
Amitabh Chandra


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By Amitabh Chandra*

Writing almost a quarter century ago, Richard Butler and James Heckman (1977) cautioned social scientists to look beyond the dynamics of the racial wage gap for full-time workers, and to study the richer set of behaviors observed at the extensive margin of employment. They argued that, as the employment rate for blacks declined, primarily because of expansions in the generosity of transfer programs, observed relative wages increased because of the selective withdrawal of the least-skilled blacks from the labor force. At the time of writing their paper, Butler and Heckman could not have anticipated the phenomenal increase in the returns to skill that would occur in the 1980's. Therefore, in addition to expanding transfer programs, it is also possible that falling skill prices for the least skilled have reinforced the incentives to withdraw from the labor force. For both reasons, a preoccupation with the wages of full-time workers may cause social scientists to overstate the success of Title VII Legislation, or spuriously conclude that discrimination against blacks has declined.

In one of the first tests of this thesis, Charles Brown (1984) adjusted aggregate Current Population Survey (CPS) data to obtain estimates of the racial wage gap that reflected nonemployment by race. He found that, even though the published earnings ratios converged from 0.59 in 1953 to 0.71 in 1978, the corrected ratios moved from 0.57 to only 0.61 over the same period. Under the identifying restriction that nonworkers earn below what the median agent earns, Brown's results attribute two-thirds of the observed convergence to the selective withdrawal of blacks from the labor force (the observed gain of 20 percent is only 7 percent when the nonemployed are accounted for). Despite the magnitude of Brown's findings, the U.S. Commission on Civil Rights (1986) remains extremely cautious of accepting the relevance of the selective-withdrawal hypothesis. In the same spirit, much of the subsequent literature on the racial wage gap has continued to analyze the convergence of the wage gap for workers, or even more restrictively, for full-time workers. Most recently, Chinhui Juhn (1997) finds that the selective withdrawal of blacks reduces the observed convergence by one-third over 1968–1988, whereas Bruce Western and Becky Pettit (1999) attribute half of the observed convergence to this hypothesis for the 1982–1996 period.

This paper uses data from the U.S. Decennial Census from 1940–1990 and summarizes the results of a larger inquiry into the empirical content of the selective-withdrawal hypothesis (see Chandra [2000] for further details). The use of 50 years of data allows me to subsume all the time-periods examined by previous studies, hence allowing me to compare my estimates to those obtained by the literature. As part of my analysis, I demonstrate the importance of not relying on inferences made on the racial wage gap from CPS data. The CPS has the advantage of producing a fairly consistent yearly time-series from 1964 onward; however, it does not sample members of the armed forces and contains no information on the incarcerated population. These omissions bias empirical estimates of the racial wage gap. The former causes the researcher to overstate the racial wage gap because it ignores the significant role of employment in the armed forces in compressing the racial wage gap. This point has been noticed and documented in the sociology literature by Robert Mare and Christopher Winship (1984) who also provide evidence that the most able blacks are in the military. The military sample is typically excluded from most analyses of labor markets because the CPS does not collect earnings data on this sample. Ignoring the

* Address: Department of Economics, 6106 Rockefeller Center, Dartmouth College, Hanover, NH 03755 (e-mail: chandra@pop.uky.edu). This paper is drawn from my doctoral dissertation at the University of Kentucky. I have benefited from suggestions on the source paper from Steven Allen, Mark Berger, Dan Black, Chris Bollinger, Ken Chay, John Garen, Jacob Klerman, Derek Neal, James Smith, Jeffrey Smith, and participants at the AEA and APPAM Meetings.
incarcerated sample overstates the convergence over time because it ignores the role of increasing criminal activity as a response to changing wage structure. I restrict my analysis to men because the extent of nonemployment among black women has fallen over time, in sharp contrast to the increase for black men. Furthermore, I restrict my analysis to prime age men (aged 25–55) so that my results are not contaminated by the increasing prevalence of early retirement among men. In addition, a substantial fraction of younger cohorts in the 20–25 age group are enrolled in college. To avoid incorrectly classifying these youths as being out of the labor force, I exclude them from my analysis.

I. What Are the Facts?

I begin by noting the following facts from Figure 1, which was constructed using U.S. Census data for men aged 25–55. Not conditioning on any variables, these data indicate that in 1940 black men’s weekly wages were 48.4 percent of white men’s wages. By 1990 this number had increased to 75 percent—an improvement of 60 percent over five decades, although the improvement from 1980 to 1990 has been stationary. Simultaneously, the racial difference in the employment rates has increased over time. Figure 1 also demonstrates the phenomenal convergence in black–white earnings that occurred over the decade of the 1940’s. This convergence is particularly remarkable when one notes that this period precedes the passage of Brown v. Board of Education and the major Civil Rights initiatives of the 1960’s. In fact, there is evidence that the racial wage gap actually deteriorated slightly over the decade of the 1950’s. Both the 1940’s and 1950’s are typically excluded in analyses that are based on CPS microeconomic data but deserve the further attention of labor economists and economic historians. Running parallel to these trends in relative weekly earnings is the corresponding decline in the employment rates of black men relative to whites. Together, these two series provide preliminary evidence in favor of the selective-withdrawal hypothesis. Whereas observed wage ratios have improved, the data also indicate that a growing fraction of men are not working.

In Table 1, I examine the current labor-force employment status for prime-aged men. First, notice the decline in black self-employment over time. Also note the growing share of black men

1 Aggregate data separated by race are available from the Bureau of Labor Statistics from 1972 onward. According to these data, black women aged 25–55 increased their employment to population ratios from 0.459 in 1972 to 0.612 in 1998. Over the same period, the corresponding numbers for white women went from 0.406 to 0.577. Based on these numbers, the selective-withdrawal hypothesis appears to be nonexistent for women.

2 Other sample restrictions include the requirement that no respondent should have imputed values for race, age, education, weeks worked, or wage and salary earnings. In addition, the weekly wage distributions (by year and race) were trimmed at 1 percent and 99 percent to guard against outliers. This approach circumvents the problem of imposing a real-dollar cutoff on the wage distributions.

3 These tables extend the work of Finis Welch (1990). Welch does not describe the sample restrictions imposed in his paper; therefore, his results are not strictly comparable to mine. My sample restrictions are described in this paper, and their implications are studied in the source paper (see Chandra 2000).

4 In their analysis of the self-employment behavior of white and black men, Robert Fairlie and Bruce Meyer (1999) include all men ages 16–64. They restrict their sample to include nonagricultural workers, who worked 40 or more weeks in the preceding year and 35 or more hours in the preceding week. I am examining workers aged 25–55 with no restrictions on industry worked or on labor supply.
in the armed forces, as well as the fraction that are in the “not in the labor force” (NILF) category. The institutionalized fraction (which includes those who are incarcerated) has been growing over time. This group of individuals is excluded from any analysis that relies on CPS data by construction. In Table 2, I interact the employment-status variables with broad measures of education attainment and present results for 1940 and 1990 by race. From, these tables it is possible to see that

In the earlier years my classification of farmers as being self-employed raises estimates of the self-employment rate. This effect aside, in all years my estimates of the self-employment rate will be lower than Fairlie and Meyer’s because I am looking at the self-employed’s share of the population, and not of all workers.
a substantial portion of the less-skilled (those with less than a high-school degree) are also unemployed, NILF, or incarcerated. Furthermore, this trend has increased over time: in 1940 a little less than 7 percent of blacks aged 25–55 who were high-school dropouts were NILF or institutionalized. By 1990, this number had grown to almost 35 percent. Table 2 therefore provides direct evidence in favor of the Butler-Heckman hypothesis: the least-skilled members of society are also the ones who are the most likely to be not working.

II. Estimates of the Wage Gap Accounting for Nonemployment

To assess the empirical content of the selective-withdrawal hypothesis in more detail, in Table 3 I use three alternative methods to predict the mean of the unobserved distribution of offer wages. For each year of data, I report the observed average weekly earnings for whites and blacks. This row is followed by the results from the “Brown” estimator that reproduces the approach of Brown (1984). It generates the maximum possible value for the racial wage gap because it makes the identifying assumption that nonworkers are drawn from below the median of the offer-wage distribution. According to this estimator, even though the observed convergence in the average ratio from 1950 to 1990 was 13 percentage points, the “true” convergence was only approximately 3 percentage points. As a validity check, the results for 1950–1980 provide estimates that are found to be generally consistent with Brown’s original analysis that covered the 1953–1978 period using CPS data. In interpreting Brown’s results, remember that the institutionalized population is excluded from his analysis. The “cell minimum” estimator is motivated by Charles Manski (1995) and proceeds by saturating the data by seven schooling groups and six age groups, and then matching all nonworkers in a given (age × education) cell to the lowest earner in that cell. Finally, the more traditional matching estimator operationalizes the framework of Juhn (1997) and assigns the mean cell wage to all nonworkers in that cell. The power of matching estimators is that they do not im-

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Table 3—Estimates of the Racial Wage Gap Accounting for Nonemployment, Males Aged 25–55

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimator</th>
<th>Weekly earnings ($)</th>
<th>Whites</th>
<th>Blacks</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td>Observed</td>
<td>308</td>
<td>149</td>
<td>0.484</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brown</td>
<td>252</td>
<td>109</td>
<td>0.433</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell minimum</td>
<td>275</td>
<td>129</td>
<td>0.469</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell mean</td>
<td>307</td>
<td>148</td>
<td>0.482</td>
<td></td>
</tr>
<tr>
<td>1950</td>
<td>Observed</td>
<td>401</td>
<td>251</td>
<td>0.626</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brown</td>
<td>355</td>
<td>213</td>
<td>0.600</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell minimum</td>
<td>360</td>
<td>221</td>
<td>0.614</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell mean</td>
<td>400</td>
<td>250</td>
<td>0.625</td>
<td></td>
</tr>
<tr>
<td>1960</td>
<td>Observed</td>
<td>560</td>
<td>346</td>
<td>0.618</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brown</td>
<td>505</td>
<td>290</td>
<td>0.574</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell minimum</td>
<td>527</td>
<td>310</td>
<td>0.588</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell mean</td>
<td>558</td>
<td>344</td>
<td>0.616</td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>Observed</td>
<td>712</td>
<td>491</td>
<td>0.690</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brown</td>
<td>659</td>
<td>428</td>
<td>0.649</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell minimum</td>
<td>672</td>
<td>442</td>
<td>0.658</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell mean</td>
<td>712</td>
<td>487</td>
<td>0.684</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>Observed</td>
<td>769</td>
<td>582</td>
<td>0.757</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brown</td>
<td>699</td>
<td>450</td>
<td>0.644</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell minimum</td>
<td>726</td>
<td>483</td>
<td>0.665</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell mean</td>
<td>766</td>
<td>572</td>
<td>0.747</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>Observed</td>
<td>799</td>
<td>602</td>
<td>0.753</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brown</td>
<td>684</td>
<td>430</td>
<td>0.629</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell minimum</td>
<td>754</td>
<td>500</td>
<td>0.663</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matching, cell mean</td>
<td>794</td>
<td>585</td>
<td>0.737</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author’s tabulations from U.S. Census PUMS data. The Brown estimator refers to the Brown (1984) assumption that all nonworkers are drawn from below the median of the unconditional offer-wage distribution. The cell-minimum estimator assigns the minimum value of observed earnings in each (age × schooling) group to all nonworkers in that cell, and the cell-mean matching estimator assigns the cell mean to all nonworkers. All dollar figures have been deflated to 1997 dollars using the implicit GDP price deflator, and the data are weighted using person weights.

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5 An additional sample restriction is imposed for this exercise. It may not be correct to treat weekly self-employment earnings or weekly earnings for those in the armed forces as providing a measure of skill prices for these two groups. The former includes a return to physical and financial capital, and the latter group receives a large fraction of compensation in the form of in-kind compensation. Therefore, based on current employment status, both groups were dropped for this portion of the analysis.

6 My approach is similar to Juhn (1997), but not identical. Juhn treats all workers who worked 1–13 weeks as being nonworkers and imputes wages for this group, as well as for respondents who worked zero weeks in the previous year, by matching them to similar workers who worked 14–26 weeks in the previous year.
pose an arbitrary functional form on the data, and their estimates are readily interpretable. However, each must assume the logic of ignorable selection once age and schooling are conditioned on. As such they ignore the fact that, given agents with identical observables, some chose to work whereas others did not. This limitation of matching estimators is explored further by Chandra (2000) where the selective withdrawal hypothesis is examined by using semi-parametric estimation techniques.

The results of Table 3 provide evidence that supports the selective-withdrawal hypothesis. The table provides estimates of average weekly earnings as computed by the different estimators. The last column provides estimates of the relative-earnings ratio once the nonemployed are accounted for. As is to be expected, the Brown estimator results in the most substantial correction to the observed ratios. The matching estimator that relies on using cell-minima as estimates of the earnings of the nonemployed provides estimates that are between those obtained from the Brown estimator and the cell-mean-based matching estimator. A more complete analysis would disaggregate the analysis by skill-group to assess the differential impact of the selective-withdrawal hypothesis across skill groups. Regardless of the estimator chosen to “correct” for nonemployment, it is evident that during the 1960’s black males made substantial gains relative to their white counterparts. This analysis is therefore consistent with the conclusion that the Civil Rights legislation played an important role in improving the labor-market outcomes of black men. More generally however, the results of Table 3 should caution social scientists who focus only on observed wages to consider the importance of studying the joint determination of wages and employment.

III. Discussion

In this paper I have focused on the ratio of black weekly earnings to white weekly earnings as being the parameter of interest in studying the racial wage gap. This approach provides a succinct method for summarizing trends in the racial wage gap over time. However, in the presence of skill-biased technological change which “stretches” the skill distribution, it is possible that the relative position of black men on the aggregate wage distribution has not changed, even though the convergence in observed or corrected mean weekly earnings has stagnated or even deteriorated. This point constitutes the central thesis of Juhn et al. (1991) and provides an important avenue for future research in this area.

In the source paper (Chandra, 2000) I follow the framework developed in Juhn (1992) to disentangle the role of falling offer wages versus rising reservation wages in contributing to black nonemployment. I find that, since 1980, black males are not working because of declining skill prices. For this period, I do not find evidence for the hypothesis that rising reservation wages are causing black males to withdraw from the labor force. When this finding is combined with the results of Derek Neal and William Johnson (1996), the role of public policies that affect relative wages becomes clearer. Because less-skilled black men are not working due to low offer wages, such interventions should be made early in life and should be directed at closing the skill gap that exists between blacks and whites, before they enter the labor market.

REFERENCES


Juhn, Chin Hui. “Decline of Labor Market Participation: The Role of Declining Market Oppor-


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