CENTRE for ECONOMIC PERFORMANCE

CEP Discussion Paper No 856

February 2008

Employment Outcomes in the Welfare State

L. Rachel Ngai and Christopher A. Pissarides

LSE THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Abstract
We examine the implications of tax and subsidy policies for employment in the "three worlds of welfare", Anglo-Saxon, Continental European and Scandinavian. We argue that home production is key to a proper evaluation of the employment outcomes. Anglo-Saxon low-support policies encourage more overall market employment. Continental transfer policies encourage more home production in services with close substitutes at home. Scandinavian policies give incentives to move home production in social services to the market but discourage other service activity. We find support for our claims in sectoral employment data for five representative countries, United States, Britain, France, Italy and Sweden.

Keywords: welfare state, employment, social services, tax and subsidy, three worlds of welfare
JEL Classification: E24, I38, J22

This paper was produced as part of the Centre's Macro Programme. The Centre for Economic Performance is financed by the Economic and Social Research Council.

Acknowledgements
Research assistance was provided by Eva Vourvachaki, Milan Lisicky and Urban Sila.

L. Rachel Ngai is an Associate of the Macro Programme at the Centre for Economic Performance and a Lecturer in the Department of Economics, London School of Economics. Christopher Pissarides is an Associate of the Macro Programme at the Centre for Economic Performance and Norman Sosnow Professor of Economics at the London School of Economics.

Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

ISBN 978-0-85328-249-5

1 Introduction

There are large differences across countries in the total number of market hours of work and in their distribution across sectors of economic activity and persons. Figure 1 shows total employment for OECD countries as a percentage of the population of working age. Even excluding Turkey, where employment rates are below 50 per cent, employment rates range from about 55 per cent to over 75 per cent. Most of this variation is due to employment rates for women. Figure 2 shows the employment rates for women. In the Scandinavian countries female employment rates are over 70 per cent, whereas in the Mediterranean countries and some East European countries they range between 40 and 50 per cent.

Some of these differences in employment rates are due to unemployment differences. But unemployment is not the whole story. Unemployment rates in the OECD rarely exceed 12-15 per cent of the labour force, and if they do it is only for short periods of time, whereas employment gaps are larger and more persistent. There has been a large amount of work aiming to explain unemployment differences in terms of differences in institutions across countries, and their role in the transmission of shocks to the labour market, but much less has been written for employment.[1] Our focus in this paper is welfare policy and employment differences. Although the welfare state is an important "institution" in the work on shocks and institutions across the OECD, our starting point is a related literature that attributes employment differences to differences in taxes.[2] We claim that although taxes do have an impact on decisions that have to do with the allocation of hours of work, their full impact can only be understood if the way the revenue from them is spent is also modelled and if due attention is paid to the type of market work that is taxed.[3] In particular, taxes will have a bigger impact on a particular economic activity if that activity has untaxed alternatives and they will have a bigger impact on a particular person's labour supply if that person has alternative uses of time that yield approximately the same marginal utility as market work.

We outline a model of the allocation of time to three uses, market work, home production and leisure, and show how the availability of close substitutes in home production increases the impact of taxes on market work. We model the impact of both taxes and expenditure associated with welfare policies. In order to do this we make use of two sectoral databases, the OECD *Social Expenditure Database* (SOCX) and the European Union's *EU KLEMS Growth and Productivity Accounts* (KLEMS). We show that taxes and expenditure have a large impact on the allocation of time to sectors that have close substitutes in home production, such as social work and unskilled services. But their impact is less in other sectors, such as manufacturing industry. The fact that more women are employed in the sectors that have the close home substitutes may also explain why the biggest differences in the allocation of time to the market are by women.

[1] See Nickell, Nunziata and Ochel (2005) and Blanchard (2006) for summaries of results and updates on unemployment differences. For an example of work aiming to explain relative employment patterns in terms of institutions see Bertola, Blau and Kahn (2007).

[2] See Prescott (2004) for the main claim and Daveri and Tabellini (2000), Rogerson (2006) and Faggio and Nickell (2007) for related work.

[3] Similar claims about the importance of expenditure are made by Rogerson (2007) and Ragan (2005).

Our focus are the policy differences in the "three worlds of welfare capitalism," (Esping-Andersen 1990, 1999): the Anglo-Saxon countries, with low taxes and transfers; continental Europe, with higher taxes and transfers; and Scandinavia, which, in the words of Lindbeck (1988, 1997), has "nationalized the family" with large market subsidies targeted to functions traditionally done within the family. We document the differences in time allocations in five representative countries, the United States, Britain, France, Italy and Sweden. They are all major countries that span the range of employment differences and belong to different clusters in the three worlds of welfare capitalism. Two are the main Anglo-Saxon countries, two are in the continental/southern European block, and the final is the leading Scandinavian country.

We find some striking differences in the allocation of time across economic activities, all of which concern service employment. Whereas employment outside the service sectors has converged in all countries to a low level of about 17% of the working age population, service employment rates range from about 60% in the United States to 40% in Italy. We do a decomposition of the differences in service employment rates (and hours of work) at the 2-digit industrial level and find that although - as one might expect - there are large differences between the Anglo-Saxon countries and the continental European countries in the size of the finance and business services sector, this is not the whole story. There are also large differences in employment in other sectors, in particular in the sectors which have close substitutes in "home production", such as childcare, looking after sick relatives and cooking and shopping.

Our focus is on the role of the state in explaining these differences in the allocation of time. Intuitively, our approach is that if an individual has the choice of either buying services in the market, or spending more time at home to produce similar services, she might choose the home if prices in the market are high. Government policy affects relative prices in a variety of ways, and through this channel influences household allocations between the home and the market. We study the role of this policy channel in generating differences in time allocations in the five countries in our sample.

In order to differentiate between different channels, we divide the economy into sectors which can be classified into three broad groups. In the first group we put all sectors that produce goods like manufactures or highly specialized business services, which can either be produced in the market or foregone altogether. In the second group we put health and social care, services which, if not bought in the market, could be produced to some extent at home. In the final group we have services such as cooking and cleaning, the traditional "home production" sectors, whose outputs are services which can be produced either in the market or by household members at home.

In the first "world of welfare capitalism", which in our sample includes the United States and Britain, we would expect to see large employment levels in all sectors and less home production time because of low taxation and regulation of market activity. In the second world of welfare capitalism, in our sample France and Italy, there is higher taxation and regulation, so we would expect to see low employment in the first group of sectors, and especially low employment in sectors 2 and 3, compensated by higher home production time. In the third world of welfare capitalism, represented in our study by Sweden, we would expect to see low employment in the first group of sectors because of high taxes, especially low employment in the third group of sectors compensated by

high home production time, but higher employment in the social care sector, because of the "nationalization" of the family - the elaborate system of support for market services connected with childcare and social work. We show that the broad employment trends in the data are consistent with these predictions.

Section 2 gives a brief preview of our approach to the problem of evaluating the employment implications of welfare policies and section 3 summarizes employment and hours of work in the five countries in our sample, making use of the KLEMS data set. Section 4 outlines our model of employment allocations with policy and draws out the policy predictions. Section 5 describes the main policy variables in the three worlds of welfare capitalism, making use mainly of the OECD's social expenditure database and presents a number of graphs that provide support for our arguments.

2 Brief description of the model and methodology

Our principal claim is that taxes and subsidies associated with welfare and other policies influence market economic activity differently in different sectors of the economy. The reason for the difference is that the impact that policy has on market activity depends on the alternatives that are available to the consumer. Loosely speaking, it depends on the demand elasticities for the output of each market activity. In the classic textbook case of the allocation of time between work and leisure the alternative to market activity is leisure time. The extent to which the individual withdraws hours from market activity when it is taxed depends on the elasticity of substitution between the aggregate final good produced by market work and leisure time. If the individual does not consider the taking of leisure a good substitute for consuming market-produced goods, taxes do not have a big impact on the number of market hours. In such cases the demand for the output of market time is inelastic.

We believe that when the only choices available are between market time and leisure time the elasticities of substitution are indeed small, and so the impact of taxation on market time is also small. However, a bigger impact is obtained when we consider a third use of time, home production.[4] Home-production time is work time spent either at home or elsewhere, so it does not yield direct utility. For utility purposes it is treated as market time. But the consumption of the output of home production time yields utility. The difference between the output of market time and the output of home time is that the latter is produced by the individual for her own use, or for the use of family members. It is not sold to someone else. Normally there is also a requirement that no part at all of the output of home production time is sold in the market, which is a stronger condition than the one just stated. For example, the farmer who consumes part of his produce is considered to be engaged in market activity and buying some of his output for his own use. But this principle is not applied to services because of the difficulty of distinguishing between home and market time in the data. For example, is the tax accountant who does her annual tax return on a weekend engaged in market

[4]Benhabib, Rogerson and Wright (1991) make a similar claim about the role of home production over the business cycle. Freeman and Schettkat (2005) find microeconomic evidence supporting our substitution claims.

Table 1:

Economic sectors and their composition

production and business services		health	other services
agriculture and allied	wholesale trade	health and social work	sale, motor repairs retail trade
mining and quarrying	air transport, post and telecom		hotels and restaurants
manufacturing	finance, insurance, real estate and business services		inland transport water transport aux. transport
gas, electricity, water	education		refuse disposal recreational, other personal
construction	membership organizations, media activities		
	public admin. and defence, soc. security		

All economic sectors in KLEMS are included except for the sector private households with employed persons, which is excluded from the analysis because of apparent inconsistencies in the data.

production but the lawyer who spends her time in exactly the same way engaged in home production? In time use surveys the time spent by each will be counted as home production time.

What type of activities are done in the home and which sectors of economic activity are likely to be affected by it? Historically many families produced food and other goods at home, through back-yard cultivation, the rearing of small animals and the making of clothes. But such production activities ceased to attract home time in modern industrial societies a long time ago.[5] In contemporary societies all home production goods are goods traditionally classified as services. Moreover, even within services, only services that do not require special skills can be done in the home. The main entries for home production time in modern time use surveys are shopping, childcare and other family care, cooking and cleaning.[6] These are all low-skill services that can be done by non-specialists. Business services such as the ones done by accountants, lawyers or real estate agents are not ones that have close substitutes in home production.

We therefore divide industrial sectors into two: manufacturing and business services, which have no substitutes in home production, and all other services, which have substitutes in home production. But given our interest in policy, we should also draw a

[5] The historical literature on home production is reviewed briefly in Ngai and Pissarides (2008).

[6] See Robinson and Godbey (1997) for extensive discussion of the American data and Burda, Hamermesh and Weil (2008) for a good study of some European countries.

distinction between sectors that are treated differently by policy within the two groups. The policy instruments that we study are the three main types of taxes, income tax, expenditure tax and employment (payroll) tax, employment subsidies (active labour market policies) and the subsidies associated with social policy. Partly because it is not possible to distinguish between the sectoral allocations of the taxes and employment subsidies, partly because of realism, we assume that all sectors are equally exposed to the first four instruments of policy, the three taxes and the employment subsidies. But social subsidies, when given in the form of goods, belong to the health and social care sector.[7] Thus, our service sectors are further subdivided into the health and social sectors on the one hand and other (low-skill) services on the other. Table 1 gives the two-digit classification of our three sectors. The biggest employment share in the other services category is retailing, which accounts for about 40% of the sector. Retailing is also the biggest single home production activity in time use surveys.[8] We include government employment in administration, defence and compulsory social security in business services, although in the model it is treated separately from the market sectors, being one whose wages are financed from taxation.

Next a decision has to be made about what social transfers to include as subsidies to the health and social care sector. Our approach is to isolate some transfers as subsidies and include all other government expenditure in a single category of "lump sum transfers".[9] Employment subsidies include the entry "active labour market programmes" in SOCX. Social subsidies include the following "benefits in kind": old age, incapacity-related benefits, and family. The main expenditure are on maintaining and running retirement homes, invalidity services and childcare services, all of which have close home substitutes.

3 Hours of work and employment across five countries

Although it is possible to construct time series data for all our variables since 1980, in this paper we focus on the cross-country differences in policies and outcomes. We do this as a first step towards the fuller understanding of employment and hours dynamics. As we show in Table 2, the changes that have taken place in hours of work and employment rates since the mid 1970s are of about the same order of magnitude as the cross-country differences in outcomes. For example, if we were to compare the United States with France, in the first decade in Table 2 US hours exceed French hours by 1, but in the

[7]Social subsides that are given in the form of unconditional transfers, e.g., in the form of income support or cash benefits for children but without conditions on how to spend it, are a separate category that is akin to lump sum transfer than subsidization of a particular sector.

[8]Retailing is not the typical example of home production that usually springs to mind. However, shopping time is a big fraction of home production time and it is obviously influenced by the number of employees in the retailing industry. In a country with more shops, more employees per square meter of retail space and longer opening times shopping time per item bought should be lower.

[9]In Prescott (2004) all tax revenue is treated as a lump sum transfer back to taxpayers. Ragan (2006) and Rogerson (2007) distinguish between different spending patterns.

Table 2:

Weekly hours of work and employment rates for population of working age, 15-64 years

	hours of work					employment rates				
period	US	UK	FR	IT	SW	US	UK	FR	IT	SW
1975-1984	23.5	24.6	22.5	22.0	23.6	66.5	68.5	63.6	57.4	78.4
1985-1994	25.1	23.7	19.5	21.5	24.1	71.8	68.6	59.8	55.4	77.9
1995-2004	25.6	23.8	18.9	21.2	22.8	72.4	70.1	61.6	54.6	71.4

last decade they exceed them by 6.8. We could either explain this as a cross-sectional difference of 6.8 hours in 1995-2004 or as a difference in the 30-year dynamic evolutions of about the same order of magnitude. Here we focus on the former dimension of the problem - given the economic environment in the last ten years of data, to what extent can taxes and subsidies associated with the welfare state account for the cross-sectional differences in employment outcomes? Of course, a model that claims to explain the cross-country differences in labour market outcomes should be able to explain them both in 1980 and 2004. But a study of the dynamics of hours or employment needs to allow variations across time and countries in more than welfare policies. In our view the most pressing need is to construct technology (TFP) time series for individual sectors, since, as we have shown in Ngai and Pissarides (2007), technology drives substitutions between home and sectorial market allocations over time. This is outside the scope of this paper.[10]

Some issues need to be discussed before we take a closer look at the recent data. Should we be looking at hours of work or employment rates? The hours of work that we report in Table 2 are total weekly hours divided by the population of working age, irrespective of their employment status. Of course, total hours are given by the product of employment and average hours of work for employed persons, so the picture that hours tell will be different from the one that employment tells only when employed persons work on average different hours across countries. This is the case in important cases in the data shown in Table 2. The most striking differences involve France, which has experienced a bigger fall in weekly hours than any other country. Comparing for example France and Italy, Italians work more hours but have lower employment rate. That means that employed Italians work much longer per week than employed French workers do.

One needs a model to explain such differences in the allocation of worktime between hours and persons. Our model is not designed to deal with this issue, so we cannot address it in an informed way. We conduct our analysis in terms of a representative agent of the working age population who decides to split her time between three activities, work in the market, work at home and leisure. For this reason, the variable that is closest to our analysis is the average number of hours of work for a typical person in the

[10]If we are right in claiming that technology is a driver for the evolution in hours allocations, then the closer the level of technological development in the countries in our sample the more justified we are in focusing on the partial question of the impact of policy on allocations. This guided to some extent the choice of countries and time period for our cross-sectional analysis.

Table 3:

Annual hours differences for population of working age, 15-64 years

	absolute differences				log differences			
sector	US-UK	US-FR	US-IT	US-SW	US-UK	US-FR	US-IT	US-SW
industry etc.	95	245	195	122	4.8	13.7	10.4	6.2
health soc. care	3	8	56	−59	1.0	3.1	30.0	−18.6
other services	−6	101	19	79	−0.8	17.6	2.8	13.0
total	92	354	269	141	3.3	13.3	8.2	5.1

population of working age. But because employment rates are more intuitive and they are usually the focus of policy (such as the European Union Lisbon targets) we will also give some data for employment rates.

Of course, if we were to find that on average the number of hours of market work, home work and leisure are about the same - which is not far off the truth if sleep and preparation time are ignored - this does not mean that each and every person of working age splits her time equally between the three activities. There is specialization within the household based on comparative advantage. We ignore this specialization, and aggregate the time spend by different household members into a representative-agent time allocation. Given, however, well known patterns in comparative advantage, we can discuss less formally whether the main effects that we identify are likely to affect men or women.

How do differences in hours of work across our countries compare with employment differences and participation differences? The log difference between hours of work in the United States and hours in each of the four European countries is, respectively, $3.3, 13.3, 8.2$ and 5.1. The employment differentials are, respectively, $2.5, 11.1, 18.1$ and 0.9. So in the cross-sectional comparison the divergencies between the two relate more to Italy and Sweden than to France. In Italy hours per worker are longer than in the United States, so the employment differential far exceeds the hours differential. In Sweden the opposite is true, so the hours differential exceeds the employment differential by a large margin. The participation rate differentials, obtained by adding the employment and unemployment rates for each country, are, respectively, $1.5, 5.5, 12.7$ and -1.3. So they are smaller than the employment differentials, as one might expect because of the higher unemployment rates in Europe, and in the case of Sweden participation exceeds that of the United States.

We now focus on the differences in hours of work. Table 3 shows the distribution of the differences in hours across the three sectors that we study. We report both absolute differences and log differences, and because the absolute numbers involved in weekly hours are small, we report differences in annual hours by multiplying the weekly hours by 52 and then rounding to the nearest integer. The absolute numbers are reported to show where the biggest differences in hours of work are across countries. However, the models used to explain differences in the supply of labour are not usually linear, so the prediction of the impact of taxes is not linear either. In the model of this paper taxes have proportional (log-linear) effects on the hours allocated in each sector, so the log

Table 4:

Annual hours differences in industry and business services

sector	US-UK	US-FR	US-IT	US-SW
industry	−4	41	−64	−4
FIRE	−6	68	94	84
wholesale trade	10	30	16	4
air trans &com.	−2	8	13	2
education	14	15	37	−13
org. activities	41	45	47	17
government	42	15	46	26

differences between hours allocations are more likely to capture the relative impact of policy.

Looking at the absolute differences in Table 3 it is clear that the biggest differences in hours of work in the countries of our sample are in the first sector. This, however, is due to the large size of that sector. In terms of the log differences other sectors dominate. Notable features of the differences include the very similar distribution between US and UK hours; the far greater allocation of hours in the Anglo-Saxon countries than in France in all economic activities except health and social care; the far greater allocation of hours in the Anglo-Saxon countries than in Italy in health and social care; and the larger number of hours allocated to health and social care in Sweden than elsewhere.

In the model in this paper the only differences that we consider across the countries in our sample are in their tax and subsidy polices. For this reason, and given what we said in the preceding section, our model cannot tell us how the differences in the distribution of hours within the first sector can be explained. Nevertheless, and mainly to prepare the ground for future work, we report in Table 4 a more detailed breakdown of the differences in hours within the first sector. We report only the absolute differences since we do not apply the model to these differentials.

Italy allocates more hours to manufacturing and other production industries than all the other countries, a sign perhaps that it is behind in the industrialization process that eventually diminishes the industrial sector. Finance, insurance and real estate accounts for a large fraction of the differences, with the notable exception of Britain, which employs more hours in this sector due to its large financial sector based in the City of London. But perhaps the most notable difference between the United States and the European countries in this comparison is in the size of government and "organizational activities". These activities include all activities connected with the political process, such as lobbying of politicians, representing professional or ethnic groups in politics, trade unions etc. Together with government, these two sub-sectors account for a large fraction of the differences in hours between the US and the European countries (in the case of Britain they account for 90 per cent of the difference). In order to understand why there is so much more employment in the United States in these sectors we need a political economy model, which we do not have here. But it is certainly an important topic for future work in explaining employment differences across countries.

4 The model

Preliminaries. Our theoretical model builds on the decompositions that we discussed in the preceding section. Figure 3 shows the way preferences are structured. Market goods are produced in all three sectors but home-produced goods are substitutes only for sectors 2 and 3. Our approach to solving for the time allocations is to solve first the consumer problem as a static maximization problem for a representative consumer with labour income w and no assets. We assume that all production functions are linear in labour, so there are no profits in equilibrium and all income is in the form of wages. We first obtain demand functions for all goods and subsequently obtain the time allocations from the demand functions and the production functions.

Government taxes or subsidizes market activities, makes implicit or explicit transfers to consumers, spends on final goods and employs labour. We assume that each market good is taxed at a rate t_i, which can be either positive or negative. In all sectors other than health and social care, t_i is common and equal to the expenditure tax (value added tax). The tax on health and social care, however, is net of the subsidy. The way the tax and subsidy are combined depends on the way that policy is structured. In the formal model we assume that there is a net tax rate t_2 that applies to the health and social sector only. For convenience of exposition we write also t_1 and t_3 for the VAT tax on the other two goods. Wage income is taxed at rate τ, which, as with goods taxes, is a proportional tax.

Governments make large per capita transfers, which we denote by T. Transfers include direct transfers, such as invalidity benefits, child benefits and the like, and goods and services bought or produced by the government and given to consumers either free or for a subsidized price, such as education and health. This assumption requires that goods bought or produced by the government are not in excess of what consumers would have bought, had they faced a free choice. If the representative consumer tops up government goods with her own demand, the marginal cost of additional consumption to the consumer is still the price plus the expenditure tax and the government transfer is equivalent to a lump-sum transfer. But obviously, if the government offered goods at zero price in excess of what the consumer would have bought at market prices, and there was no market for the resale of these goods, then the government's policy would amount to more than a lump-sum transfer. It would involve the subsidization of the sector that produces the good that is transferred. We do not take up this possibility.[11]

Government employment is added to the appropriate sector (e.g., government employment in education is added to the private education sector) and government employment in administration, defence and compulsory social security is assumed to yield utility separately from other consumer goods. We assume that government pays the

[11] The only "good" that one might argue that is offered in free supply is health, in countries that have a free health programme. But we doubt whether this is correct. Although consumers can get basic health care at zero cost in many countries, including some in our sample, there is also demand for private care in all our countries. Even in the absence of private care, a large increase in the demand for health care in countries with a national health service is met with long waiting lines, rationing of care according to urgency, and the like, which are equivalent to a shadow price that may well match the cost in private care for the representative agent.

same wages as the private sector, so we can ignore government employment in the consumer maximization problem. We treat government employment as a perfect substitute for private employment and the goods produced by government within each sector as perfect substitutes for the private goods in the sector. As we show below, under these assumptions the value of all goods either bought from the private sector or produced by government is equivalent to a lump-sum transfer to consumers. But spending on the wages of government employees is not equivalent to a transfer because it is paid in return for the sale of time, which yields utility to the worker. This implies that government spending on the wages of employees in the administrative civil service, defence and compulsory social security is not part of the transfer from the government to the private sector.

Our objective in this paper is to construct a tax-subsidy variable for each of our sectors, which we call the "tax wedge". The form that the tax wedge takes is dictated by the model, so we need to derive optimal decisions to arrive at the correct formula for the tax wedge. Following this we give the correlations between the sector's tax wedge and the cross-sectional allocations of hours of work, both in the market and the home. For the latter we need to use time use data, which we discuss after the development of the model.

The consumer problem. We assume a constant elasticity of substitution at each level of consumption shown in figure 3. At the top level preferences are given by

$$U\left(c, l_m, l_h, g\right) = \ln c + v(1 - l_m - l_h) + v_g(g), \tag{1}$$

where c is a consumption aggregate, l_m is market work, l_h is home work and g is the consumption of government goods that have no substitutes in private production (administration and defence). $v(.)$ is the utility of leisure and $v_g(.)$ the utility of government production. Aggregate consumption is a CES aggregate of consumption at the next level,

$$c = \left[\sum_{i=1}^{3} \omega_i \tilde{c}_i^{(\varepsilon-1)/\varepsilon}\right]^{\varepsilon/(\varepsilon-1)}, \tag{2}$$

where $\varepsilon \geq 0$ is the constant elasticity of substitution and $\tilde{c}_i$ is a composite good of market produce and home produced goods in each sector i. In sector 1 the composite $\tilde{c}_1$ is the market good c_1, which the consumer buys at price $(1 + t_1)p_1$. In sectors 2 and 3 it is a CES aggregate of market and home produced goods,

$$\tilde{c}_i = \left[\psi_i c_i^{(\sigma_i-1)/\sigma_i} + (1 - \psi_i) c_{ih}^{(\sigma_i-1)/\sigma_i}\right]^{\sigma_i/(\sigma_i-1)}, \tag{3}$$

where c_{ih} is the amount produced at home and $\sigma_i \geq 0$ is the elasticity of substitution between home and market production. We argued in Ngai and Pissarides (2007, 2008) that the elasticity of substitution ε is likely to be a very small number but the elasticities σ_i are likely to be fairly large (say 1.5 to 2.5). The reason is that whereas consumers do not substitute easily one good for another when the goods are defined broadly (e.g., all manufacturing goods versus all services) consumers are less picky when deciding whether to consume goods bought in the market or similar goods produced at home (e.g., home cooked food versus restaurant food).

Market work yields income which is spent buying goods at given prices. Because of perfect labour mobility between sectors, consumers are indifferent about the sector they enter as workers, so in the utility function we enter market work for the representative consumer as an aggregate l_m. All government employment is part of l_m. Work at home is divided into l_{2h} and l_{3h} according to the sector in which it is allocated. In order to clarify the role of government employment and purchases of goods and services, suppose government either buys or produces goods c_{ig} for each $i = 1, 2, 3$, and gives them free to households. Then the budget constraint is

$$\sum_{i=1}^{3}(1+t_i)p_i(c_i - c_{ig}) \leq (1-\tau)w\,(l_m + l_h) + T_0 \tag{4}$$

where T_0 are direct transfers. Define a generalized transfer from the government to the representative agent $T = T_0 + \sum_{i=1}^{3}(1+t_i)p_i c_{ig}$ to obtain the more conventional budget constraint

$$\sum_{i=1}^{3}(1+t_i)p_i c_i \leq (1-\tau)w(l_m + l_h) + T. \tag{5}$$

Thus, the government transfer includes direct transfers associated with the welfare state and all government spending on goods and services, but excludes direct subsidies conditional on spending on particular goods, which are part of the t_i,[12] and spending on the wages of employees used to produce the government good g, which is part of wl_m.

Home production functions are linear so the constraints on home production are

$$c_{jh} \leq A_{jh}l_{jh}, \quad j = 2, 3. \tag{6}$$

Write now l for total work, i.e., the sum of l_m and l_h. The consumer's "total" income is $(1-\tau)wl$. We can write the budget constraint as

$$\sum_{i=1}^{3}(1+t_i)p_i c_i \leq (1-\tau)wl - (1-\tau)w(l_{2h} + l_{3h}) + T. \tag{7}$$

Making use of the production constraints in (6) this becomes

$$\sum_{i=1}^{3}(1+t_i)p_i c_i + \sum_{i=2}^{3} p_{ih}c_{ih} \leq (1-\tau)wl + T, \tag{8}$$

where $p_{ih} = (1-\tau)w/A_{ih}$ for sectors 2 and 3 is a net implicit price for home produced goods. The numerator is the net wage that the household could get by supplying one unit of labour to the market and the denominator is the number of units of the home good that she could get by supplying the same unit to home production.

The consumer problem has now become the conventional problem of maximizing the utility function in (1)-(3) subject to the single constraint (8). We do not derive results

[12] The essential difference between the transfer component of government expenditure and the subsidy is that in the case of the transfer the consumer has no choice how much she gets, the government decides. In the case of the subsidy the consumer can get more of it by consuming more of the good that is subsidized.

explicitly but state some of the more interesting ones that can be compared to the data for the five countries in our sample.

The demand for leisure. The demand for leisure is given by the condition:

$$\frac{1}{v'(1-l)} - l = \frac{T}{(1-\tau)w}. \tag{9}$$

This equation brings out clearly the role of policy in the determination of overall work. If there are no lump-sum transfers, $T = 0$, then total work time depends only on the preference parameters in the $v(.)$ function. The choice of leisure is constant, as in the standard model with log utility. Importantly, this result shows that once $T = 0$, total work time and leisure are independent of the level of wage income and relative tax rates, so workers with different skills should choose to work the same number of hours. But even in this case, their allocations between market and home may differ. If $T \neq 0$ workers of different incomes and skills choose different allocations between total work and leisure. With positive transfers consumers with higher net wages work more hours and all consumers in countries with higher income taxes or transfers work fewer hours.

Marketization. We next solve for the "marketization" of consumption. The composite good $\tilde{c}_j$ can be acquired by buying some c_j from the market at price p_j, or by producing it at home as c_{jh} at a unit cost of p_{jh}. How does the consumer choose the division of $\tilde{c}_j$ between c_j and c_{jh}, or equivalently, how much of c_{jh} does she marketize? The answer to this question is obtained from the maximization of (3) subject to a given allocation $\tilde{c}_j$ and it is:

$$\frac{c_{jh}}{c_j} = \left(\frac{\psi_j}{1-\psi_j}\frac{p_{jh}}{(1+t_j)p_j}\right)^{-\sigma_j} \qquad j = 2, 3. \tag{10}$$

Recalling that $p_{jh} = (1-\tau)w/A_{jh}$, it follows that consumers marketize more of the home-produced good if they have higher net wages, if the market good is cheaper or if labour productivity in home production is lower. The impact of these parameters depends on the elasticity of substitution between the goods. If the market good is a very poor substitute for the home good the goods are consumed, in the limit , in fixed proportions. But if home and market goods are good substitutes for each other there could be a lot of differences in the marketization of home production across individuals, countries or over time, depending on the values taken by taxes and market prices. These are predictable properties and we return to them later.

Relative demand for market goods. We next solve for the relative demand for market goods, which we use to get market employment shares. The standard condition on the marginal rate of substitution between any goods i and j applies, so we first calculate the MRS between good 1, which is only a market good, and one of the other goods, denoted j. Differentiation of the utility function with respect to c_1 and c_j $(j = 2, 3)$ yields the MRS

$$\frac{\partial U/\partial c_1}{\partial U/\partial c_j} = \frac{\omega_1}{\omega_j}\psi^{\sigma_j(1-\varepsilon)/\varepsilon(\sigma_j-1)}x_j^{1/\varepsilon-1/\sigma_j}\left(\frac{c_1}{c_j}\right)^{-1/\varepsilon} \tag{11}$$

where x_j is derived from (3):

$$\begin{aligned}\tilde{c}_j &= c_j \psi_j^{\sigma_j/(\sigma_j-1)} \left[1 + \left(\frac{1-\psi_j}{\psi_j}\right)\left(\frac{c_{jh}}{c_j}\right)^{(\sigma_j-1)/\sigma_j}\right]^{\sigma_j/(\sigma_j-1)} \\ &\equiv c_j \psi_j^{\sigma_j/(\sigma_j-1)} x_j. \end{aligned} \tag{12}$$

It follows that the relative demand for market goods is given by

$$\frac{c_1}{c_j} = B^{\varepsilon}\left(\frac{(1+t_1)p_1}{(1+t_j)p_j}\right)^{-\varepsilon} x_j^{1-\varepsilon/\sigma_j}, \tag{13}$$

where B stands for the preference parameters in (11). Given the marketization condition (10) this gives the two relative demands in terms of relative prices, policy parameters and preference parameters. The relative demand for market good 1 is a decreasing function of its relative price and, under the plausible restriction $\varepsilon \leq \sigma_j$, a decreasing function of the extent of marketization of the alternative good.

The allocation of time. We can now use the conditions for the relative demands, (10) and (13), to obtain predictions about the allocation of time to alternative uses. For this we need to use the production functions and market clearing. The home production functions are given in (6). We assume also linear production functions for market goods, $c_i = A_i l_{im}$, where A_i is a technology parameter and l_{im} is the market time used to produce good i. The revenue from good i is used to pay for wages and employment taxes net of subsidies. Denote the net employment tax rate by t_e. Free mobility of labour implies that wages are the same in all market sectors, so relative market prices are given by the ratio of the technology parameters:

$$(1+t_e)w = p_i A_i \Longrightarrow \frac{p_i}{p_j} = \frac{A_j}{A_i}. \tag{14}$$

The relative price of the market good to the implicit price of the home good is also obtained from (14) and the condition $p_{jh} = (1-\tau)w/A_{jh}$:

$$\begin{aligned}\frac{(1+t_j)p_j}{p_{jh}} &= \frac{(1+t_j)(1+t_e)w/A_j}{(1-\tau)w/A_{jh}} \\ &= \frac{(1+t_j)(1+t_e)A_{jh}}{(1-\tau)A_j}. \end{aligned} \tag{15}$$

Returning to the relative demand equations we can now use (10) to get a simple log-linear relation for the marketization of time in sector j :

$$\frac{l_{jh}}{l_j} = \left(\frac{A_{jh}}{A_j}\right)^{\sigma_j - 1}\left(\frac{1-\psi_j}{\psi_j}\frac{(1+t_j)(1+t_e)}{1-\tau}\right)^{\sigma_j} \quad j = 2, 3. \tag{16}$$

We also use (13) in conjunction with (14) to get

$$\frac{l_1}{l_j} = B^{\varepsilon}\left(\frac{A_j}{A_1}\right)^{1-\varepsilon}\left(\frac{1+t_1}{1+t_j}\right)^{-\varepsilon} x_j^{1-\varepsilon/\sigma_j}, \tag{17}$$

with x_j now given by (see (12))

$$x_j = \left[1 + \left(\frac{1-\psi_j}{\psi_j}\right)^{\sigma_j} \left(\frac{A_{jh}}{A_j}\frac{(1+t_j)(1+t_e)}{1-\tau}\right)^{\sigma_j - 1}\right]^{\sigma_j/(\sigma_j-1)}. \tag{18}$$

Looking first at (16) we find that the marketization of time depends on preference parameters, technology and taxes. We define the "tax wedge" that applies to sector j as t_{wj} by

$$t_{wj} = 1 - \frac{1-\tau}{(1+t_j)(1+t_e)}. \tag{19}$$

Note that if all tax rates are small numbers this is approximately equal to the conventional tax wedge used in econometric studies, $t_{wj} = \tau + t_j + t_e$. But because taxes in our sample can be large, this approximation is not usually good. The marketization condition (16) implies that a sector with higher tax wedge will marketize less time, i.e., more of the output of sectors 2 and 3 will be produced at home. Moreover, the elasticity with which the relative time allocation responds to $1 - t_{wj}$ is constant and equal to the elasticity of substitution between market and home goods. The closer substitutes they are, the bigger the impact of the tax wedge.

Condition (17) also implies that if a sector has higher tax wedge, it will have less market employment relative to sector 1, of which there are no home substitutes. This is plausible since it says that when a sector has close home substitutes its market employment is affected more by taxes than is the employment of a sector without home substitutes. In addition, (17) says that the relative expenditure taxes on the two sectors influence their relative employment levels. If a sector is subsidized more, or taxed less, it will have a bigger employment level even when controlling for the marketization of the sector.

We now turn to data on the allocation of hours to market sectors, which we already discussed, and to time use surveys which give information on the allocation of time to home production.

5 Policy and the allocation of time

It is clear now from the discussion of the model in the preceding section that we need to construct a tax wedge for each sector and we need to obtain data on home production for the countries in our sample. The underlying assumption to comparing outcomes with the policy data is that in the 10-year period for which we are making the comparisons, 1995-2004, preferences and technology were about the same in the five countries in our sample, so cross-sectional differences in the allocation of time can be accounted for by policy differences. To the extent that either preferences or technology were not similar there will be lack of good correlations between policy and outcomes, at least in the simple charts that we use in this paper.

The tax rates in the model do not need further clarification, as empirical counterparts

Table 5:

The net tax wedge, 1995-2004

sector	US	UK	FR	IT	SW
non-health	0.29	0.33	0.45	0.45	0.53
health	0.24	0.21	0.30	0.40	0.08

are widely used in the literature.[13] The employment subsidy includes all the money governments spend to support employment, which appear in OECD statistics under the heading active labour market policies. The three tax rates and the employment subsidy are common to all sectors in the economy. The second subsidy is exclusively applied to the health and social care sector. This subsidy includes only expenditure which are specifically tied to the provision of social services, such as subsidized child care centres and retirement homes. The employment subsidy is reported in the literature as total money spent on measures to enhance employment as a percentage of GDP. We recalculate it here as the ratio of total money spent to the aggregate wage bill and deduct it from the employer tax rate. Thus, in terms of the notation of our model, t_e is now the OECD employer tax series minus the ratio of active employment measures to the wage bill. The social subsidy is applied specifically to one sector, so we derive the rate by dividing the total money spent on this subsidy by the gross output of the sector. Let this subsidy rate by s and let the gross expenditure tax rate be t_2^g. We assume that the net tax on this sector is obtained from the product $(1 + t_2^g)(1 - s)$, the reasoning behind it being that the consumer's expenditure in this sector is subsidized at rate s and then the remaining net spending is taxed at t_2^g. The net tax rate is then $t_2 = t_2^g - s - st_2^g$.[14]

The tax wedge for the first two sectors is the same but it is different in the third, because of the bigger subsidy that it receives. Table 5 reports the results of our calculations. Looking first at the tax wedge in the economy outside the health and social sector, the ranking and rates are at levels that one would expect. The United States has the smallest tax wedge followed closely by the United Kingdom. Then come France and Italy and finally Sweden, with the highest tax. But in the health and social sectors rankings change. In Sweden the implicit tax is very small because of the large subsidy received in the form of social services. The subsidy is much less in the other countries, especially in Italy and the United States. Given the tax wedge elsewhere, the implicit tax on social services is highest in Italy followed by France and then the United States and Britain.

We finally turn to the allocation of time within the household. Household time use surveys have proliferated recently but despite their widespread use they do not always give consistent statistics. There are two harmonized sources that we could use to get comparable cross-country data, the Multinational Time Use Survey (MUTS) and

[13] The original source is the OECD but an update that we use here is in the CEP/OECD data set. See W. Nickell (2006).

[14] Because the rates t_2^g and s are large in the countries in our sample, the results differ somewhat when t_2 is simply set equal to the difference $t_3^g - s$.

Table 6:

Weekly hours in time use surveys, ages 15-64

country and survey year	US 2003	UK 2000	FR 1998	IT 2002	SW 2001
market hours	31.4	27.5	24.5	25.9	31.0
all home hours	27.7	25.5	27.5	26.5	26.0
childcare	3.6	3.1	2.6	2.9	3.4
leisure	32.6	37.0	28.3	33.0	26.3
all work	59.1	53.0	52.0	52.5	57

Travel time is included in each category. All home work includes childcare. Education time is not included. For Sweden only the age group is 20-64.

Eurostat (2005). MUTS have comparable data for the United States, United Kingdom and France whereas Eurostat has comparable data for the four European countries. We decided to use the Eurostat data for the European countries and MUTS for the United States, although there are some differences in the numbers given for the two countries that overlap the two data sets. Data for the population over 15 give similar results to data for ages 15-64. We report data for the latter age groups only, to make it more comparable to the hours of work data in section 3.

Market hours in time use surveys are always higher than in other sources. One reason is that travel time to the place of work is counted as market hours in time use surveys. But comparing the results in Table 6 with those in Table 2 we find a difference for the five countries of 7.9, 2.9, 3.4, 3.9 and 7.4 hours per week respectively. The hours for the US seem too high to be plausible as work-related travel time. For Sweden the large difference might be explained partly by the fact that the time use survey refers to ages 20-64. We exclude education time from the Table. Sometimes researchers add education time to market hours.

The row headed leisure gives the time that respondents say they are engaged in leisure activities, the main one being watching television. The difference between the numbers for all activities given in Table 6 and the total number of hours in the week is taken up by "personal needs" (and education). The time taken up by personal needs such as sleep and preparation for the day's activities varies across some countries. For example it is higher in France, and to a lesser extent Italy, than in the other countries. We decided not to use the responses to the leisure activities question as our measure for leisure but to work instead with a total work and education variable as the non-leisure component of time. We felt that items such as how long one takes to get ready to go out are not "needs" but partly preparation for leisure activities.

We report three sets of graphs, following our analysis in the preceding section. The three sets are correlations between the policy variables and (a) total work, (b) the fraction of time that is marketized, and (c) the number of hours in the sectors that have home substitutes to the first and biggest sector. It cannot be overemphasized that with only five countries these are simply correlations to check whether the general trends suggested by the model have support in the data. They cannot be formal tests of any

model of the impact policy.

The policy variable that influences total work is the ratio of the total transfer from the government to the net wage rate. We constructed such a variable by taking all government spending and then deducting the social spending and the gross output of the administrative, military and compulsory social security sector. For total work we have measures that are constructed entirely from time use surveys, that include market work, home work and may or may not include education. The correlations between these series and the policy variable are not very strong but they are in the general direction of our preferred series for total work. The latter is a "leaner" series constructed by adding market hours from KLEMS and home hours from time use surveys. The correlation between it and the ratio of transfer to wages is shown in figure 4. The figure shows a good correlation between all work and the government transfer for the four countries excluding Sweden but Sweden, which has the biggest transfer, has more hours of work than would be predicted by the other four countries' experience. We will argue shortly that Swedish policy is such that more hours are marketized than in the other countries. In view of this, the puzzle with Sweden may not necessarily be why Swedes work so many market hours given the large transfers, but why do they work so many home hours, given the many market hours? Part of the explanation for this puzzle may be in the fact that our Swedish time use data is for people aged 20-64 and the excluded group of 15-19 year olds spends much less time on home production than other age groups. But it is not likely to be the whole story because of the numbers involved.

Next we turn to the marketization issue. Our model predicts a log linear relation between the ratio of market hours to home hours in a sector and one minus the tax wedge; see (16) and (19). The slope of the relation is the elasticity of substitution between home and market production in the sector. Figure 5 reports the correlation between the marketization in the health and social care sector with its tax wedge. We report also the equation for the line through the points to get a point estimate of the slope. The correlation is strong. The only country that does not completely conform to the model's prediction is France, where there is too much marketization. The reason is a very low number for home childcare in France in the one survey at our disposal. The slope of the line in figure 5 is 2, which is in the middle of the range of estimates of the elasticity of substitution between home and market goods found in the literature (see Ngai and Pissarides, 2008).

Figure 6 reports the correlation between the marketization in the sector of "other services" with its tax wedge. The reported correlation is reasonably good but not as good as in the health and social care sector. The main deviation is again in French data, but in contrast to the health and social care sector, here the marketization is too low, given its tax wedge. The slope of the line through the points is 0.84, suggesting a rather small elasticity of substitution between home and market production in these services. However, this is the point estimate of a large range consistent with the five points in the graph.

We finally turn to the model's prediction about the ratio of market hours in sector 1

and the other two sectors, shown in equation (17). Taking logs of this equation we find,

$$\log\left(\frac{l_1}{l_j}\right)+\varepsilon\log\left(\frac{1+t_1}{1+t_j}\right)=\left(1-\frac{\varepsilon}{\sigma_j}\right)\log x_j+\text{other variables.} \tag{20}$$

We then express $\log x_j$ as a function of $\log(l_{hj}/l_j)$ for $j=2,3$ and other variables that are functions of the parameters of preferences and technology. The interesting property of the model when we write relative market hours as in equation (20) is that the ratio of market hours in sector 1 to market hours in either sector 2 or sector 3 depends only on the expenditure tax in the two sectors and in the marketization in sector 2 or 3. Moreover, since the expenditure tax in sector 3 is the same as in sector 1, relative market hours in sector 1 to sector 3 depend only on the marketization of sector 3.

Figure 7 shows the correlation between the left-hand side of (20) and the log of home to market hours in sector 2. The coefficient ε was set equal to 0.1, as in Ngai and Pissarides (2008). The correlation between the two series is almost perfect. Interestingly, the expenditure tax ratio in the left hand side contributes to this correlation. As ε is increased in the plausible range given in Ngai and Pissarides (2008), from 0 to 0.3, the correlation increases, reaching 0.997 at $\varepsilon=0.3$. The main effect of increasing ε is to reduce the slope of the line, from 1 when $\varepsilon=0$ to 0.88 when it is $\varepsilon=0.3$.

Figure 8 repeats the correlation for sector 3, for other services. The correlation is not as good as in the health and social care sector but it is still confirmation that the model's predictions are not violated by the data. There is clearly a positive association between the ratio of market hours in sectors 1 and 3 and the non-marketization of services in sector 3, as predicted by the model.

6 Conclusions

Our motivation in this paper was the idea that the policies that governments follow to support social services influence the employment outcomes differently across sectors of economic activity. We have shown that in a representative sample of countries the Anglo-Saxon welfare policies of limited transfers and encouragement of market participation lead to more employment overall, especially when compared to the continental European policy of encouraging the family to look after dependents at home, through a more extensive unconditional system of social transfers. Both contrast with the Scandinavian policy of providing traditional family functions through market-based state-supported activities. The outcome in our representative countries is that whereas both continental European countries and Sweden have less employment in business services than Britain and the United States, Sweden has more employment in health and social care than the rest of the countries in the sample.

An obvious question is whether one welfare system is "better" than another, in some general social welfare sense. There can be no answer to this question, at least without specifying the welfare criteria. A first issue is the trade-off between market incentives and social support. There is no doubt that there is strong support in Europe for an elaborate system of social care. Anglo-Saxon systems encourage market activity with limited provision for system failures such as low pay, long-term unemployment

and disability. Whereas other European countries admire the market-based successes of the Anglo-Saxon world, it is doubtful whether they would be prepared to sacrifice their social support systems to achieve them. Contrasting the Anglo-Saxon system is the Scandinavian system, which encourages more market participation of low skilled workers, more equality and more women in the labour force, who become the providers of market-based social services. But the Scandinavian system requires higher taxes, which can be a disincentive to high-skill innovative activity.

A second issue is related to where society wants social services to take place. The predominant social services that come under welfare support are caring services - for children, the physically impaired and aged household members unable to look after themselves. Continental European systems encourage home support for these services, with the family given the main responsibility for looking after dependents. Scandinavian policies "nationalize" these family functions, by giving incentives to the family to offshore them to the market. Ignoring the public finance implications, the outcome in terms of the type of social service provided is different. In our approach to preferences we treated the outcomes as close but not perfect substitutes, and given our interest in the employment outcomes assumed that preferences are common across countries. But for social welfare comparisons preferences may differ.

In terms of public finances, all welfare policies involve some distortion, which is another factor in evaluating them. Continental European policies reduce the tax base by shifting more services away from the market and distort the choice between home-provided services and business services. For example, Italians work as much as the British, but in Britain market work, especially by women, attracts many more hours than in Italy. Because women have a comparative advantage in the supply of social services, more Italian and French women stay at home in response to the incentives given by their welfare systems, and more British and especially Swedish women enter the labour force. On the plus side the tax base is large because social services are moved to the market, but the subsidies needed to achieve this transfer are heavy and are financed by taxing other services, especially high-income business services. The implications of this for the location of services could become more disadvantageous for the high tax countries as the European economy becomes more integrated.

Ultimately the question is how does a country choose to support lower incomes? Anglo-Saxon policies encourage all market activity but Scandinavian policies encourage more low-skill activity. They both help lower-skill workers through the market but Scandinavian policies help them more through a system of subsidies. In this respect continental transfer policies are the least efficient because they push low-skill work to the home and support low incomes with cash transfers, which are both distortionary and reduce the tax base.

References

[1] Benhabib, J., R. Rogerson and R. Wright (1991). "Homework in Macroeconomics: Home Production and Aggregate Fluctuations." *Journal of Political Economy* 99: 1166-1187.

[2] Bertola, G., F. D. Blau, and L. M. Kahn (2007). "Labour Market Institutions and Demographic Employment Patterns." *Journal of Population Economics* 20: 833–867.

[3] Blanchard, O. J. (2006). "European Unemployment: The Evolution of Facts and Ideas." *Economic Policy* 21: 5-59.

[4] Burda, M., D. S. Hamermesh and P. Weil (2008). "The Distribution of Total Work in the EU and USA", in T. Boeri, M. C. Burda and F. Kramarz, *Working Hours and Job Sharing in the EU and USA: Are Europeans Lazy? Or Americans Crazy?* forthcoming

[5] Daveri, F. and G. Tabellini (2000). "Unemployment, Growth and Taxation in Industrial Countries." *Economic Policy* 30: 49-90.

[6] Esping-Andersen, G. (1990). *The Three Worlds of Welfare Capitalism,* Princeton: Princeton University Press.

[7] Esping-Andersen, G. (1999). *Social Foundations of Postindustrial Economies,* Oxford: Oxford University Press.

[8] Eurostat (2005). "Comparable Time Use Statistics: National Tables from 10 European Countries", *Working Papers and Studies*, Luxembourg: Office for Official Publications of the European Communities.

[9] Faggio, G. and S. Nickell (2007). "Patterns of Work Across the OECD." *Economic Journal* 117: 416–440.

[10] Freeman, R. B. and R. Schettkat (2005). "Marketization of Household Production and the EU-US Gap in Work." *Economic Policy* 1: 5-50.

[11] Lindbeck, A. (1988). "Consequences of the Advanced Welfare State". *World Economy* 11: 19-37.

[12] Lindbeck, A. (1997). "The Swedish Experiment", *Journal of Economic Literature*, 35: 1273-1379.

[13] Ngai, L. R. and C. A. Pissarides (2007). "Structural Change in a Multi-Sector Model of Growth", *American Economic Review*, 97, 429-443.

[14] Ngai, L. R. and C. A. Pissarides (2008). "Trends in Hours and Economic Growth", *Review of Economic Dynamics*, forthcoming

[15] Nickell, S., L. Nunziata, and W. Ochel (2005). "Unemployment in the OECD since the 1960s. What Do we Know?" *Economic Journal* 115: 1-27.

[16] Nickell, W. (2006). "The CEP-OECD Institutions Data Set (1960-2004)", Centre for Economic Performance, London School of Economics, Discussion Paper No. CEPDP0759, November.

[17] Prescott, E. C. (2004). "Why Do American Work So Much More than Europeans?", *Federal Reserve Bank of Minneapolis Quarterly Review*, 28: 2-13.

[18] Ragan, K. S. (2005). "Taxes, Transfers, and Time Use: Fiscal Policy in a Model with Household Production", University of Chicago mimeo.

[19] Robinson, J. P. and G. Godbey (1997). *Time for Life: The Surprising Ways Americans Use Their Time*. University Park, Pennsylvania: Pennsylvania State University Press.

[20] Rogerson, R. (2006). "Understanding Differences in Hours Worked." *Review of Economic Dynamics* 9: 365-409.

[21] Rogerson, R. (2007). "Taxation and Market Work: Is Scandinavia an Outlier?", *Economic Theory*, 32: 59-85.

CENTRE FOR ECONOMIC PERFORMANCE
Recent Discussion Papers

855	Carlo Rosa	Talking Less and Moving the Market More: Is this the Recipe for Monetary Policy Effectiveness? Evidence from the ECB and the Fed
854	Dimitra Petropoulou	Competing for Contacts: Network Competition, Trade Intermediation and Fragmented Duopoly
853	Barbara Petrongolo Christopher A Pissarides	The Ins and Outs of European Unemployment
852	Mirko Draca Steve Machin Robert Witt	Panic on the Streets of London: Police, Crime and the July 2005 Terror Attacks
851	Augustin de Coulon Jonathan Wadsworth	On the Relative Gains to Immigration: A Comparison of the Labour Market Position of Indians in the USA, the UK and India
850	Andreas Georgiadis	HRM Practices and Knowledge Processes Outcomes: Empirical Evidence from a Quasi-Experiment on UK SMEs in the Tourism Hospitality and Leisure Sector
849	Mirabelle Muûls Dimitra Petropoulou	A Swing-State Theory of Trade Protection in the Electoral College
848	Dimitra Petropoulou	Information Costs, Networks and Intermediation in International Trade
847	Bernardo Guimaraes	Optimal External Debt and Default
846	Javier Ortega Laurence Rioux	On the Extent of Re-Entitlement Effects in Unemployment Compensation
845	Richard E. Baldwin Frédéric Robert-Nicoud	A Simple Model of the Juggernaut Effect of Trade Liberalisation
844	Richard B. Freeman	Labor Market Institutions Around the World
843	Emma Hall Carol Propper John Van Reenen	Can Pay Regulation Kill? Panel Data Evidence on the Effect of Labor Markets on Hospital Performance
842	Fabrice Defever Farid Toubal	Productivity and the Sourcing Modes of Multinational Firms: Evidence from French Firm-Level Data
841	Barbara Petrongolo	What are the Long-Term Effects of UI? Evidence from the UK JSA Reform

840	Kevin D. Sheedy	Robustly Optimal Monetary Policy
839	Christopher A. Pissarides	The Unemployment Volatility Puzzle: Is Wage Stickiness the Answer?
838	Kevin D. Sheedy	Inflation Persistence when Price Stickiness Differs between Industries
837	Kevin D. Sheedy	Intrinsic Inflation Persistence
836	Andrew E. Clark Ed Diener Yannis Georgellis Richard E. Lucas	Lags and Leads in Life Satisfaction: A Test of the Baseline Hypothesis
835	Jean-Baptiste Michau	Creative Destruction with On-the-Job Search
834	Nikolaus Wolf	Scylla and Charybodis: the European Economy and Poland's Adherence to Gold, 1928-1936
833	Sharon Belenzon Tomer Berkovitz	Innovation in Business Groups
832	Espen R. Moen Åsa Rosén	Incentives in Competitive Search Equilibrium
831	Eran Yashiv	U.S. Labor Market Dynamics Revisited
830	Laura Alfaro Andrew Charlton	Growth and the Quality of Foreign Direct Investment: Is All FDI Equal?
829	Richard Layard David Clark Martin Knapp Guy Mayraz	Cost-Benefit Analysis of Psychological Therapy
828	Emma Tominey	Maternal Smoking During Pregnancy and Early Child Outcomes
827	Christos Genakos Tommaso Valletti	Testing the “Waterbed” Effect in Mobile Telephony
826	Luis Garicano Paul Heaton	Information Technology, Organization, and Productivity in the Public Sector: Evidence from Police Departments
825	Laura Alfaro Andrew Charlton	Intra-Industry Foreign Direct Investment

The Centre for Economic Performance Publications Unit
Tel 020 7955 7673 Fax 020 7955 7595 Email info@cep.lse.ac.uk
Web site http://cep.lse.ac.uk