

Response to referee comments made on the paper titled “Welfare, employment and hours of work.”

We appreciate the reviewer’s effort. His comments are very useful.

First about our paper. The model, which is an application of the Pissarides-Mortensen model, shows why Europeans may like fewer hours of work in comparison to Americans: Strong unions, higher social benefits and more public consumption in Europe raise bargained wages relative to productivity, which raises the opportunity cost of leisure due to a higher level of consumption, consumption being time consuming. In effect, people enjoy their free time more because they have more consumer goods to play around with. Firms’ profits fall and they post fewer vacancies, which reduces employment. So instead of presuming cultural differences, as in Blanchard (2004), we try to explain the greater desire for leisure by Europeans using an insight about consumption requiring time that goes back to Becker. We also try to capture the hypothesis of Alesina, Glaeser, and Sacerdote (2006) that unions may be a cause of both fewer hours for employed workers and higher unemployment in Europe.¹

We are quite confident that the derivation of the model is correct. However, we agree that the exposition could be improved and the text certainly could be polished. Perhaps the paper can be made shorter.

¹ In our model unions would affect the bargaining power of workers.

Response to comments

The referee makes two points that we have to take very seriously. First, we have to motivate the analysis with more and better data. This should only strengthen the paper. The other point is to improve the formulation and justification of the utility function in light of the Becker analysis.

Below we address each of the points raised by the referee:

- We agree that the stylized facts need a more thorough delivery. Below there are tables with OECD data from 2000-2016 that show that the stylized facts described at the beginning of the paper are quite robust but these or other tables need to be added to a revised draft of the paper.

The tables show annual hours, unemployment rates, trade union density and social benefits to households for the period 2000-2016 taken from the OECD (www.oecd.org). Average hours in Europe are fewer than in the US, the UK and New Zealand (and Australia when it is included) and average unemployment is higher for the period 2000 to 2016. These are the stylized facts that the model is intended to explain.

We may want to go further back in time, perhaps to 1995 as the referee suggest but the picture is unlikely to change. And including more variables such as hourly productivity and tax rates sounds very sensible.

- It is too bad that a missing M in the text on page 5 of the paper leaves the reader frustrated and also that the two misplaced references in the list of references leave an impression of “sloppiness throughout the paper.” It is too bad because so much work has been invested in making the equations and analysis right. The analysis, although an application of the Pissarides-Mortenson model, is not completely straightforward, for example the derivations in the appendix.

We agree that the paper needs to be polished, especially the first part, starting with the motivation and the setting up of the model.

- The referee claims that the results are limited by modelling restrictions and that, specifically, the model assumes either no savings or perfect insurance against unemployment shocks and that both are very limiting and that the paper fails to admit these shortcomings.

The model does not have a time dimension, it is static. Workers do not save but there is a government that pays benefits to unemployed workers.

The same static property underlies the comparative statics exercise. We allow the government to increase benefits without changing other spending or taxes. This implies that the increased benefits are funded by a deficit on the government budget. But, and this may be a shortcoming, we leave out the intertemporal government budget constraint, the no-Ponzi conditions and so on because the model is static. We believe this is in the tradition of much work in this area, that one can change the level of benefits or taxes without simultaneously consider the future path of government debt and without workers taking that into account, that is to say workers do not internalize the government budget constraint.

- We now come to the utility function. This point is very useful and relevant.

The Becker paper from 1965 models consumption as a bundle of goods and the time needed to consume them. Thus a variable Z that gives utility – which can, for example, be defined as the experience of going to the theatre – entails both direct costs as well as sacrificed time that also has value. So Z is a function of consumption C and the time required for consuming C , which we can label T_C :

$$Z = f(C, T_C) \quad (1)$$

This is a household production function for Z . The bundle of time and consumption, Z , then yields utility:

$$U = U(Z) \quad (2)$$

Combining the two equations gives:

$$U = U(f) = U(C, T_C) \quad (3)$$

Becker assumes that there is a given amount of time needed for each level of Z and also a given amount of goods that has to be paid for in order to enjoy the experience of Z :

$$T_C = t_C Z \quad (4)$$

$$C = b_C Z \quad (5)$$

The cost of consuming a unit of Z then consists of the direct costs pC as well as the sacrificed wage income wT_C . The budget constraint then becomes: $Z(b_C P + t_C w) = Z\pi = Tw$ and utility maximisation gives:

$$U'(Z) = \lambda\pi \quad (6)$$

So the marginal utility of consuming the bundle of goods and time Z is equal to the marginal utility of income λ times the sum of the direct cost of consumption and the indirect cost in the form of sacrificed working time.

The utility function used in the present draft is

$$U(C, T_C) = C\phi(T_C), \quad \phi(1) = 1, \quad \phi' > 0 \text{ and } \phi'' < 0. \quad (7)$$

to use the same notation as in the Becker paper ($T_C = 1-h$ in our paper). Equation (7) corresponds to equation (3) in Becker above. What it has in common with the intuition of the Becker (1965) paper is that more leisure increases the marginal utility of consumption (buying a television gives more utility the more time you have to watch television) and increased consumption increases

the marginal utility of leisure (if you have a television set then it gives more utility to take time off from work). What it does not do is to lay out equations (1) and (2) above and explicitly specify the time and cost of consuming as in equations (4) and (5). So, as the referee points out, in Becker there is a home production function f that describes how people can enjoy a mixture of time and a television set and we do not have this. Instead, we say that the better the television set the greater is the utility of leisure.

Using our utility function, $\phi(T_C)$ can measure the ability to enjoy a television set, to continue with the same example. When $T_C=1$ we get $\phi=1$, which is the maximum utility one can get from the television set. Then as we reduce T_C to zero we get no utility from the television set because there is no time to watch it.

One way to revise the paper would be to add the Becker home production function into the model so that a given increase of consumption would automatically increase the time spent consuming. This might not be too difficult.

To conclude, this paper describes how social benefits, unions and public consumption can raise wages, reduce hours worked and lower employment in a Pissarides-Mortensen model of the labour market. It is a possible way to explain what Blanchard (2004) proclaims to be the greater desire for leisure by Europeans.

The paper needs to be polished but the derivations are to our knowledge correct and nothing that the referee says suggests otherwise. The missing M and the two misplaced references are unfortunate, but should not dissuade the reader from going through the model and making up his mind whether the insights are interesting.

Hours of annual work in dependent employment

Countries	2000	2002	2004	2006	2008	2010	2012	2014	2016
Europe									
France	1,445	1,401	1,430	1,417	1,447	1,439	1,441	1,425	1,423
Germany	1,360	1,345	1,335	1,344	1,340	1,310	1,301	1,300	1,298
Italy	1,696	1,672	1,657	1,652	1,653	1,616	1,580	1,566	1,577
Spain	1,705	1,723	1,700	1,675	1,668	1,667	1,654	1,643	1,653
Average	1,551	1,535	1,530	1,522	1,527	1,508	1,494	1,483	1,487
Comparison countries									
United Kingdom	1,680	1,668	1,642	1,644	1,642	1,632	1,638	1,667	1,660
United States	1,831	1,806	1,799	1,797	1,792	1,781	1,791	1,790	1,787
New Zealand	1,777	1,769	1,796	1,767	1,739	1,741	1,723	1,760	1,740
Average	1,763	1,748	1,746	1,736	1,724	1,718	1,717	1,739	1,729

Unemployment rate (%)

	2000	2002	2004	2006	2008	2010	2012	2014	2016
Europe									
France	..	..	8.5	8.4	7.1	8.9	9.4	10.3	10.1
Germany	7.8	8.7	9.8	10.3	7.5	7.0	5.4	5.0	4.1
Italy	10.6	9.0	8.0	6.8	6.7	8.4	10.7	12.7	11.7
Spain	13.9	11.4	11.0	8.5	11.2	19.9	24.8	24.4	19.6
Average	10.8	9.7	9.3	8.5	8.1	11.0	12.6	13.1	11.4
Comparison countries									
United Kingdom	5.6	5.1	4.7	5.3	5.6	7.8	7.9	6.1	4.8
United States	4.0	5.8	5.5	4.6	5.8	9.6	8.1	6.2	4.9
New Zealand	6.2	5.3	4.0	3.9	4.0	6.2	6.4	5.4	5.1
Australia	6.3	6.4	5.4	4.8	4.2	5.2	5.2	6.1	5.7
Average	5.5	5.6	4.9	4.7	4.9	7.2	6.9	5.9	5.1

Source: OECD (www.OECD.org)

Trade union density (% of labor force)

Countries	2000	2002	2004	2006	2008	2010	2012	2014	2016
Europe									
France	10.5	10.5	10.5	..	10.7	10.8	..	..	..
Germany	24.6	23.5	22.2	20.6	19.0	18.9	18.3	17.7	17.0
Italy	34.4	33.4	33.6	33.1	33.4	35.5	36.3	36.4	34.4
Spain	16.5	16.0	15.3	14.3	17.1	17.2	17.0	15.6	..
Average	25	24	24	23	23	24	24	23	26
Comparison countries									
United Kingdom	29.8	28.8	28.8	28.3	27.5	26.6	26.1	25.0	23.5
United States	12.9	12.8	12.0	11.5	11.9	11.4	10.8	10.7	10.3
New Zealand	22.4	21.8	21.7	21.8	21.4	21.4	20.3	18.5	17.7
Australia	24.7	23.1	22.7	20.3	18.9	18.3	18.2	15.1	14.5
Average	22	22	21	20	20	19	19	17	16

Social benefits to households (% of GDP)

Countries	2000	2002	2004	2006	2008	2010	2012	2014	2016
Europe									
France	16.8	17.2	17.4	17.6	17.6	19.2	19.5	20.0	19.9
Germany	17.4	18.0	18.1	17.1	15.8	16.7	15.6	15.4	15.4
Italy	15.8	15.9	16.2	16.3	17.0	18.6	19.3	20.2	19.9
Spain	11.7	11.6	11.6	11.3	12.3	15.1	16.2	16.5	15.6
Average	15	16	16	16	16	17	18	18	18
Comparison countries									
United Kingdom	11.3	11.7	12.1	11.7	12.4	14.3	14.5	13.8	13.4
United States	10.3	11.5	11.6	11.6	13.2	15.3	14.5	13.8	13.4
New Zealand	11.1	10.0	9.1	9.6	10.4	11.0	10.7	10.0	9.5
Australia	8.4	8.0	8.1	7.5	8.9	7.5	7.8	8.0	7.4
Average	10	10	10	10	11	12	12	11	11

Source: OECD (www.OECD.org)

Note: Since union coverage is much higher than density in France we omit France when taking the average of the trade union density numbers for Europe.