Methodology in the "Job Quality" Debate

ROBERT M. COSTRELL

This paper critically examines the use of the earnings distribution of net employment gains in the analysis of "new jobs." The paper explains why this measure of economic performance is not robust and why it can be misleading. Alternative analyses, based on industry and/or occupation, are more robust and may be more informative. Illustrative results show that new job growth has been concentrated in industries with generally lower wages than the industries where jobs have been lost.

The on-going debate over "job quality" has often focused on a new measure of economic performance introduced by Bluestone and Harrison (1986), the earnings distribution of net employment gains. On the basis of this measure, they conclude that there was a "proliferation of low wage employment" between 1979 and 1984, and a net drop in high wage employment. By contrast, Kisters and Ross (1987a, 1988a) conclude, on the basis of their net distribution, that there has been disproportionate growth of high-wage employment. More recently, Harrison and Bluestone (1988) and Kisters and Ross (1988b) have responded with another round of net distributions, and the net distribution has become a popular device among both Democrats and Republicans as a means of showing that "new jobs" are either very bad or very good.1

1 A recent Democratic staff report of the Senate Budget Committee, released by Senator Lawton Childs (New York Times, September 27, 1988), finds that between 1979 and 1987, 50 per cent of net employment gains of year-round, full-time employees earned below $11,611. By contrast, a recent Republican staff report of the Joint Economic Committee, inserted into the Congressional Record (S-10823, August 4, 1988) by Senator William Roth, reports that between 1982IV and 1987IV, net employment of full-time employees below $10,400 fell, while 37 per cent of the net gains earned above $31,200. Finally, Undersecretary of Commerce Robert Ortner reported (San Diego Union, August 23, 1988) that between 1982IV and 1988II, 77 per cent of net employment gains earned over $31,200.


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Evidently, the net distribution is not very robust. As this paper explains, the basic problem is that the net distribution does not correspond to the distribution of “new jobs,” as usually understood. Indeed, it provides no additional information than the earnings distributions on all jobs—new and old together—from which it is derived. A review of various approaches to the definition of a new job helps illustrate the novel—and potentially confusing—definition of new jobs implicitly adopted by Blustone and Harrison and Kosters and Ross. This paper demonstrates analytically why the net distribution is so highly sensitive to such seemingly minor matters as the choice of deflators. A more satisfactory approach would distinguish the distribution of employment gains from employment losses, using a more conventional definition of jobs. Doing so shows that new jobs have been created in industries with generally lower wages than the industries where jobs have been lost.

Defining New Jobs, Old Jobs, and Lost Jobs

Over any period of time, the economy’s jobs can be divided into new jobs + old jobs -- lost jobs.\(^2\) Conceptually, however, “new jobs” may be understood either as those which are new to the individual or those which are new to the economy. Both approaches have their difficulties, including the shared difficulty of defining a job. Consider first the individual approach. New jobs would then certainly include first-time job-holders, while lost jobs would include retirees. This immediately raises one difficulty in comparing their pay distributions with each other, and with the population at large—how to control for age and experience. Implementing this approach would require some type of earnings equation to compare distributions. We would also have to consider job-changers, both with and without spells of unemployment between new and lost jobs. This group, which includes both voluntary and involuntary job-changers, cannot be specified without some operational definition of a job, such as industry and/or occupation. Of course, much depends on the degree of industrial and occupational disaggregation, including the classification of various promotions. In addition, we would have to consider whether changes in establishment and employer should be classified as job changes. Narrower job definitions mean more job changes, and larger groups of new jobs and lost jobs. Comparing the distributions of these jobs also raises the life-cycle problem, since new jobs of voluntary job-changers are presumably better than their old jobs.

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\(^2\) By “lost” jobs, we mean both voluntary and involuntary job losses.
Now consider the second approach. Focusing on jobs that are new to the economy nets out individuals entering and leaving given jobs, so it is one (imperfect) method of addressing the life-cycle issue. Still, as with individual job-changers, some workable definition of jobs is necessary. With ideal data, we could identify expanding and contracting industry-occupation cells, and the average pay associated with them. The pay distributions of expanding and contracting industry-occupation cells can be compared with each other, as well as with the total distribution of such cells. A cell’s average pay could be unrepresentative of the individuals entering it or leaving it, which would be an advantage, to the extent that it avoids the life-cycle problem; but it may be a disadvantage if the job definition is too coarse (as will be discussed further below).

We can be sure that the cell’s average pay is representative of the individuals entering and leaving it if we define the cell (and therefore the job) by its real pay. This is what Bluestone and Harrison’s and Kosters and Ross’ net distributions do. However, this implicit definition of a job, by its real pay, does not correspond to the more commonly used definitions. As a result, there is considerable confusion when the net distribution is identified with the distribution of new jobs, a problem which both sets of authors acknowledge. The next section expands on this point.

Understanding the Net Distribution

Table 1 presents results from Bluestone and Harrison’s and Kosters and Ross’ first round of papers. For each study, the first two columns represent in percentage form the earnings distribution of total employment (new jobs and old jobs together) for all workers (including part-time and part-year). For Bluestone and Harrison, we see a 2 percentage point rise in the “low earnings” category, and a 1.6 point drop in the “high earnings” category. For Kosters and Ross, we see a small drop at the low end and a small rise at the top end, due to a different deflator, an extra year of data, and a few other seemingly minor differences. Perhaps the debate would not have become so intense had the matter rested here.

However, the contrast is stark between the distributions of net employment gains, given in the third column, for each study. Bluestone and Harrison’s results were interpreted by some as showing that 58 per cent of new jobs over this period paid less than $7,012, a finding which attracted wide

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<table>
<thead>
<tr>
<th>Table 1</th>
<th>Percentage Distribution of Total Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluestone and Harrison</td>
<td>Kosters and Ross</td>
</tr>
<tr>
<td>Low earnings</td>
<td>8%</td>
</tr>
<tr>
<td>High earnings</td>
<td>5%</td>
</tr>
</tbody>
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2. “Low earnings” are less than $7,012 in 1984 dollars, as inflated by the CPI, while “high earnings” are over $28,048.
TABLE 1

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Total employment 1979 1984</td>
<td>Total employment 1979 1985</td>
</tr>
<tr>
<td>Low earnings</td>
<td>30.4% 32.4%</td>
<td>29.2% 28.9%</td>
</tr>
<tr>
<td>Middle earnings</td>
<td>53.1 52.7</td>
<td>51.9 51.6</td>
</tr>
<tr>
<td>High earnings</td>
<td>16.5 14.9</td>
<td>18.8 19.5</td>
</tr>
<tr>
<td>Low earnings</td>
<td>58.0%</td>
<td>24.1%</td>
</tr>
<tr>
<td>Middle earnings</td>
<td>47.5</td>
<td>47.3</td>
</tr>
<tr>
<td>High earnings</td>
<td>-5.5</td>
<td>28.6</td>
</tr>
</tbody>
</table>

*CPS data for all workers, including part-time, part-year.
Sources: Bluestone and Harrison (1986), Table 2; Kosters and Ross (1987a), Tables 5 and 6, line 6. (Both groups of authors’ results are reproduced in Kosters and Ross [1988a], Table V.)

attention. By contrast, Kosters and Ross’ net distribution suggested large gains at the high end, and those of the Republican studies (see footnote 1) were even more pronounced.

The meaning of the net distribution may be clarified by Figures 1–4. Figure 1 depicts hypothetical earnings distributions over total employment at two points in time, $f_0(w)$ and $f_1(w)$, where $w$ denotes the real wage.\(^5\) Note that $f_0(w)$ and $f_1(w)$ are absolute densities (rather than relative ones), so the areas under them represent the levels of employment, $L_0$ and $L_1$. As illustrated here, the distribution grows and shifts left. If it shifts enough, they will cross, as Bluestone and Harrison find, and as depicted in Figure 3.

Suppose for the moment that they do not cross. Then net employment gains, $\Delta L = L_1 - L_0$, are represented by the hatched area in Figure 1, and their distribution is described by the absolute density function, $f_1(w) - f_0(w)$. Obviously, this net distribution carries no more information than the distributions of total employment from which it is derived. It simply tells us how many more jobs there are at any given real wage level.

It is a big step, however, to identify those additional jobs at that real wage level as the number of “new jobs” paying that wage, as some readers (especially many journalists and politicians) have done, despite the generally careful wording of the original studies.\(^6\) To do so implicitly defines what is

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\(^5\) Kosters and Ross (1987a, 1988a) note that the CPS data depart significantly from this idealized representation, with spikes at round-numbered dollars. They point out that this introduces some sensitivity of the fractiles employed by them and Bluestone and Harrison with respect to cutoff points.

\(^6\) Bluestone and Harrison observe (1986, p. 48, note 11) that “it is almost impossible for researchers and writers in this field to prevent ourselves from occasionally slipping into the ‘job creation’ language, but the reader should be aware of the limitations in such usage.” Similarly, Kosters and Ross note that the “new job” terminology is “imprecise” (1988b,
meant by a new job, identifying all jobs by their real wage. Under this strained definition, virtually everyone changes jobs each month or each quarter, since measured real wages change every time the deflator is released. The net "new jobs" at any given wage level, therefore, is likely the result of an entire group of workers leaving that real wage level and another (larger) group of workers entering it.\(^7\)

\(^7\) Using the individual approach, we would have a trivial result regarding (gross) new jobs and lost jobs: Since everyone's real pay changes, all jobs from time 0 are lost jobs, and all jobs at time 1 are new jobs.
It is preferable to define jobs independently of the real wage they pay, say by industry and/or occupation. This allows us to consider changes in the real wages of old jobs. Suppose, for example, that the real wages of all old jobs fall at the same rate, and that no old jobs are lost. Then the distribution of old jobs, $f_0$, shifts left to $f'_0$, as shown in Figure 2. The net distribution, the hatched area of Figure 1, will then be very different from the distribution of new jobs, the hatched area in Figure 2. In this case, the net distribution exaggerates how bad the new jobs are. If, instead, real wages rise in old jobs, then the net distribution will overstate how good the new jobs are.

Now suppose the net distribution, $f_1(w) - f_0(w)$, is negative over some interval of $w$, as depicted in Figure 3, and as reported by Bluestone and Harrison. This is often interpreted as the loss of high-wage jobs. As Bluestone and Harrison are careful to point out, however, old high-wage jobs may have deteriorated in purchasing power, rather than having disappeared entirely. If so, the horizontally hatched area will overstate the loss of high-
wage jobs. Figure 4 depicts the extreme case where no high-wage jobs are lost, but real wages fall in all old jobs.

Finally, although the simple shifts in the pay of old jobs depicted in this section illustrate the distinction between the net distribution and the distributions of new jobs and jobs lost, the true picture is still more complex. All we have shown are net new jobs and net job losses at various wage levels. In fact, job losses and job gains are both distributed across the spectrum, as is illustrated later in this paper.

Sensitivity of the Net Distribution

The debate over the net distribution has focused on whether "new jobs" are better or worse than "old jobs," comparing the net distribution with the total distribution. We now formalize the relationship between the net and total distributions.

The proportion of the work force earning between any two given wage rates, \( w \) and \( w' \), in periods 0 and 1 are\(^8\)

\[
p_0 = \int_{w^-}^{w^+} f_0(w)dw / \int_{0}^{\infty} f_0(w)dw = \int_{w^-}^{w^+} f_0(w)dw / L_0
\]

\[
p_1 = \int_{w^-}^{w^+} f_1(w)dw / \int_{0}^{\infty} f_1(w)dw = \int_{w^-}^{w^+} f_1(w)dw / L_1.
\]

The change in this segment of the earnings distribution is \( \Delta p = p_1 - p_0 \). The corresponding fractile of the net distribution is:

\[
p_n = \int_{L_0}^{L_1} [f_1(w) - f_0(w)]dw / (L_1 - L_0)
\]

\[
= \int_{L_1}^{L_1} f_1(w)dw / \Delta L - \int_{L_0}^{L_0} f_0(w)dw / \Delta L
\]

where the limits of integration are understood. The net distribution and the total distribution can be compared by examining the differences between these fractiles:

\[
(1) \quad p_n - p_0 = (L_1 / \Delta L)\Delta p
\]

\[
p_n - p_1 = (L_0 / \Delta L)\Delta p.
\]

\(^8\) In the expressions below, summation signs can be substituted for integrals, to represent discrete distributions.
Equation (1), in either version, conveys the main points. If the fractile of the total distribution grows ($\Delta p > 0$), then the fractile of the net distribution will be greater than that of either total distribution ($p_0$ or $p_1$), and conversely if $\Delta p < 0$. This is simply the familiar relationship between marginal and average.\(^9\)

Moreover, the gap between the fractile of the net distribution and the fractile of the total distribution multiplies $\Delta p$ by the reciprocal of employment growth over the interval. This multiplier will be large for relatively short periods. Hence, \textit{small changes in the total distribution will be magnified in the net distribution.}

This can be illustrated by the results of Bluestone and Harrison and Kosters and Ross (given in Table 1). For Bluestone and Harrison, the 2.0 percentage point growth in the low-earnings fractile (from 30.4 per cent to 32.4 per cent) is magnified by the inverse of employment growth (7.7 per cent over the period) to a 26.1 per cent gap between the fractiles of the net distribution and the 1984 distribution ($58.0 - 32.4$). Kosters and Ross find instead a small drop (0.3 per cent) in the low-earnings fractile, from 1979 to 1985, primarily due to the extra year of recovery and use of an adjusted CPI (which rose a bit less rapidly than the unadjusted CPI that Bluestone and Harrison used). This is magnified into a considerably larger gap between the low-earnings fractiles of the net and total distributions.

What does this magnification mean? \textit{If} the change in the total distributions reflected solely the different mix of new jobs (with no change in pay on the old jobs), then it would take a \textit{very} different mix to have a perceptible effect on the distribution as a whole. However, any small change in the real pay of old jobs will constitute a measurement error for the construction of the net distribution, and this error will be greatly magnified. As a result, we get wildly varying results based on slightly different deflators, endpoints, etc.\(^{10}\)

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\(^9\) Equation (1) is a discrete example of this relationship, $M(x) - A(x) = x \cdot dA/dx$, where $M(x)$ and $A(x)$ are the marginal and average functions. Equation (1) also shows quite clearly that the net distribution adds no information to the total distributions. Given any fractile of the total distributions, and the change in employment, the corresponding fractile of the net distribution can be calculated without any further reference to the underlying data.

\(^{10}\) The sensitivity of the net distribution can also be illustrated by examining the mean. It can readily be shown that equation (1) holds for the means, as well as the fractiles, simply by replacing the $p$'s with $w$, the mean wage. Applying this, for example, to data from the BLS Office of Productivity and Technology, we find that from 1967 to 1973, mean real compensation per employee in the nonfarm business sector rose from $23,089$ to $25,320$, which implies that the mean of the net distribution was $40,649$. No one, however, would suggest that the compensation growth was due to newly created jobs at that level, rather than compensation growth in old jobs. More recently, when compensation growth has been
New Jobs vs. Lost Jobs

Apart from whether pay on old jobs is changing, the net distribution can produce deceptive results when it crosses over from positive to negative, as in Figure 3, and as Bluestone and Harrison report. In such cases, the low-earnings fractile of the net distribution is misleadingly large.

To see this, suppose that the pay on old jobs is not changing, so that it might make sense to interpret the vertically hatched area of Figure 3 as “new jobs,” and the horizontally hatched area as “lost jobs.” The low-earnings fractile of the net distribution, however, is expressed as a fraction of new jobs net of lost jobs, rather than of new jobs per se, so the fractile is misleadingly large.11

For example, Bluestone and Harrison’s low-earnings fractile is 58.0 per cent, representing 4.687 million workers out of 8.082 million net employment gains. However, the 8.082 million nets out the negative portion of the distribution at the high end, which is at least .442 million.12 This means that there are at least 8.524 million workers below the crossover point of the net distribution, which, for the sake of argument, we are calling “new jobs.” Therefore, as a fraction of “new jobs,” the low-earnings fractile can be no larger than 55.0 per cent, rather than the 58.0 per cent reported.

More generally, the problem lies in applying the tools of probability to distributions with negative densities.13 It is preferable to distinguish, where possible, job gains from job losses, and to consider their distributions separately. In this regard, Bluestone and Harrison’s and Kosters and Ross’ distributions are unsatisfactory. They suggest that job gains and job losses are confined to disjoint ranges of earnings: all new jobs are worse than all

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11 Similarly, if net job losses are at the low end, as noted in the Senate Republican staff report cited in footnote 1, then the high-earnings fractiles of the net distribution will be misleadingly large.

12 The employment data are from Bluestone and Harrison (1986), Table 2. The .442 million figure is the net employment loss above the high earnings cutoff. Bluestone and Harrison do not report whether the crossover point of the net distribution is to the left or right of the high earnings cutoff, but either way, the net employment loss above the crossover point must exceed .442 million. If the crossover point is to the left of the high earnings cutoff, this is obvious; and if it is to the right, then the .442 million loss is itself net of the gain between the earnings cutoff and the crossover point, so the loss to the right of the crossover point must exceed .442 million.

13 This can result in such nonsense as a negative mean of the net distribution. For example, between 1979 and 1984, mean weekly earnings of the net distribution for production and nonsupervisory workers were −$124.39. (This will occur when total real earnings fall; i.e., when wage rates fall more rapidly than employment rises.)
lost jobs (or *vice versa*). Again, this is a consequence of the implicit definition of jobs by their wages. Under usual job definitions, job gains and job losses are somewhat more heterogeneous.

**Where Are the Job Gains and Job Losses?**

Clearly, it is preferable to identify jobs by some attribute(s) other than wages. Definitions should be based on attributes related to labor demand, since that is what the job quality debate is all about. A useful working definition of jobs would be industry-occupation pairs. Because of difficulties in the occupational data (noted below), the discussion here uses only industry.\(^\text{14}\) Consider Table 2. Columns (1) and (3) give the distributions of nonfarm production and nonsupervisory employment in 323 three-digit industries, by average hourly wage in the industry.\(^\text{16}\) These columns are analogous to distributions \(f_0\) and \(f_1\) in Figures 1–4.

Column (2) gives the industry employment distribution for 1979, ordered by the hourly wage paid by each industry in 1986. Column (2) differs from column (1), therefore, due to changes in real pay within industries, while the difference between columns (2) and (3) reflects employment shifts among industries with different pay.\(^\text{17}\) These latter two columns provide the basis for our analysis of job gains and job losses, since they are purged of wage changes. They are depicted in the (absolute) distributions of Figure 5, which are analogous to \(f_0'\) and \(f_1\) in Figure 2. These distributions are deflator-free.

Suppose for the moment that there had been no industries with declining employment. Then the net distribution from Figure 5 (i.e., the difference between the two curves) would be nonnegative and would provide the pay distribution of net employment gains by industry. In this case, the net

\(^{14}\) Further refinements beyond industry and occupation might be desirable. If pursued far enough, however, refined job definitions converge on the individual.

\(^{15}\) There is now a well-established literature regarding wage differentials among industries, most of which appear to represent labor rents. See, for example, Katz and Summers (1988); Krueger and Summers (1988); and Dickens and Katz (1987). Shift-share analyses by industry include Kosters (1986); Kosters and Ross (1987); Mishel (1986); and Costrell (1988). These studies consider the effect of industry shift on mean wage growth. Their results, when converted to a common basis for comparison, are in very close agreement with each other and are consistent with those presented here. Lawrence (1984); Tilly, Bluestone, and Harrison (1987), and Davidson and Reich (1988) provide shift-share analyses of wage dispersion.

\(^{16}\) These data were selected for presentation because their level of disaggregation reduces the lumpiness of the distributions. In column (1), hourly wages for 1979 are inflated to $1986 by the PCE deflator.

\(^{17}\) In place of 1979 employment at 1986 wages, 1986 employment at 1979 wages could be used. Alternatively, 1979 and 1986 employment can be compared using the average of 1979 and 1986 wages, as well as the years in between.
### TABLE 2

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<td>$4–$6</td>
<td>17.0%</td>
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<td>21.1%</td>
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<td>1.7</td>
<td>1.1</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Median ($1986) | $8.29 | $8.53 | $8.26 | $7.50 | $10.50 |

* Data include production and nonsupervisory workers in 523 nonfarm, private industries.
* Distribution of 1979 industry employment by industry’s average hourly wage in 1979, inflated to 1986 by PCE.
* Distribution of 1979 industry employment by industry’s average hourly wage in 1986.
* Distribution of 1986 industry employment by industry’s average hourly wage in 1986.

Source: Author’s calculations on published and unpublished data from the Bureau of Labor Statistics’ Current Establishment Survey.

distribution would be somewhat informative regarding the pay distribution among industries where employment opportunities are growing. Again, the reason the net distribution here would be more informative than in the Bluestone and Harrison and Kosters and Ross studies is that the two distributions (analogous to $f_0$ and $f_1$) are based on the same industry wages, excluding pay growth within industries.

The fractiles of the net distribution here also magnify the shift between columns (2) and (3), as equation (1) indicates, but the construction of column (2) makes the results somewhat more illuminating. In particular, we are not magnifying changes in real pay of old jobs. Still, the distribution of employment across industries may be sensitive to the choice of years, and this possibility is addressed below.

The difference between the curves in Figure 5, of course, represents the employment gains of expanding industries, net of the losses in contracting industries. We can readily derive distinct distributions of expanding and contracting industries. Figure 6 depicts these distributions in absolute form, while columns (4) and (5) of Table 2 give the relative distributions. Figure 6 shows that the job gains in most low-paying industries far outweighed the job losses in other low-paying industries. As Table 2 shows, 80 per cent of the employment gains were located in industries paying under $10 per hour, while only 40 per cent of the employment losses were in such industries.
The median expanding industry had an average pay of $7.50 per hour, while the median contracting industry’s average pay was $10.50. The employment gains are in generally lower-paying industries than the old jobs (median of $8.53, using 1986 wages), while the losses are from generally higher-paying industries.

Although this approach does not suffer from deflator-sensitivity, the possibility of endpoint sensitivity remains. The obvious way to address this issue is to examine all the data, rather than only that of selected years, using regression methodology. Trend coefficients from time series are far more efficient and reliable than simple trends between two endpoints. Moreover, regression methodology allows us to control for the business cycle without restricting ourselves to dividing up the data at cyclically comparable years. Indeed, Costrell (1988) finds a break in patterns of cyclically controlled industry shift around 1981, corresponding to the emergence of large trade
deficits in manufactured goods.\textsuperscript{18}

Table 3 presents the distribution of expanding and contracting industries for the two periods 1972–1981 and 1981–1986, based on these cyclically controlled estimates.\textsuperscript{19} As it turns out, the results for 1981–1986 are rather

\textsuperscript{18}Not only is there a break in the pattern of industrial shift around 1981, there is also an acceleration in the rate of shift.

\textsuperscript{19}Costrell (1988) estimated cyclically controlled (using the unemployment rate) rates of change in employment \textit{shares}, allowing for a break in trend (while imposing continuity) to be found by the data at a year which minimized the sum of squared residuals. This turned out to be 1981 for a variety of data sets, including the production and nonsupervisory data set under consideration here. Table 3 is based on estimates of change in employment \textit{levels}, which are related to share changes by

\begin{equation}
\Delta L_i = L_i [\Delta (L_i/L) + (L_i/L) \Delta (L_i/L)]
\end{equation}

Here, $\Delta (L_i/L)$ are the cyclically controlled coefficients calculated in Costrell (1988), $\Delta L_i/L$ is drawn from a semi-log regression of total employment with a break in trend from 1981 (and no cyclical controls), while interval averages are used for $L_i$ and $L_i/L$ on the RHS of (i). To use all the available data, the wages are averaged over the respective time periods,
TABLE 3
REGRESSION-BASED ANALYSIS OF EMPLOYMENT GAINS AND LOSSES

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<thead>
<tr>
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<tr>
<td></td>
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<td>19.4%</td>
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</tr>
<tr>
<td>&gt; $14</td>
<td>2.6</td>
<td>4.8</td>
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</table>

Median ($1986)  $7.93 $8.13 $8.00 $10.71

⁵ Data are from the CES and include production and nonsupervisory workers in 323 nonfarm, private industries.
⁶ Average hourly wages are drawn from the respective time periods under consideration, inflated to $1986 by PCE. Analysis based on estimates adapted from Costrell (1988). See text for explanation of estimates.

close to the less sophisticated estimates in Table 2. Table 3 also shows the distinctly different patterns of industrial shift before and after 1981: as the medians indicate, the distributions of expanding and contracting industries were far more similar prior to 1981 than after.²⁰

It is important to take some care in expressing these results. We cannot say that “new jobs” had this distribution of wages, while jobs lost had that distribution. The most we can say is that new jobs were created in industries which had this distribution of average wages, while jobs were lost in industries which had that distribution. Although this provides some information regarding the nature of new jobs and jobs lost (certainly more than the net distributions of Blustone and Harrison and Kosters and Ross), we would get more information with a finer definition of jobs. We might then find that the jobs gained in these industries pay significantly differently from the industry average.

Specifically, it is sometimes claimed that the new jobs are in higher-paying

after inflating to $1986 by the PCE. The analysis is no longer deflator-free, since the ordering of industries might differ slightly with a different deflator. Still, this sensitivity is of a wholly different type, and of a smaller order of magnitude than that which plagues the net distribution.

²⁰ The acceleration of industrial shift is also illustrated by this analysis. The ratio of estimated job loss in contracting industries to job gains in expanding industries rose from 2,124/12,389 = .17 over 1972–1981 to 2,787/8,224 = .34 over 1981–1986. This is also evident from the raw data, rising from 1,087/9,151 = .12 over 1973–1979 to 3,578/10,082 = .35 over 1979–1986. See Costrell (1988) for evidence based on shifting employment shares, controlling for the cycle.
occupations in these industries.\textsuperscript{21} Unlike the evidence on industrial shift, however, the evidence on occupational shift is mixed. CPS data show a shift toward higher-paying managerial and professional occupations (see Rosenthal, 1985 and McMahon and Tschetter, 1986). By contrast, a recent BLS study of the establishment data underlying the Employment Cost Index (Wood, 1988) indicates adverse occupational shift for production and nonsupervisory workers, controlling for industry. This disparity is consistent with Mellow and Sider's (1983) finding that discrepancies between matched responses of households and employers are particularly pronounced for occupation.

Nonetheless, further research in this area is most likely to proceed with CPS data. To date, Reiff (1987) has provided the only shift-share analysis of industry-occupation matrices, based on CPS data for selected years. He finds positive occupational shift slightly outweighing adverse industrial shift between 1978 and 1984. His study is limited to fairly aggregated industries (16, including agriculture and public administration) and occupations, however. The January 1983 change in occupational categories (see Green et al., 1983) has hampered more detailed research, but the BLS is developing a concordance.

Finally, research on industrial and occupational shift among specific demographic groups offers insights. At the three-digit level, Costrell (1988) finds that adverse industrial shift has been concentrated among males, while females have had a more mixed pattern. At the one-digit level, Levy (1988) finds that the decline of durables manufacturing employment has been most pronounced for young males without college education. This is consistent with the findings of Murphy and Welch (1988), that the age-earnings profile has tilted against such workers in recent years, a result they associate with the trade deficit. Wagman and Folbre (1988) suggest that occupational shift (at a highly aggregated level) has been favorable for females and unfavorable for males.

Conclusion

The analysis of "job quality" has advanced by examining changes in the earnings distributions over time, for various demographic groups. For example, there now appears to be agreement that there has been disproportionate growth in low-wage employment among full-time, year-round workers

\textsuperscript{21} It is also sometimes claimed that even if the new jobs are in occupations which do not currently offer higher pay, they may be jobs with steeper age-earnings profiles. It is unclear whether this argument is based on available data on existing occupations or whether it concerns new occupations, in which case the age-earnings profiles will only be revealed in the future.
(especially young males without college education) (see Bluestone and Harrison [1986, 1988]; Harrison and Bluestone [1988], and Kosters and Ross [1987a, 1988a,b]; and also Mishel’s [1988a,b] discussions of their results). Some of this growth represents new low-wage jobs, while some represents deteriorating real pay in old jobs. The problem with the net distribution is that it expresses both of these as a fraction of net new employment, so the numerator and the denominator do not match.

The analysis of new jobs can only proceed once jobs are defined independently of the wage, say by industry and/or occupation. This approach is not sensitive to deflators, and time series analysis minimizes the sensitivity to endpoints. Moreover, it can distinguish the distribution of industries and/or occupations where employment is growing from that where it is contracting. We have illustrated this approach with distributions based on industry, showing that job growth in the eighties has been concentrated in industries that generally pay less than the industries where jobs have been lost. This pattern, based on industry, appears to be quite robust. The pattern by industry and occupation together remains an open question.

References


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