



Can progressive taxation account for cross-country variation in labor supply?

Murat Koyuncu *

Department of Economics, Bogazici University, Bebek, Istanbul TR-34342, Turkey

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ABSTRACT

The difference between average hours worked in the US and average hours worked in Continental European countries has been increasing since the early 1970s. To explain this phenomenon, this paper develops an endogenous growth model with two key properties: agents are heterogeneous in their rates of time preference and labor skills, and the model incorporates progressive income taxes. The model is calibrated to US and German data for the periods 1971–1974 and 1986–1989. Our findings suggest that the degree of progressivity is a major factor in explaining the patterns of the US and German labor supply over time. Predictions of the model also match the distributional trends in both countries during this time period.

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1. Introduction

In the early 1970s, average weekly hours worked per person in Continental European countries such as Germany and France were slightly higher than those in the US. Tracking these three countries from 1970s to 1990s, Fig. 1 shows that the picture changed drastically over this time period. While the US numbers rose, the German and French working hours steadily declined. In 1994, Americans worked almost 35 percent more than Germans according to the data.

The aim of this paper is to analyze whether the structure of income tax schedules plays a role in this widening gap across the Atlantic. More specifically, we assess how much of the growing difference can be explained by the changes in the progressivity of the US and German tax systems over time. To this end, we use an endogenous growth model with heterogeneous agents who differ in terms of their rates of time preference and skills. This model has two major advantages over standard representative agent models: First of all, we can incorporate not only the average tax rate, but also the progressivity of income taxes in our analysis. This proves to be crucial in explaining the evolution of cross-country labor supply differences over time. Secondly, the income and tax burden distributions and macroeconomic aggregates such as the growth rate and the average labor supply are jointly determined in the model. In a progressive tax system, there is a two-way relationship between the tax rates and individuals' decisions. On the one hand, an individual's tax liability is determined by her income. On the other hand, the tax rate that she is subject to affects her income through her labor-leisure and savings choices. Agents with heterogeneous time preference characteristics make different choices, which determine the aggregate level of labor supply and the growth rate. Our model captures this crucial point.

* Tel.: +902123597640; fax: +902122872453.

E-mail address: mkoyuncu@boun.edu.tr

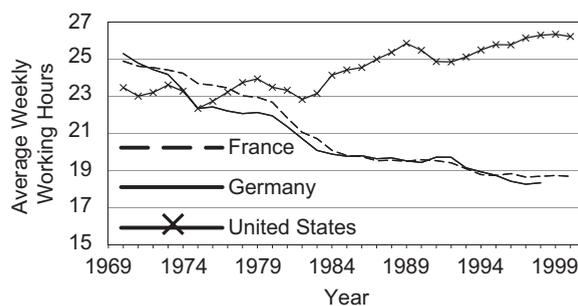


Fig. 1. Average weekly working hours per person at working age in France, Germany, and the US.

The model is calibrated to the US and German economic data during the periods of 1970–1974 and 1986–1989. It correctly predicts that the US labor supply increases, while the German labor supply decreases between the two periods. We find that the change in the degree of progressivity plays an important role in the change of working hours between the two periods, especially in the US case. In Germany, both the progressivity and the level of income taxes increase from early 1970s to late 1980s. We show that each of these shocks reduce the working hours in this country. In the US, the degree of progressivity fell while the average tax rate increased during the same time period. The model shows that these two effects work in opposite directions as expected; holding the level of the average tax rate constant, a lower degree of progressivity leads to higher working hours, whereas increasing the average tax rate while holding the degree of progressivity constant results in a lower average labor supply. The fall in the progressivity of the US tax system dominates the negative effect of the rise in the average tax rate.

In terms of distributional patterns, the model's predictions match both the worsening in the US income inequality between 1970s and the late 1980s and the improvement in German income inequality. These findings also relate to previous work by Alesina et al. (2005) and Bell and Freeman (2001) who find a positive relationship between the level of income inequality and average labor supply. Finally, the model produces growth rate predictions that are comparable to the actual data.

This paper contributes to the recent literature on the differences between the European and American working hours. Prescott (2004) and Ohanian et al. (2008) use standard representative agent models with flat tax rates and correctly predict the fall in the European labor supply from 1970s to 1990s, but their predictions for the US are not as accurate. They expect the working hours in the US to fall while the data shows that the opposite is true. Our results suggest that this might be due to the fact that these models focus on average tax rate differentials between countries and assume that the degree of progressivity is the same across time and countries.

Our model belongs to the expanding family of growth models that use heterogeneous agents in complete asset markets setting, such as Caselli and Ventura (2000), Sorger (2000), García-Peñalosa and Turnovsky (2006, 2007, 2008a,b), and Koyuncu and Turnovsky (2010). These models mainly focus on the income distribution-economic growth relationship but they do not deal with progressive income taxation. Earlier heterogeneous agent models that consider progressive taxation, such as Sarte (1997), Sorger (2002) and Li and Sarte (2004), abstract from flexible labor supply, which is an important margin in terms of the distortionary effects of progressive taxes. Two recent papers, Carroll and Young (2009) and Bosi and Seegmuller (2010), incorporate elastic labor supply, however, they concentrate on the stationary characteristics of the wealth distribution in Ramsey models. Finally, Guvenen et al. (2009) uses a life-cycle model with human capital to show that an important fraction of the wage inequality differences between the US and Continental European countries can be explained by progressive taxation. This paper emphasizes the effects of progressive taxes from a wage inequality perspective, and hence provides a complementary view to ours.

The plan of this paper is as follows. Section 2 introduces the model. Section 3 investigates the quantitative implications of the model for the US and Germany between the early 1970s and the late 1980s. Finally, Section 4 concludes the paper.

2. The model

In this section, we set up an endogenous growth model with heterogeneous households and progressive taxation.

2.1. Technology and factor payments

All firms are identical and indexed by j . We assume that the representative firm produces output according to the Cobb–Douglas production function

$$Y_j = A(L_j K)^{\alpha} K_j^{1-\alpha} \quad 0 < \alpha < 1 \quad (1a)$$

where K_j and L_j represent individual firm's capital stock and employment of labor, respectively. K is the average capital stock in the economy and $L_j K$ is the efficiency units of labor employed by the firm. The production function exhibits constant returns to scale in labor and capital.

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