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WORKING PAPER

Is the Impact of Labour Taxes on Unemployment asymmetric?

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Is the Impact of Labour Taxes on Unemployment Asymmetric? *

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Abstract

This paper tests whether the impact of labour taxes on unemployment is symmetric with respect to increases and decreases in labour taxes. Using a panel of 16 OECD countries over the period 1970-2005, we estimate a panel unobserved component model to account for the fact that unemployment rates and labour taxes are non-stationary but not cointegrated. We find a positive impact of tax increases in European and Nordic countries but no effect of decreasing labour taxes on the rate of unemployment. For Anglo-Saxon countries, no impact of labour taxes on unemployment is found.

JEL Classification: C15, C33, E24

Keywords: unemployment, labour taxes, asymmetry, unobserved component model

1 Introduction

It is a widespread belief, especially among policymakers, that the increase in labour taxes over the last decades is one of the prime factors responsible for the increase in unemployment. Consequently, the alleviation of the high tax burden on labour has been declared to be one of the prime instruments to fight high unemployment. This strategy relies on the assumption that the alleged impact of labour taxes on unemployment is more or less symmetric, i.e. cutting taxes will reduce unemployment as much as its increase induced unemployment to go up. The contribution of this paper is to test whether the impact of labour taxes on unemployment is symmetric. To the best of our knowledge, this has not been tested empirically.

2 Asymmetries in the labour taxes unemployment trade-off

From a theoretical point of view there are two reasons for an asymmetric trade-off between labour taxes and unemployment. First, the insider-outsider distinction (see e.g. Blanchard and Summers, 1986; Lindbeck and Snower, 1987) may give rise to an asymmetric response. Briefly, it states that

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insiders (those currently employed) are insulated from competition of outsiders (those currently unemployed) due to labour turnover costs (i.e. costs associated with hiring, training and firing). As a result, insiders have scope to push wages above the market-clearing level. i.e. they may use their privileged position to shift the tax burden to the employer (resulting in higher unemployment) in response to an increase in taxes and try to push for higher net wages (instead of lower unemployment) in response to a decrease in taxes. It is often argued that insider-outsider effects are less strong when unions are centralised (as they are in e.g. the Nordic countries) as the negative wage externalities will be internalised in a centralised wage setting system. Higher wages in one sector of the economy causes unemployment to rise and consequently imply a fall in output and the taxable base and higher costs for unemployment benefits. These costs however will be paid for mainly by others (Calmfors and Driffill, 1988). Moreover, membership rules in centralised wage settings are more favourable to the unemployed who typically remain union members. Thus they receive more attention in the wage bargaining process implying that insiders have less incentives to push wages above the market-clearing level (see e.g. Layard et al., 2005; Blanchard and Summers, 1986). Insider-outsider effects in wage formation may therefore be a less appropriate explanation for potential asymmetries in the labour taxes unemployment trade-off in countries with a centralised wage bargaining system.

The second reason for asymmetry are asymmetric labour adjustment costs. Different costs for hiring and firing imply a different speed of adjustment for employment and hence unemployment in response to a labour market shock. A large literature provides considerably empirical evidence in support of asymmetries in labour demand. Using various different techniques and functional forms Holly and Turner (2001); Pfann and Palm (1993); Burgess (1992a,b); Hamermesh and Pfann (1996) show that there are asymmetries in labour demand due to asymmetric adjustment costs.

3 Data and country grouping

Our dataset consists of yearly observations for 16 OECD countries over the period 1970-2005. The unemployment rate is taken from the OECD Economic Outlook. As a measure of labour taxes we use an update of the effective tax rates on employed labour from Martinez-Mongay (2003).[1] In order to take possible heterogeneity of the impact of taxes on unemployment into account, we group countries according to their wage-setting institutions. Following Daveri and Tabellini (2000), Domenech and Garcia (2007) and Berger and Everaert (2007) we classify countries in three different groups. The first group (NORDIC) includes Austria, Denmark, Finland and Sweden. These countries are characterised by strong unions, wage bargaining at a central level and/or a high degree of co-ordination. The second group (EUCON) includes Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain and Greece. The third group (ANGLO) includes Japan, Ireland, the US and the UK. In a recent study, OECD (2004), it has been shown that in some

[1] We would like to thank Carloz Martinez-Mongay for providing this dataset. This tax rate has been calculated with the so-called Mendoza-Razin-Tezar approach (see Mendoza et al., 1994) using the EU AMECO database.

countries the wage setting institutions changed over time. Particularly Sweden, Denmark and Ireland have experienced substantial changes to their wage setting institutions. We take this changes into account by modifying the country grouping, i.e. Denmark and Sweden are classified in the EUCON group from 1985 onwards and Ireland in the NORDIC group from 1990 onwards. Although an asymmetric response to shocks of labour market indicators is well established in the literature there is no attempt to empirically investigate asymmetries in the labour taxes unemployment trade-off. This is even more surprising if one takes the direct political relevance of this question into account. A hint of why this issue did not receive much attention can be seen in Figure 1 which shows the evolution of labour taxes for the 16 OECD countries considered here. Labour taxes steadily increased in most OECD countries until the mid 1990s. Only recently, a decrease in labour taxes can be observed in a number of countries. In Finland, for instance, labour taxes increased steadily to reach a level of 48% in 1994. Since then they continuously decreased to a level of 40% in 2005. In the Netherlands labour taxes increased from 32% in 1970 to 43% in 1993 and then decreased to a level of 33% in 2005. The picture of increasing taxes until the mid 1990s followed by steadily decreasing taxes is not as clear in all countries as it is in Finland and the Netherlands. Nevertheless, they are far more periods with decreasing taxes after the mid 90s as they are in the 70s and 80s for most of the countries. This fact may explains why the hypothesis of asymmetries in the labour taxes unemployment trade-off has not been tested. However with the availability of recent data, it is now possible to analyse the response of unemployment to decreasing labour taxes.

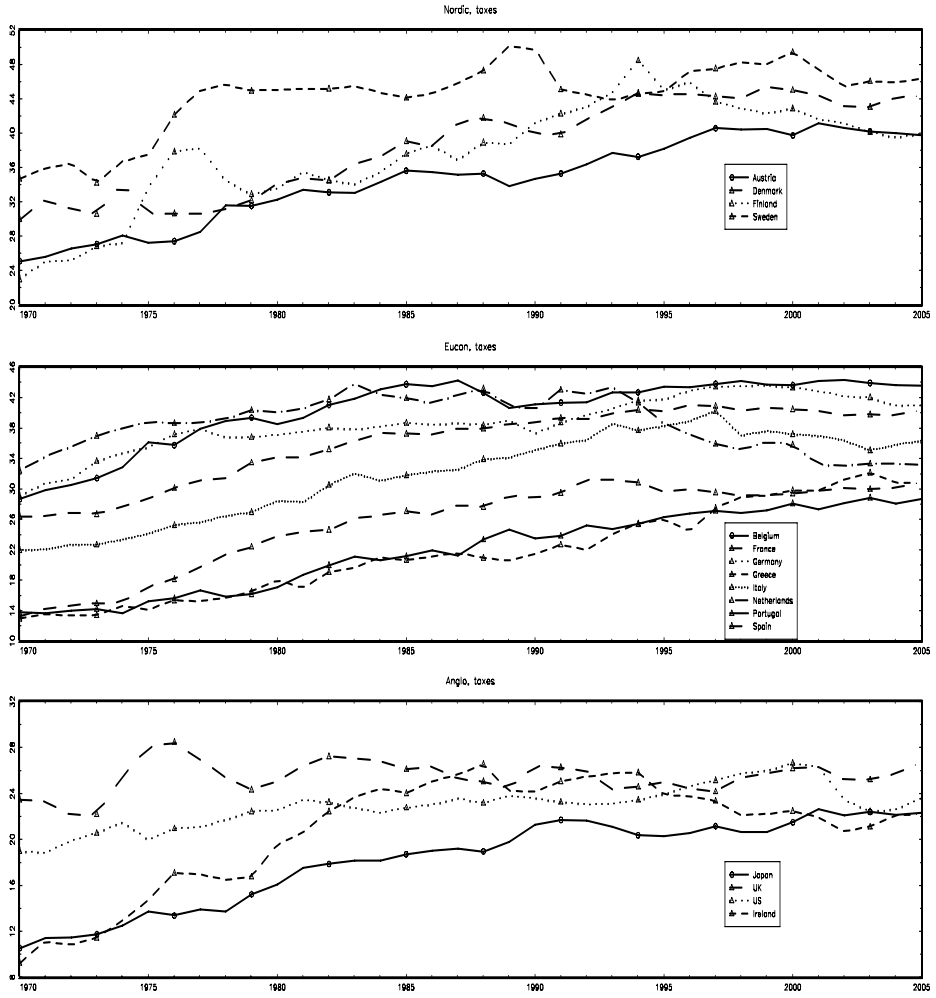

Figure 1: Effective tax rates on employed labour for 16 OECD countries (1970-2005)

4 Empirical Specification

Empirical studies on the determinants of unemployment typically estimate a reduced form unemployment equation linking the rate of unemployment to various labour market institutions and macroeconomic shocks (see e.g. Nickell et al., 2005, for a recent example). One major concern is that observed unemployment rates are found to exhibit unit root behaviour in most OECD countries over the past four decades. Thus, unless there is a cointegrating relation between unemployment and its alleged determinants, standard estimation methods yield spurious results. Using a panel of yearly data for 16 OECD countries ranging from 1960 to 1995, Berger and Everaert (2006) show that unemployment is not cointegrated with a large set of labour market institutions and macroeconomic shocks. The finding of no panel cointegration does not imply that there is no relation between unemployment and labour market institutions, though. Economic theory relates the equilibrium rate of unemployment to a large variety of factors, some of them being difficult to measure or even unobservable, e.g. the reservation wage which is a function of, among others, the

value of leisure. By inducing a unit root component in the residuals, both missing non-stationary variables and measurement error in non-stationary variables turn an otherwise cointegrating relation into a spurious regression (see Everaert, 2007, for a simulation experiment). To solve this missing variables problem, Planas et al. (2007) and Berger and Everaert (2007) set up an unobserved component model in which the sum of all missing variables is treated as a latent state variable and identified through the Kalman filter. Here, we follow Berger and Everaert but extend their model to allow for an asymmetry impact of labour taxes on unemployment.

Let the total unemployment rate, u_{it}, be the sum of an equilibrium component, u^*_{it}, which is a function of structural factors driving long-run unemployment, and a temporary component, u^c_{it}, which we label cyclical unemployment,

$$u_{it} = u^*_{it} + u^c_{it}, \qquad i = 1, \ldots, N, \qquad t = 1, \ldots, T, \tag{1}$$

where N is the number of countries and T is the number of time series observations. In order to allow cyclical unemployment to exhibit the standard hump-shaped pattern, u^c_{it} is assumed to be an AR(2) process

$$u^c_{it+1} = \phi_1 u^c_{it} + \phi_2 u^c_{it-1} + \eta^c_{it}, \qquad \eta^c_{it} \sim NID(0, \sigma^2_{\eta^c_i}). \tag{2}$$

The equilibrium rate u^*_{it} is assumed to be given by

$$u^*_{it} = u^*_{it-1} + \varepsilon_{it}, \tag{3}$$

such that ε_{it} reflects all factors that induce a permanent shift in the equilibrium rate of unemployment. In order to estimate the impact of labour taxes on u^*_{it} we disentangle ε_{it} into the impact of labour taxes, ε^t_{it}, and the impact of all other factors, ε^z_{it}, i.e. $\varepsilon_{it} = \varepsilon^t_{it} + \varepsilon^z_{it}$ where

$$\varepsilon^t_{it} = \beta_1 \Delta TAX_{it} + \beta_2 D_{it} \Delta TAX_{it}, \tag{4}$$

$$\varepsilon^z_{it} = \delta \varepsilon^z_{it-1} + \eta^z_{it}, \qquad \eta^z_{it} \sim NID(0, \sigma^2_{\eta^z_i}), \tag{5}$$

with $D_{it} = 1$ if $\Delta TAX_{it} < 0$ and zero otherwise. Thus shocks to the equilibrium rate of unemployment are disentangled into changes in labour taxes which are observed, and all remaining shocks that we treat as unobserved. The impact of labour taxes on u_{it} is measured by β_1 and β_2. Accounting for a potential asymmetric impact, β_1 measures the impact of increasing labour taxes whereas β_2 measures the differential impact of decreasing labour taxes on unemployment. Thus $\beta_1 + \beta_2$ measures the effect of decreasing labour taxes on unemployment. If there are asymmetric effects, one would expect that $\beta_1 > \beta_1 + \beta_2$. As a pure random walk process for equilibrium unemployment would result in a non-smooth series that is hard to reconcile with the expected smooth evolution of the structural characteristics driving equilibrium unemployment, the AR(1) specification in equation (5) allows for a smooth evolution of ε^z_{it} over time, i.e. the closer δ to one the smoother ε^z_{it}.

5 Results and Discussion

After casting the model given by equation (1)-(5) into state-space form the likelihood can be calculated by a routine application of the Kalman filter and maximised with respect to the unknown parameters using an iterative numerical procedure (see e.g. Harvey, 1989; Durbin and Koopman, 2001). [2]

The estimated parameters are presented in Table 1. For the group ANGLO we do not find a significant impact of labour taxes on unemployment neither for an increase nor for a decrease in taxes. In contrast, there is a significant positive impact of increases in labour taxes on unemployment in both the EUCON and the NORDIC group, with the impact being more moderate in the latter. These results confirm earlier studies in the literature which typically do not distinguish between increasing and decreasing taxes. However the majority of previous estimates covers a period in which labour taxes were persistently increasing. By using more recent data and thus covering the recent decrease in taxes we find that there is clear evidence of asymmetry in the EUCON and the NORDIC group, i.e. the point estimate of the impact of tax decreases as measured by $\beta_1 + \beta_2$ is considerably lower and not statistically significant different from zero as the $t-$test indicates. Although this finding may not be very surprising as insider-outsider effects and asymmetric adjustment costs can explain this asymmetry, it calls into question the strategy of reducing labour taxes to fight high unemployment.

The estimates of δ_1 indicate that equilibrium unemployment is smoother than a simple random walk. Further, ϕ_1 and ϕ_2 imply that cyclical unemployment exhibit the standard hump-shaped pattern in all country groups. Two LM tests show that we cannot reject the null of no autocorrelation in any of the three country groups (see bottom Table 1).

Table 1: Parameter estimates

	ANGLO	EUCON	NORDIC
β_1	0.01 (0.07)	0.16 (0.04)	0.07 (0.03)
β_2	-0.23 (0.15)	-0.15 (0.08)	-0.07 (0.07)
ϕ_1	0.87 (0.24)	1.48 (0.06)	1.28 (0.21)
ϕ_2	-0.39 (0.25)	-0.76 (0.06)	-0.71 (0.15)
δ_1	0.62 (0.16)	0.54 (0.07)	0.54 (0.18)
$t_{\beta_1+\beta_2=0}$	-0.95 [0.34]	0.02 [0.98]	-0.04 [0.97]
LM_{AR}	0.10 [0.75]	0.07 [0.79]	0.08 [0.78]
LM_{MA}	0.31 [0.62]	0.27 [0.61]	0.28 [0.61]

Standard errors are in parentheses. LM_{AR} and LM_{MA} are LM tests for an AR respectively MA structure in the residuals, $t_{\beta_1+\beta_2=0}$ is a t-test of no impact to decreasing taxes, i.e. $H_0 : \beta_1+\beta_2 = 0$. P-values are in brackets.

[2]The stationary state variables are initialised by drawing from their stationary distributions while a diffuse initialisation is used for the non-stationary state variables u^*_{it}. Standard errors for the estimates are calculated by inverting the Hessian matrix. This standard method of inference has recently been shown to be valid even in models with integrated series such as the one used here (see Chang et al., ming).

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