WHY DO EUROPEANS WORK (MUCH) LESS? IT IS TAXES AND GOVERNMENT SPENDING

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We develop and calibrate a theoretical model that explains per capita hours worked and output growth as a function of three fiscal policy variables. Differences in income taxes, productive government expenditures, and nonemployment transfers are sufficient to answer the question why Europeans work (much) less than Americans and why some Europeans work less than others. Differences in taste for leisure have little role to play given the actual variation of these three policy variables. (*JEL* E24, E62, J22, O41)

I. INTRODUCTION

The reason why Europeans work less than Americans is the subject of intense discussion in recent literature. Prescott (2004), Cardia, Kozhaya, and Ruge-Murcia (2003), and Roeger and De Fiore (1999) emphasize the negative effects of high taxes in Europe. Other authors, like Blanchard (2004) and Alesina, Glaeser, and Sacerdote (2005), point to differences in the desire for leisure. Cultural differences or differences in unionization and labor market regulations may be at the basis of a higher European taste for leisure. Freeman and Schettkat (2005) explain higher employment in the United States as the result of a much more extensive shift of traditional household production to the market. Lower taxes on wages and higher degrees of labor market flexibility in the United States may be among the factors that have contributed to this shift.

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There is no doubt that these hypotheses contain relevant elements to account for the employment differences between Europe and the United States. However, they are also incomplete. First of all, each of these hypotheses will have difficulty explaining employment in the Nordic countries. Countries like Sweden, Norway, and Denmark also have high taxes, which increased during the last decades. According to Nicoletti and Scarpetta (2005), they also combine many of the European labor and product market rigidities. Yet, as we show in Table 1 for 1995–2004, the average employment rate in persons in the Nordic countries is about the same as in the United States. The employment rate in hours is lower than in the United States, but it is still much higher than in the core countries of the euro area or in ‘‘convergence’’ countries like Spain and Ireland. Second, these explanations ignore the other side of the performance gap between Europe and the United States. They neglect per capita growth differences. A coherent theory should also be able to explain why in the last decade most of the core countries of the euro area have had lower potential per capita growth than the United States, while again several

ABBREVIATIONS

APW: Average Production Worker
GDP: Gross Domestic Product
OECD: Organisation for Economic Co-operation and Development
R&D: Research and Development

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of the Nordic countries have performed at least as well as the United States or even better (Table 1).[1]

Our contribution in this paper is double. First, we explain not only employment differences between the United States and Europe, as most of the above-mentioned literature does, but also employment differences within Europe.[2] Second, our explanation also accounts for per capita growth differences. A critical explanatory variable in our analysis is the composition of fiscal policy. Taxes are important, but not only taxes. The allocation of government spending to productive or nonproductive purposes is at least as important. By contrast, our results would suggest that any differences in taste for leisure or labor market rigidity are not critical.

The structure of the paper is as follows. In Section II, we develop a theoretical model that explains both employment and long-run growth within a coherent framework. We basically build on seminal work by Barro (1990). We show the impact of income taxes, transfers in the case of nonemployment and productive government expenditures. In Section III, we calibrate the model on actual data and compare its predictions with the facts reported in Table 1. It should be clear from the outset that we take fiscal policy differences across countries as given. We investigate their effects on employment and growth, but we do not try to explain why policy differs. This approach is not unusual in related literature like Roeger and De Fiore (1999), Cardia, Kozhaya, and Ruge-Murcia (2003), and Prescott (2004). Section IV concludes the paper. Anticipating, we find that our model explains well. Employment in the United States is higher than in the core euro area thanks to lower income tax rates and much lower transfers in the case of nonemployment. The Nordic countries have higher employment than the core euro area mainly thanks to a higher share of productive government expenditures and lower nonemployment transfers. The combination of high taxes, high nonemployment transfers, and relatively low productive government expenditures also clarifies why many core euro area countries have the lowest per capita growth rates. High productive expenditures and slightly lower taxes, financed by lower transfers, explain the relatively good growth performance of the Nordic countries. Growth in the United States is less outstanding mainly due to relatively low productive government expenditures.

II. THE MODEL

We investigate the relationship between fiscal policy, employment, and growth in a simple endogenous growth framework. We extend Barro (1990) by endogenizing the decision to work and by allowing two kinds of government expenditures: productive government expenditures and transfers related to nonemployment, where it should be recognized that nonemployment is a structural or equilibrium phenomenon in our model. Given ample empirical evidence that transfers related to structural nonemployment are a major determinant of (un)employment and growth, we consider their introduction to be a major strength of our model.[3]

Set-up of the Model

Consider a closed economy consisting of N identical individuals with infinite lives and perfect foresight and N identical perfectly competitive firms. Population is constant. Assuming an equal number of individuals and firms, each firm's output equals per capita output.

Firms. Firms produce output by using physical capital and effective labor. The production function exhibits constant returns to scale, which allows us to focus on a representative firm.

1. Growth differences are even more pronounced if one considers average actual real per capita growth over 1995–2004 as an indicator for potential growth. In the four Nordic countries, average actual growth was 2.47% in this period. In the six core euro area countries, it was only 1.72% and in the United States 1.98%.

2. Daveri and Tabellini (2000), Rogerson (2007), and Ragan (2004) also recognize the better performance of the Nordic countries. Daveri and Tabellini emphasize the higher degree of coordination or centralization in Nordic wage bargaining. However, a tendency toward decentralization since the mid 1980s, especially in Denmark and Sweden (OECD, 2004b), may make this explanation less convincing now. Rogerson (2007) and Ragan (2004) also pay attention to the expenditure side of fiscal policy. None of these two studies, however, explain both employment and growth within a coherent theoretical framework.

3. See the evidence provided by Blanchard and Wolfers (2000), Arjona, Ladaique, and Pearson (2002), Nickell, Nunziata, and Ochel, (2005), and Lindert (2004).

TABLE 1
Employment and Growth: Europe and the United States (1995–2004)

	Employment Rate Persons (%)[a]	Employment Rate Hours (%)[b]	Real Per Capita Potential GDP Growth (Average Annual, %)[b]
Core euro area			
Austria	68.7	56.4	1.85
Belgium	58.9	48.2	1.81
France	61.0	48.1	1.77
Germany	65.6	50.3	1.38
Netherlands	71.0	50.3	2.18
Italy	54.6	45.8	1.44
Average	**63.3**	**49.8**	**1.74**
Nordic countries			
Finland	65.8	59.9	2.21
Denmark	76.3	58.6	1.92
Norway	78.0	56.0	2.71
Sweden	74.3	62.4	1.85
Average	**73.6**	**59.2**	**2.17**
Convergence EU			
Spain	55.8	52.7	2.29
Portugal	70.8	64.1	2.05
Ireland	62.6	55.6	5.22
Average	**63.1**	**57.4**	**3.17**
United States	**75.1**	**71.3**	**1.93**
United Kingdom	72.7	64.9	2.14

Notes: Employment rate in persons is the ratio of total employment to population of age 15–64 yr. Employment rate in hours is the ratio of average annual hours worked per person of age 15–64 yr to 1920. It has been calculated as the employment rate in persons times the ratio of average annual hours per employed worker to 1920. We consider 1920 to be the number of hours of a full-time worker (48 wk times 40 working hours per week). Per capita GDP is GDP per person of age 15–64 yr.

Sources: [a]OECD, Department of Employment and Social Affairs, historical series; [b]OECD (2005a).

$$(1) \qquad y_t = k_t^{1-\beta}(h_t l_t)^\beta,$$

where y_t, k_t, and $h_t l_t$ stand for output per capita, physical capital per capita, and effective labor per capita at time t, respectively. The evolution of physical capital is determined by the individuals' consumption and saving behavior, to be discussed below. Effective labor depends on hours worked per capita (l_t) and on effective human capital per capita (h_t). Effective human capital increases both in accumulated schooling or training and in the productive efficiency of accumulated schooling. It is our assumption that effective human capital is driven by per capita productive government expenditures (g_t). It does not depreciate over time.

$$(2) \qquad \dot{h}_t = q g_t \qquad q > 0$$

with q a constant productivity parameter. Obvious components of g_t are education spending, active labor market expenditures, public fixed investment, and research and development (R&D) expenditures. The former two components directly contribute to more human capital being accumulated; the latter two will mainly raise the productive efficiency of accumulated human capital. Individuals and firms take g_t to be exogenous.

Firms hire labor and physical capital up to the point where their marginal products equal the real wage per hour and the real interest rate, respectively.

$$(3) \qquad \begin{aligned} w_t &= \beta k_t^{1-\beta} h_t^\beta l_t^{\beta-1} = \beta h_t (h_t l_t / k_t)^{\beta-1} \\ r_t &= (1-\beta)(h_t l_t / k_t)^\beta \end{aligned}$$

Individuals. The representative individual's welfare is given by the intertemporal utility function:

$$(4) \qquad U = \int_0^\infty [\ln(c_t) + a\ln(1-l_t)]e^{-\rho t}\,dt \quad \text{with } a>0$$

where c_t is per capita private consumption at time t and l_t per capita hours worked in the market sector. $\rho > 0$ is the pure rate of time preference. To keep things simple, we normalize the maximum number of hours to 1. By consequence, $(1-l_t)$ indicates per capita hours devoted to useful nonmarket activities and leisure. The felicity function is assumed to be log-linear in both arguments. The parameter a specifies the relative value of nonmarket activities and leisure versus private consumption. In what follows, we will define l_t as the employment rate.

Individuals will maximize Equation (4), subject to the resource constraint

$$(5) \qquad \dot{k}_t = (1-\tau)(w_t l_t + r_t k_t) + b_t(1-l_t) - c_t + z_t = (1-\tau)k_t^{1-\beta}h_t^{\beta}l_t^{\beta} + b_t(1-l_t) - c_t + z_t$$

with k_t the individual's capital holdings, τ the income tax rate, b_t a per capita transfer related to working less, and z_t a lump sum transfer paid by the government. Like human capital, physical capital is assumed not to depreciate.

Government. The government runs a balanced budget. In per capita terms,

$$(6) \qquad g_t + b_t(1-l_t) + z_t = \tau y_t.$$

Following Roeger and De Fiore (1999), we assume that the government claims a given fraction of output for productive expenditures. Algebraically,

$$(7) \qquad g_t = \sigma y_t \quad \text{with } \sigma > 0.$$

Transfers related to nonemployment are nonproductive. They are an unconditional source of income support for inactivity (leisure) and nonmarket household activities. Although it may seem strange to have such transfers in a model without involuntary unemployment, one can analyze their employment and growth effects as a theoretical benchmark case. Moreover, there is also clear practical relevance. Unconditional or quasi-unconditional benefits related to structural nonemployment are a fact of life in most European countries (see Table 2 below). In Equation (8), we assume that the government transfer b_t is proportional to after-tax per capita labor income according to the replacement rate, v.

$$(8) \qquad b_t = v(1-\tau)\beta y_t.$$

Substituting Equations (7) and (8) into Equation (6), we can rewrite the budget constraint as:

$$(9) \qquad z_t/y_t = \tau - \sigma - v(1-\tau)\beta(1-l_t).$$

Optimization. The individual's optimization problem concerns choosing c_t and l_t to maximize lifetime utility, subject to the resource constraint (Equation 5) and taking g_t, z_t, b_t, and τ as given. The present value Hamiltonian for this problem is:

$$H_t = [\ln(c_t) + a\ln(1-l_t)]e^{-\rho t} + \lambda_t[(1-\tau)k_t^{1-\beta}h_t^{\beta}l_t^{\beta} + b_t(1-l_t) - c_t + z_t].$$

The first-order conditions yield three equations describing optimal behavior for given g_t, z_t, b_t, and τ. After dropping the time subscripts, this implies

$$(10) \qquad \gamma_c = \dot{c}/c = (1-\tau)(1-\beta)(hl/k)^{\beta} - \rho$$

$$(11) \qquad \gamma_k = \dot{k}/k = [(1-\tau) + (b/y)(1-l) + (z/y) - (c/y)](hl/k)^{\beta}$$

$$(12) \qquad a/(1-l) = [(1-\tau)\beta k^{1-\beta}h^{\beta}l^{\beta-1} - b](1/c).$$

Equation (10) is the usual Euler equation for the optimal growth rate of consumption over time γ_c. This equation describes intertemporal optimality. Agents decide to invest more (i.e., to have a higher growth rate of consumption over time), the higher the after-tax marginal product of physical capital and the lower the rate of time preference. Equation (11) follows from the household's resource constraint (Equation 5) after dividing both sides by k and using the result that $(y/k) = (hl/k)^{\beta}$. Equation (12) describes the intratemporal optimality condition between labor (consumption) and "leisure." The left-hand side of this equation represents the marginal utility of nonemployment; the right-hand side is the net marginal utility of working. The latter rises in the marginal utility of consumption ($1/c$) and in the net marginal after-tax income gain induced by employment $[(1-\tau)\beta k^{1-\beta}h^{\beta}l^{\beta-1}-b]$.

In order to find equilibrium growth and employment rates in terms of the parameters of the model, we first rewrite Equation (2) using that $g = \sigma y$. This yields an equation for the growth rate of effective human capital

$$\dot{h}/h = \gamma_h = q\sigma(y/h) = q\sigma l(hl/k)^{\beta-1}$$

from which we can derive an expression for $(hl/k)^{\beta}$.

$$(hl/k)^{\beta} = [ql\sigma/\gamma_h]^{\beta/(1-\beta)} \tag{13}$$

Next, using Equation (8), we can rewrite the intratemporal optimality condition (Equation 12) as an equation for c/y.

$$c/y = (\beta/a)[(1-l)(1-\tau)((1/l)-v)] \tag{14}$$

Our final equation for intertemporal optimality (Equation 15) follows from substituting Equation (13) into the Euler Equation (10). Substituting Equations (8), (9), (13), and (14) into Equation (11) yields Equation (16) which is consistent with intratemporal optimality, private agents' resource constraint, and government budget balance.

$$\gamma_c = (1-\tau)(1-\beta)[ql\sigma/\gamma_h]^{\beta(1-\beta)} - \rho \tag{15}$$

$$\gamma_k = [ql\sigma/\gamma_h]^{\beta/(1-\beta)}[1-\sigma-(\beta/a)(1-l) \times (1-\tau)((1/l)-v)] \tag{16}$$

Since along the economy's balanced growth path, the growth rates of per capita consumption, output, physical capital, and human capital are all equal ($\gamma_c = \gamma_k = \gamma_y = \gamma_h$), Equations (15) and (16) allow us to determine the equilibrium values of γ and l, consistent with individual optimization, firm optimization, and the government budget constraint. Note that it is not possible to solve the model analytically. We will solve it numerically for realistic parameterizations.

III. EMPLOYMENT AND GROWTH IN EUROPE AND THE UNITED STATES

In this section, we test the ability of our model to explain the cross-country employment and growth differences that we have reported in Table 1. We first discuss the choice of structural parameter values. Then, we describe relevant fiscal policy data and assess the explanatory power of the model.

A. Parameters

In order to find numerical solutions for our model, we have chosen specific values for the structural parameters. Following among others Barro (1990), we have set the time preference rate ρ at 0.02. The physical capital share coefficient $(1-\beta)$ is assumed to be equal to 0.4. The productivity parameter q and the relative weight of leisure in the felicity function a have been determined by calibration. We have calibrated values for these parameters such that with average levels of the observed fiscal policy parameters v, τ, and σ in the group of core euro area countries and Nordic countries, the model correctly predicts the average of these countries' employment and growth rates in 1995–2004 (employment in hours). The weight of leisure in the felicity function a has been set at 0.21 and the productivity parameter q at 0.12. Our calibrated value for a is very low compared to the value of 1.54 assigned to this parameter by Prescott (2004). Turnovsky (2000), however, assigned a relative weight of 0.3 to leisure. Moreover, Prescott's choice of a very high relative weight of leisure is one of the elements underlying the criticism raised by Alesina, Glaeser, and Sacerdote (2005) that the elasticity of hours worked with respect to the wage and with respect to taxes is excessively high in Prescott's study.

B. Description of Fiscal Policy Data

Table 2 describes key characteristics of fiscal policy in 1995–2001. All reported data are averages of the available annual data in that period. Appendix 1 contains more details. In our discussion here, we focus on the core countries of the euro area, the Nordic countries, the United States, and the United Kingdom.

Our proxy for the income tax rate concerns the total tax wedge on labor, for which we report the marginal rate in percent. The data confirm the general perception of much higher tax rates in the core euro area and the Nordic countries than in the United States or the United Kingdom. In the next section, we will also take capital tax rates into account as a robustness test of our results.

Governments in the Nordic countries allocate by far the highest fractions of output to productive expenditures. We include four categories: public expenditures on education, public expenditures on active labor market policy, government-financed R&D expenditures, and government fixed investment. Productive expenditures in percent of gross domestic product (GDP) are the lowest in the United Kingdom. The United States and the core countries of the euro area take intermediate positions. Finally, the core countries of the euro area pay the highest net transfers related to structural nonemployment. Structural nonemployment is here defined as unemployment for at least 5 yr. In each country, v is (much) higher than 40%. The only exception is Italy. In the Nordic countries, the net transfer replacement rate is below 40%, with now Finland being the only exception. Transfers to structurally nonemployed are by far the lowest in the United States.

TABLE 2
Fiscal Policy in Europe and the United States (1995–2001)

	Proxy for		
	Marginal Tax Rate on Income (τ, %)[a]	**Productive Government Expenditures (σ, % of GDP)[b]**	**Net Transfer Replacement Rate (v, %)[c]**
Core euro area			
Austria	56.2	9.1	62.3
Belgium	67.4	8.3	60.2
France	50.6	11.1	52.2
Germany	61.8	8.7	61.5
Netherlands	54.5	10.3	44.8
Italy	56.1	8.9	28.5
Average	**57.8**	**9.4**	**51.6**
Nordic countries			
Finland	59.4	11.8	62.3
Denmark	50.8	12.4	39.8
Norway	46.4	12.2	23.2
Sweden	51.5	13.5	37.8
Average	**52.0**	**12.5**	**40.8**
EU convergence			
Spain	45.0	9.1	21.7
Portugal	39.6	10.8	35.3
Ireland	42.5	10.2	63.3
Average	**42.4**	**10.0**	**40.1**
United States	**34.7**	**9.6**	**15.3**
United Kingdom	39.4	7.3	40.8

Notes: A brief description of all variables is given in the main text. For more details on calculation and underlying assumptions, see Appendix 1. The net transfer replacement rate in Italy has been set equal to the average in Spain and Portugal (see motivation in Appendix 1).

Sources: [a]OECD (2005b); [b]see Appendix 1; [c]OECD, tax-benefit models. Data kindly provided by D. Paturot (OECD).

C. Explaining Employment and Growth Differences

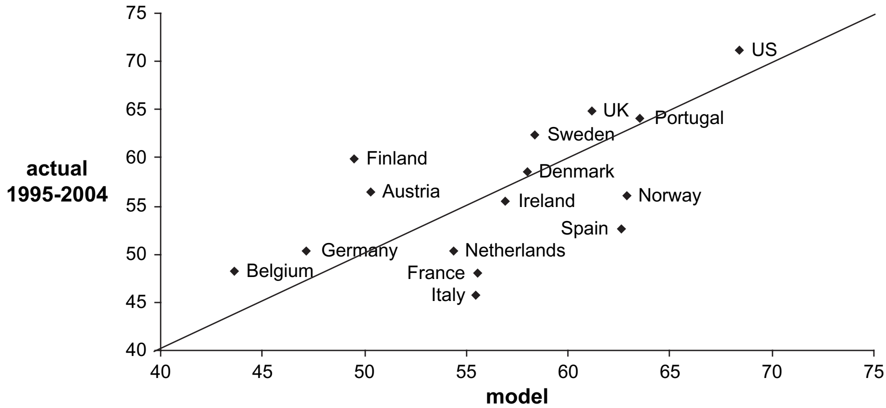
Using the fiscal policy data of Table 2, Figures 1 and 2 now assess the explanatory power of our model for all countries in our sample. Figure 1 depicts predicted and actual employment rates in hours. Actual employment rates are averages for 1995–2004. Predictions are based on the values for β, ρ, a, and q as mentioned above and on true values for the fiscal policy parameters τ, σ, and v in 1995–2001.

Correlation in Figure 1 is quite strong ($R = 0.62$). Our model correctly predicts the highest employment rate in the United States and a relatively strong employment performance in the Nordic countries and the United Kingdom in comparison with the core countries of the euro area. The rather poor employment performance of the latter group of countries is also correctly predicted by our model. Clearly, these results support the hypothesis that our model—with the imposed parameter values—is capable of explaining structural differences in the employment rates across countries. Moreover, all countries are reasonably close to the 45° line. Only for Finland and Italy, the gap is bigger than 7 percentage points.

Our model does a fairly good job also in explaining per capita potential growth. Correlation in Figure 2 between actual growth in 1995–2004 and predicted growth is only 0.25. However, if we exclude Ireland, correlation rises to 0.49.[4] Our model correctly

4. Our model has clearly the biggest difficulty explaining growth in Ireland. Considering recent work by Honohan and Walsh (2002), however, we should not take this difficulty too seriously. Honohan and Walsh point to the exceptional—and unlikely to be repeated—nature of the very high Irish growth in the second half of the 1990s. In line with this, OECD data for the more recent period 2002–2005 reveal an average annual per capita potential growth rate of "only" 3.5%.

FIGURE 1
Employment Rates in Hours in Individual Countries, in %, 1995–2004

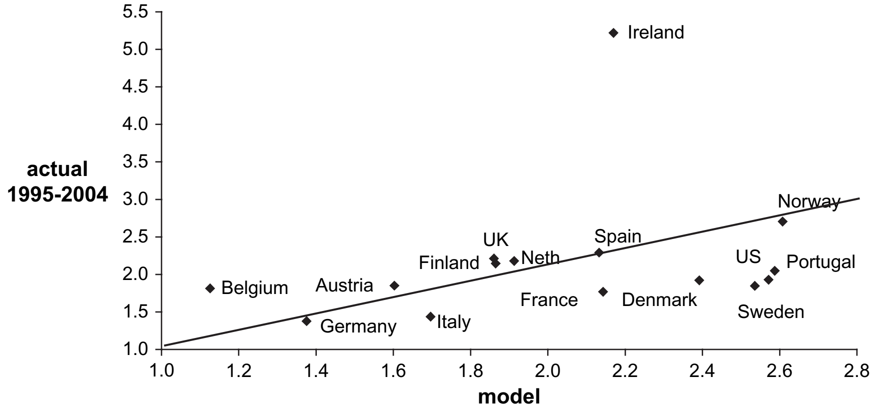


Notes: The added solid line is the 45° line.

predicts a relatively strong growth performance in the Nordic countries and, to a lesser extent, the United States in comparison with the core countries of the euro area. Two-thirds of the countries are within a relatively narrow band of 0.35 percentage points from the 45° line, and all but Ireland are within 0.7 percentage points of the 45° line.

The reason for high employment in the United States and low employment in the core countries of the euro area is obvious from our model. The United States impose low income tax rates and pay the lowest benefits to structurally nonemployed individuals. As a consequence, the net return to working is high. Countries like France, Germany, and Belgium do exactly the opposite, implying a low net return to working. Up to here, our results broadly confirm the idea of taxes being the main cause of employment differences at both sides of the Atlantic, as in Prescott (2004). However, with a narrow focus on taxes, one

FIGURE 2
Per Capita Potential Growth Rates in Individual Countries, in %, 1995–2004



Notes: The added solid line is the 45° line.

cannot explain relatively high employment in the Nordic countries. The composition of government spending is at least as important. High income taxes need not reduce the net return to working if tax receipts are allocated productively, as they are in the Nordic countries. Productive government expenditures directly raise pretax labor income by contributing to higher effective human capital. Indirectly, since higher human capital raises the marginal product of physical capital, productive government expenditures will also promote physical capital formation, which implies an additional favorable effect on pretax labor income and the net return to working. The relatively productive allocation of tax receipts in the Nordic countries, compared to the core euro area, is furthermore reflected in lower nonemployment benefits (except in Finland). Paying lower benefits also promotes the net return to working.

Our theory also allows us to explain growth differences across countries. Growth is low in many core countries of the euro area for more than one reason. First, relatively low productive government expenditures imply relatively weak accumulation of effective human capital. Second, high income tax rates, low employment, and relatively low effective human capital all imply a low net marginal product of physical capital. Given a low net return to investment, physical capital accumulation will also be weak. Growth in the United States will be higher thanks to lower income tax rates and higher employment. Both raise the net marginal product of physical capital, which will promote physical capital accumulation. Due to relatively low productive government expenditures, the contribution to growth of effective human capital accumulation will, however, be weaker in the United States. The strong growth performance of the Nordic countries on average can be explained from high productive government expenditures and relatively high employment. The former implies high effective human capital accumulation. The two together contribute to a high pretax return on physical capital. Physical capital accumulation may then be strong, despite high income tax rates.

D. Robustness

We have tested (and been able to confirm) the robustness of our results in various ways. First, we have used an alternative proxy for τ which reflects not only labor taxes but also capital taxes. This alternative is a weighted average of the marginal labor tax rate reported in Table 2 and the corporate income tax rate. Details are given in Appendix 1. Using this alternative τ does not affect correlation in Figure 1 between predicted and actual employment rates. Correlation in Figure 2 between predicted and actual growth rates rises to 0.56 (without Ireland). As a second robustness test, we have calibrated the structural parameters a and q on other countries/country groups. Successively, a and q have been determined such that our model correctly predicts employment and growth in the United States, in the Nordic countries on average, and in the core euro area countries on average.[5] Obviously, changes in the values for a and q affect the position of the individual countries around the 45° line in Figures 1 and 2. However, neither of these alternative calibrations change the correlation in these figures. In a third series of robustness tests, we have allowed variation in the imposed values for β between 0.4 and 0.8 and for ρ between 0.01 and 0.03. Again, we observe that changes in these parameters affect the position of countries vis-à-vis the 45° line, especially for growth, but they do not affect the correlation between actual and predicted employment and growth rates. A final robustness test reconsidered our assumption of identical taste for leisure (a) in all countries. Blanchard (2004) and Alesina, Glaeser, and Sacerdote (2005), for example, emphasize differences in the desire for leisure to explain lower employment in Europe. Although their argument may make sense for some countries, our results suggest that any differences in a are of minor importance. First of all, this conclusion should be clear from the high correlation that we observe in Figure 1 and in all of the above-mentioned robustness tests. Second, one may, however, also recognize in Figure 1 that our model overpredicts employment in countries like France, Italy, and Spain. Taking this observation as a starting point, we have recalibrated the structural parameters a and q on

5. These alternative calibrations, respectively, imply $a = 0.18$ and $q = 0.08$, $a = 0.19$ and $q = 0.11$, and $a = 0.23$ and $q = 0.14$.

average employment and growth in four separate groups of countries: Southern Europe (France, Italy, Spain, Portugal), Western Europe (Germany, Belgium, Netherlands, Austria), the four Nordic countries, and two Anglo-Saxon countries (United Kingdom, United States). These calibrations, respectively, imply $a = 0.28$, $a = 0.19$, $a = 0.19$, and $a = 0.18$. As soon as we control for the composition of fiscal policy, structural differences in the taste for leisure can at best play a role to explain lower employment in Southern Europe. It cannot explain differences among the other European countries or between Europe and the United States since for all these countries we find about the same a. Note that when we allow for group-specific a and q, correlation in Figure 1 rises to 0.79. In Figure 2, it becomes 0.50 (without Ireland). All these results are available from the authors upon request.

IV. CONCLUSIONS

This paper argues that the main reasons why Europeans work less than Americans are to be found in the level of income tax rates and the composition of government expenditures. As for the latter, the share of productive expenditures and the level of transfers in the case of (structural) nonemployment are critical. We build an optimizing model that allows us to investigate the influence of (differences in) these three fiscal policy variables on per capita hours worked and output growth. We find that the predictions of our model match fairly closely with actual cross-country observations for hours worked and per capita growth in Europe and the United States. The introduction to this paper and the previous section contain a summary of our main explanations.

APPENDIX 1. FISCAL POLICY DATA AND DATA SOURCES

Tax Rate on Income (τ).

Our proxy for the tax rate on income concerns the total tax wedge on labor, for which we report the marginal rate in percent. The data cover personal income taxes, employee and employer social security contributions payable on wage earnings, and payroll taxes. We have calculated the average of these marginal rates for three family situations. These family types are a single individual without children who earns 100% of the average production worker's (APW) gross wage, a married couple with two children where the main earner receives 100% of the APW gross wage and the secondary earner 33% of the APW gross wage, and a married couple with two children where the main earner receives 100% of the APW gross wage and the secondary earner 67% of the APW gross wage. As a robustness test, we have also calculated an alternative proxy for τ. This alternative is a weighted average of the marginal labor tax rate described above and the corporate income tax rate. Weights are $\beta = 0.6$ and $(1 - \beta) = 0.4$, respectively. We use statutory corporate income tax rates for 1995–2001 as reported by the Institute for Fiscal Studies (http://www.ifs.org.uk/publications.php). Data for Denmark have been taken from Danish Ministry of Taxation, http://www.skm.dk/, and KPMG Corporate Tax Rate Survey.

Net Transfer Replacement Rate in the Case of Nonemployment (v).

The data concern net transfers received by long-term unemployed people and include social assistance, family benefits, and housing benefits in the 60th month of benefit receipt. They also include unemployment insurance or unemployment assistance benefits if these benefits are still paid, that is, if workers can be structurally unemployed for more than 5 yr without losing benefit eligibility. This is the case in Austria, Belgium, France, Germany, Finland, Ireland, and the United Kingdom. Workers cannot be structurally nonemployed and still receive unemployment benefits in The Netherlands, Italy, Denmark, Norway, Sweden, Spain, Portugal, Switzerland, and the United States (OECD, 2004c). The data are expressed in percent of after-tax wages. They are an average for four family types and two earnings levels.

Original data provided by the OECD show a net replacement rate in Italy equal to 17%. However, as shown by Reyneri (1994), the gap between Italy and the other European countries is much smaller than it seems. Although unemployment benefits barely exist in Italy, this does not imply a zero fall-back position. Reyneri (1994) points to the importance of family support as an alternative to unemployment benefits. Furthermore, he emphasizes the existence of invalidity benefits as an additional mechanism of public transfers that the unemployed could receive. To correct for this, we have set the net replacement rate in Italy equal to the average net replacement rate in two other Southern European countries, Spain and Portugal.

Share of Productive Government Expenditures (σ).

The data in Table 2 are a sum of four categories: public expenditures on education, public expenditures on active labor market policy, government-financed R&D expenditures, and government fixed investment. Table A1 shows underlying details.

TABLE A1

Productive Government Expenditures (1995–2001, % of GDP)

	Public Education Expenditure[a]	Public Expenditures Active Labor Market Policy[b]	Government-Financed R&D[c]	Government Fixed Investment[c]
Austria	5.92	0.45	0.72	1.98
Belgium	4.73	1.34	0.44	1.76
France	5.83	1.29	0.86	3.10
Germany	4.67	1.33	0.80	1.95
Netherlands	4.97	1.53	0.75	3.05
Italy	4.78	0.81	0.52	2.73
Average	**5.15**	**1.12**	**0.68**	**2.43**
Finland	6.65	1.33	0.86	2.85
Denmark	8.27	1.67	0.69	1.80
Norway	7.35	0.96	0.70	3.15
Sweden	7.77	1.83	0.92	2.98
Average	**7.51**	**1.45**	**0.79**	**2.70**
Spain	4.67	0.70	0.35	3.41
Portugal	5.75	0.75	0.39	4.03
Ireland	5.33	1.38	0.46	3.01
Average	**5.25**	**0.94**	**0.37**	**3.48**
United States	**5.57**	**0.17**	**0.79**	**3.10**
United Kingdom	4.88	0.37	0.57	1.53

Notes: Since not all data are available for each country in the whole period 1995–2001, we report averages of all available annual data.

Sources: [a]OECD (2003, 2004a), UNESCO (http://www.uis.unesco.org); [b]OECD (2005a), OECD (2001, 2002); [c]OECD (2005a).

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