Annex 8 - The impact of institutions on the employment performance in European Labour Markets, 1979-2001

Rigidities on national labour markets are widely seen as responsible for the weak employment performance in Europe. The average unemployment rate in the EU15 is around 8 percent, and is predicted to be stable at this level for the near future. According to OECD measures, a substantial part is due to long term unemployment: 45 (60) percent of the unemployed are unemployed for longer than 12 (6) month. Despite a gradual decline since the mid 1990s the rates are highly persistent. Actually, long term unemployment rates exceed the US level by a factor of 4.

The high unemployment rates are accompanied by lower employment and participation rates.[1]. After a rise in the 1990s, EU15 employment rates are 65 percent, which is not far below the Lisbon goal (70 percent). But, the gaps are wider for young people, older workers and women. Due to the weak economic recovery, the rise in the employment rate will not continue in the close future. At the same time, differences within the EU are larger than the difference between the EU average and the US. Long term unemployment rates exceed the average especially in Germany, Italy and Spain. Employment rates are relatively low in Belgium, Greece, Italy and Spain. The correlation between the long term unemployment and employment rate is –0.8 over the last decade. Hence, the unemployment problem is not caused by higher participation.

To some extent, labour market institutions may account for this outcome. Rigid institutions can reduce the chance of flexible adjustments in case of structural shocks. Examples of institutions include employment protection legislation, the system of wage bargaining and benefits in favour of the unemployed. Over the last years, several papers have investigated this issue, see for example Nickell (1997), Blanchard and Wolfers (2000) and IMF (2003). The main topic analysed is the link between labour market institutions and unemployment. In contrast, the focus of this paper is on the impact of institutions on the employment performance. Institutions should affect unemployment by enhancing employment. Looking at the unemployment rate might be misleading: if there is only a link from institutions to unemployment, workers who have lost their jobs would drop out of the labour force. This contradicts the Lisbon goal of high participation. To obtain robust results, different aspects of the employment record are examined. In addition to the participation and part time rate, the threshold of employment is considered: due to productivity gains, output growth has to exceed a certain level to create new jobs. This threshold is inversely related to the marginal intensity of employment to

---

[1] Employment rates are obtained as employment population ratios, where the number of employed persons aged 15 to 64 is divided by the total population of the same age group. Participation rates include the unemployed in the nominator.

output growth, that is, the elasticity of employment growth with respect to output growth. As both parameters are not observable they have to be estimated.

The paper is organized as follows. In the next section (section1) the threshold and marginal intensity for employment are derived. Then, the role of institutions is discussed and results of the literature are reviewed (section 2). The empirical section is divided into two parts. In the first step (section 3), estimates of the threshold and marginal intensity of employment are presented for a sample of EU countries. Second, in section 4 the impacts of institutions on the employment record are investigated. Finally, section 5 concludes.

1   Derivation of the employment threshold

The law of Verdoorn (1949, 1993) states that faster output growth (y) will induce gains in labour productivity growth (p). Formally, the relationship

(1) $p_t = \theta_0 + \theta_1 y_t \, , \theta_1 > 0$

predicts increasing returns to scale if the Verdoorn coefficient θ_1 turns out to be greater than 0, see Fingleton (2001). A positive, but declining slope parameter is found in most empirical studies, see Harris and Lau (1998) and Léon-Ledesma (2000) for the UK and Spanish case, respectively. Increasing returns may be explained by a variety of endogeneous growth models, see Aghion and Howitt (1998) for a survey.

A serious issue with Verdoorn's law is the absence of the role of capital, that can be substituted for labour. Due to the omitted variable problem, estimation of the regression parameters from the relation (1) seems to be biased. Suppose output is produced by a Cobb-Douglas technology

(2) $y_t = \tau + \eta l_t + \gamma k_t$

where l, k and τ are the growth rates of labour, capital and technology, respectively. As employment growth is the difference between output and productivity growth, the relation

(3) $p_t = \tau / \eta + [(\eta - 1) / \eta] y_t + (\gamma / \eta) k_t$

is implied. Hence, the bias is proportional to the coefficient from a regression of capital growth on output growth, see Greene (2003). However, the link between productivity and output growth can be defended, if capital growth equals output growth. This is in line with the stylized fact of a roughly constant capital-output ratio, see Jones (1998). In

that case, the relations $\beta_0 = \tau / \eta$ and $\beta_1 = (\eta + \gamma - 1)/\eta$ are supposed to hold, and unbiased estimates can be obtained from (1). But, the returns to scale parameter cannot be revealed from this expression without knowledge of the production elasticities of labour and capital. The intercept corresponds to the rate of technological progress, divided by the production elasticity of labour.

Because of the high correlation of output growth and productivity growth, spurious regressions may occur. If employment growth and technical progress were constant, a perfect correlation between productivity and output growth would appear, which is not informative at all. This problem can be avoided in a specification between employment and output growth,

(4) $\quad l_t = \alpha_0 + \alpha_1 y_t, \quad \alpha_0 = -\beta_0, \alpha_1 = 1 - \beta_1$

that has been already favoured by Kaldor (1975). A high correlation between output and productivity does not imply the same for employment and productivity growth: if the former are perfectly correlated, the latter variables are not related at all.

A Verdoorn coefficient of 0.5 in (1) implies a marginal employment intensity α_1 of the same size in (4). This means that a 1 percent acceleration in output growth would stimulate employment growth by half a percent on the average. The underproportional reaction is due to efficiency gains, which can be realized more easily in periods of higher growth. They may be traced, for example, to manpower reserves, increases in working hours, or higher labour intensities. The threshold of employment (y_E) indicates output growth for which employment is constant ($l_t=0$). In terms of the model parameters the threshold level y_E reads:

(5) $\quad y_E = -\alpha_0 / \alpha_1$

Due to the parameter $-\alpha_0$, it is positively related to the rate of technological progress (τ), and negatively related to the production elasticity of labour (η). In addition, a higher marginal employment intensity (α_1) is expected to reduce the threshold. Provided that output growth is above the threshold, employment will be stimulated. If growth falls beyond the bound, losses in employment are predicted on the average. In that case, output growth is not sufficient to compensate for the rise in productivity because of technological progress and employment will shrink. According to (4) and (5), the evolution of employment

(6) $\quad l_t = \alpha_1(y_t - y_E)$

depends on the deviation of actual output growth from the threshold. Each percentage point of output growth above (below) the threshold comes along with a positive (negative) employment reaction determined by the marginal employment intensity.

Most previous studies indicate a decline of the threshold over time, see Fingleton and McCombie (1998) and Walwei (2002), among others. Hence, the model parameters are subject to change. This finding may be caused by the decrease in total factor productivity (TFP) in most EU economies, see European Commission (2003). Furthermore, if deregulation in the labour markets was successful over the past, the marginal intensity of employment should have risen over time.

2   The role of labour market regulation

It is widely acknowledged that proper institutions are of key importance for a smooth working of the labour market, see Agell (1999), Blanchard (2004) and Bertola (2004). Information problems for both workers and firms generate imperfections in matching and monitoring processes. Different degrees of market power of wage contractors and the risk of becoming unemployed require an appropriate mix of the institutional framework. However, such regulations also cause rigidities which can impede the reallocation of labour in case of structural shocks. Overly restrictive elements may actually worsen the employment performance. To examine this issue, a set of variables has been developed in the literature, covering different aspects of the institutional setting. The set includes employment protection legislation, the structure of wage determination, measures in favour of the unemployed, like unemployment benefits and active labour market policies, and taxes on labour. In addition, product market institutions may be relevant for the employment record. However, they are highly correlated with labour market institutions, and are not considered separately.

Employment protection legislation may raise the effective costs to firms of employing workers and the costs of adjusting employment over the business cycle. Dismissals become more difficult and firms will be more cautious about filling vacancies. A higher degree of job security can be compensated by lower wage growth, although stronger employment protection may also raise the bargaining power of insiders. On the other hand, employment protection makes regular employment more stable. As personnel selections within firms are more effective, involuntary separations are reduced. In addition, a higher degree of employment protection can support investments in firm specific human capital, thereby inducing productivity and competitiveness gains, see Pissarides (2001) and Belot and van Ours (2002).

4

Trade unions are highly important for the wage setting process in Europe. Greater union power tends to raise wages above the competitive equilibrium. This effect may be boosted in countries with strict employment protection schemes and extensive measures in favour of the unemployed. Moreover, wages and other working conditions are determined by collective bargaining agreements either on the regional or on the sectoral level. The outcomes often bind not only the bargaining parties, but also employers and employees within a particular sector. Due to the centralisation of bargaining, flexibility is lost. But, if union power is accompanied by a high degree of coordination of firms and workers, employment can be supported, see Calmfors and Driffill (1988). For example, centralized bargaining may improve the responsiveness of wage to the overall macroeconomic conditions, and a greater internalisation of the consequences of high wage demands can be achieved.

Higher unemployment benefits and longer benefit duration periods reduce the gap between net wage earnings and public transfer payments, and thus the incentives of households to work. The unemployed will become more choosy to fill vacancies, implying that the matching process appears to be less effective. As the fear of unemployment declines, an upward pressure on wages is generated. The positive impact of benefit levels and durations on the length of unemployment spells is well documented by numerous microeconometric studies. However, more generous unemployment benefits could also increase the incentives for human capital accumulation. As the search process can last longer, it becomes more likely to get an appropriate job. Furthermore, participation in the labour force might become more attractive, as it is a prerequisite to be eligible for the benefits.

Active labour market policies aim to reduce the dependency of people on unemployment benefits by improving their chances to move into work. This is relevant in particular for low skilled workers, see OECD (2003). Strategies include public employment services, labour market training, subsidies on employment and measures for the young and disabled. Insofar as the employability of the participants is improved, labour market performance should improve. However, regular employment can be crowded out by public work. Policies are financed through taxes and contributions of employers and employees. Training programmes might not match with the qualifications really demanded by firms, see Martin and Grubb (2001).

Taxes on labour widen the wedge between the wages as employer's costs and wages as worker's income. The tax share that is borne by the employers will raise the effective costs of employment, thereby reducing labour demand. If higher labour taxes are fully compensated by lower wages, the product wage paid by firms will be unchanged, but

the consumption wage received by households declines. Thus, the distance to transfer payments is narrowed, and the incentives of households to work are reduced. Overall, rising labour taxes should have a negative impact on the employment record, see Daveri and Tabellini (2000). Especially in the low income - low productivity range, high marginal tax rates can generate inactivity traps. A significant part of the relative good employment performance in the Euro area between 1997 and 2001 can be traced to decreasing labour tax rates, see Mourre (2004).

According to Blanchard and Wolfers (2000), the interaction between macroeconomic shocks and institutions may be crucial for a proper understanding of the development in EU labour markets. In fact, a substantial part of the institutional framework was already in place in the 1960s and 1970s, when unemployment was quite low. The rise in unemployment since then may be explained by adverse supply shocks like the oil crises in the 1970s or financial crises of the social security systems because of unfavourable demographic trends. But, these shocks hit the EU countries in a symmetric way. Thus, they can account for a general increase in the unemployment rate, but the cross country variation is left unexplained. If institutions are not optimally designed, the persistence of unemployment in response to shocks might be prolonged. In the last years, several papers have examined this issue, see for example Nickell (1997), Elmeskov, Martin and Scarpetta (1998), Blanchard and Wolfers (2000), Fitoussi, Jestaz, Phelps, and Zoega (2000), and Nickell, Nunziata, Ochel and Quintini (2002). Most researchers have investigated the impacts of the institutions on unemployment for a sample of 20 OECD countries. More recent studies have controlled for interactions between institutions and macroeconomic shocks or within the set of institutions, stressing the relevance of the appropriate institutional mix, see Belot and van Ours (2001) and Bertola, Blau and Kahn (2002). For example, the effect of an increase in payroll taxes on the incentives to work will be larger in the country with the more generous unemployment benefit system.

Overall, the evidence taken from these studies is not straightforward, see Baker, Glyn, Howell and Schmitt (2002) for a survey. Most important, many of the institutional features are no more rigid among the group of high unemployment countries than among those with low unemployment. Results often appear to be counter-intuitive. In particular, employment protection legislation seems to have almost no impact on the course of unemployment. Stricter protection of jobs increases the long term unemployment rate, but the effect is no longer significant, when the overall rate is considered. Strength of trade unions and bargaining coverage tends to raise unemployment. However, this effect is usually compensated, if wage setting is highly coordinated on both the employers side and that of the employees. Comparing the actual outcome with a model assuming fixed

institutions over time, Nickell, Nunziata, Ochel and Quintini (2002) are able to explain half of the unemployment experience by institutional shifts in the 1960-1995 period, especially in the tax and transfer systems. But, the result is built upon substantial levels of endogeneous persistence as reflected by a high coefficient of the lagged dependent variable in the regressions. This persistence should be caused by the institutional framework, but is left unexplained in the model. In the IMF (2003) study, institutions and interaction terms play a vital role for the evolution of unemployment in France and Italy, but not in Germany.

3 Threshold and marginal intensity of employment

Estimates for the threshold and the marginal intensity of employment are based on annual data of real gross value added and employment taken from the Groningen Growth and Development Centre (2004) database. The overall time span runs from 1979-2001. The parameters are determined via recursive OLS. Initially, the regression (4) is run country-by-country over the period 1979-1985, and the first set of parameters is computed (corresponding to 1985). Then, the observation period is prolonged by 1, and the process is repeated until the end of the sample is reached. Due to this procedure, country specific time series of the threshold and the marginal intensity of employment are obtained. Estimates are more reliable in later periods, because they are based on a broader information set.[2] The results are presented for three subperiods: 1985-1990, 1985-1995, and 1985-2001, see table 1. A few outliers occurred in the Italian threshold in 1991 and 1992. They have been smoothed out, using 1990 and 1993 as the start and end point of the linear interpolation.

-Table 1 about here-

Consider Austria as a numerical example. The threshold is 1.9 over the entire sample period. Hence, output growth has to be at least 1.9 on the average to generate jobs. As the marginal intensity of employment is 0.4, the constant in (4) is 1.9*0.4=0.76. Assuming a production elasticity of labour of 0.5, the implied rate of TFP growth is 1.5 percentage points on the annual base. For the majority of the EU countries, the threshold has declined over time, although the change is hardly significant. The threshold appears

---

[2] Alternatively to recursive OLS, a moving window seems to be appropriate. But, results are less robust in this case, as all estimates would refer to a shorter observation period.

to be rather stable in Denmark and the UK, while an increase can be detected for Finland, Germany, Italy and Sweden. Moreover, the threshold has substantially converged across the EU. Its dispersion has fallen by 50 percent since the second half of the 1980s, as measured by the coefficient of variation.

The marginal intensity of employment is more or less constant. Although an upward trend in the parameter can be detected for most countries, the change is often insignificant. The threshold and the marginal intensity of employment are almost not connected over the entire sample, as their correlation is not significantly different from 0. Over the last decade, only three countries (Austria, Ireland, Portugal) experienced a decrease in the threshold and an increase in the marginal intensity parameter. For the other countries, the evolution of the threshold parameter is largely due to fluctuations in the TFP growth rate.

4   The institutional impact on the employment record

Data on the participation and employment rate and the share of part time employment have been obtained from OECD labour force statistics. For institutions, Nickell and Nunziata (2001) have assembled an annual dataset for a sample of 20 OECD countries, covering the period from 1960-1995 (Labour Market Institutional DataBase, hereafter LMIDB). Measures include employment protection legislation, trade union density, that is the share of unionised workers in total employment, bargaining coverage and the coordination of bargaining, benefit replacement rates and durations, and the tax wedge on labour income. See Nickell and Nunziata (2001) on how these variables are defined. As the series in the LMIDB usually show more variation than OECD indicators, they are preferred by most researchers. Data on active labour market policies start later (1985) and are taken from various issues of the OECD employment outlook.

As a main shortcoming, the LMIDB ends in 1995. Since then, employment rates have increased slowly in the EU, perhaps just because of some progress in the implementation of labour market reforms, see Mourre (2004). Fortunately, Nickell (2003) has provided an update, extending the period to 1998. For both employment protection legislation and bargaining coverage, the length of the series can be further enhanced by the Fraser Institute database, see Gwartney, Lawson, and Emerick (2003). Correlations are about 0.8 in absolute value between the respective LMIDB and Fraser Institute measure (1995). Other variables, like benefit replacement rates and trade union densities can be prolonged by OECD measures. Due to data merging, the time span can be extended to

2001. However, a few missing values remain, especially in 1999. They are replaced by the average of 1998 and 2000.

Results are based on the 1979-2001 period. Due to the derivation of the threshold and the marginal intensity of employment, the first 6 observations have been dropped, and the effective sample employed runs from 1985-2001. In contrast to previous studies, institutional information reaching back to the 1960s is not considered. Because of the shorter period, the results are supposed to be less affected by structural breaks. Macro-economic shocks and their interactions with institutions are expected to play a less vital role, implying that the regressions are less complex and easier to interpret. Degrees of freedom are enhanced by estimating a panel model allowing for country individual fixed effects. The results refer to the average of EU15 economies. However, Luxembourg and Greece are excluded due to data limitations.

The models with the best empirical fit are reported for the employment and part time employment rate (table 2) and for the threshold and marginal intensity of employment (table 3). As the results for participation rates are very similar to those obtained for employment rates, the former have been skipped. Initially, all institutions and reasonable interactions between them are included in the equations. The high correlation of the variables implies imprecise parameter estimates. Hence, the large models hide the relevant forces at work, and they need to be simplified successively. Simplification starts from different points to get a robust picture.

To control for the business cycle situation, the equations have been enhanced by macro-economic variables, that is output growth and inflation. Both variables behave procyclical. In addition, interactions with the institutional setting are taken into account. Note that for the derivation of the threshold and the marginal intensity of employment, output growth rate is already taken into account. In contrast to the dominant view, only a few channels of interactions with the institutional design turn out to be significant. This may be caused by the sample period, which is substantially shorter than in most other studies. In addition, the evidence may differ between the performance of employment and that of unemployment.

-Table 2 about here-

Nevertheless, the results are more or less reasonable. For example, higher union power (union density) and stricter employment protection are expected to lower the employ-

ment rate (table 2, A). This result might reflect labour demand behaviour. Provided that union power increases wages above the competitive equilibrium, employment prospects are worsened, leading to a decline in participation. Moreover, a rise in taxes or active labour market policies tends to reduce the employment rate. The negative impact is restricted to countries with a more generous unemployment benefit system. Both interaction terms emphasize the relevance of policies aiming at stronger incentives for households to work. Regarding active labour market policies, some ineffectiveness seems to be prevalent. This points to some ineffectiveness in the use of these policies. As the active labour market policies include several components, additional evidence can be provided. Here, the ineffectiveness is traced back mainly to a negative impact of public employment services on the employment rate, but not to labour market training measures. Significant crowding out effects of regular employment can be detected especially for the East German economy. Finally, an upturn of economic activity will contribute to an increase of employment rates. This effect seems to be more important, if wage bargaining is highly coordinated.

For the majority of countries, part time employment is highly correlated with the overall employment rate. Exceptions are the Scandinavian countries, and France and Italy, where the correlation is even negative. Part time employment will benefit from stronger employment protection and bargaining coordination, but this is compensated by the reversed impact of the interaction term (table 2, B). In principle, more security placed on regular jobs is expected to lead to an increase of temporary contracts with lower separation costs, see OECD (2004). However, part time employment is not necessarily associated with jobs being less safe. Persons who are employed part time work usually less than 30 hours per week, irrespective of other conditions of the contract. In addition, the part time employment rate is expected to decrease in an economic upturn, as the utilization of labour tends to increase.

Union strength is relevant for the threshold of employment (table 3, A). Higher union densities raise the threshold, especially in countries with more generous unemployment benefits. This is partly compensated by a high degree of coordination in wage bargaining. Furthermore, an increase in the tax wedge is expected to lower the threshold, which appears difficult to interpret. However, the reduction of the threshold might reflect a TFP slowdown, see equation (4). This view is supported by the analysis of the marginal intensity of employment, where the tax wedge is not significant at all. In an economic upturn, the threshold is reduced, thereby improving the employment outlook. However, this effect is compensated, if the countries have extensive employment protection legislation schemes.

Employment protection legislation is the most important variable for the marginal intensity (table 3, B). Stronger employment protection will reduce the job content of output growth. Empirically, the best fitting models point to some interaction of employment protection with other institutional and business cycle variables. In particular, a decline in the marginal intensity is expected, if union power is high, and the unemployment benefit system is more generous. Furthermore, higher levels of coordination tend to raise the marginal intensity of employment. A better consideration of the macroeconomic situation in wage negotiations can activate jobs to a larger extent, especially at the lower income range.

5   Conclusions

The analysis has shown that labour market institutions are important for the EU employment record. Most results have sensible interpretations. Policies should be directed to introduce more flexibility in the labour markets. Compared to the current setting, a less stringent employment protection legislation seems to be favourable, while both the need for flexibility and security have to be taken into account. The tax and transfer systems should be more aligned to support the incentives for households to work. In addition, fiscal consolidation is important, as it is a precondition for cutting taxes in the medium and long run.

Some progress has been made in recent years due to the liberalisation of temporary contracts with low separation costs and exceptions for small enterprises and business start-ups, see Young (2003). In the field of employment protection legislation, the use of temporary work arrangements has been eased, while the protection of regular employment remained mostly unaltered, see OECD (2004). Instead of partial reforms, the results point to a more comprehensive strategy, as interactions between institutions often turn out to be significant.

However, the institutions do not tell the whole story. Only a minor part of the employment record can be explained by the institutional setting. The bulk of the explanation is due to country individual fixed effects. On the other hand, institutions are partly embedded in these effects, as the institutional change is usually slow. Efforts should be undertaken to improve the institutional database to capture the complexity of the institutional

framework, see Bertola, Boeri and Cazes (2000). In particular, the dataset should be enhanced to cover variables focusing on actual deregulation strategies. These include the use of temporary contracts, variable payment schemes, such as bonuses, and opening clauses in collectively bargained contracts.

Table 1: Threshold of employment (left) and marginal employment intensity

	1985-1990		1985-1995		1985-2001	
Austria	2.1 (0.7)	0.3 (0.2)	2.1 (0.4)	0.4 (0.1)	1.9 (0.4)	0.4 (0.1)
Belgium	2.1 (0.3)	0.6 (0.1)	2.1 (0.3)	0.5 (0.1)	1.6 (0.3)	0.5 (0.1)
Denmark	1.3 (0.4)	0.6 (0.1)	1.7 (0.4)	0.5 (0.1)	1.4 (0.3)	0.5 (0.1)
Finland	1.8 (1.0)	0.5 (0.2)	3.2 (0.7)	0.7 (0.1)	2.8 (0.5)	0.8 (0.1)
France	2.1 (0.3)	0.7 (0.1)	1.8 (0.3)	0.5 (0.1)	1.4 (0.3)	0.6 (0.1)
Germany	0.6 (0.8)	0.5 (0.2)	1.2 (0.5)	0.6 (0.1)	1.2 (0.3)	0.6 (0.1)
Ireland	4.4 (1.3)	0.2 (0.2)	2.7 (0.9)	0.5 (0.2)	2.8 (0.7)	0.6 (0.1)
Italy	0.5 (1.0)	0.3 (0.2)	1.3 (0.7)	0.4 (0.2)	1.0 (0.7)	0.4 (0.2)
Netherlands	1.1 (0.7)	0.9 (0.3)	0.8 (0.6)	0.8 (0.2)	0.8 (0.5)	0.8 (0.2)
Portugal	3.0 (1.5)	0.3 (0.2)	2.7 (1.2)	0.4 (0.2)	1.8 (0.9)	0.4 (0.1)
Spain	2.6 (0.3)	1.3 (0.2)	2.2 (0.3)	1.2 (0.2)	1.9 (0.3)	1.3 (0.1)
Sweden	0.2 (1.0)	0.3 (0.2)	2.1 (0.3)	1.0 (0.1)	2.2 (0.3)	0.9 (0.1)
United Kingdom	1.9 (1.3)	0.6 (0.2)	2.0 (0.7)	0.7 (0.2)	1.8 (0.5)	0.7 (0.1)

Table shows averages over the respective period. Parameters are derived country-by-country using recursive OLS in (4). Standard errors in parantheses. The threshold is a ratio of two random variables; its variance has been calculated by a first order Taylor approximation. Output refers to gross value added, employment to persons employed. Data obtained from the Groningen Growth and Development Centre (2004) database.

Table 2: Effects of labour market institutions on the overall employment rate and on part time employment in a panel of EU countries

A. Employment rate

	Coefficient	t-value (absolute)
UDS	-0.397	7.92
EPL	-0.045	2.88
TAX*BRR	-0.324	4.02
ALMP*BRR	-0.025	2.04
GP	0.525	5.04
COO*GY	0.177	4.49
Adjusted R^2	0.90	
F-Statistic	389.97	

B. Part time employment rate

	Coefficient	t-value (absolute)
UDS	-0.197	5.99
COO	0.118	8.34
EPL	0.117	4.72
COO*EPL	-0.092	8.37
GP*EPL	-0.123	3.25
Adjusted R^2	0.92	
F-Statistic	623.21	

Panel stimation with country fixed effects. ALMP=Active labour market policy, BRR=benefit replacement rate, COO =bargaining coordination, EPL=employment protection legislation, TAX=tax wedge, UDS=trade union density, GY= growth rate gross value added, GP=CPI inflation. Employment and part time employment rates obtained from OECD Labour Market Statistics, CPI from the OECD Main Economic Indicators.

Table 3: Effects of labour market institutions on the threshold and marginal intensity of employment in a panel of EU countries

A. Threshold of employment

	Coefficient	t-value (absolute)
UDS	0.041	3.49
UDS*BRR	0.117	8.42
COO	-0.005	2.59
TAX	-0.058	4.02
GP	-0.229	4.48
GP*EPL	0.179	6.14
Adjusted R^2	0.81	
F-Statistic	185.73	

B. Marginal intensity of employment

	Coefficient	t-value (absolute)
COO	0.314	7.06
EPL*UDS	-0.358	3.18
EPL*BRR	-0.476	6.76
GP*EPL	-0.515	1.96
Adjusted R^2	0.80	
F-Statistic	291.36	

Panel stimation with country fixed effects. ALMP=Active labour market policy, BRR=benefit replacement rate, COO =bargaining coordination, EPL=employment protection legislation, TAX=tax wedge, UDS=trade union density, GP= CPI inflation.

References

Agell, J. (1999): On the benefits from rigid labour markets: norms, market failures and social insurance; Economic Journal 109, 143-164.

Aghion, P., Howitt, P. (1998): Endogeneous growth theory, MIT Press, Cambridge.

Baker, D., Glyn, A., Howell, D., Schmitt, J. (2002): Labour market institutions and unemployment: a critical assessment of cross-country evidence, Center for Economic Policy Analysis, Working Paper 2002-17.

Belot, M., Van Ours, J. (2001): Unemployment and labour market institutions: An empirical analysis; Journal of Japanese and International Economics 15, 1-16.

Belot, M., Van Ours, J. (2002): Welfare effects of employment protection, CEPR discussion paper, 3396.

Bertola, G., Boeri, T., Cazes, S. (2000): Employment protection in industrialized countries: The case for new indicators; International Labour Review 139, 57-72.

Bertola, G., Blau, F.D., Kahn, L.M. (2002): Comparative analysis of labour market outcomes; Lessons for the US from the international long run evidence; in A. Krueger and R. Solow (eds.) The Roaring Nineties: Can full employment be sustained?, New York: Russell Sage and Century Foundations.

Bertola, G. (2004): A pure theory of job security and labour income risk; Review of Economic Studies 71, 43-61.

Blanchard, O. (2004): Designing labour market institutions; unpublished manuscript, http://econ-www.mit.edu/faculty/blanchar/papers.htm.

Blanchard, Blanchard, O., Wolfers, J. (2000): The role of shocks and institutions in the rise of European unemployment: the aggregate evidence, Economic Journal 110, Conference Papers, C1-C33.

Calmfors, L., Driffill, J. (1988): Centralization of wage bargaining; Economic Policy 2, 14-61.

Daveri, F., Tabellini, G. (2000): Unemployment, growth and taxation in industrial countries; Economic Policy 15, 47-104.

Elmeskov, J., Martin, J.P., Scarpetta, S. (1998): Key lessons for labour market reforms: Evidence from OECD countries experiences; Swedish Economic Policy Review 5, 205-252.

European Commission (2002): Employment in Europe 2002. Chapter 2: Structural changes in the European labour markets, 47-78.

European Commission (2003): The EU economy: 2003 review. Chapter 2: Drivers of productivity growth, 63-118.

Fingleton, B. (2001): Equilibrium and economic growth: Spatial econometric models and simulations, Journal of Regional Science 41, 117-147.

Fingleton, B., McCombie, J.S. (1998) : Increasing returns and economic growth : some evidence from the European Union regions; Oxford Economic Papers 50, 89-105.

Fitoussi, J.-P., Jestaz, D., Phelps, E., Zoega, G. (2000): Roots of the recent recoveries: labour reforms of private sector forces?; Brookings Papers on Economic Activity, Brookings Institution, 237-309.

Greene, W.H. (2003): Econometric Analysis, 5th ed, Prentice Hall.

Groningen Growth and Development Centre and The Conference Board (2004): Total Economy Database, 60-Industry Database, http://www.ggdc.net.

Gwartney, J., Lawson, R., Emerick, N. (2003). Economic Freedom of the World: Annual Report of the Fraser Institute, Vancouver, http://www.freetheworld.com.

Harris, R., Lau, E. (1998): Verdoorn's law and increasing returns to scale in the UK regions, 1968-91: Some new estimates based on the cointegration approach, Oxford Economic Papers 50, 201-219.

International Monetary Fund (2003): Unemployment and labour market institutions: why reforms pay off; April World Economic Outlook.

Jones, C.I. (1998): Introduction to economic growth, Norton & Company, New York.

Kaldor, N. (1975): Economic growth and the Verdoorn law – A comment on Mr. Rowthorn's article, Economic Journal 85, 891-896.

León-Ledesma, M.A. (2000): Economic Growth and Verdoorn's law in the Spanish regions, 1962-91, International Review of Applied Economics 14, 55-69.

Martin, J.P., Grubb, D. (2001): What works and for whom: A review of OECD countries' experrience with active labour market policies; Swedish Economic Policy Review 8, 9-56.

Mourre, Gilles (2004): Did the pattern of aggregate employment growth change in the Euro area in the late 1990s; European Central Bank, Discussion paper 358.

Nickell, S. (1997): Unemployment and labor market rigidities: Europe versus North America, Journal of Economic Perspectives 11, 55-74.

Nickell, S. (2003): Labour Market Institutions and Unemployment in OECD Countries, CESifo DICE Report 2/2003, 13-26.

Nickell, S., Nunziata, L. (2001): Labour market institutions database, vers. 2.00, LSE, Centre of Economic Performance; http://cep.lse.ac.uk/pubs/download/data0502.zip.

Nickell, S., Nunziata, L., Ochel, W., Quintini, G. (2002): The Beveridge curve, unemployment and wages in the OECD from the 1960s to the 1990s; in Aghion, P., Frydman, R., Stiglitz, J., Woodford, M. (eds.): Knowledge, Information and Expectations in modern macroeconomics, Princeton University Press, Princeton.

OECD (2003): Employment outlook, chapter 4: Benefits on employment, friend or foe? Interactions between passive and active social programmes.

OECD (2004): Employment outlook, chapter 2: Employment protection legislation and labour market performance.

Pissarides, C. (2001): Employment protection, Labour Economics 8, 131-159.

Verdoorn, P.J. (1993): On the factors determining the growth of labour productivity, Italian Economic Papers 2, 59-68. Originally published: Verdoorn, P.J. (1949), Fattori che regolano lo sviluppo della produttivita del lavoro, L'Industria 1, 3-10.

Walwei, U. (2002): Labour Market Effects of Employment Protection, IAB Labour Market Research Topics 48, Institut für Arbeitsmarkt- und Berufsforschung der Bundesanstalt für Arbeit, Nürnberg.

Young, D. (2003): Employment protection legislation: its economic impact and the case for reform; EU Economic Papers 186.