

The European Economic and Monetary Union and Labour Market Reform

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Abstract

We examine whether EMU has led to more labour market flexibility, differentiating between reform enhancing the capacity of an economy to adjust to economic shocks and reform aiming to increase long-run output. Based on a panel model and using OECD data on labour market reforms for 27 OECD countries over the period 1994-2004, we find that EMU has had no effect on the two types of labour market reform. In the run-up to EMU, countries in the euro area introduced labour market reforms enhancing their adjustment capacity, but there is no evidence that these reforms are significantly different from reforms in countries outside the euro area. We also find that both types of labour market reform are driven by different variables.

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1. Introduction

It is a popular belief that the European Economic and Monetary Union (EMU) will create more labour market flexibility. The argument is that in EMU monetary policy is no longer available to individual countries to respond to asymmetric shocks, which increases the incentives to undertake structural reform (Bean, 1998).¹ Such reforms are likely to increase the flexibility of the labour market and, therefore, make adjustments to asymmetric shocks easier. In addition, structural reforms are also claimed to reduce the natural rate of unemployment.

However, deregulating the labour market has high political costs. Labour market reform would include reductions in the level and duration of unemployment benefits, lower minimum wages, and possibly also reductions in employment protection. Politicians may be highly reluctant to pursue such policies because in the short run they may harm many voters.

Furthermore, EMU might also reduce the incentives for governments to reform the labour market. Before the monetary union, a high inflation bias created an incentive for national policy makers to reform their labour market, because reform would reduce this bias. However, reform in any individual country in the monetary union is unlikely to affect the union-wide inflation bias and the country's incentive to reform is therefore smaller than before the start of the monetary union (Calmfors, 2001). Furthermore, for most countries in the monetary union the delegation of monetary policy to the independent and conservative (i.e., inflation-averse) European Central Bank (ECB) has reduced the inflationary bias in comparison to the pre-monetary union situation.

So, on theoretical grounds it is not clear whether EMU will lead to more or less labour market reform. Scant empirical research, to be discussed more extensively in section 2, has also not come up with clear answers yet.

The purpose of this paper is to re-examine whether EMU has led to labour market reform. However, contrary to previous empirical work, we follow the

¹ There is an extensive literature dealing with the issue whether EMU has led to a reduction in asymmetric shocks (see, e.g. Frankel and Rose, 1998 and Inklaar et al., 2008). This issue will not be dealt with in the present paper. See De Haan et al. (2008) for a survey.

suggestion of Saint-Paul and Bentolila (2001) to differentiate between reform measures that enhance the capacity of an economy to adjust to economic shocks and those that aim to raise long-run equilibrium output. To that end, we use data on labour market reforms provided by Brandt et al. (2005), covering 27 OECD countries over the period 1994-2004. We find that both types of labour market reform are driven by different factors. Most importantly, our results suggest that EMU has had no effect on both types of reform. In the run-up to EMU, countries in the euro area introduced labour market reforms enhancing their adjustment capacity, but there is no evidence that these reforms are significantly different from reforms in countries outside the euro area. We find that this conclusion is robust to the inclusion of a wide range of control variables.

The remainder of the paper is structured as follows. Section 2 discusses the arguments in more detail, using a very simple model. Section 3 describes our data, while section 4 presents the empirical evidence. Finally, section 5 offers our conclusions.

2. Review of the arguments and previous studies

Although it is often argued that EMU must strengthen the incentives for labour market reform due to the loss of monetary policy autonomy, this may not be true. We can illustrate this using a simple model that includes labour market reform in a time inconsistency model of monetary policymaking (Eijffinger and De Haan, 2000).² The government is supposed to minimize the following loss function:

$$L = 1/2\pi_t^2 + \frac{\gamma}{2}(u_t - u^*)^2 + \frac{\tau}{2}r_t^2 \quad (1)$$

where π_t denotes inflation; u_t is actual unemployment; u^* is the target rate of unemployment (which is lower than the natural rate of unemployment; u_n), and r denotes the level of labour market reform. The first part of equation (1) is a standard loss function in which both inflation and deviations from some target rate of unemployment are considered to be costly. As reforms are politically costly, they are also a loss for the government.

² See Berthold and Fehn (1998), Sibert and Sutherland (2000), and Calmfors (2001) for more extensive analyses along these lines. See Leiner-Killinger et al. (2007) for a survey.

The structure of the economy is represented by a simple expectations-augmented Phillips curve:

$$u_t = u_{wr} - \lambda r - (\pi_t - \pi_t^e) + \varepsilon_t \quad (2)$$

where u_{wr} is unemployment without reform, π^e is expected inflation, and ε_t is a random shock. It is quite easy to see how EMU can affect the incentives for labour market reform. Under full commitment, the optimum level of labour market reform (r^*) is simply:

$$r^* = \frac{\gamma\lambda}{\tau + \lambda^2\gamma}(u_{wr} - u^*) \quad (3)$$

The marginal benefits of reform due to lower unemployment equal the marginal political costs of this reform. If there is a time inconsistency problem, the solution is:

$$r^* = \frac{\gamma\lambda(1 + \gamma)}{\tau + \lambda^2\gamma}(u_{wr} - u^*) \quad (4)$$

The value for r^* in equation (4) is higher than in (3). If the ECB-led policy reduces the inflationary bias in comparison with the situation before EMU, there will be less labour market reform than before EMU.

But even if the ECB suffers from the same inflation bias as individual national central banks before EMU, there may be less labour market reform (Calmfors, 2001). This is due to the fact that labour market reform in an individual country has only a small effect on aggregate unemployment in the monetary union. So each member state internalises only a fraction of the benefits of labour market reform. This effect is strongest in small countries, because the effects of their labour market reforms on aggregate unemployment will be the smallest.³

³ Calmfors (2001) also argues that if EMU leads to larger variations in employment because national monetary policy can no longer be used to stabilise country-specific shocks, there is a precautionary motive for more reform inside than outside EMU. This argument hinges on the assumption that EMU will not reduce country-specific shocks, while most evidence points in another direction (see De Haan et al., 2008).

According to Duval and Elmeskov (2006), a different reason why EMU may lead to less reform is that labour market reform expands potential output. However, it is possible that the expansion of potential output is not accompanied by a corresponding expansion in aggregate demand. Before entering a monetary union, lower interest rates and exchange rate depreciation in an individual country could in principle boost demand, but in a monetary union these mechanisms no longer work.

Furthermore, as Bean (1998) suggests, inside EMU the inability to pursue a complementary macroeconomic policy that could ease the pain of reforms will make it politically harder to implement large-scale reforms. Before entering the monetary union, policymakers could try to reduce costs associated with the structural change by stimulating demand (often referred to as a ‘two-handed approach’).⁴ In the monetary union, such support from the ECB is unlikely while the possibilities for using national fiscal policy are arguably constrained by the Stability and Growth Pact.

Saint-Paul and Bentolila (2001) distinguish between reforms that allow for faster adjustment of the economy to shocks, such as reductions in nominal wage or employment inertia, and reforms that alter the economy’s long-run performance, such as reductions in rents obtained by insider wage setters. The incentives to implement these different types of reform depend on the rigidities affected by the reform and on possibly diverging preferences for inflation, unemployment, and real wages in different countries in the euro area. Saint-Paul and Bentolila (2001) show that certain types of rigidities are more costly than others under EMU; some rigidities may even increase welfare under certain assumptions about society’s preferences. As a result, a priori it is not clear whether labour markets in the euro area will become more or less flexible.

The argument that EMU will stimulate reforms due to the loss of national monetary policy refers to reforms that affect the economy’s response to economic shocks. In contrast, most of the arguments reviewed above why EMU may deter reforms refer to reforms that affect long-run (equilibrium) output. In our empirical analysis we will therefore follow Saint-Paul and Bentolila (2001) and examine

⁴ As Leiner-Killinger et al. (2007) point out, the macroeconomic thrust of the ‘two-handed approach’ is as follows: structural reforms in the labour market may lead to an immediate fall in the natural rate of unemployment, but the actual unemployment rate does not immediately follow the adjustment in the natural rate. As output might for some time remain below potential, it is desirable to exert some stimulus through monetary and/or fiscal policies.

whether the occurrence of these different types of reform have been differently affected by EMU.

A few previous studies have examined the impact of EMU on labour market reform. Duval and Elmeskov (2006) estimated a probit model over the period 1994-2004 using indicators of labour market reform as developed by Brandt et al. (2005) to examine the impact of EMU on major reforms in the labour market. Their dependent variable is a binary variable capturing major reforms.⁵ The key explanatory variable in their model is a dummy variable that takes value 1 if a country has a sovereign monetary policy and 0 otherwise.⁶ Duval and Elmeskov find that participation in a fixed exchange rate regime hardly influences labour market reforms. However, macroeconomic factors - such as the initial level of unemployment, the capability to compensate losers as determined by the situation of the public finances, the occurrence of economic crises, and being a small open economy - influence labour market reforms.

Recently, Alesina et al. (2008) have also examined the impact of the euro on structural product and labour market reform. They find that the adoption of the euro has been associated with an acceleration of the pace of structural reforms in the product market. In line with the results of Elmeskov and Duval, Alesina et al. conclude that the adoption of the euro does not seem to have accelerated labor market reforms. The measures used by Alesina et al. (2008) capture the degree of employment protection related to the firing decisions, and the level of insurance provided to the unemployed.

In contrast, Bertola and Boeri (2002) report that the adoption of the euro accelerated the pace of labour market reforms in those countries that joined the euro area. Although the euro area countries started out with a higher level of labour market inflexibility, as measured by employment protection legislation and benefits for the unemployed, euro area countries implemented more reforms between 1997 and 2002

⁵ The reforms refer to: unemployment benefit systems, labour taxes, employment protection legislation, product market regulation, and retirement schemes. See the next section for a further description.

⁶ As a result, the authors examine whether fixed exchange rate arrangements (for example, pegs, the former Exchange Rate Mechanism of the European Monetary System, or EMU) stimulate reforms. This ignores the unique characteristics of a monetary union. Membership in a monetary union is less easy to reverse and therefore a much more credible commitment than participation in a fixed exchange rate regime. Furthermore, fixed exchange rate regimes come in different forms and even in one regime there may be large differences. For instance, the ERM involved countries that maintained a hard peg to the Deutsche Mark as well as countries that saw their currency frequently devaluated. The coding applied by Duval and Elmeskov does not differentiate between these cases.

than between 1986 and 1996 compared to non-euro area countries. However, the analysis of Bertola and Boeri (2002) is based on the number of reforms, which is an unsatisfactory measure of reform efforts (Leiner-Killinger et al., 2007).⁷

3. Data

We re-examine whether monetary union has affected labour market reform in the countries in the euro area. There are several reasons why this issue needs further examination. First, previous empirical research has not differentiated between reforms that increase the adjustment capacity of an economy and those that increase long-term output even though research by Saint-Paul and Bentolila (2001) suggests that this difference is important. Second, Duval and Elmeskov (2006) focused on major reforms only. However, Saint-Paul and Bentolila (2001) argue that one would expect reforms under EMU to be carried out in small steps. Third, the uniform treatment of the monetary union and fixed exchange rate regimes raises serious doubts whether the study by Duval and Elmeskov (2006) has captured the influence of EMU on the propensity of European countries to carry out reforms. Finally, the indicators of reform used by Bertola and Boeri (2002) and Alesina et al. (2008) are quite limited: the first study employs the number of reforms, while the second uses only two indicators of reform.

We employ the data of Brandt et al. (2005) to proxy labour market reform. In their study, all reforms have been divided into 44 individual policy categories and 7 broad policy areas and assessed by assigning a score to each reform in two sub-periods: 1994-1998 and 1999-2004. The 7 policy areas considered are: (1) active labour market policies; (2) taxes and social security contributions; (3) employment protection legislation; (4) unemployment benefit systems; (5) wage formation and industrial relations; (6) working-time flexibility and part-time work; and (7) old-age pension systems and early retirement schemes. The score assigned is positive or negative, depending on whether or not the policy measure implemented is in line with

⁷ Another related study is from Enderlein (2006) who focuses on changes in the structure of the labour market, arguing that a one-size-fits-all monetary policy will lead to more centralized wage setting and a stronger government involvement. Such an institutional setup may prevent excessive wage claims in times of economic upturn exceeding the EMU average and may help to avoid overheating of the economy.

OECD recommendations. The indicators of reform intensity for the seven policy areas are calculated as the ratio of the actual and the maximum possible score.⁸

Although the data of Brandt et al. (2005) are much more comprehensive than other indicators of labour market reform, they are only available for two sub-periods: 1994-1999 and 2000-2004. Our analysis is based on Differences-in-Differences (DD) estimation. DD estimation consists of identifying a specific intervention or *treatment* (in our case: the start of EMU). The difference in outcomes after and before the intervention for countries affected by the intervention are then compared to the same difference for unaffected countries. Bertrand et al. (2004) show that most studies based on DD use many years of data and focus on serially correlated outcomes but ignore that the resulting standard errors are inconsistent. They show that collapsing the time series information into a “pre”- and “post”-period works well, even for a small numbers of countries.

Table 1 summarizes the reform intensity indicators for the full sample period. It turns out that the strongest labour market reforms have occurred in Denmark, the Netherlands, and Germany.

We categorize the indicators in two groups following the suggestion by Saint-Paul and Bentolila (2001). Table 2 shows our priors. In the first category (reforms affecting long-run equilibrium output) we include those variables that directly affect labour supply and therefore, the economy’s growth potential, whereas the variables in the second category influence the economy’s capability to absorb shocks by adjusting employment and wages. In our view, one variable (i.e., wage formation and industrial relations) does not fall explicitly into just one category. The institutions related to wage formation clearly determine the level of wage flexibility. On the other hand, this indicator reflects also such issues as the degree of wage-bargaining centralisation or the level of minimum wage, which affect the labour supply and the ability of incumbent employees to extract rents.

⁸ A serious shortcoming of the indicators is that the initial situation is not taken into account. As a result, a low level of reform intensity may either reflect a reluctance to carry out reforms or that there is no room for further changes.

Table 1. Reform intensity indicators by area: 1994-2004 (percentage of maximum possible score)

Country	Total score	Active labour market policies	Taxes and social security contributions	Employment protection legislation	Unemployment benefit system	Wage formation and industrial relations	Working-time flexibility and part-time work	Early retirement, invalidity and old-age pension schemes
Australia	21	54	25	-7	19	27	0	17
Austria	17.8	15	31	13	23	2	17	33
Belgium	21.4	40	44	10	15	5	33	17
Canada	15.2	38	13	0	23	0	17	17
Czech Republic	6.2	17	0	-3	12	-5	-17	33
Denmark	29.3	56	13	10	42	27	17	25
Finland	25	48	13	13	35	0	17	50
France	14.5	42	31	-7	0	-5	33	42
Germany	23.9	58	13	17	19	9	17	25
Greece	13.8	42	13	7	12	5	17	-8
Hungary	12.3	31	25	-7	19	-9	0	33
Ireland	17.4	46	88	-10	15	-14	0	0
Italy	21.7	31	56	23	-12	5	33	50
Japan	8.7	23	-13	13	4	0	33	8
Korea	12.3	27	0	25	8	0	17	8
Luxemburg	14.9	33	38	0	4	-5	33	33
Netherlands	25.7	56	25	13	12	14	33	42
New Zealand	12.3	42	19	-13	15	-5	0	33
Norway	15.2	46	-19	10	27	0	17	8
Poland	11.2	29	0	-3	15	5	17	25
Portugal	15.9	23	25	17	8	5	33	17
Slovakia	13	12	25	14	19	0	17	8
Spain	10.5	8	19	17	8	7	0	8
Sweden	17.4	50	13	13	12	5	0	8
Switzerland	8.7	23	6	0	15	0	17	0
United Kingdom	16.7	50	56	-10	12	-9	0	25
United States	11.6	19	50	0	12	0	0	0

Source: Brandt et al. (2005)

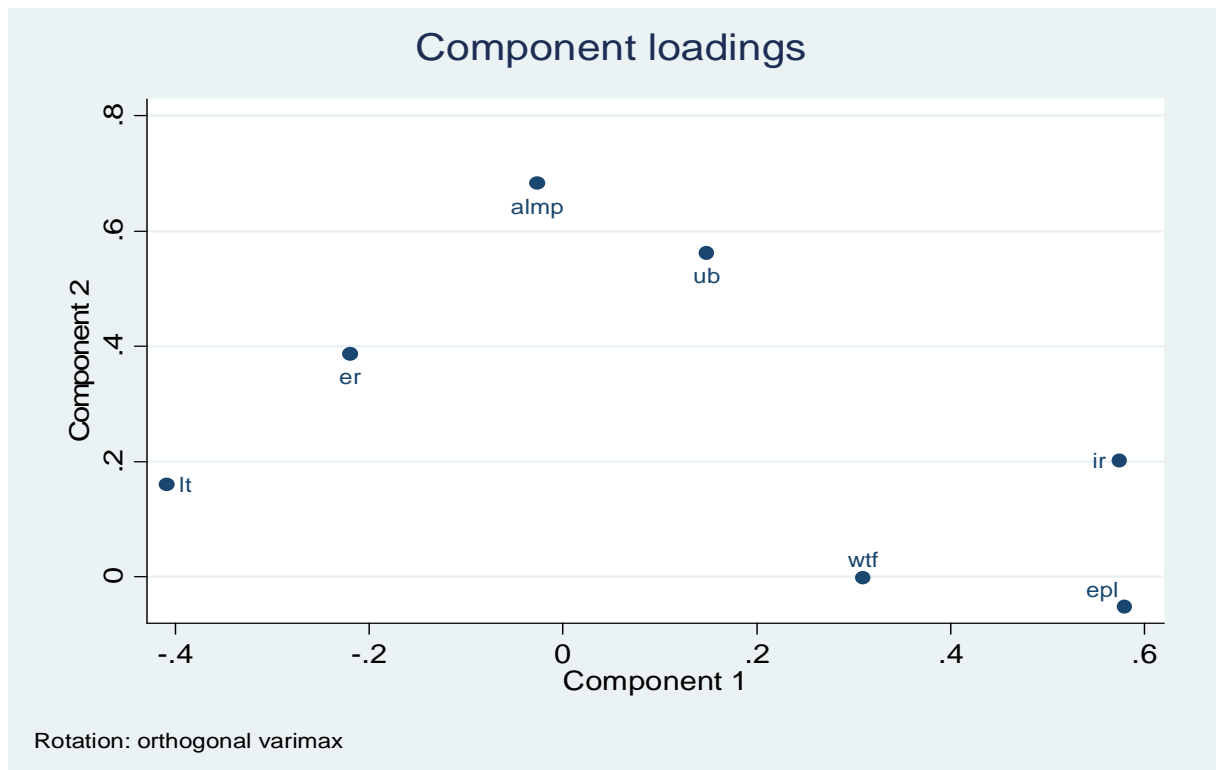
Table 2. Reforms affecting adjustment capability and long-run equilibrium

Reforms affecting the long run equilibrium	Reforms affecting adjustment capabilities
Active labour market policies (almp)	Employment protection legislation (epl)
Taxes and social security contributions (lt)	Working-time flexibility and part-time work (wtf)
Unemployment benefit system (ub)	Wage formation and industrial relations (ir)
Wage formation and industrial relations (ir)	
Early retirement, invalidity and old-age pension schemes (er)	

A principal component analysis largely confirms our classification.⁹ Figure 1 shows that most indicators load high on one component, except for wage formation and industrial relations. In our empirical analysis we have used two measures that reflect reform enhancing the long-run performance and reform enhancing the adjustment capacity of the economy, respectively, that are calculated on the basis of a factor analysis of the indicators of Brandt et al. (2005). Figure 2 shows these measures for all the countries in our sample; part (a) refers to reform in the first period, while part (b) shows reform in the second period. Figure 3 shows (unweighted) averages of both types of labour market reform for these periods for countries inside and outside the euro area. In the run-up to EMU, the countries in the euro area had a high level of reform enhancing the adjustment capacity of the economy. However, after the start of the monetary union this type of reform has been less pronounced in the countries in the euro area.

⁹ We have done principal components analysis using the Varimax rotation. The number of components is selected on the basis of our theoretical priors. When we use different selection criteria such as the scree plot criterion or the Kaiser criterion, it is not clear whether to select two or three components. Therefore, we have done the same analyses also with three components. It turns out that our results are very similar when three components are extracted.

Figure 1. Principal component loadings of the reform indicators



Note: The figure shows the factor loadings of a principal components analysis in which two components are identified, which have been rotated using the orthogonal Varimax rotation technique. Component 1 refers to the dimension reflecting the adjustment capability to respond to economic shocks, whereas component 2 refers to the dimension reflecting the extent to which the reforms are aimed to increase the long run equilibrium.

Figure 2. Labour market reform indicators: long-run equilibrium and adjustment capacity, 1994-2004

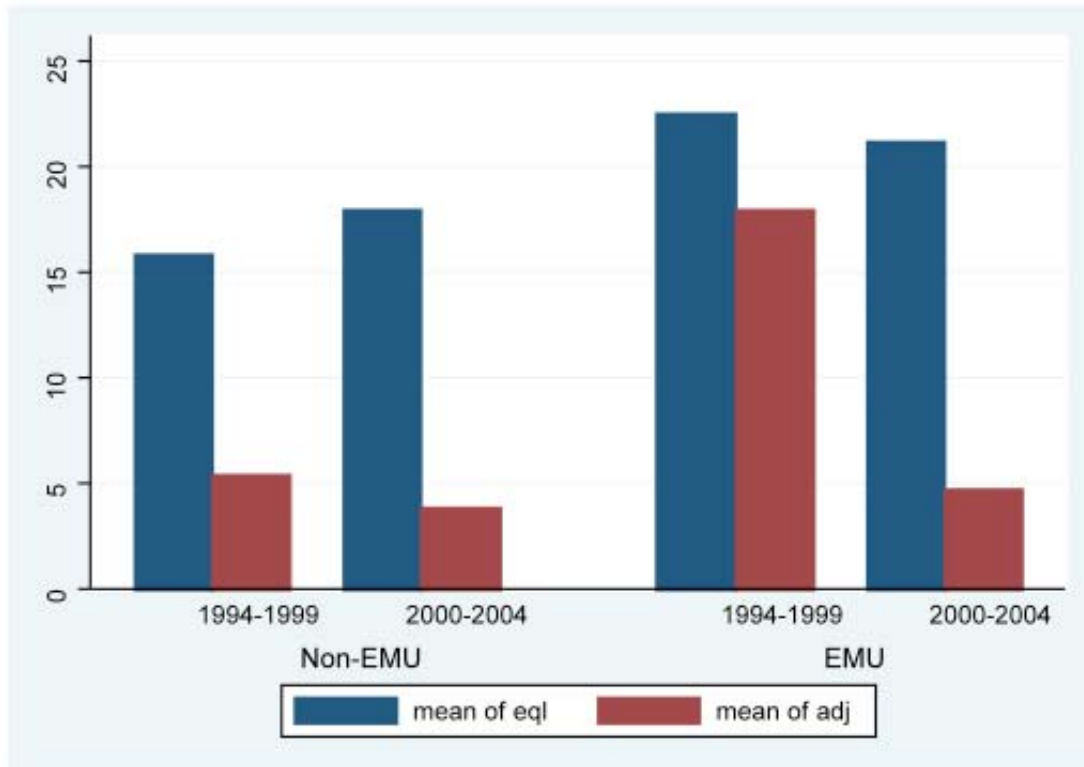
(a) 1994-1999



(b) 2000-2004



Figure 3. Comparison of reform intensities over time between euro area countries and non-euro area countries



4. Empirical results

To examine whether EMU has affected the different categories of labour market reform as distinguished in the previous section, we have performed two different analyses.

We start by comparing (the average rate of) reform in various sub-samples of our data set using simple t-tests. Table 3 shows the results. The null-hypothesis we test is that there are no differences between the various groups that we distinguish. The first line in Table 3 compares euro area countries with the other countries in our sample. The hypothesis that there are no differences between these groups of countries over the full sample period cannot be rejected for both types of reform.

In lines two and three of Table 3 we test whether euro area countries are different from the other countries before and after the start of the monetary union, respectively. The hypotheses that the euro area countries before and after the start of EMU are not different from countries outside the euro area can again not be rejected at conventional significance levels for both measures of reform.

The final lines of Table 3 test for differences before and after the start of the monetary union for countries in the euro area, and for countries that are not part of the euro area, respectively. The test indicates that the level of reforms that enhance the adjustment capacity is different before and after the start of EMU in countries in the euro area. The hypothesis that there are no differences can be rejected at the 1 percent significance level. In contrast, this hypothesis cannot be rejected for the countries outside the euro area. The tests concerning reforms that enhance the long-term growth potential of the economy do not indicate that there are differences among the various samples that we distinguish.

Whereas these simple t-tests show that there are hardly any differences between the groups that we compare, they may hide the impact of EMU on labour market reform for various reasons. First, the t-tests only compare countries inside and outside the euro area and periods before EMU and after EMU separately. Second, there may be differences in the initial level of labour market flexibility that are not taken into account. Finally, there may be other variables that affect labour market reform. We therefore turn to a multivariate regression analysis with interaction effects.

Table 3. T-tests on differences in reform

	Reform enhancing adjustment capacity			Reform increasing long-run equilibrium		
	mean	st. dev	p-value	mean	st. dev	p-value
Non-euro area countries vs. euro area countries	-0.05	0.66	0.51	0.03	0.63	0.67
	0.07	0.71		-0.04	0.56	
Non-euro area countries vs. euro area countries before EMU	0.11	0.15	0.14	0.16	0.77	0.62
	0.43	0.15		0.04	0.54	
Non-euro area countries vs. euro area countries after EMU	-0.22	0.18	0.79	-0.10	0.58	0.93
	-0.29	0.20		-0.12	0.60	
Before vs. after EMU in euro area countries	0.43	0.52	0.01	0.04	0.54	0.52
	-0.29	0.71		-0.12	0.60	
Before vs. after EMU in non-euro area countries	0.11	0.58	0.18	0.16	0.68	0.28
	-0.22	0.71		-0.10	0.58	

To further investigate the impact of EMU on labour market reforms, we estimate a regression model that takes the difference between euro area countries and non-euro area countries as well as the difference between the period before and after the start of EMU simultaneously into account, and that also takes up other relevant variables:

$$\Delta L_{it} = \beta_0 + \beta_1 * EMU_i + \beta_2 * time_t + \beta_3 * (EMU_i * time_t) + \beta_4 L_{it} + \beta_5 X_{it} + \alpha_i + \varepsilon_{it} \quad (5)$$

In this model, ΔL is one of our two measures for labour market reform, EMU is a dummy variable that is equal to one if the country under consideration is part of the euro area, $time$ is a dummy equal to one in the period after the start of EMU and zero in the period before EMU. L is a measure of the initial flexibility of the labour market. It is important to include this variable since countries with a very flexible labour market have fewer opportunities to reform than countries with low labour market flexibility. Unfortunately, the data set of Brandt et al. (2005) does not provide information on the initial degree of labour market flexibility. Therefore, the index of labour market regulation of the Fraser Institute is used to control for the initial level of flexibility of the labour market.¹⁰ X is a vector of control variables to be discussed below. Finally, α is country specific error term and ε is a residual error term.

Obviously, the model specified above is an interaction model.¹¹ That is, the impact of EMU on labour market reforms in euro area countries relative to non-euro area countries is conditional on the time period under consideration. Consequently, we have to calculate the appropriate marginal effects and their corresponding standard errors to assess the impact of EMU on labour market reform.¹² We calculate the marginal effects by taking the first derivative of the function above and inserting the relevant value of the time dummy. That is:

$$\begin{aligned} \frac{\partial L}{\partial EMU} &= \hat{\beta}_1 & \text{if } time = 0 \\ \frac{\partial L}{\partial EMU} &= \hat{\beta}_1 + \hat{\beta}_3 & \text{if } time = 1 \end{aligned} \quad (6)$$

¹⁰ Available at: www.freetheworld.com.

¹¹ In effect, our analysis is equivalent to a DD approach, in which the countries in the euro area are the treatment group, the other countries make up the control group, and EMU is the treatment.

¹² The studies by Duval and Elmeskov (2006) and Alesina et al. (2008) do not properly take these interactions into account. See Brambor et al. (2006) for a discussion on the correct specification and interpretation of interaction models.

The estimated standard errors of the marginal effects in equation (6) are:

$$\begin{aligned} \hat{\sigma}_{\frac{\partial L}{\partial EMU}} &= \sqrt{\text{var}(\hat{\beta}_1)} && \text{if } time = 0 \\ \hat{\sigma}_{\frac{\partial L}{\partial EMU}} &= \sqrt{\text{var}(\hat{\beta}_1) + \text{var}(\hat{\beta}_3) + 2 \text{cov}(\hat{\beta}_1, \hat{\beta}_3)} && \text{if } time = 1 \end{aligned} \quad (7)$$

Table 4 shows the estimation results of the model without control variables. The table shows the estimated coefficients as well as the marginal impact of EMU on labour market reform before and after the start of the monetary union. Our results suggest that EMU has had no significant effect on both types of labour market reform. That is, whereas the results in Table 3 indicate that countries in the euro area have reformed their labour markets with respect to their adjustment capabilities more intensively in the period before than after the start of EMU, this reform was not significantly different from that of countries outside the euro area. As expected, the coefficient of the initial level of labour market flexibility is estimated with a negative sign although it is insignificant in the regression explaining reforms that aim to increase the long-run equilibrium.¹³

¹³ Our results are not driven by the inclusion of the initial level of labour market flexibility into our model. Estimating the model without this variable yields similar results (available on request).

Table 4. The impact of EMU on labour market reform: baseline model

Dependent variable:	(1) Reform enhancing adjustment capacity	(2) Reform increasing long-run equilibrium
Euro area country	0.042 (0.17)	-0.177 (0.68)
EMU period (1999-2004)	-0.391 (2.60)***	-0.268 (1.53)
Euro area country*EMU period (1999-2004)	-0.334 (1.47)	0.122 (0.46)
Initial flexibility of the labour market	-0.223 (2.75)***	-0.044 (0.51)
Constant	1.355 (2.84)***	0.402 (0.81)
Observations	53	53
Number of countries	27	27
R-squared	0.33	0.05
Marginal effect of EMU 1994-1999	0.04 (0.17)	-0.18 (0.68)
Marginal effect of EMU 2000-2004	-0.29 (1.19)	-0.05 (0.21)

Absolute value of z-statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

To check the robustness of our results and to examine whether both types of labour market reform are driven by the same factors, we include sequentially a range of control variables into our model (represented in equation 5). The variables that we consider have all been suggested in the literature on economic reform. These control variables are:

- *The average level of unemployment and the participation rate.* A poor performance of the labour market is often attributed to its rigidity and excessive regulation. High unemployment and low participation may therefore stimulate labour market reform. We therefore include the unemployment rate and the participation rate at the beginning of both sub-periods, i.e., 1994 and 2000 as controls. The data come from the OECD.
- *The occurrence of an economic crisis.* A crisis may stimulate reforms (cf. Pitlik, 2008). The incidence of a crisis may convince policymakers that decisive actions are needed, even if unpopular, in order to overcome the adverse economic conditions. We follow Duval and Elmeskov (2006) and

construct a dummy that is one when actual output is at least 4 percentage points below potential output according to OECD data, and zero otherwise.

- *The openness of the economy.* Following Pitlik (2008), we include openness, defined as the sum of exports and imports over GDP, as a control variable. The data are taken from the World Bank Development Indicators 2007.
- *Fiscal balance.* Sound public finances allow the government to provide compensation to those who lose from the reforms. Another reason why a strong initial fiscal position may enhance reform is that there is more room for fiscal policy to stimulate aggregate demand in the wake of any structural reform that expands potential output, but is not necessarily accompanied by a corresponding expansion in aggregate demand (Duval, 2008). The variable included is the average fiscal balance over the period considered. The data come from the OECD.
- *The occurrence of a fiscal adjustment.* Eichengreen and Wyplosz (1998) argue that poor public finances may force governments to spend their political capital on unpopular fiscal adjustment measures, leaving them with less ability and/or willingness to undertake structural reforms later on. So when there is a fiscal adjustment, there may be less room for reforms of the labour market. Using updated data from Mierau et al. (2007), we include two dummies reflecting the occurrence of two different types of fiscal adjustment. The first is based on von Hagen et al. (2001) who propose that an improvement of the budget balance by 1.25% points in two consecutive years or an improvement of 1.5% points of the budget balance proceeded or preceded by a positive change in the budgetary position can be considered as a period of fiscal adjustment. The second definition is due to Heylen and Everaert (2000) who propose that any period starting with an improvement of the budget balance by at least 0.25% points in the first year, a minimum duration of 2 years and a total improvement of the budget balance by at least 2% points can be considered as a period of fiscal adjustment. The definition by von Hagen et al. captures rapid adjustments whereas the Heylen-Everaert definition captures gradual adjustments.
- *The demographic structure.* As industrial countries face an increase in old-age dependency ratios (i.e., the percentage of the population that is older than 60),

one would expect policy measures to be taken aiming at increasing employment and labour market participation rates in order to offset the negative effects ageing. We therefore include the average dependency ratio (source: United Nations) as a control variable.

- *Ideology of the government.* Some governments may put more emphasis on equity than on efficiency when confronted with the short-term equity-efficiency trade-off that often comes with reform than others. According to Høj et al. (2006), left-wing governments may therefore be less inclined to reform. To control for this, we include a variable measuring the ideology of the government that ranges between 1 (right) and 5 (left) and is taken from Potrafke (2008) and Bjørnskov and Potrafke (2008), who apply the procedure of Woldendorp et al. (2000) to come up with a consistent index for most OECD countries.
- *Political fragmentation and political polarization.* Mierau et al. (2007) argue that a high degree of political fragmentation will lead to conflicts over the distribution of the costs of reform. Likewise, a high level of political polarization will cause reforms to be delayed. To proxy fragmentation, we include a variable measuring the probability that two randomly picked representatives in parliament are from different parties. This variable is taken from the World Bank Database of Political Institutions (Beck et al., 2001). The measure for political polarization is also taken from this source. The database reports the political colour of the four largest parties and the executive in each country. Pair-wise comparisons are made and the difference in orientation between the pair of veto players exhibiting the largest difference in orientation is the political polarization measure. It ranges between 0 and 2 (see also Keefer and Stasavage, 2003).
- *Migration,* measured as outflow of workers as share of the population (source: OECD). According to the optimum currency area literature, migration may be an alternative adjustment mechanism in case of asymmetric shocks that could work in a similar way as wage flexibility (Eijffinger and De Haan, 2000).
- *Globalization.* It is often argued that globalization forces governments to make their economy more flexible. We therefore include the index of Dreher (2006) to proxy globalization.

- *Trade union density.* Strong trade unions may be an important obstacle for labour market reform. On the other hand, reforms may be more easily implemented in corporatist societies. The data come from the OECD.

Table 5. The impact of EMU on labour market reform when control variables are added to the model

	Budget balance	Fiscal adjustments (Heylen and Everaert)	Fiscal adjustments (von Hagen et al.)	Economic crisis	Openness	Participation rate	Unemployment	Government fractionalization	Polarization	Government ideology	% population 65+	Globalization	Migration (out of country)	Union density
Inserted control variable:														
dependent variable: adjustment capabilities														
control variable	0.058	0.071	-0.009	0.029	-0.005	0.001	0.029	0.435	0.066	-0.252	0.027	0.011	-10.802	0.002
	(1.51)	(0.45)	(0.05)	(0.14)	(1.95)*	(1.05)	(1.24)	(1.10)	(0.60)	(2.30)**	(0.73)	(1.10)	(0.71)	(0.45)
R-squared	0.37	0.33	0.33	0.36	0.37	0.38	0.30	0.34	0.34	0.33	0.34	0.32	0.35	0.41
Marginal effect of EMU 1994-1999	-0.09	0.03	0.04	-0.03	0.16	-0.06	-0.08	0.01	0.03	0.04	-0.01	-0.01	0.04	-0.16
	(0.35)	(0.11)	(0.17)	(0.11)	(0.63)	(0.23)	(0.29)	(0.06)	(0.13)	(0.17)	(0.04)	(0.05)	(0.12)	(0.60)
Marginal effect of EMU 2000-2004	-0.43	-0.30	-0.29	-0.27	-0.19	-0.33	-0.36	-0.28	-0.21	-0.37	-0.36	-0.36	-0.40	-0.41
	(1.66)*	(1.20)	(1.18)	(0.99)	(0.77)	(1.30)	(1.36)	(1.13)	(0.83)	(1.45)	(1.36)	(1.35)	(1.26)	(1.58)
dependent variable: long run equilibrium														
control variable	0.070	0.190	-0.045	0.395	0.001	0.000	0.043	0.558	0.181	0.124	0.009	0.026	-2.019	0.015
	(1.82)*	(1.06)	(0.24)	(1.88)*	(0.33)	(0.16)	(1.69)*	(1.38)	(1.52)	(0.93)	(0.23)	(2.95)***	(0.14)	(3.09)***
R-squared	0.13	0.08	0.05	0.17	0.05	0.05	0.04	0.09	0.12	0.08	0.05	0.22	0.15	0.32
Marginal effect of EMU 1994-1999	-0.35	-0.22	-0.17	-0.29	-0.20	-0.23	-0.28	-0.22	-0.24	-0.22	-0.19	-0.34	-0.64	-0.23
	(1.28)	(0.84)	(0.66)	(1.04)	(0.73)	(0.81)	(0.96)	(0.84)	(0.92)	(0.83)	(0.71)	(1.42)	(1.94)*	(0.88)
Marginal effect of EMU 2000-2004	-0.23	-0.06	-0.05	-0.22	-0.07	-0.11	-0.12	-0.04	-0.03	-0.08	-0.07	-0.23	-0.23	-0.02
	(0.85)	(0.25)	(0.20)	(0.84)	(0.27)	(0.39)	(0.42)	(0.14)	(0.11)	(0.30)	(0.27)	(0.95)	(0.77)	(0.09)
Observations	53	53	53	47	53	49	49	53	50	51	53	53	39	45
Countries	27	27	27	24	27	25	25	27	26	26	27	27	22	23
Missing countries (WDI code)				KOR, POL , SVK		CZE, POL	CZE, POL		CHE	KOR			CZE, GRC, CZE, HUN, KOR, SVK POL, SVK , SWE	

Absolute value of z statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5 shows the estimated effects of the inserted control variable as well as the marginal effects of EMU in both time periods. The main result of this table is in line with our previous finding, namely that EMU has had no effect on both types of labour market reform. Our results also suggest that the driving forces of both types of reform are quite different. Whereas openness and ideology have a significant negative impact on reforms enhancing the adjustment capacity of the economy, they have no impact on reforms enhancing long-run equilibrium. Likewise, the budget balance, economic crises, unemployment, globalization and union density only affect labour market reforms enhancing long-run equilibrium.

5. Conclusions

In this paper we have examined whether EMU has led to more labour market flexibility. Following Saint-Paul and Bentolila (2001), we differentiate between reform measures enhancing the capacity of an economy to adjust to economic shocks and those enhancing long-run equilibrium. On theoretical grounds it can be argued that EMU will have a different effect on both types of reform. We use data on labour market reforms provided by Brand et al. (2005), covering 27 OECD countries. These data are much more comprehensive than other indicators of labour market reform, and are available for two sub-periods: 1994-1999 and 2000-2004. We find that both types of labour market reform are driven by different factors, confirming that it is important to differentiate between both types of reform. Most importantly, in contrast to the theoretical predictions, our results suggest that EMU has had no effect on both types of labour market reform. Although in the run-up to EMU, countries in the euro area introduced labour market reforms enhancing the adjustment capacity, there is no evidence that these reforms are significantly different from reforms undertaken by countries outside the euro area.

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REFERENCES

- Alesina, Alberto, Silvia Ardagna and Vincenzo Galasso (2008) 'The Euro and Structural Reforms', NBER Working Paper No. 14479.
- Bean, Charles (1998) 'The Interaction of Aggregate-Demand Policies and Labor Market Reform', *Swedish Economic Policy Review* 5(2): 353-82.
- Beck, Thorsten, George Clarke, Alberto Groff, Phillip Keefer and Patrick Walsh 2001 'New Tools in Comparative Political Economy: The Database of Political Institutions', *World Bank Economic Review* 15(1): 165-76.
- Bertrand, Marianne, Esther Duflo and Sendhil Mullainathan (2004), 'How Much Should We Trust Differences-in-Differences Estimates?', *Quarterly Journal of Economics*, 69 (February): 249-75.
- Bertola, Giuseppe and Tito Boeri (2002) 'EMU Labour Markets Two Years on: Microeconomic Tensions and Institutional Evolution', in Marco Buti and Andre Sapir (eds), *EMU and Economic Policy in Europe*, pp. 249-80. Cheltenham: Edward Elgar.
- Berthold, Norbert and Rainer Fehn, (1998) 'Does EMU Provide Labour-Market Reform?', *Kyklos* 51(4): 509-36.
- Bjørnskov, Christian and Niklas Potrafke (2009) 'Politics and Privatization in Central and Eastern Europe: A Panel Data Analysis', available at SSRN: <http://ssrn.com/abstract=1319730>.
- Brambor, Thomas, William Clark and Matt Golder (2006) 'Understanding Interaction Models: Improving Empirical Analysis', *Political Analysis* 14: 63-82.
- Brandt, Nicola, Jean-Marc Burniaux and Romain Duval (2005) 'Assessing the OECD Jobs Strategy: Past Developments and Reforms', OECD Economics Department Working Paper No. 429.
- Calmfors, Lars (2001) 'Unemployment, Labour-Market Reform and Monetary Union' *Journal of Labour Economics* 19(2): 265-89.
- De Haan, Jakob, Robert Inklaar and Richard Jong-A-Pin (2008) 'Will Business Cycles in the Euro Area Converge? A Critical Survey of Empirical Research', *Journal of Economic Surveys* 22(2): 243-73.
- Dreher, Axel (2006) 'Does Globalization Affect Growth? Evidence From a New Index of Globalization', *Applied Economics* 38(10): 1091-1110.
- Duval, Romain (2008) 'Is There a Role for Macroeconomic Policy in Fostering Structural Reforms? Panel Evidence from OECD Countries over the Past Two Decades', *European Journal of Political Economy* 24: 491-502.
- Duval, Romain and Jørgen Elmeskov (2006) 'The Effects of EMU on Structural Reforms in Labour and Product Markets', ECB Working Paper No. 596.
- Eichengreen, Barry and Charles Wyplosz (1998) 'The Stability Pact: More Than a Minor Nuisance?' *Economic Policy* 26: 65-113.
- Eijffinger, Sylvester and Jakob De Haan (2000) *European Monetary and Fiscal Policy*. Oxford University Press, Oxford.
- Enderlein, Henrik (2006) 'Adjusting to EMU: The Impact of Supranational Monetary Policy on Domestic Fiscal and Wage-Setting Institutions' *European Union Politics* 7(1): 113-140.
- Frankel, Jeffrey and Andrew Rose (1998) 'The Endogeneity of the Optimum Currency Area Criteria', *The Economic Journal* 108 (July): 1009-25.

- Heylen, Freddy and Gerdi Everaert (2000) 'Success and Failure of Fiscal Consolidation in the OECD: A Multivariate Analysis', *Public Choice* 105(1/2): 103-24.
- Høj, Jens, Vincenzo Galasso, Giuseppe Nicoletti and Thai-Thanh Dang (2006) 'The Political Economy of Structural Reform: Empirical Evidence from OECD Countries', OECD Economics Department Working Papers No. 501.
- Inklaar, Robert, Richard Jong-A-Pin and Jakob De Haan (2008) 'Trade and Business Cycle Synchronization in OECD Countries A Re-examination', *European Economic Review* 52(4): 646-66.
- Keefer, Phillip and David Stasavage (2003) 'The Limits of Delegation: Veto Players, Central Bank Independence and the Credibility of Monetary Policy' *American Political Science Review* 97(3): 407-23.
- Leiner-Killinger, Nadine, Victor López Pérez, Roger Stiegert and Giovanni Vitale (2007) 'Structural Reforms in EMU and the Role of Monetary Policy – A Survey of the Literature', ECB Occasional Paper No. 66.
- Mierau, Jochen, Richard Jong-A-Pin and Jakob De Haan (2007) 'Do Political Variables Affect Fiscal Policy Adjustment Decisions? New Empirical Evidence', *Public Choice* 133(4-5): 297-319.
- Pitlik, Hans (2008) 'The Impact of Growth Performance and Political Regime Type on Economic Policy Liberalization' *Kyklos* 61 (2): 258–78.
- Potrafke, Niklas (2008) 'The Growth of Public Health Expenditures in OECD Countries: Do Government Ideology and Electoral Motives Matter?', Mimeo, University of Konstanz.
- Sibert, Anne and Alan Sutherland (2000) 'Monetary Union and Labor Market Reform', *Journal of International Economics* 51(2): 421–35.
- Saint-Paul, Gilles and Samuel Bentolila, (2001), Will EMU Increase Eurosclerosis? in Charles Wyplosz (ed), *The Impact of EMU on Europe and the Developing Countries*, pp. 128-168. Oxford: Oxford University Press.
- von Hagen, Jürgen, Andrew Hughes Hallett and Rolf Strauch (2001) 'Budgetary Consolidation in EMU', *European Commission Economic Papers*, No. 148.
- Woldendorp Jaap, Hans Keman and Ian Budge (2000) *Party Government in 48 Democracies (1945-1998): Composition – Duration - Personnel*. Dordrecht: Kluwer Academic Publishers.