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# The Effects of Labor Composition on Hours Volatility: Evidence from the U.S.*

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**Abstract** For the past few decades, labor composition has changed drastically in the U.S. This paper examines how these changes help to explain the recent decline in aggregate hours fluctuations. I disaggregate workers by gender, education, marital status, and spousal characteristics among married workers, and quantify the impact of their changing shares on cyclical volatility of hours at both the extensive and intensive margins. The main result is that these labor composition changes explain little of the reduction in hours volatility along the extensive margin, yet they explain a significant fraction of the fluctuations at the intensive margin. Educational attainment is the single most important factor in aggregate hours fluctuations: it accounts for 1% and 14% of cyclical volatility of employment rate and average weekly hours, respectively. I also find that spousal education among married workers with a working spouse played an important role in the phenomenon.

**Keywords** labor composition, aggregate hours volatility, quantitative accounting.

**JEL Classification** E32, J11, J21

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## 1. INTRODUCTION

U.S. labor composition has changed drastically during the past few decades. It is well known that for the last forty years, female labor force participation has risen sharply while the average educational attainment of the workforce continued to increase. On top of that, there have been sizable changes in the employment shares by marital status and spousal characteristics within married workers. Since empirical evidence suggests that labor supply elasticity varies significantly across these worker groups,[1] these changes in labor composition may be an important factor in aggregate hours volatility.

To examine this possibility, this paper explores the role of labor composition in explaining changing aggregate hours volatility. A wide range of economists point out that cyclical volatility of U.S. aggregate hours after 1984 is significantly lower than that before 1984, a phenomenon that is a part of the "Great Moderation."[2] This study quantifies the contribution of changing shares of various demographic groups to the reduction in business cycle fluctuations of aggregate hours at both the extensive and intensive margins.

I begin by documenting recent changes in labor composition by gender, educational attainment, marital status, and spousal working status among married workers using the Current Population Survey (CPS) March Supplements 1964-2010. Examining the data more closely shows that cyclical volatility of employment rates and average weekly hours of the employed varies substantially across these disaggregated worker groups. I then compute two counterfactual series of aggregate employment rates and the average weekly hours of the employed with population and employment shares fixed at their pre 1984 levels. Comparing changes in aggregate hours volatility between pre and post 1984 implied by this counterfactual series to its actual counterpart provides a quantitative measure of the impact of labor composition changes on the reduction in aggregate hours volatility.

The main finding is that labor composition changes account for a reduction in cyclical volatility of aggregate hours at the extensive margin little, but explains a sizable fraction along the intensive margin. I also find that among various demographic characteristics, educational attainment is the single most important factor, accounting for 1% and 14% of fluctuations in the employment rate and average weekly hours, respectively. The changing population structure by marital status counteracted driving forces that reduce volatility of aggregate employ-

[1] For a survey of the literature on wage elasticity of labor supply, see Saez et al. (2012).

[2] The Great Moderation refers to a decline in business cycle fluctuations in the U.S. that started in the mid-1980s.

ment rate. Looking more closely, spousal characteristics of married workers, particularly working spouse's educational attainment, played an important role in the phenomenon.

This paper can relate to several lines of research. The first line of research is on trends in hours worked by various demographic characteristics. Beginning from Katz and Murphy (1992), increases in relative supply of more educated workers in the U.S. received much attention in the literature. Autor et al. (2005) extend the CPS data used in Katz and Murphy (1992) to 2003 and confirm that the same pattern holds until recently. Jones et al. (2003) examine rises in work hours of married women in the U.S. censuses and link the trends to gender gap and technological progress in home production. McGrattan and Rogerson (2007) describe changes in hours worked of married households by skill level using U.S. decennial censuses. Knowles (2013) addresses trends in hours spent on market work and non-market work by married men using the CPS data and time-use surveys. Aguiar and Hurst (2007) study how hours spent on market work and leisure have evolved for various demographic groups based on time-use surveys.

Another strand of research this paper is connected to is a literature on the "Great Moderation." Suggested explanations include improved monetary policies (e.g. Clarida et al. (2000)), improved inventory control methods (Ramey and Vine (2006)), and good luck (e.g. Stock and Watson (2003)), etc. Relative to these studies, my study focuses on the role of labor composition changes in the reduction in aggregate hours volatility.

This study is closer to Jaimovich and Siu (2009) in that both attempt to link demographic changes to macroeconomic volatility.[3] Jaimovich and Siu (2009) focus on age composition in the population as an important determinant of aggregate fluctuations, whereas my work considers labor composition changes in gender, education, marital status, and spousal characteristics within married workers to explain the recent decline in hours volatility. Another contribution of this study relative to Jaimovich and Siu (2009) is that I examine the contributions of demographic changes to aggregate hours fluctuations both at the extensive and intensive margins. I find that the demographic changes have very different quantitative effects on the hours volatility at the extensive margin, compared to the intensive margin. Gomme et al. (2005) also show that cyclical volatility of market hours may vary substantially across different demographic groups. This paper takes one step further from their study by examining evolving demograph-

[3] On the other hand, there are studies on changes in hours volatility within demographic groups. For instance, Castro and Coen-Pirani (2008) and Shim and Yang (2013) examine changes in hours volatility of different skill groups separately.

ics' contribution to the changes in aggregate hours volatility.

The remainder of this paper is organized as follows. Section 2 discusses data and empirical findings regarding the changes in U.S. labor composition. In section 3, I present cyclical volatility of hours worked by disaggregated worker groups, which is followed by main accounting results. Section 4 concludes the paper.

## 2. CHANGES IN LABOR COMPOSITION

This section begins by describing the dataset used for empirical analysis. It then presents empirical findings on U.S. labor composition changes.

### 2.1. DATA

In order to analyze changes in demographic composition of the U.S. labor force, I exploit data from the CPS. The CPS has advantages for the analysis over other surveys such as the Panel Study of Income Dynamics (PSID) and the Survey of Income and Program Participation (SIPP). The CPS is a representative sample of the current U.S. population, whereas the PSID represents the U.S. population in 1968. The Survey of Income and Program Participation (SIPP), although it is a nationally representative sample, has a much smaller sample size than the CPS.

Data are taken from the CPS March Supplements 1964-2010. The sample is restricted to individuals ages 25 to 64 who have non-missing information about gender, educational attainment, marital status and annual hours worked in the previous calendar year. Individuals ages less than 25 are dropped because it is difficult to collect information about their completed education levels. Among married workers, I further restrict the sample to those whose spousal characteristics, including their working status and educational attainment, are non-missing.

Using the data set, individual annual hours worked in the previous calendar year are calculated as a product of weeks worked in the past year and usual hours worked per week. Since usual hours worked per week have been only available since 1976, hours worked in the past week instead of usual hours worked per week are used to calculate annual hours worked for surveys prior to 1976. Average weekly hours are obtained by dividing annual hours worked by 52 weeks. Based on the annual hours worked in the previous year, I define those who worked positive hours as employed (or working) and those with zero hours as non-employed (non-working). Educational attainment of each individual in the sample falls into the following four categories: high-school dropout; high school

graduate; some college education; and college graduate. In classifying workers by marital status, the following three categories are exploited: married with spouse present, single (never married), and other. For married workers, information on their spousal characteristics is also collected. In the CPS, a 'pointer' variable is available to locate every married person's spouse within the household. With this pointer variable, each married person is linked to their spouse. Their spouses' working status (working /non-working) and educational attainment are used to disaggregate married workers further.

Using the resulting sample, I document the changes in labor composition. Since annual hours worked are for the previous calendar year, the data covers the period of 1963 through 2009, although the surveys are conducted from 1964 to 2010. All statistics are calculated using the March Supplement weights.

## 2.2. CHANGING LABOR COMPOSITION

This subsection outlines changes in U.S. labor composition by gender, educational attainment, marital status, and spousal characteristics among married workers. Table 1 presents the average population and employment shares of these demographic groups for both pre and post 1984 periods. The most notable change in population shares is by educational attainment. College graduates and high school dropouts form 15% and 34% of the U.S. population, respectively, before 1984. College graduates rose to 27% after 1984 while the portion of high school dropouts decreased to 14% over the same period. These changes are also reflected in similar changes in their employment shares.[4]

Gender composition in U.S. population changed little for the same period– male population share was 48% pre 1984 and 49% post 1984. However, employment shares of male and female workers have undergone notable changes because of increased labor participation rates of women. The share of female workers in total employment rose from 39% to 45% between pre and post 1984 while male share of employment dropped from 61% to 55%.

Changes in demographic composition by gender and marital status are also related to these increases in female labor force participation. Population shares of both married men and women declined by about 20% for the period as more men and women remain single in the population after 1984, compared to before 1984. However, the employment share of married women moved in the opposite direction. The fraction of married men in the total employment has been reduced by one-fourth, whereas employment share of married women increased slightly.

[4]Employment share of college graduates increased from 14% before 1984 to 26% after 1984 while that of high school dropped from 33% to 12%.

Moreover, single women displayed the same change in their population share as in their employment share. This imply that a large fraction of increased female labor force participation is attributable to married women.

Increasing labor force participation of married women directly implies increased population and employment shares of married men with working spouses. Between pre and post 1984, married men with working spouses expanded their share in the population while the fraction of married men with non-working spouses was reduced by one-third. Among married men with working spouses, shares of those with more educated wives rose notably. This pattern holds for employment shares as well.

In order to examine how hours worked of each demographic group have evolved both at the extensive and intensive margins, I proceed by presenting trends in their employment rate and average weekly hours if employed. Figure 1 indicates the time series of employment rate and average weekly hours by gender between 1963 and 2009. Women not only increased their participation in the labor market but also expanded their hours worked if employed for the period. Female employment rate rose from 0.4 in 1963 to 0.6 in the 2000s while employed women's average weekly hours increased by 8 hours (about 30%). On the other hand, the male employment rate declined slightly with little changes in their average hour worked if employed.

Figure 2 shows that changing the educational distribution affected aggregate hours mostly at the extensive margin. More educated workers increased their shares in employment while less educated workers reduced their labor force participation over the period of 1963 to 2009. In contrast, average weekly hours among the employed did not show any distinct trends for either education group. Disaggregating the data jointly by gender and education indicates that these patterns disguise heterogeneous changes in work hours at both extensive and intensive margins by gender. As shown in Figure 3, men with a college degree increasingly participated in the labor market while all other education groups displayed a reduced employment rate later in the sample period, compared to 1963. This reduction in labor market attachment of non-college degree men is also observed in the intensive margin. Although college graduated men maintained roughly same average weekly hours, all other men worked significantly less in the latter half of the sample period than for the first half. On the other hand, Figure 4 shows that among women, all education groups increased their hours of work both at the extensive and intensive margins with the rises most pronounced among college graduates.

Examining female work hours by marital status, I also find that married

women increased their employment and hours worked more than other women. Figure 5 reports that employment rate among married women rose from less than 0.4 in 1963 to about 0.6 in 2009 while single and other women displayed only slight changes along the participation margin. All women increased their average weekly hours significantly over time, but the change was most pronounced among married women–married women experienced an increase from roughly 26 average weekly hours in 1963 to 33 in 2009.

As more married women participated in the labor market, it is straightforward that more married men now have working wives than in the past. Figure 6 shows that married men with a working spouse displayed little change in their employment rate, whereas married men with non-working spouses significantly reduced their labor market participation. However, both groups' average weekly hours are very similar in their changes as well as levels. I further study trends in married men's work hours with working spouses by their spousal educational attainment as shown in Figure 7. It indicates that both employment rate and average weekly hours of married men with a working spouse increased over time if their spouse held a college degree. However, married men's hours of work declined if their working spouse is less educated, which is at odds with the income effects from an additional income earner within a household.

## 3. CYCLICAL VOLATILITY OF HOURS

This section presents cyclical volatility of hours worked by various demographic groups. I then present quantitative accounting results on how important labor composition changes have been in explaining the recent decline in aggregate hours volatility.

### 3.1. HOURS VOLATILITY OF DISAGGREGATED WORKER GROUPS

Labor composition changes may affect aggregate hours volatility if hours responses to the same exogenous shocks are very different across worker groups. To gauge whether the labor composition changes documented in section 2 can potentially explain the decline in aggregate hours volatility, I compare cyclical volatility of hours worked of various worker groups in this section. Cyclical volatility is defined as the standard deviation of a cyclical component of detrended hours. Both employment rate and average weekly hours of each worker group are used as measures of hours. These measured hours are logged and Hodrick-Prescott (HP) filtered with a smoothing parameter of 6.25. To focus on business cycle fluctuations in hours, these filtered series are projected on a

constant, current detrended output, and current and lagged detrended aggregate hours.[5] The fitted values from these regressions are used to compute the cyclical volatility.

Table 2 presents the results. The results show that cyclical volatility varies substantially by gender, educational attainment, marital status, and spousal characteristics if married. However, volatility of hours at the extensive margin does not necessarily imply volatility at the intensive margin.

Male employment rates display less volatility than female employment rates over business cycles, yet this pattern is reversed at the intensive margin. Cyclical volatility of average weekly hours is much larger for men than for women. This may be due to the fact that female workers are more concentrated in industries and occupations less subject to business cycle fluctuations such as the service industry.

I also examine cyclical volatility of hours by education. Comparing hours volatility of four education windows, I find that educational attainment is inversely correlated with cyclical volatility of hours: more educated workers display less cyclical volatility in their hours both at the extensive and intensive margins than less educated workers. The differences in cyclical volatility of hours by educational attainment are large. Cyclical volatility of employment rates of high school dropouts is more than double that of college graduates. At the intensive margin, hours volatility of high school dropouts is even larger, almost five times that of those with a college education. This implies that the changing educational distribution may have a sizable impact on aggregate hours volatility.

Cyclical volatility of hours also differs by gender and marital status. Particularly, male hours display very different volatility by marital status. The standard deviations of single men's detrended employment rate and average weekly hours are almost three times those of married men. Although women's hours volatility also varies by marital status, the differences are smaller than those for male workers.

Disaggregating married men further by their spousal characteristics reveals that hours responses of married men depend on spousal characteristics as well. When married men's spousal working status is considered, I find that married men with a non-working spouse display more cyclical volatility than those with a working spouse. In contrast, cyclical volatility of married men's average weekly hours varies little by their spousal working status. The aggregate measure of married men with working spouses actually masks substantial differences in cyclical

[5]Data on output and hours are taken from the Current Employment Statistics (CES) private sector in Bureau of Labor Statistics (BLS) labor productivity and costs.

volatility of average weekly hours by spousal educational attainment. Average weekly hours of married men with more educated working wives fluctuate much less than those of married men with less educated working wives. It appears that what matters for husbands' hours volatility is how much their wives earn rather than whether their wives work.

## 3.2. AN ACCOUNTING EXERCISE FOR AGGREGATE HOURS VOLATILITY

This section begins with documenting how U.S. hours volatility over the business cycles has changed post 1984, relative to pre 1984. I first calculate the aggregate employment ($E_t$) and average weekly hours ($H_t$) of employed using CPS data. These time series are logged and detrended using the HP filter with a smoothing parameter of 6.25. Cyclical components of these times series are then exploited to compute cyclical volatility.

Table 3 presents aggregate hours volatility both at the extensive and intensive margins for pre and post 1984 periods and their ratios. Employment rate volatility declined by 15% between pre and post 1984, while fluctuations in the average weekly hours of the employed dropped by 8%. Since the CPS sample used in this study includes individuals ages 25 to 64, the changes in aggregate hours volatility reported in table 3 are different from those reported in previous studies to the extent that hours volatility of individuals ages less than 25 and more than 64 are different from that of my sample.[6]

Given the hours volatility of disaggregated worker groups differ significantly, as shown in section 2, the changes in labor compositions may have a sizable impact on aggregate hours volatility. In order to quantify this effect,
I create a counterfactual time series $\widehat{E}_t$ of aggregate employment rate, wherein population shares are fixed at their average for pre 1984 period (1963 through 1984):

$$\widehat{E}_t = E_t^1 p_{pre84}^1 + E_t^2 p_{pre84}^2 + E_t^3 p_{pre84}^3 + \cdots + E_t^I p_{pre84}^I,$$

where $E_t^i$ is employment rate for worker group $i$ at time $t$, $p_{pre84}^i$ is its average population share pre 1984, and $I$ is the number of worker groups. The same procedure is repeated with average weekly hours to obtain a counterfactual series $\widehat{H}_t$ that holds employment shares fixed at their pre 1984 averages:

$$\widehat{H}_t = H_t^1 e_{pre84}^1 + H_t^2 e_{pre84}^2 + H_t^3 e_{pre84}^3 + \cdots + H_t^I e_{pre84}^I,$$

[6] Jaimovich and Siu (2009) include all individuals 15 years and older from the CPS March supplements in their sample and report that the standard deviation of aggregate employment rate declined by 62.2 log points (≈46%) between pre and post 1984.

where $H_t^i$ is average weekly hours of worker group $i$ at time $t$ and $e_{pre84}^i$ is the average employment share of worker group $i$ pre 1984. Cyclical volatility of these counterfactual time series are computed separately for pre and post 1984. Percent changes $\Delta\widehat{E}_t$ and $\Delta\widehat{H}_t$ in cyclical volatility of both counterfactual time series between pre and post 1984 are compared to the declines ($\Delta E_t$ and $\Delta H_t$)[7] reported in Table 3. Their differences measure the contributions of labor composition changes to the reduction in hours volatility at the extensive and intensive margins. Specifically, my measures are $\frac{\Delta E_t - \Delta\widehat{E}_t}{\Delta E_t} \times 100$ for the employment rate and $\frac{\Delta H_t - \Delta\widehat{H}_t}{\Delta H_t} \times 100$ for average weekly hours.

For this main exercise, it is implicitly assumed that cyclical volatility of the employment rate and average weekly hours of every demographic group is independent of changes in labor composition. However, it is possible that hours decisions of different demographic groups are indirectly affected by their shares in the population and employment. In this case, the measured contribution of changes in labor composition is biased. Despite that, this simple accounting exercise is meaningful in that it provides a first-cut estimate for how important demographic changes in gender, education, marital status, and spousal characteristics are in explaining changing aggregate hours volatility.

Table 4 presents the accounting results. Despite a significant change in women's labor force participation, it did not reduce employment rate volatility at all. It rather had a marginal increasing effect on aggregate employment rate volatility. However, this gender composition change explains 9% of the decline in cyclical volatility of average weekly hours.

Education turns out to be the most important factor in moderating cyclical volatility of hours at both margins with a greater impact along the intensive margin. This is in line with the negative correlation between cyclical volatility of hours and educational attainment reported in Table 2. Rising population and employment shares of more educated workers who display less cyclical volatility contributed to 0.9% and 14% of the decline in hours volatility at the extensive and intensive margins, respectively. Gender and education jointly led to the decline in cyclical volatility of hours worked. Changes in the joint distribution of gender and education explain 0.3% and 18% of cyclical volatility of employment rate and average weekly hours, respectively.

Changing distribution of workers by gender and marital status affected cyclical volatility of the employment rate and average weekly hours in opposite directions. Note that cyclical volatility of single men's employment rate is larger

[7] More precisely, $\Delta E_t = 1 - 0.8461$ and $\Delta H_t = 1 - 0.9213$.

than that of married men and that married women display a greater volatility of employment rate than married men. Rising shares of single men and married women then increased cyclical volatility of the aggregate employment rate. In contrast with the participation margin, volatility of average weekly hours of married women is lower than that of married men. Together with this, a rising share of single women–whose hours volatility is even smaller at the intensive margin than married women–accounts for 9% of the reduction in cyclical volatility of average weekly hours. Disaggregating married workers further by their spousal working status produce very similar results. It raises volatility of the employment rate and reduces hours fluctuations along the intensive margin. Its quantitative impact on cyclical volatility of average weekly hours is much larger, explaining about 18% of the decline.

As shown in table 2, working spouses' educational attainment had a sizable effect on cyclical volatility of average weekly hours. Declining shares of married men with less educated working wives, whose cyclical volatility of average weekly hours is very large, reduced aggregate hours volatility along the intensive margin. The magnitude amounts to 33% of the decline in average weekly hours fluctuations between pre and post 1984. However, it contributed to the reduction of employment rate volatility only slightly.

Note that I define every worker who reported positive hours of work in the past calendar year as employed for the main exercise and that I do not distinguish part-time workers (whose usual hours worked are at most 34 hours per week) from full-time workers (whose usual hours worked exceed 34 hours per week). However, hours volatility of full-time workers may be different from that of part-time workers. If workers' full-time/part-time status are correlated with individual characteristics such as gender, education, and marital status, the results in table 4 may be partly attributable to changing shares of full-time and part-time workers. To address this issue, I repeat the main exercise by defining full-time workers who worked positive weeks in the previous calendar year as employed.

Table 5 presents cyclical volatility of employment rate and average weekly hours with this new definition of employed. The third row in table 5 confirms that changes in cyclical volatility of employment rate and average weekly hours between pre and post 1984 with the new definition are similar to those found in table 3. This implies that the great moderation in hours is a robust phenomenon.

I report the main results with this new definition of employed in table 6. As the second column of table 6 indicates, the results for the employment rate change little except for the change in educational distribution. In this exercise,

changing educational distribution accounts for 5% of the decline in employment rate volatility, whereas it explained little (0.89%) in the baseline results. This suggests that changing shares of different education groups among part-time workers were not quantitatively important in explaining the decline in cyclical volatility of employment rate.

Along the intensive margin, changes in working spouses' educational attainment are still the most important factor of the decline in hours volatility. However, gender or education alone contributes to the decline in cyclical volatility of full-time workers' average weekly hours little, whereas they explained 9.36% and 14.04% of the decline, respectively, in the baseline results. It appears that labor composition changes in gender or education contributed to the reduction in cyclical fluctuations of average weekly hours of part-time workers. Changes in the joint distribution of gender and marital status also account for little (-0.75%) of hours volatility at the intensive margin, which compares to their counterpart of 9.13% in table 4. It implies that these composition changes have been important for hours fluctuations of part-time workers.

## 4. CONCLUSION

This paper explores the role of labor composition changes in explaining the reduction in aggregate hours volatility in the U.S. since the mid-1980s. It documents changes in work hours by various worker groups disaggregated by gender, education, marital status, and spousal characteristics if married. It then shows that cyclical volatility of hours vary significantly across these worker groups both at the extensive and intensive margins. The main contribution of this paper is to provide a quantitative measure of the contribution of these labor composition changes to the decline in aggregate hours volatility.

The main finding is that labor composition changes explain cyclical volatility of hours at the extensive margin little, yet a significant fraction of hours fluctuations along the intensive margin is attributable to demographic changes. The results also indicate that education composition is the single most important factor in accounting for evolving aggregate hours fluctuations: its changes account for 0.9% and 14% of the decline in business cycle fluctuations in hours at the extensive and intensive margins, respectively. Labor composition by marital status and spousal working status raised cyclical volatility of the aggregate employment rate, while reducing fluctuations in average weekly hours. However, spousal educational attainment among married workers with working spouses explain a significant fraction of cyclical volatility of hours at the intensive margin.

In this study, it is implicitly assumed that labor composition changes are purely exogenous phenomenon and that hours responses of each worker group are independent of changes in the demographic structure. However, it is possible that these demographic changes affect individual hours decisions. The size of these biases resulting from this endogeneity remains a topic of future research.

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Table 1. Population and Employment Shares of Various Demographic Groups

| | Population Share | | Employment Share | |
|---|---|---|---|---|
| | Pre 1984 | Post 1984 | Pre 1984 | Post 1984 |
| By gender | | | | |
| Male | 0.48 | 0.49 | 0.61 | 0.55 |
| Female | 0.52 | 0.51 | 0.39 | 0.45 |
| By education | | | | |
| Less than high school | 0.34 | 0.14 | 0.33 | 0.12 |
| High school graduates | 0.38 | 0.35 | 0.39 | 0.36 |
| Some college | 0.13 | 0.25 | 0.14 | 0.26 |
| College graduates | 0.15 | 0.27 | 0.14 | 0.26 |
| By gender and marital status | | | | |
| Married men | 0.39 | 0.32 | 0.50 | 0.37 |
| Single men | 0.05 | 0.09 | 0.06 | 0.10 |
| Married women | 0.39 | 0.33 | 0.27 | 0.28 |
| Single women | 0.03 | 0.07 | 0.03 | 0.07 |
| By married men's spousal trait | | | | |
| With working spouse | 0.17 | 0.19 | 0.23 | 0.23 |
| Spouse with a college degree | 0.01 | 0.05 | 0.02 | 0.06 |
| Spouse with some college | 0.02 | 0.05 | 0.03 | 0.06 |
| Spouse with HS | 0.08 | 0.07 | 0.11 | 0.09 |
| Spouse with less than HS | 0.05 | 0.02 | 0.07 | 0.02 |
| With non-working spouse | 0.22 | 0.14 | 0.27 | 0.14 |

Note: Data taken from the CPS March Supplements 1964-2010.

Table 2: Hours Volatility of Disaggregated Worker Groups

| | Emp. Rate | Avg. Weekly Hours |
|---|---|---|
| By gender | | |
| Male | 0.84 | 1.34 |
| Female | 1.27 | 0.56 |
| By education | | |
| Less than high school | 1.39 | 1.61 |
| High school graduates | 1.23 | 1.07 |
| Some college | 1.11 | 1.12 |
| College graduates | 0.61 | 0.35 |
| By gender and marital status | | |
| Married men | 0.53 | 1.21 |
| Single men | 1.92 | 1.81 |
| Married women | 1.23 | 0.62 |
| Single women | 0.74 | 0.36 |
| By married men's spousal trait | | |
| With working spouse | 0.41 | 1.16 |
| Spouse with a college degree | 0.88 | 0.39 |
| Spouse with some college | 0.33 | 0.96 |
| Spouse with HS | 0.66 | 1.25 |
| Spouse with less than HS | 0.77 | 2.45 |
| With non-working spouse | 0.55 | 1.13 |

Note: Data taken from the CPS March Supplements 1964-2010. Numbers presented represent cyclical volatility of each worker group relative to cyclical volatility of aggregate employment rate and average weekly hours reported in table 3.

Table 3: Cyclical Volatility of Aggregate Hours

| | Emp. Rate | Avg. Weekly Hours |
|---|---|---|
| Pre 84 | 0.0060 | 0.0052 |
| Post 84 | 0.0050 | 0.0048 |
| Ratio | 0.8461 | 0.9213 |

Note: Data taken from the CPS March Supplements 1964 through 2010. Cyclical volatility is defined as the standard deviation of HP-filtered data series that are projected on a constant, detrended current output and detrended current and lagged hours.

Table 4. Changes in Labor Composition and the Decline in Hours Volatility

| | Emp. Rate | | Avg. Weekly Hours | |
|---|---|---|---|---|
| | Ratio | % Explained | Ratio | % Explained |
| Gender | 0.8438 | −1.44% | 0.9287 | 9.36% |
| Education | 0.8474 | 0.89% | 0.9324 | 14.04% |
| Gender + Education | 0.8465 | 0.26% | 0.9357 | 18.28% |
| Gender + Marital Status | 0.8322 | −8.97% | 0.9285 | 9.13% |
| Gender + Marital Status + Spousal Work Status | 0.8282 | −11.60% | 0.9353 | 17.66% |
| Gender + Marital Status + Working Spousal Edu | 0.8463 | 0.19% | 0.9470 | 32.60% |

Note: Data taken from the CPS March Supplements 1964-2010. Columns 2 and 4 report counterfactual ratios of employment rates and average weekly hours pre 84 to those post 84, respectively. Reported numbers in columns 3 and 5 are the fractions of the declines in cyclical volatility of the aggregate employment rate and average weekly hours explained by each composition change.

Table 5: Cyclical Volatility of Hours: Full-Time Workers

| | Emp. Rate | Avg. Weekly Hours |
|---|---|---|
| Pre 84 | 0.0085 | 0.0060 |
| Post 84 | 0.0072 | 0.0056 |
| Ratio | 0.8502 | 0.9320 |

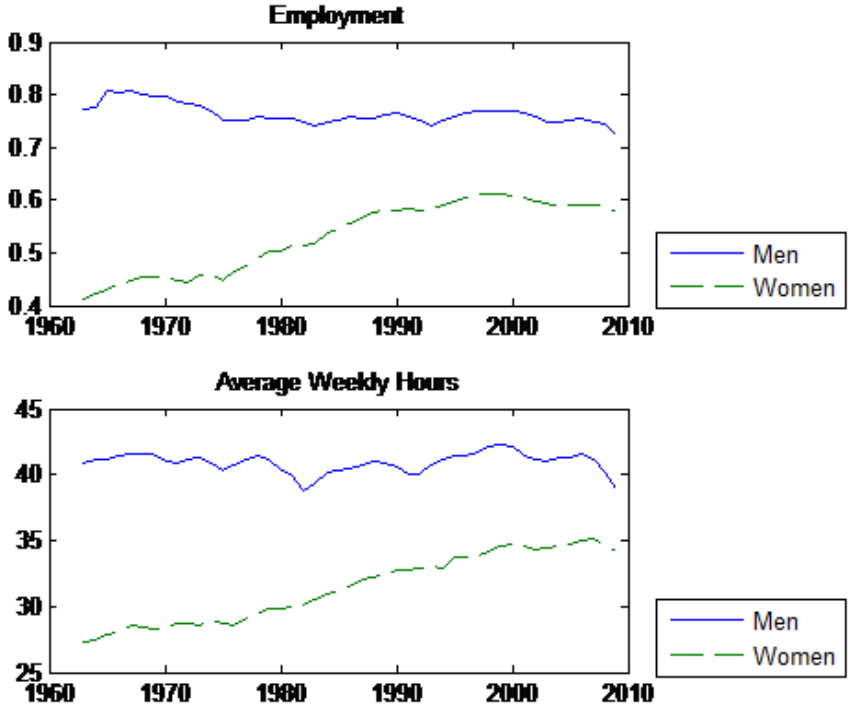
Note: Data taken from the CPS March Supplements 1964 through 2010. I define full-time workers (whose usual hours of work per week exceed 34 hours) who reported positive weeks worked in the previous calendar year as employed. Cyclical volatility is defined as the standard deviation of HP-filtered data series that are projected on a constant, detrended current output and detrended current and lagged hours.

Table 6. Labor Composition Changes and Hours Volatility: Full-Time Workers

| | Emp. Rate | | Avg. Weekly Hours | |
|---|---|---|---|---|
| | Ratio | % Explained | Ratio | % Explained |
| Gender | 0.8480 | −1.47% | 0.9325 | 0.79% |
| Education | 0.8577 | 5.00% | 0.9324 | 0.66% |
| Gender + Education | 0.8561 | 3.94% | 0.9405 | 12.59% |
| Gender + Marital Status | 0.8372 | −8.73% | 0.9315 | −0.75% |
| Gender + Marital Status + Spousal Work Status | 0.8368 | −8.95% | 0.9366 | 6.85% |
| Gender + Marital Status + Working Spousal Edu | 0.8542 | 2.63% | 0.9433 | 16.59% |

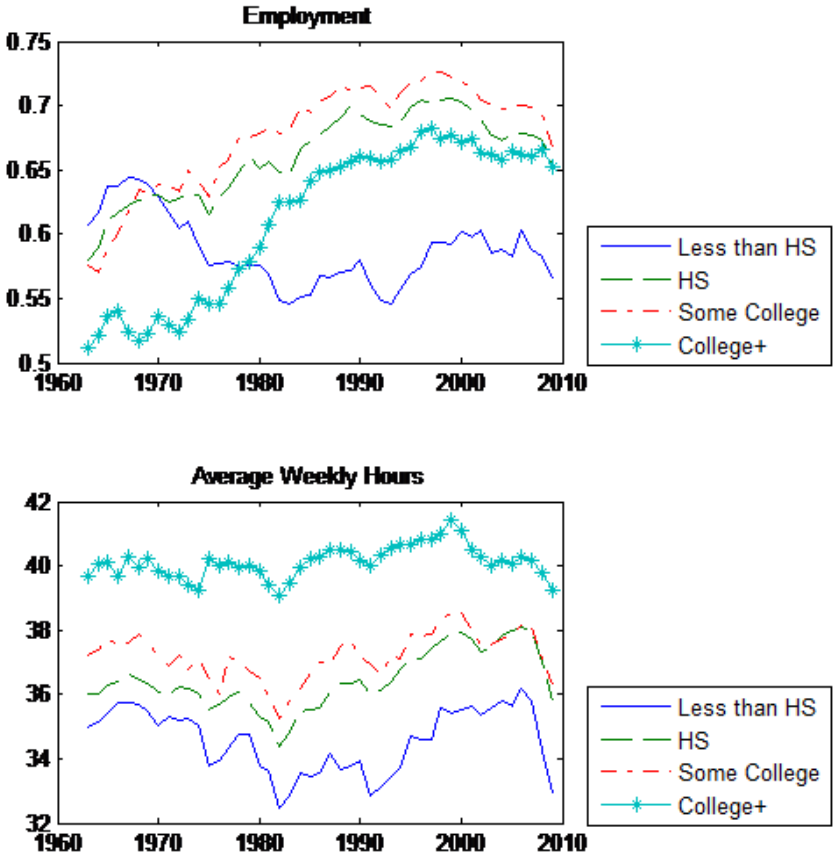
Note: Data taken from the CPS March Supplements 1964-2010. Columns 2 and 4 report counterfactual ratios of employment rates and average weekly hours pre 84 to those post 84, respectively. Reported numbers in columns 3 and 5 are the fractions of the declines in cyclical volatility of the aggregate employment rate and average weekly hours explained by each composition change.

Figure 1: Trends in Employment Rate and Average Weekly Hours by Gender



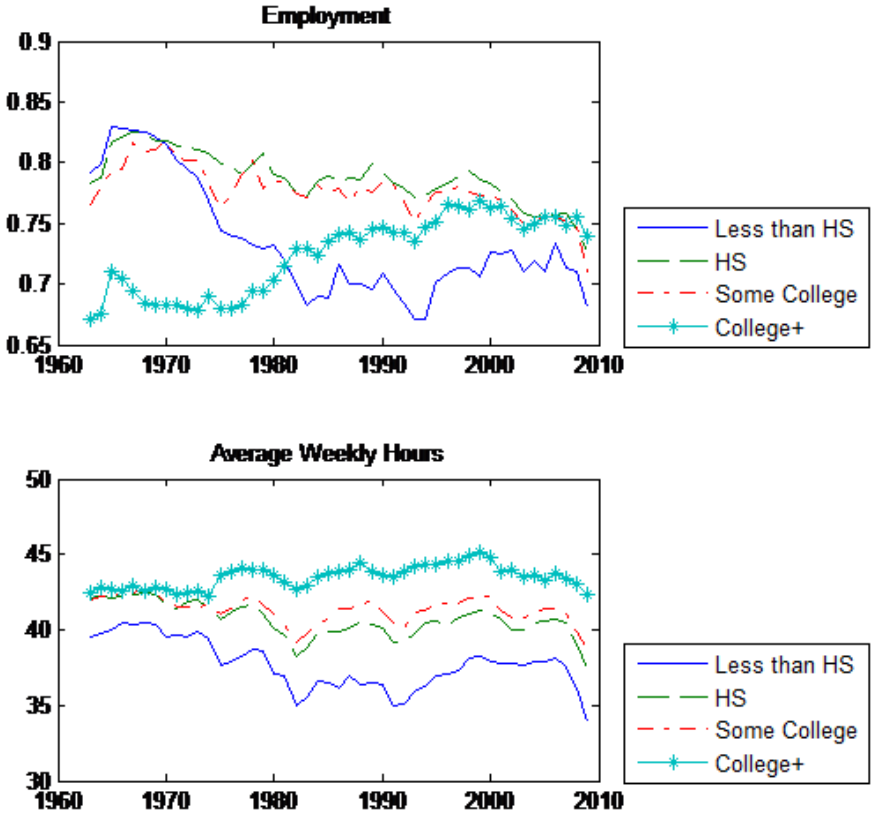

Note: Data taken from the CPS March Supplements 1964-2010. Employment rate is the share of employment in the sample, where those employed include those who reported positive hours worked in the previous calendar year. Average weekly hours are average hours worked per week of those employed.

Figure 2: Trends in Hours Worked by Education



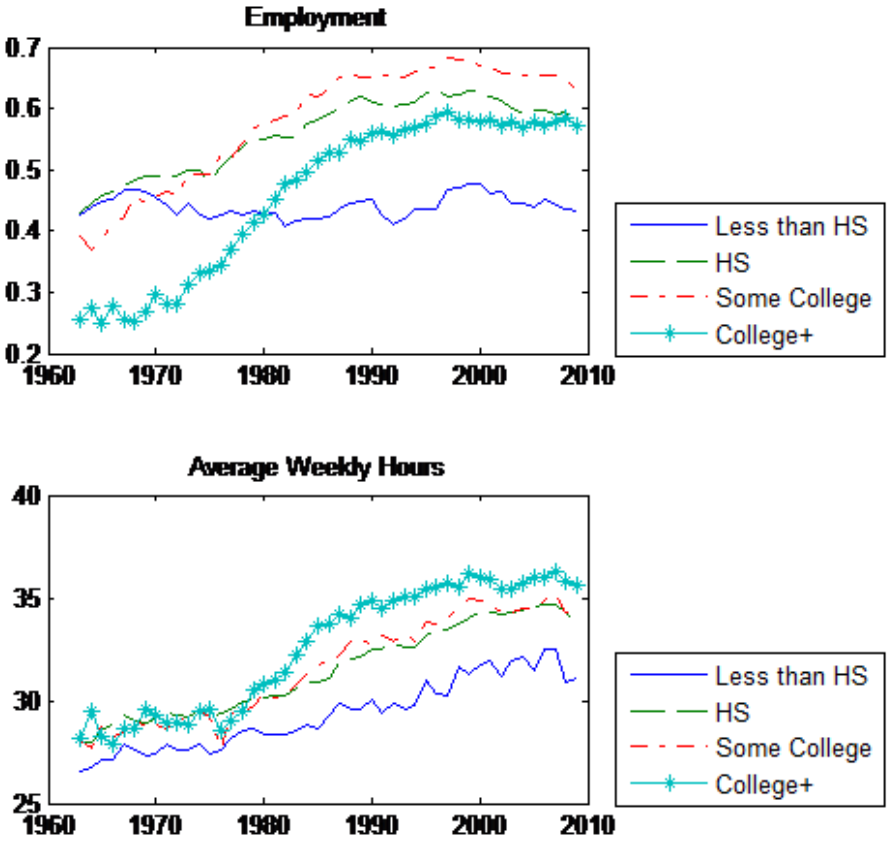

Note: Data taken from the CPS March Supplements 1964-2010. Employment rate is the share of employment in the sample, where those employed include those who reported positive hours worked in the previous calendar year. Average weekly hours are average hours worked per week of those employed.

Figure 3: Trends in Male Work Hours by Education



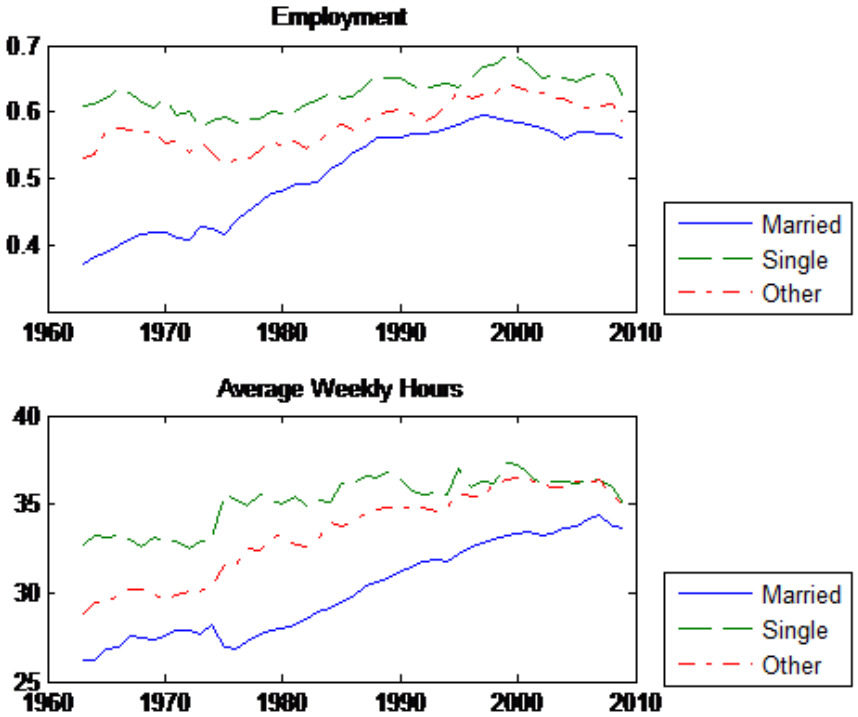

Note: Data taken from the CPS March Supplements 1964-2010. Employment rate is the share of employment in the sample, where those employed include those who reported positive hours worked in the previous calendar year. Average weekly hours are average hours worked per week of those employed.

Figure 4: Trends in Female Work Hours by Education



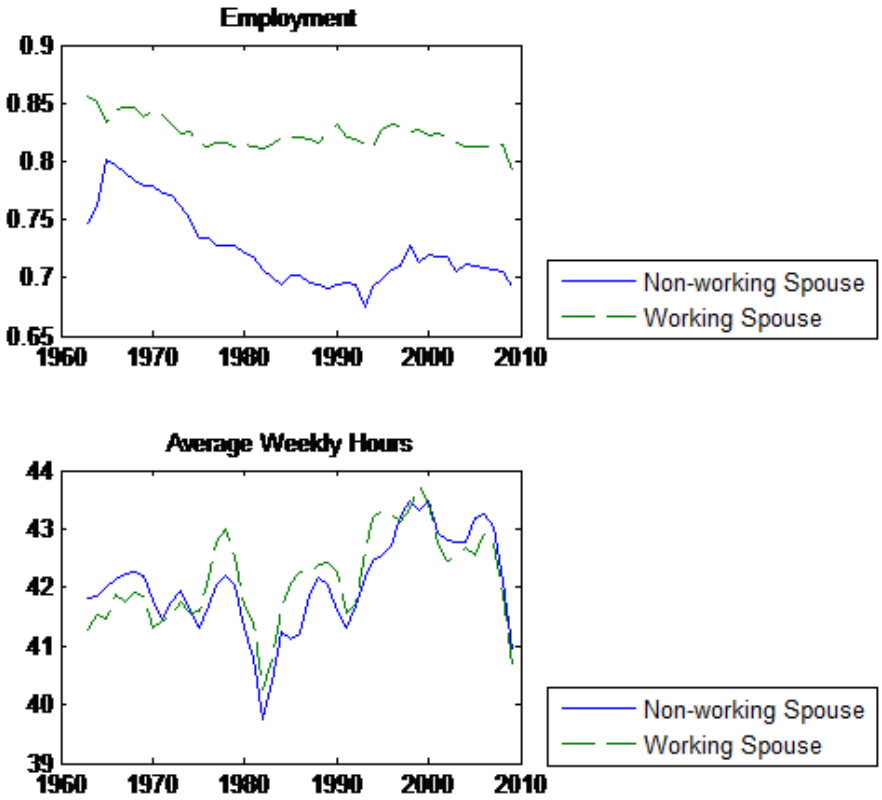

Note: Data taken from the CPS March Supplements 1964-2010. Working status of spouses is determined by whether the spouse worked a positive number of hours in the previous calendar year.

Figure 5: Trends in Female Work Hours by Marital Status



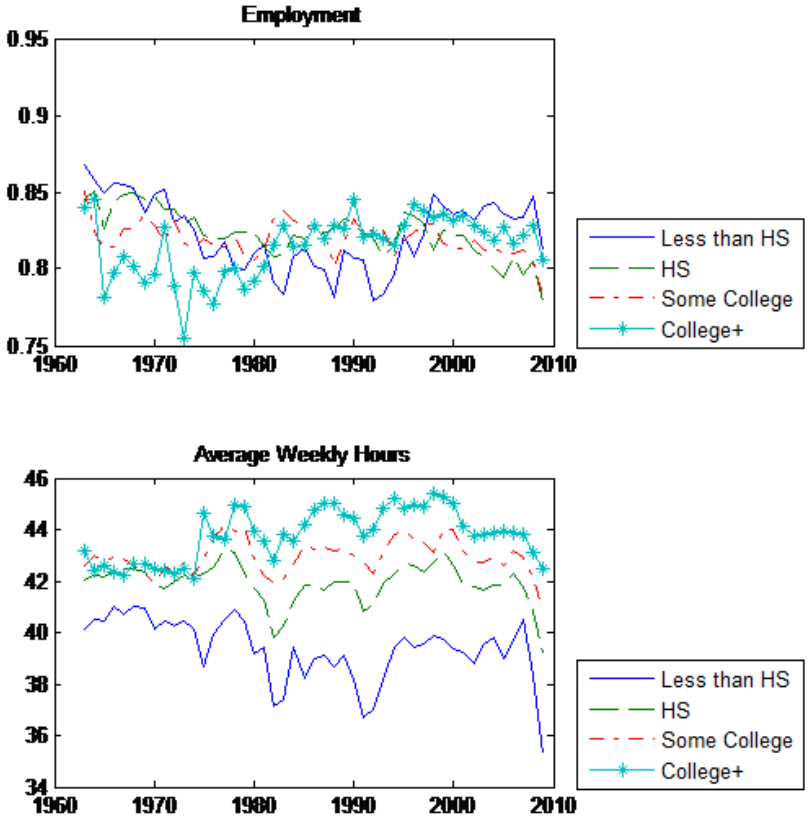

Note: Data taken from the CPS March Supplements 1964-2010. The employed includes those who reported positive hours worked in the previous calendar year. Average weekly hours are obtained by dividing annual hours worked by 52 weeks.

Figure 6: Trends in Married Men's Work Hours by Spousal Working Status




Note: Data taken from the CPS March Supplements 1964-2010. Working status of spouses is determined by whether the spouse worked a positive number of hours in the previous calendar year.

Figure 7: Trends in Married Men's Work Hours by Working Spouse's Education Attainment




Note: Data taken from the CPS March Supplements 1964-2010. The sample consists of married men with working spouses.