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Cities, Skills, and Inequality

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Abstract

The surge in U.S. wage inequality over the past several decades is now commonly attributed to an increase in the returns paid to skill. Although theories differ with respect to why, specifically, this increase has come about, many agree that it is strongly tied to the increase in the relative supply of skilled (i.e. highly educated) workers in the U.S. labor market. A greater supply of skilled labor, for example, may have induced skill-biased technological change or generated greater stratification of workers by skill across firms or jobs. Given that metropolitan areas in the U.S. have long possessed more educated populations than non-metropolitan areas, these theories suggest that the rise in both the returns to skill and wage inequality should have been particularly pronounced in cities. Evidence from the U.S. Census over the period 1950 to 1990 supports both implications.

JEL: J31, R23

1 Introduction

The rise in U.S. wage inequality over the past several decades has been the subject of a massive body of research in recent years.[1] Although many elements have been identified, including changes in industrial structure (e.g. declining manufacturing) and institutional factors (e.g. declining unionization and minimum wage), much of the literature has concluded that the rise in the returns to skill, both observable and unobservable, has played a major role in widening inequality.

At the same time, the literature studying urban labor markets has demonstrated (at least recently) that, although workers situated in metropolitan areas tend to earn higher wages than workers with the same observable characteristics living outside of cities (i.e. there is a significant urban wage premium), the estimated premium is higher for workers with greater measures of observable skill. In particular, Glaeser and Mare (2001) have shown that workers with either more experience or more education receive a greater boost from living in a metropolitan area than identical workers with less experience or education. Thus, as they conclude (p. 340), "the urban wage premium is highest among the most skilled workers."

To date, of course, these two insights have largely been treated separately. Studies of inequality have not, for the most part, considered the potential influence of urbanization patterns on wage dispersion, and, although a large literature has studied the connection between geographic concentration and aggregate growth and productivity (e.g. Carlino and Voith (1992), Ciccone and Hall (1996), Henderson (1999)), surprisingly little work in urban economics has considered how cities affect the distribution of economic outcomes across individuals.

[1] See Levy and Murnane (1992) and Acemoglu (2002) for surveys of both the evidence and theories.

This paper attempts to bridge these two literatures by offering some descriptive evidence on wage inequality and returns to observable measures of skill for both the metropolitan areas and non-metropolitan areas of the U.S. between 1950 and 1990. Results from five Census samples over this period indicate that, although inequality in weekly wage and salary earnings – measured by differences in the 90th, 50th, and 10th percentiles – increased throughout the entire U.S., the increase was substantially higher within urban areas than outside of them.

In 1950, for instance, inequality among white males between 18 and 65 years of age was higher outside of metropolitan areas than in them. Rural 90-10, 90-50, and 50-10 log wage differentials at this time exceeded those among urban residents by, respectively, 23, 6, and 17 percentage points.[2] These gaps, however, had been virtually eliminated by 1970 and, by 1990, 90-10, 90-50, and 50-10 differences in urban areas exceeded those of the rural U.S. by 16, 5, and 11 percentage points.

Estimates of the returns to observable measures of skill (i.e. education and experience) indicate that, just as previous work has established, inequality between workers with different levels of education (holding experience constant) and experience (holding education constant) has grown steadily since 1950. The gap between education groups within metropolitan areas, however, has outpaced that among rural workers over this period. For example, between 1950 and 1990, the wage gap between a worker with a college degree or more and an observationally equivalent worker with only a high school degree increased by 9 percentage points for workers outside of metropolitan areas. Among urban workers, the gap increased by 18 percentage points.

A similar result does not hold, however, when the returns to experience are considered.

[2]These figures, naturally, represent log points and so are only approximate percentage points.

To be sure, the gap between identical workers differing with respect to years of experience has grown larger over time. A worker with between 26 and 30 years of experience earned 40 percent more, on average, than an identical worker with 0 to 5 years of experience in 1950. By 1990, the premium had risen to 61 percent. In addition, those premia are significantly higher in urban areas than in rural ones. Between 1950 and 1990, this particular premium was, approximately 11 percentage points higher in cities than outside of them. Yet, the results indicate that experience premia have risen by approximately the same amount within urban areas as they have in rural ones and, thus, left the urban-rural difference relatively constant over time.

Such findings, I believe, are interesting because they provide an indication as to how the spatial distribution of the U.S. population across urban and rural areas may have influenced the degree of inequality in the labor market. In particular, one of the most striking trends characterizing the geographic distribution of the U.S. population over the last century has been increasing urbanization. Black and Henderson (1999), for example, report that the fraction of the population residing in metropolitan areas increased from roughly 40 to 60 percent between 1900 and 1950. The data on white males between the ages of 18 and 65 used in the analysis here indicates a similar rate of increase between 1950 and 1990, when the urbanization rate rose from 64.5 percent to 78.6 percent.

Combining this trend with the pattern describing the returns to experience yields the following insight. Given that experience premia have been consistently higher in metropolitan areas than outside of them over the sample period, growing urbanization has likely contributed to increased inequality through a cross-sectional effect. That is, as the fraction of workers residing in urban areas has increased, the degree of spread between the wage earnings of workers with different levels of experience has increased. Of course, while ex-

perience premia have also increased over the sample period, the increase has been similar in both rural and urban areas. With respect to experience premia, then, urbanization has contributed to inequality through a level effect (i.e. shifting population to areas with higher inequality levels) as opposed to a growth rate effect (i.e. shifting populations to areas with higher inequality growth).

With education, on the other hand, the movement of the population from rural to urban areas has likely added to inequality because, over time, the returns to educational attainment in cities has increased beyond that in rural areas. Thus, because education premia in cities did not differ substantially from those in rural areas in 1950, 1960, or even 1970, an increase in the degree of urbanization would not have generated much of an increase in between-education-group inequality over these years. When combined with the significant rise in education premia in urban areas in 1980 and 1990, however, increased urbanization likely exacerbated inequality levels. The impact of urbanization on inequality due to education returns, therefore, has both cross-sectional and temporal aspects.

The remainder of the paper proceeds as follows. The next section offers a brief summary of two well-known theories of inequality, both of which suggest that wage inequality may have increased more rapidly inside of cities than outside of them. Section 3 then describes the data used in the analysis, the results from which appear in Sections 4, 5, and 6. A formal decomposition of changing aggregate U.S. inequality into urban and rural observables and unobservables is given in Section 7. Section 8 concludes.

2 Background: Theories of Skill Returns and Inequality

There are at least two prominent explanations for the rise of U.S. wage inequality which suggest that both relative skill returns and earnings distributions may have evolved differently

inside of cities than outside of them. First, as argued by Acemoglu (1998, 2002), technological change may have been skill-biased in recent decades, allowing both the productivity and earnings of high-skill workers to rise relative to low-skill workers. This change, he argues, is largely the product of a rise in the relative supply of skilled workers in the U.S. labor force over the past several decades. Indeed, in 1950, a mere 15.4 percent of employed white males between the ages of 18 and 65 had completed some education at the college level. By 1990, this figure had more than tripled, reaching 54.2 percent.[3] Such a rise has, at least in theory, made the search for workers possessing a high level of skill easier and, consequently, increased the expected payoff to investing in skill-complementing technologies.

As it happens, much of this rise in educational attainment has been concentrated in cities.[4] Consider Table 1A, which reports the distribution of educational attainment for white male workers between the ages of 18 and 65 for each of the five Census years between 1950 and 1990. In the table, there are two sets of statistics across the five years: one based on the population residing inside of metropolitan areas (i.e. urban), the other calculated from the population of individuals living outside of metroplitan areas (i.e. rural).

Quite clearly, metropolitan areas have been characterized by greater educational attainment than rural ones over this period. In each each year, the fraction of white males with at least some education at the college level was higher in cities than outside of them. Moreover, this urban-rural difference has grown over time. In 1950, 17 percent of metropolitan area workers had completed at least some college versus 12 percent for non-metropolitan

[3]These figures are calculated from the U.S. Census samples described in the next section. The only selection criteria applied in calculating these statistics is that individuals report positive wage and salary earnings.

[4]Throughout the paper, I use the terms 'city' and 'metropolitan area' interchangeably for expositional purposes. In practice, urbanization is defined based on the metropolitan area concept.

areas. By 1990, these figures had risen to 57 percent among urban dwellers as opposed to 42 percent for rural residents. Table 1B demonstrates that much the same pattern holds when each of the four Census regions is considered separately, so this aggregate trend is not being driven solely by cities in one part of the country.[5]

If technologies do, in fact, respond to the distribution of skill, these educational attainment patterns suggest that skill-biased technological change should have been most pronounced in urban areas where the relative supply of skilled workers has been the highest. We should then expect to see a particularly rapid increase in the returns to skill and wage inequality within metropolitan areas.

Interestingly, urban theory has long argued that cities are an important source of growth and innovation due to the enhanced exchange of ideas and knowledge that arises from a dense spatial configuration of economic agents (e.g. Marshall (1920), Jacobs (1969), Lucas (1988), Duranton and Puga (2001)). Empirical evidence certainly offers some support for this hypothesis. Harrison et al. (1996), for example, find that plants located in large urban markets are more likely to adopt new technologies than those located in smaller markets. Similarly, Feldman and Audretsch (1996) find that the development of new products tends to be clustered in large, diverse urban areas. As a result, the combination of more skilled populations with dense environments may make urban areas a focal point for skill-biased technological change and, thus, earnings inequality.[6]

[5]Constituent states for each region are listed in the Appendix.

[6]Although the literature examining innovation in cities has focused on whether localization (i.e. the concentration of a single industry) or urbanization (i.e. diversity) effects are more important for technological change, little work has considered the role of human capital. Yet, since much of the evidence indicates that innovation is more prevalent in large, diverse urban markets (e.g. Glaeser et al. (1992), Harrison et al. (1996), Feldman and Audretsch (1996)), which also tend to have large supplies of skilled workers, innovation may be driven by skill distributions, not necessarily by diversity per se.

A second explanation for rising skill returns and wage dispersion focuses instead on the manner in which workers are organized into production units. In particular, the theory advanced by Kremer and Maskin (1996) suggests that both can be linked to an increase in the extent to which workers are segregated by skill at the workplace (i.e. high-skill workers working with other high-skill workers leaving low-skill workers to work amongst themselves). Assuming that skills are complementary in production, increases in segregation magnify the earnings of individuals at the top end of the skill distribution while decreasing those of individuals at the bottom.

Although Kremer and Maskin's (1996) analysis examines a frictionless environment in which increased segregation is driven by a widening of the underlying skill distribution, it is straightforward to show that the same basic result emerges in a search-based model when search costs decrease.[7] Because urban areas may involve lower search costs, say due to a greater flow of information between workers and producers or, alternatively, by allowing inefficient matches to be more readily replaced by productive ones, cities may be characterized by more extensive segregation.

Over time, these higher returns may have produced more rapid changes in inequality as the most talented workers from the national (or even international) economy have been drawn to urban labor markets. Such an influx, after all, would shift the upper tails of the earnings distributions in metropolitan areas to the right.[8] This hypothesis is not incompatible with the educational attainment statistics reported in Tables 1A and 1B.[9]

[7] See Wheeler (2001) for a characterization of a simple search environment.

[8] I thank an anonymous referee for making this point.

[9] As noted by Glaeser et al. (2000), low-wage workers may also tend to flock to cities to take advantage of various urban amenities (e.g. transportation) thereby generating greater wage dispersion in cities. Of course, this would not necessarily imply that cities experience more rapid *changes* in inequality unless urban amenities have become increasingly desirable among low-wage workers over time (i.e. relative to high-wage

3 Data

The data are derived from the following five 1 Percent Census samples of the Integrated Public Use Microdata Series (IPUMS) compiled by Ruggles and Sobek et al. (2003): 1950 General Sample, the 1960 General Sample, the 1970 Form 2 State Sample, the 1980 Metro ('B') Sample, and the 1990 Metro Sample.[10] These data are selected because they provide larger numbers of observations over a longer time horizon than other data sets commonly used to examine inequality, such as the Current Population Survey. In addition, since my goal is to investigate general inequality patterns and not to identify specific years in which inequality may have started a particular short-run or long-run trend, I use the Census.

With each sample, I begin by eliminating all observations except those for white males between the ages of 18 and 65 who reported positive wage and salary earnings for the year and for whom both metropolitan area status (i.e. whether an individual lived in a metropolitan area or not) and state of residence are reported.[11] Doing so generates sample sizes of 87814 for 1950, 290558 for 1960, 365897 for 1970, 478302 for 1980, and 517768 for 1990.[12] These are then used to calculate the educational attainment distributions reported in Tables 1A and 1B.

workers). This conjecture, however, seems difficult to reconcile with Tables 1A and 1B.

[10] To construct inequality measures for specific metropolitan areas (as in Sections 4 and 6), I also use the 1970 Form 2 Metro Sample.

[11] Metropolitan area definitions do change from one Census year to the next (existing areas expand, new ones emerge), so the analysis is not (necessarily) based on a consistent set of geographic entities. While this feature of the data may influence some of the results (e.g. rural areas may lose high-wage suburbs to urban areas over time), I argue below that it does not likely account entirely for the patterns reported. See footnotes 14 and 19.

[12] In part, the 1950 sample is considerably smaller than all of the other samples because several key variables (e.g. weeks worked, income, education) are identified for 'sample line' individuals only.

When estimating either wage inequality or skill returns, I further restrict these samples to those individuals who worked at least 14 weeks in the past year, were not in school at the time of interview, and earned at least 67 dollars per week (in 1982 dollars). These are standard selection criteria in many existing studies of inequality (e.g. Katz and Murphy (1992), Juhn et al. (1993), Bernard and Jensen (2000)). Doing so leaves 76825 observations for 1950, 258993 for 1960, 311987 for 1970, 403326 for 1980, and 433350 for 1990.

Topcoded wage and salary earnings in each year's sample are imputed as 1.5 times the topcode, with the exception of 1990 in which the topcoded value is estimated as 210,000 dollars. This is similar to the scheme utilized by Autor et al. (1998) and Acemoglu and Angrist (1999) who also study labor earnings using Census samples. All dollar figures are converted to real terms using the Personal Consumer Expenditure Chain-Type Price Index of the National Income and Product Accounts.

The wage measure examined throughout the analysis is a worker's weekly wage, calculated as the ratio of annual real wage and salary earnings to weeks worked. Because weeks worked is reported in categorical form in both the 1960 and 1970 Census samples, weeks worked for these years are estimated as follows. First, I divide the 1980 and 1990 sample observations by weeks worked categories corresponding to the categories reported in the 1960 and 1970 samples. Within each category, I further divide the observations by educational attainment (no high school, some high school, high school only, some college, college degree or higher). I then calculate a mean number of weeks worked for each group and assign the average of the 1980 and 1990 means to the corresponding groups in the 1960 and 1970 samples.

Finally, although the 1960, 1970, and 1980 Census samples are constructed as random samples, the 1950 and 1990 samples are not. Thus, all of the calculations using the 1950

and 1990 samples in the analysis below are weighted using, respectively, the sample line and person weights reported by the IPUMS.

4 Overall Inequality Patterns

From the construction of log weekly wages for individuals in each of the five Census samples, I begin by calculating the 90th, 50th, and 10th percentiles of three distributions: (i) all individuals, (ii) all individuals residing in metropolitan areas, and (iii) all individuals residing outside of metropolitan areas. Inequality is then measured for each of these samples as 90-10, 90-50, and 50-10 differences. Results are reported in Table 2A.

Beginning with the distribution of log weekly wages throughout the entire U.S., we see the usual result: there was a substantial rise in wage differentials at both the top and bottom of the distribution. Between 1950 and 1990, 90-50 differences increased by 25 percentage points; 50-10 differences increased by 31 percentage points, implying that the difference between the 90th and 10th percentiles increased by approximately 56 percentage points over this period. Much of this overall rise, not surprisingly, occurred during the 1980s, when the 90-10 differential increased by 25 percentage points alone. Again, this much has already been established by previous research.

When the sample is divided into metropolitan and non-metropolitan residents, however, we can see a substantial difference in the trends in inequality. Although both urban and rural inequality measures increased over this 40-year period, metropolitan areas exhibited a much more striking increase. In 1950, each of the inequality measures was actually larger outside of cities than within them. Among rural residents in 1950, the 90th percentile was 119 percent higher than the 10th percentile. For cities, the figure was a more modest 96 percent. Much of this difference, as it turns out, is attributable to a difference in the median

and the 10th percentile, which was 17 percentage points higher in rural areas than in urban ones.

The gap between urban and rural inequality, however, declined steadily over the next three decades until 1980, at which point 90-10 and 50-10 differences in metropolitan areas had overtaken those outside of cities. During the 1980s, each of the three inequality measures continued to increase more rapidly in U.S. cities than outside of them: 90-10 differences increased by 23 percentage points, 90-50 by 13 percentage points, and 50-10 by 10 percentage points. The corresponding changes among non-metropolitan residents were 14, 8, and 7. As a consequence, by 1990, wage inequality was substantially higher within urban areas than outside of them, a feature that stands in direct contrast to what existed in 1950.

To see that these results are not being driven merely by inter-regional differences in wage earnings across cities (e.g. extremely large, dense urban areas in the Northeast versus smaller, less dense urban areas in the South), consider first Table 2B, which reports inequality measures calculated separately for each of the four Census regions (West, Midwest, Northeast, and South). Although levels of inequality across the four regions differ somewhat over this time period – the South and West appear to have the highest inequality measures, the Midwest the lowest – the same basic pattern is present in all four. With the exception of the 90-50 difference in the Northeast region at the beginning of the sample period, rural inequality exceeded that found in urban areas in 1950, whereas by 1990, urban inequality had become the larger of the two. During this time frame, for example, 90-10 differences increased in the urban areas of the West, Midwest, Northeast, and South regions by, respectively, 73, 68, 65, and 56 percentage points. The corresponding rural figures were 37, 33, 42, and 27.

For an even more limited geographic scale, consider Table 2C, which reports inequality

from a collection of individual metropolitan areas over the period 1970 to 1990.[13] For the sake of highlighting the extent of inequality in urban areas, the table shows 90-10, 90-50, and 50-10 wage differentials for the three largest metropolitan areas in the country (as of 1990 population) – New York, Los Angeles, Chicago – and the average levels across all remaining metropolitan areas from each year's sample.

Two features stand out. First, when compared to the increase in rural inequality in the U.S., the average increase in inequality witnessed within specific metropolitan areas was substantially higher. For example, although 90-10 wage differentials increased by 21 percentage points between 1970 and 1990 among rural workers, the (unweighted) average within-city increase was roughly 34 percentage points.[14] Therefore, the rapid growth in urban inequality documented in Tables 2A and 2B does not seem to be entirely the product of growing between-city differences in wages. Second, among cities, the increase in inequality was particularly pronounced among the country's largest urban areas. Over this period, 90-10 differentials in New York, Los Angeles, and Chicago registered increases of, respectively, 44, 54, and 47 percentage points as opposed to an average of 34 percentage points for the remaining metropolitan areas.

The basic upshot of this evidence, quite simply, is that growing wage inequality in the

[13]The sample, in this case, is limited to a shorter time horizon because information on wage and salary earnings in specific metropolitan areas is extremely limited for years prior to 1970. Metropolitan areas are defined as metropolitan statistical areas (MSAs) or consolidated metropolitan statistical areas (CMSAs).

[14]Because a similar pattern emerges within each decade individually – 1970-1980 and 1980-1990 – it is unlikely that changes in the geographic definitions of urban and rural areas (noted in footnote 11) entirely account for these urban-rural gaps in inequality growth. In particular, definitional changes within a single decade tend to be small (see IPUMS documentation, Ruggles and Sobek et al. (2003)). Hence, even among specific metropolitan areas with relatively stable geographic definitions (e.g. Chicago between 1970 and 1980; Los Angeles over both decades), inequality has risen faster than in the rural U.S..

U.S. has a strong urban component. The next section considers the influence of skill returns in helping to explain this result.

5 Returns to Observable Measures of Skill

Following the insights of the existing literature on wage inequality, an obvious candidate explanation for the urban-rural difference in inequality trends is the return to skill. This section provides evidence on the evolution of the returns to two observable measures of skill – education and experience – across urban and rural workers between 1950 and 1990. To this end, I consider the following statistical characterization of a worker's wage earnings. Let the logarithm of individual's i's weekly wage in year t, w_{it}, be given by

$$w_{it} = \alpha_t + \delta_t(Urban_{it}) + \beta_t X_{it} + \gamma_t Z_{it} + \epsilon_{it} \tag{1}$$

where α_t is an overall, time-specific constant; $Urban_{it}$ is an urban residence indicator; and X_{it} is a vector of personal covariates including the number of weeks worked, marital status, three Census region dummies, nine one-digit occupation indicators, and nine one-digit industry indicators.[15] The vector Z_{it} contains two observable measures of skill: four educational attainment dummies (no high school, some high school, some college, college or more), and eight potential experience indicators (6-10 years, 11-15 years, 16-20 years, 21-25

[15] Occupations include Professional/Technical; Farmers; Managers, Officials, Proprietors; Clerical and Kindred; Sales; Craftsmen; Operatives; Service; and Farm Laborers. Industries include Agriculture, Forestry, Fishing; Mining; Construction; Durable Manufacturing; Nondurable Manufacturing; Transportation, Communications, Other Utilities; Trade; FIRE; and Services.

years, 26-30 years, 31-35 years, 36-40 years, 40 or more years).[16] The parameters, δ_t, β_t, and γ_t, which capture the influence of these characteristics on wage earnings, are allowed to differ across years. The final term, ϵ_{it}, is a person-time-specific residual allowed to be both heteroskedastic and cross-correlated within states.[17]

Consider, first, the results from the baseline specification of equation (1) whereby both vectors of prices, β_t and γ_t, are restricted to be constant across all individuals, regardless of urban-rural status, within a given year. In particular, this baseline case assumes that skill prices, γ_t, do not differ between urban and rural residents although they may change over time. Estimates are presented in Table 3.

Looking across the rows to see the evolution over time, a couple of patterns are notable. First, there is a substantial urban wage premium – roughly on the order of 12 to 14 percent – which remained fairly constant between 1950 and 1990. That is, across all workers, the average shift effect associated with urban residence has boosted weekly wages by a reasonably constant factor – 12 to 14 percent – for the last half century.

Second, over the same period, there has been a rise in the return to observable measures of skill, especially educational attainment. To be sure, the coefficient estimates, which represent the average effects relative to workers with a high school degree only, suggest a monotonic rise of average weekly wages with years of schooling completed. Yet, over time, the differences in the wages of 'identical' workers with different years of schooling became noticeably larger. The relative wage of white males with no high school (0 to 8 years of

[16] Potential experience is calculated as the maximum of (age - years of education - 6) and 0. Because the 1990 Census does not code education as years of schooling completed for all individuals, years of schooling are imputed using the figures reported in Table 5 of Park (1994).

[17] Estimation proceeds by OLS, but standard errors are adjusted in the spirit of White (1980). Results are similar when the cross-correlation structure is specified over individuals within regions instead of states.

schooling) dropped from -17 percent in 1950 to -30 percent by 1990. For those with a college degree or more, the relative wage increased from 25 percent in 1950 to 42 percent in 1990. Thus, there has been a rise in between-education-group inequality over this period.

The estimated returns to experience, which in Table 3 are reported as returns relative to workers with only 0 to 5 years of experience, show a similar albeit less striking pattern. Again, more experience is associated with higher wages, on average. In addition, for some experience categories, particularly those representing more than 20 years, the estimated premium also rose, more or less, over the sample period. When considering otherwise identical workers, for example, an individual with 26 to 30 years of work experience made 40 percent more per week, on average, than a worker with between 0 and 5 years of experience in 1950. By 1990, that difference had risen to 61 percent.

A more important question with respect to the issue at hand, however, is the following: Do these skill premia vary with urban-rural status as suggested by the theories of wage inequality mentioned previously? To answer this question, I estimate a second specification of (1) in which the prices of observable skill, γ_t, are permitted to vary by urban-rural status within each year.[18] Those results appear in Table 4.

Because I have interacted each skill variable with the urban status dummy, the coefficients on the education variables now represent an individual's wage relative to that of an otherwise identical high-school graduate across rural residents. Likewise, the experience coefficients in this case denote a worker's weekly wage relative to that of a worker with 0 to 5 years of experience among non-metropolitan area dwellers. For urban residents, these relative skill premia are given simply by the sums of these raw coefficients and the

[18] Naturally, I could permit the coefficients pricing 'non-skill' personal covariates, β_t, to vary by urban-rural status as well. However, since the goal of the analysis is to focus on urban-rural differences in skill prices, I do not consider that case here.

corresponding interacted values.

With this interpretation in mind, it is interesting to note that, although the increase in the gap between workers differing only by educational attainment has grown on average, the increase has been much larger among urban dwellers than rural ones. Among rural residents, for instance, the high school wage premium relative to workers with no high school completed increased from 18 percent to 23 percent between 1950 and 1990, while the college-high school premium increased from 22 percent to 31 percent. These figures are considerably lower than what occurred in U.S. metropolitan areas where the high school-no high school gap increased from 17 percent to 31 percent, and the college-high school gap rose from 26 percent to 44 percent.

This result, incidentally, reveals another finding of interest. The urban wage premium, which, according to the first specification described above, remained fairly steady at 12 to 14 percent between 1950 and 1990, has not been steady within education groups. In 1950, the premium for workers with between 0 and 8 years of schooling completed was 6.5 percent. That is, an urban resident with 0 to 8 years of education earned, on average, 6.5 percent more per week than an identical worker living outside of a metropolitan area. For high school graduates and those with a college degree or more, the premia were quite similar in magnitude: respectively, 5.5 and 9.5 percent. While this same pattern held for the next two decades, the urban premium started to diverge across education groups betweeen 1970 and 1980 so that by 1990, the situation had changed dramatically: the urban residence premia for workers with no high school, high school only, and college or more were, respectively, -4.6, 3.4, and 16.4 percent. Evidently, some fundamental change favoring highly educated workers occurred in urban markets at this time.

A somewhat different picture emerges when considering the returns to experience. There

has been a rise in the relative returns to experience among both urban and rural dwellers over time, particularly for those workers with more than 20 years. In addition, the fact that the interactions with the urban status dummy are significantly positive and generally rise with experience indicates that the gap between the wages of workers belonging to different experience categories tends to be larger in metropolitan areas than outside of them. However, there is no discernible trend in these relative returns over time. Consider, again, a worker with 26 to 30 years of work experience. Between 1950 and 1990, the rural premium relative to a worker with 0 to 5 years of experience rose by approximately 20 percentage points. Among urban residents, that same premium rose by 19 percentage points, leaving the urban-rural difference reasonably constant.

6 Residual Inequality Patterns

To what extent do these changing returns to observable measures of skill account for the trends in overall inequality documented in Section 4? One way to provide an answer, naturally, is to consider the trends in residual inequality. This section provides some evidence on the distribution of residual wages after a first-stage regression on a worker's observable characteristics.

In this case, I estimate a version of equation (1) in which the vector of personal characteristics, X_{it}, is specified as before (weeks worked, marital status, three region dummies, nine occupation dummies, nine industry dummies), and the vector of skill prices in year t, γ_t, is allowed to vary across urban and rural residents. In addition, although education enters Z_{it} as before in indicator-variable form, I replace the eight categorical dummies with a fourth-order polynomial in potential experience to account for any within-category differences in the returns to experience. After running these first-stage regressions individ-

ually for each year, I then construct 90-10, 90-50, and 50-10 differentials using the residual distributions. Results for the United States as a whole are reported in Table 5A.

Most notably, they indicate that, although the covariates considered in the first stage capture a sizable fraction of the increase in inequality across all three levels (i.e. total U.S., urban U.S., rural U.S.) in the sense that the increase in the three residual inequality measures is substantially less than the increase in the overall inequality measures, a large fraction of the rise in U.S. wage inequality is not tied directly to observable characteristics. Indeed, looking at Table 2A, we see that 90-10 differences in raw wages increased by 56 percentage points between 1950 and 1990 for the U.S. as a whole. Over the same period, residual inequality increased by 34 percentage points, suggesting that more than half of overall inequality is tied to unobserved elements.

Since numerous authors (e.g. Juhn et al. (1993) and Acemoglu (2002)) have suggested that rising residual inequality still represents a rise in the premium paid to skills, do we find that residual inequality has risen more rapidly in cities? The results in Table 5A indicate that it has, at least to a modest extent. Much like with raw wage level differences, in 1950, the difference between the 90th and 10th percentile of the residual log wage distribution was higher outside of metropolitan areas than it was inside them: 0.94 versus 0.85. By 1990, however, the opposite was the case. The 90-10 difference had risen to 1.23 within cities, 1.18 outside of them. The same qualitative pattern holds for 90-50 and 50-10 differences as well, indicating that the distribution of residual wages has grown faster in cities than outside of them at both the top and bottom of the distribution.[19]

[19]This may further help to mitigate concerns that changing city definitions completely influence the results. In particular, if one is concerned that, as cities expand, they tend to become increasingly heterogeneous (i.e. inequality rises) while rural areas become more homogeneous (i.e. inequality falls), residual measures should at least offset the influence of changing observable characteristics (industry, occupation, education,

Results, again, are similar when the analysis is conducted separately by Census region (Table 5B) and for individual metropolitan areas (Table 5C). While residual measures of inequality all exhibit a significantly lower rate of increase over the sample period than the overall inequality measures listed in Tables 2B and 2C, all show a substantial increase over time. Therefore, much of the overall wage inequality witnessed within each region and metropolitan area can be attributed to unobserved elements. More importantly, however, the same basic conclusion remains: the rate of increase in residual inequality remains higher among metropolitan area populations than among non-urban populations.

7 A Decomposition - Urban Versus Rural Components

To get a better sense of how much the change in overall U.S. inequality has been influenced by urban and rural elements, consider the following decomposition based on the method of Juhn et al. (1993). For each individual i in each year t, let

$$w_{it}^1 = Urban_{it}\left(\bar{\alpha} + \bar{\delta} + \bar{\beta}\bar{X}^U + \bar{\gamma}^U\bar{Z}^U + \bar{\epsilon}_{it}^U\right) + (1 - Urban_{it})\left(\bar{\alpha} + \bar{\beta}X_{it} + \bar{\gamma}^R Z_{it} + \bar{\epsilon}_{it}^R\right) \quad (2)$$

where $Urban_{it}$ is an indicator equal to 1 if the individual lives in a metropolitan area; X_{it} and Z_{it} are vectors personal covariates (non-skill and skill); $\bar{X}^U$ and $\bar{Z}^U$ are vectors of average characteristics taken across all urban residents in all years; $\bar{\gamma}^U$ ($\bar{\gamma}^R$) is the average coefficient vector on education and experience estimated for urban (rural) residents using a single, pooled regression across all years; $\bar{\alpha}$, $\bar{\delta}$, and $\bar{\beta}$ are the overall intercept, urban residence coefficient, and coefficient vector on non-skill covariates from this same pooled

experience) on each area's earnings distribution.

regression; and $\bar{\epsilon}_{it}^{U}$ ($\bar{\epsilon}_{it}^{R}$) represents the average urban (rural) residual for this worker based on his position in the urban (rural) residual distribution following estimation of equation (1).[20] Since only the characteristics of rural dwellers change from year to year, I interpret changes in the distribution of w^1 as those associated with rural characteristics. I then calculate

$$w_{it}^2 = Urban_{it}\left(\bar{\alpha} + \bar{\delta} + \bar{\beta}X_{it} + \bar{\gamma}^U Z_{it} + \bar{\epsilon}_{it}^U\right) + (1 - Urban_{it})\left(\bar{\alpha} + \bar{\beta}X_{it} + \bar{\gamma}^R Z_{it} + \bar{\epsilon}_{it}^R\right) \quad (3)$$

in which the characteristics of both urban and rural residents are permitted to change over time. The contribution of changing urban characteristics I take to be given by the difference between how w^2 changes and how w^1 changes (e.g. the difference between the change in the 90-10 differential for w^2 and the change in the 90-10 differential for w^1).

Similarly, define

$$w_{it}^3 = Urban_{it}\left(\bar{\alpha} + \bar{\delta} + \bar{\beta}X_{it} + \bar{\gamma}^U Z_{it} + \bar{\epsilon}_{it}^U\right) + (1 - Urban_{it})\left(\hat{\alpha}_t + \hat{\beta}_t X_{it} + \hat{\gamma}_t^R Z_{it} + \bar{\epsilon}_{it}^R\right) \quad (4)$$

and

$$w_{it}^4 = Urban_{it}\left(\hat{\alpha}_t + \hat{\delta}_t + \hat{\beta}_t X_{it} + \hat{\gamma}_t^U Z_{it} + \bar{\epsilon}_{it}^U\right) + (1 - Urban_{it})\left(\hat{\alpha}_t + \hat{\beta}_t X_{it} + \hat{\gamma}_t^R Z_{it} + \bar{\epsilon}_{it}^R\right) \quad (5)$$

where $\hat{\alpha}_t$, $\hat{\delta}_t$, $\hat{\beta}_t$ and $\hat{\gamma}_t$ represent the estimated time- (and with $\hat{\gamma}$, area-) specific coefficients from (1). These two wages are used to compute the contributions of changing rural prices

[20] These average residuals are computed from the year-specific residuals generated by estimating (1). Based on an individual's residual quantile in his own year and area (i.e. urban-rural), I assign to him five residuals - one from each year and the appropriate area. $\bar{\epsilon}$ is simply the average of these five.

(based on changes in w^3 relative to w^2) and changing urban prices (looking at w^4 relative to w^3).[21]

Finally, let

$$w_{it}^5 = Urban_{it}\left(\hat{\alpha}_t + \hat{\delta}_t + \hat{\beta}_t X_{it} + \hat{\gamma}_t^U Z_{it} + \hat{\epsilon}_{it}^U\right) + (1 - Urban_{it})\left(\hat{\alpha}_t + \hat{\beta}_t X_{it} + \hat{\gamma}_t^R Z_{it} + \hat{\epsilon}_{it}\right) \tag{6}$$

and

$$w_{it}^6 = Urban_{it}\left(\hat{\alpha}_t + \hat{\delta}_t + \hat{\beta}_t X_{it} + \hat{\gamma}_t^U Z_{it} + \hat{\epsilon}_{it}\right) + (1 - Urban_{it})\left(\hat{\alpha}_t + \hat{\beta}_t X_{it} + \hat{\gamma}_t^R Z_{it} + \hat{\epsilon}_{it}\right) \tag{7}$$

where $\hat{\epsilon}_{it}$ denotes this individual's residual from the estimation of (1). Thus, w_{it}^6 is respondent i's actual log wage in year t. The influence of rural residual elements on inequality is based on the difference between the distributions of w^5 and w^4; that of urban residual elements is derived from the difference between w^6 and w^5.[22]

Results appear in Table 6. In general, they reiterate the basic conclusion already drawn – namely, that there has been a strong urban component to the rise in overall U.S. wage inequality. More specifically, we can see that this contribution derives from three important sources. First, changing urban characteristics at fixed skill prices has added between 3 and 7 percentage points to each decade-by-decade increase in the overall 90-10 wage differential.

[21] Since these two wage specifications do not isolate the effects of changing *skill* prices alone – α, δ, and β are also allowed to be year-specific – I interpret these effects broadly as rural and urban price effects, not simply urban and rural skill price effects.

[22] It should be noted that this decomposition could also be performed letting urban characteristics and prices vary first in the sequence (e.g. define w^1 using mean rural characteristics but year-specific urban characteristics). Doing so does not greatly alter the conclusions drawn. Only one pair of figures is altered significantly (rural and urban price effects between 1950 and 1960), albeit with the same qualitative outcome.

Again, this result likely reflects the steady rise in the percentage of urban dwellers over time combined with the higher returns to experience documented in Table 4. Given that the results also show that the contribution of changing rural characteristics has been mostly negative (with the exception of the 1970-1980 period, when it was close to zero), the total characteristic effect on changing inequality has been minor – on the order of 17 to 18 percent of the total change in the 90-10 difference between 1950 and 1990.

Second, there has been a significant component associated with how those personal characteristics are priced. Looking at the fourth column of figures in the table, it is apparent that, with the exception of the 1970-1980 period during which the college premium declined (see both Tables 3 and 4), changes in urban prices are responsible for roughly 6 to 14 percentage points of each 10-year change in the 90-10 wage difference.[23] Since here too, the rural effect has been primarily negative, contributing roughly -8 percentage points for the 90-10 difference between 1950 and 1990, the total contribution of changing prices – 20 of the 56 percentage points for the 90-10 differential between 1950 and 1990 – tends to understate the urban price effect which may account for as much as one half of the total rise in the 90-10 gap.

Third, each decade has witnessed a large increase in urban residual inequality. Looking again at the 90-10 difference, the contribution of urban unobservables has ranged from 2 to 10 percentage points during each decade. The impact of rural residuals has, in contrast, been considerably smaller, averaging roughly 1 percentage point per decade. So, while in total, the results reiterate the well-known role played by unobservables in the rise of U.S.

[23]This latter figure, 14 percentage points between 1950 and 1960, represents the estimate from Table 6 that differs most substantially from what is generated by doing the decomposition using urban prices first (see previous footnote). The other point estimate derived for the urban price estimate in this period is somewhat smaller, although still large and positive: 5.5 percentage points.

wage inequality (i.e. nearly half of the change in the 90-10 differential between 1950 and 1990), we can see that the vast majority of this rise has occurred within cities.[24]

8 Concluding Comments

A sizable literature has developed over the past decade arguing that the growing supply of skills in the U.S. labor market has, in one way or another, contributed to the striking rise in earnings inequality. Given that skilled workers (or, at least, highly educated workers) have traditionally been concentrated in urban markets, this notion implies that the rise in inequality ought to have been particularly pronounced in cities.

This paper has provided evidence in support of this conclusion. To reiterate, although various measures of wage inequality have risen throughout the entire country, the rise has been much more substantial within urban areas – defined at either the aggregate U.S., region, or individual metropolitan area levels – than in rural ones. The evidence also indicates that a large part of this difference in inequality can be linked to skill returns, which tend to be higher in urban areas.

Identifying the specific reasons for these patterns, of course, remains an open question. To be sure, there are several candidates including the two discussed previously: skill-biased technological change and increased sorting of high-ability workers into cities. Future work exploring which of these two (or any other) explanations hold, I believe, would prove useful on at least two counts: contributing to our understanding of changing wage inequality and providing greater insight into how urbanization influences labor earnings.

[24] Although this figure is somewhat smaller than what the results of Section 6 indicated, the basic conclusion remains the same.

Table 1A: Educational Attainment Distributions – U.S.

Level	Category	1950	1960	1970	1980	1990
Urban U.S.	Some High School	0.22	0.22	0.19	0.13	0.08
	High School	0.26	0.28	0.34	0.35	0.3
	Some College	0.09	0.12	0.17	0.21	0.3
	College or More	0.08	0.12	0.16	0.23	0.27
Non-Urban U.S.	Some High School	0.2	0.21	0.19	0.16	0.11
	High School	0.22	0.28	0.36	0.42	0.4
	Some College	0.07	0.09	0.13	0.17	0.27
	College or More	0.05	0.08	0.1	0.14	0.15

Note: Proportions of white males, age 18 to 65, by educational attainment.

Table 1B: Educational Attainment Distributions – Regions

Level	Category	1950	1960	1970	1980	1990
Urban West	Some High School	0.22	0.22	0.17	0.11	0.07
	High School	0.3	0.3	0.35	0.33	0.26
	Some College	0.13	0.16	0.21	0.25	0.33
	College or More	0.09	0.13	0.17	0.23	0.26
Non-Urban West	Some High School	0.22	0.22	0.17	0.13	0.09
	High School	0.24	0.31	0.36	0.39	0.34
	Some College	0.1	0.12	0.19	0.23	0.34
	College or More	0.07	0.09	0.13	0.18	0.19
Urban Midwest	Some High School	0.21	0.22	0.19	0.14	0.08
	High School	0.26	0.29	0.36	0.39	0.32
	Some College	0.09	0.12	0.16	0.2	0.31
	College or More	0.07	0.11	0.15	0.21	0.26
Non-Urban Midwest	Some High School	0.18	0.2	0.18	0.14	0.1
	High School	0.26	0.32	0.41	0.48	0.43
	Some College	0.07	0.1	0.13	0.16	0.28
	College or More	0.06	0.08	0.1	0.13	0.14
Urban Northeast	Some High School	0.21	0.23	0.2	0.13	0.08
	High School	0.25	0.26	0.34	0.37	0.33
	Some College	0.06	0.11	0.14	0.19	0.26
	College or More	0.08	0.12	0.17	0.24	0.29
Non-Urban Northeast	Some High School	0.22	0.22	0.19	0.14	0.1
	High School	0.25	0.29	0.38	0.44	0.43
	Some College	0.06	0.09	0.13	0.17	0.25
	College or More	0.05	0.08	0.12	0.16	0.17
Urban South	Some High School	0.23	0.2	0.19	0.14	0.09
	High School	0.23	0.28	0.31	0.33	0.29
	Some College	0.1	0.13	0.17	0.21	0.3
	College or More	0.09	0.13	0.17	0.23	0.27
Non-Urban South	Some High School	0.21	0.21	0.21	0.18	0.14
	High School	0.15	0.23	0.31	0.37	0.38
	Some College	0.06	0.09	0.12	0.15	0.25
	College or More	0.05	0.07	0.1	0.13	0.14

Note: Proportions of white males, age 18 to 65, by educational attainment.

Table 2A: Overall Wage Inequality – U.S.

Level	Measure	1950	1960	1970	1980	1990
Total U.S.	90-10	1.1	1.19	1.31	1.41	1.66
	90-50	0.51	0.53	0.57	0.61	0.76
	50-10	0.59	0.66	0.75	0.8	0.9
Urban U.S.	90-10	0.96	1.14	1.26	1.43	1.66
	90-50	0.49	0.52	0.57	0.6	0.73
	50-10	0.47	0.62	0.69	0.83	0.93
Non-Urban U.S.	90-10	1.19	1.24	1.29	1.36	1.5
	90-50	0.55	0.52	0.58	0.6	0.68
	50-10	0.64	0.73	0.71	0.75	0.82

Note: 90-10, 90-50, and 50-10 differences in log weekly wages.

Table 2B: Overall Wage Inequality – Regions

Level	Measure	1950	1960	1970	1980	1990
Total West	90-10	1.06	1.18	1.38	1.51	1.75
	90-50	0.44	0.49	0.57	0.62	0.78
	50-10	0.62	0.69	0.8	0.9	0.97
Urban West	90-10	1.03	1.16	1.4	1.54	1.77
	90-50	0.45	0.48	0.58	0.63	0.78
	50-10	0.58	0.68	0.82	0.9	0.99
Non-Urban West	90-10	1.12	1.26	1.4	1.43	1.59
	90-50	0.46	0.52	0.59	0.61	0.72
	50-10	0.66	0.75	0.81	0.81	0.88
Total Midwest	90-10	0.98	1.04	1.13	1.32	1.56
	90-50	0.46	0.48	0.51	0.55	0.68
	50-10	0.52	0.55	0.62	0.77	0.81
Urban Midwest	90-10	0.91	0.99	1.15	1.3	1.59
	90-50	0.44	0.47	0.53	0.55	0.68
	50-10	0.47	0.52	0.63	0.75	0.92
Non-Urban Midwest	90-10	1.11	1.07	1.16	1.27	1.44
	90-50	0.5	0.47	0.5	0.57	0.65
	50-10	0.61	0.6	0.66	0.7	0.8
Total Northeast	90-10	1	1.1	1.2	1.38	1.59
	90-50	0.52	0.54	0.61	0.61	0.76
	50-10	0.49	0.56	0.59	0.76	0.84
Urban Northeast	90-10	0.96	1.12	1.19	1.39	1.61
	90-50	0.52	0.55	0.58	0.61	0.75
	50-10	0.44	0.57	0.6	0.78	0.85
Non-Urban Northeast	90-10	1.01	1.08	1.17	1.28	1.43
	90-50	0.47	0.47	0.56	0.56	0.65
	50-10	0.55	0.61	0.61	0.73	0.78
Total South	90-10	1.25	1.36	1.42	1.45	1.65
	90-50	0.57	0.59	0.65	0.68	0.78
	50-10	0.68	0.77	0.77	0.77	0.88
Urban South	90-10	1.16	1.31	1.4	1.49	1.72
	90-50	0.54	0.58	0.63	0.68	0.82
	50-10	0.62	0.72	0.78	0.81	0.9
Non-Urban South	90-10	1.22	1.28	1.37	1.38	1.49
	90-50	0.59	0.59	0.65	0.66	0.73
	50-10	0.64	0.69	0.72	0.73	0.76

Note: 90-10, 90-50, and 50-10 differences in log weekly wages.

Table 2C: Overall Wage Inequality – Individual Cities

Metropolitan Area	Measure	1970	1980	1990
New York	90-10	1.27	1.5	1.71
	90-50	0.64	0.69	0.81
	50-10	0.64	0.81	0.9
	Obs.	26745	30005	30132
Los Angeles	90-10	1.35	1.58	1.89
	90-50	0.58	0.66	0.83
	50-10	0.77	0.92	1.06
	Obs.	18244	20679	24847
Chicago	90-10	1.14	1.28	1.61
	90-50	0.53	0.56	0.71
	50-10	0.61	0.72	0.9
	Obs.	13713	14816	13142
All Others	90-10	1.23	1.35	1.57
	90-50	0.57	0.6	0.7
	50-10	0.66	0.75	0.86
	Obs.	1624.7	1125.9	1136.9

Note: 90-10, 90-50, and 50-10 differences in log weekly wages. Individual cities are defined as (1) New York-Northern New Jersey-Long Island CMSA, (2) Los Angeles-Anaheim-Riverside CMSA, and (3) Chicago-Gary-Lake CMSA. "All Others" gives an average across the inequality measures of the remaining MSAs and CMSAs. Sample sizes (including New York, Los Angeles, and Chicago) are 104 cities for 1970, 221 for 1980, and 227 for 1990. "Obs." represents number of individual observations used in the calculations for the first three cities, and the average number for all others. Minimum numbers of individual observations per city in the last case are 343 for 1970, 149 for 1980, and 141 for 1990.

Table 3: Urban and Skill Premia – U.S.

Variable	1950	1960	1970	1980	1990
Urban	0.133	0.136	0.14	0.124	0.146
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
No High School	-0.17	-0.2	-0.21	-0.25	-0.3
	(0.01)	(0.01)	(0.01)	(0.016)	(0.03)
Some High School	-0.07	-0.08	-0.09	-0.12	-0.15
	(0.005)	(0.004)	(0.004)	(0.004)	(0.007)
Some College	0.09	0.095	0.08	0.08	0.125
	(0.01)	(0.005)	(0.004)	(0.005)	(0.005)
College or More	0.251	0.3	0.34	0.32	0.42
	(0.01)	(0.008)	(0.007)	(0.006)	(0.009)
6-10 Years Exp.	0.19	0.24	0.31	0.22	0.26
	(0.008)	(0.007)	(0.013)	(0.005)	(0.005)
11-15 Years Exp.	0.28	0.38	0.43	0.36	0.4
	(0.008)	(0.008)	(0.015)	(0.006)	(0.007)
16-20 Years Exp.	0.34	0.45	0.49	0.45	0.49
	(0.01)	(0.01)	(0.016)	(0.008)	(0.007)
21-25 Years Exp.	0.38	0.47	0.53	0.5	0.56
	(0.01)	(0.01)	(0.016)	(0.009)	(0.009)
26-30 Years Exp.	0.4	0.48	0.54	0.51	0.61
	(0.01)	(0.01)	(0.018)	(0.01)	(0.011)
31-35 Years Exp.	0.41	0.48	0.53	0.51	0.61
	(0.015)	(0.01)	(0.019)	(0.01)	(0.011)
36-40 Years Exp.	0.41	0.47	0.51	0.5	0.59
	(0.015)	(0.01)	(0.017)	(0.01)	(0.012)
$>$ 40 Years Exp.	0.37	0.46	0.46	0.45	0.54
	(0.012)	(0.01)	(0.018)	(0.015)	(0.016)
R^2	0.31	0.38	0.39	0.36	0.38
Individual Obs.	76825	258993	311987	403326	433350

Note: OLS estimates. Dependent variable is log weekly wage. Estimated coefficients on urban, education, and experience indicators. Each regression also includes marital status, weeks worked, and dummies for nine occupations, nine industries, and three Census regions. Regressions are performed separately for each year. Standard errors, adjusted for heteroskedasticity and within-state correlation, are reported in parentheses.

Table 4: Skill Premia by Urban Status – U.S.

Variable	1950	1960	1970	1980	1990
Urban	0.055	0.06	0.044	0.024	0.034
	(0.02)	(0.017)	(0.02)	(0.013)	(0.014)
No High School	-0.18	-0.22	-0.22	-0.22	-0.23
	(0.015)	(0.017)	(0.015)	(0.012)	(0.017)
Some High School	-0.07	-0.09	-0.1	-0.12	-0.14
	(0.008)	(0.007)	(0.007)	(0.007)	(0.008)
Some College	0.08	0.1	0.08	0.07	0.09
	(0.012)	(0.009)	(0.007)	(0.005)	(0.006)
College or More	0.22	0.29	0.32	0.26	0.31
	(0.017)	(0.012)	(0.01)	(0.01)	(0.012)
No High School-Urban	0.01	0.03	0.02	-0.04	-0.08
	(0.013)	(0.012)	(0.014)	(0.02)	(0.035)
Some High School-Urban	-0.001	0.01	0.01	-0.005	-0.01
	(0.008)	(0.007)	(0.007)	(0.008)	(0.009)
Some College-Urban	0.01	-0.01	0.008	0.02	0.04
	(0.012)	(0.008)	(0.007)	(0.007)	(0.008)
College or More-Urban	0.04	0.01	0.03	0.08	0.13
	(0.018)	(0.012)	(0.01)	(0.011)	(0.013)

Table 4 Continued

Variable	1950	1960	1970	1980	1990
6-10 Years Exp.	0.18	0.2	0.27	0.17	0.21
	(0.01)	(0.011)	(0.012)	(0.006)	(0.008)
11-15 Years Exp.	0.25	0.34	0.38	0.29	0.34
	(0.011)	(0.013)	(0.014)	(0.006)	(0.009)
16-20 Years Exp.	0.3	0.4	0.43	0.37	0.42
	(0.011)	(0.014)	(0.015)	(0.008)	(0.01)
21-25 Years Exp.	0.33	0.43	0.47	0.41	0.48
	(0.012)	(0.014)	(0.017)	(0.01)	(0.01)
26-30 Years Exp.	0.33	0.43	0.46	0.41	0.53
	(0.013)	(0.015)	(0.016)	(0.009)	(0.012)
31-35 Years Exp.	0.34	0.42	0.44	0.42	0.53
	(0.016)	(0.016)	(0.015)	(0.009)	(0.014)
36-40 Years Exp.	0.34	0.41	0.42	0.4	0.5
	(0.017)	(0.017)	(0.015)	(0.01)	(0.011)
$>$ 40 Years Exp.	0.3	0.38	0.36	0.33	0.45
	(0.013)	(0.016)	(0.016)	(0.012)	(0.012)
6-10 Years Exp.-Urban	0.02	0.04	0.06	0.06	0.06
	(0.015)	(0.013)	(0.019)	(0.007)	(0.009)
11-15 Years Exp.-Urban	0.05	0.05	0.08	0.09	0.07
	(0.016)	(0.018)	(0.019)	(0.006)	(0.011)
16-20 Years Exp.-Urban	0.06	0.07	0.09	0.11	0.09
	(0.017)	(0.017)	(0.021)	(0.008)	(0.012)
21-25 Years Exp.-Urban	0.08	0.06	0.08	0.12	0.1
	(0.02)	(0.018)	(0.021)	(0.011)	(0.011)
26-30 Years Exp.-Urban	0.11	0.07	0.11	0.13	0.1
	(0.02)	(0.016)	(0.02)	(0.01)	(0.014)
31-35 Years Exp.-Urban	0.11	0.09	0.11	0.12	0.11
	(0.023)	(0.019)	(0.021)	(0.011)	(0.019)
36-40 Years Exp.-Urban	0.1	0.09	0.12	0.13	0.11
	(0.019)	(0.018)	(0.022)	(0.011)	(0.015)
$>$ 40 Years Exp.-Urban	0.1	0.1	0.14	0.15	0.1
	(0.019)	(0.018)	(0.02)	(0.015)	(0.019)
R^2	0.31	0.38	0.39	0.36	0.38

Note: OLS estimates. Dependent variable is log weekly wage. Estimated coefficients on urban, education, and experience indicators; urban-education interactions; and urban-experience interations. Each regression also includes marital status, weeks worked, and dummies for nine occupations, nine industries, and three Census regions. Regressions are performed separately for each year. Standard errors, adjusted for heteroskedasticity and within-state correlation, are reported in parentheses.

Table 5A: Residual Wage Inequality – U.S.

Level	Measure	1950	1960	1970	1980	1990
Total U.S.	90-10	0.88	0.91	0.98	1.08	1.22
	90-50	0.42	0.43	0.46	0.51	0.58
	50-10	0.45	0.48	0.51	0.57	0.63
Urban U.S.	90-10	0.85	0.89	0.97	1.08	1.23
	90-50	0.41	0.43	0.46	0.51	0.59
	50-10	0.43	0.46	0.51	0.57	0.64
Non-Urban U.S.	90-10	0.94	0.95	0.99	1.08	1.18
	90-50	0.44	0.44	0.46	0.52	0.56
	50-10	0.49	0.5	0.53	0.56	0.62

Note: 90-10, 90-50, and 50-10 differences in residual log weekly wages based on year-specific regressions.

Table 5B: Residual Wage Inequality – Regions

Level	Measure	1950	1960	1970	1980	1990
Total West	90-10	0.89	0.91	1.01	1.13	1.28
	90-50	0.41	0.43	0.47	0.53	0.61
	50-10	0.48	0.48	0.54	0.6	0.66
Urban West	90-10	0.87	0.9	1	1.13	1.28
	90-50	0.4	0.42	0.47	0.53	0.62
	50-10	0.47	0.48	0.53	0.59	0.66
Non-Urban West	90-10	0.92	0.96	1.05	1.15	1.27
	90-50	0.41	0.44	0.49	0.54	0.59
	50-10	0.51	0.52	0.55	0.61	0.68
Total Midwest	90-10	0.81	0.83	0.91	1.02	1.16
	90-50	0.39	0.4	0.44	0.48	0.55
	50-10	0.42	0.43	0.48	0.54	0.61
Urban Midwest	90-10	0.78	0.81	0.89	1.01	1.16
	90-50	0.38	0.4	0.43	0.47	0.55
	50-10	0.4	0.41	0.46	0.53	0.61
Non-Urban Midwest	90-10	0.87	0.87	0.97	1.03	1.16
	90-50	0.41	0.39	0.44	0.49	0.54
	50-10	0.46	0.46	0.47	0.52	0.61
Total Northeast	90-10	0.84	0.87	0.93	1.03	1.2
	90-50	0.42	0.42	0.45	0.49	0.57
	50-10	0.41	0.45	0.48	0.54	0.62
Urban Northeast	90-10	0.83	0.87	0.94	1.03	1.21
	90-50	0.42	0.42	0.46	0.49	0.58
	50-10	0.41	0.45	0.48	0.54	0.63
Non-Urban Northeast	90-10	0.85	0.86	0.91	1.01	1.11
	90-50	0.4	0.41	0.43	0.48	0.51
	50-10	0.44	0.45	0.48	0.54	0.59
Total South	90-10	0.96	1	1.03	1.11	1.21
	90-50	0.47	0.48	0.49	0.53	0.58
	50-10	0.49	0.52	0.54	0.58	0.63
Urban South	90-10	0.93	0.99	1.04	1.11	1.23
	90-50	0.45	0.47	0.49	0.53	0.59
	50-10	0.48	0.52	0.55	0.58	0.64
Non-Urban South	90-10	0.98	1	1.02	1.11	1.18
	90-50	0.48	0.49	0.48	0.54	0.57
	50-10	0.5	0.51	0.54	0.57	0.61

Note: 90-10, 90-50, and 50-10 differences in residual log weekly wages based on region-year specific regressions.

Table 5C: Residual Wage Inequality – Individual Cities

Metropolitan Area	Measure	1970	1980	1990
New York	90-10	1.01	1.11	1.31
	90-50	0.49	0.53	0.63
	50-10	0.51	0.58	0.67
Los Angeles	90-10	1	1.17	1.33
	90-50	0.46	0.55	0.65
	50-10	0.54	0.61	0.68
Chicago	90-10	0.92	1.05	1.19
	90-50	0.45	0.49	0.56
	50-10	0.46	0.56	0.62
All Others	90-10	0.94	1.04	1.17
	90-50	0.45	0.49	0.56
	50-10	0.49	0.55	0.61

Note: 90-10, 90-50, and 50-10 differences in residual log weekly wages based on year-specific regressions. For additional information, see Table 2C.

Table 6: Inequality Decomposition - Urban Versus Rural Components

90-10 Diff.	Rural Characteristics	Urban Characteristics	Rural Prices	Urban Prices	Rural Residuals	Urban Residuals	Total Change
1950-60	-0.076	0.066	-0.07	0.14	0.01	0.02	0.09
1960-70	-0.03	0.066	-0.033	0.067	0.006	0.05	0.12
1970-80	0.0001	0.073	-0.005	-0.04	0.017	0.056	0.1
1980-90	-0.03	0.03	0.03	0.11	0.01	0.1	0.25
90-50 Diff.	Rural Characteristics	Urban Characteristics	Rural Prices	Urban Prices	Rural Residuals	Urban Residuals	Total Change
1950-60	-0.016	0.005	-0.03	0.05	0.002	0.004	0.015
1960-70	-0.006	0.023	-0.014	0.02	0.004	0.013	0.04
1970-80	-0.006	0.02	-0.007	-0.003	0.005	0.032	0.04
1980-90	-0.004	0.013	0.014	0.066	0.006	0.06	0.155
50-10 Diff.	Rural Characteristics	Urban Characteristics	Rural Prices	Urban Prices	Rural Residuals	Urban Residuals	Total Change
1950-60	-0.06	0.061	-0.037	0.09	0.007	0.016	0.077
1960-70	-0.025	0.043	-0.02	0.046	0.002	0.035	0.08
1970-80	0.006	0.053	0.002	-0.04	0.01	0.024	0.06
1980-90	-0.029	0.02	0.014	0.048	0.008	0.035	0.095

Note: Figures represent decade-by-decade changes in 90-10, 90-50, and 50-10 wage differentials associated with observable characteristics, prices of observable characteristics, and unobservables. "Total Change" represents change in overall inequality measure.

Appendix

Composition of U.S. Census Regions

West: Washington, Oregon, California, Nevada, Idaho, Montana, Wyoming, Utah, Colorado, Arizona, New Mexico, Alaska, Hawaii

Midwest: North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana, Ohio

Northeast: Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, New Jersey

South: Texas, Oklahoma, Arkansas, Louisiana, Kentucky, Tennessee, Mississippi, Alabama, West Virginia, Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Florida

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