The Impact of Institutions on the Employment Performance in European Labour Markets

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ABSTRACT

This paper investigates the role of the institutional framework for the labour market performance in EU countries. The point of departure is the labour demand equation that is derived from cost minimization behaviour of firms. Labour demand is expressed by its structural parameters, i.e. the output and real wage elasticity. Cointegration relationships between employment, output and wages are revealed by efficient estimation techniques. The long run parameters are explained by indicators for product and labour market institutions using panel fixed effects models. The results suggest that higher flexibility in the product and labour markets could be a strategy to improve the employment record. The response of employment to macroeconomic conditions is stronger in a more deregulated environment, and the absorption of shocks can be relieved.

1. INTRODUCTION

THE RISING INTEGRATION OF MARKETS and the introduction of the euro has intensified competition in many European countries. Companies are less able to raise prices, and income that could be allocated in wage bargaining is reduced. Advances in competition are accompanied by the suppression of transaction costs, declining information costs and uncertainty. On the macroeconomic side, higher price stability achieved by the European Central Bank and the resizing of the public sector by the Stability and Growth Pact can create conditions for higher growth and employment. On the other hand, the loss of competence in terms of nominal exchange rates, the centralisation of monetary policy, and fewer opportunities for independent fiscal policies limit the capacity to react against adverse shocks. In this environment, labour markets have to bear a larger role in the adjustment process. Nevertheless, European labour markets have shown a weak performance over

the last decades. Unemployment is still at high levels and persistent. For example, 50 per cent of the unemployed in the large euro area countries (Germany, France, Italy) are long term unemployed, i.e. they have been out of the labour market for more than one year. Significant barriers to re-enter the labour market seem to exist once a job is lost. Participation in the labour force is quite low. Employment rates fluctuate around 65 per cent, not far below the Lisbon goal (70 percent). However, the gaps are even wider for specific groups in the labour force, including young and old people, women and the lower educated.

Despite the fact that the EU members have been hit by similar shocks like oil price hikes, the performance of national labour markets has been quite heterogeneous. While some countries experienced a temporary deterioration in their unemployment prospects, the shocks had long lasting impacts in other countries. For example, the UK experienced high unemployment rates in the 1980s, but they have been markedly fallen since then. Germany has changed from a country with very low unemployment to a position slightly above the EU average. The unemployment rate in Spain declined from 20 per cent in the beginning of the 1990s to numbers well below 10 per cent in recent years. In some smaller countries like Austria, Denmark and the Netherlands, unemployment has been reduced to a relatively low level.

To some extent, the labour market record might be caused by the institutional framework. Institutions are important since they define the rules of the game under which private households and firms operate. On the one hand, rigid institutions can prolong the adjustment period and may lead to persistence, see Eichengreen and Iversen (1999) and Blanchard and Wolfers (2000). On the other hand, they can introduce a higher degree of stability into labour market relationships, which can be an advantage especially in periods of economic downturns. However, the process of market integration and the loss of instruments for national policies have put severe pressure on the institutional setting. In this respect, regulation measures should be adaptable to rapidly changing technologies in product markets and increasing heterogeneity of the labour force.

Several papers have investigated whether differences in the performance of national labour markets can be linked to the institutional framework. Overall, the results are not very conclusive. Only certain aspects of the institutional framework seem to be relevant, while others did not show the expected sign or are not significant at all. For example, Nickell (1997), Layard and Nickell (1999) and Nickell, Nunziata, and Ochel (2005) have stressed the role of the social security system to move people from welfare to work. In contrast, institutions like employment protection and minimum wages do not seem relevant to explain the unemployment experience. Other authors have emphasized the importance of the latter institutions, see Blanchard and Portugal (2001) in case of employment protection and duration of unemployment benefits, and Bertola, Blau and Kahn (2001, 2002), where high employment lev-

els are associated with flexible wage structures and a high wage dispersion.

This paper extends the previous literature in various respects. First, a different endogenous variable is used, which is better suited to measure the adjustment capabilities of national labour markets. Since the deterioration in unemployment is primarily caused by shortages in labour demand, this relationship defines the point of departure (Bean, 1994). Specifically, the elasticities of labour demand are considered, as they represent the strength of the employment reaction to a changing economic environment. Output and real wage elasticities are estimated per country by means of recursive techniques. As time series of elasticities are available per country, the impact of institutions on the elasticities can be examined in a panel setting. This approach allows to disentangle the institutional effect from other sociodemographic characteristics, which are bounded in the fixed effects.

Second, not only labour, but also product market institutions are relevant for the labour market. Several studies have emphasized that both product and labour market institutions are crucial for the labour market performance, see Blanchard and Giavazzi (2003), Berger and Danninger (2005) and Boeri (2005). To save degrees of freedom, a summary indicator describing the state of product market regulation is used. In case this regressor is neglected, the evidence on labour market institutions might be seriously flawed. Third, updated OECD indicators describing the institutional framework are used, which were not available in the former studies. Therefore, the analysis also provides insights in the usefulness of these indicators.

The results suggest that more flexibility in product and labour markets and higher incentives for households to work could be appropriate strategies to improve the labour market record. The employment response to changing conditions is stronger in more deregulated environments. Compared to the current state of the economy, more deregulation in labour markets could relief the absorption capabilities to shocks. This also underpins the usefulness of the OECD regulation indicators. On the other hand, the optimal degree of flexibility is certainly not infinite. Appropriate reform strategies need to take the European social model into account.

The paper is organized as follows. A standard labour demand relationship is derived from cost minimization behaviour of firms (section 2). Results of the literature concerning the institutional impact are reviewed in section 3. Section 4 holds the cointegration analysis for the variables entering the labour demand equation and presents output and real wage elasticities per country. The impacts of institutions on these measures are examined in section 5. Section 6 offers a conclusion. The data involved in the study are described in detail in an appendix.

2. Labour demand behaviour

According to standard economic theory, profit maximizing firms are faced by output demand and factor prices, which are both exogeneous (Hammermesh,

1993). As a result of duality, optimal behavior can be inferred from the analysis of the cost function. Cost minimizing labour and capital input quantities are obtained by taking the partial derivatives of total costs with respect to the factor prices (Shephard's lemma). Using a log linear approximation, optimal labour demand L^* can be stated as

$$L_t^* = \alpha_1 T_t + \beta_1 Y_t + \delta_1 w_t + \theta_1 r_t \ , \ \beta_1 > 0 \ , \ \delta_1 < 0 \ , \theta_1 > 0 \tag{1}$$

where Y is output, w the real wage, and r the real rental price of capital. Prices are measured in real terms, implying that the output price moves in line with nominal factor prices. Technological progress T is assumed to be Hicks-neutral and proxied by a linear time trend. The parameters β, δ and θ denote the elasticities of labour demand to output, wages and capital prices, respectively. Higher demand for goods will raise labour input, while an increase in relative factor prices — either due to a rise in wages or a fall in the rental price of capital — will lower it. Due to imperfections such as institutional or cost restrictions, adjustment to the economic environment may not be instanteneous. Actual employment only partially reacts

$$\Delta L_t = \lambda (L_{t-1}^* - L_{t-1}) \ , \lambda \in (0,1) \tag{2}$$

to the level desired by firms. The higher the degree of persistence λ, the lower the employment response in the short run. By substituting the labour demand function into (2), an error correction mechanism

$$\Delta L_t = -\lambda (L_{t-1} - \alpha_1 T_{t-1} - \beta_1 Y_{t-1} - \delta_1 w_{t-1} - \theta_1 r_{t-1}) \tag{3}$$

is implied, which can be enhanced by a more complex dynamic structure. The long run equilibrium is captured by a cointegrating relationship and can be inferred from (3). If ΔL=0, actual and optimal employment coincide. The cointegration parameters are the elasticities to be examined.

3. The role of product and labour market institutions

Institutions are of key importance for a smooth working of laabor markets, see Agell (1999), Bertola (2004) and Acemoglu, Johnson and Robinson (2005). For example, in-formation asymmetries between workers and firms or different degrees of market power might require an appropriate mix of the regulation framework. But institutions may also introduce rigidities which may protract the reallocation of labour in response to shocks, and overly restrictive elements might worsen the employment performance. To examine this issue, a set of variables has been developed in the literature, which cover several

aspects of regulation in product and labour markets, including entrance barriers to firms, the tax burden and transfers, employment protection legislation, the wage bargaining structure and active labour market policies.

Often the institutional impact is not clear on theoretical grounds and has to be determined empirically. For example, stronger employment protection legislation may foster the bargaining power of workers in the wage negotiations, while the unemployed cannot exert much downward pressure, see Layard, Nickell and Jackman (1991). As a consequence, wages are above equilibrium and the level of employment is lower. But investments in firm-specific human capital might be supported and can generate long run productivity and competitiveness gains (Belot and Van Ours, 2002). Employment protection can also work as a substitute for incomplete unemployment insurance, see Boeri, Conde-Ruiz and Galasso (2003). Active labour market policies could improve the skills of the unemployed, especially for the low qualified, but can also crowd out regular labour, as firms have the incentive to hire subsidized workers, see Calmfors, Forslund and Hemström (2002).

According to Blanchard and Wolfers (2000), adverse supply shocks like the oil crises cannot explain the divergence in the national labour market performance, as there is insufficient heterogeneity in these shocks. Institutions can account for these differences, but many of them were already in place when unemployment was low. However, interactions between shocks and institutions may explain the development, as the reallocation of labour in response to shocks can be prolonged. Therefore, researchers have controlled for interactions between institutions and shocks, and also between the components of the institutional setting, emphazising the relevance of the regulatory mix, see Daveri and Tabellini (2000), Belot and Van Ours (2001) and Mourre (2004). For example, the presence of unemployment benefits and employment protection can amplify the effects on the unemployment rate.

Overall, the empirical evidence is far from conclusive, see Aidt and Tzannatos (2002), Baker, Glyn, Howell and Schmitt (2002) and Arpaia and Mourre (2005) for recent surveys. Shocks seem to have larger and more persistent effects in countries with a stricter regulation framework, see Blanchard and Wolfers (2000) and Fitoussi, Jestaz, Phelps and Zoega (2000). According to Bertola, Blau and Kahn (2001), the interaction of de-mographic as well as macroeconomic shocks and labour market institutions is crucial to explain the shift of the US from a country with relatively high to low unemployment rates. By contrast, Nickell, Nunziata and Ochel (2005) did not find any empirical evi-dence for the interaction hypothesis.

Other papers have focused on key elements of the institutional setup. Employment protection legislation seems to have no impact on unemployment (Nickell, 1997, Nickell and Layard, 1999, Belot and Van Ours, 2001). As employment protection affects the duration of unemployment periods and worker flows in an opposite direction, the net effect can be ambigious (Blanchard and Portugal, 2001). The impact of dismissal costs might also

depend on the state of the business cycle (Chen, Snower and Zoega, 2002). Strong trade unions tend to raise unemployment, see Elmeskov, Martin and Scarpetta (1998). However this effect is compensated if wage bargaining is highly centralized. If unions are important, a more compressed wage structure emerges and employment chances are worsened in particular for the unskilled and young (Kahn, 2000). On the other hand, the likelihood of attending school increases, as education bears lower opportunity costs.

By 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, especially in the tax and transfer system, during the 1960-95 period. However, this finding is based on high levels of endogeneous per-sistence as reflected by the coefficient of the lagged dependent variable. The persistence should be caused by institutions, but is left unexplained in the model. The importance of the tax and transfer system for the decision of households to work has also been stressed by Mourre (2004).

4. Empirical analysis of labour demand

Labour demand analysis is carried out using the annual data taken from the AMECO database of the EU Commission. The sample covers the EU countries, where Greece and the new member states have been excluded due to a lack of data. Luxembourg has been pooled with Belgium, using GDP weights. Overall, the development in 13 countries is observed over the 1973-2003 period. Time series for each country are obtained for employment, real GDP, real compensation per employee and real interest rates. Real GDP, compensation and interest rates serve as proxies for output, the real wage, and the rental price of capital, respectively. As the latter turned out to be largely insignificant in the subsequent analysis, the results refer to the three variable system (employment, output and real wage). Exact variable definitions are given in the appendix. The series enter the analysis in logs.

As the variables entering the labour demand equation might be nonstationary, their integration and cointegration properties have to be examined. ADF and KPSS tests are used to check for a unit root in the individual time series (see Table 1). The lag length of the ADF regressions is determined using Campbell and Perron's general-to-simple procedure (1991). The estimator of the long run residual variance needed for the KPSS statis-tics is obtained by the Bartlett kernel and the automatic bandwidth parameter approach suggested by Newey and West (1994). All variables include a constant and a linear time trend in levels and a constant in first differences.

As a rule, the ADF test cannot reject the null of a unit root for the levels, but for the first differences. The evidence based on the KPSS test is not in opposite with these findings. Nevertheless, there are some exceptions. For example, employment in Finland seems to be stationary already in the level, and output nonstationary even in the first difference representation. However,

a same order of integration across countries relieves the inter-pretation of the results. Thus, the variables are seen to be integrated of order 1, i.e. non-stationary in their levels and stationary in first differences.

Table 1: Unit root tests of labour demand variables

Employment

	ADF		*KPSS*			*ADF*		*KPSS*	
AT	-2.339	-3.034*	0.155*	0.205	IT	-2.440	-2.988*	0.121	0.138
BL	-2.869	-2.947*	0.156*	0.308	NL	-1.421	-5.064*	0.149*	0.413
DK	-2.823	-3.592*	0.062	0.099	PO	-2.353	-3.665*	0.169*	0.287
FI	-3.658*	-3.247*	0.089	0.099	SP	-1.504	-2.625	0.166*	0.400
FR	-1.950	-2.630	0.146*	0.267	SW	-2.842	-1.836	0.124	0.137
GY	-2.294	-4.997*	0.110	0.130	UK	-2.497	-4.762*	0.100	0.107
IR	-1.176	-2.065	0.168*	0.391					

Output

	ADF		*KPSS*			*ADF*		*KPSS*	
AT	-2.527	-6.150*	0.082	0.064	IT	-1.243	-6.219*	0.170*	0.374
BL	-2.855	-6.545*	0.108	0.068	NL	-2.333	-2.719	0.156*	0.160
DK	-2.344	-5.134*	0.125	0.156	PO	-5.634*	-4.492*	0.059	0.075
FI	-3.067	-2.614	0.092	0.088	SP	-3.026	-2.993*	0.125	0.132
FR	-2.504	-3.716*	0.093	0.096	SW	-4.259*	-3.408*	0.071	0.103
GY	-2.226	-3.732*	0.089	0.130	UK	-3.123	-4.123*	0.123	0.228
IR	-0.225	-3.039*							

Real wages

	ADF		*KPSS*			*ADF*		*KPSS*	
AT	-4.011*	-2.836	0.107	0.376	IT	-1.947	-4.527*	0.169*	0.550*
BL	-3.061	-3.927*	0.160*	0.374	NL	-2.273	-3.141*	0.081	0.209
DK	-2.286	-6.241*	0.140	0.129	PO	-2.872	-3.596*	0.119	0.143
FI	-2.173	-4.722*	0.180*	0.368	SP	-2.490	-2.566	0.157*	0.484*
FR	-5.062*	-2.913	0.169*	0.518*	SW	-0.541	-4.397*	0.159*	0.213
GY	-3.481	-6.806*	0.148*	0.331	UK	-1.517	-4.114*	0.124	0.153
IR	-3.474	-5.153*							

AT=Austria, BL=Belgium (+Luxembourg) DK=Denmark, FI=Finland, FR=France, GY=Germany, IR=Ireland, IT= Italy, NL=Netherlands, PO=Portugal, SP=Spain, SW=Sweden, UK=United Kingdom. The first (second) column in the ADF or KPSS section refers to the level (differenced) series. Level variables include a constant and a linear trend, and variables in differences a constant. A * indicates the rejection of the null hypothesis of nonstationarity (ADF) or stationarity (KPSS) at least on the 0.05 level of significance. The ADF (KPSS) critical value at the 0.05 percent level is -3.574 (0.146) for the model in levels and -2.972 (0.463) for the model in first dfifferences.

Table 2: Cointegration tests for labour demand variables

	Lag	*Trace*		*Lag*	*Trace*
AT	1	44.006*	IT	1	40.364*
BL	1	43.282*	NL	1	65.022*
DK	1	37.064*	PO	2	43.361*
FI	2	44.896*	SP	1	40.836*
FR	2	55.500*	SW	2	43.627*
GY	2	63.048*	UK	1	57.987*
IR	1	44.216*			

AT=Austria, BL=Belgium (+Luxembourg) DK=Denmark, FI=Finland, FR=France, GY=Germany, IR=Ireland, IT= Italy, NL=Netherlands, PO=Portugal, SP=Spain, SW=Sweden, UK=United Kingdom. The lag length of the underly-ing VAR in levels is reported. All models include an unrestricted constant, i.e. the linear trend is not restricted to the cointegration relationship. A * indicates the rejection of the null hypothesis of no cointegration at least on the 0.05 level of significance. Critical values are from MacKinnon, Haug, and Michelis (1999). The 0.05 percent critical value is 29.797.

Because of the nonstationarities of the variables involved, a cointegration analysis is the way to proceed. The results of the Johansen (1991) trace test are shown in Table 2. The trace statistic evaluates the null of no cointegration against the alternative of at most one cointegration vector. The lag orders of the VARs have been determined by the Schwartz criterion, where a maximum of 2 periods is considered. This corresponds to a 3-year lag in the level representation. All models include an unrestricted constant. The null of no cointegration is rejected for all countries. Thus, the variables in the labour demand func-tion are cointegrated.

In principle, the cointegration vector can be also derived from the Johansen procedure. However, this is not recommended. In fact, whether or not the cointegrating relationship can be interpreted in terms of an equation explaining labour demand can be inferred from a conditional error correction model. This approach may lead to constant coefficients even if a shift is present in the reduced form. Given the identification problems in full systems, a structural model for an individual variable might be easier to develop using the single equation context. To avoid the well known deficits arising from OLS estimation, efficient techniques are used, see Saikkonen (1991) and Hendry (1995). In a dynamic setting, the long run equation is augmented by lead and lagged differences of the regressors to control for endogeneous feedback. Lagged differences in the dependent variable are also involved in case that the residuals exhibit serial correlation. In this context, the relevance of the individual regressors can be inferred using conventional statistics.

Country specific elasticities for labour demand are shown in Table 3. As a result of the unification, a break occurs in the German time series in 1991,

which has been removed by impulse and step dummies. Due to space constraints, stationary terms in the regressions have been suppressed. All variables are estimated with the expected signs, implying that a standard labour demand equation is valid for the EU economies. In the majority of cases, the output elasticity does not significantly differ from 1. Real wage elasticities are lower than output elasticities in absolute value, but show stronger variation across the member states. Technological progress contributes to a decline in labour demand by roughly 1.5 per cent per year in most countries. The equations are well behaved accord-ing to standard specification tests. For example, the residuals are neither heteroscedastic nor autocorrelated.

5. Institutional impact on labour demand

Labour market institutions refer to employment protection legislation, the structure of the wage bargaining process, the tax and transfer system and active labour market policies. Product market regulation is also included and measured by a summary index.

Institutions for wage negotiations are proxied by trade union densities, the coverage of wages bargained by unions, and the degree of coordination/centralization at which bargaining actually takes place. Taxes and transfers are defined in terms of the benefits available to the unemployed and the tax wedge on labour income. Public employment services and labour market training are used as a substitute for active labour market policies. Data on labour market institutions are mostly taken from the OECD (2004) employment outlook.

The degree of product market regulation refers to seven non-manufacturing industries. These sectors are typically less open for international competition, and the institutional framework might be more important here. The OECD summary indicator covers different dimensions like public ownership of firms, entry regulation, market structure, vertical integration and price controls (Conway and Nicoletti, 2006). Exact variable definitions are given in the appendix.

Institutional indicators are the regressors to explain output and real wage elasticities. However, a model with constant elasticities would inevitably lead to a cross-section analysis, where the institutional impact cannot be separated from other country characteristics. In general, a panel approach is superior, where unobserved heterogeneity is bounded in the fixed effects.

To develop a panel structure, labour demand elasticities are allowed to vary over time. Although the elasticities reported in Table 3 are fairly stable, they show some (possibly insignificant) variation, if the equations are considered over subperiods. Time varying elasticities are estimated using dynamic OLS recursively. Initially, all the equations are run over the 1973-1985 period, and the first set of parameters (corresponding to 1985) is computed. Then, the period is prolonged by 1, and the process is repeated until the end of the

sample is reached. The panel fixed effects models are based on annual data covering the 1985-2003 period, because estimates of labour demand elasticities are not available earlier.[2]

In principle, there may be endogeneous feedback, as the labour market performance can affect the institutional pattern. Hence, the regressions have been also estimated with lagged indicators as intruments for the current state of regulation. Since the effects on the results are largely neglectable, a simultaneity bias does not occur. The labour market outcome might affect the institutional pattern, but this relationship is hardly a contem-poraneous one (Blanchard, 2005).

As institutions adjust only slowly, the correlation between the regressors is usually high. This leads to imprecise estimates of the institutional impact, even in the context of fixed effects models. To get some insights into the robustness of the results, equations cover-ing different aspects of the regulation framework are considered. In particular, individual models are presented for employment protection legislation (I), wage bargaining (II), the tax and transfer system (III), active labour market policies (IV), and product market regulation (V), see the tables 4 and 5 for the output and the real wage elasticity, respectively. The models are optimal from a statistical point of view, i.e. only signifi-cant or marginal significant variables are allowed to enter. Optimal nested models (VI) are shown in the right hand column of each table. It should be noted, that most indica-tors are measured on a rank scale. Hence, only the sign, but not the size of the coeffi-cients should be interpreted.

As a general result, the regulation framework measured by the indicators is important to explain aggregated labour demand behavior in the EU. The signs of the institutional impact have sensible interpretations.

In particular, stronger employment protection legislation will lead to a decline in the output elasticity, as the costs to firms to adjust labour input over the business cycle tend to increase (I). Dismissals are more difficult and firms are more cautious about filling vacancies. The significance of the employment protection index is in sharp contrast to the bulk of the literature, where almost no impacts have been detected so far, see for example Layard and Nickell (1999) and Belot and Van Ours (2004). Furthermore, a stronger presence of unions and centralization of the wage bargaining process dampen the employment reaction to output shocks (II). This effect is partly compensated in countries where wages negotiated by unions spread over the various sectors of the economy, thereby reinforcing the findings of previous studies like Mourre (2004) and Nickell, Nunziata and Ochel (2005).

An increase in the tax wedge or in unemployment benefits reduces the distance between labour income and transfers. Therefore, households have less incentives to work and the reaction to output changes should decline. However, both variables for the tax and transfer system appear to be insignificant at the 0.05 level (III). Although the variables in isolation do not dominate, the interaction with the degree of product market regulation is important. The

Table 4: Impact of institutions on output elasticity

	I	II	III	IV	V	VI
Constant	1.903	0.603	1.321	0.498	1.328	1.655
	(0.102)	(0.400)	(0.056)	(0.091)	(0.060)	(0.393)
EPL	-0.780					-0.457
	(0.097)					(0.101)
DEN		-2.636				-2.185
		(0.374)				(0.358)
COV		2.499				1.386
		(0.403)				(0.377)
COO						
CEN		-0.158				-0.181
		(0.058)				(0.056)
BRR						
TAX						
TAX*PMR			-0.172			
			(0.024)			
PES				2.236		1.779
				(0.459)		(0.458)
LMT				0.293		
				(0.113)		
PMR					-0.096	
					(0.014)	
R^2	0.731	0.748	0.716	0.696	0.710	0.797

BRR=benefit replacement rate. EPL=employment protection legislation, DEN=trade union density, COV=bargaining coverage, COO=bargaining coordination, CEN=bargaining centralization, LMT=labour market training measures, PMR=product market regulation, PMS=public employment services, TAX=tax wedge. R^2=adjusted R-squared, standard errors in parantheses.

tax wedge exerts a negative effect on the elasticity in highly regulated economies. The evidence from other studies is not conclusive on this point. While the tax wedge worsens the employment performance according to Mourre (2004), it is insignificant in the analysis of Belot and Van Ours (2004). According to Nickell, Nun-ziata, Quintini and Ochel, an rise in the tax wedge will raise unemployment, especially in countries with a high degree of bargaining coordination.

Table 5: Impact of institutions on real wage elasticity

	I	II	III	IV	V	VI
Constant	-0.830	0.597	-0.564	0.134	-0.572	-0.240
	(0.113)	(0.331)	(0.048)	(0.091)	(0.052)	(0.232)
EPL	0.517					
	(0.091)					
DEN		1.927				2.015
		(0.346)				(0.286)
COV		-1.616				-1.020
		(0.366)				(0.298)
COO		-0.107				
		(0.042)				
CEN						
BRR						
TAX						
TAX*PMR			0.168			0.082
			(0.021)			(0.019)
PES				-1.160		-0.785
				(0.373)		(0.374)
LMT				-0.463		-0.299
				(0.092)		(0.088)
PMR					0.094	
					(0.012)	
R^2	0.623	0.667	0.665	0.695	0.657	0.798

BRR=benefit replacement rate. EPL=employment protection legislation, DEN=trade union density, COV=bargaining coverage, COO=bargaining coordination, CEN=bargaining centralization, LMT=labour market training measures, PMR=product market regulation, PMS=public employment services, TAX=tax wedge. R2=adjusted R-squared, standard errors in parantheses.

Active labour market policies show a positive effect on the output elasticity (IV). These measures tend to improve the qualifications of the labour force, especially in the low productivity segment, and a human capital effect may increase the reaction. Again, this finding is not uncontroversial, as Mourre (2004) did not detect an impact of active labour market policies on the labour market performance. Finally, the effect of output on employment is

lower in countries with highly regulated product markets (V). Because of multicollinearity problems, not all regressors remain significant if the models are merged to a nested specification (VI). Only labour market institutions seem to be impor-tant to explain the employment response.

The directions of impacts are reversed if the real wage elasticity is considered. Here, a positive sign actually raises the real wage elasticity, i.e. the parameter declines in absolute value. Thus the real wage becomes less important for employment. In particular, an increase in the strength of employment protection is expected to reduce the response to shocks in the real wage, possibly due to higher insider power. This interpretation is supported when indicators for wage setting behaviour are analysed. The more regulated the bargaining process, the lower the ability of firms to readjust the level of employment to wage fluctuations. Union densities and coordination of wage negotiations appear to be most important, while bargaining coverage shows a compensating effect. Taxes and transfers raise the elasticity in countries where product markets are highly regulated. Active labour market policies exert a negative effect. They may act as a buffer to the regular labour market, and a higher availability of these measures enables firms to adjust labour input easier. Finally, the employment response to real wage shocks is lower in more regulated product markets.

6. Conclusions

In this paper, the role of institutions for labour market performance is investigated using a panel of EU countries. The starting point of the analysis is the labour demand function, which is expressed by its structural parameters, such as the elasticities of employment to output and factor prices. Institutional variables include employment protection legislation, the structure of wage bargaining, measures of the tax and transfer system, active labour market policies and an overall indicator describing the degree of product market regulation.

The analysis shows that standard labour demand equations can be justified for the EU countries. The variables of the labour demand function are cointegrated, and the long run elasticities are estimated with the expected signs. Furthermore, labour market institutions are important to explain the response of employment to output and real wage shocks. The findings have sensible interpretations, emphasizing that the employment reaction to the macroeconomic conditions is stronger in more deregulated environment. In contrast to the bulk of the literature, a strong impact of employment protection legislation is obtained. Moreover, the tax wedge appears to be highly relevant, but only in countries with a high degree of product market regulation.

Given that labour markets need to be more flexible in the process of EU integration, policies should introduce more deregulation in the product and labour markets to ensure a smooth adjustment to shocks while avoiding per-

sistence effects. However, the optimal degree of flexibility is certainly not infinite, and appropriate reform strategies need to take the European social model into account.

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APPENDIX

The sample runs from 1973-2003, using annual data from 13 EU member states (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, United Kingdom). The series for Belgium includes Luxembourg. GDP and employment refer to the sum of the figures in these two countries, and factor prices have been aggregated using real GDP weights.

All macroeconomic data have been taken from the AMECO database of the EU Com-mission (http://europa.eu.int/comm/economy_finance/indicators_en.htm). Country-by-country time series are obtained for employment in persons, GDP at market prices, labour compensation per employee, long term nominal interest rates, and the GDP deflator (1995=100). Nominal GDP and compensation per employee are deflated by GDP prices to compute the real variables used in the analysis. The real interest rate is proxied as the difference between the long term interest rate and annual inflation in GDP prices. Apart from real interest rates, all series enter the analysis in logs.

The bulk of the institutional data have been taken from the OECD (2004) employment outlook, chapters 2 and 3, available at www.oecd.org. Institutional data are considered for the 1985-2003 period.

Some institutional variables, including employment protection legislation, bargaining coordination and centralization are measured on a rank scale where a higher number refers to stronger regulation. For example, bargaining coordination is scaled in the [1;5] interval, where 1 is bargaining at firm level, with no coordination by higher-level asso-ciations, and 5 is coordination by top-level confederations of unions and employers' associations where even the government can impose a wage freeze. Other variables are quantitative. Trade union densities show the share of workers organized in unions. The rate of workers governed by unionized contracts is measured by bargaining coverage. Benefit replacement rates are obtained as a percentage of earnings before tax, averaged over family types. The tax wedge refers to the sum of the rates of employment taxes, social contributions and indirect taxes. The two categories of active labour market poli-cies, public employment services and labour market training are expressed as expenditure shares in nominal GDP. The index for product market regulation comprises the informa-tion of seven non-manufacturing industries, including telecommunication, electricity, gas, post, rail, air passenger transport and road freight. Data have been taken from Conway and Nicoletti (2006).

Some of the institutional data are unavailable at the annual frequency.The OECD (2004) reports 5-yearly or 10-yearly data for employment protection legislation, coverage, co-ordination and centralization. In these cases, the database is extended to match the annual frequency. Intermediate values for employment protection of regular and temporary work have been calculated using the OECD (2004) table 2.A2.6, in which information on the timing of the reforms in this variable is provided for the past 20 years. Measures of the bargaining process were interpolated using the Nickell and Nunziata (2001) database.

ENDNOTES

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2. As a check for robustness, rolling regressions have been performed with a fixed length of observations. The results turn out to be broadly stable and can be obtained from the authors upon request.

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