Hours Worked over the Business Cycle: Evidence from OECD Countries, 1960 - 2010

Lee E. Ohanian*         Andrea R. Raffo†
UCLA                  Federal Reserve Board

Abstract

Documenting and understanding cyclical changes in hours worked has been the focus of much business cycle research since at least Kydland and Prescott (1982) and Hansen (1985), and the very different labor market outcomes observed during the current recession across countries have generated renewed interest in these issues. However, this research has been significantly limited outside of U.S. data due to the very limited availability of hours worked in other countries, including other high income countries. Consequently, what currently is known about the cyclical changes in labor input - and labor productivity - outside the U.S. is largely based on cyclical changes in employment, and not hours.

This paper fills this gap in the literature on cyclical changes in labor input by first constructing a new dataset for total hours worked at the quarterly frequency which covers 17 OECD countries and spans the last fifty years. The dataset draws on a variety of international sources, including data from national statistical offices, establishment surveys, and household surveys. Our main contributions provide not only the most comprehensive, international cyclical hours worked database that can be used by other researchers¹, but shows that these hours data in foreign countries contrast sharply with some commonly-held

*Corresponding authors: ohanian@econ.ucla.edu
†Email: andrea.raffo@frb.gov
¹Full details regarding the data sources and the methodology implemented to insure that our measure of labor input is consistent with the national accounts measures will be provided in the Appendix.
views about labor input and productivity based on just U.S. data or international employment data, including the relative importance of hours per worker versus employment as a determinant of changes in hours worked, the cyclical properties of hours versus employment, and the cyclical patterns of the labor wedge and its implications for some leading labor search models.

We first present some key facts about the behavior of hours over the business cycle in these countries. We document that total hours of work are surprisingly as volatile as output, and that the intensive margin (hours per worker) and the extensive margin (employment per capita) margins, on average, account for about equal shares of such volatility. Hence, changes in hours per worker over the business cycle are as important as changes in employment. We also show that the volatility of total hours relative to output has increased over time in almost all countries. This suggests that the reduction in output volatility that occurred over the past 25 years (often called the Great Moderation) has not been accompanied by anything close to a similar reduction in the volatility of hours of work.

Hours worked are generally procyclical, with a strong contemporaneous relationship with output, as in the United States. However, there is significant variation across countries in terms of the distribution of intensive vs extensive margin adjustments. In the United States, Canada, and Australia, hours and employment are highly correlated. In contrast, the cross-correlation between hours and employment in the remaining countries is S-shaped, indicating that there are very different economic forces at work in other countries that lead, in equilibrium, to movements in hours per worker well before employment changes. The high volatility of hours per worker over the business cycle and the aforementioned cross-correlation patterns between hours per worker and employment provide a very different view about cyclical fluctuations in labor and productivity across countries than is standard. We then discuss the plausibility of different mechanisms for these findings, including cross-country differences in the importance of adjustment/hiring/firing costs.
After comparing and contrasting the cyclical patterns of employment and hours, we next describe the cyclical properties of movements in the relationship between the marginal rate of substitution between consumption and leisure and the marginal product of labor, or what is often called the labor wedge. Following a large and growing literature (see, for instance, Shimer (2009, 2010), Chari et al. (2007), Cole and Ohanian (2002), Ohanian, Raffo and Rogerson (2008), just to mention a few) we use this measure as a proxy for cyclical changes in labor market distortions. We find that the labor wedge is significantly more volatile than output, even for large labor supply elasticities. In our previous work with Rogerson (Ohanian, Raffo, and Rogerson (2008)), we documented that most of the low frequency movements in the labor wedge is accounted for by movements in hours of work, with very little role for changes in the consumption to output ratio. In contrast, we find that this is not the case at business cycle frequency, as both elements contribute significantly to the high volatility of the labor wedge. Finally, we document that the labor wedge rises in recessions and falls in booms (i.e. it is countercyclical), consistent with previous findings for the United States, which suggests that there are large departures from competitive labor market outcomes across countries, and that are similar across countries, irrespective of hypothesized differences in labor market rigidities. We conclude this section showing that the labor wedge is quantitatively very important to understand the current recession in the U.S., but not so important in other countries.

The dataset that is constructed in this paper will provide guidance for researchers in analyzing the key features of the labor market that are relevant for aggregate outcomes. For instance, we emphasize that fluctuations in employment represent a poor description of the behavior of the European labor markets. This has implications also for the cyclical properties of labor productivity, which is strongly procyclical in Germany, France, and Italy and less so in the United States. Moreover, our finding that the labor wedge is countercyclical in most countries stands in sharp contrast with the implications of standard search frictions models as in Mortensen and Pissarides (1994), which are the starting point of most
research on imperfectly competitive labor markets. These models, in fact, deliver a labor wedge that rises in booms and falls in recession, which is counterfactual. In our last section, we investigate whether measures of labor market institutions, which are typically found as important in the unemployment literature, represent a promising avenue to understand the variation over time and across countries in the labor wedge.
References


