

Aggregate Employment Dynamics and (Partial) Labour Market Reforms*

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Abstract

European labour markets have undergone several important innovations over the last three decades. Most countries have reformed their labour markets since the mid-1990s, with the liberalization of fixed-term contracts and temporary work agencies being the common elements to such reforms. This paper investigates the existence of a change in the dynamic behaviour of the aggregate employment for major European Union countries - France, Germany, Italy, and Spain. According to our results, national labour market reforms have made the response of the aggregate employment to output shocks larger and quite comparable to that found for the UK - the most flexible labour market in Europe since the Thatcher reforms.

Keywords: labour market deregulation; dynamic responses.

JEL Classification: C22, J23

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1 Introduction

In the last three decades the institutional integration of the European economies has been ever increasing, in particular since the adoption of the single currency in 2001. However, despite the protracted efforts to co-ordinate monetary and fiscal policies, several important differences still remain across the members of the European Union. Although a full-fledged European labour market is still a long way to come, it is possible to identify some common institutional developments such as the so-called "partial deregulations" initiated in the mid-1990s.

Since a deregulation implies, in most cases, the reduction of job protection for the incumbent workers, reforms run into strong political opposition. As a consequence, the governments have introduced reforms especially at the margin, by reducing protection only for new hirings. While the extent of the reforms has been different for each country, the liberalization of both fixed-term contracts (hereafter FTCs) and temporary work agencies (hereafter TWAs) have been common elements.

The related literature has paid particular attention to the effect of labour market institutions on the employment level (see Nickell and Layard, 1999). Although no clear-cut results on this relationship exist,¹ a consensus emerges on the point that protective labour market institutions dampen the employment fluctuations (see, among others, Bentolila and Bertola, 1990; Veracierto, 2008). This finding implies that labour market flexibility is visible through an increased responsiveness of the aggregate employment to macroeconomic shocks. Bertola (1990) verifies that employment is less volatile in countries with high job-protection, whereas Abraham and Houseman (1994) find no evidence of increased employment volatility after the first attempts of labour market deregulation in Europe in the mid-1980s.

Subsequently, the literature has favoured the use of microeconomic techniques to evaluate the effect of labour market reforms. For instance, Garibaldi (1998) and Messina and Vallanti (2007) show that employment protection makes job destruction less responsive to the business cycle. Garcia-Serrano (1998) finds that fixed-term contracts increase the employment volatility by increasing both the hiring and firing rates.

This approach is very useful to investigate the effect of a single reform, though less convenient to analyse the effect of a reform *process*, since the latter implies a series of reforms, which are usually complementary and show their impact only at the end of a prolonged period (see Orszag and Snower, 1998). Besides, microdata-based outcomes rely on short-time horizons and they are affected by the underlying economic trends.

Therefore, it can be difficult to disentangle the effect of a reform from the effect of a country-specific trend: an increase in permanent employment might be simply due to a booming economy, and vice-versa (see Kahn, 2007; Holmlund and Storrie, 2002).

The present paper extends the empirical work on the effects of labour mar-

¹See Howell *et al.* (2007) for a survey on the empirical evidence.

ket reforms by analysing the possible changes in the dynamic response of the aggregate employment to output shocks for some major European Union countries (France, Germany, Italy, and Spain).^{2,3} These countries are economies of comparable size and typical examples of partial labour market reforms, with strict job protection for regular workers and comparatively little protection for "atypical" workers. Our goal is twofold. First, we analyse whether the response of the aggregate employment to output shocks in the countries under consideration has increased after the mid-1990s labour market reforms. Second, we compare the post-reform responses to the UK one, in order to check whether they have become more similar to a country with a deregulated labour market⁴. In doing so, we use an approach based on a recursively identified bivariate VAR model.

Our findings show that partial labour market reforms have substantially affected the response of the aggregate employment, and have made it quite similar to the UK one.

The rest of the paper is organized as follows. Section 2 reviews the labour market reforms in the countries studied. Section 3 describes the methodology. Section 4 presents the empirical results. Finally, Section 5 concludes.

2 Labour Market Regulation

This Section briefly summarizes the main labour market reforms adopted in the countries considered. As we are going to see, the usual approach to deregulate the labour market has been to add periodically new reforms, rather than enacting a single one.

2.1 Italy

The Italian labour market has undergone a long-lasting deregulation process. In 1984 the wage indexation to inflation was reduced by 15%, and part-time and training contracts were introduced.⁵ Wage indexation, further reduced in 1986, was finally dismantled in 1992. In 1993 a law (the so-called "Giugni Agreement") reformed the wage setting by introducing a two-stage wage bargaining: a national-level bargaining to preserve the purchasing power, and a firm-level

²Unfortunately, the employment series is inconsistent over the whole period considered (1980-2008) due to the German reunification. This forces us to restrict the starting of our German sample to the beginning of 1990s.

³For comparison purposes, the UK is also considered.

⁴The OECD index of overall employment protection is 2.8 for France, 2.6 for Germany, 3.2 for Italy, 3 for Spain, and 1 for the UK. The index goes from 0 to 4. Protection for permanent workers accounts for 1.3 points (France), 1.7 (Germany), 1.5 (Italy), 1.7 (Spain), and 0.8 (UK). See OECD (2004) for further information on the construction of the index.

⁵Training contracts for young workers were introduced for the first time after the 1960s. Such contracts were used extensively, as they provided for a lower wage and made it possible to fire an employee at termination (three years) without costs. The described changes established important innovations with respect to the previous decade. For more details on Italian labour market reforms, see Jiménez-Rodríguez and Russo (2008).

bargaining to share productivity gains. The Agreement was indeed a comprehensive reform, which announced wage moderation and reshaped the industrial relations. Since 1994 different kinds of FTCs were allowed making it possible to hire almost any worker under a FTC, and TWAs broke the monopoly of public employment agencies. It is important to remark that deregulation in Italy has concerned both employment contracts and wage bargaining.

2.2 France

France was quite reluctant to reduce job-protection. Among the countries presented in this paper, France was the only one to go against the tide of deregulation. In fact, the reforms adopted by the socialist government in 2001 tried to intensify labour market regulation (severance pay entitlements were increased and the working time was reduced; see OECD, 2004). Apparently, FTCs have been the only flexibility device. They were introduced in 1990, when a 1982 law was amended to make their use easier, but their regulation was further relaxed over time. The use of FTCs was extensive (see Blanchard and Landier, 2002), and they quickly became a method to circumvent the persisting regulation and to reduce labour costs. The 2001 reforms did not affect significantly this situation.⁶

2.3 Spain

The Spanish regulation of dismissals for permanent workers (established in 1980 with the Workers' Statute) was quite restrictive. The 1984 reform liberalized the use of temporary contracts and reduced their dismissal costs to 12 days pay for year of seniority, with no possibility to appeal for unfair dismissal. As a result, in the early 1990s the share of temporary contracts over the total employment was over 30%, and 95% of new hirings occurred under such contracts (see Kugler *et al.*, 2003).

In 1994 new regulations were introduced to allow temporary employment only for seasonal jobs, and to substitute part-time work to temporary work. For this reason, TWAs were also allowed. In practice, however, employers continued to hire workers under FTCs for all types of jobs (see Kugler *et al.*, 2003; Gil Martin, 2002).

The ineffectiveness of the 1994 reform led to another reform in 1997, based on the idea of stimulating the use of permanent contracts, rather than introducing further ineffective regulation. TWAs regulation was made more restrictive and, on the other hand, both unfair dismissal costs and payroll taxes were substantially reduced for new permanent contracts and for conversions of FTCs into permanent contracts.⁷ Kugler *et al.* (2003) show that this reform was able

⁶The share of FTCs over the total employment was 14% from 1996 to 2001, and 13.86% from 2002 to 2007 (Source: Eurostat).

⁷For workers under 30 or over 45, the long-term unemployed, women under-represented in their occupations, and disabled workers, unfair dismissal costs were reduced by 25% and payroll taxes were reduced between 40 and 90% (see Kugler *et al.*, 2003).

to spur the substitution of permanent contract to FTCs.

In 2001, a new law modified again the regulation of part-time work by suppressing the ceiling for the number of part-time hours (established at 77% of a full-time contract) and by allowing a more flexible distribution of working hours groups (see Gil Martin, 2002).

2.4 Germany

Germany cannot be included properly in our analysis since a consistent employment series between 1980 and 2008 is not available due to the reunification. However, its main institutional reforms are similar to those enacted in the other countries under study. A comprehensive reform of labour market institutions was decided because the burden of the reunification and the increase in unemployment over the 1990s put the generous unemployment benefit system at risk of financial collapse (see, *e.g.*, Jacobi and Kluve, 2007). As a first step, the TWAs regulation dating back to 1972 was loosened in 1994. Then, the so-called Hartz reforms were implemented over the period 2002-05.

The Hartz reforms aimed at (1) improving the efficiency of both public and private labour market services; (2) stimulating the unemployed to search and accept new jobs; (3) deregulating the labour market. We refer to Jacobi and Kluve (2007) for points (1) and (2), and we briefly report the measures of labour market deregulation, which concern, again, temporary jobs.

In 1996 the regulation concerning the renewal period and the frequency of FTCs was abolished, providing that the worker under a FTC was paid and treated as a corresponding regular worker. In 2002 the maximum duration of a TWA was brought to 24 months, and liberalized from January first, 2004 (see OECD 2004). Standard employment relations were not affected by the reform, except for smaller firms: exemption from dismissal protection legislation, formerly granted to firms up to 5 employees, was extended up to 10 employees.

2.5 UK

The UK shows a remarkable institutional stability on the "flexible" side. After the Thatcher deregulation in the 1980s (see, *e.g.*, Card and Freeman, 2002), we observe a moderate increase in job protection in 2000, when a reform lowered from two to one year the tenure necessary for a worker to be able to sue her employer for unfair dismissal. In 2002 the maximum duration for a FTC was limited to 4 years, being previously unlimited (see OECD, 2004).

3 Methodology

It is our aim to analyse the effects of labour market reforms on the behaviour of the aggregate employment.⁸ To do so, we split our time series into two different periods: a "pre-reform" period and a "post-reform" period. It is not immediate

⁸We use quarterly data from OECD's Economic Outlook database.

to pick out a proper breakdate, since labour market reforms are an ongoing process rather than a one-off innovation (see Section 2).⁹ However, it is possible to point out some key reforms, which opened the way to further legislative innovations and set up a watershed in labour legislation.

In Italy, we can identify two waves of labour market reforms, one in the mid-1980s and another in the mid-1990s. Thus, we let our first sample period start in 1984:1. The second -and most important- stream of reforms appears in 1993, with the approval of the "Giugni Agreement" and the introduction of additional deregulation for FTCs (see Section 2). The latter were further liberalized in the following years. As such, we choose 1993:3 to split the sample period.

We split the French series in 1990:3 because it coincides with the liberalization of FTCs (see Blanchard and Landier, 2002).

The Spanish case is, instead, quite different. The 1984 reform suddenly liberalized the use of FTCs in a country with a high level of job-protection. That is why we start our first sample period in 1984:1. Moreover, the ineffectiveness of the 1994 reform, which led to another reform in 1997, makes us select 1997:3 as the starting point for the second sample period.

The UK labour market does not show any substantial reform over the period 1980:1-2008:3, thus there is no need to divide the sample in subperiods.

Finally, we present some estimates for Germany. Since consistent series for our variables are unavailable before 1990, we simply estimate over the period 1994:1-2002:4 and 1994:1-2008:3. We have decided to discard the 1990-1993 data given that 1994 coincides with the introduction of the TWAs. On the other hand, 2002 coincides with the initiation of the Hartz reforms.

We first study the order of integration of all variables considered in this study by performing unit root tests for each subperiod defined above. Once the order of integration of our variables is established for each sample period, if they are non-stationary in levels we test for the presence of a cointegration relationship.¹⁰ To do so, we calculate the trace and maximum eigenvalue test statistics (see, *e.g.*, Johansen, 1995). Finally, when non-evidence of cointegration is found¹¹ we consider a recursively identified bivariate VAR model for each sample period

⁹Our results are robust to the use of alternative one-year breakdates within the reform process.

¹⁰Apart from analysing the stationarity and cointegration of the variables considered in this study for each subsample, for completeness we have also studied the order of integration of the variables for the full sample in France, Italy and Spain by performing unit root tests allowing for structural breaks (specifically, the test statistic S^{***} developed by Busetti and Taylor, 2003). This test indicates the existence of non-stationarity of the levels of the variables and the stationarity of the first log-differences. Additionally, we have also tested for the presence of a cointegration relationship by applying the Gregory-Hansen (1996) extension of the Engle-Granger (1987) test, which allows for breaks in either the intercept or the intercept and trend of the cointegrating relationship. The outcomes of the latter test are consistent with lack of cointegration at the 5% significance level. It is worth stressing that the breakdate are established in the dates used to split the sample. An Appendix with these results is available from the authors upon request.

¹¹In the case of cointegration, we use a bivariate VEC model.

with variables in log-levels:¹²

$$z_t = \beta_0 + \beta_1 z_{t-1} + \dots + \beta_p z_{t-p} + \xi_t,$$

where z_t where is a vector that contains the real GDP and the aggregate employment (entering the model in that order).¹³ We estimate by maximum likelihood and we choose the suitable lag length on the basis of the likelihood ratio test. We obtain the impulse response functions (IRFs) of the aggregate employment to an output shock for each subsample and their corresponding 95% confidence bands calculated through Monte Carlo with 2500 draws. If the second period IRFs did not statistically differ from those resulting for the first period, we could conclude that there is no evidence for the effect of labour market reforms on the aggregate employment.

4 Empirical results

In this Section, we assess the impact of an output shock on the aggregate employment in France, Italy, Spain, Germany, and the UK. Prior to do so, we analyse the order of integration of our variables by using the *DFGLS* and *P_T* tests of Elliott *et al.* (1996), and the *DFGLS_u* and *Q_T* tests of Elliott (1999), as well as the Augmented Dickey-Fuller (ADF) test for the corresponding sample period. The results of these tests, summarized in Table 1, indicate that the series seem to be non-stationary in levels and stationary in first log-differences.¹⁴ Given the evidence of non-stationarity, we test for the existence of cointegration between the levels of output and employment by applying the standard trace and maximum eigenvalue test statistics (Johansen, 1995) for each subperiod. The outcomes are consistent with lack of cointegration at the 5% significance level (see Table 2).¹⁵ Therefore, we consider a recursively identified bivariate VAR model with real GDP and aggregate employment in log-levels.

Figure 1 displays the effects of an output shock on the aggregate employment for the first subsample ("pre-reform" period) in France, Italy, and Spain, with their corresponding 95% confidence intervals, as well as the estimated impact on the aggregate employment for the second subsample ("post-reform" period). On comparing the results from both sample periods, we observe that the responses resulting from the second subsample lie outside the confidence intervals

¹²For further discussion in this issue, see, *e.g.*, Hamilton (1994), and Ramaswamy and Sløk (1998).

¹³It is worth stressing that a convenient vehicle for assessing the average effects of output shocks on the aggregate employment is a recursively identified bivariate VAR, in which output is ordered first and aggregate employment is ordered second. See, *e.g.*, Kilian (2008) for further details on the advantage of using a recursively identified bivariate VAR over the use of higher-dimensional VAR models.

¹⁴Notice that even though we cannot observe stationary in first log-differences for Spain, such a stationary is found on applying the unit root test to the whole Spanish sample allowing for structural break in 1997:2.

¹⁵The only exception is the Italian second subsample. Consequently, we use a VEC model in this case.

calculated around the responses for the first subsample in the three countries. Moreover, the employment responses for the second subsample are significantly larger than those obtained for the first one, with France being the country with the highest impact differential between the two periods (see Table 3).

France and Italy show that partial labour market reforms have increased significantly their employment responsiveness to output shocks. Furthermore, a comparison of these two countries to the UK enables us to draw a more interesting conclusion (see Figures 2 and 3), namely that the reforms did not only modify their employment responses to output shocks, but they also made them quite similar to the UK one. In other words, the reaction of the aggregate employment to an output shock in France and Italy is now quite close to that found for the most flexible European labour market.

Spain presents employment responses quite similar to those of the UK already in the first subsample (see Figure 2). This result confirms that the response of the aggregate employment after the partial reforms reproduces the response of the aggregate employment of a flexible labour market. Moreover, the Spanish employment response increases after the 1997 reform and becomes even higher than the UK one (see Figure 3). The latter result indicates that the 1997 reform did not reduce the response of the Spanish employment to output shocks. A likely explanation is that the reform did not affect the overall share of FTCs,¹⁶ and higher flexibility was introduced for previously safer permanent jobs.

Finally, the German employment response to an output shock over the 1994-2002 period is the lowest of our country-sample. This result is in line with the high regulation of the German labour market and with the obligation to pay temporary workers the same wage as permanent workers, which makes it impossible to use temporary contracts to circumvent wage rigidity. Moreover, the employment response computed over the 1994-2008 period (therefore including the Hartz reforms) lies uniformly above that calculated for 1994-2002 (see Figure 4). Though statistically insignificant, the change goes in the predicted direction and does not contradict our previous results, given that including years 2003-2008 increases the response of the employment to output shocks.

In sum, the results seem to indicate that partial labour market reforms have been able to change the response of the aggregate employment to output shocks in all countries under analysis.

5 Concluding remarks

Over the mid-1990s labour market regulation has been blamed as a cause of "eurosclerosis". The poor employment performance of many countries with high standards of job protection was considered a proof that deregulation was urgent (see Siebert 1997). However, to overcome the difficulty of reducing job protection for incumbent workers, governments chose to enact partial labour

¹⁶The share of FTCs on the total employment over 1998-2007 was 15.38 for the EU-15, and 32.54 for Spain (Source: Eurostat).

market reforms, which reduced protection only for workers with deregulated contracts. The possible effects of labour market regulation over the employment level are still an open question. The effects of partial reforms are uncertain as well, and there is no consensus about whether they lead to increase the regular employment or they lead to create a pool of permanently disadvantaged workers.

This paper has investigated the effect of partial labour market reforms on the dynamic behaviour of the aggregate employment for some representative EU countries. Our purpose required a comparison of the employment response to output shocks over different decades. Therefore, we had to exploit the series of the last three decades. Unlike the related literature, our approach enabled us to compare different eras of labour market regulation.

Our findings are unambiguous, and they indicate that the reaction of the aggregate employment to output shocks has become higher after labour market deregulations. Furthermore, the wave of partial reforms seems to have been able not only to reshape the national IRFs, but also to reproduce the behaviour of a fully flexible labour market like the UK one. This is particularly evident for Spain, whose employment shows a responsiveness to output shocks even higher than the UK one. Such an outcome strongly confirms that, since the majority of workers still enjoys high job protection, the cost of the employment adjustment to shocks is borne mainly by "atypical" workers (see Dolado *et al.*, 2002; Bentolila and Dolado, 1994). The difference in the IRFs estimated before and after the reforms gives a measure of this cost, that should be taken into account when evaluating costs and benefits of partial labour market reforms.

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Table 1: *Unit-root tests*

		Model with constant and trend					Model with constant					Model without constant	
		<i>ADF</i>	<i>DFGLS</i>	P_T	<i>DFGLS_U</i>	Q_T	<i>ADF</i>	<i>DFGLS</i>	P_T	<i>DFGLS_U</i>	Q_T	<i>ADF</i>	<i>DFGLS</i>
<i>Real GDP in Levels</i>													
FRA	<i>1st period</i>	-1.49	-0.65	89.85	-1.18	45.11	3.61	3.98	390.9	1.45	368.8	2.80	2.80
	<i>2nd period</i>	-2.74	-2.13	8.80	-2.44	3.91	-0.19	0.50	55.44	-0.53	37.47	2.57	2.57
GER	<i>1994:1-2002:4</i>	-1.78	-2.00	11.16	-2.02	6.35	-1.07	0.57	142.9	-0.95	161.20	4.01	4.01
	<i>1994:1-2008:3</i>	-1.76	-1.66	17.92	-1.73	9.26	-0.79	2.18	270.3	-0.73	218.52	5.12	5.12
ITA	<i>1st period</i>	1.76	0.47	67.22	0.11	39.70	-2.35	-1.22	4.13*	-1.72	15.86	0.58	0.58
	<i>2nd period</i>	-1.15	-0.98	18.80	-1.29	8.66	-1.79	0.51	89.38	-0.80	58.75	2.57	2.57
SPA	<i>1st period</i>	-1.82	-1.73	11.56	-1.81	6.23	-1.55	0.15	19.12	-0.81	17.12	2.26	2.26
	<i>2nd period</i>	-1.44	-0.93	0.14***	-1.36	0.03***	-2.21	-1.51	0.03***	-1.71	11.19	0.27	0.27
UK	<i>Whole period</i>	-2.55	-2.80*	11.27	-2.85	4.20	-1.40	0.24	56.51	-1.70	36.19	3.78	3.78
<i>Real GDP in First Log-Differences</i>													
FRA	<i>1st period</i>	-5.36***	-4.71***	5.99*	-5.12***	3.17*	-3.04**	-1.50	10.50	-2.85**	7.73	-0.76	-0.76
	<i>2nd period</i>	-5.03***	-5.09***	3.24***	-5.07***	1.80***	-3.32**	-3.34***	1.34***	-3.35***	2.67***	-2.03**	-2.03**
GER	<i>1994:1-2002:4</i>	-6.43***	-6.61***	5.15**	-6.59***	2.84**	-6.39***	-6.45***	1.47***	-6.46***	2.90***	-2.51**	-2.51**
	<i>1994:1-2008:3</i>	-6.94***	-6.96***	3.34***	-6.85***	1.86***	-6.99***	-7.01***	1.06***	-6.97***	1.97***	-1.87*	-1.87*
ITA	<i>1st period</i>	-5.13***	-4.87***	5.61**	-5.06***	3.02*	-1.07	-1.18	7.11	-1.17	13.33	-1.01	-1.01
	<i>2nd period</i>	-4.19***	-4.13***	0.54***	-4.01***	0.40***	-3.81***	-3.70***	0.36***	-3.90***	0.59***	-2.26**	-2.26**
SPA	<i>1st period</i>	-2.88	-2.27	18.16	-2.53	8.57	-2.67*	-1.81*	7.34	-2.64*	8.19	-0.89	-0.89
	<i>2nd period</i>	-1.53	-2.24	2.99***	-2.23	1.81***	-0.53	0.13	9.70	-0.79	4.51**	-0.98	-0.98
UK	<i>Whole period</i>	-4.26***	-1.20	30.78	-2.79	8.58	-4.42***	-0.74	25.38	-3.33***	8.82	-2.12**	-2.12**

We use data-driven lag selection procedures for the Augmented Dickey-Fuller tests, taking 1.645 as the critical value used for significance of lagged terms and 4 as the maximum number of lags allowed in these procedures into account. The same number of lags is used in the other tests considered. We denote with one/two/three asterisks the rejection of the null hypothesis of non-stationarity at a 10%/5%/1% critical level.

Table 1: *Unit-root tests (continued)*

		Model with constant and trend					Model with constant					Model without constant	
		ADF	DFGLS	P_T	DFGLS _U	Q_T	ADF	DFGLS	P_T	DFGLS _U	Q_T	ADF	DFGLS
<i>Aggregate Employment in Levels</i>													
FRA	<i>1st period</i>	-1.56	-2.06	1.58***	-2.12	1.53***	-1.52	-1.69*	0.01***	-1.70	0.01***	0.75	0.75
	<i>2nd period</i>	-2.44	-1.59	16.61	-1.94	6.74	-0.59	-0.35	22.72	-0.96	28.05	1.59	1.59
GER	<i>1994:1-2002:4</i>	-1.32	-1.51	10.83	-1.54	6.01	-1.19	-0.98	14.43	-1.22	23.80	0.87	0.87
	<i>1994:1-2008:3</i>	-2.19	-2.29	5.39**	-2.30	3.06*	-0.30	0.39	27.76	-0.58	26.34	1.84	1.84
ITA	<i>1st period</i>	-1.96	-1.85	9.07	-1.94	4.21	-1.72	-1.59*	5.30	-1.83	4.31**	0.25	0.25
	<i>2nd period</i>	-3.05	-1.60	39.11	-2.44	15.93	0.91	2.11	196.2	0.55	232.5	4.02	4.02
SPA	<i>1st period</i>	-2.97	-2.94**	4.53**	-2.96*	2.47**	-2.28	-1.28	3.78*	-2.24	5.83	1.25	1.25
	<i>2nd period</i>	0.59	0.95	61.48	0.19	33.74	-1.97	-1.16	6.32	-1.46	22.99	0.39	0.39
UK	<i>Whole period</i>	-4.04**	-3.09**	5.03**	-3.81***	2.09**	-1.18	-0.71	12.42	-1.41	16.12	1.41	1.41
<i>Aggregate Employment in First Log-Differences</i>													
FRA	<i>1st period</i>	-2.70	-2.52	2.59***	-2.56	1.39***	-1.44	-1.41	5.15	-1.45	10.03	-1.26	-1.26
	<i>2nd period</i>	-2.55	-2.78*	2.52***	-2.79	1.47***	-2.79*	-2.75***	0.83***	-2.80**	1.59***	-2.26**	-2.26**
GER	<i>1994:1-2002:4</i>	-2.68	-2.79*	8.58	-2.83	4.87	-2.76*	-2.61***	2.73**	-2.77**	4.87	-2.63***	-2.63***
	<i>1994:1-2008:3</i>	-4.11***	-4.09***	4.39**	-4.14***	2.37**	-4.09***	-3.68***	1.67***	-4.12***	2.57**	-2.45**	-2.45**
ITA	<i>1st period</i>	-3.65**	-3.69***	5.50**	-3.51**	1.82***	-2.23	-2.12**	0.82***	-2.30	2.18***	-1.82*	-1.82*
	<i>2nd period</i>	-3.74**	-1.41	39.70	-2.10	13.35	-3.37**	-0.64	31.59	-2.43	14.04	-1.40	-1.40
SPA	<i>1st period</i>	-1.94	-1.67	18.18	-1.79	9.17	-1.93	-1.34	8.25	-1.91	9.34	-1.55	-1.55
	<i>2nd period</i>	-1.87	-2.15	10.40	-2.22	6.22	-0.85	-0.91	7.04	-1.08	10.38	-1.19	-1.19
UK	<i>Whole period</i>	-3.21*	-3.07**	5.23**	-3.23**	2.80***	-3.36***	-2.60***	2.18***	-3.30***	2.97***	-3.05***	-3.05***

We use data-driven lag selection procedures for the Augmented Dickey-Fuller tests, taking 1.645 as the critical value used for significance of lagged terms and 4 as the maximum number of lags allowed in these procedures into account. The same number of lags is used in the other tests considered. We denote with one/two/three asterisks the rejection of the null hypothesis of non-stationarity at a 10%/5%/1% critical level.

Table 2: Standard cointegration tests

		<i>Trace statistic</i>		<i>Max-Eigen statistic</i>	
		<i>none</i>	<i>at most 1</i>	<i>none</i>	<i>at most 1</i>
FRA	<i>1st period</i>	5.362	0.010	5.352	0.010
	<i>2nd period</i>	9.570	0.126	9.444	0.126
GER	<i>1994:1-2002:4</i>	12.807	1.708	11.099	1.708
	<i>1994:1-2008:3</i>	11.597	1.453	10.144	1.453
ITA	<i>1st period</i>	12.128	0.707	11.421	0.707
	<i>2nd period</i>	33.173**	2.317	30.857**	2.317
SPA	<i>1st period</i>	12.867	2.689	10.178	2.689
	<i>2nd period</i>	14.533	1.429	13.104	1.429
UK	<i>Whole period</i>	7.242	0.348	6.893	0.348

For further details, see *e.g.* Johansen (1995). One/two asterisks mean a p-value less than 5%/1%.

Table 3: Responses of aggregate employment

	FRA		ITA		SPA	
	after 1 year	after 2 years	after 1 year	after 2 years	after 1 year	after 2 years
<i>1st period</i>	0.33	0.45	0.68	0.41	0.64	0.78
<i>2nd period</i>	0.60	0.89	0.30	0.70	1.10	1.03

The entries refer to the impulse responses of aggregate employment attributed to one unit output shock.

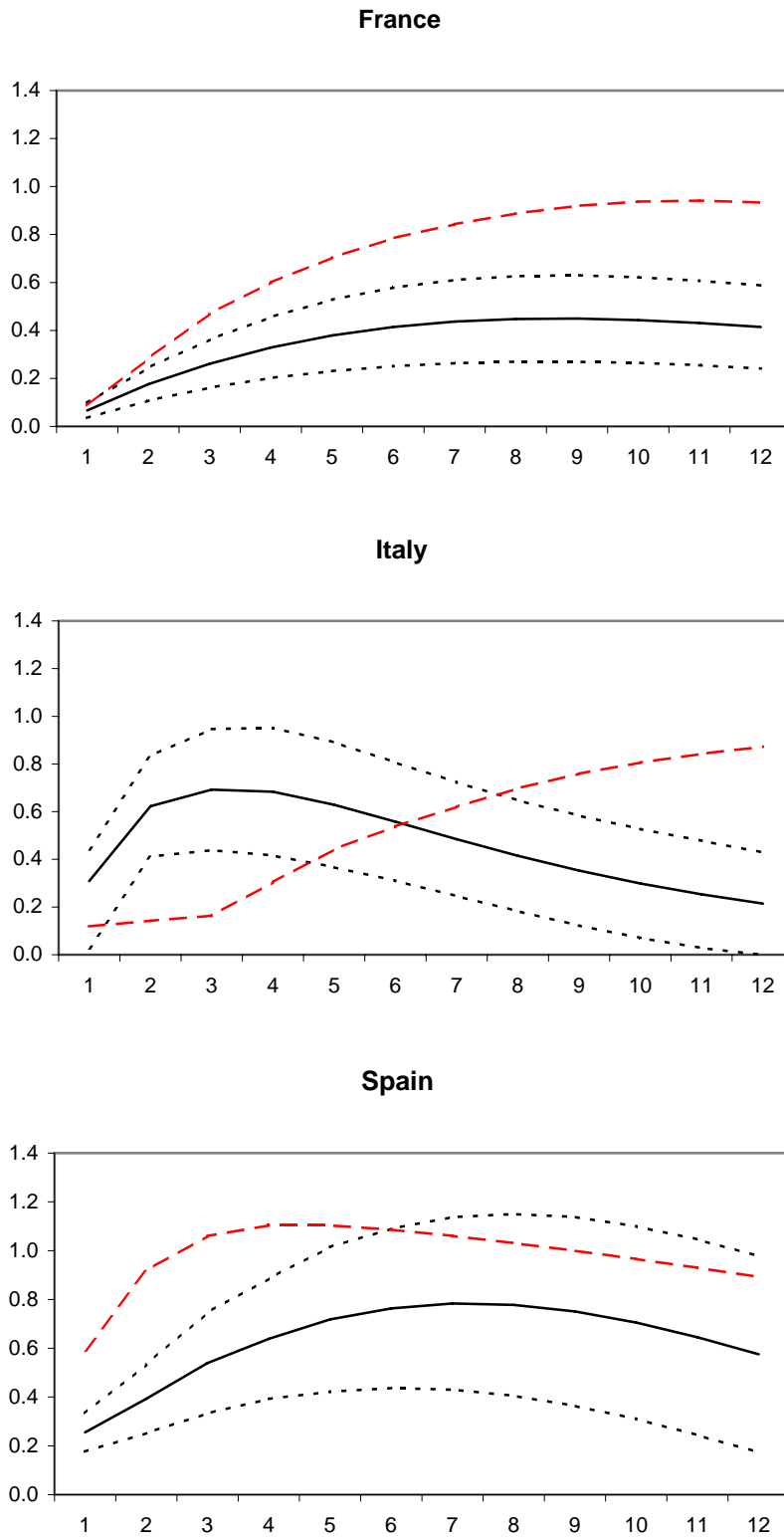


Figure 1: This figure presents the impulse responses of aggregate employment to one unit output shock for the first sample period (solid line), their 95% confidence intervals (dotted line), and the impulse responses obtained for the second sample period (dashed line).

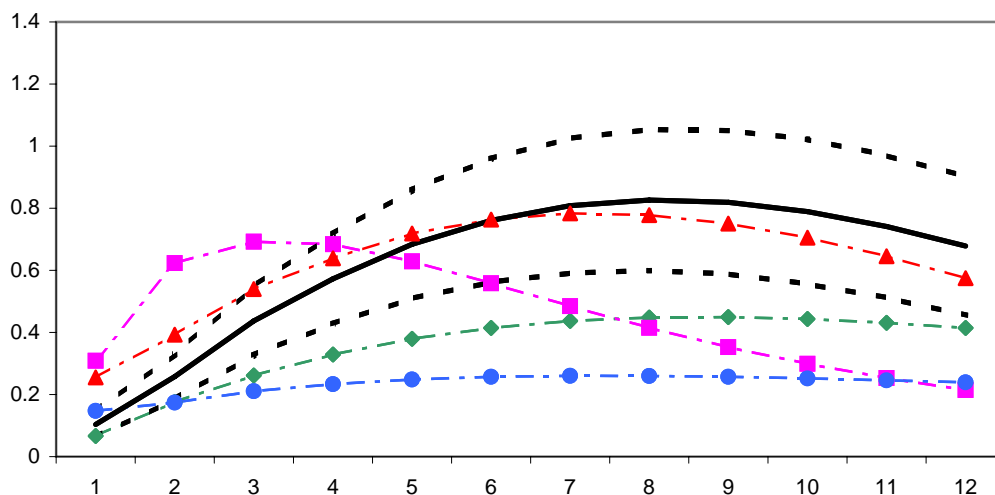


Figure 2: This figure presents the impulse responses of aggregate employment to one unit output shock for the UK (solid black line), their 95% confidence intervals (dotted black line), and the impulse responses obtained for the first sample period in France (dashed green line), Germany (dashed blue line), Italy (dashed pink line) and Spain (dashed red line).

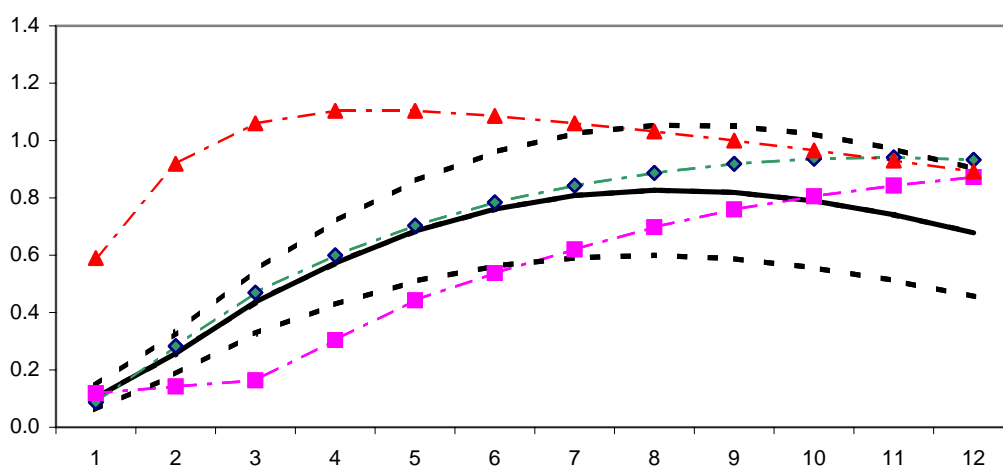


Figure 3: This figure presents the impulse responses of aggregate employment to one unit output shock for the UK (solid black line), their 95% confidence intervals (dotted black line), and the impulse responses obtained for the second sample period in France (dashed green line), Italy (dashed pink line) and Spain (dashed red line).

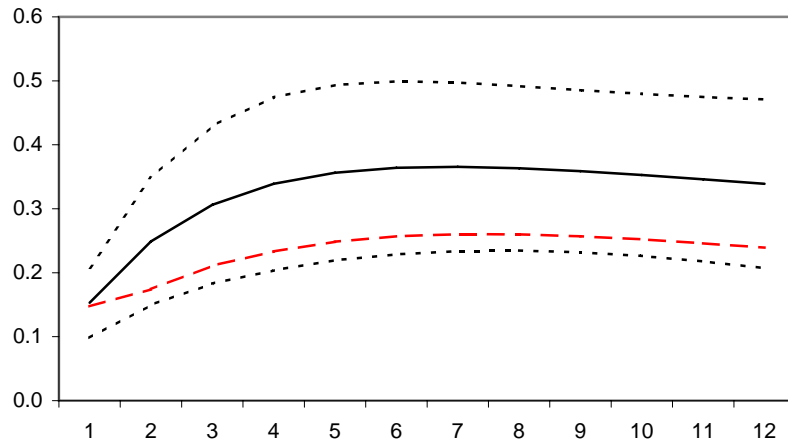


Figure 4: This figure presents the impulse responses of German aggregate employment to one unit output shock for the 1994-2008 sample period (solid line), their 95% confidence intervals (dotted line), and the impulse responses obtained for the 1994-2002 period (dashed line).