

LOW WAGE WOMEN IN THE TWENTIETH CENTURY: UNJUSTLY EXCLUDED

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Abstract

In U.S. Census data from 1940 to 1990, a large number of women appear to be earning unbelievably low wages. While these outliers are customarily dropped from the data when performing economic analysis, I find that this is an inappropriate strategy. From 1940 to 1960, many women appear to have actually earned such extremely low wages. These women were primarily full-year full-time black domestic workers. They represent a significant disadvantaged population that experienced major improvement in the latter half of this century. The paper argues that this group should not be excluded from the history of American inequality.

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1. Introduction

Throughout the twentieth century in the United States, women have earned less than men and black women have earned less than white women. Working women were relatively concentrated in few poorly-paid occupations, and the women's wage distribution has a substantial lower tail. This paper investigates this low end of the women's wage distribution. It asks if the women who appear to have been earning extremely low wages actually were earning that little, who they were, and whether their inclusion or exclusion significantly affects our understanding of the history of inequality in the United States. Briefly, the answer is that a substantial population *does* appear to have been earning such low wages, and their exclusion has profound effects on our understanding of inequality in the mid-twentieth century in the United States.

When evaluating the U.S. wage distribution, we often homogenize the sample to eliminate potential sources of variation. In one respect, this is important because the female labor force is more heterogeneous. In another respect, doing so may smooth over many of the interesting features of women's labor market experience. In particular, it can entirely eliminate a population of women at the very bottom of the distribution. This excluded population is the focus of the current paper.

Figure 1 shows the distributions of log weekly wages for men and women in 1940 and 1990. The women's distribution has a longer and larger left tail in 1940. This tail is even more pronounced in the distribution of hourly wages (not shown), and is much less significant in the later years or in the men's distribution. By analyzing census data and consulting the historical record, I show that in 1940 and 1950 the lower tail is real. It is largely composed of full-time black domestic workers in the South who truly were earning extremely low wages. By 1970 and

almost entirely by 1990, the lower tail becomes much less significant. It appears to be composed primarily of part-time or part-year workers, or observations with measurement or recording error. Thus, because the lower tail is significant and real in the early years, truncation of the distribution is not justified, substantially alters inequality measures, and distorts our understanding of the history of the U.S. wage structure. The final lesson of the paper is that the wage distribution should not be truncated unnecessarily.

The paper proceeds as follows. Section 2 characterizes the lower tail of the wage distribution and Section 3 consults the historical record. Section 4 investigates exclusion of this group from economic analysis, and Section 5 concludes.

2. Empirical analysis of the lower tail

a. Data

The data employed are United States Census Files for 1940 to 1990, available as the Integrated Public Use Microdata Samples. Weekly wages are calculated as wage and salary income from the past year divided by the reported weeks worked in that year.

It is standard practice to clean a Census sample or other wage distribution by eliminating part-year or part-time workers. Because such filters would eliminate a large percentage of women from the sample, I will not do this. I will exclude only those who worked zero weeks or had no income. It is also standard practice to eliminate those earning implausibly low wages, often below half of the minimum wage.¹ Because such a cutoff not only eliminates a large

¹ The justification for exclusion of individuals earning very little is that the data is most likely measurement error -- incorrectly measured income, weeks, or hours which together result in unusually low values. However, given that weekly wages are calculated by dividing wage salary income by weeks worked, and that either of these variables could be higher or lower than their actual values, there is no particular reason to expect measurement error to be concentrated in the lower tail. Since either the numerator or denominator could be in error, without further information we should assume that the error is approximately spread throughout the distribution. Measurement error is not a very convincing explanation for a large spurious population in the lower tail.

percentage of women but is also sensitive to the real value of the minimum wage² and the position and shape of the wage distribution, I will not do this. I calculate a more robust cutoff, calculating a smoothed minimum wage proxy of 33% of the median wage among full-time full-year prime age men in each census year, and using half of that minimum wage as a cutoff.³

b. Size of the low-wage population

It is important to get a sense of the size of the low-wage population, those earning below the minimum wage or even below half the minimum wage. Table 1 shows the value of the minimum wage and the smoothed minimum wage proxy in each census year, as well as the percentile those wages represent in the men's and women's wage distributions.⁴ The striking fact is that substantial numbers of women are earning below the weekly minimum wage in most years. In 1940, 1960, 1970, and 1980 the share below the minimum wage exceeds 30%, and the share below half the minimum wage exceeds 10%. There is no doubt that dropping this population is a severe truncation of the sample.^{5,6}

For the purposes of the following discussion I define three wage categories: between zero and a half of the smoothed weekly minimum wage proxy, between half and the full minimum wage, and above the minimum wage.⁷ The average shares of the population in the first and second wage categories are 10% and 17% respectively. It is important to state at the outset that

² The real minimum wage has not increased monotonically over time. At times it has been eroded for 10 years or more, and it was particularly low in the census years 1949 and 1979.

³ Between 1940 and 1990, the minimum wage represented 26 to 39% of the median wage among full-time full-year prime age men.

⁴ The relevant population is wage/salary workers with positive income last year.

⁵ We note that the movement of the smoothed minimum wage within the men's distribution reflects the "great compression" in U.S. wage inequality from 1940 to 1950, and the subsequent expansion. (See Goldin and Margo, 1992.) This is a good indicator that the smoothed minimum wage proxy has dampened the nuisance variation in the minimum wage while retaining the important movement of the tail relative to the overall distribution. The more volatile movement of the proxy within the women's distribution reflects the secular changes in women's employment and wages superimposed on general trends.

⁶ It is important to note that many women were not in jobs in which they were constrained by the actual minimum wage. This will be discussed in greater detail in Section 3 of the paper.

this is not a discussion of wages in general, but rather of very low wages in particular. The wage categories are defined accordingly.

c. Characterization of the low-wage group

This section aims to characterize the demographic and labor market characteristics of the low wage group. It shows that there is demographic structure to the data and we can draw historically significant conclusions about individuals at the bottom of the wage distribution. Figure 2 shows the shares non-white, full-year (48 or more week worked), or full-time (35 or more hours per week) in the three wage categories in the years 1940 to 1990.

Age and Race

In terms of age, the women in the low wage category are somewhat younger, and those in the high wage category somewhat older, but the differences are slight. There are, however, significant differences by race: the extremely low wage women are disproportionately black. In 1940, the lowest wage category was 51% non-white and the highest was 6% non-white. (In that year, the entire female working population was 13% non-white). The split had largely disappeared by 1970, and by 1990 the percentages non-white within each of the wage categories were virtually indistinguishable.⁸

Weeks worked

The data also shows significant changes in labor market characteristics of the three wage groups. In 1940 low-wage individuals were just as likely to work a full year as other women in the labor market, but by 1990 they were much less likely to do so. In 1990, when 65% of all working women worked a full year, only 30% of those in the low wage category did. Thus, in

⁷ All subsequent analyses will include only women who reported positive wage/salary income and positive weeks, unless otherwise noted.

the early years more of these individuals were working actual year-round jobs for very low wages, but later on more of them were non-traditional workers.

Hours worked

I now investigate how many hours these low-wage women are working. While it is possible that they were working only part-time and were consequently paid less per week, it is also possible that they were working full-time and were paid poor wages. Between 1940 and 1990, the percentage of low wage women who were full-time decreased significantly from 46% to 13%, while the percentage who were part-time increased significantly from 28% to 42%. (The remaining individuals report zero hours.) For the high wage group, the shares full-time and part-time changed only slightly, and in opposite directions: the full-time share increased from 73% to 82%, and the part-time share dropped from 15% to 10%.⁹ It appears that in the early years, nearly half of low wage women were working full-time, but by the end of the period very few of them were and their low weekly wages may be at least partially explained by their lower hours.¹⁰

How can we best explain these trends? First, measurement error – incorrectly reported hours, weeks, or income – could produce strange wage/time combinations. While measurement error would be expected to affect all wage groups uniformly, the different trends within wage

⁸ We are careful to note that the movement over time of black women out of the low wage category does not mean that black women's wages have caught up to those of white women, but merely that black women have gained on this specific margin – extremely low-wage compared to decent wages.

⁹ There is an important difference in the data between 1940 and the other census years. Weeks recorded in 1940 are supposed to be “full-time equivalent” weeks. An individual's full-time equivalent weeks would always be lower than his or her actual weeks worked. The lower number of weeks reported would increase any weekly wage measure calculated using these weeks as the denominator. This would decrease the overall number of people observed earning extremely low wages. It would increase calculated wages only for individuals working part-time (because regular weeks and full-time weeks only diverge if an individual works part-time). This would then bump part-time people up out of the low wage category, and thereby increase the relative percentage of full-time people in the low wage category. As a consequence, some of the drop in percentage full-time between 1940 and 1950 could be an artifact of this change in the data. However, the trends in percentages full-time and part-time are evident throughout the period from 1940 to 1990, so this is certainly not the entire story.

¹⁰ In addition, the share of individuals reporting income last year but zero hours last week is substantial. This share is higher for the low wage category (35%), and declines more over time for this category. In general, low wage women are less likely to be in the center of the hours distribution.

categories belie this prediction. Measurement error cannot explain the trends, but could possibly explain some baseline percentages.

Second, the time discrepancy in the Census data – income and weeks from *last year* combined with hours from *last week* – could cause some reasonable data to look strange. Individuals could be variable-time workers (who work variable hours but happened to work full-time last week) or they could be moving into full-time work (were not full-time last year, and therefore earned little, but were full-time last week). Since this discrepancy existed in all census years, it could only be responsible for observed trends if the number of non-traditional workers *fell*. The data and the historical record show just the opposite. The time discrepancy cannot explain the trends, but could possibly explain some baseline percentages.¹¹

This leaves us with an explanation that the data show evidence of actual changes in work patterns. It is possible that in the earlier years the low-wage population is largely comprised of people who were actually earning very little while working “regular” jobs, but in later years the smaller low-wage population (13%) is mostly due to measurement error and the time discrepancy. This is by no means a clear conclusion, but it accords well with the observed patterns. One implication of this is that the low wage population would probably look different demographically from the general population in the earlier years whereas it would look representative of the general population in the later years. This was confirmed above by the analysis of the racial distribution, and will be strengthened by consideration of the occupational distribution in the next section.

¹¹ There is some evidence suggesting some role for the time discrepancy. The percentage of extremely low wage individuals (earning less than one-quarter of the smoothed minimum wage proxy) reporting zero hours peaked in 1960 and 1970. This supports the hypothesis that at least some of these zero-hours workers were in fact non-traditional workers either working part of a year or moving out of (and into) the labor force.

Occupation

Historically, black and white women in the United States have had very different occupational distributions. These distributions, for white and black women in 1940 and 1990, are shown in Table 2. In 1940, white women in the labor force were working in four major occupational categories: 28% in clerical occupations, 24% as operatives, and 21% in service occupations, and 14% in professional and technical occupations. In contrast, black women were largely concentrated in one occupational category: 75% were in service occupations, with much smaller percentages distributed in professional and technical, operatives, and agriculture.

After 1950, the occupational distributions for both white and black women changed considerably, to the point where by 1990 the distributions were rather similar. White women moved out of the service sector and into professional and clerical work. Black women also moved out of the service sector, spreading into professional and technical, management, clerical, and other categories, but their progress was hampered by discrimination and educational differences.¹² In the end, the percentage of black women in service occupations decreased from 75% in 1940 to only 24% in 1990.

This concentration in the service sector was certainly detrimental to black women. It is no surprise that service occupations are some of the most poorly paid. Among the occupational categories, agriculture and service have the highest percentages in the low wage group: averaging 38% and 21% respectively, compared with 5-10% for other occupations.¹³ In fact, 74% of those below half the minimum wage in 1940 were in service occupations. Given that black women were so concentrated in the relatively poorly paid service sector, does their

¹² Claudia Goldin reports that black women were often prevented from working in clerical occupations either by lack of appropriate education or by stated hiring policies of firms. (Goldin, *Understanding the Gender Gap*, 1990, p.147)

presence in the service sector account for their presence in the low-wage group? The answer is largely yes. In 1940, when 36% of black women were earning less than half the minimum wage, 83% of those low-wage black women were in the service sector. Overall, between 1940 and 1960, more than 70% of the low-wage black women were in service. By 1990, only 42% of low-wage black women were in service.

A more detailed investigation of specific occupations emphasizes the importance of the link between low wages, black women, and service occupations. Among occupations in which at least 0.1% of working women were working *and* more than half of those in the occupation were earning less than 1.5 times the minimum wage, the correlation between share black and share low wage is 0.80. Not surprisingly, service occupations have high shares black and high shares low-wage: occupations such as housekeepers, laundresses, other private household workers, attendants, cleaners, cooks, and waitresses. Even *within* service occupations, the correlation between the share black and the share low-wage is 0.60.¹⁴

Thus, there is a clear structure reflecting occupational segregation and discrimination: a primarily black occupation is almost synonymous with an extremely low-wage occupation. In the earlier years (1940 and 1950), black women's concentration in low-wage service occupations largely accounts for their disproportionate representation in the low-wage categories. By 1990 black women's concentration in the service sector was not as extreme (only 24% of black women in service compared with 14% of white women) and neither were they disproportionately represented in the low-wage categories (only 8.5% of black women earning below half the minimum wage compared with 8.8% of white women).

¹³ Among women in service occupations, 23% were earning below half the minimum wage in 1940, 14% in 1950, 26% in 1960, 25% in 1970, 20% in 1980, and 17% in 1990.

d. Conclusion: The Low Wage Group

Between 1940 and 1990 the low-wage population has exhibited secular trends relative to the general population in racial composition and percentage working full year or full-time. In 1940, the low-wage population was disproportionately black but by 1990 its racial composition was relatively similar to that in the general population. In 1940, low-wage women were just as likely to work year-round, but by 1990 they were much less likely to do so. In 1940, low-wage women were somewhat more likely to work part-time, but by 1990 they were much more likely to do so. In 1940, black women were concentrated in low-wage service occupations, but by 1990 this concentration had largely dissipated. Taken together, these trends indicate that initially the low-wage population was different from the general population racially and occupationally, but similar in hours and weeks worked. Over this period they became similar racially and occupationally, but different in terms of hours and weeks worked.

These observations support the following tentative conclusions. In 1940, the low-wage women were largely full-year full-time disproportionately black workers primarily in service occupations who just were not earning very much. By 1990, the low-wage women were nontraditional racially representative workers who *appeared* to be earning very little because of their nonstandard income, hours, and weeks but were actually largely measurement error.

These conclusions are confirmed by probit regressions predicting presence in the low wage group.¹⁵ This analysis shows that, in 1940, working in the service sector and living in the South both increase the probability of being low wage, by 13 and 4 percentage points

¹⁴ For example, housekeepers were better paid and less likely to be black, whereas laundresses were very poorly paid and more than 50% (in some years exceeding 80%) black. Only sales occupations were predominantly low-wage but not predominantly black, and these occupations were more likely to be part-time.

¹⁵ The probit regressions predict the probability of being below half the minimum wage (or below the minimum wage) using educational, demographic, occupational, and labor market characteristics. The set of characteristics includes those employed in standard wage regressions and those characteristics which the above analyses showed to be relevant on this margin.

respectively. The main effect of being Black is to slightly decrease the probability of being low wage (by 2 percentage points), but the combined effect of being Black in the service sector in the South is to increase the probability of being low wage by 30 percentage points.¹⁶ Furthermore, the low wage group does appear to be comprised both of individuals actually earning very low wages *and* individuals earning normal wages but working few hours (and therefore earning a low *weekly* wage). The probit results trend over time in a manner supportive of the above analysis.

3. The historical record: were they really earning so little?

The above analysis of Census data argues that there is a significant population of black women working in the service sector who were earning extremely low wages. The historical record can confirm the accuracy of these low reported wages for black and other women in the service sector. I first examine the possible role of minimum wage legislation, and then turn to a more detailed study of wages in the domestic service sector.

a. Minimum Wage Regulations

In 1938, the Fair Labor Standards Act (FLSA) established a national minimum wage of 25 cents per hour that applied to certain industries and jobs. The FLSA has since been amended to include further labor regulations and has been extended by states. The minimum wage has moved up in steps, roughly keeping in line with overall wage growth.

The FLSA was not the first national minimum wage legislation. The National Recovery Act (NRA) was passed in 1933 in an effort to ameliorate some of the effects of the Great Depression. The stated goals of the NRA were to increase purchasing power, reduce unemployment, and improve working standards. The codes provided hourly wage minima,

¹⁶ When predicting the likelihood of earning less than the minimum wage (rather than less than half the minimum), being Black in service in the South increases the probability by 73 percentage points.

weekly hours maxima, and overtime provisions for industries in or affecting interstate and foreign commerce. Nearly half of women, however, were unaffected.

The major groups covered by the codes included managers, officials, and proprietors, clerical workers, sales workers, craftsmen, operatives, laborers, and service workers *not* in private households. Important exceptions *within* these groups included those working in public administration, in telegraph or telephone industries, and in insurance; shoemakers, dressmakers, and seamstresses not working in factories; and other industrial home workers. The major *groups* not covered by the codes included professional and technical workers, farmers and farm laborers, and service workers in private households. The result was that approximately half of employed women were covered by the codes, and the bulk of the uncovered half was made up of domestic and personal service workers. Although the Act did produce significant wage gains for many women, it did nothing to help women in domestic service.¹⁷

The hours and wage regulations were established to be representative of each industry, reasonably satisfying employers, government, workers, and consumers. The hours regulations significantly shortened the work week: an eight-hour day and 40 hour week were established in more than two-thirds of the codes, a marked improvement over previous conditions. The wage regulations varied across industries, region, sex, and city size. The mean and median minimum wage across the codes was approximately 32 cents an hour (or \$12.80 per week), and the minimum ranged widely from 14 cents to above 40 cents. Geographic differences in one-third of the codes specified weekly wages one dollar lower for the South than the North. Gender differences in one-quarter of the codes specified wages one to three dollars lower for women than for men performing the same jobs. In addition, predominantly female occupations had

¹⁷ United States Department of Labor. Women's Bureau. Bulletin No. 130. *Employed Women under NRA Codes*. Washington: United States Government Printing Office, 1935.

substantially lower minimum wages. Nonetheless, the new codes did present definite improvement in wages for most women who were covered. However, since black women were particularly concentrated in non-covered domestic service and agricultural work, they were much less likely to be covered by the minimum wage laws, and saw little change.¹⁸

A 1935 report by the Women's Bureau of the U.S. Department of Labor stated that "where such increases [in weekly wages] have occurred to women, it is largely because so many have been paid at shockingly low rates before the code. The effect of the code has been just what is expected of the minimum wage -- that numbers who were in the most hopeless abyss have been brought up at least to some bottom level."¹⁹ The Census data confirms this: 25% of those *not* covered earned below half the minimum wage, compared with a mere 5% of those covered. Furthermore, 26% of those not covered earned just above the minimum wage (between the minimum wage and two times the minimum wage), compared with 56% of those covered. It appears that NRA coverage created a large displacement of wages from below the minimum wage to just above the minimum wage.

Overall, 39% of working women working remained uncovered by minimum wage legislation. Among white women, 33% were not covered.²⁰ Among black women, the rates were much higher: 78% were not covered. This is largely due to the extreme concentration of black women in domestic service occupations -- 65% of black women worked in domestic service in private homes, constituting 83% of the uncovered black women. In addition, blacks were more likely to be uncovered in the South: 82% of blacks in the South were not covered, compared with 68% of blacks elsewhere. Black women living in the South who were not covered by the

¹⁸ Ibid.

¹⁹ Ibid, p. 130.

²⁰ The coverage rates of white women did not vary by region.

NRA codes earned very little: 65.4% were earning less than half of the minimum wage and 90.4% were earning less than the minimum wage.²¹

Thus, coverage by the minimum wage does appear to matter in both regions and for both races, but the above (and other) results indicate that this is largely due to the non-coverage of service and agricultural workers. Legislation appears to have prevented some low wage work, but it certainly did not help domestic service workers. The associations between domestic service workers, low wages, and black women persist, and do not appear to be substantially modified by labor regulations.

b. Domestic servants in the 1940s to 1970s

Having seen the importance of domestic service workers in the low-wage groups, I turn to the historical record for confirmation of these wages. By all accounts, working as a domestic servant was an extremely undesirable job. One had to cope with long hours, poor pay, low status, bad conditions, and in many cases a lack of privacy. It appears that almost any other job was preferable. There is little evidence that there were any spillover effects of the better working conditions from industry work.²²

After World War I, many white women left domestic service jobs as other opportunities opened up. By 1940, domestics were largely black women who were earning less than their white counterparts. After World War II, having glimpsed better jobs at higher pay during the war, many former domestic workers moved to alternative jobs. This exodus only exacerbated the shortage of servants: demand was high because servants were relatively cheap, and supply was low because the job was unpleasant and poorly paid. Job tenure was quite low: only one-

²¹ This compares with blacks living in the South who were covered (31.1% below half the minimum wage, 76.6% below the minimum wage), blacks living in the non-South who were not covered (13.8%, 63.2%), and blacks living in the non-South who were covered (8.3%, 39.0%).

tenth of servants surveyed in 1951 had been in the same job for 10 years, and nearly one-third had held their current jobs for less than six months.²³ As is elegantly discussed by Linda Martin and Kerry Segrave in their 1985 book “The Servant Problem,” employers viewed this situation as nothing short of a crisis.

Many articles in the media perpetuated the idea that employees exploited employers by making unreasonable demands, seeking specific arrangements and high pay for low hours while remaining incompetent and unable to do the job properly. There are, however, more reliable sources of information. In 1939, the Philadelphia School of Household Employment sought to establish minimum standards that live-in maids be paid \$8 for a 54 hour week and live-out maids be paid \$10 for a 48 hour week.²⁴ We can reasonably assume that these conditions were significantly better than average. In fact, an article in the *New York Times Magazine* in 1941 appears to have accurately reported that "The most usual weekly cash wage [is] from \$5 to \$7... Hours of work, for all but a small minority, are from 70 to 80 a week."²⁵ The 1939 census shows a median weekly wage of \$6 and median hours worked of 48.

Thus, the historical record appears to confirm the accuracy of the wages observed in the Census: the average domestic service worker in 1939 was earning an hourly wage of approximately 12 cents, less than half the federal minimum wage of 30 cents. In the South, the situation was even worse, and domestic service workers earned less than half what they earned elsewhere.

While the wages match relatively well, the hours reported in the census appear to be lower than those expected from the Philadelphia School of Household Employment report and

²² Martin, Linda and Kerry Segrave, *The Servant Problem: Domestic Workers in North America*. Jefferson, N.C.: McFarland & Company, Inc., 1985. Ch. 1.

²³ The U.S. Bureau of the Census, *Survey of Domestic Workers*, 1951.

²⁴ Martin and Segrave, *The Servant Problem*, p. 54.

the New York Times Magazine article. This discrepancy can be resolved by noting that actual hours worked may have been higher than reported hours for two reasons. First, live-in domestics were often required to be "on call" for many more hours (sometimes twice as many) than either they were paid for or officially worked.²⁶ Second, many part-time workers were expected to do a full week's work in half the time.²⁷ Both of these facts render the hours higher, the wages lower and the conditions even worse.

Things did not appear to get much better in the 1960s and 1970s. A 1967 conference held on the "Status of Household Help" reported that "maids now work from 60 to 100 hours a week... the median yearly wage for domestic work was \$1,193 in 1965; ... Nothing in a maid's life... has kept pace with rising labor standards."²⁸ These data correspond to a median weekly wage of approximately \$24 in 1965. This seems reasonable, given that the median weekly wages in the Census for white and black domestic workers in 1960 were \$25 and \$21, respectively, and in 1970 were \$36 and \$34.²⁹

Domestic service workers in the 1970s were still earning below the minimum wage, and less than families on welfare.³⁰ When surveyed in November 1974, nearly half of the domestics reported earnings below the supposedly applicable minimum wage of \$1.90.³¹ Not until 1974 were domestic workers brought under the coverage of the minimum wage and overtime provisions of the FLSA.³² However, this coverage may have been more on the books than in

²⁵ Ibid., p. 40.

²⁶ Ibid., p.2.

²⁷ The U.S. Bureau of the Census, Survey of Domestic Workers, 1951.

²⁸ Ibid., pp. 70-71.

²⁹ What does not seem reasonable is the reports in the media of high wages: in 1967, *Time* reported wages exceeding \$50 a week plus benefits, and in 1957 the *Wall Street Journal* had reported wages of \$35 in Florida and \$50 in Detroit for live-in maids. (Martin and Segrave, p. 71.)

³⁰ Martin and Segrave report that "In 1971 the mean wage of full-time domestics was \$1,981, while families receiving welfare averaged \$2,291 in benefits." (Martin and Segrave, p. 73).

³¹ U.S. Department Of Labor, Employment Standards Administration, Domestic Service Employees: a Study of the Economic Effects of the Provisions of the Fair Labor Standards Act, Submitted to Congress 1979, p. 20.

³² Ibid, p. 9.

reality. In 1979, the U.S. Department of Labor reported "a large degree of noncompliance with the FLSA's minimum wage and overtime provisions."³³ There have been no major changes in the legal requirements for employing domestic service workers since the 1970s, although compliance may have improved.

c. Conclusion: confirmation of low wages

Thus, other available information about minimum wages and actual wages confirms the validity of the low wages observed in the Census. It appears that minimum wage legislation did not help many women, and did nothing to help women working in domestic service. Service occupations paid very low wages, and the wages reported in the Census seem to accord well with those reported elsewhere. Put together with the results from Section 2, it appears that only when black women moved out of service occupations (which had no minimum wages and very low wages) did they see any substantial improvement in their wages.

4. Considering exclusion

We have seen that the individuals in the lower tail of the wage distribution seem to be a distinct disadvantaged population, *not* measurement or recording error. Such error is the standard justification for exclusion of individuals earning below half the minimum wage (or below the minimum wage) from analysis of the wage distribution. The above results argue that measurement error on such a large scale is unlikely. I now investigate exclusion further, examining the consequences of sample truncation for our understanding of the wage structure.

a. Sensitivity of wage regressions

Table 3 shows wage regressions for women in 1940, 1960, and 1990. Log weekly wages are regressed on dummies for education categories, a quartic in experience, race dummies, and

³³ Ibid., p. 19.

region dummies.³⁴ Results are shown for three possible samples: those with wages above the first percentile, those with wages above half of the minimum wage, and those with wages below half of the minimum wage (the lower tail).

If observations at the bottom tail of the distribution are mostly measurement error, the regressions for the "under" samples would not show significant results. Furthermore, if these observations were measurement error and that error were classical, the coefficients for the "over" sample would not change significantly from those for the above first percentile sample, they would just become more precise. We see that neither of these results holds, particularly in the early years. Not only are the regression coefficients for the "under" samples significant, but the regression coefficients change significantly upon exclusion of the under groups in the early years.³⁵ It does not seem justified to exclude the lower tail in the early years.

Looking in more detail at the results provides some additional insight. The education coefficients are generally as expected, showing positive and plausible returns to education, and they are altered only slightly by truncation of the sample. To the contrary, the results for the lower tail samples show *negative* returns to all non-high-school education categories, suggesting that the few observations with high education in the lower tail may be measurement error. The experience profile exhibits the standard pattern and is somewhat dampened when the lower tail is dropped. Returns to experience are almost non-existent in the lower tail itself, reflecting either the presence of measurement error or the flatter experience profile in lower wage, lower skill occupations.

³⁴ Alternate specifications were run, but did not alter the main results or provide substantial additional insight. These alternate specifications included: every census year, other truncation rules, detailed education categories, or further interaction terms.

³⁵ For easy interpretation, recall that a 1.00 difference in log weekly wages is equivalent to an increase or decrease of weekly wages by a factor of 2.7. A difference in log weekly wages of 0.10 is approximately a 10% increase or decrease of weekly wages.

The results with regard to race shed light on the historical evolution of racial wage gaps. The wage differential associated with being black is strongly negative in the early years, and decreases substantially over time. Furthermore, it is altered significantly by truncation of the sample: in the earlier years, this log wage differential is approximately cut in half when the lower tail is excluded. For example, in 1940 the full sample indicates that black women earned 48% less than white women, whereas the truncated sample indicates a gap of only 30%. Dropping out the lower tail of the distribution in the early years amounts to dropping out a large portion of black women. The regression results show that, not surprisingly, this significantly biases the interpretation of the wage structure by artificially reducing the racial wage gap. This bias from truncation diminishes over time, and by 1990 the results for the full sample (above the first percentile) and the truncated sample (above half the minimum wage) look nearly identical. This further supports the argument that the truncation, while problematic in the early years, appears to be reasonable in later years. However, it also indicates that it may be unnecessary: the results are unaffected by the truncation.

Thus, the results from standard wage regressions would urge caution about truncating a national wage sample. They indicate that black women have gained substantially, moving out of very low wage occupations, integrating into a more similar labor market, and closing racial gaps higher up in the distribution. Truncating the sample distorts our understanding of this path, making black women's gains over time look substantially smaller than they actually were. In sum, an *a priori* exclusion of the lower tail systematically eliminates certain demographic groups and biases results, distorting the understanding of the historical evolution of the wage structure.

b. Sensitivity of inequality measures

Next, I examine the effects of truncation and exclusion on measures of overall wage inequality in the United States. Table 4 shows the 90-10 ratio for log weekly wages, for men and women separately.³⁶ Within each sample, the results are shown for the full sample and separately for the sample excluding those below half of the smoothed minimum wage. The 90-10 ratio is often used as a relatively robust measure of inequality because it should be insensitive to the tails of the distribution. Not surprisingly, I show that that is not the case here.

For men, the 90-10 ratio for full-year full-time workers in 1940 is 1.61 for the full sample and 1.47 for the truncated sample, a difference of 0.14. For women, the ratio for the full sample is 1.75 and that for the truncated sample is 1.22, a difference of 0.55. Apparently, the inequality ratios for women are quite sensitive to sample truncation. Put another way, without truncation the data show a wage ratio of 5.8 of the 90th percentile to the 10th percentile, whereas truncation artificially reduces that ratio to only 3.4. For the men the distortion is much smaller, changing a ratio of 5.0 to 4.3. The sensitivity of the women's inequality measure to truncation decreases in 1950 (likely due to the Great Compression), and then re-appears in 1960, decreasing to relative insignificance by 1990.³⁷

This distortion also appears to be linked to race. Full year full-time white men are almost completely robust to truncation of the sample. When non-whites are excluded from the women's sample, the ratios are 1.39 in the full sample and 1.16 in the truncated sample, a difference of only 0.23. The data therefore suggest that women and blacks, being disproportionately

³⁶ The 90-10 ratio is the ratio of the 90th percentile of the log weekly wage distribution to the 10th percentile of that distribution. These are shown for the years 1940 to 1990 for various samples. For reference, a ratio of 1 of the logs is a ratio of 2.7 of the actual values, 1.5 is a ratio of 4.5, and 2.0 is a ratio of 7.4.

³⁷ Most of this artificial compression occurs in the 50-10 differential, not in the 90-50 differential. There is very little movement in the 90-50 differential because the median is quite robust.

represented in the lower tail, are consequently wrongly excluded from inequality measures when the tail is truncated. Inequality measures are biased downward substantially.

c. Conclusion: Exclusion is unwarranted

The above analyses show that the individuals in the lower tail do not appear to be measurement error. Truncation of the lower tail biases results from standard wage regressions and distorts measures of wage inequality. This is not surprising – when half of the minimum wage is at the 10th percentile of the women’s wage distribution, one would expect significant effects of dropping that lower tail – but it remains troubling. The distortion is substantial and historically significant. In 1940, the distortion in women’s wage inequality is similar in magnitude to the Great Compression of the wage structure between 1940 and 1950.³⁸ Also in 1940, truncation makes the racial wage gap among women appear one-third smaller than it actually was. Thus, the distortion caused by truncating the sample substantially alters our perceptions of the evolution of wage inequality and of racial progress over time.

The main conclusion is that measures of inequality which exclude disadvantaged groups have questionable relevance. Individuals in the lower tail are significant, different, and probably disadvantaged, and deserve to be incorporated in our understanding of the U.S. wage structure. Until they are included, we will not see the true history of racial and wage inequality.

These results have several general implications for how best to deal with large samples and wage distributions. First, it seems unwise to truncate a sample at the minimum wage or half of the minimum wage, or at any other point that is significantly far up in a distribution. In the present case, a cutoff of $\frac{1}{4}$ or possibly $\frac{1}{2}$ of the smoothed minimum wage might be justified. A more conservative choice might be the 1st percentile of the wage distribution, or simply no selection at all. Second, it seems wise to test the hypothesis on which any sample selection is

based. If the rationale for exclusion from the sample is that some observations are likely measurement error, it is important to test that rationale to whatever extent possible. Third, whatever the sample selection criterion, any exclusion may be likely to exclude not just aberrant individuals but possibly entire aberrant groups. In the current case, many black women would be excluded, creating a significant bias. This is amplified when the investigation concerns distribution or inequality, in which cases extremes and the disadvantaged may be of particular interest. In sum, our understanding of the wage structure can be substantially altered by the choice of sample, and hence such choice of sample should be undertaken cautiously and responsibly.

5. Conclusion

This paper has investigated the extreme low end of the women's wage distribution. It has shown that many women actually were earning remarkably low wages. While it is certainly the case that some of the women who appeared to be earning very low wages were part-time and some were incorrectly measured, in the earlier years (1940 to 1960), large numbers of women appear to have actually earned extremely low wages. Many of these women were full-year full-time black domestic service workers who were just not earning very much. Those living in the South were even worse off. As black women moved out of domestic service and into other occupations, their situation appears to have improved.

A key conclusion of this paper is that the lower tail of the wage distribution represents a significant disadvantaged population that appears to have experienced major improvement in the latter half of the 20th century. Furthermore, it does not seem reasonable to exclude them from analyses of wages and inequality. To the contrary, their exclusion significantly biases our

³⁸ Goldin and Margo, 1992.

understanding of the historical evolution of the wage structure in the United States. There is no doubt that they should be included in analyses of the evolution of the United States wage structure over this period. Their inclusion will provide important insights into historical trends in inequality. It is crucial that we accurately understand the history of wage inequality, and to do that we must not neglect the gains that have been made by some of the most disadvantaged.

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Table 1. Actual Minimum Wage and Smoothed Minimum Wage Proxy, Values and Percentiles.

	1940	1950	1960	1970	1980	1990
<i>Minimum Wage (current dollars)</i>						
Actual	10.20	16.30	40.20	64.30	115.60	134.60
Smoothed	8.90	20.03	34.68	57.37	114.48	181.21
Half of smoothed	4.45	10.02	17.34	28.69	57.24	90.61
<i>Percentiles in Women's wage distribution of ...</i>						
Actual minimum wage	31	11	35	35	32	17
Smoothed minimum wage	23	16	28	30	31	27
Half of smoothed minimum wage	9	5	12	12	10	9
<i>Percentiles in Men's wage distribution of ...</i>						
Actual minimum wage	15	4	11	12	11	7
Smoothed minimum wage	11	6	8	9	11	12
Half of smoothed minimum wage	3	2	3	3	4	3

Notes: Data is from the U.S. Census in each year. Wage is weekly wage based on a 40-hour work week. Calculations are on a sample of wage/salary workers with positive income last year. The smoothed minimum wage is calculated as 33% of the median wage among full-time full-year prime age men in each census year.

Table 2. Occupational Distributions for White and Black Women in 1940 and 1990.

<i>Occupation category</i>	<i>1940</i>		<i>1990</i>	
	<i>White</i>	<i>Black</i>	<i>White</i>	<i>Black</i>
Professional, Technical (99)	14.2	5.3	24.0	18.3
Farmers (199)	0.1	0.4	0.1	0.0
Managers, Officials & Proprietors (299)	2.2	0.3	10.8	6.2
Clerical & Kindred (399)	28.0	1.4	32.6	30.9
Sales Workers (499)	7.9	0.5	7.0	4.0
Craftsmen (599)	1.6	0.4	1.8	2.0
Operatives (699)	23.7	8.9	7.5	12.1
Service Workers (799)	21.0	75.4	14.4	24.4
Farm Laborers (899)	0.4	5.8	0.3	0.3
Laborers (970)	1.1	1.6	1.4	1.9
Total	100.0	100.0	100.0	100.0

Notes. Data from U.S. Census in 1940 and 1990.

Table 3. Regressions of Log Weekly Wages.

		1940			1960			1990		
		Above 1st percentile	Over half min. wage	Under half min. wage	Above 1st percentile	Over half min. wage	Under half min. wage	Above 1st percentile	Over half min. wage	Under half min. wage
Education	Less than HS	-0.349 **	-0.285 **	0.029	-0.244 **	-0.170 **	-0.033 **	-0.220 **	-0.202 **	-0.055 **
	Some college	0.197 **	0.162 **	-0.101 **	0.069 **	0.099 **	-0.035 **	0.195 **	0.191 **	-0.031 **
	College	0.475 **	0.415 **	-0.025	0.447 **	0.426 **	-0.027	0.587 **	0.558 **	-0.111 **
	Beyond college	0.612 **	0.564 **	-0.363 **	0.648 **	0.601 **	0.102 **	0.802 **	0.764 **	-0.152 **
Experience	Experience	0.070 **	0.059 **	0.005	0.044 **	0.038 **	-0.010 **	0.114 **	0.098 **	-0.026 **
	Exp ²	-0.307 **	-0.258 **	-0.102 **	-0.277 **	-0.244 **	0.104 **	-0.723 **	-0.614 **	0.165 **
	Exp ³	0.587 **	0.492 **	0.369 **	0.775 **	0.667 **	-0.278 **	1.916 **	1.611 **	-0.391 **
	Exp ⁴	-0.459 **	-0.370 **	-0.394 **	-0.776 **	-0.635 **	0.223 **	-1.791 **	-1.492 **	0.297 **
Race	Black	-0.652 **	-0.362 **	-0.015	-0.401 **	-0.206 **	0.006	0.055 **	0.049 **	-0.060 **
	Other race	-0.139 **	-0.068	0.023	-0.102 **	-0.073 **	-0.046	-0.001	-0.012 **	-0.024
Region	Midwest	-0.125 **	-0.068 **	0.095 **	-0.100 **	-0.036 **	-0.011	-0.151 **	-0.133 **	-0.009
	South	-0.253 **	-0.118 **	-0.050 **	-0.250 **	-0.136 **	0.001	-0.151 **	-0.119 **	-0.021 **
	West	-0.037 **	-0.009	-0.020	-0.058 **	-0.002	-0.025 **	-0.028 **	-0.025 **	-0.040 **
Constant	_cons	2.574 **	2.632 **	1.256 **	3.819 **	3.940 **	2.252 **	5.000 **	5.137 **	3.796 **

Notes: The sample is the U.S. census in the given year, women with positive wage/salary income and positive weeks worked. Log weekly wages are regressed on dummies for education categories, a quartic in experience, race dummies, and region dummies. The omitted category is a white woman in the Northeast with a highschool education and no experience. Results are shown for three possible samples: those with wages above the first percentile, those with wages above half of the minimum wage, and those with wages below half of the minimum wage. Significance is indicated by * for the 5% level, ** for the 1% level.

Table 4. Inequality measures 1940 to 1990: 90-10 Ratios for Log Weekly Wages.

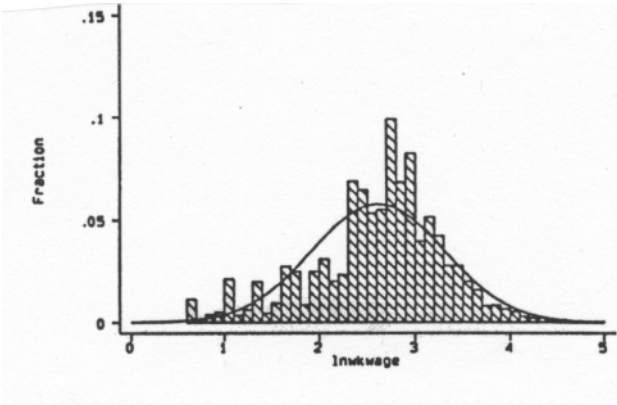
<u>Women</u>		1940	1950	1960	1970	1980	1990
All	Full sample	1.79	1.43	1.66	1.66	1.63	1.78
	Truncated at 1/2 min wage	1.35	1.23	1.26	1.29	1.34	1.64
Full-yr, Full-time	Full sample	1.75	1.10	1.18	1.22	1.18	1.35
	Truncated at 1/2 min wage	1.22	1.06	1.02	1.01	1.10	1.33
White	Full sample	1.54	1.22	1.66	1.84	1.73	1.92
	Truncated at 1/2 min wage	1.26	1.16	1.32	1.33	1.36	1.72
White, Full-year, Full-time	Full sample	1.39	0.98	1.02	1.14	1.17	1.34
	Truncated at 1/2 min wage	1.16	0.95	0.94	1.02	1.10	1.32

<u>Men</u>		1940	1950	1960	1970	1980	1990
Full-yr, Full-time	Full sample	1.61	1.14	1.19	1.28	1.35	1.51
	Truncated at 1/2 min wage	1.47	1.12	1.12	1.18	1.30	1.52

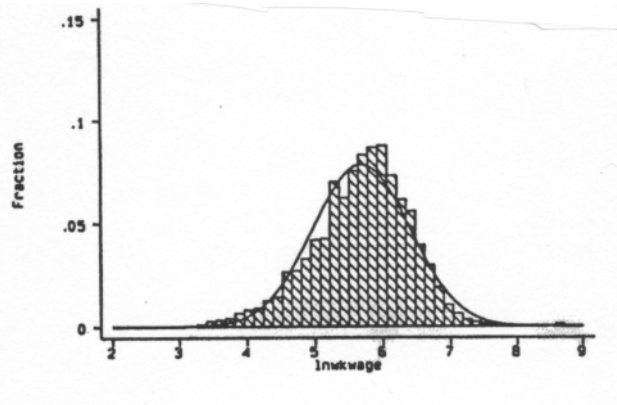
Notes: The sample is from the U.S. Census. It includes workers who have positive wage and salary income, are not in institutions, are 19-65 years old, and have positive hours worked. The values shown are the ratios of the 90th percentile of the log weekly wage wage distribution to the 10th percentile of that distribution. Full-year is 48 or more weeks worked, and full-time is 35 or more hours worked per week. The minimum wage values for truncation are shown in Table 1.

Figure 1. Distributions of Log Weekly Wages, Women and Men, 1940 and 1990.

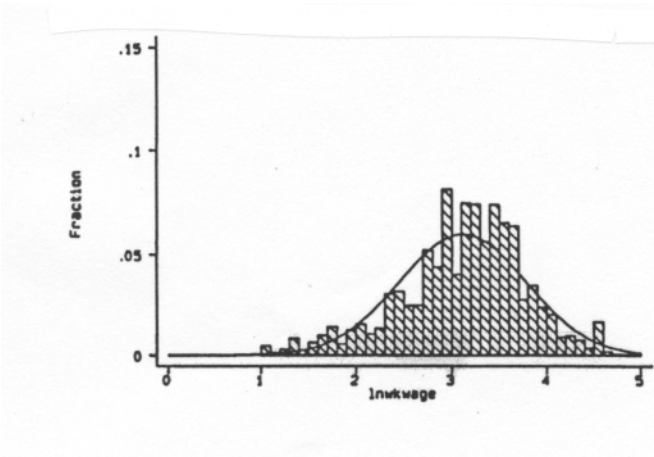
Women 1940



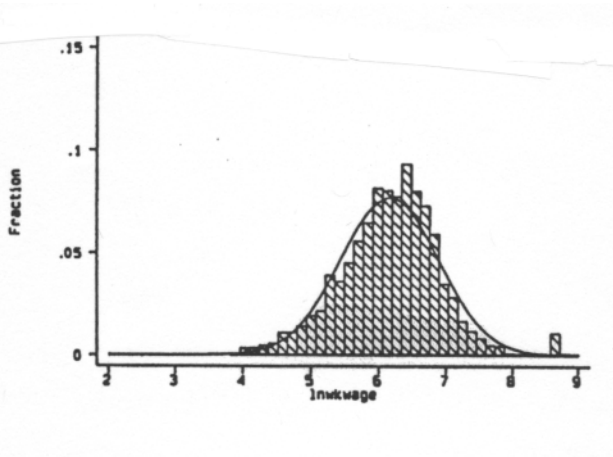
Women 1990



Men 1940

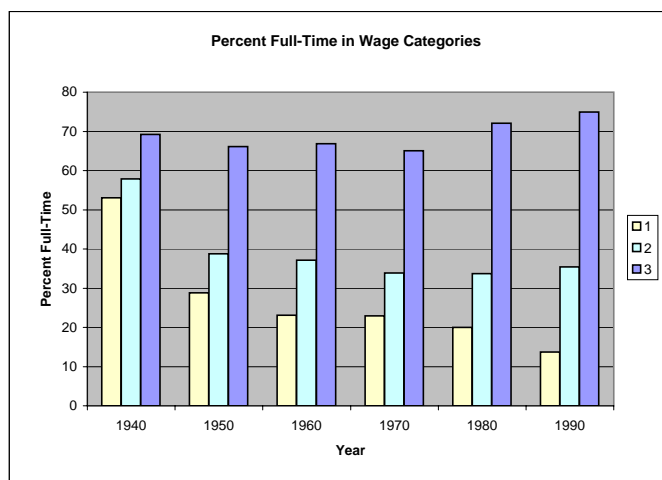
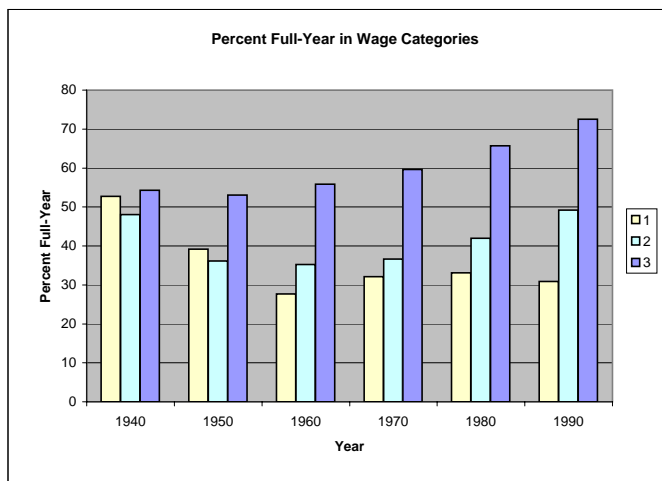
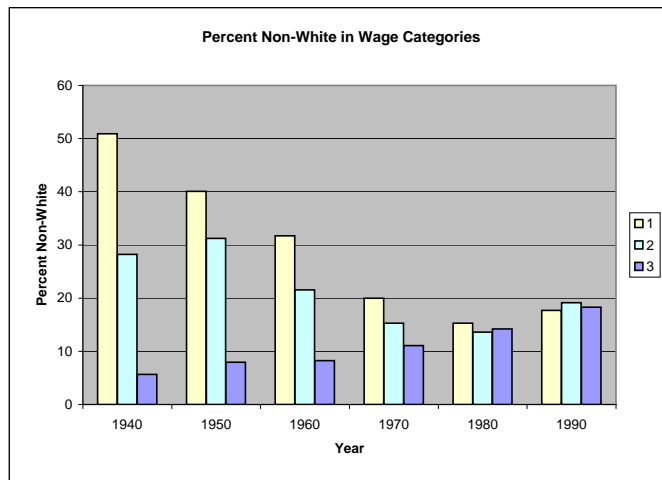


Men 1990



Notes. The data is from the U.S. Census in 1940 and 1990, and includes all wage and salary workers with positive income, positive weeks worked, and positive hours worked, whose wages are above the first percentile.

Figure 2. Shares of workers within wage categories with various characteristics, 1940 to 1990.



Notes: Data are from the U.S. Census in each census year. They include all female wage/salary workers with positive income and positive weeks worked. Wage categories are as follows: 1) up to one-half of the smoothed minimum wage (shown in Table 1); 2) from one-half of the smoothed minimum wage to the full smoothed minimum wage; 3) above the smoothed minimum wage.