WORKING PAPER NO. 260

Aggregate Employment Dynamics and (Partial) Labour Market Reforms

Rebeca Jiménez-Rodríguez and Giuseppe Russo

October 2010

University of Naples Federico II

University of Salerno

Bocconi University, Milan

CSEF - Centre for Studies in Economics and Finance
DEPARTMENT OF ECONOMICS – UNIVERSITY OF NAPLES
80126 NAPLES - ITALY
Tel. and fax +39 081 675372 – e-mail: csef@unisa.it

WORKING PAPER NO. 260

Aggregate Employment Dynamics and (Partial) Labour Market Reforms

Rebeca Jiménez-Rodríguez [*] and Giuseppe Russo[**]

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, partial 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.

JEL Classification: 22, J23.

Keywords: labour market deregulation; dynamic responses.

Acknowledgement: We benefited from the comments of Paolo Addesso, Bruno Contini, Sergio Destefanis, Fabio Postiglione, Vincenzo Pierro and Luigi Senatore. Rebeca Jiménez-Rodríguez acknowledges support from the Research Grant SEJ2006-09937 (Ministerio de Educación y Ciencia).

[*] University of Salamanca. Address: Department of Economics. University of Salamanca. Campus Miguel de Unamuno. E-37007. Salamanca. Spain. Tel.: +34 923 29 46 40 (ext. 3514). Fax: +34 923 29 46 86. E-mail: rebeca.jimenez@usal.es

[**] University of Salerno and CSEF. Address: Dipartimento di Scienze Economiche e Statistiche, Università di Salerno. I-84084. Fisciano. Italy. Tel.: +39 089 96 27 09. Fax.: +39 089 96 31 51. E-mail:grusso@unisa.it

Table of contents

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 decided to introduce reforms only 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 TWA) 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; Bassanini and Duval, 2006). 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.[2] In this line, Bentolila and Bertola (1990) and Bentolila and Saint-Paul (1994) examine the effect of adjustment costs on labour demand, obtaining that hiring and firing costs reduce the cyclical variability of employment. Veracierto (2008) also finds that firing taxes reduce the employment fluctuations over the business cycle. However, adjustment costs are not the only source of labour market rigidity. Wages are not less regulated than dismissals (for instance, laws introducing centralized bargaining, wage floors, seniority rules, and inflation indexation, among others). Labour market regulation, therefore, includes a ramified structure of restrictions, and it is necessary to consider their joint effect in order to evaluate their impact on the aggregate employment. For this purpose, it is essential to observe

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

[2] It is worth stressing that labour market protection also has other consequences. Authors such as Blanchard (1997), Cabrales and Hopenhayn (1997) and Campbell and Fisher (2000) investigate their effects on job creation and destruction. Likewise, Bertola (1994) analyses their impact on growth. Despite their different approaches, all of these authors share the basic result that firing costs lower the response of the economy to aggregate shocks.

that rigidities are complementary: wage flexibility can be used to undo any firing restriction by a contract that shifts firing costs on the workers (see Lazear, 1990) or by inducing a voluntary quit. Likewise, firing limitations assure that the outsiders cannot efficiently undercut the insiders' wage.

It is in the very nature of protective labour market institutions to shield workers from macroeconomic fluctuations. Agell (2002) shows that labour market regulation can be interpreted not only as a barrier to competition, but also as an insurance scheme in presence of risk aversion and capital market imperfections. In other words, existing labour market institutions can be regarded as the result of a demand for rent-seeking *and* social insurance. Both purposes imply that labour market flexibility is visible through an increased responsiveness of the aggregate employment to macroeconomic shocks.[3] The empirical evidence, indeed, supports this conjecture (see Bertola, 1990; and Backus *et al.*, 1995, for studies performed before the wave of partial reforms; Jiménez-Rodríguez and Russo, 2008, for a study developed after the partial reforms).[4]

Another strand of the literature uses microeconometric 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 FTCs increase the employment volatility by increasing both the hiring and firing rates.

The microeconometric 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 trends. This makes it difficult to disentangle the

[3] Bertola and Rogerson (1997) stress that a flexible economy could display *less* employment volatility. This is possible because, when prices (wages) are rigid, only quantities (employment) adjust in response to shocks. Allowing wage flexibility would then reduce the employment fluctuations. However, for the above-outlined reasons, wage rigidity without firing restrictions would be of little use for providing the insiders with either insurance or rents. As far as the labour market presents complementary regulations, more wage flexibility contributes to dismantle the protection for the incumbents against competition and against shocks.

[4] Bertola (1990) finds that employment is less volatile in countries with high job-protection. Backus *et al.* (1995) observe that employment volatility is 30% lower in Europe than in the US. Jiménez-Rodríguez and Russo (2008) find an increase of the employment volatility in Italy after the partial reforms of the mid-1990s.

effect of a reform from the effect of a country-specific trend: an increase in employment might be due simply to a booming economy, and vice-versa (see Kahn, 2007; Holmlund and Storrie, 2002). Therefore, we consider that the long-term perspective adopted in this paper provides useful information on the effect of (partial) labour market reforms.

The contribution of this paper is to extend the empirical work on the effects of partial labour market 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).[5] These nations 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.[6] 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.[7] 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 market.[8] In doing so, we use an approach based on a recursively identified bivariate VAR model.

This paper shows that partial labour market reforms have considerably affected the response of the aggregate employment, and have made it quite similar to the UK one. These results lead us to confirm that partial reforms, originally conceived to relax regulations in order to ease labour market access for the young people and the long-term unemployed, have had an important effect on the labour market as a whole. However, we do *not* conclude that partial reforms are equivalent to a complete deregulation. While the response of the aggregate employment is now not statistically different between “rigid” countries and the UK, the creation of a dual labour market implies that the

[5] We have also included Germany in our study for sake of completeness, but the data inconsistency due to the 1989 reunification, forces us to a very rough analysis.

[6] Notice that all the countries considered have only introduced labour market reforms at the margin, *i.e.*, partial reforms.

[7] Despite the fact that we emphasize the role of institutional reforms in determining the possible rise of aggregate employment fluctuations to output shocks, we are aware that there could be alternative explanations (see, for example, Azariadis and Pissarides, 2007; OECD, 2007). For this reason, we propose a simple check to verify that institutions are still crucial to understand the response of the aggregate employment to shocks. We are indebted to an anonymous referee for this point.

[8] The 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.

employment adjustment concerns mainly the unprotected workers, who act as a buffer. While this outcome is known especially for Spain (Bentolila and Saint-Paul, 1992; Saint-Paul, 2004), the evidence found in this paper suggests another possible source of concern: after the partial reforms, in Italy and France shocks last longer and cause larger employment fluctuations. It seems therefore that these two countries have combined "the worst of both worlds" (Saint-Paul 2004): they display wide employment fluctuations, as "flexible" countries, and strong shock persistence, as "rigid" countries.

The rest of the paper is organized as follows. Section 2 reviews the partial labour market reforms of the countries studied. Section 3 describes the methodology. Section 4 presents the empirical results. Section 5 discusses some alternative possibilities for the rise of employment volatility, and Section 6 concludes.

2. Labour Market Regulation

This Section briefly summarizes the main partial labour market reforms adopted in the countries considered. 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.[9] 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 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

[9] Training 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).

FTCs were allowed making it possible to hire almost any worker under a FTC, and TWA broke the monopoly of public employment agencies. It is important to remark that deregulation in Italy 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.[10]

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, TWA were also allowed. In practice, however, employers continued to hire workers under FTCs for all types of jobs (see Gil Martin, 2002; Kugler *et al.*, 2003).

---

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

The dissatisfaction for 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. TWA regulation was made more restrictive and, on the other hand, both unfair dismissal costs and payroll taxes were substantially reduced for some categories of workers and in case of conversions of FTCs into permanent contracts.[11] Kugler *et al.* (2003) show that this reform only affected marginally 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

In Germany, the main institutional reforms are similar to those enacted in the other countries under analysis. 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, in 1994, the TWA regulation dating back to 1972 was loosened. 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. Since this paper is mainly focused on point (3), we refer to Jacobi and Kluve (2007) for points (1) and (2), and we briefly summarize 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

[11] For 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).

January first, 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

3.1. The choice of the subperiods

It is our aim to analyse the effects of labour market reforms on the behaviour of the aggregate employment.[12] To do so, we split our time series in two periods: a "pre-reform" period and a "post-reform" period; then we estimate and compare the related impulse response functions (IRFs).[13] It is not immediate to pick out a proper breakdate, since labour market reforms are an ongoing process rather than a one-off innovation (see Section 2).[14] 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 partial 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 since 1993, with the approval of the "Giugni

[12] We use quarterly data from OECD's Economic Outlook database.

[13] We assume implicitly that the IRFs are not different over different phases of the business cycle. This assumption is not irrelevant: Glosser and Golden (2005), for example, show that in the US such asymmetries are likely to occur. In our case, this problem is less important because the division in subperiods restricts the impact of recessions to few observations. Noticeably, also Glosser and Golden (2005) cannot estimate separately the response to expansions and recessions for insufficient sample size (they use 1960-79 and 1980-95).

[14] Our results are robust to the use of alternative one-year breakdates within the reform process. An Appendix with this information is available from the authors upon request.

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 dissatisfaction for 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 to consider an institutional change. However, we exploit this situation to test the hypothesis that other variables related to globalization or capital mobility may be the true causes of the results we observe for the other countries (see Section 5). As such, we split the sample in 1991:2. If the IRFs estimated over the two subsamples are not statistically different, we reject the hypothesis that our results are driven by globalization/capital mobility.[15]

Finally, for applying our approach to Germany, we should have split our sample into the 1984-2001 and 2002-2008 subperiods (*i.e.*, before and after the Hartz reforms). However, this is not possible because German employment data are inconsistent before 1990 due to the 1989 reunification and the 2002-2008 period is too short. Notwithstanding this, we have decided to include Germany in our analysis for sake of completeness. In order to capture some information within such a restricted sample, we have been compelled to force our method. Thus, the related results (presented separately) can be considered only as exploratory indications. Therefore, we first estimate the German IRF of the employment over the sample 1994-2008, which includes the Hartz reforms.[16] Then, we estimate the IRF over 1994-2002, *i.e.* before the reforms. If the partial

[15] We thank an anonymous referee for this suggestion.
[16] We have discarded the 1990-1993 data since 1994 coincides with the introduction of the TWAs.

deregulation made the employment more responsive to shocks, the second IRF should display a weaker employment response. In other words, we expect that the IRF including the Hartz reforms lies above the IRF before the reforms.

3.2. The Data

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.[17] To do so, we calculate the trace and maximum eigenvalue test statistics (see, *e.g.*, Johansen, 1995). Finally, when non-evidence of cointegration is found[18] we consider a recursively identified bivariate VAR model for each sample period with variables in log-levels:[19]

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

where z_t is a vector that contains the real GDP and the aggregate employment (entering the model in that order).[20] We estimate by maximum likelihood and we choose the suitable lag length on the basis of the likelihood ratio test. We obtain the IRFs of the aggregate employment to an output shock for each subsample and their corresponding 95% confidence bands calculated through Monte

[17] Apart form analysing the stationarity and cointegration of the variables 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 stationarity 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 breakdates are established in the dates used to split the sample. An Appendix with these results is available from the authors upon request.

[18] In the case of cointegration, we use a bivariate VEC model.

[19] The researcher confronts the trade-off between (statistical) efficiency and the potential loss of information that takes place when I(1) variables are differenced. The VAR model should be specified as a vector error correction model (*i.e.*, restricted VAR model) when cointegration exists. However, it is worth noting that including misspecified cointegrating relationships in the VAR model in levels would lead to biased estimates, and estimating the VAR model in first differences would lead to a loss of information in the levels (see, Sims *et al.*, 1990). We can find a brand of the macroeconomic literature which uses variables the levels/log-levels of I(1) variables in the VAR model specifications (see, Sims, 1992; Eichenbaum and Evans, 1995; Cushman and Zha, 1997; Bernake and Mihov, 1998; Christiano, Eichenbaum and Evans, 1999; Christiano, Eichenbaum and Evans, 2005; Dedola and Lippi, 2005; among others). For further discussion in this issue, see, *e.g.*, Hamilton (1994), and Ramaswamy and Sl k (1998).

[20] It is worth stressing that structural models may be another good choice, but our aim is to analyse the average effects of output shocks on the aggregate employment and to do so, a recursively identified bivariate VAR is a convenient vehicle. The use of large-dimensional VAR models requires additional identifying assumptions that may not be realistic and they tend to be less precisely estimated. More importantly, adding some variables is not required if the objective is merely to estimate consistently the response of employment to an output shock. 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.

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.[21]

4. Empirical results

In this Section, we assess the impact of an output shock on the aggregate employment in France, Italy, Spain, and the UK, as well as Germany for completeness. 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.[22] 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).[23] Therefore, we consider a recursively identified bivariate VAR model with real GDP and aggregate employment in log-levels.[24]

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 calculated around the responses for the first subsample in the three countries. Moreover, the

[21] We have performed the Chow break-point test, using bootstrapped p-values proposed by Candelon and Lütkepohl (2001). For each country, we test for model stability in the above-mentioned breakdates (specifically, 1990:2 for France, 1993:2 for Italy, and 1997:2 for Spain). Table 5 indicates that the null hypothesis of no structural change is rejected in all countries considered.
[22] Notice that even though we cannot observe stationarity in first log-differences for Spain, stationarity appears on applying the test to the whole Spanish sample allowing for structural break in 1997:2.
[23] The only exception is the Italian second subsample. Consequently, we use a VEC model in this case.
[24] Table 3 presents descriptive statistics for each country and each period.

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 4).

In France, partial labour market reforms have increased significantly the employment responsiveness to output shocks (see Figure 1, Chart 1). Furthermore, a comparison to the UK enables us to draw a more interesting conclusion (see Figures 2 and 3), namely that the reforms did not only modify the employment responses to output shocks, but they also made it quite similar to the UK one. In other words, the reaction of the aggregate employment to an output shock in France is now quite close to that found for the most flexible European labour market. In addition, it is important to remark that in the second subsample shocks are more persistent.

Results for Italy also indicate that output shocks last longer and give rise to an increased reaction of the aggregate employment (see Figure 1, Chart 2). Moreover, the employment response in the second subsample is statistically similar to the response found in the UK (see Figures 2 and 3).

These findings suggest that both Italian and French labour markets seem to have adopted inefficient reforms: the employment responds to output shocks as in competitive markets, but the shocks persist as in regulated markets (see Duval *et al*., 2007). Even though this result may look unexpected, it is worth to emphasize that models of rigid labour markets only predict larger employment fluctuations after the deregulation, and this is the focus of the present paper. Shocks persistence is determined by several other factors, including monetary policies and capital markets imperfections (see Duval *et al.*, 2007).

The Spanish employment response is quite similar to that of the UK already in the first subsample (see Figure 2), which is not an unexpected result because Spain was the first country to deregulate the use of FTCs in 1984. Moreover, the 1997 reform did not reduce the response of the Spanish employment to output shocks, rather it became even higher than the UK one (see Figure 3).

A likely explanation is that the reform did not affect the overall share of FTCs[25] and higher flexibility was introduced for some previously safer permanent jobs. This outcome confirms Kugler *et al*. (2003) who find that the 1997 law had little effect in spurring the substitution of permanent contracts to FTCs.

The above-mentioned results are in line with Duval *et al.* (2007), who find that Italy and France perform the worst among 20 OECD countries with respect to the time needed to recover after a shock, the cumulative output loss, and the output gap volatility.[26] The correspondence with Duval *et al.* (2007) extends to the UK, which shows a quick recovery from shocks, a low output loss, and a high output gap volatility. Spain lies in the middle: it performs better than Italy and France, but worse than the UK. By looking at the estimated IRFs, indeed, it is also evident in our results that shock persistence is lowest in Spain and in the UK.

Finally, the German employment response to an output shock over the 1994-2002 period is the lowest of our 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 reduces the possibility to use FTCs 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 (see Section 3.1) and, more importantly, it does not contradict the results we obtain for the other countries.

To sum up, our findings seem to indicate that partial labour market reforms have indeed affected the response of the aggregate employment to output shocks in all countries under analysis. Moreover, the conclusions of Duval *et al.* (2007) strongly support our own outcomes.

---

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

[26] Duval *et al.* (2007) measure the output gap as the deviation from the GDP trend.

5. Alternative approaches to the rise of employment fluctuations

Besides labour market deregulation, other factors, such as international economic integration and capital mobility, can affect employment volatility. The former factor works through two channels: (a) it increases the labour demand elasticity by enhancing the substitutability of domestic labour with foreign labour (offshoring), and, as a consequence, by magnifying the effects of labour demand shocks; (b) it exposes firms to increased competition on output markets and to exchange-rate fluctuations (Rodrik, 1997).

Clearly, if globalisation makes labour demand and supply more elastic, any shock leads to greater employment fluctuations. OECD (2007) surveys the literature concerned with this issue. The evidence for such an effect is quite mixed. While the available analyses suggest that it might be not negligible, it is still difficult to isolate the sectors and/or the conditions for it to emerge. New estimates at the sectoral level provided by OECD (2007) confirm that the establishment of international production networks contributed to expand the flexibility of firms in the OECD countries between 1980 and 2002. More precisely, OECD (2007) estimates proportional hazard models for workers to another job, unemployment or inactivity using individual panel data for 1994-2001 in 13 European countries. The result is that foreign competition (measured by the industry-specific exchange-rate) tends to increase the probability of job separations, but the effect varies by sector, being more important for low-tenure and low-skill workers, and it is not significant for job-to-job transitions in the full sample. Overall, these findings are not in contrast with our approach, and they are rather complementary, because, as it is stated in OECD (2007), "the fact that countries with similar trade and FDI liberalisation patterns have widely different employment and unemployment rates, strongly supports the conclusion that the actual impact of globalisation on overall employment performance depends largely on domestic policy settings" (page 113).

According to Blanchard and Wolfers (2000) as well, "a given shock on unemployment may be larger or longer lasting, depending on the specific labour market institutions". Their main findings, indeed, indicate that considering the interaction of common shocks and national institutions yields a very good account of the evolution of unemployment in Europe.

Regarding the capital mobility factor, Azariadis and Pissarides (2007) argue convincingly that capital mobility can shorten the lag of response to shocks and raise the variability of unemployment. They stress that the big increase in capital mobility recorded after the mid 80s was accompanied by a 50% increase in the volatility of unemployment.[27] For their analysis, they consider different subperiods (specifically, 1970-85, 1986-91, and 1992-97), which are consistent with those used in the present paper.[28]

Therefore, we check whether FDI flows and/or the effects of globalization are driving our results: an increase in the variability of the employment could be caused by the growing economic integration rather than by institutional change. To address this issue, we propose a simple test, which is based on the following ideas: (a) the FDI trend is the same in the countries under analysis; (b) none of these countries is sheltered from globalization. Then, if globalization or FDI drive our results, the response of the employment to shocks should increase even in absence of any labour market reform.[29] The UK gives a good opportunity to test this idea, since it receives most FDIs in our sample and since its labour market institutions show a remarkable stability in the period under analysis. Figure 5 shows that the UK IRFs of aggregate employment to output shock before and after the early 1990s are not statistically different. Then, we reject the hypothesis that our results are driven by globalization/capital mobility.

6. Concluding remarks

Over the mid-1990s labour market regulation was blamed as a cause of "eurosclerosis". The poor employment performance of many countries with high standards of job protection was

[27] They measure the volatility as the standard deviation of the cyclical component of the unemployment.
[28] It is worth stressing that the ratio of Foreign Domestic Investment (FDI) to domestic investment doubles again between 1997 and 2008. The current ratio is 15.35% for France, 11.74% for Germany, 5.35% for Italy, 13.86 for Spain, 27.5% for the UK (source: the World Bank).
[29] This check does not obviously allow to disentangle the effect of FDI from the effect of outsourcing, but it is sufficient for our purposes.

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 market reforms, which reduced protection only for workers under 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 a prolonged time horizon. Therefore, we exploited the series of the last three decades. Our approach, in comparison with the related literature, has the advantage of comparing different eras of labour market regulation.

Our findings suggest that the response of the aggregate employment to output shocks has become significantly higher after the partial labour market reforms, making the impact of the shock quite similar among Italy, France Spain and the UK. This is distinctly evident for Spain, whose employment shows a response to output shocks even higher than the UK. In addition, when we look at the shock persistence, we find some allegedly unexpected effects in Italy and France. While Spain’s employment reproduces to a certain extent both the responsiveness and the resilience of the UK economy, Italy and France connect the sensitivity to shocks of a “flexible” economy with the sluggish adjustment of a “rigid” economy, and they seem to be worse off on both sides of the trade-off. Such an outcome, on the one hand, 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, 1994a and 1994b). On the other hand, the evidence shown in this paper denotes the possibility that partial reforms might have had undesirable consequences even with respect to the persistence of aggregate shocks. Finally, it is worth to mention the considerable correspondence between our findings and those of Duval *et al.* (2007).

References:

- Agell, J. (2002), “On the Determinants of Labour Market Institutions: Rent Seeking vs. Social Insurance”, *German Economic Review*, 3, 107-135.
- Azariadis, C., Pissarides, C.A. (2007), “Unemployment Dynamics with International Capital Mobility”, *European Economic Review*, 51, 27-48.
- Backus, D., Kehoe, P., Kydland, F. (1995), “International Business Cycles: Theory and Evidence”, in T.F. Cooley (ed.), *Frontiers of Business Cycle Research*, Princeton University Press, 331-356.
- Bassanini, A., Duval, R. (2006), “Employment Patterns in OECD Countries: Reassessing the Role of Policies and Institutions”, *OECD Economics Department Working Papers* 486, OECD, Economics Department.
- Bentolila, S., Bertola, G. (1990), “Firing Costs and Labour Demand: How Bad is Eurosclerosis?”, *Review of Economic Studies*, 57, 381-402.
- Bentolila, S., Dolado J.J. (1994a), “Labour Flexibility and Wages: Lessons from Spain”, *Economic Policy*, 18, 55-99.
- Bentolila, S., Dolado, J.J. (1994b), “Spanish Labour Markets”, *Economic Policy*, 9, 53-99.
- Bentolila, S., Saint-Paul G. (1992), “The Macroeconomic Impact of Flexible Labor Contracts, with an Application to Spain”, *European Economic Review*, 36, 1013-1047.
- Bentolila, S., Saint-Paul G. (1994), “A Model of Labour Demand with Linear Adjustment Costs”, *Labour Economics*, 1, 303-326.
- Bernanke, B.S., Mihov, I. (1998), “Measuring Monetary Policy”, *Quarterly Journal of Economics*, 113, 869-902.
- Bertola, G. (1990), “Job Security, Employment and Wages”, *European Economic Review*, 34, 851-886.
- Bertola, G. (1994), “Flexibility, Investment and Growth”, *Journal of Monetary Economics*, 34, 215-238.
- Bertola, G., Rogerson, R. (1997), “Institutions and Labor Reallocation”, *European Economic Review*, 41, 1147-1171.
- Blanchard, O. (1997), “Labor Market Flexibility and Aggregate Employment Volatility: A Comment”, *Carnegie-Rochester Conference Series on Public Policy*, 46, 229-239.
- Blanchard, O., Landier, A. (2002), “The Perverse Effect of Partial Labour Market Reforms: Fixed-Term Contracts in France”, *Economic Journal*, 112, 214-244.
- Blanchard, O., Wolfers J. (2000), “The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence”, *Economic Journal*, 110,C1-C33.
- Busetti, F., Taylor, A. (2003), “Variance Shifts, Structural Breaks, and Stationarity Tests”, *Journal of Business and Economic Statistics*, 21, 510-531.
- Cabrales A., Hopenhayn H. (1997), “Labor Market Flexibility and Aggregate Employment Volatility”, *Carnegie-Rochester Conference Series on Public Policy*, 46, 189-228.
- Campbell, J., Fisher, J. (2000), “Aggregate Employment Fluctuations with Microeconomic Asymmetries”, *American Economic Review*, 90, 1323-1345.
- Candelon, B., Lütkepohl, H. (2001), “On the Reliability of Chow-type Tests for Parameter Constancy in Multivariate Dynamic Models”, *Economics Letters*, 73, 155-160.

- Card, D.E., Freeman, R.B. (2002), "What Have Two Decades of British Economic Reform Delivered?", *NBER Working Paper* No. 8801.
- Christiano, L.J., Eichenbaum, M., Evans, C.L. (1999), "Monetary Policy Shocks: What Have we Learned and To What End?", In Taylor, J. B. and M. Woodford (Eds.), *Handbook of Macroeconomics*. Amsterdam, North-Holland.
- Christiano, L.J., Eichenbaum, M., Evans, C.L. (2005), "Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy", *Journal of Political Economy*, 113, 1-45.
- Cushman, D.O., Zha, T.A. (1997), "Identifying Monetary Policy in a Small Open Economy under Flexible Exchange Rates", *Journal of Monetary Economics*, 39, 433-448.
- Dedola, L., Lippi, F. (2005), "The Monetary Transmission Mechanism: Evidence from the Industries of Five OECD Countries", *European Economic Review*, 49, 1543-1569.
- Dolado, J.J., Garcia-Serrano, C., Jimeno, J., (2002), "Drawing Lessons from the Boom of Temporary Jobs in Spain", *Economic Journal*, 112, F270-F295.
- Duval, R., Elmeskov, J., Vogel, L. (2007), "Structural Policies and Economic Resilience to Shocks", *OECD Working Papers* No. 567.
- Eichenbaum, M., Evans, C.L. (1995), "Some Empirical Evidence on the Effects of Shocks to Monetary Policy on Exchange Rates", *Quarterly Journal of Economics*, 110, 1975-1010.
- Elliott, G. (1999), "Efficient Tests for a Unit Root when the Initial Observation is Drawn from its Unconditional Distribution", *International Economic Review*, 40, 767-783.
- Elliott, G., Rothenberg, T., Stock, J. (1996), "Efficient Tests for an Autoregressive Unit Root", *Econometrica*, 64, 813-36.
- Engle, R.F., Granger, C.W.J. (1987), "Cointegration and Error Correction: Representation, Estimation, and Testing", *Econometrica*, 55, 251-276.
- Garcia-Serrano, C. (1998), "Worker Turnover and Job Reallocation: The Role of Fixed-Term Contracts", *Oxford Economic Papers*, 50, 709-725.
- Garibaldi, P. (1998), "Job Flow Dynamics and Firing Restrictions", *European Economic Review*, 42, 245-275.
- Gil Martin, S. (2002), "An Overview of Spanish Labour Market Reforms, 1985-2002", *Working Paper* 02-17, Unidad de Politicas Comparadas (Consejo Superior de Investigaciones Cientificas).
- Glosser, S., Golden, L. (2005), "Is Labour Becoming More or Less Flexible? Changing Dynamic Behaviour and Asymmetries of Labour Input in US Manufacturing", *Cambridge Journal of Economics*, 29, 535-557.
- Gregory, A.W., Hansen, B.E. (1996), "Residual-Based Tests for Cointegration in Models with Regime Shifts", *Journal of Econometrics*, 70, 99-126.
- Hamilton, J. (1994), "Time Series Analysis", Princeton University Press.
- Holmlund, B., Storrie, D. (2002), "Temporary Work in Turbulent Times: the Swedish Experience", *Economic Journal*, 112, F245-F269.
- Howell, D., Baker, D., Glyn, A., J. Schmitt (2007), "Are Protective Labour Market Institutions at the Root of Unemployment? A Critical Review of the Evidence", *Capitalism and Society*, Vol. 2, Issue 1, Article 1.
- Jacobi, L., Kluve, J. (2007), "Before and After the Hartz Reforms: The Performance of Active Labour Market Policy in Germany", *Journal for Labor Market Research*, 40, 45-64.

- Jiménez-Rodríguez, R., Russo, G. (2008), “Institutional Rigidities and Employment Rigidity on the Italian Labour Market”, *Applied Economics Quarterly*, 3, 217-227.
- Johansen, S. (1995), “Likelihood Based Inference in Cointegrated Vector Autoregressive Models”, Oxford University Press, Oxford.
- Kahn, M.L. (2007), “Employment Protection Reforms, Employment and the Incidence of Temporary Jobs in Europe: 1995-2001”, *IZA Discussion Papers* No. 3241.
- Kilian, L. (2008), “The Economic Effects of Energy Price Shocks”, *Journal of Economic Literature*, 46, 871-909.
- Kugler, A., Jimeno, J., Hernanz, V. (2003), “Employment Consequences of Restrictive Permanent Contracts: Evidence from Spanish Labor Market Reforms”, *FEDEA Working Papers* 2003-14.
- Lazear, E.P. (1990), “Job Security Provisions and Employment”, *Quarterly Journal of Economics*, 105, 699-726.
- Messina, J., Vallanti, G. (2007), “Job Flow Dynamics and Firing Restrictions: Evidence from Europe”, *Economic Journal*, 117, 279-301.
- Nickell, S., Layard, R. (1999), “Labor Market Institutions and Economic Performance”, In Ashenfelter, O. and D. Card (Eds.), *Handbook of Labor Economics*, Edition 1, Volume 3, Chapter 46, 3029-3084.
- OECD (2004), Employment Outlook, OECD Publications, 2, rue André-Pascal, 75775 Paris Cedex 16.
- OECD (2007), Employment Outlook, OECD Publications, 2, rue André-Pascal, 75775 Paris Cedex 16.
- Orszag, M., Snower, D. (1998), “Anatomy of Policy Complementarities”, *Swedish Economic Policy Review*, 5, 303-345.
- Ramaswamy, R., Sl k, T. (1998), “The Real Effects of Monetary Policy in the European Union: What Are the Differences”, *IMF Staff Papers*, 2, 374-399.
- Rodrik D. (1997), “Has Globalization Gone Too Far?” Institute for International Economics, Washington DC.
- Saint-Paul G. (2004), “Flexibility vs. Rigidity: Does Spain Have the Worst of Both Worlds?”, In Agell, J, Keen, M. and A. Wiechenreider (Eds.), *Labor Market Institutions and Public Regulation*, MIT Press, 101-122.
- Siebert, H. (1997), “Labor Market Rigidities: At the Root of Unemployment in Europe”, *Journal of Economic Perspectives*, 11, 37-54.
- Sims, C.A., Stock, J.H., Watson, M. (1990), “Inference in Linear Time-Series Models with Some Unit Roots,” *Econometrica*, 58, 113-144.
- Sims, C.A. (1992), “Interpreting the Macroeconomic Time Series Facts: The Effects of Monetary Policy”, *European Economic Review*, 36, 975-1000.
- Veracierto, M., (2008), “Firing Costs and Business Cycle Fluctuations”, *International Economic Review*, 49, 1-39.

Table 1: *Unit-root tests*

		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*
Real GDP in Levels													
FRA	*1st period*	-1.49	-0.65	89.85	-1.18	45.11	3.61	3.98	390.9	1.45	368.8	2.80	2.80
	2nd period	-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	*1994:1-2002:4*	-1.78	-2.00	11.16	-2.02	6.35	-1.07	0.57	142.9	-0.95	161.20	4.01	4.01
	1994:1-2008:3	-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	*1st period*	1.76	0.47	67.22	0.11	39.70	-2.35	-1.22	4.13*	-1.72	15.86	0.58	0.58
	2nd period	-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	*1st period*	-1.82	-1.73	11.56	-1.81	6.23	-1.55	0.15	19.12	-0.81	17.12	2.26	2.26
	2nd period	-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	*Whole period*	-2.55	-2.80*	11.27	-2.85	4.20	-1.40	0.24	56.51	-1.70	36.19	3.78	3.78
Real GDP in First Log-Differences													
FRA	*1st period*	-5.36***	-4.71***	5.99*	-5.12***	3.17*	-3.04**	-1.50	10.50	-2.85**	7.73	-0.76	-0.76
	2nd period	-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	*1994:1-2002:4*	-6.43***	-6.61***	5.15**	-6.59***	2.84**	-6.39***	-6.45***	1.47***	-6.46***	2.90***	-2.51**	-2.51**
	1994:1-2008:3	-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	*1st period*	-5.13***	-4.87***	5.61**	-5.06***	3.02*	-1.07	-1.18	7.11	-1.17	13.33	-1.01	-1.01
	2nd period	-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	*1st period*	-2.88	-2.27	18.16	-2.53	8.57	-2.67*	-1.81*	7.34	-2.64*	8.19	-0.89	-0.89
	2nd period	-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	*Whole period*	-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*
Aggregate Employment in Levels													
FRA	*1st period*	-1.56	-2.06	1.58***	-2.12	1.53***	-1.52	-1.69*	0.01***	-1.70	0.01***	0.75	0.75
	2nd period	-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	*1994:1-2002:4*	-1.32	-1.51	10.83	-1.54	6.01	-1.19	-0.98	14.43	-1.22	23.80	0.87	0.87
	1994:1-2008:3	-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	*1st period*	-1.96	-1.85	9.07	-1.94	4.21	-1.72	-1.59*	5.30	-1.83	4.31**	0.25	0.25
	2nd period	-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	*1st period*	-2.97	-2.94**	4.53**	-2.96*	2.47**	-2.28	-1.28	3.78*	-2.24	5.83	1.25	1.25
	2nd period	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	*Whole period*	-4.04**	-3.09**	5.03**	-3.81***	2.09**	-1.18	-0.71	12.42	-1.41	16.12	1.41	1.41
Aggregate Employment in First Log-Differences													
FRA	*1st period*	-2.70	-2.52	2.59***	-2.56	1.39***	-1.44	-1.41	5.15	-1.45	10.03	-1.26	-1.26
	2nd period	-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	*1994:1-2002:4*	-2.68	-2.79*	8.58	-2.83	4.87	-2.76*	-2.61***	2.73**	-2.77**	4.87	-2.63***	-2.63***
	1994:1-2008:3	-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	*1st period*	-3.65**	-3.69***	5.50**	-3.51**	1.82***	-2.23	-2.12**	0.82***	-2.30	2.18***	-1.82*	-1.82*
	2nd period	-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	*1st period*	-1.94	-1.67	18.18	-1.79	9.17	-1.93	-1.34	8.25	-1.91	9.34	-1.55	-1.55
	2nd period	-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	*Whole period*	-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*

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

		Mean	*Median*	*Maximum*	*Minimum*	*Std. Dev.*
Real GDP (in log-levels)						
FRA	*1 st period*	13.90017	13.88061	14.04606	13.80706	0.07354
	2 nd period	14.20386	14.20828	14.37978	14.04851	0.11050
GER	*1994:1-2002:4*	14.52316	14.51905	14.58820	14.44382	0.04826
	1994:1-2008:3	14.56091	14.58137	14.67677	14.44382	0.06413
ITA	*1 st period*	13.97215	13.99138	14.06188	13.84353	0.07356
	2 nd period	14.17878	14.20665	14.26955	14.04311	0.06619
SPA	*1 st period*	13.34579	13.38942	13.51509	13.13745	0.11555
	2 nd period	13.74070	13.74432	13.91177	13.52646	0.11565
UK	*Whole period*	14.06721	14.03895	14.43340	13.70438	0.22137
Aggregate Employment (in log-levels)						
FRA	*1 st period*	16.91419	16.91251	16.94467	16.89966	0.01214
	2 nd period	16.98970	16.98357	17.06888	16.92436	0.04932
GER	*1994:1-2002:4*	17.45858	17.45106	17.48821	17.43667	0.01992
	1994:1-2008:3	17.46874	17.47396	17.51349	17.43667	0.02189
ITA	*1 st period*	16.91521	16.91426	16.95621	16.87757	0.02332
	2 nd period	16.96314	16.96133	17.04903	16.89596	0.05221
SPA	*1 st period*	16.32650	16.33895	16.40843	16.21910	0.05979
	2 nd period	16.65522	16.65681	16.83659	16.41676	0.13112
UK	*Whole period*	17.08779	17.08413	17.20007	16.97875	0.06143

This table provides descriptive statistics for all countries.

Table 4: *Responses of aggregate output*

	France		Italy		Spain	
	after 1 year	after 2 years	after 1 year	after 2 years	after 1 year	after 2 years
First sample period	0.33*	0.45*	0.68*	0.41*	0.64*	0.78*
Second sample period	0.60*	0.89*	0.31*	0.66*	1.10*	1.03*

The entries refer to the impulse responses of aggregate employment attributed to one unit output shock. One asterisk indicate statistical significance at the 5% critical level

Table 5: *Testing for model stability*

	t^*	Chow break-point test statistics	Bootstrapped p-values
FRA	1990:2	24.7407	0.0288
ITA	1993:2	64.2880	0.0070
SPA	1997:2	100.8849	0.0000

The Chow break-point test used is based on a recursive identified bivariate VAR model for each country. The models are estimated for the period 1980:1-2008:3 for France and 1984:1-2008:3 for Spain and Italy. The null hypothesis of no structural changes in t^* (specifically, 1990:2 for France, 1993:2 for Italy, and 1997:2 for Spain) is tested. Bootstrapped p-values proposed by Candelon and Lütkepohl (2001) are calculated on the basis of 2500 bootstrap replications.

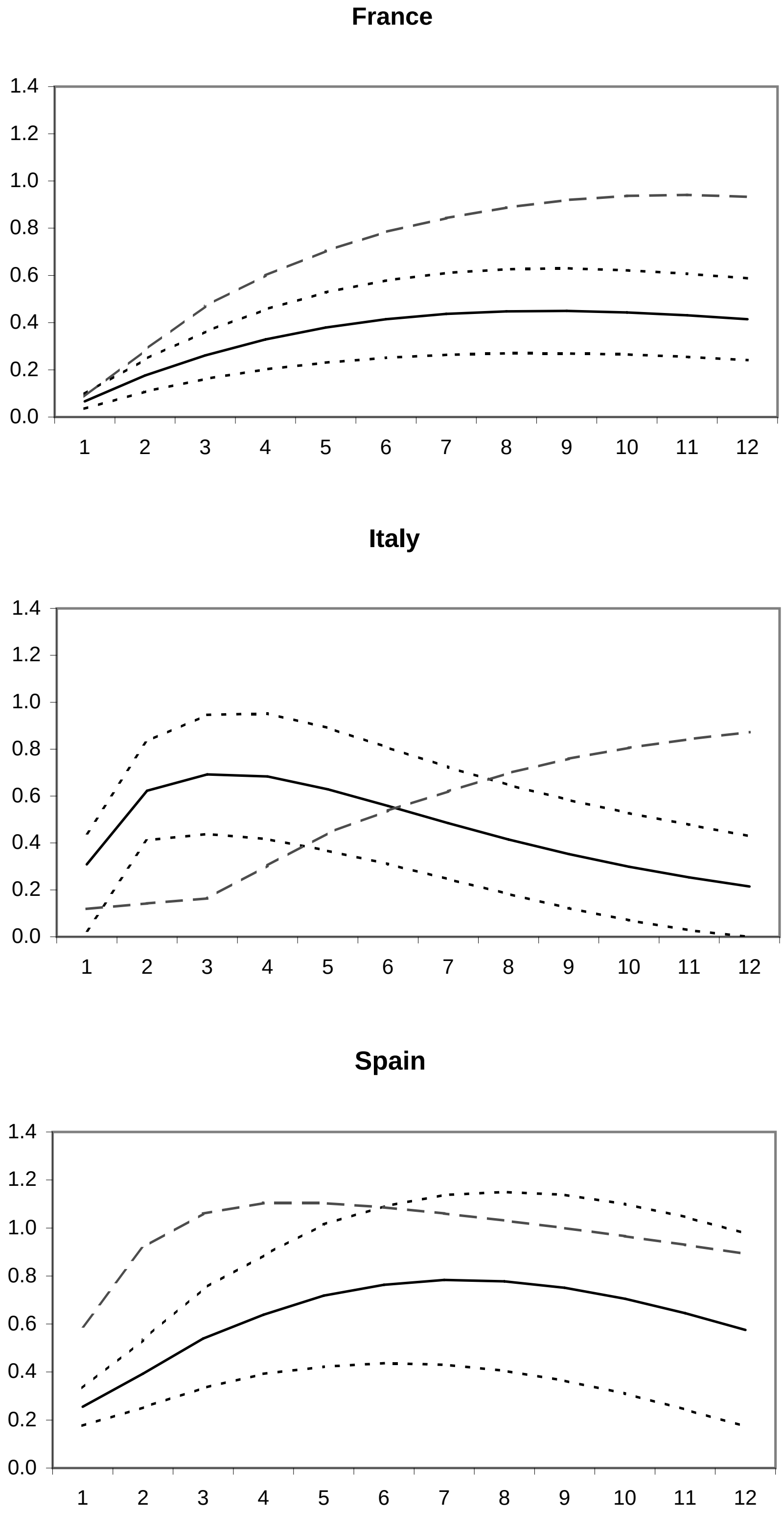

Figure 1: This figure presents the impulse responses of aggregate employment to one unit output shock for the first sample period (solid line), their 95% confidence intervals (dotted line), and the impulse responses obtained for the second sample period (dashed line).

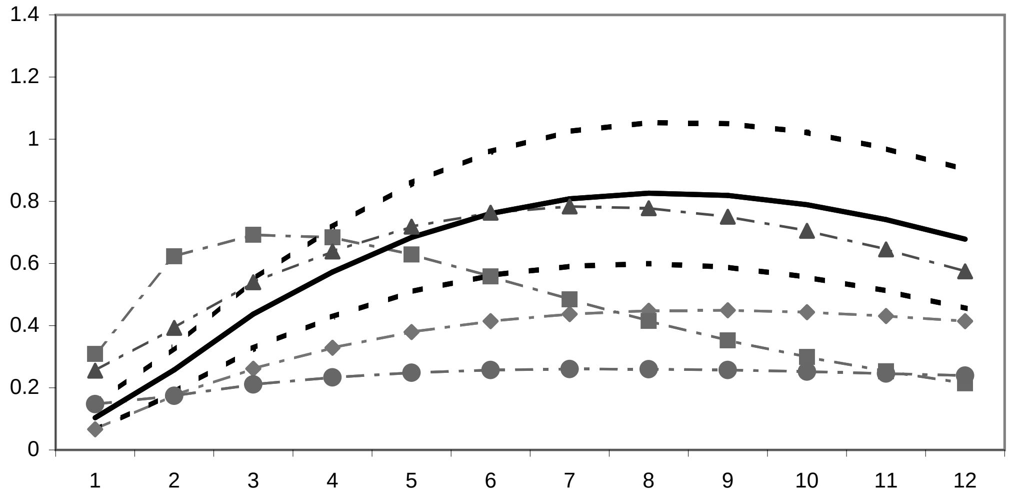

Figure 2: This figure presents the impulse responses of aggregate employment to one unit output shock for the UK (solid line), their 95% confidence intervals (dotted line), and the impulse responses obtained for the first sample period in France (dashed line with diamond markers), Germany (dashed line with circle markers), Italy (dashed line with square markers) and Spain (dashed line with triangle markers).

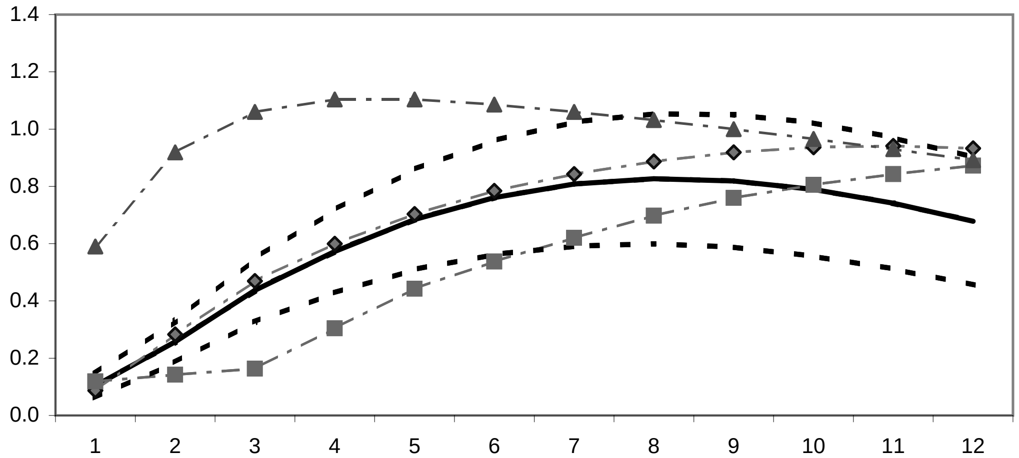

Figure 3: This figure presents the impulse responses of aggregate employment to one unit output shock for the the UK (solid line), their 95% confidence intervals (dotted line), and the impulse responses obtained for the second sample period in France (dashed line with diamond markers), Italy (dashed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

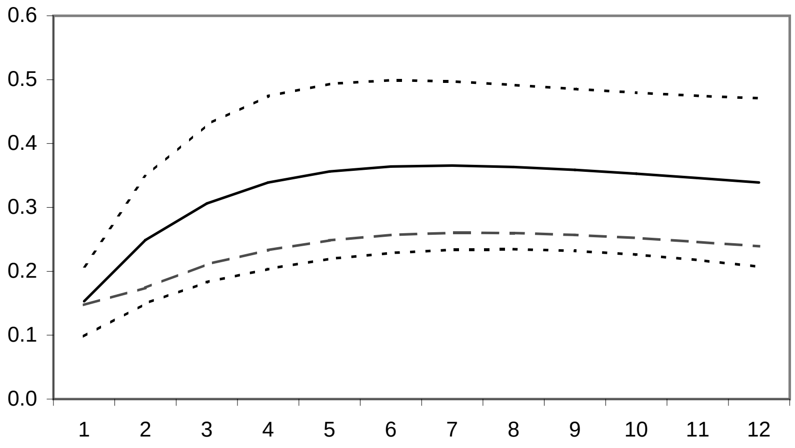

Figure 4: This figure presents the impulse responses of German aggregate employment to one unit output shock for the 1994-2008 sample period (solid line), their 95% confidence intervals (dotted line), and the impulse responses obtained for the 1994-2002 period (dashed line).

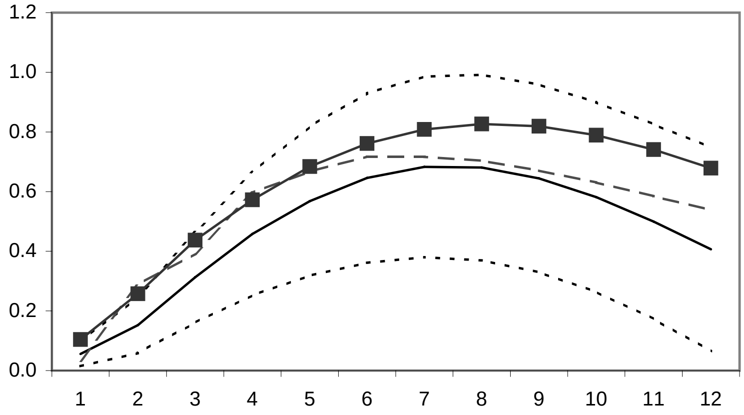

Figure 5: This figure presents the impulse responses of UK aggregate employment to one unit output shock for the first sample period (solid line), their 95% confidence intervals (dotted line), the impulse responses for the second sample period (dashed line), and the impulse responses for the full sample (solid line with square markers).