

Have Recent College Graduates Experienced Worsening Wage and Job Distributions?

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Abstract

This article examines whether recent college graduates have fared as well as their predecessors. We examine changes in both the wage and occupational distributions. Specifically, we explore the claim that college educated workers are increasingly likely to be in “non-college” occupations. The latter are defined using standard economic concepts rather than the subjective groupings of occupations used in previous studies. We show that changes in the wage distribution and changes in the proportion of college-educated workers in “non-college” jobs reflect continued improvements through the mid-1980s, but a deterioration in the late 1980s and early 1990s.

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Introduction

It is well known that college graduates fared well in the 1980s, both in absolute terms and relative to high school graduates.² Demand for college workers increased due to a number of fortuitous factors including technological change and an increase in international trade. This increase in demand was larger than the increase in supply, leading to an increase in the real wages of college workers. Meanwhile, the real wages of high school educated workers were declining, leading to a substantial increase in the college premium.

This paper asks whether these gains continued into the 1990s. In particular, we examine the claim that college educated workers were faring sufficiently poorly that an increasing proportion were taking “non-college” jobs. The possibility that college workers were being displaced into jobs formerly held by non-college workers has been largely ignored in the academic literature, though not in the popular press, for two reasons. First, classification of occupations as “college” or “non-college” jobs has reflected subjective judgments that have not always held up to closer scrutiny. Second, even if a rigorous definition could be agreed upon, it seemed unlikely that college workers were taking “non-college” jobs, since this would imply that they were taking jobs with declining real wages. This would seem to contradict the well-known increase in the mean wages of college graduates.

We take a fresh look at this issue by providing a rigorous definition of “non-college” jobs and examining recent data for young college graduates. Section 1 briefly describes the data we use in our analysis. In section 2, we examine recent changes both in the mean and dispersion of the wage distribution of recent college graduates to see whether the gains of the early 1980s

continued into the 1990s. Section 3 provides a definition of “non-college” jobs that is based on standard concepts in the inequality literature. In section 4, we use two different data sets to track changes in the proportion of college workers in “non-college” jobs and show how this series mirrors changes in the moments of the distribution of wages, during both the 1980s and 1990s. Section 5 provides a summary of our findings.

We conclude that, although young college graduates have continued to do well, on average, relative to high school graduates, mean real earnings of recent college graduates leveled off during the 1990s. At the same time, inequality among college workers has continued to increase. As a result of the leveling off of the mean and the continued increase in inequality, the probability that a college graduate was employed in a “non-college” job stopped decreasing and, in fact, started increasing in the 1990s.

1. Data

We make use of two different datasets: the Current Population Survey (CPS) and the Survey of Income and Program Participation (SIPP). Our CPS sample is taken from the 1983-1996 March Current Population Surveys, which provide earnings for 1982-1995. This allows us to examine the employment of college graduates in “non-college” jobs during a time when the college premium was rising. We start in 1982 in order to reduce the effects of changes in occupational classification.³

² For example, see Katz and Murphy (1992), Levy and Murnane (1992), and Gottschalk (1997).

³ Since 1964, the CPS has used five different occupation classification codes. Beginning with the 1983 interview, the CPS began to use the 1980 Census of Population Occupation Classification and switched to the 1990 Classification in the 1992 interview. The differences between these two classifications are relatively minor. Appendix N.7 of the Unicon documentation contains a list of the differences between the 1980 and 1990

Both males and females are included in our CPS sample if they are not students, are between the ages of 20 and 35 at the time of the interview, and have 12 to 17 years of education.⁴ The age restriction is imposed in order to focus on the early labor market experiences of college graduates. This education cut is imposed since we focus on the returns to college over high school.⁵ Individuals who are self-employed on their main job, report working zero weeks, or working more than 98 hours per week during the previous year are excluded. Our earnings measure is the real average weekly wage earned during the previous year, expressed in 1994 dollars (using the chain-weighted Personal Consumption Expenditures deflator, PCE).⁶

We also use the Surveys of Income and Program Participation to benchmark our CPS results. The first SIPP panel (1984 SIPP) began in mid-1983, while the most recent available panel began at the end of 1990 (1991 SIPP). Following the recommendations of Cain (1992), we merged these seven SIPP panels into one dataset.⁷ This provides a continuous period over which data has been collected, from June 1983 to August 1993.⁸

The SIPP sample is restricted to employed individuals ages 20 to 35 who are not students and who have a high school diploma, some college education, or a bachelor's degree.

Respondents are considered "employed" if they report working for someone other than

classifications. Also, see Appendix N.5 and Appendix N.6, respectively, for the complete 1980 and 1990 classifications.

⁴ Beginning with the 1992 interview, the CPS switched from reporting years of education to reporting educational attainment. For the latter part of our sample period, individuals are included if they hold a high school diploma or equivalent, have attended some college, or hold an associate's or bachelor's degree. For discussion of the change in educational coding see Jaeger (1997).

⁵ Jaeger (1997) concludes that a person with 17 years of education should be included as a college graduate (someone whose highest degree is a BA) since a large number of students are taking five years to obtain a BA.

⁶ We also performed our analysis using annual earnings; the results are qualitatively similar to those using average weekly earnings.

⁷ There is not a 1989 SIPP panel.

⁸ The SIPP uses the 1980 Occupation Classification for each of its panels, facilitating a comparison across panels and with the CPS.

themselves at any time during the month.⁹ Our earnings measure is the real hourly wage earned on an individual's primary job, expressed in 1994 dollars.¹⁰ If an individual reports being paid by the hour on the primary job, that reported hourly rate is used. Otherwise, average hourly wages are calculated using monthly earnings, weeks and hours worked on the primary job.

2. Changes in the Distribution of Wages of Recent College Graduates

Numerous studies have shown that the mean wages of college graduates rose during the 1980s, both in real terms and relative to the mean wages of workers with less education. For example, Katz and Murphy (1992, Table 1) show that real weekly wages of full-time workers with 16 or more years of education rose by 7.7 percent between 1979 and 1987. Furthermore, the increase in real wages was largest for the most recent college graduates, who experienced a 10.8 percent increase over the same period. On the other hand, high school graduates experienced a 4.0 percent decline in real wages, and the decline for high school dropouts was even larger (6.6 percent). As a result of these changes, the college premium increased substantially, especially for recent labor market entrants.

Did these increases persist into the 1990s? To answer this question, we use our CPS sample to examine changes in the distribution of weekly wages of recent college graduates.¹¹

Figure 1 shows the mean real wage of recent college graduates in the CPS. The dotted lines indicate the 95 percent confidence bounds. Consistent with Katz and Murphy (1992) and other

⁹ Self-employed individuals, then, are excluded only if they do not simultaneously work for someone else during the month in question.

¹⁰ The "primary job" (JOB-ID1 in the SIPP) is the (non- self-employment) job at which the respondent works the most during the month. The "secondary job" (JOB-ID2 in the SIPP) is the other (non- self-employment) job listed (if any).

studies, we show an increase in the mean real wages of college educated males through 1986. From 1986 to 1990, however, these males experienced a statistically significant decline in mean earnings. For college educated females, on the other hand, the increase in mean earnings continues through 1989. Both series, however, level off during the 1990s. This lack of growth during the late 1980s and early 1990s stands in sharp contrast to the substantial increases in our data for the 1982 to 1986 period and the large real growth found during earlier periods by Katz and Murphy (1992).¹²

While there was a break in trend for recent college graduates, the mean wages of recent male high school graduates continued to fall. This is shown in Figure 2. The modest decline between 1982 and 1987 accelerated after 1987, leading to weekly wages that were 13 percent lower in 1993 than in 1987. While there was a small increase between 1993 and 1994, this only partially offset the long and steep decline. For recent female high school graduates, the decline in earnings is smaller, but the peak to trough difference is still statistically different from zero.

Figure 3 shows the college premium for recent labor market entrants, measured by the college differential (the difference in earnings of a college graduate and a high school graduate) in a log weekly wage regression, estimated separately for each year.¹³ This figure shows that the college premium rose during the 1980s and into the early 1990s for both males and females.

Consistent with the unconditional means in Figures 1 and 2, the conditional earnings of college

¹¹ For this portion of our analysis, we restrict our attention to full-time, full-year workers, since this has been the practice in previous work. The CPS defines “full-time workers” as those who work 35+ hours per week; “full-year workers” are those who work 50+ weeks during the year. Similar results are also found using our SIPP sample.

¹² While the mean earnings of recent college graduates remained constant in the 1990s, average earnings of postgraduates increased slightly, and the mean earnings of those with less than a college degree declined. As a result, the average earnings of all full-time, full-year workers declined by 3 percent from 1989 to 1993, which is consistent with Abraham, Spletzer, and Stewart (1997, Figure 2).

¹³ Each regression includes dummy variables for “some college” and “college”, dummy variables for Hispanics and Blacks (non-Hispanic), and a quadratic in (potential) experience. Following Jaeger (1997), respondents with

graduates stopped growing in the early 1990s. Thus, the rise in the premium since the late 1980s reflects the decline in mean wages of recent high school graduates, and not an increase in the mean wages of college graduates. Therefore, while college graduates fared well both in absolute and relative terms during the early and mid-1980s, more recent gains exist only relative to the earnings of high school graduates.

It is also well known that inequality among almost all groups, including college graduates, increased during the 1980s. Did this growing within-group dispersion continue into the 1990s? Figure 4 examines this question by showing the percentage change between 1990 and 1995 in real wages of college graduates at different points in the college distribution. For example, male college graduates at the 10th percentile in 1995 earned 8.5 percent less than those at the 10th percentile in 1990. On the other hand, males at the 90th percentile earned 4 percent more in 1995 than those in 1990. In general, the lower the percentile rank, the larger the decrease in real earnings. Similar patterns exist for recent female college graduates. While mean wages of college graduates stopped growing during the 1990s, there was a continued increase in the dispersion of wages, leading to real wage declines for those at the bottom of the college distribution. As we will show in section 4, these changes are consistent with changes in the proportion of college-educated workers in “non-college” jobs.

3. Changes in the Proportion of Recent College Graduates in Non-College Jobs

Changes in the moments of the wage distribution of persons classified by educational attainment are common in the inequality literature. Much less attention has been paid to another branch of the inequality literature that focuses on changes in the occupational distribution of

“some college” education are those with 13-15 years of education in the 1983 to 1991 CPS and those with some college education (but not a BA) in the later CPS.

college graduates. In this literature, occupations are classified as “college” jobs or “non-college” jobs.¹⁴ Changes in the proportion of college graduates in “non-college” jobs are then used as an indicator of changes in the labor market prospects of college graduates. This literature suffers from two shortcomings, both of which we address in this section.

First, the literature on changes in the occupational distribution has not been explicitly linked to the literature on changes in the wage distribution. This largely reflects the fact that this literature uses concepts more common to sociologists than to economists. As a result, this research has not been integrated into the economics literature on changes in wage inequality. The second, and related, issue is that the classification schemes used to classify occupations into “college” and “non-college” jobs have been based on subjective judgments rather than on market signals. For example, Amirault (1990) and Hecker (1992) base their classifications on the respondent’s perception of the education requirement for each occupation. Rumberger (1981), Howell and Wolff (1991), and Mishel and Teixeira (1991) use skill requirements based on the Dictionary of Occupational Titles.

Our definition of a “non-college” occupation focuses explicitly on the premium an employer is willing to pay for a college-educated worker. College jobs are defined as those occupations where employers are either unwilling to hire non-college workers (for example, in hiring physicians), or where non-college workers are also hired but where college workers are paid a premium. An occupation with a large college premium signals that college workers have skills that are valued by employers in that occupation.¹⁵ On the other hand, employers in some jobs hire both college educated workers and workers with less education, but do not offer a

¹⁴ For example, see Rumberger (1981), Amirault (1990), Howell and Wolff (1991), Hecker (1992), and Tyler, Murnane, and Levy (1995).

premium for college-educated labor (for example, in food service occupations). We classify these as non-college jobs.¹⁶

Our procedure is based on estimates of occupation-specific log wage regressions that yield estimates of occupation-specific college premiums. These college premiums are estimated in each year for each 3-digit occupation with a sufficient number of college and non-college workers. In order to obtain sufficiently large samples, we merge data for years $t-1$, t , and $t+1$ when estimating returns in t .¹⁷ For example, a college premium in a specific 3-digit occupation for 1983 uses data from 1982-1984.¹⁸

An occupation-specific college premium is estimated for all occupations with at least 50 college *and* 50 non-college workers.¹⁹ Occupations with less than 50 college or 50 non-college workers are pooled with other occupations at the next higher level of aggregation in the 1980 Census Classification. For example, “Financial managers” are included in their own occupation, while “Legislators”, “Chief executives & general administrators, public administration”, and “Administrators and officials, public administration” are pooled into the occupational category “Public Administration”. Appendix 1 provides a list of the occupations that were merged.

In order to avoid combining occupations, such as lawyers, that require a college degree with other occupations that include a mixture of college and non-college graduates, we classify

¹⁵ Without differences in productivity, there would be no wage differential, even if college and non-college workers had different preferences for the non-pecuniary aspects of these jobs.

¹⁶ Tyler, Murnane, and Levy (1995) observe that many occupations typically classified as non-college jobs in the previous literature actually pay a premium to college graduates.

¹⁷ In order to increase sample size, these premiums are not estimated separately for males and females, and our estimates are for all employed individuals, not just full-time, full-year workers. In addition to the independent variables noted earlier, each log earnings regression also includes dummy variables for years $t-1$ and $t+1$, a female dummy variable, and a dummy variable for full-time workers. All individuals without a BA are considered “non-college graduates”; no distinction between those with a HS diploma and those with “some college” is made.

¹⁸ As a result, we are able to estimate occupation-specific college premiums for each year from 1983 to 1994. We are not able to estimate college premiums for an occupation in 1982 and 1995 (the first and last year in our sample), since data for 1981 and 1996 are not part of our sample.

occupations with more than 90 percent college graduates as “college” jobs. These occupations (“Chemical Engineers”, “Health Diagnosing Occupations”, “Pharmacists”, “Teachers, elementary school”, “Teachers, secondary school”, “Teachers, special education”, “Lawyers”, and “Judges”) include 13 percent of college graduates.²⁰ This approach leaves us with 78 occupational categories for which a college premium can be estimated in at least one year.²¹ These represent 30 occupations at the 3-digit level, which include 33 percent of college graduates, and 48 aggregated categories that include the remaining 54 percent of college graduates.²²

“Non-college” jobs are defined as those with a sufficiently low college premium. We set the threshold at .10, which is a quarter as high as the lowest overall college premium in Katz and Murphy (1992, Figure 1). To test for robustness, we use different thresholds and find that the choice of threshold does not affect our results. We also calculate the probability that each occupation-specific college premium is less than 10 percent. This probability incorporates information on both the point estimate, as well as the precision of the estimate, of the college premium. College graduates are assigned the probability that the occupation in which they are employed offers a premium less than 10 percent, and the aggregate probability is given by the average of these probabilities.

Table 1 contains a listing of occupations, as well as the estimated college premium and probability that the occupation is a non-college job in 1983. Occupations are ranked by the estimated college premium. The first column, which displays our estimates of the college

¹⁹ We use the 1982-1984 CPS data to determine which occupations to aggregate. This aggregation is maintained in all other years so that the definitions of occupational cells do not change over time.

²⁰ In determining the proportion of workers within an occupation with at least a BA, postgraduates (and those with 18 years of education in the 1983-1991 CPS) are temporarily included in the sample. Once these calculations have been made, however, postgraduates are excluded from the remainder of the analysis.

²¹ If, in subsequent years, an occupation does not have at least 50 college and 50 non-college workers, a premium is not estimated for that occupation in that particular year.

²² Our level of aggregation is in all cases more detailed than the standard, 2-digit classification.

premium, shows that most occupations commonly viewed as “non-college” jobs do indeed offer low premiums to college graduates. For example, financial records processors, office clerks, bank tellers, and waiters and waitresses all have low premiums. Other occupations that might be classified as “non-college” in a subjective ranking, however, turn out to pay substantially more to college-educated workers than to workers without a college degree (for example, child care workers). Furthermore, our method allows us to classify occupations, such as purchasing agents, that cannot be readily classified using a subjective ranking.

While our definition of a college job has the conceptual advantage of being based on market signals (i.e., employers’ willingness to pay a premium for college-educated workers) rather than on subjective judgments, it puts strong requirements on the data. Ideally, we would like to estimate college premiums for narrowly-defined occupations. This would allow us to compare the wages of college and non-college workers in the same job (e.g., aerobics instructors). This is not always possible, either because 3-digit occupations are already aggregations or because we must further aggregate in order to obtain a sufficient sample size.²³

In order to see whether there is any systematic relationship between the level of aggregation and the estimated college premiums, we indicate occupations that we aggregated in Table 1 by an asterisk. Visual inspection suggests that aggregated occupations are not concentrated in any particular part of the distribution. The mean premium for 3-digit occupations is .22, while the mean for aggregated occupations is .24, and their variances are also similar (.010 versus .013). As an additional check on the effect of our aggregation of some 3-digit

²³ The 3-digit occupation classification system used by the Census already reflects different degrees of aggregation by occupation. For example, “Marketing Managers”, “Advertising Managers”, and “Public Relations Managers” are considered “Managers, marketing, advertising, and public relations” by the Census, while “Metallurgical Engineers” and “Mining Engineers” are treated as separate occupational categories.

occupations, we also replicate our analysis using only those occupations that did not require aggregation. This replication suggests that our results are not being driven by aggregation.

4. Change in the Proportion of College Workers in Non-College Occupations

Figure 5 displays kernel density estimates of recent college graduates by occupational college premium for 1983 and 1994 from the CPS. This figure illustrates two important points. First, college graduates are distributed across occupations that offer widely different premiums. For example, while the mean premium in 1994 is .33, about five percent of college graduates were in occupations offering a college premium of ten percent or less, while the top 10 percent had premiums above 45 percent. Furthermore, it is clear from Figure 5 that there is a greater concentration of college graduates in occupations offering relatively high premiums in 1994 than there was in 1983. Also, it is clear that in 1994 there are fewer college graduates employed in occupations that offer a premium less than 10 percent. This “shift to the right” of the density function is consistent with the increase in the college premium displayed in Figure 3.

While Figure 5 shows a decline between 1983 and 1994 in the proportion of college-educated workers in occupations with low premiums (i.e., non-college jobs), this does not necessarily imply a monotonic decline over the full period. Figure 6 shows the full time series on the probability that a college graduate is employed in an occupation with a premium less than 10 percent. Again, upper and lower bounds of a 95 percent confidence interval for the point estimates are represented by the dashed lines. The results show a U-shaped pattern in the likelihood that a college graduate is employed in a non-college job. The probability declined steadily throughout the 1980s, reaching a low in 1989. Since 1989, however, this probability has

risen. The prevalence of college graduates in non-college occupations significantly increased both during the recession of 1990 and 1991, and again from 1993 to 1994. The decline in the likelihood during the 1980s is larger than the rise in the 1990s, which explains the net decline in the probability that a college graduate is employed in a non-college job over the entire sample period, shown in Figure 5.

Figure 6 shows that the probability that a recent college graduate is employed in a non-college occupation declined sharply through the 1980s and then grew modestly during the early 1990s using our definition. It is possible, however, that previously used definitions would have led to the same conclusion. If so, our definition might be conceptually preferable but have little practical importance. To address this question, we calculate the probability that a college-educated worker was in a “non-college” job using the classification scheme adopted by Hecker (1992), the most widely cited study.²⁴ Figure 7 shows the series based on these two different definitions. Since the levels of the two series differ, we benchmark them both to 1.00 in 1983. The results are striking. While our series (the “College Premium Approach”) shows a substantial change in trend after 1988, Hecker’s definition (the “Hecker Approach”) shows little change over the full period.²⁵ Thus, while both definitions include such obvious occupations as waiters and waitresses as “non-college” jobs, they differ in important ways for less obvious occupations. We conclude that the choice of classification schemes is not immaterial to the debate.

²⁴ Hecker (1992) classifies “Executive, Administrative, and Managerial”, “Professional Specialty”, “Technicians”, “Sales Representatives”, and supervisors in blue-collar occupations as “college” jobs. All other occupations in “Sales”, “Administrative Support”, “Service”, “Farming, Forestry, and Fishing”, “Precision Production, Craft, and Repair”, and “Operators, Fabricators, and Laborers” are considered “high school” jobs.

²⁵ Our estimates using Hecker’s definition are consistent both qualitatively with Hecker (1992), who finds little change during the 1980s, and quantitatively with the estimates for recent college graduates in Tyler, Murnane, and Levy (1995).

Sensitivity of Results

Figures 8a and 8b demonstrate that the U-shaped pattern holds for full-time, full-year (FT/FY) workers and generalizes to both genders. While non-FT/FY workers consistently have a higher probability of working in a non-college job, Figure 8a indicates that the series for FT/FY workers also rises significantly during the early 1990s. While this probability reached a low of .036 in 1989, by 1994 it had risen back to .056. Figure 8b shows the times series on this probability for males and for females. Both genders experienced statistically significant declines during the 1980s, and the probability that female graduates were in non-college jobs was higher than it was for men. During the 1990s, however, this likelihood increased for both genders. Although the increase for women during the 1990s is not as smooth as it is for males, the trough to peak difference is statistically significant.

Figure 9 shows that our inclusion of job categories that are aggregations of 3-digit occupations is not what is driving our results. Even when we exclude these occupations from the analysis, we still find a sharp decrease between 1984 and 1988 in the probability that a college-educated worker was in a 3-digit non-college occupation.²⁶ The increase between 1988 and 1991 is again statistically significant, though the decline between 1991 and 1993 is more pronounced. The resulting change between 1988 and 1994, however, continues to be significant. Thus, our general conclusion of a sharp decline, followed by a modest increase, holds whether or not we include the aggregated occupations.

As we have noted, there are some occupations for which a college premium can only be estimated for a subset of the years because of insufficient sample size. It is possible, then, that changes in our estimate of the probability that college graduates work in non-college jobs are due

²⁶ College graduates in these occupations are dropped from the sample.

to changes in the *mix* of occupations for which college premiums are estimated. To explore this possibility, we restrict our analysis in Figure 10 to those occupations for which a college premium can be estimated in *every* year of our sample period. While the point estimates are slightly lower in each year, the overall trends remain the same: there was a steady decline during the 1980s in the proportion of college graduates in non-college jobs, followed by an increase during the early 1990.²⁷ This suggests that our results are robust to changes in the mix of occupations.

In order to assess the sensitivity of our results to the choice of dataset, we also replicate our analysis using the SIPP. We estimate a college premium for each occupation for each year from 1984 to 1992.^{28,29} The SIPP estimates of the probability that a college graduate is employed in a non-college job are plotted in Figure 11.³⁰ While the levels are uniformly higher in the SIPP than in the CPS, the trends in the SIPP are similar to those found in the CPS over the same time period. The probability that a college graduate worked in a non-college job fell significantly during the 1980s, reaching a low in 1990. This probability increased from 1990 to 1992, however, a rise that is significant at the .01 level. Since the latest year of available data in the SIPP is 1992, this dataset only includes a few years of rising probabilities. As with the CPS,

²⁷ We also examined whether this probability was changing due to a change in the number of occupations being classified as “non-college” jobs or to a change in the proportion of graduates working in the same set of non-college jobs. There are no discernible trends in the college premium for most occupations, and the occupations with significant trends are not driving our results. Our conclusion, therefore, is that changes in the probability are coming from changes in the proportion of graduates working in non-college jobs, and not from a change in the classification of occupations.

²⁸ In addition to the independent variables noted earlier, each log earnings regression also includes dummy variables for the month from which the observation is taken.

²⁹ Weights are used in the estimation to account for possible non-random attrition in the SIPP. See Fitzgerald, Gottschalk, and Moffitt (1998) for discussion of the use of weights in estimation. Since multiple observations for each individual introduce heteroscedasticity, we use robust (White) standard errors in the estimation of the probability values.

³⁰ Technically, the unit of observation in the SIPP dataset is a person-month. Implicitly, then, occupations are weighted by the number of person-months worked in a given year, rather than by the number of individuals in the occupation (CPS).

the declines during the 1980s are larger than the increases during the 1990s, so that the probability declined significantly over the entire period.

Finally, Figure 12 shows the trends for men and women in the SIPP. Like the CPS, female graduates had a higher likelihood of employment in non-college occupations than male graduates during the 1980s. The two series, however, are not significantly different during the 1990s. For male college graduates, the probability of employment in non-college jobs declined until 1987 and remained relatively steady until 1990. Since 1990, however, the increase in the likelihood is statistically significant. For women, there was a steady decline until 1990, and then a leveling off. Thus, while the SIPP does not cover a sufficiently long period during the 1990s to strongly confirm the recent increase in the probability that a college graduate is employed in a non-college job, the evidence of a decline during the 1980s and the beginning of an increase in the 1990s is consistent with our CPS data.

Reconciling Changes in the Occupational and Wage Distributions

In retrospect, there is no inconsistency between changes in the moments of the wage distribution and changes in the occupational distribution. Specifically, the U-shaped pattern in the proportion of college graduates in non-college jobs is consistent with the changes in the college premium and the changes in the distribution of wages of college-educated workers shown in Figures 1-4. During most of the 1980s, the mean of the college distribution was increasing sufficiently fast, both in absolute terms and relative to the mean of the high school distribution, to offset the rise in inequality among college workers. During this time period, the probability that college graduates were employed in non-college occupations fell steadily.

Beginning around 1989, however, the increase in inequality among college graduates was no longer offset by sufficiently large changes in the mean of the college wage distribution. As a result, an increasing proportion of college workers at the bottom of the college distribution found that their best options were in non-college occupations. The probability that a college worker was employed in a non-college occupation, therefore, began to rise.

5. Summary

Our results indicate that the average young college graduate still earned higher real wages in 1995 than in 1982. Disaggregation by year or by position in the wage distribution, however, gives a less optimistic picture. The growth in mean real wages that college graduates enjoyed in the early 1980s came to a halt in the 1990s, so that average earnings in 1995 were roughly at the same level as the average earnings in 1989. While the college premium continued to increase, this was driven by the deterioration of real earnings of high school graduates. Although the growth in average earnings slowed, inequality among college graduates continued to increase over the early 1990s. As a result, recent graduates at the bottom of the college wage distribution experienced real declines in wages.

These changes in the wage distribution were accompanied by changes in the probability that college graduates were employed in non-college occupations. While this likelihood steadily declined during the 1980s, there have been significant increases in the early 1990s. This U-shaped pattern mirrors the change in the wage distribution of college graduates. As the average earnings of college graduates grew, more and more college graduates moved out of non-college occupations. Beginning in 1989, increases in inequality were no longer offset by increases in

average earnings. As a result, an increasing proportion of graduates found that their best options were in non-college occupations.

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Figure 1
Mean Real Weekly Wages of
Young, Full-Time Full-Year College Graduates
1982-1995 -- March CPS

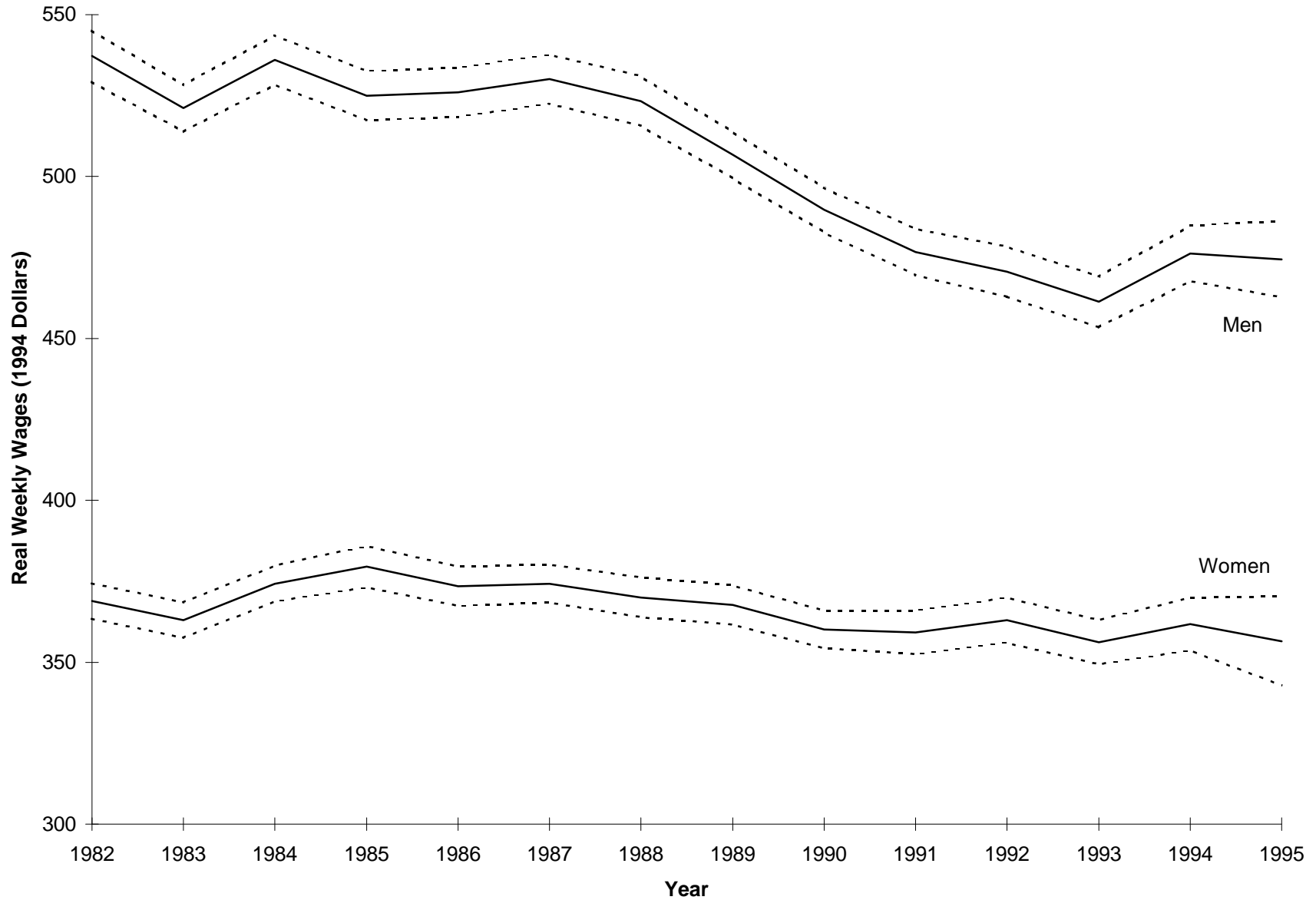


Source: Authors' tabulation of the March CPS.

Sample consists of individuals between the ages 20 and 35 who work 35+ hours per week and 50+ weeks during the year.

Upper and lower bounds of a 95 percent confidence interval are shown as dashed lines.

Figure 2
 Mean Real Weekly Wages of
 Young, Full-Time Full-Year High School Graduates
 1982-1995 -- March CPS

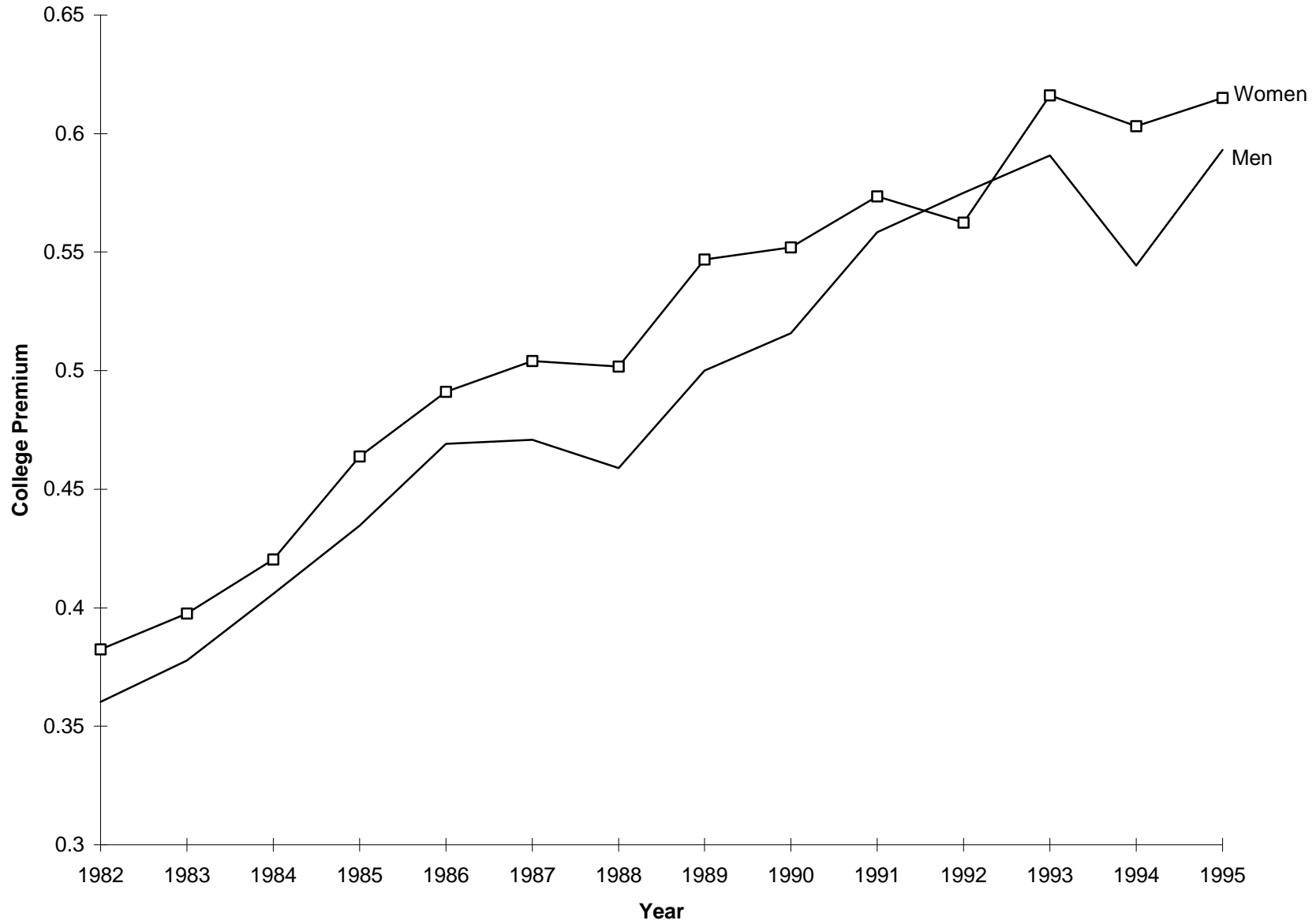


Source: Authors' tabulation of the March CPS.

Sample consists of individuals between the ages 20 and 35 who work 35+ hours per week and 50+ weeks during the year.

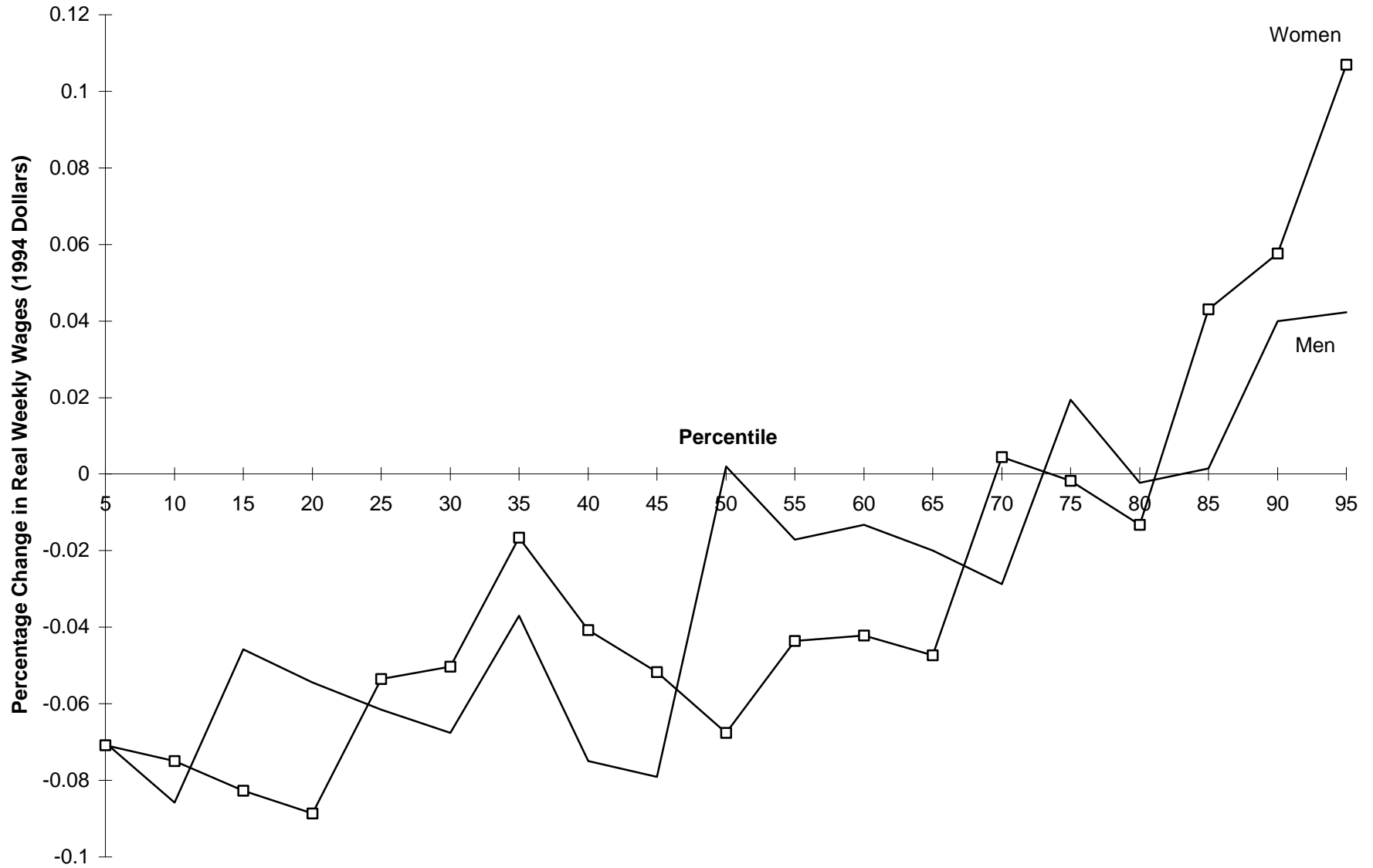
Upper and lower bounds of a 95 percent confidence interval are shown as dashed lines.

Figure 3
College Premium for
Young, Full-Time Full-Year Workers
1982-1995 -- March CPS



Source: Coefficient on college education in log earnings regression, estimated separately in each year from the March CPS. Sample consists of individuals between the ages 20 and 35 who work 35+ hours per week and 50+ weeks during the year.

Figure 4
 Percentage Change in Real Weekly Wages of
 Young, Full-Time Full-Year College Graduates by Percentile
 1990-1995 -- March CPS



Source: Authors' tabulation of the March CPS.

Sample consists of individuals between the ages 20 and 35 who work 35+ hours per week and 50+ weeks during the year.

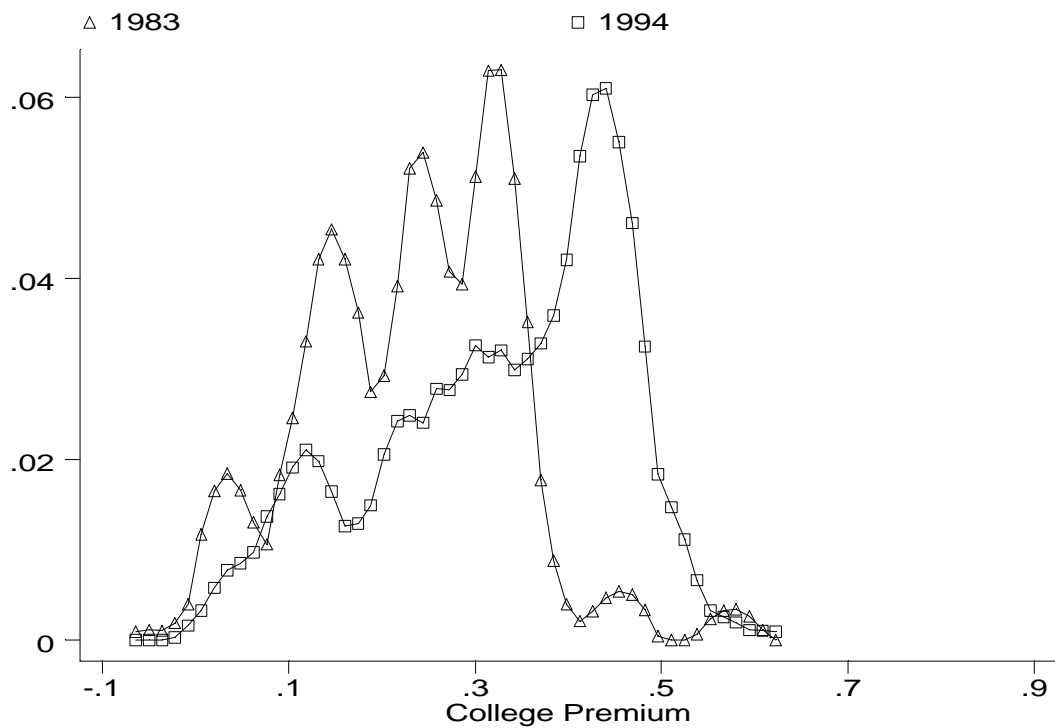
Table 1
Occupational College Premium and Probability That
An Occupation Is a Non-College Job
1983 -- March CPS

College Premium	Pr(Premium <= .10)	Occupation
-0.045	0.763	Farm Occupations*
0.014	0.957	Financial Records Processing Occupations*
0.031	0.752	Fabricators and Assemblers, Miscellaneous Production Occupations*
0.035	0.995	Registered Nurses
0.065	0.713	Food Preparation and Service Occupations, Excluding Waiters and Waitresses*
0.080	0.641	Bank Tellers
0.080	0.576	General Office Clerks
0.092	0.546	Technicians, n.e.c.*
0.101	0.495	Stenographers and Typists*
0.101	0.489	Engineering Technologists and Technicians*
0.109	0.459	Records Processing Occupations, Except Financial*
0.110	0.421	Waiters and Waitresses
0.114	0.461	Clergy and Religious Workers*
0.119	0.365	Administrative Support Occupations, n.e.c.*
0.123	0.384	Construction Trades*
0.126	0.326	Drafting Occupations, Surveying and Mapping Technicians*
0.127	0.325	Electrical and Electronic Engineers
0.137	0.304	Legal Assistants
0.143	0.095	Sales Workers, Retail and Personal Services; Sales Related Occupations*
0.145	0.262	Mechanics and Repairers, Vehicle and Industrial Machinery*
0.146	0.205	Information Clerks*
0.157	0.131	Miscellaneous Adjusters and Investigators*
0.158	0.016	Secretaries
0.158	0.098	Health Service Occupations*
0.158	0.246	Agricultural, Forestry, Fishing, and Hunting Occupations*
0.159	0.122	Transportation and Material Moving Occupations*
0.166	0.138	Extractive and Precision Production Occupations*
0.169	0.085	Machine Operators*
0.170	0.151	Mail and Message Distributing Occupations*
0.174	0.141	Cleaning and Building Service Occupations, Excluding Household*
0.177	0.081	Protective Service Occupations, Excluding Police and Detectives*
0.179	0.195	Science Technicians*
0.179	0.218	Clinical Laboratory Technologists and Technicians
0.189	0.052	Computer Equipment Operators*
0.190	0.169	Securities and Financial Services Sales Occupations
0.204	0.024	Other Mechanics and Repairers*
0.209	0.151	Editors and Reporters
0.211	0.063	Handlers and Laborers, n.e.c.*
0.214	0.119	Insurance Adjusters, Examiners, and Investigators
0.228	0.060	Freight, Stock, Material Handlers, and Service Station Occupations*
0.228	0.038	Writers, Artists, Entertainers, and Athletes*
0.229	0.012	Health Assessment and Treating Occupations, n.e.c.*
0.231	0.001	Police and Detectives*
0.231	0.001	Material Recording, Scheduling, and Distributing Clerks, n.e.c.*
0.232	0.036	Service Occupations, n.e.c.*
0.238	0.000	Computer Programmers
0.244	0.014	Designers
0.248	0.061	Education Administrators
0.248	0.000	Supervisors and Proprietors, Sales Occupations
0.252	0.001	Miscellaneous Management Related Occupations*
0.255	0.000	Accountants and Auditors
0.280	0.000	Purchasing Agents and Buyers*
0.280	0.008	Public Administration*
0.282	0.000	Computer Systems Analysts and Scientists
0.289	0.013	Personnel, Training, and Labor Relations Specialists
0.295	0.060	Teachers, Not Elsewhere Classified
0.303	0.000	Supervisors, Production Occupations
0.303	0.000	Sales Occupations, Advertising and Other Business Services*
0.304	0.006	Mathematical and Computer Scientists, n.e.c.*
0.305	0.001	Insurance Sales Occupations
0.306	0.000	Engineers, Not Elsewhere Classified*
0.307	0.000	Industrial Engineers
0.312	0.001	Inspectors and Compliance Officers
0.314	0.000	Health Technologists and Technicians*
0.321	0.000	Supervisors, Administrative Support Occupations*
0.325	0.000	Miscellaneous Managers and Administrators*
0.329	0.000	Financial Managers
0.332	0.000	Miscellaneous Financial Officers
0.340	0.000	Miscellaneous Professional Specialty Occupations*
0.341	0.011	Child Care Workers*
0.351	0.000	Sales Representatives, Commodities Except Retail*
0.362	0.000	Prekindergarten and Kindergarten Teachers
0.367	0.000	Managers, Marketing and Advertising
0.386	0.054	Real Estate Sales Occupations
0.403	0.004	Real Estate Managers
0.458	0.000	Social and Recreation Workers*
0.575	0.000	Postsecondary Teachers*

Source: Authors' tabulation of the March CPS.

An asterisk (*) indicates that an occupational category has been aggregated above an original 3-digit category.

Figure 5
Young College Graduates By Occupational College Premium – 1983 and 1994
Kernel Density Estimates – March CPS



Source: Authors' tabulation of the March CPS.

Figure 6
Probability That A Young College Graduate Is Employed In A Non-College Occupation
1983-1994 -- March CPS



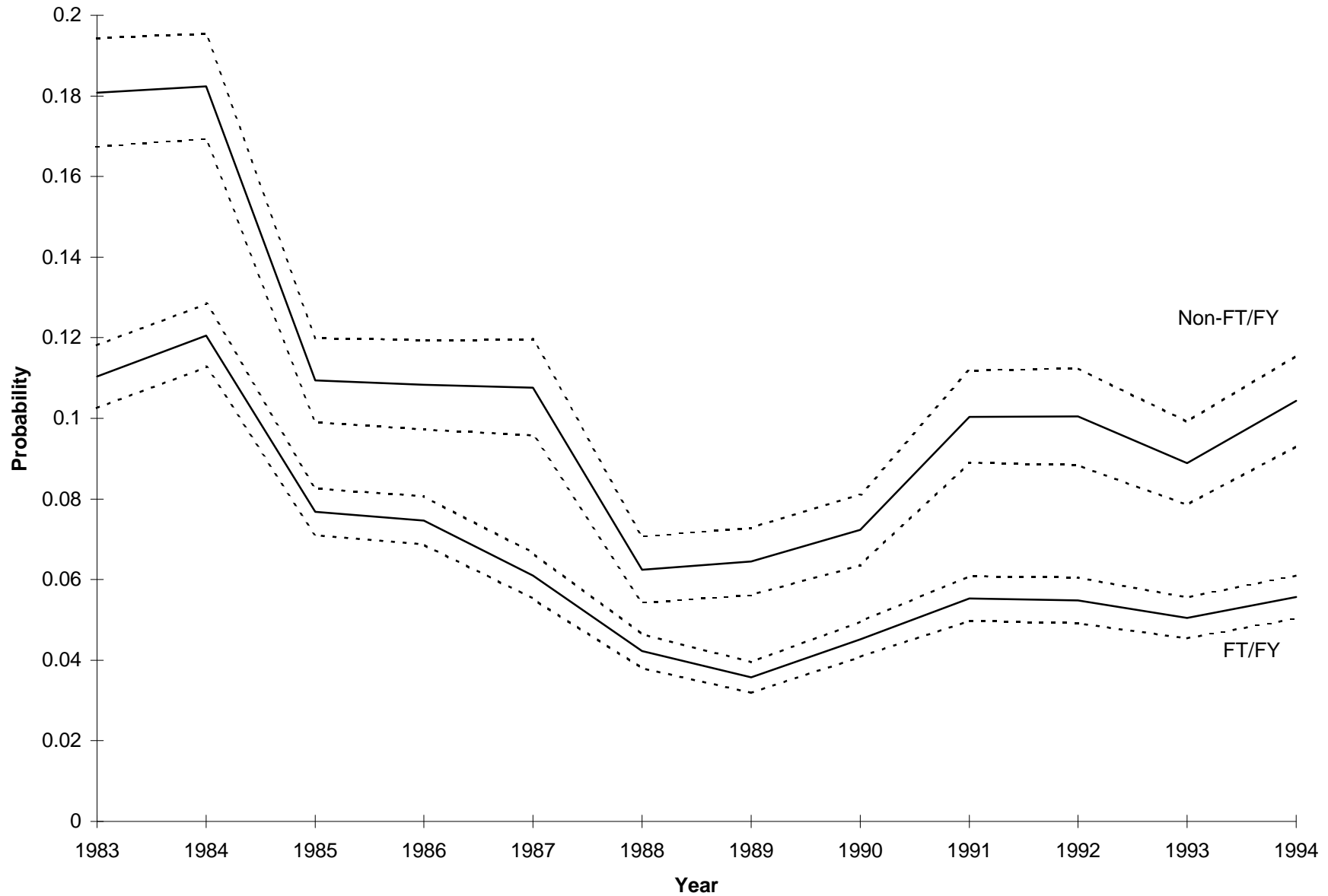
Source: Authors' tabulation of the March CPS.
Upper and lower bounds of a 95% confidence interval are shown as dashed lines.

Figure 7
Probability That A College Graduate Is Employed In A Non-College Occupation
Hecker Approach and College Premium Approach (1983 = 1.00)
1983-1994 -- March CPS



Source: Authors' tabulation of the March CPS.
The "Hecker Approach" classifies occupations according to Hecker (1992).
The "College Premium Approach" classifies occupations according to this paper.

Figure 8a
 Probability That A Young College Graduate Is Employed In A Non-College Occupation
 By Full-Time Full-Year Status
 1983-1994 -- March CPS



Source: Authors' tabulation of the March CPS.
 Upper and lower bounds of a 95% confidence interval are shown as dashed lines.

Figure 8b
 Probability That A Young College Graduate Is Employed In A Non-College Occupation By Gender
 1983-1994 -- March CPS



Source: Authors' tabulation of the March CPS.
 Upper and lower bounds of a 95% confidence interval are shown as dashed lines.

Figure 9
Probability That A College Graduate Is Employed In A Non-College Occupation
Restricted to Occupations That Retain Original 3-Digit Classification
1983-1994 -- March CPS



Source: Authors' tabulation of the March CPS.
Upper and lower bounds of a 95% confidence interval are shown as dashed lines.

Figure 10
Probability That A College Graduate Is Employed In A Non-College Occupation
Restricted to Occupations For Which A Return Is Estimated In Every Year
1983-1994 -- March CPS



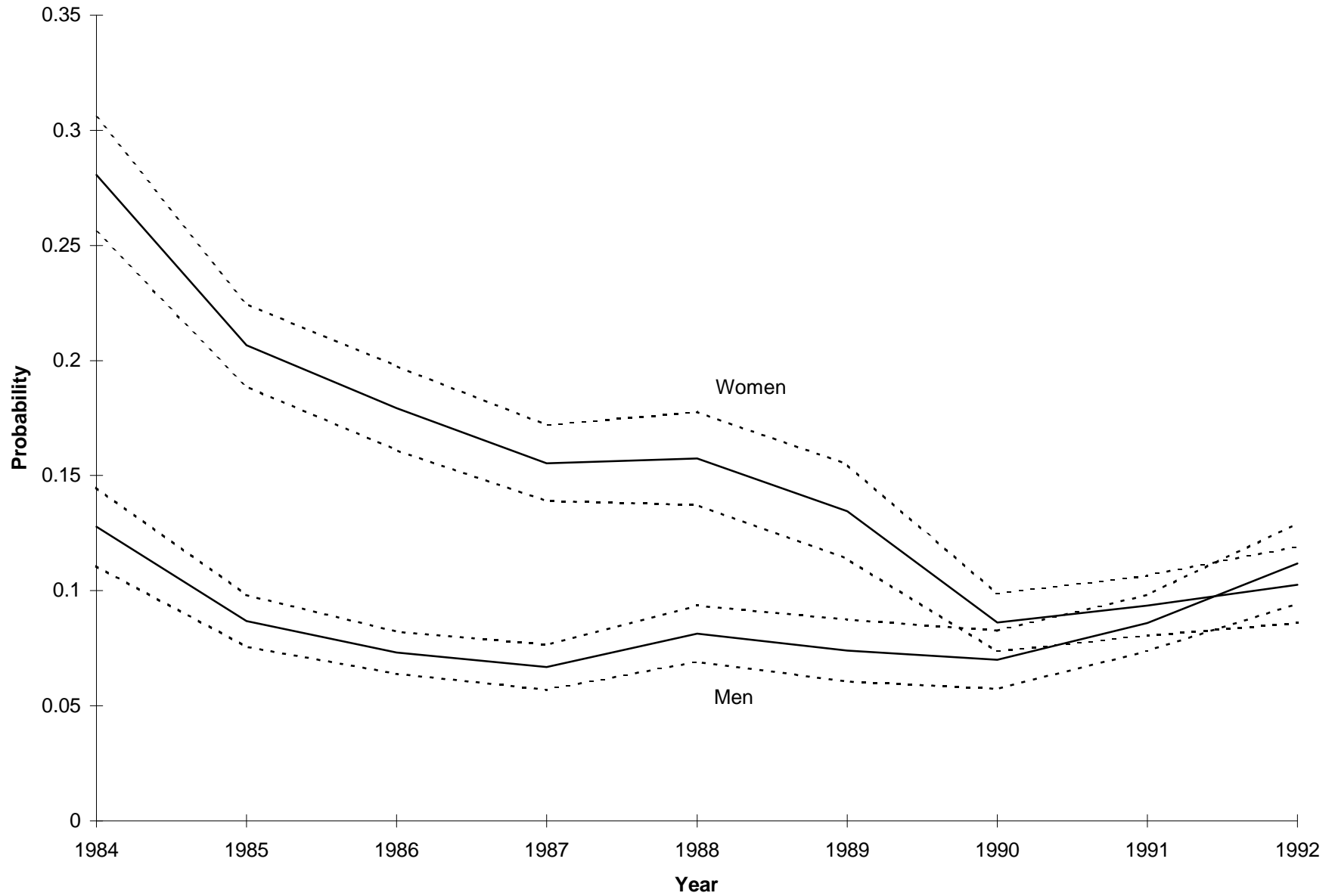
Source: Authors' tabulation of the March CPS.
Upper and lower bounds of a 95% confidence interval are shown as dashed lines.

Figure 11
Probability That A Young College Graduate Is Employed In A Non-College Occupation
1984-1992 -- SIPP



Source: Authors' tabulation of the 1984-1991 SIPP panels.
Upper and lower bounds of a 95% confidence interval are shown as dashed lines.
Robust (White) standard errors are used.

Figure 12
Probability That A Young College Graduate Is Employed In A Non-College Occupation By Gender
1984-1992 -- SIPP



Source: Authors' tabulation of the 1984-1991 SIPP panels.
Upper and lower bounds of a 95% confidence interval are shown as dashed lines.
Robust (White) standard errors are used.

Appendix 1

Correspondence Between Occupation Classification and 3-Digit Census Designation

The following list identifies the correspondence between the occupation classification we use and the 3-digit classification used in the 1980 Census. For the changes in code from the 1980 to 1990 Census, see Appendix N.7 of the Unicon CPS documentation.

<u>Occupation Category</u>	<u>1980 Census Code</u>
Public Administration	3-5
Financial Managers	7
Managers, Marketing and Advertising	13
Education Administrators	14
Real Estate Managers	16
Miscellaneous Managers and Administrators	6, 8-9, 15, 17-19
Accountants and Auditors	23
Miscellaneous Financial Officers	25
Personnel, Training, and Labor Relations Specialists	27
Purchasing Agents and Buyers	28-33
Inspectors and Compliance Officers	36
Miscellaneous Management Related Occupations	26, 34-35, 37
Miscellaneous Professional Specialty Occupations	43, 63, 69-83, 163-173
Engineers, Not Elsewhere Classified	44-47, 49-54, 57-59
Chemical Engineers	48
Electrical and Electronic Engineers	55
Industrial Engineers	56
Computer Systems Analysts and Scientists	64
Mathematical and Computer Scientists, n.e.c.	65-68
Health Diagnosing Occupations	84-89
Registered Nurses	95
Pharmacists	96
Health Assessment and Treating Occupations, n.e.c.	97-106
Postsecondary Teachers	113-154
Prekindergarten and Kindergarten Teachers	155
Elementary School Teachers	156
Secondary School Teachers	157
Special Education Teachers	158
Teachers, Not Elsewhere Classified	159
Social and Recreation Workers	174-175
Clergy and Religious Workers	176-177
Lawyers	178
Judges	179
Writers, Artists, Entertainers, and Athletes	183-184,186-194,197-199
Designers	185
Editors and Reporters	195
Clinical Laboratory Technologists and Technicians	203

Occupation Category (cont.)1980 Census Code

Health Technologists and Technicians	204-208
Engineering Technologists and Technicians	213-216
Drafting Occupations, Surveying and Mapping Technicians	217-218
Science Technicians	223-225
Technicians, n.e.c.	226-228, 233, 235
Computer Programmers	229
Legal Assistants	234
Supervisors and Proprietors, Sales Occupations	243
Insurance Sales Occupations	253
Real Estate Sales Occupations	254
Securities and Financial Services Sales Occupations	255
Sales Occupations, Advertising and Other Business Services	256-257
Sales Representatives, Commodities Except Retail	258-259
Sales Workers, Retail and Personal Services; Sales Related Occupations	263-285
Supervisors, Administrative Support Occupations	303-307
Computer Equipment Operators	308-309
Secretaries	313
Stenographers and Typists	314-315
Information Clerks	316-323
Records Processing Occupations, Except Financial	325-336
Financial Records Processing Occupations	337-344
Administrative Support Occupations, n.e.c.	345-353, 384-389
Mail and Message Distributing Occupations	354-357
Material Recording, Scheduling, and Distributing Clerks, n.e.c.	359-374
Insurance Adjusters, Examiners, and Investigators	375
Miscellaneous Adjusters and Investigators	376-378
General Office Clerks	379
Bank Tellers	383
Service Occupations, n.e.c.	403-405,407,456-467,469
Child Care Workers	406, 468
Protective Service Occupations, Excluding Police and Detectives	413-417, 425-427
Police and Detectives	418-424
Food Preparation and Service Occupations, Excluding Waiters and Waitresses	433-434, 436-444
Waiters and Waitresses	435
Health Service Occupations	445-447
Cleaning and Building Service Occupations, Excluding Household	448-455
Farm Occupations	473-484
Agricultural, Forestry, Fishing, and Hunting Occupations	485-499
Mechanics and Repairers, Vehicle and Industrial Machinery	503-519
Other Mechanics and Repairers	523-549
Construction Trades	553-599
Extractive and Precision Production Occupations	613-617, 634-699
Supervisors, Production Occupations	633
Machine Operators	703-779
Fabricators and Assemblers, Miscellaneous Production Occupations	783-799
Transportation and Material Moving Occupations	803-859
Handlers and Laborers, n.e.c.	863-874, 885-889
Freight, Stock, Material Handlers, and Service Station Occupations	875-885
Armed Forces	905