



# Gender-specific differences in labor market adjustment patterns: Evidence from the United States



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## ABSTRACT

Do men and women behave differently while adjusting labor supply over the business cycle? Using data from the United States, we show that women are significantly more likely to adjust along the intensive margin (number of hours), while men adjust more along the extensive margin (employment). Older, single, and divorced/widowed adjust predominantly along the extensive margin.

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## 1. Introduction

The labor supply in the United States has experienced a substantial change over recent decades. While with the change in the US labor force generally holds hours worked as a function of sex and marital status, it is particularly true for the female labor supply. Findings from Jones, Manuelli and McGrattan (2003) show that hours worked by married women increased by roughly 30% over the time period from 1950 to 2000, while supply by married men decreased slightly over the same period. Moreover, hours worked by single women and single men remained almost constant over this time period. These trends have important and persistent economic and social effects. The progress in understanding factors behind female and family labor supply does not only require analysis of the gender wage gap, changes in the fertility rate, decrease in marriage and increase in divorce rates, and changing social norms, it also requires understanding of the business cycle response

of men and women to adjustments in the labor market.

The latter has, to the best of our knowledge, been neglected in the labor economics literature so far. The objective of this study is to assess the question whether men and women behave differently within the labor market adjustment process over the business cycle and to close this gap in the literature. Adjustments along the extensive margin are adjustments in the number of workers, while adjustments along the intensive margin are adjustments in the number of hours worked. It is important to distinguish between these two margins, because knowledge of the quantitative importance of the extensive and intensive margins is needed for economic models and policy. The relative strength of a margin alters the effects of policy reforms concerning the effects of taxes, labor market adjustments, and other policy changes related to female and family labor supply decisions. It is documented that many countries established policy programs to increase the participation rate of women in the way of tax benefits, increased child-care, or extended paid maternity leave, which includes for husbands as, for example, shown in Ray,

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Gornick and Schmitt (2009) or discussed in the “International Review of Leave Policies and Related Research” of the Department of Business (2007)<sup>i</sup>. Along this line, it is important to separate the extensive–intensive margin for men and women, as income taxes from benefit reforms that may have larger disincentive effects when the intensive margin is more important, which would increase labor supply elasticity.

Three patterns are clear. First, our results indicate that men and women in the age group 16–19 have the same ratio of extensive vs. intensive margin. When they grow older, we find that men tend to adjust more often along the extensive margin (0.74), while women adjust more often along the intensive margin (0.66). Second, we find that the extensive–intensive margin split depends on the marital status of agents. The extensive margin of married men and women is roughly 0.65, while it increases for singles to roughly 0.74. Third, we observe large differences across occupations. For example, individuals employed in the service sector adjust almost equally likely along the intensive and the extensive margin. In contrast, employees in the management sector almost entirely adjust along the extensive margin (0.80). Further, while the importance of the extensive margin across occupations stays rather constant for men, it varies more strongly for women.

The study by Blundell, Bozio and Laroque (2011) decomposes the total change of hours worked into individual contributions from men and women across different age groups. This is different from our analysis, since we investigate the role of extensive versus intensive margin for the adjustment within a given age group over the business cycle. Furthermore, a technical difference is that they decompose the change in hours between periods by assuming the change is driven by a structural factor and the intensive and extensive margins. As an alternative, our analysis refrains from econometric or causal assumptions, and in contrast, solely uses the statistical properties of the time series.

In an earlier paper, Merkl and Wesselbaum (2011) provide evidence for the relative importance of the two margins for business cycle dynamics using a data set for the United States and Germany. They show that the extensive margin in both countries is the primary margin of adjustment. However, their study uses highly aggregated data, and does not allow for gender differences.

## 2. Data manipulation and decomposition

We use monthly data for individual hours worked and employment from January 1977 to December 2011 (420 observations) for the United States provided by the Current Population Survey of the Bureau of Labor Statistics (BLS). According to the NBER recession dates, this time span covers five recessions, therefore, provides sufficient variation in the time series for decomposition. In particular, we compare women and men’ extensive and intensive

margins along five different age groups: 16 years and over, 16–19 years, 16–17 years, 18–19 years, and 20–24 years. Three different marital statuses are considered for ages 16 years and over: married, other including divorced and widowed, and single/never married. Five different occupations are considered for management, service, sales, construction, and production. We use data from January 2000 to December 2011, which includes 144 observations provided by the BLS.

The reader should note that data for other age groups are either not available or only covers shorter time periods. Furthermore, to draw conclusions for differences across age, marital status, and occupation, the remaining five age groups cover working age groups. For example, the average age married and birth age lie in the interval [24, 25]. Therefore, we expect differences in the extensive–intensive margin split when agents move from single to married and from a single utility function maximizer to joint utility function maximizers.

Using time series for individual hours,  $h$ , and employment,  $n$ , we construct a series of aggregate hours,  $t = h \times n$ . All time series are then expressed in logarithmic scale and filtered using the Baxter and King (1999) Band-pass filter to identify the business cycle component. We set the lower cycle period to 18 months, the high cycle period to 96 months, with 36 leads/lags in accordance with Baxter and King (1999). Therefore, the sample size is 348 observations. Total hours in log-linearized form is

$$\hat{t} = \hat{h} + \hat{n},$$

We write the variance of total hours as

$$\begin{aligned} \text{Var}(\hat{t}) &= \text{Var}(\hat{h}) = \text{Var}(\hat{n}) + 2\text{Cov}(\hat{h}, \hat{n}) \\ &= \text{Cov}(\hat{t}, \hat{n}) + \text{Cov}(\hat{t}, \hat{h}) \end{aligned}$$

The latter equality follows from the covariance term that gives the variability explained by variations in the respective margins, both directly and through correlations. Following Fujita and Ramey (2009), the proportion of the intensive margin,  $\vartheta^{INT}$ , of total variation is given by

$$\vartheta^{INT} = \frac{\text{Cov}(\hat{t}, \hat{h})}{\text{Var}(\hat{t})}$$

and the extensive margin,  $\vartheta^{EXT}$ , is

$$\vartheta^{EXT} = \frac{\text{Cov}(\hat{t}, \hat{n})}{\text{Var}(\hat{t})}$$

## 3. Results

As defined above, Figs. 1 and 2 present the men and women filtered time series for hours, employment, and total hours for different ages and marital statuses. Visual inspection indicates that employment follows total hours closely over the cycle. Furthermore, we deduce that individual hour variance is smaller compared to the variance of employment and total hours, which holds for all series.

<sup>i</sup> Further evidence is presented in the “Making work pay” report of the European Commission (2005) or in the report for the Department of Labour (2006).

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