the results using the unrestricted sample (Appendix C), and the results of sub-sample analyses (Appendix D).
10. Controlling for state-level fixed effects leads to the same findings.
11. All statistical findings of this study are produced using Stata 13. All datasets, programing codes, intermediate results, and alternative analyses are available upon request.
12. The existing literature provides limited knowledge about the life-course processes that produce these top earners/wealth holders, other than that they tend to be older white males with elite education (Keister 2014; Torche 2011). This limitation is caused particularly by the lack of presentation of extremely privileged individuals/households in survey datasets.

Supplementary Material

Supplementary material is available at *Social Forces* online

About the Author

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