Job Quality and Labor Market Segmentation in the 1980s: A New Perspective on the Effects of Employment Restructuring by Race and Gender

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ABSTRACT

Cluster analysis is used to produce a small number of job contours more homogeneous in job quality than standard occupation and industry groups. The results indicate a six-contour job structure that is consistent with dual and tripartite labor market segmentation frameworks. This classification scheme is used to examine the effects of employment restructuring in the 1980's by race and gender. We find a sharp redistribution of employment away from the middle (the high-wage blue-collar contour) towards the best jobs (the private independent primary contour) and the worst jobs (the contingent contour). At the same time, our indices of job quality suggest that the greatest declines in quality took place in the secondary (low-wage blue-collar and contingent) contours. These trends had strong adverse effects on the contours with the highest concentrations of black and Hispanic men.

It is widely accepted that changes in the mix, quality and location of jobs played a central role in the declining employment status of low-skilled workers in the 1980's. Recent empirical research has established that returns to skill increased considerably in this decade, contributing to a growth in earnings inequality (Levy and Murnane, 1992). But we know much more about the age, race, gender and education levels of the winners and losers than about the kinds of jobs they held. Earnings equations in these studies typically include controls for large industry and occupation group employment, but have offered little insight into which specific jobs grew and declined most in employment, which jobs increased and decreased most in quality, and what effects these developments had on the workforce, categorized by race, ethnicity and gender.

Similarly, studies that were explicitly concerned with documenting changes in the composition of "good" and "bad" jobs did not directly address these questions either, in part because the unit of analysis employed was not jobs per se but real individual earnings (Bluestone and Harrison, 1986; Kosters and Ross, 1987). By measuring changes in job quality by changes in real earnings levels, this approach places a premium on the way earnings are defined and measured. In his critique of this methodology, Costrell (1990:95,99) noted that it generates results that are "highly sensitive to such seemingly minor matters as the choice

of deflators" and that "with ideal data, we could identify expanding and contracting industry-occupation cells, and the average pay associated with them".

Another literature has considered the implications of changes in the job structure by focusing exclusively on the manufacturing sector. Because it has been common to associate this industry group with high-wage, low cognitive skill jobs, many analysts have tried to explain the decline in the economic status of black men in the 1970's and 1980's by reference to the loss of manufacturing employment in central cities (for a survey see Moss and Tilly, 1991). We know of no research, however, that actually attempts to establish the broad aggregate of "manufacturing" as the category of jobs most appropriate for explaining changes in the employment and earnings status of black men. In fact, the data clearly indicate that this sector is characterized by an extremely diverse set of jobs. Low-wage, unstable, "dead-end" production jobs are common in many manufacturing industries, particularly in those traditionally concentrated in the central city. Further, black men are not much more concentrated in this sector than are white men and the relative black wage is only slightly higher in this sector than it is for the economy as a whole (Holzer and Vroman, 1991:5; Bound and Holzer, 1991:13).

Rather than relying on individual earnings data and large heterogeneous industry groups like manufacturing for understanding the nature and implications of changes in the mix of "good" and "bad" jobs, why not use **jobs** as the unit of analysis? As Costrell suggests, we can define jobs as detailed occupation-industry cells. And as labor market segmentation theorists have contended, these jobs can be grouped on the basis of various indicators of job quality.

Indeed, one of the popular propositions of the 1980's was that good middle-class jobs were being replaced by high-wage, high-skill jobs or by low-wage (not necessarily low-skill) jobs. This conception of the structure of the labor market is strikingly similar to the tripartite segmentation scheme advanced by segmented labor market (SLM) theorists

in the 1970's (Doeringer and Piore, 1971; Piore, 1975; Harrison and Sum, 1979). Although this literature provided no theoretical justification for any particular segmentation scheme, the dominant view was that most jobs could be usefully categorized as either "independent primary," "subordinate primary," or "secondary" (Rosenberg, 1989). In recent studies, however, a dual framework (primary and secondary) has been more commonplace (Dickens and Lang, 1985; Bulow and Summers, 1986; Boston, 1990). Curiously, despite its focus on jobs, SLM empirical research has relied upon either industry, occupation or individual level data.

In this paper we develop a job classification scheme comprised of "contours" that are more homogeneous in job quality than are the standard occupation and industry groups. We use this segmentation scheme to examine the effects of employment restructuring in the 1980's on white, black and Hispanic men and women. We make no attempt to formally test for the distinctiveness of our job groups on mobility or wage determination grounds (see Dickens and Lang, 1985). Rather, our aim is limited to determining whether a small number of contours can describe the job structure, whether these contours are consistent with those described in the SLM literature, and whether the job structure we identify can provide a useful perspective on labor market restructuring in the 1980's. More specifically, our aim is to describe changes in number and quality of jobs in each contour and to consider the implications of these changes for black and Hispanic workers of each gender. This last objective is particularly important in light of the apparent reversal in the trend toward convergence in the black/white relative earnings in the 1980's (Juhn, Murphy, and Pierce, 1991; Bound and Freeman, 1992).

1. The Segmentation Literature

Job classification schemes have a long history in the literature on labor markets. Over a century ago, Cairnes observed that "What we find, in effect, is not a whole population competing indiscriminately for all occupations, but a series of industrial layers." He identified four non-competing groups in the English economy of the late 19th century: un-

skilled laborers, artisans, "producers and dealers of a higher order such as engineers and opticians," and "the learned professions and the higher branches of mercantile business" (Dunlop, 1988, p. 51). In the early post war period, Dunlop, Ross, Livernash, Kerr and others analyzed labor markets in terms of "wage contours," "orbits of coercive comparison," and "job clusters."

But since the 1960's, by far the most influential conception has been that of a "dual economy", which distinguished "core" from "peripheral" firms, and dual labor markets, in which "primary" jobs are distinguished from "secondary" jobs on the basis of earnings, working conditions, job advancement, work rules and employment stability. In the 1970's, dual labor markets were explained by reference to a "dual economy," consisting of "core" and "periphery" sectors that are differentiated by firm size, capital intensity, and the extent of monopoly rents (Bluestone, 1970; Harrison, 1972; Edwards, 1979). A more complex explanation for segmentation is found in the strand of the literature that develops from Doeringer and Piore's (1971) work on internal labor markets, which, in Rosenberg's (1989:367) words, locates the sources of segmentation in "the interactions between technology, training, product demand and social class". The microfoundations of segmentation were advanced in the 1980's by tying dual labor market theory to efficiency wage models, in which firms may be able to increase worker productivity by paying high wages: primary labor markets are those in which this high wage strategy prevails (Akerlof and Yellen, 1986; Bulow and Summers, 1986).

The "primary" labor market is often subdivided into upper and lower tiers, since, as Piore (1975:127) notes, "upper-tier work seems to offer much greater variety and room for individual creativity and initiative, and greater economic security." Piore suggested that this tripartite scheme of "independent primary," "subordinate primary" and "secondary" segments might need to be amended to distinguish both craft and routine white collar jobs. Gordon, Edwards and Reich (1982) emphasized employment relations as another key source of segmentation and identify con-

trol workers (supervisory jobs) and public sector jobs as distinct job segments. Unfortunately, theory has provided little guidance for empirical implementation of the labor market segmentation hypothesis.

The most common approach, particularly when the unit of analysis is occupations, has been to begin with the researcher's judgment about how many and what kind of segments exist, and then to identify a set of rules to empirically implement the scheme, again based on the researcher's judgment (Osterman, 1975; Carnoy and Rumberger, 1980; Rosenberg, 1980; Reich, 1984). The arbitrariness of this approach has been sharply criticized (Cain, 1976; Dickens and Lang, 1985; 1991). Other studies, using industry level data, have employed factor or cluster analysis (Oster, 1979; Kaufman, Hodson and Fligstein, 1979), or constrain themselves to a dual framework with individual-level data (Dickens and Lang, 1985; Boston, 1990). Not surprisingly, this literature has not produced a single, widely accepted segmentation scheme. Nor has there been any attempt to decompose the dual scheme into smaller, more homogeneous groups (Rosenberg, 1989).

Our reading of the literature suggested several methodological requirements. First, the unit of analysis should be the job, which we define as a detailed occupation-industry cell. While the fundamental hypothesis of SLM theory is that **jobs** are segmented, virtually every empirical study has relied upon either occupation, industry, or individual level data. To capture substantial differences in work tasks and work settings, the use of detailed occupations seemed essential, and given the sizable effects of industry on earnings, benefits, skill requirements and working conditions, an industry dimension was also necessary.[1]

As noted above, previous occupation-based SLM studies simply assumed the segmentation structure (dual or tripartite) and then applied subjec-

1 If the data were available, firm size would be a third important dimension since its inclusion would have the effect of substantially reducing within-job variation of many of our variables. On the importance of firm size for labor market outcomes, see Brown, Hamilton and Medoff (1990).

tive decision rules to a single or a few skill indices to generate the precise composition of the segments. A second objective, therefore, is to employ a method that independently determines the structure on the basis of a series of job quality indicators that is as comprehensive as possible.

To achieve these objectives we use cluster analysis. This technique groups observations on the basis of their similarity on a variety of measures. The use of cluster analysis is not uncommon in the literature. Galbraith (1991) used the technique to group industries on the basis of patterns of wage growth and found that these patterns were linked to production technology and trade performance. Boston (1990) found support for a dual structure by applying cluster analysis to a single measure of skill derived from individual-level data. But he restricted the number of clusters to two and does not report the effect of changing the stopping rule to three or more clusters. Closer to our approach, Anderson, et. al. (1987) conducted a cluster analysis on jobs, defined as occupation-industry cells. They concluded that the clusters that were generated from these data "did not conform to the assertions of dual labor market theory" (p.588).[2]

2. The **Cluster Analysis**

A. Method and Data

The clustering was done with Ward's method, a hierarchical agglomerative procedure. "Hierarchical" implies that once two clusters are merged, they will remain together at higher levels of aggregation. "Agglomerative" indicates that the procedure sequentially merges similar

2 The Anderson study differs, however, in two important ways. First, it defines jobs with different, and much less detailed, industry and occupation categories (14 industries and 22 occupations). As a result, they do not distinguish between, for example, high wage operatives in petroleum refining plants and extremely low wage sewing machine operatives in apparel shops (two "nondurable" manufacturing industries), or between relatively low skilled roofers and much higher skilled electricians (two "craft worker" occupations). Another key difference is that their clustering is done on just 8 variables, none of which directly measure skill requirements or working conditions.

clusters. Ward's method is designed to minimize the variance within clusters, which is achieved by merging at each step the two clusters that will lead to the smallest increase in the within-cluster sum of squares, measured as the squared Euclidean distance between jobs and existing cluster means. To avoid scale effects, all the variables were standardized to have a mean of 0 and a variance of 1 and jobs were weighted by employment.

Occupation and industry detail were constrained by our data sources, the 1980 Census 1% Public Use Sample (PUMS) and various Current Population Survey (CPS) files (March and May). To ensure that we would capture key differences in job quality while keeping the jobs large enough to be statistically reliable, we settled on a scheme with 90 occupations and 19 industries - 1710 potential jobs. The industries were chosen by grouping detailed industries with similar noncompetitive wage premia, which are the wage differentials that remain after accounting for a variety of human capital controls.[3] Since this premium is an indicator of "industry quality" from the worker's point of view, grouping industries on this basis made it possible to capture the major industry effects with relatively few industry groups (19).

Most of our 1710 occupation-industry cells were not large enough to be included in the analysis.[4] The 621 jobs that met our size constraints covered 94 percent of total nonagricultural employment and ranged in size from 21,167 (elementary school teachers) to 58 (vehicle equipment mechanics in the textile, lumber, furniture, and printing industries) in our 1980 Census sample. Only 17 jobs had fewer than 100 workers, while 92 had at least 2,000.

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3 These were calculated by Katz and Summers (1988, Table 2). For example, we combined primary metals, machinery and transportation equipment (.169, .149 and .211) to form a high premium industry group, while apparel (-.153) and leather (- .134) were joined to form a low premium group.

4 We excluded jobs with fewer than 50 workers in the Census sample and those that did not exceed 50,000 (after weighting) in a consolidated sample of three CPS files. The CPS data were necessary to generate the health, pension, union and involuntary part-time variables.

We began with the premise that, as much as possible, the variables should reflect job rather than individual characteristics. We created variables to reflect five key dimensions of job quality: **1) earnings and benefits** (hourly wages, annual earnings, health and pension benefits); 2) **skill requirements** (general educational development, specific vocational preparation, "people" skills, and motor skills); 3) **working conditions** (physical demands, environmental conditions, and strength requirements); 4) **employment status** (unemployment, involuntary part-time employment, weeks and hours worked); and 5) **institutional setting** (public sector employment, union coverage). These variables are defined and referenced in Table 1.

Because the cluster analysis groups jobs on the basis of similarity among the variables, highly correlated measures will be weighted more heavily in the analysis. Median annual earnings and the median hourly wage are the most highly correlated variables (.98). While earnings is also highly correlated to health and pension benefits (.83 and .78), the skill measures show a much lower association with earnings: .51 for GED and .61 for SVP, .32 for PEOPLE, and -.11 for MS. Other highly correlated variables are GED and SVP (.87), health and pension benefits (.90), and strength and physical demands (.75).[5]

B. Cluster Results

According to Everitt (1980, p. 66), there is no generally accepted stopping rule for determining the appropriate number of clusters. The objective is interpretation and simplicity. A "good" result is one that produces a small number of easily interpreted clusters that account for a large portion of the variance in the data. Our results consistently showed that the 621 jobs can be reduced to a small number of fairly homogeneous groups that are consistent with the segmentation literature. As Figure 1 shows, the most detailed scheme consists of six contours,

5 Our measures of cognitive skills (GED) and training requirements (SVP) are highly correlated with years of schooling (EDUC), .888 and .659. EDUC was not included in the cluster analysis.

from which the more common tripartite and dual "segments" can be derived. Since our concern is with the effects of employment restructuring on different demographic groups, and the six contours differ sharply in race and gender composition, the remainder of this paper focuses on the six job contour structure.

But why not a seventh contour? Both the 5th and 6th clusters reduced the variation in the data (differences among the 621 jobs on the 17 job quality variables) by 5.1%. Moreover, these clusters distinguished a relatively large set of jobs that were consistent with groupings suggested by previous studies of the structure of labor markets (see below). But a 7th cluster adds just 3.6% to the explained variance, distinguishing a small set of jobs with particularly bad working conditions (primarily food service) from what we will call the "low-wage blue-collar" contour. While our six contours ranged in size from 11-21% of the workforce, a seventh would cover only about 7% of total employment. Separating a small number of food service workers from other low-wage blue-collar workers adds complexity (a seventh contour) but seemed to increase our understanding of the fundamental structure of jobs only marginally. It is also worth noting that this seventh cluster was very similar in race/gender composition to its "parent," the low-wage blue-collar contour.

A different list of variables would, of course, produce job contours that differ in composition. We would stress, however, that there is a certain arbitrariness underlying any classification scheme, as anyone who has carefully studied standard occupation and industry categories knows. Further, the key issue for us is that, taken separately, these two traditional classification schemes do not do a very good job of grouping workers by the quality of their jobs. As it turns out, the broad outlines of the job structure (six contours with similar characteristics) does not change and the job composition of the contours is only slightly altered if we omit a small number of variables. Indeed, we found that by excluding four highly correlated variables that could reasonably be assumed to be driving the results (hourly wages, annual earn-

ings, health benefits and fringe benefits), a stopping rule of six produced job contours with the same general characteristics as generated by the full set of 17 variables and in which the rankings of the contours on wages and annual earnings were identical.

Figure 1 shows that, stopping at two clusters, our job quality measures distinguish two large job groups, one with 436 jobs (two-thirds of the workforce) and another with 185 jobs. In the larger of the two, which we term "primary," mean annual earnings were just over $14,000 in 1979 dollars, compared to about $6,700 in the smaller, "secondary" segment. As expected, in the primary segment the share of workers covered by health and pension plans at work were far higher than in the secondary (73% and 42 5%; 59% and 28.9%). Our measures of cognitive skill requirements (GED, EDUC, and SVP) were also substantially higher in the primary segment, while unemployment and involuntary part-time employment were far greater in the secondary segment.

With a stopping rule of 3 clusters, the primary segment divides approximately in half, with 31% of total employment (179 jobs) in one and about 34% (257 jobs) in the other. We identify the former as "independent primary" (IP) and the latter as "subordinate primary" (SP) since the characteristics of these two job groups are consistent with those described in the early SLM literature. Motor skills (6.31 and 3.81), union coverage (30.8% and 20.1%), strength (2.22 and 1.76), physical demands (1.92 and .85), unemployment (4.29% and 1.97%) and involuntary part-time employment (1.73% and 1.26%) are all much higher in the SP than in the IP segment. While health coverage is similar, annual earnings are one-third higher ($16,500 and $12,200) and educational attainment is more than two full years greater in IP jobs. As would be expected given the characteristics of these job groups, two-fifths of all white male employment was located in the IP segment, while only about one-fifth of black and Hispanic men were employed there. At the other end of the job quality spectrum, just 28% of white men were employed in the secondary segment, but about half of all black and Hispanic men and half of all female workers were employed in secondary jobs.

Upon closer examination, we found that the subordinate primary (SP) segment consists of two very different kinds of jobs to which different demographic groups are attached. With a stopping rule of 4, the SP segment breaks into two fairly evenly sized job contours that we have identified, following Piore (1975:130) and Harrison and Sum (1979:689), as "routine white-collar" and "high-wage blue-collar." The former consists of typically female jobs, such as nurses, typists and bank tellers, while the latter is comprised primarily of traditionally male blue-collar jobs, such as heavy truck drivers and various production worker occupations in transportation, communication, public utilities, construction, and high wage manufacturing industries.

As Table 2 shows, while cognitive (GED, SVP and EDUC) and people skill requirements are far higher in the routine white-collar contour, these jobs paid annual earnings only 65% as high as the blue-collar contour. While 55% of the high-wage blue-collar contour were covered by union contracts, less than 11% of the routine white-collar workers were covered. Among the six job contours shown in this table, physical demands were highest in the former (3.43) and lowest in the latter (.61). About 24% of all employed men (5.1% of women) worked in the high-wage blue collar contour but only 8.3% (30.6% of women) worked in the lower wage, higher cognitive skill white-collar contour.

With a stopping rule of 5, the secondary segment divides into "low-wage blue-collar" and "contingent" contours. The former appear to be similar to the class of jobs that Osterman (1977) claims may "bridge" the primary and secondary labor markets.[6] Workers in these jobs include

6 Harrison and Sum (1979:691) summarize these as jobs that "pay relatively low wages and few, if any, fringe benefits, but they tend not to impose rigid industrial discipline on their (predominantly young) workers. They also offer significant on-the-job training through informal apprenticeships of young men to older, experienced craft and technical workers. These firms are often connected to the primary labor market through both formal subcontracting and informal personnel director information networks, which explains why they are able to facilitate inter-segment mobility for at least some young people." While Carnoy and Rumberger (1980) and Gordon, Edwards and Reich (1982) distinguish a "craft" segment, our results show craft jobs split between the routine white-collar contour (supervisors), the high-wage blue collar contour, and the low-wage blue-collar contour.

production workers in low wage manufacturing industries, low wage construction trades, and various manual service sector jobs. The contingent contour includes low-wage retail industry jobs, household workers, childcare workers, teachers aides, pre-K and kindergarten teachers, office clerks, building service and garage jobs. Table 2 indicates that while routine blue-collar jobs pay much less well on an annual basis than high-wage blue-collar jobs ($8,141 compared to $15,051), they pay almost twice as much as contingent jobs ($4,684). Hours worked explain a large part of this difference, but hourly wages are about 28% higher in this blue-collar contour ($4.79) than in the contingent jobs ($3.75). Routine blue-collar jobs are also much more likely to be covered by employer-provided health and pension plans, and almost one-third of the workers in these jobs were covered by a union contract, compared to under 12% of those employed in the contingent contour. It is also worth noting that contingent contour workers had higher average schooling levels than either of the two higher paying blue-collar job contours. About 70% of contingent jobs were held by women in 1979.

Finally, a stopping rule of 6 breaks the independent primary (IP) segment into a group of jobs (132) that are almost exclusively located in the private sector - only 5% are public sector employees - and another (47 jobs) in which 83.5% of the workers are employed in the public sector. Workers in the private ("IP-PVT") contour are more likely to be full-time than the public ("IP-PUB") contour (86.1% and 65.2%) but much less likely to be covered by a union contract (9.2% and 39%). Hourly earnings are about the same, but IP-PUB jobs are more likely to be covered by pension plans (75.9% and 57.5%) and tend to require much higher educational attainment (15.5 years compared to 13.8).

Perhaps the most striking differences between these two IP contours are demographic. Three-quarters of the workers in the IP-PVT job contour are men, compared to just over half in the public contour. For both men and women, black and white workers were about equally likely to be employed in the public contour, but in the IP-PVT contour white men and women were far more likely to be employed than their black or Hispanic

counterparts. For example, 28.5% of all white workers were in the IP-PVT contour, but only 11% of all black men.

Figures 2 and 3 summarize the demographic distribution among contours in 1979. While white men were most concentrated in the IP-PVT contour (28.5%), black and Hispanic men were most likely to be employed in the low-wage blue-collar contour (35.5% and 36.6%). White, black and Hispanic men had similar shares of employment in the other contours. Women are most heavily concentrated in the routine white-collar, the low-wage blue-collar, and the contingent contours, with white women most likely to be working in the former (32.2%), and black and Hispanic women most highly concentrated in the two secondary contours (51.4% and 54.8%).

How do these contours compare to standard large occupation and industry classifications? The purpose of the cluster analysis was to develop a classification scheme that groups detailed jobs into a small number of clusters that are as homogeneous as possible in job quality. While our 17 measures cover most dimensions of what is commonly understood to be the "quality" of a job, we have no composite measure of job quality with which to compare these classification schemes. Consequently, we examined three proxy measures: hourly earnings, full-time full-year earnings, and hours worked. It should be remembered that the cluster analysis would have produced much more within-group homogeneity on earnings and hours if we had included only these variables in the analysis.

The results of a decomposition of variance, presented in Table 3, shows the share of total variance in each classification scheme accounted for by within-group differences - the lower this percentage, the greater the homogeneity of the groups. Across a variety of measures, within-group differences were smaller (between group differences mattered more) than for similar numbers of occupation and industry classifications. While differences within the six contours accounted for 75.2% of the total log variance in hourly earnings, this figure was 81.4% and 91.0% for the six large occupation and industry groups. The Table also

shows that the contours were more homogeneous in hourly earnings than were the more detailed 13-occupation (79.6%) and 14-industry classifications (86.1). The same pattern is shown in columns 2 and 3: the six contours are substantially less heterogeneous in full-time full-year earnings and hours worked than the more detailed standard occupation and industry groups.

To provide a better sense of the kinds of jobs that characterize each contour, Table 4 lists the jobs in each with at least .5% of total employment. These 39 jobs include about one-third of the total employed workforce in our sample.

Finally, the results of our cluster analysis has implications for the common view that "good" low-skill jobs - those in our high-wage blue-collar contour - are typically manufacturing sector jobs. Although four of the five jobs listed under this contour in table 4 are in manufacturing, our results do not in fact lend much support to this view. In the bottom two rows of Table 2 we report both the manufacturing share of each contour's employment and the distribution of manufacturing workers among the six contours. These figures indicate that, even among production workers, there is considerable heterogeneity in job quality in this sector. About half'of the workers in the high-wage blue-collar job contour are **not** employed in manufacturing, and only about one-third of all manufacturing workers are employed here. Almost as many manufacturing workers are employed in the low-wage contour as in the high-wage contour, and over half (52%) of production workers in manufacturing are located in the two secondary job contours. These figures indicate that it is difficult to generalize about the quality of production worker jobs in this sector. At least from the point of view of job quality, manufacturing includes an extremely diverse set of industries.

3. Employment Restructuring, 1979-88

A. Employment Shifts

Figure 4 shows the distribution of employment among job contours in 1979, 1983 and 1988. We included 1983 to determine whether the shifts

that occurred did so primarily during the first half of the decade, during which the economy underwent two back-to-back recessions (1980-82), or during the expansionary last half of the decade. In the first half of the decade a substantial decline (2.2 points) took place in the high wage blue-collar job contour. But more than offsetting this decline was the dramatic increase (3.5 points) in the contingent contour's share of total employment. Good blue-collar jobs continued to decline after 1983, but the most significant shift in the post-1983 period was the increase (2.7 points) in the share of the IP-PVT contour after 1983. This graph clearly shows a "declining middle" for this 1979-88 decade. A substantial employment shift (-4.5 percentage points) took place away from the two subordinate primary job contours towards the private IP-PVT (+2.2 points) and contingent (+2.7 points) contours. The IP-PUB and low-wage blue-collar contours show only slight declines.

Who benefited from these shifts? Figures 5 and 6 shows the percentage point change in male and female employment distributions for each contour by race/ethnicity. The declines in the SP segment reflect two developments, 1) the shift away from the routine white-collar contour by women (particularly white women) and 2) declining employment in the high-wage blue-collar contour by all three male groups, particularly by black and Hispanic men. Figure 5 shows that white men redistributed themselves towards both ends of the job structure, while blacks and Hispanics shifted away from high-wage blue collar jobs downward to the low-wage blue-collar and contingent contours. Figure 6 shows that the three female groups increased their employment shares only at the very top, in the IP-PVT contour, and at the very bottom, in the contingent contour. White women showed the greatest increases at the top and Hispanic women increased most in the contingent contour.

Table 5 presents alternative ways of ranking these changes by demographic group. The first column shows that all 6 groups were relocated away from the subordinate primary contours. These shifts ranged from 2.3 points for black women to 6.2 points for Hispanic men. Columns 2 and 3 show that for white women, the decline in SP employment was com-

pensated almost entirely by an upward shift to the IP segment. About three-quarters of the 2.3 point decline in employment share for black women was accounted for by increasing IP segment employment, whereas the decline in SP employment for Hispanic women was made up about equally by movement upward to the IP segment and downward to the secondary segment. In contrast, virtually the entire shift away from the SP segment for black men was offset by their increasing concentration in the two secondary contours. But Hispanic men did even worse, with an 8.3 percentage point increase in the secondary segment that came from a 2.1 decline in the IP segment and a 6.2 loss in SP jobs. The last column of the table subtracts the change in secondary segment share from that of the IP segment, showing clearly that, from this perspective, white women benefitted the most and Hispanic men were hurt the most by employment shifts over this decade.

B. Job Qualitv Shifts

What happened to the relative quality of the jobs in each of the six contours? We address this question by examining changes in average hourly earnings and annual earnings, health benefits coverage, union density, and involuntary part-time employment for each job contour over this decade.

Figure 7 shows that the increase in hourly earnings and annual earnings between 1979 and 1988 was greatest in the primary contours (l-4) and least in the secondary contours (5-6). Thus, for both earnings measures, inequality among contours grew during this decade. Earnings growth performed less well than wage growth in the secondary contours - apparently as a result of the increase in the part-time share of secondary employment. Consistent with the common finding of a rise in the return to education in the 1980's, the higher cognitive skill information processing job contours (l-3) showed far higher earnings growth than did the lower cognitive skill contours (4-6). It should also be noted that since the CPI increased by about 60%, average real earnings in the top three clusters changed only slightly while the high-wage

blue-collar and the secondary contours saw considerable real declines, from 8 to 22 percent.

Figure 8 reports changes in health coverage across the contours. It is striking to note that the share of employees with health benefits has declined in every job contour, with the greatest absolute and percentage losses occurring in the two blue-collar contours (4 and 5), where over 60% of black and Hispanic men were employed in 1979. The smallest declines were in the two IP contours, where almost two-thirds of all white employees work.

Similarly, Figure 9 shows an across-the-board decline in union density, with by far the largest percentage declines in the two blue-collar contours. The high-wage blue-collar contour dropped by 16.3 percentage points (or about 30%), from 54.6% to 38.3%. An even larger percentage decline occurred in the low-wage blue-collar contour, in which only 17.7% of all workers were covered by union contracts in 1988.

Our last indicator of job quality change is the share of employees working part-time who would prefer to be working full-time. Figure 10 shows that between the late 1970's and 1989 there were small increases in the rate of involuntary part-time employment in the subordinate primary contours and enormous increases in the secondary contours - from 4.6% to 6.7% in low-wage blue-collar jobs and from 6.9 to 9.1% in contingent jobs. Again, these are the same job groups in which blacks and Hispanics became substantially more concentrated between 1979-88.

Despite this evidence of declining job quality in the subordinate primary and secondary contours (3-6) in the 1980's, Figure 11 shows that educational levels in these contours rose. These results suggest that in the contours in which black and Hispanic workers are most concentrated, the educational requirements of jobs increased as the earnings, benefits and union coverage declined. Further research is necessary to substantiate this (for example by looking at the education levels of entry level workers) and to determine whether declining availability of "good" jobs, declining quality in the low-skill contours, and rising educa-

tional requirements helps explain recent trends in labor force participation rates, particularly for black and Hispanic men.[7]

We can conclude, then, that the economic status of black and Hispanic men was undercut by both employment shifts and changes in in job quality in the 1980's. Of our six demographic groups, our job quality indices show that black and Hispanic men were hurt most by the redistribution of employment among job contours in the 1980's, in the sense that they were more concentrated in lower quality (secondary) contours in 1988 than in 1979. And compounding this negative effect, the quality of these secondary jobs declined in both absolute and relative terms. While employment shifts were not as detrimental to black and Hispanic women, their economic status was adversely affected by the declining relative quality of secondary jobs in the 1980's.

4. Concluding Remarks

This paper provides a new perspective on what happened on the demand side of the labor market in the 1980's by employing a simple six contour classification scheme that groups detailed jobs on the basis of a variety of job quality measures. Our results indicate that the job structure has become more bifurcated, as "middle-class" (subordinate primary) jobs have declined and employment has been redistributed to the upper and lower ends of the job quality spectrum. This decline was driven primarily by the disappearance of low-skill, high-wage blue collar jobs. These conclusions are consistent with studies that report rapid growth in low-wage service (contingent) jobs (Howell and Wolff, 1991; Mishel and Teixeira, 1991) and those that find that technical change has raised the demand for professional and technical (independent primary) jobs while lowering the demand for operatives, laborers, clerical and lower level managerial (subordinate primary) workers (Howell and Wolff, 1992).

One of the objectives of this study was to offer a "job-structure" perspective on the employment and earnings shifts that have taken place

7 Using the six-contour classification scheme described in this paper, Howell is examining this question in a cross-sectional study of 62 metropolitan areas and their central cities.

since 1979. In recent years there has been an increasing effort to explain the declining economic status of low skilled black men in the 1980's (Bound and Freeman, 1992). While it has been common to focus on the role of the manufacturing sector, our results suggest that at least part of the explanation may be found, first, in the decline of the high-wage blue-collar contour (in which about 50 percent of the employment is located in manufacturing), and second, in the increasing concentration of black men in secondary jobs - jobs that have declined substantially in quality but increased in educational requirements in the 1980's.

Similarly, while Bound and Freeman interpret as an "anomaly" evidence that, despite a rising demand for low skill service jobs where young men are disproportionately employed and a declining supply of black relative to white dropouts, both the relative earnings and employment rates of black male dropouts fell in this decade. Our results suggest, in contrast, that falling relative earnings and employment rates for black male dropouts is the **predictable** consequence of two trends that characterize this decade: declining opportunities for living wage (subordinate primary) jobs for unskilled minority males and sharp declines in the quality of secondary jobs.

Our results also shed light on why poverty rates remained high in the 1980s, despite an economic expansion in many ways comparable to the long period of growth in the 1960s. Blank (1991) finds that a lower responsiveness of earnings to the economic expansion of the 1980s by low-earnings households was responsible for the persistence of high poverty rates. She concluded that this failure of earnings to rise as it has in previous expansions was due to declining real wages, rather than to any lessening of labor market effort, but does not attempt to link specific structural changes to these wage trends for low earners. Our results suggest that the growth in the size of the secondary segment as well as the decline in the quality of its jobs were important factors in closing off earnings growth as a route out of poverty.

The evidence presented here - that middle-class, living-wage jobs are rapidly declining in number and share, and that secondary jobs are in-

creasing in number and declining in quality - suggests the need for **demand-side** labor market policies designed to increase the numbers of subordinate primary jobs as well as for more generous social programs designed to supplement the earnings of secondary jobs. Given the outcomes produced by competitive labor markets in the 1980's, we now need public policies that encourage the expansion of middle-class jobs requiring less than a college education, as well as a renewed commitment at the national level to provide essential health, pension, education, and childcare benefits to the increasing numbers of workers unable to purchase them.

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TABLE1
CLUSTER ANALYSIS VARIABLE DEFINITIONS

Earnings and Benefits

Wage: median hourly wage, 1979. Calculated by dividing wage and salary earnings by total hours worked (usual hours per week times weeks worked). 1980 Census, 1% PUMS.

Earnings: median total annual wage and salary earnings, 1979. 1980 Census 1% PUMS.

Health: percent included in employer-contributed group health plan, 1979-81. Current Population Survey, consolidated 1980, 1981 and 1982 March demographic files.

Pension: percent included in pension plan at work, 1979-81. Current Population Survey, consolidated 1980, 1981 and 1982 March demographic files.

Institutional Setting

Union: percent members of a labor union, 1978-80. Current Population Survey, consolidated May 1978, 1979, and 1980 files.

Public: percent employed in the public sector, 1979. 1980 Census, 1% PUMS.

Employment Status

Unemolovment: percent not currently employed who are looking for work, 1980. 1980 Census 1% PUMS.

Involuntarv Part-Time: percent working part-time who want full-time jobs, 1978-80. Current Population Survey, consolidated 1978, 1979 and 1980 March Demographic files.

Weeks: weeks worked, 1979. 1980 Census, 1% PUMS.

Hours: usual hours worked per week, 1979. 1980 Census, 1% PUMS.

Skill Requirements

GED: general educational development, 1966-74, a measure of reading, math and reasoning requirements on a scale of l-6. Dictionary of Occupational Titles, 1977 (See Appendix F of Miller et. al., 1980).

SVP: specific vocational preparation, 1966-74, a measure of the training time required to adequately perform job tasks. Dictionary of Occupational Titles, 1977 (see Appendix F of Miller et. al., 1980).

People: a measure of interactive skills that ranges from 0 (mentoring) to 8 (taking instructions), 1966-74. Dictionary of Occupational Titles, 1977 (see Appendix F of Miller et. al., 1980).

MS: motor skills, a factor analytic measure of manual dexterity that ranges from 0 to 10, 1966-74. Derived from Dictionary of Occupational Titles, 1977 (Appendix F of Miller et. al., 1980).

Working Conditions

Phvs: physical demands, a factor analytic measure of eye-hand coordination, climbing, stooping and on-the-job hazards that ranges from 0 to 10, 1966-74. Derived from the Dictionary of Occupational Titles, 1977 (Appendix F of Miller et. al., 1980).

Envir: undesirable environmental conditions, a factor analytic measure of coldness, wetness, and heat on the job that ranges from 0 to 10, 1966-74. Derived from the Dictionary of Occupational Titles, 1977 (Appendix F of Miller et. al., 1980).

Strength: a measure of the strength required on the job from the Dictionary of Occupational Titles (1977) that ranges from 1 (sedentary) to 5 (very heavy work), 1966-74. See Appendix F of Miller et.al., 1980.

TABLE 2
Summary Statistics for Six Job Contours, 1979

SEGMENT:	---IND PRIMARY--		----SUB PRIMARY---		-----SECONDARY---	
CONTOUR:	PRIVATE	PUBLIC	ROUTINE w-c	HIGH WAGE	LOW WAGE	CTG'T
	(1)	(2)	(3)	(4)	(5)	(6)
WAGE' ($)	8.13	7.92	5.24	7.44	4.79	3.75
EARNINGS'($)	17,394	15,070	9,716	15,051	8,141	4,684
HEALTH (%)	76.8	73.4	62.7	80.0	52.1	31.6
PENSION (%)	57.5	75.9	46.2	63.7	36.3	18.6
UNEMPL (%)	2.2	1.5	2.9	5.9	8.0	6.3
FULLTIME[2] (%)	86.1	65.2	68.3	80.2	58.8	36.7
INVOL PT (%)	1.0	1.7	1.5	2.0	4.6	6.9
UNION (%)	9.2	39.0	10.6	54.8	29.1	11.7
PUBLIC (%)	5.1	83.5	17.8	5.8	12.3	12.2
GED	4.41	4.74	3.91	3.18	2.78	3.17
EDUC[2]	13.79	15.53	12.80	11.36	10.90	11.70
SVP	6.69	6.39	5.47	4.72	4.10	3.69
PEOPLE	4.91	3.39	6.48	7.21	7.40	6.30
MOTOR	3.81	3.81	6.68	5.81	5.30	4.73
PHYS	.63	1.22	.61	3.43	2.94	1.24
ENV	.05	.12	.04	.29	.74	.10
STRENGTH	1.64	1.98	1.71	2.83	2.98	2.22
Mfg Share (%)	27.3	0	14.9	51.6	36.4	8.0
Mfg Distr (%)	21.7	0	10.9	32.3	30.4	4.7

[1] We used median wages and earnings by job in the cluster analysis. The figures in this table are the means of those medians.

[2] These variables were not included in the cluster analysis. Education is measured as the highest year attended. Full-time is the share of workers with at least 1750 hours of work in 1979.

Table 3:
Decomposition of the Variance of Earnings and Hours, 1988:
A Comparison of Contour, Occupation and Industry Classifications

	-----Within-Group Variance/Total Variance----- (Percent)		
		FTFY[1]	
	Hourly Earnings	Hourly Earnings	Annual Hours
Job Contours (6)	75.2	79.0	87.3
Occupations (6)	81.4	84.0	92.9
Occupations (13)	79.6	81.2	91.1
Industries (6)	91.0	94.3	95.9
Industries (14)	86.1	90.3	92.7

[1] FTFY includes all workers who worked more than 1750 hours in 1988 (the product of weeks worked and usual hours per week).

TABLE 4
Cluster Analysis Results: The Largest Jobs
in Each Job Contour

Occupation	Industry	Employment*	%TOTAL**
INDEPENDENT PRIMARY SEGMENT			
1. Private IP Contour			
Sales Reps	FIRE	8736	1.13
Managers NEC	Retail, E&D	8449	1.10
Supervisors,Sales	Retail, E&D	6834	.89
Sales Reps	Wholesale	6382	.83
Supervisors	Construction	4075	.53
Sales, Cars/Boats	Retail, E&D	4036	.52
2. Public IP Contour			
Teachers, Elem.	Welfare,Education	21167	2.75
Police,Fire	Public Admin	7790	1.01
Teachers, Sec.	Welfare,Education	7785	1.01
Teachers, Postsec	Welfare,Education	5820	.76
Postal Clerks, Mail Carriers	Transp.,Comm,Utilities	4807	.62
Teachers NEC, Lib's, Counselors	Welfare, Education	3827	.50
SUBORDINATE PRIMARY SEGMENT			
3. Routine White-Collar Contour			
Nurses, Phys.Ass'ts Diet'ns, Therapists	Med.Serv. & Hosp'ls	12307	1.60
Health Tech'ns	Med.Serv & Hosp'ls	7904	1.03
Typists	FIRE	4902	.64
Typists	Welfare, Education	4837	.63
Typists	Prof.Serv, Nonprofits	4590	.60
Bank Tellers	FIRE	4538	.59
Vehicle Eqt Mechs	Retail, E&D	3818	.50

4. High-Wage Blue-Collar Contour			
Heavy Truck Drivers	Transp., Commun. & Public Utilities	6500	.84
Precision Workers	Primary Metals, Mach'y & Trans. Eqt	5682	.74
Assemblers	Primary Metals,...	5678	.74
Machine Opers, spec.	Primary Metals,...	5136	.67
Machine Opers. misc.	Primary Metals,...	4170	.54
SECONDARY SEGMENT			
5 Low-Wage Blue-Collar Contour			
Misc. Health Serv	Med.Serv. & Hosp'ls	13995	1.82
Machine Opers, spec.	Textile, Lumber, Furn.,Printing,	8487	1.10
Helpers/Laborers	Construction	7389	.99
Cooks	Retail, E&D	7475	.97
Carpenters	Construction	6745	.88
Misc. Food Occs	Retail, E&D	6187	.80
Building Services	Welfare, Education	4759	.62
Painters, Plasters, Roofers	Construction	4559	.59
6. Contingent Contour			
Sales, Hardware	Retail, E&D	15676	2.03
Cashiers	Retail, E&D	13068	1.70
Waiters, Bartenders	Retail, E&D	12682	1.65
Machine Opers, spec.	Apparel, Leather	7542	.98
Material Handlers	Retail, E&D	5741	.75
Sales, Light Cons.	Retail, E&D	4480	.58
Household Workers	Pvt. HH, Pers. Services	3887	.50
Total			36.73%

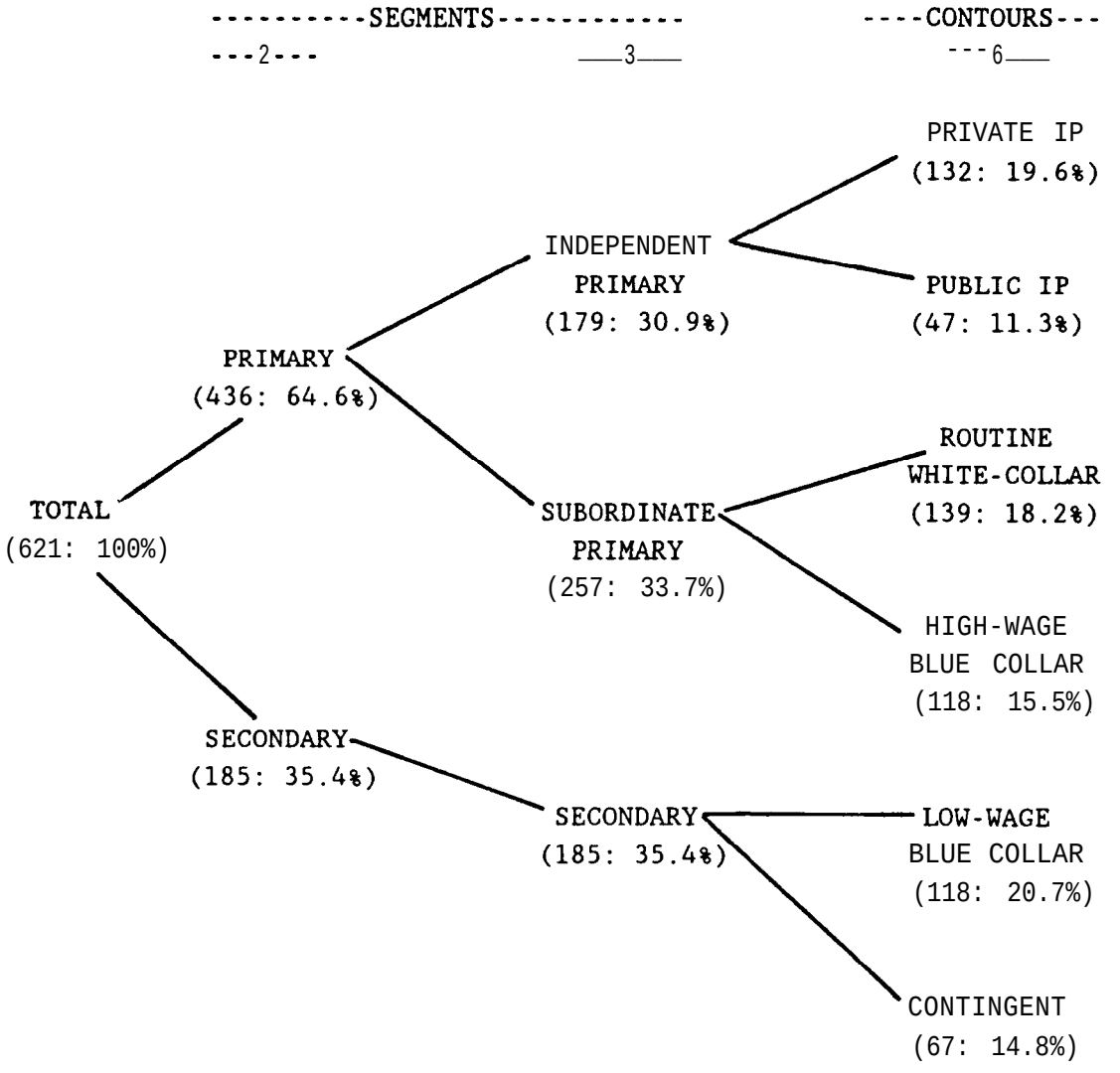
*Number of individuals in the 1980 Census 1% Public Use Sample for those 16 and over with work experience in 1979.

**Employment in the job as a percent of total nonagricultural employment.

Table 5
Percentage Point Changes in Segment Employment
by Demographic Group, 1979-88

	Subordinate Primary (1)	Independent Primary (2)	Second'y (3)	Difference (IP-SEC) (4)
White Female	-5.52	5.56	-.03	5.53
Black Female	-2.35	1.71	.62	1.09
Hispanic Female	-4.93	2.54	2.41	.14
White Men	-3.46	1.19	1.83	-.87
Black Men	-5.04	.60	4.43	-3.85
Hispanic Men	-6.22	-2.06	8.26	-10.32

FIGURE 1: CLUSTER RESULTS
(number of jobs and percent of
total employment in parentheses)*



R^2	.270	.369	.551

*Total 1979 employment in the 621 jobs (occupation-industry cells) that were included in the cluster analysis. These jobs include about 94% of total nonagricultural employment.

Figure 2: Distribution of Male Employment Among Job Contours By Race/Ethnicity, 1979

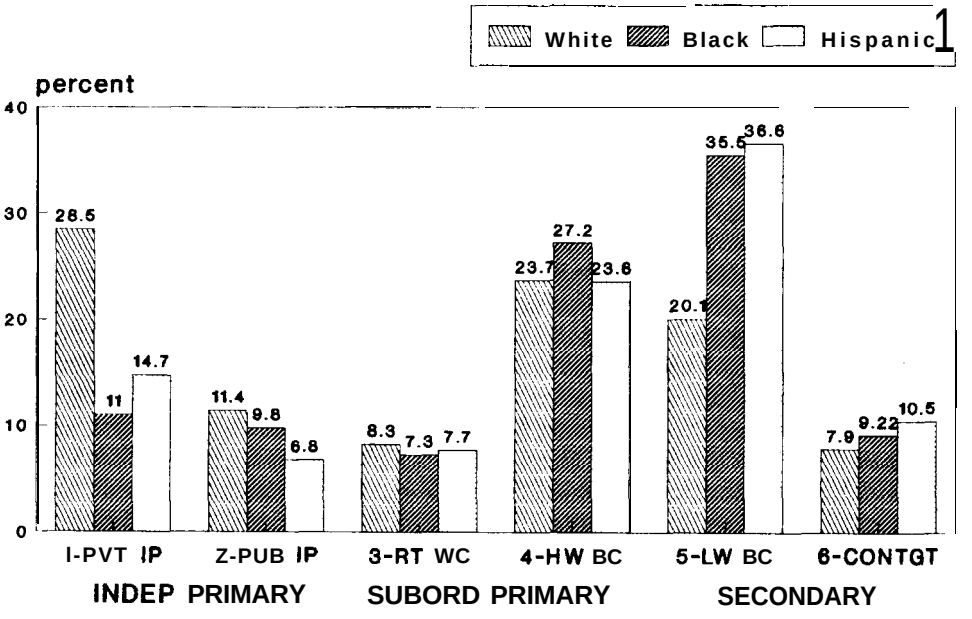


Figure 3: Distribution of Female Employment Among Job Contours By Race/Ethnicity, 1979

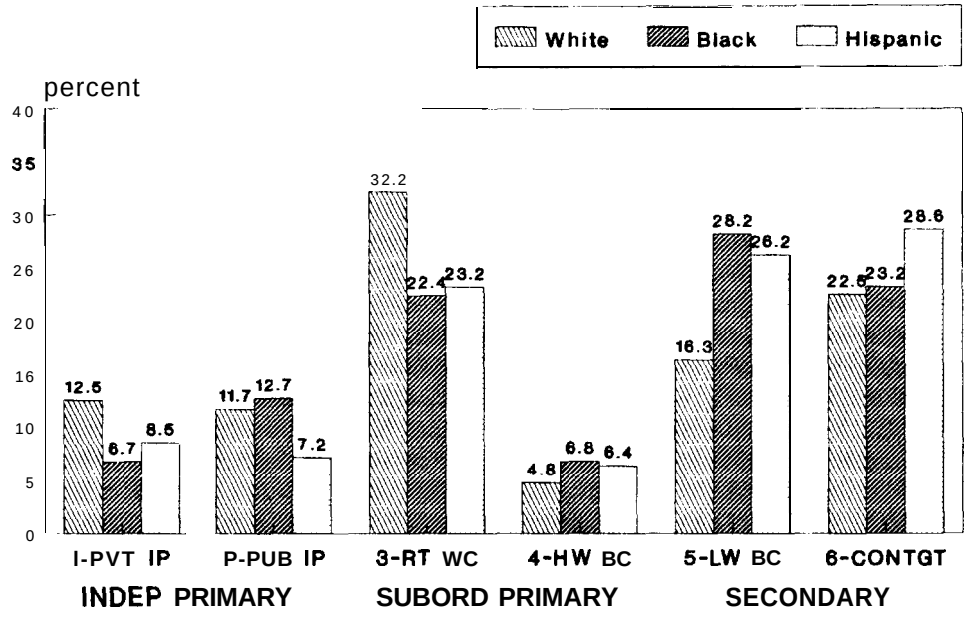


Figure 4: Distribution of Employment By Job Contour: 1979, 1983 and 1988

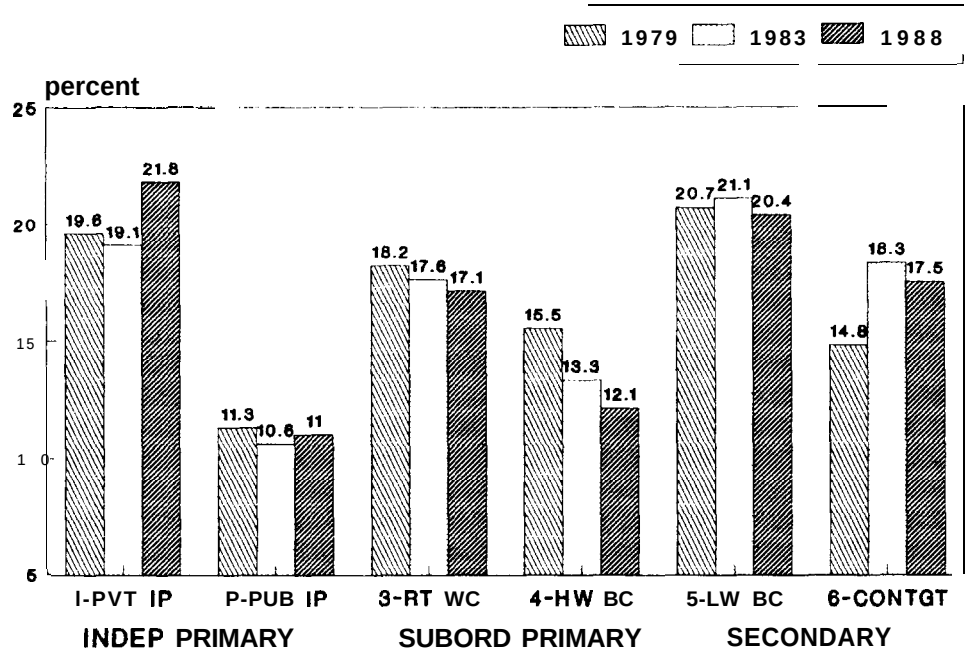


Figure 5: Change in the Distribution of Male Employment Among Job Contours By Race/Ethnicity, 1979-88

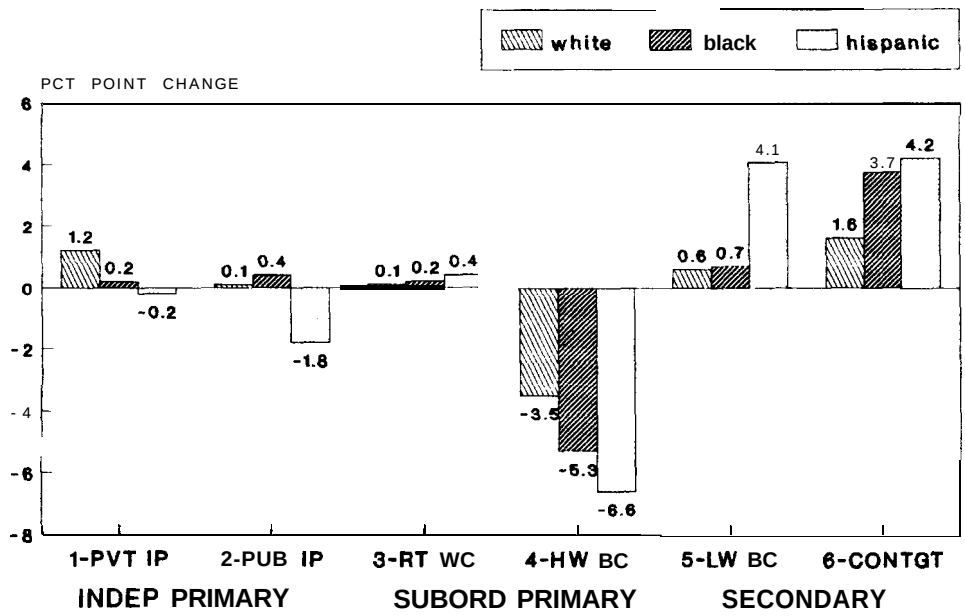


Figure 6: Change in the Distribution of Female Employment Among Job Contours By Race/Ethnicity, 1979-88

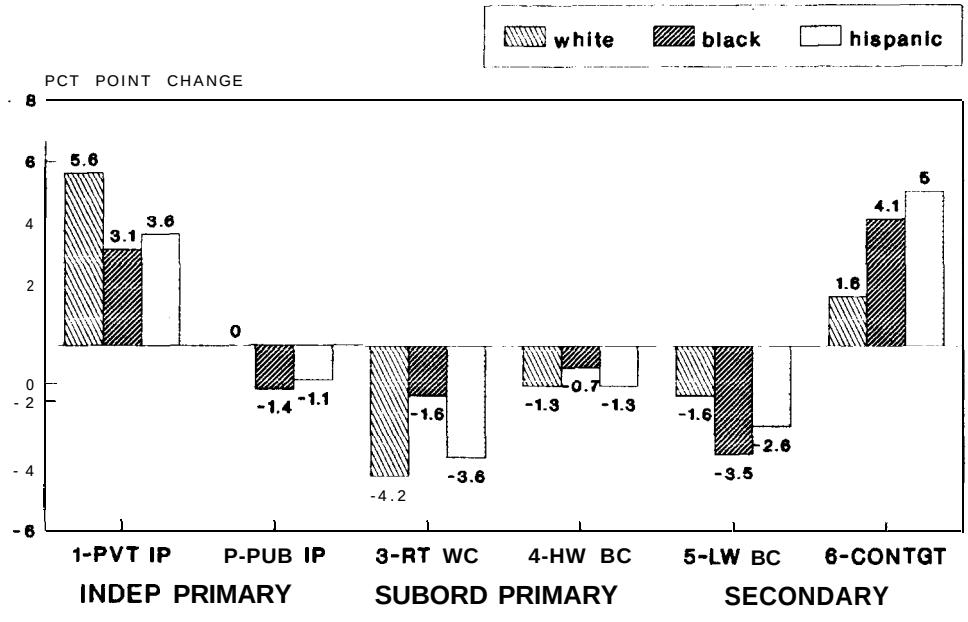


Figure 7: Ratio of 1988 to 1979 Mean Earnings by Job Contour

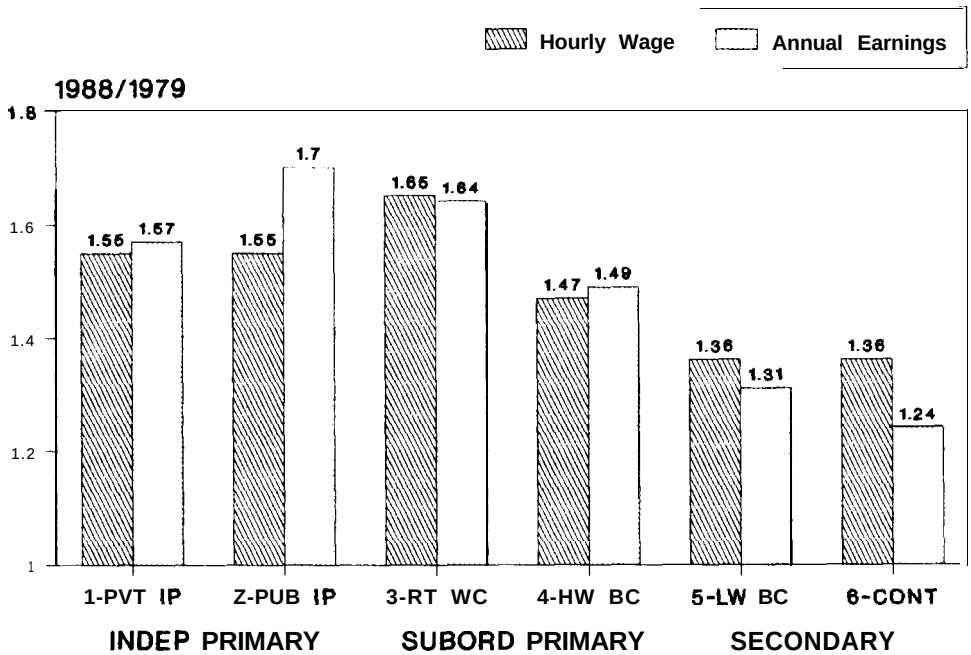


Figure 8: Workers Covered By Employer's Group Health Insurance by Job Contour, 1979-81 and 1988

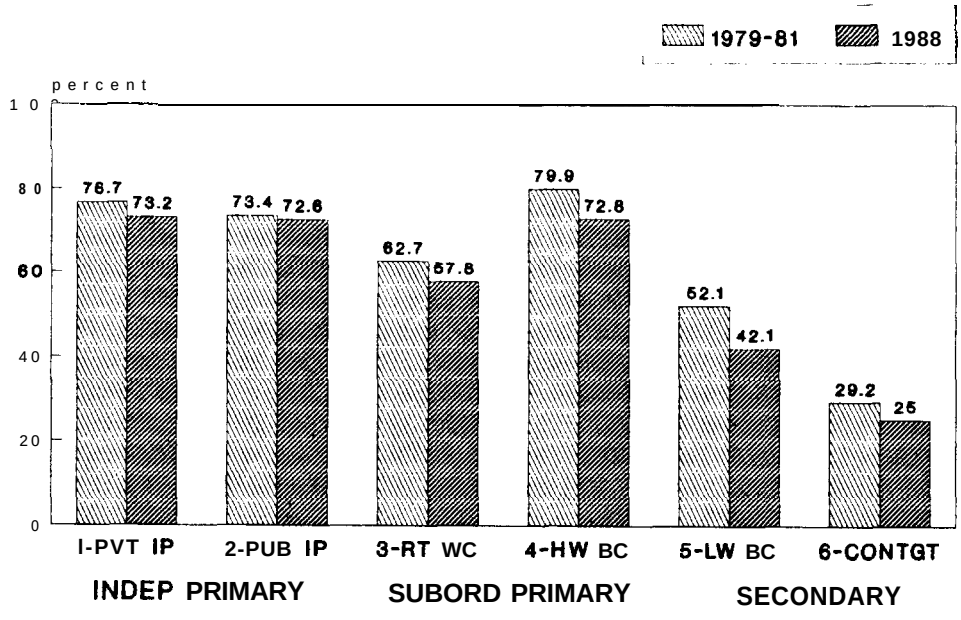


Figure 9: Union Density by Job Contour, 1978-80 and 1989

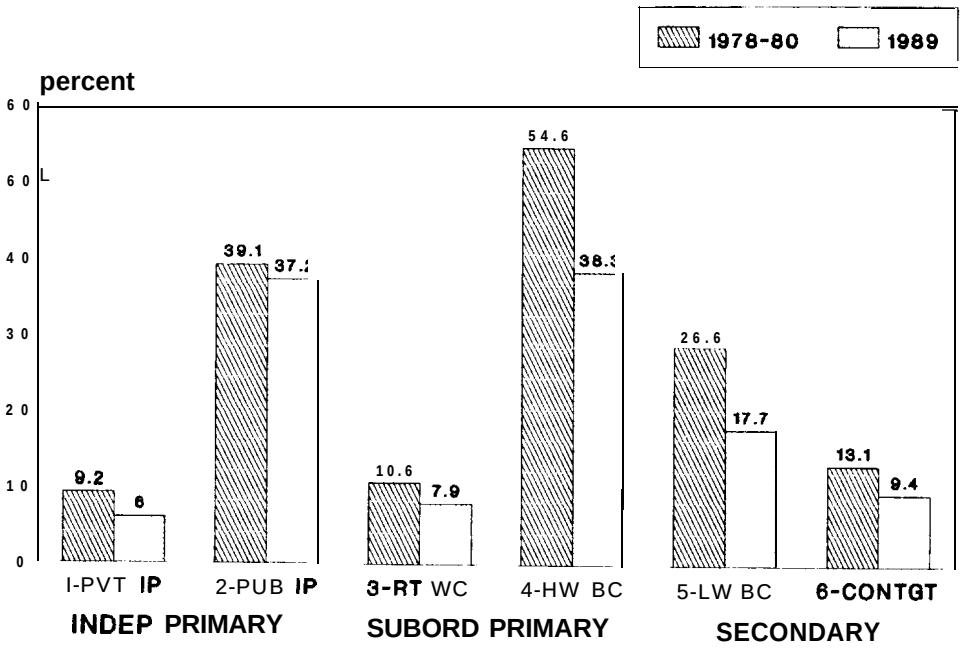


Figure IO: Percent Involuntary Part-Time by Job Contour, 1978-80 and 1989

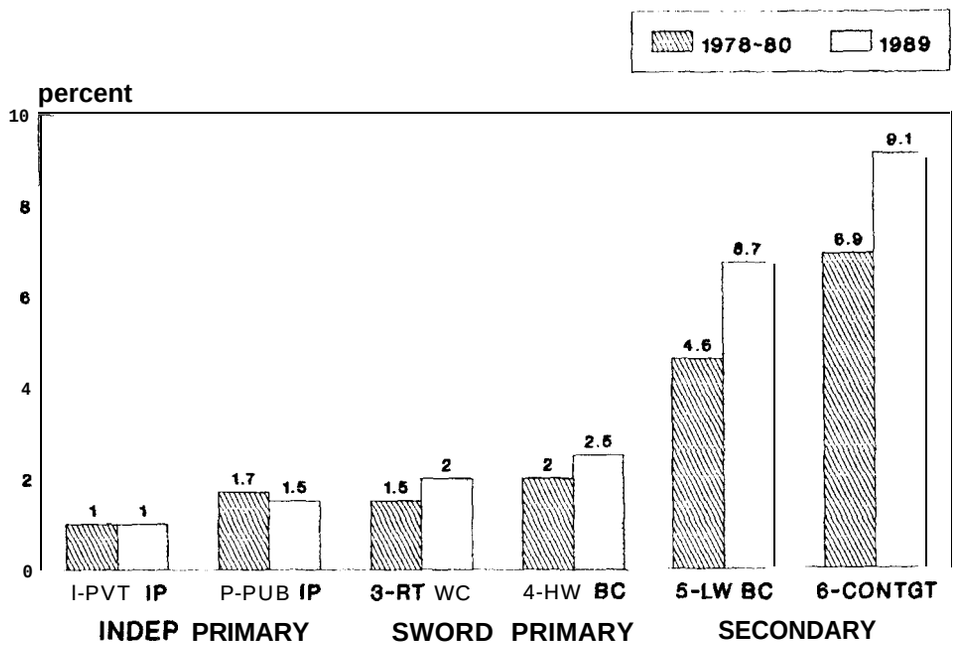


Figure 11: Mean Educational Attainment by Job Contour, 1980 and 1989