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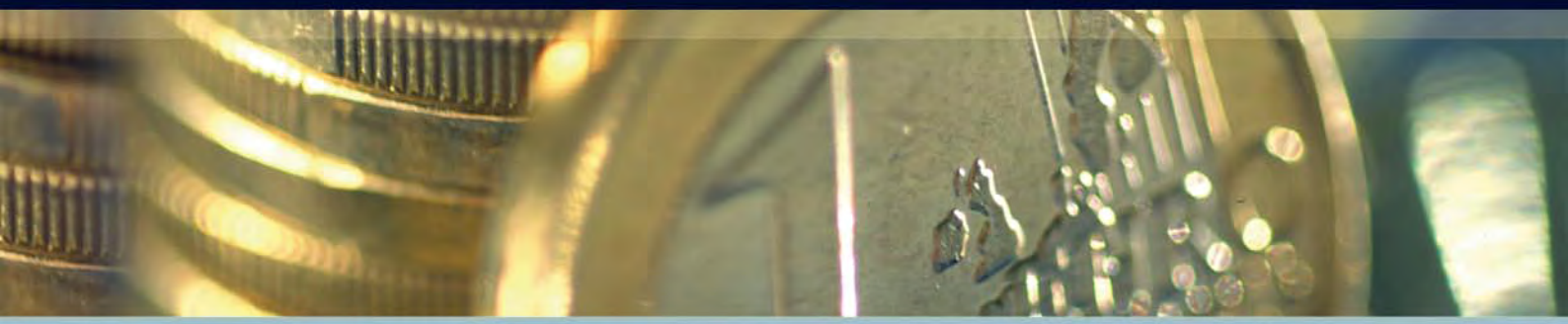

EU labour market behaviour during the *Great Recession*

Alfonso Arpaia and Nicola Curci

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Abstract

This paper provides an analysis of the labour market adjustment to the 2008-2009 recession in terms of employment, unemployment, hours worked and wages. It highlights differences in the response of employment and unemployment across countries and different socioeconomic groups. For all EU Member States, it provides evidence of the developments during the crisis of the monthly job finding and separation rates. This helps to assess whether the increase in unemployment is due to an increase of job separation or to a decline in the job finding rate. The paper discusses the risks of jobless growth and compares the dynamics of unemployment and employment across different periods. It provides evidence of an asymmetric response over the cycle, with recessions being characterised by more job destruction than by job creation in the following recoveries. The analysis of the wage dynamics during the recession suggests that there has been an adjustment in the compensation per employee led by the variable component; yet, this has not been sufficient to avoid the increase in the nominal unit labour costs due to labour hoarding.

JEL Classification: E24, E32, J6

Keywords: Unemployment, Workers' flows, job separation, job finding rate, Okun's law,

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SUMMARY FOR NON SPECIALISTS

In 2008 and 2009 European economies were subjected to shocks of unprecedented severity. GDP declined in all countries and, in some cases, output losses were the largest recorded at least since the recession of the early 1970s. Because of this unprecedented collapse in world economic activity, many have dubbed this as the *Great Recession*[1]. Bearing in mind the size of the shock, the EU unemployment rate increased initially only to a limited extent. This paper provides an analysis of the labour market adjustment in terms of quantities (employment, unemployment, hours worked) and price of labour, whilst at the same time recognising that many uncertainties remain around the short-term outlook.

We assess the labour market response from an international comparative perspective, acknowledging that whilst all countries have been hit by the global financial shock, the size of the labour market adjustment and its composition has been significantly different across countries. This heterogeneity across countries may be due to the size of domestic and external imbalances, as well as to the particular characteristics of the workforce in those industries mostly affected by the crisis.

It is clear that the burden of the recession has not been evenly spread across different socio-economic groups. For example, workers with *weaker* work contracts, the less qualified and less experienced workers have borne the brunt of the current recession. In many countries, job destruction has been more intense in male dominated sectors but the (preliminary) evidence provided suggests that the industry mix of male employment only partially explains these differences. It is the size of the initial imbalances, combined with the prevalence of men in specific sectors, which may have contributed to the differences in the labour market responses during the recession quarters.

Comparisons with previous recessions also reveal that the relative effects of the current recession on men and women are not particularly unusual, despite men having lost jobs in disproportionate numbers - a conclusion also valid for the US. One unique element of the 2008/2009 recession is, however, the increase in the young unemployment rates.

In order to have a better understanding of the elements influencing the labour market response, one needs to examine the upward and downward movements in unemployment driven by inflows into (job destruction) and/or outflows from unemployment (job finding), which respond differently to shocks and to the constraints and incentives created by labour market institutions. Elsby et al (2009) developed a methodology to exploit annual and quarterly Labour Force Survey (LFS) data to measure annual averages of monthly unemployment flows for the OECD countries. We have adapted this methodology by exploiting quarterly and monthly LFS data in order to measure quarterly averages of monthly unemployment flows for all the EU27 countries. To the best of our knowledge, this is the first paper to provide a description of inflows and outflows rates during the recession quarters. We also provide an estimate of the flow steady state unemployment rate (i.e. the unemployment rate consistent with balanced inflows into and outflows out of unemployment). When the actual unemployment rate is below the steady state, as now in Europe, there are more inflows into than outflows from unemployment. This in turn implies that the unemployment rate will rise further in the near future, as far as the two flows will balance. A closer look at the

[1] Strauss-Kahn (2009), "Crisis Management and Policy Coordination: Do We Need a New Global Framework?" Speech given at the Oesterreichische Nationalbank. http://www.imf.org/external/np/speeches/2009/051509.htm

individual countries also highlights very heterogeneous patterns in inflows and outflows. For example, both flows increase in the Nordic countries, whilst some countries like Spain and Ireland are experiencing an impressive surge in the inflow rate. The same holds true for the Baltic countries, albeit on a smaller scale, whilst, finally, inflow and outflows do not change much for countries such as Germany and Italy.

The adjustment in the average hours worked was a key factor in limiting the increase in unemployment at the early stage of the recession and the subsequent size of the labour hoarding raises concerns about the labour market response at the early stages of the recovery. We provide evidence of an asymmetric response of employment and unemployment over the cycle, with recessions being characterised by more job destruction than by job creation in the recoveries which followed. On the positive side, compared to the recession of the early 1990s, our analysis suggests that the expected increase in unemployment is similar to that estimated for the recession of the early 1990s but will probably be less persistent over time. This persistence can be influenced by a deterioration of the matching between vacant posts and unemployed people as the average unemployment rate increases. Evidence based on survey data suggests that, so far, in this recession the increase in unemployment rates linked to mismatching is due to a lack of demand for labour rather than an increase in the mismatch between vacant posts and skills. In other words, there have been changes along the Beveridge curve rather than changes of the position of the curve. Yet, the size of adjustment required in certain sectors may imply that sectoral shifts may take time to occur, rendering the skills of workers, especially those formerly employed in industries with non-transferable skills, obsolete. However, estimates based on past evidence suggest that the impact of sectoral reallocation on structural unemployment seems on average small.

The shape of the unemployment response is influenced by the capacity of wages to reflect changes in demand. We have observed that, whilst there has been an adjustment in the compensation per employee, led by the fall in the variable component, this has not been sufficient to avoid the increase in the nominal unit labour costs due to labour hoarding. This type of response may have contributed to stabilising incomes and consumption, but it may also create competitive pressures at the early stage of the recovery if negotiated wages do not incorporate the impact of the recession.

There are extensions to this analysis, which we believe could be of further interest. First, we provided evidence of heterogeneous impact of the crisis on socioeconomic groups and countries. Further work should attempt to quantify, in a multivariate framework, the determinants of this differentiated performance. In doing so, one could take into account the role played by initial institutional and macroeconomic conditions, in particular, as far as the configuration of labour market institutions and various imbalances prevailing before the crisis are concerned, and of workers' socio-demographic characteristics. Second, further work could also try to assess the extent of the stabilisation of employment and unemployment of the measures enacted in response to the crisis.

1. Introduction

When Lehman Brothers filed for bankruptcy in September 2008, many commentators started to draw parallels with the consequences of the US Stock market crash of October 1929. One year into the current recession, the worldwide economy was tracking, or even doing worse, than during the same stage period of the Great Depression (Eichengreen and O'Rourke, 2009). The fall in world trade and in the stock markets, more rapid in the first year of current recession than in the comparable period of the early 30s', the vulnerabilities and the tremendous disarray of the financial and housing sectors, combined with global trade imbalances and rising pessimistic expectations, made the world economy ripe for a second "slide in the abyss". That the risk was real was confirmed, as in the interwar period, by the swift international transmission of a crisis which originated in the US.

The great depression is usually taken as the prototype of a global crisis. The collapse in the demand that followed the stock market crash in 1929 was transmitted to the rest of the world via deterioration in expectations. As the uncertainties about the sustainability of the Gold Standard unfolded, the fall in demand became entrenched in a low labour utilisation and output (e.g. Bernanke, 1996). Staying in the Gold Standard constrained central banks ability to lower interest rates to combat unemployment, which otherwise would have been forced to abandon the peg. As countries started to abandon the Gold standard, they were able to rapidly increase money supply and promote a rapid recovery. Conversely, those that remained in the system suffered a monetary contraction that caused persistent output and employment losses (Eichengreen and Sachs, 1985; Bernanke, 1995). With falling imports many countries introduced protective measures that further reinforced the collapse in the world trade.

The incomplete adjustment of nominal wages to the decline in the price level has been considered as one element that delayed the adjustment, contributing to the propagation of the deflationary shock (Newell and Symons, 1988; Bernanke and Carey, 1996; Bordo et al, 2000). The fall in the price level, unaccompanied by a comparable downward wage adjustment, put firms' profitability, especially the more intensive users of labour, under strain (Newell and Symons, 1988; Ohanian, 2009). The sharpest decline in manufacturing output was experienced by countries where nominal wages adjusted relatively slowly to changing prices (Newell and Symons, 1988 and Bernanke, 1995). The impact on unemployment was minimised by a fall in the average hours worked, which varied across countries depending on the real wage adjustment and the availability of unemployment insurance system, which some considered having shifted the balance of adjustment toward the extensive margin (Harrison and Hart, 1985). One distinctive element of the Great Depression is the increase in labour supply of many family members in response to the increase in unemployment of the principal bread winner (Margo 1988 for evidence on the US). Finally, both the incidence of long-term unemployment and of average unemployment spells rose dramatically in the interwar period while, in many countries, men, older and young workers took the brunt of the labour market adjustment.

One unique element of the current great contraction concerns the size and timing of the policy response, which contrasts with the largely uncoordinated action of the early 1930s. Similarly, compared to the early 30s, no outbreak of protectionism was observed during the current recession (Baldwin, 2009). Moreover, while the inflationary pressures abated, persistent decreases in output prices were not observed. In assessing the labour market response during the recession, it should be considered that the European labour markets are nowadays fundamentally different from the sclerotic markets of only two decades earlier. Under the

pressure of high and persistent unemployment and low employment rates, an incremental and continuous process of labour market reforms started in the mid 1990s. Increased economic 'turbulence' and demographic developments represented exogenous pressures to relieve the constraints to labour supply. As shown elsewhere, these reforms have been successful in raising employment rates and the labour market flexibility of especially of those groups with low labour market attachment (Arpaia and Mourre 2010) as well as unemployment turnover and job-to-job shifts (Boeri and Garibaldi, 2009).

We describe the labour market response in an international comparative perspective. All countries have been hit by the global financial shock, though the size of the labour market adjustment and its composition has been significantly different across countries. Thus, we follow the same methodological approach used by many scholars to identify the forces behind the worldwide propagation of the Great Crash (e.g. Bernanke 2000). This heterogeneity across countries can be effectively exploited to identify to what extent a) the existing labour market institutions have constrained or eased the labour market reaction b) the country specific policy response has been effective in smoothing out the worldwide shock. We leave this analysis for future work. Against this background, this paper provides an anatomy of the labour market adjustment in terms of quantities (employment, unemployment, hours worked) and price of labour.

The structure of the paper is as follows. Section 2 documents the incidence of unemployment across different socio-economic groups. Section 3 describes how the employment and unemployment behave during the current recession compared to recessions of the past. We provide an original estimation and fresh evidence for all EU Member States of the inflows and outflows rates from unemployment during the crisis in Section 4. This helps to assess whether the increase in unemployment is due to an increase of job destruction or to a decline in the job finding rate. By examining the flows we can identify the effects of measures to stabilise employment and/or enhance the employability of newly unemployed workers. Section 5 analyses the response of employment and the role of labour hoarding over the cycle. Section 6 discusses factors that may delay a labour market recovery in the aftermath of the crisis. The impact of the crisis on the labour supply is briefly reviewed in section 7. The dynamics of wages is assessed in section 8. Section 9 concludes.

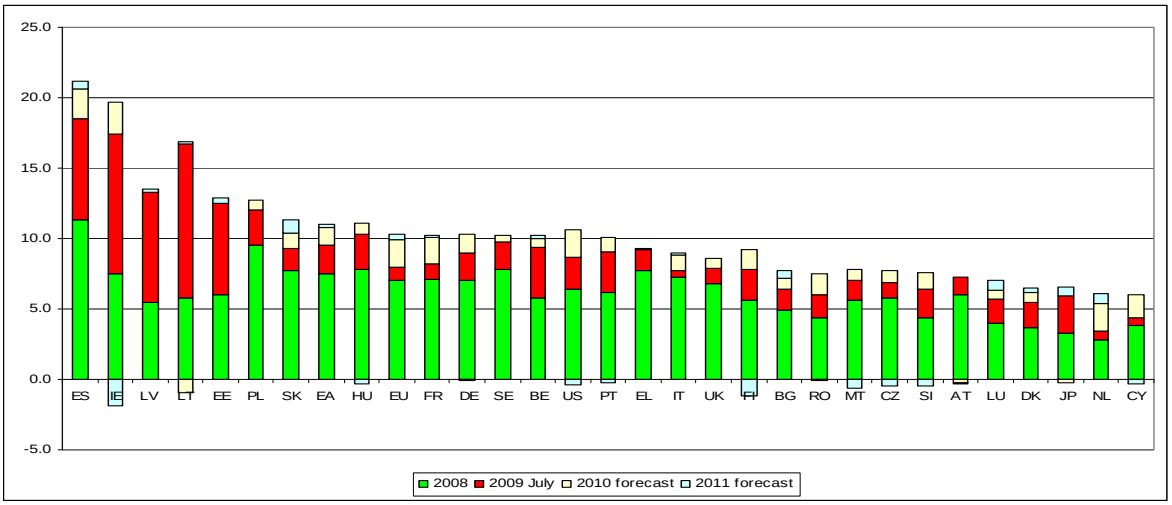
2. Who are the unemployed?

After years of relatively good performance, driven by the dynamism of the female and older workers components, the EU labour market recorded a pronounced slowdown in 2009 with significant job losses occurring across many countries and sectors. Unemployment in the EU reached its lowest rate (6.8%) in a decade in second quarter of 2008. Since then and up to the second quarter of 2009, GDP has fallen by about 5%, while the jobless rate has increased by more than 2 pps. For the euro area, the lowest unemployment rate was achieved in the first quarter of 2008; since then the harmonised unemployment rate has risen steadily to reach 10% in November 2009. Almost three years of progress in bringing the unemployment rate down from 9% to 6.8% was wiped out in less than one year (Graph 1).

Graph 2 reports the unemployment rate for the EU15, US and Japan and for selected EU countries. While the jobless rate remains mainly unchanged in Japan, it pick ups in early 2008 quite at the same time in the EU and the US. In both sides of the Atlantic the increase in unemployment was the largest since more than a decade. Yet, notwithstanding a smaller contraction of output vis-à-vis the EU, the increase in unemployment is much stronger in the US.

There is a significant heterogeneity within European countries. At the onset of the crisis, the bulk of job losses was concentrated in just a few Member States (the Baltic States, Spain and Ireland), largely as a result of pre-existing weaknesses as well as a larger exposure to the direct consequences of the shocks. However, the crisis subsequently put a widespread brake on domestic demand across the whole of the EU at a time when external demand was fading, and employment started falling in all Member States. The unemployment rate increased everywhere, particularly in the countries in which the crisis had already a very strong impact in 2008. During the recession, the increase in unemployment was rapid in France, Portugal, the UK, Denmark, Ireland, and, especially, Spain where it started to increase already one year earlier (in June 2007). Conversely, it was relatively mild and delayed in Germany and Italy.

Graph 1 – Unemployment rates in the EU

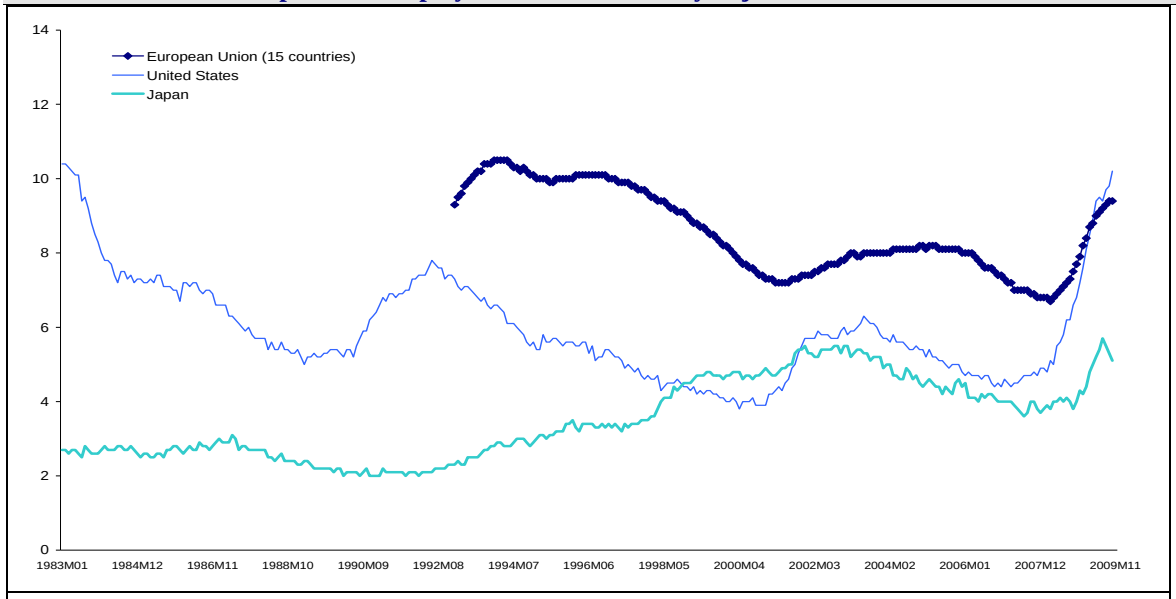


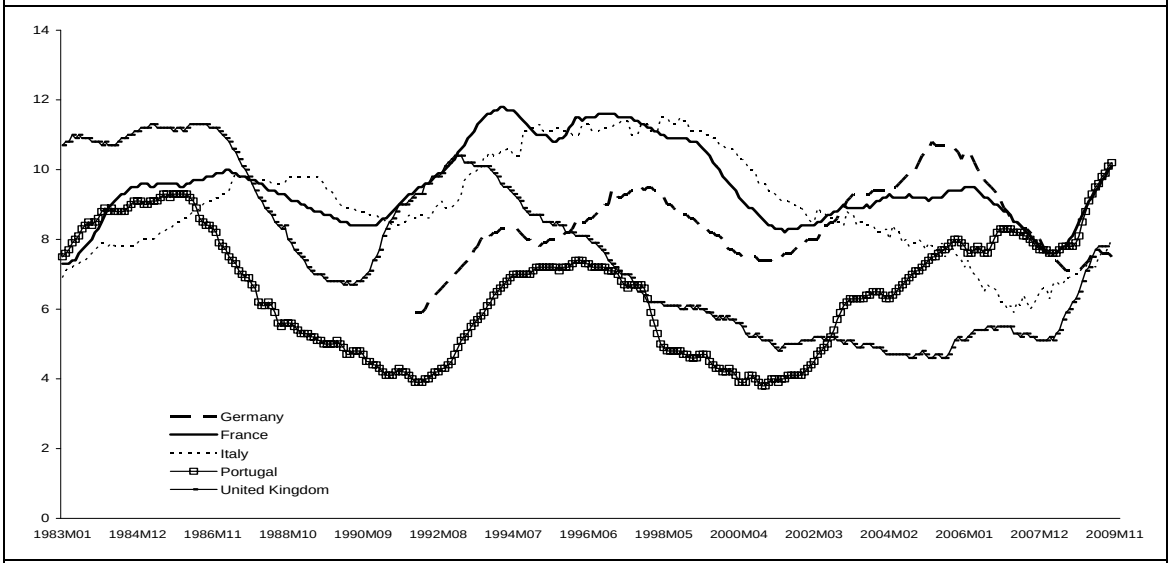
Source: LFS, Commission's Autumn Forecasts.

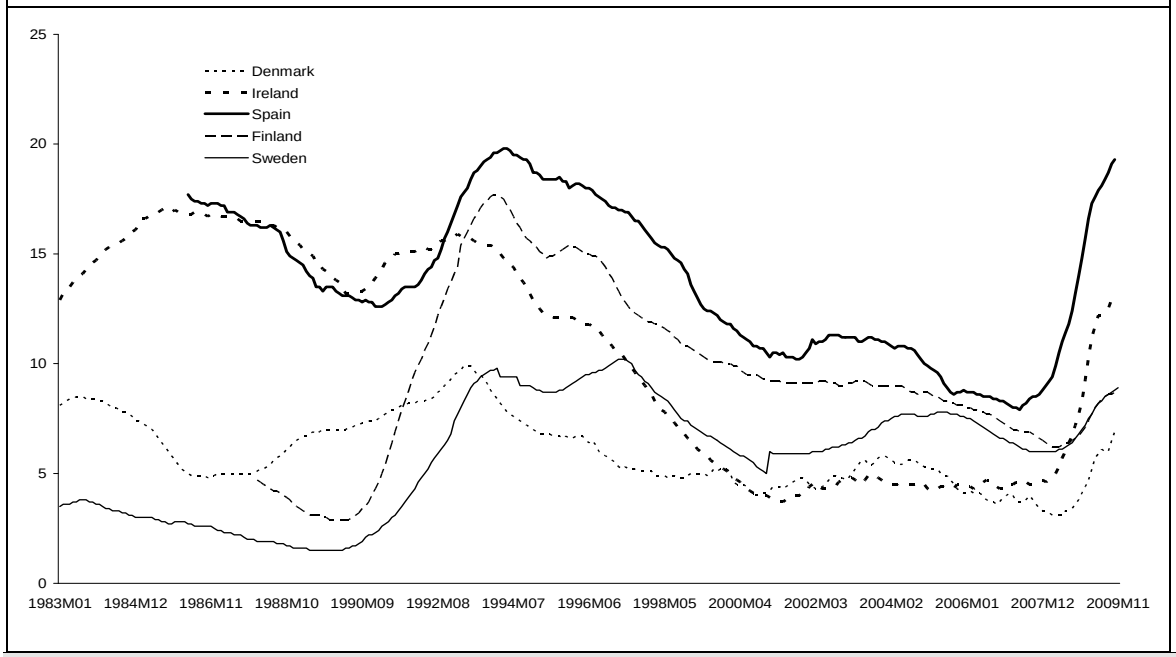
Workers with *weaker* work contracts (e.g. temporary contracts, on-call jobs), the less qualified and the less experienced workers have borne much of the brunt of the current recession (Table 1). Men, especially young, tend to be overrepresented in these categories. Conversely, women have been so far less affected than men. Yet, for the first time since the fourth quarter of 2005, female employment was in the first quarter of 2009 below the level of one year earlier (though by only 0.1%).

In the US men have been more hardly hit than women by the recession. Yet, this is not unusual compared to previous recent recessions. The greater impact on men is only partially explained by differences in the distribution of men across industries. Other factors such as differences in the educational and demographic characteristics of men and women may have contributed. Among these characteristics, married people saw smaller job losses than did their single counterparts. Within married people, the effect of the recession on the employment of men was almost nine times that on women, whereas the effect for single men was 2.4 times that for single women. In part, the lower unemployment risks of married women can be explained by the *added-worker* effect (Engemann and Wall, 2009).

Graph 2 - Unemployment rate, seasonally adjusted, ILO definition







Source: Labour Force Survey, Eurostat.

Between the second quarter of 2008 and the first quarter 2009, men bore 78% of the total job losses in the EU, the same percentage accounted by men in the US. The disproportionate effect of the recession on men could be related to the severity of the crisis first and foremost in sectors (e.g. construction and manufacturing), where male employment is relatively high, accounting for 90% and 70% of total employment respectively. Since the beginning of the recession these sectors lost about 9% of their jobs accounting together for 70% of total job destruction in the sectors (Table 2). However, the industry mix of male employment does not always explain the overall sectoral employment growth at the country level. Graph 3 shows the correlation across sectors between total employment growth and share of men in the sector. This correlation is negative for Spain, which is consistent with the view that the shock is mainly harming industries where the share of men in disproportionately high, positive for Italy, implying that employment growth is higher in industries where the share of men is high, and zero for France and Germany.

Turning to the age groups, the unemployment rate of young people (15-24) jumped in one year by 4 pps. to 20%. Their employment, down by 1 million or 5% quarter-on-quarter in the fourth quarter of 2008, declined by another million in the first quarter of 2009. Although the fall in employment of prime age workers, limited in the fourth quarter of 2008, intensified in the first quarter of 2009 (when about 3 million jobs were lost), young workers have been the most hardly hit age group. All this suggests that the differentiated labour market response to a common shock could be explained by the nature of the internal and external imbalances prevailing at the time of the shock.

Table 1 - Employment growth by type of contracts and level of education

Euro-Area					
	Avg 2000-2007	**2008 first half**	**2008 second half**	**2009Q1**	**2009 Q2**
Employment growth y-o-y	1.6%	1.6%	0.6%	-1.1%	-1.6%
Employees	1.8%	1.9%	1.2%	-0.9%	-1.4%
Self-employed	4.0%	0.4%	-1.7%	-1.8%	-1.8%
Part-time*	4.6%	2.7%	1.4%	0.0%	0.7%
Full-time*	2.3%	2.2%	0.5%	-1.4%	-2.1%
Temporary employment	3.9%	1.3%	-2.9%	-8.5%	-8.3%
low skilled	-0.8%	-1.1%	-3.8%	-5.5%	-5.4%
medium skilled	2.5%	1.4%	1.4%	-1.1%	-1.6%
high skilled	4.4%	4.4%	4.0%	3.3%	2.6%
European Union					
	Avg 2000-2007	**2008 first half**	**2008 second half**	**2009Q1**	**2009 Q2**
Employment growth y-o-y	1.2%	1.7%	0.7%	-1.0%	-1.6%
Employees	1.5%	2.0%	1.3%	-0.8%	-1.5%
Self-employed	1.9%	0.7%	-1.5%	-1.3%	-1.4%
Part-time*	3.1%	2.4%	1.4%	0.3%	1.0%
Full-time*	2.0%	2.2%	0.7%	-1.3%	-2.2%
Temporary employment	4.4%	0.2%	-2.8%	-7.0%	-6.3%
low skilled	-1.2%	-1.4%	-3.4%	-4.7%	-4.9%
medium skilled	1.9%	1.6%	1.1%	-1.5%	-2.6%
high skilled	4.4%	4.5%	4.0%	3.3%	3.1%

Source: Labour Force Survey, Eurostat.

Table 2 - Sectoral employment growth 2008q1-2008q4

	Agriculture	Mining and quarrying	Industry	Manufacturing	Construction	Wholesale and retail trade	Market Services	Hotels and restaurants	Transport and comm.	Financial intermediation	Real estate and business activities	Public administration	Education	Other services	Health and social work	Total
Males	-1.6	-0.1	-1.1	-1.3	-1.8	-1.5	-0.9	-3.5	-0.7	0.6	0.3	0.0	-0.8	0.6	2.3	-0.5
Total	-2.5	-1.2	-1.0	-1.1	-1.9	-0.7	-0.7	-3.9	-0.3	2.4	-0.4	0.8	0.4	1.3	2.8	-0.1
Share of men	63.7	86.4	76.9	69.9	91.5	51.1	55.0	45.2	74.1	48.3	55.3	54.2	29.7	28.7	22.2	55.0
Sectoral share (Total)	4.7	0.4	33.0	19.5	11.9	11.8	33.7	3.1	7.3	2.4	9.1	6.4	3.3	10.7	3.6	100

Source: Labour Force Survey, Eurostat.

Table 3 - Employment and participation rates by age and gender

Euro-Area

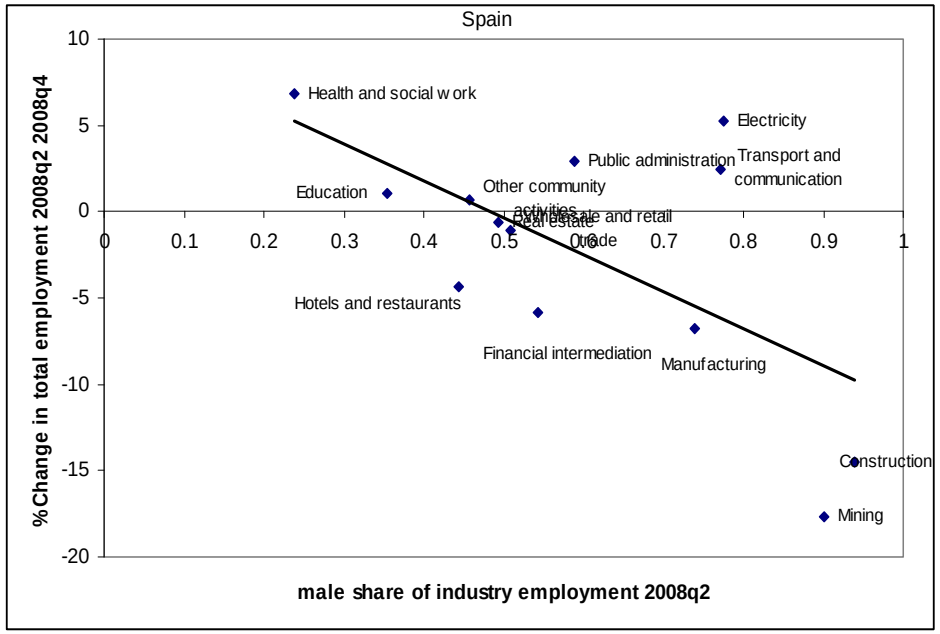
	Avg 2000-2007	2008 first half	2008 second half	2009Q1	2009 Q2
Employment rate (ages 15-64), %					
total	63.2	66.1	66.2	64.7	64.9
young (15-24)	37.0	38.0	38.2	35.3	35.1
prime-age (25-54)	76.9	79.5	79.5	78.1	78.2
older (55-64)	38.3	44.4	44.8	44.5	45.5
male	72.0	73.4	73.4	71.2	71.3
female	54.4	58.8	59.1	58.1	58.5
Participation rate (ages 15-64)					
total	69.1	71.4	71.7	71.4	71.6
young (15-24)	44.3	44.5	45.4	43.7	43.7
prime-age (25-54)	83.3	85.2	85.3	85.3	85.3
older (55-64)	41.4	46.8	47.5	47.8	48.8
male	77.8	78.7	78.9	78.4	78.6
female	60.4	63.9	64.4	64.3	64.7

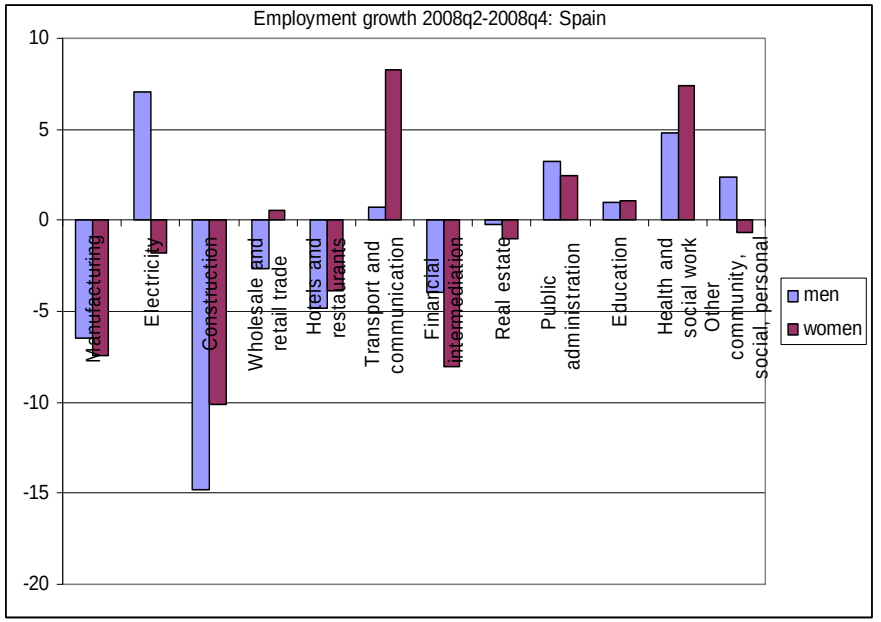
European Union

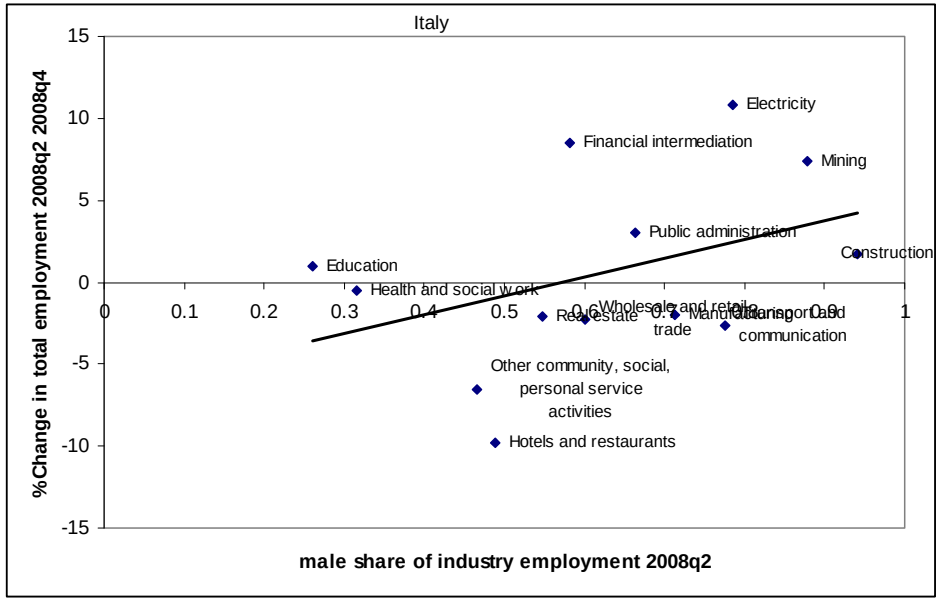
	Avg 2000-2007	2008 first half	2008 second half	2009Q1	2009 Q2
Employment rate (ages 15-64), %					
total	63.2	65.8	66.1	64.6	64.8
young (15-24)	36.6	37.6	37.9	35.3	35.0
prime-age (25-54)	77.0	79.6	79.7	78.2	78.4
older (55-64)	40.4	45.6	46.0	45.5	46.4
male	70.9	72.8	72.9	70.8	70.9
female	55.6	59.1	59.4	58.4	58.8
Participation rate (ages 15-64)					
total	69.3	70.7	71.2	70.8	71.1
young (15-24)	44.5	43.9	45.1	43.5	43.6
prime-age (25-54)	83.4	84.7	84.9	84.8	84.9
older (55-64)	43.2	47.8	48.4	48.6	49.4
male	77.2	77.8	78.2	77.6	77.8
female	61.5	63.7	64.2	64.0	64.4

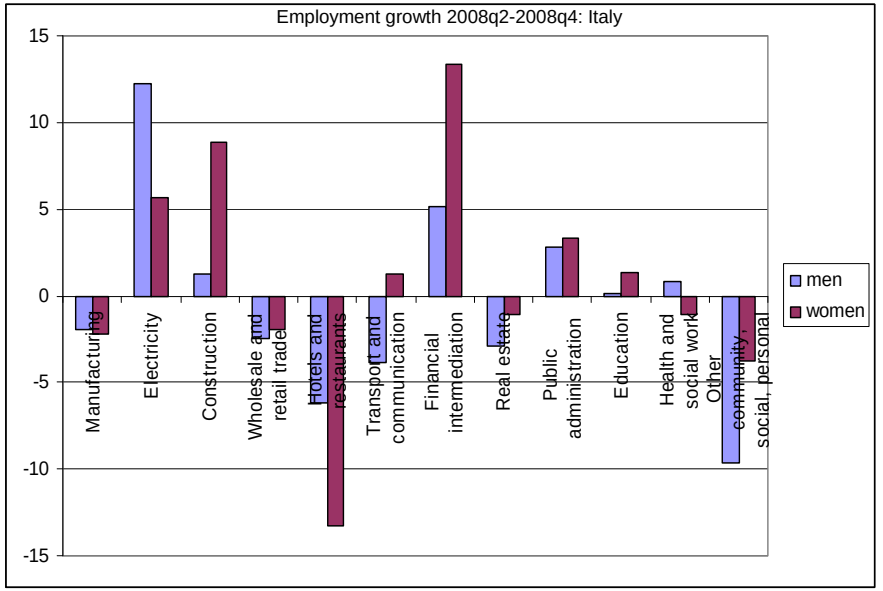
Source: Labour Force Survey, Eurostat.

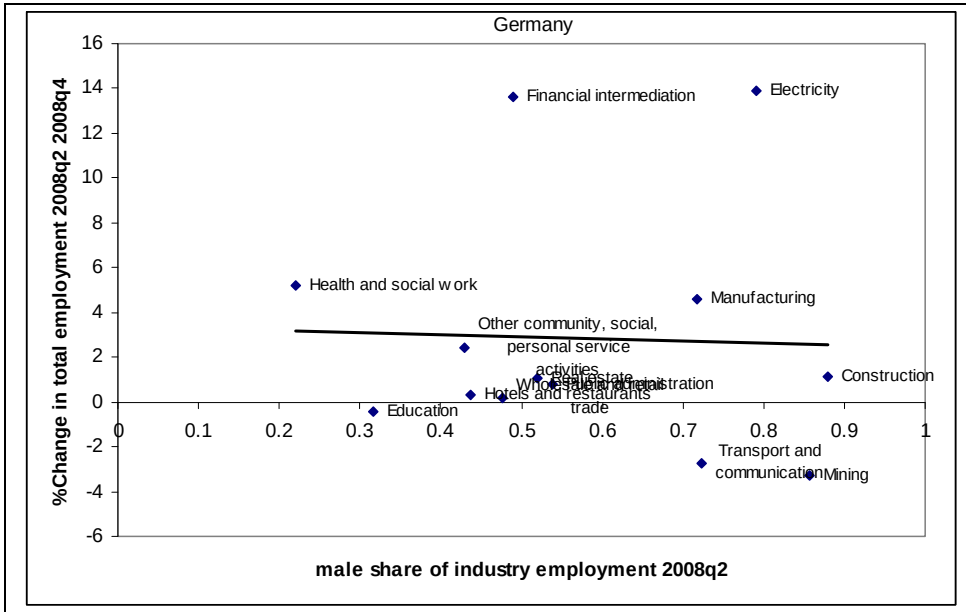
Graph 3 - Employment growth and the male share of industry employment (averages over countries)

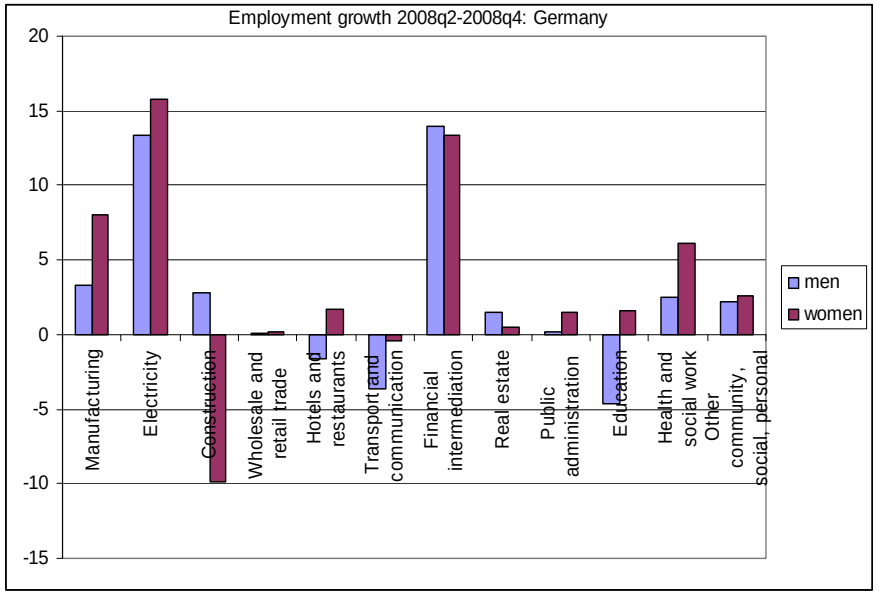


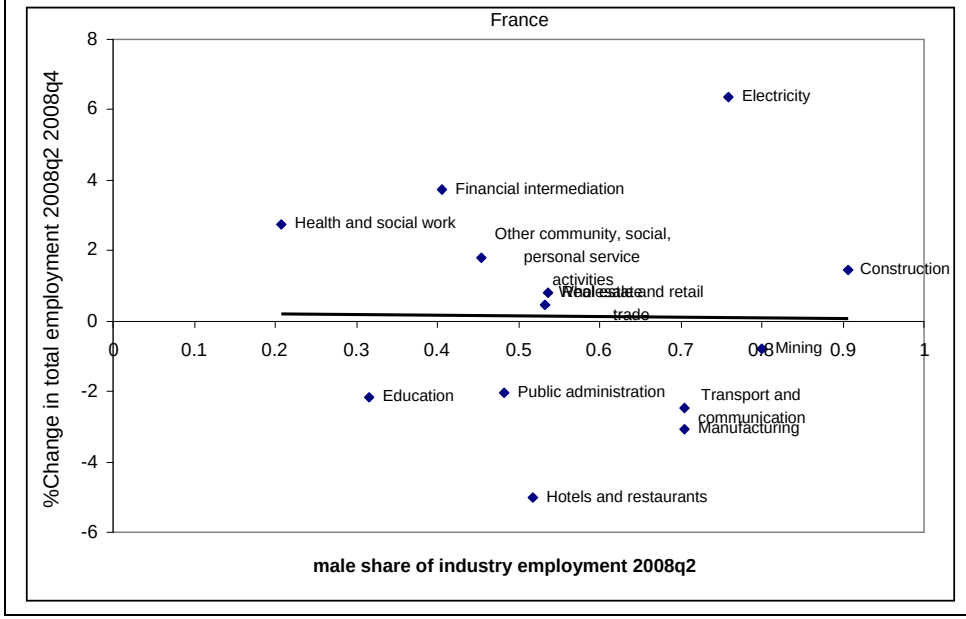


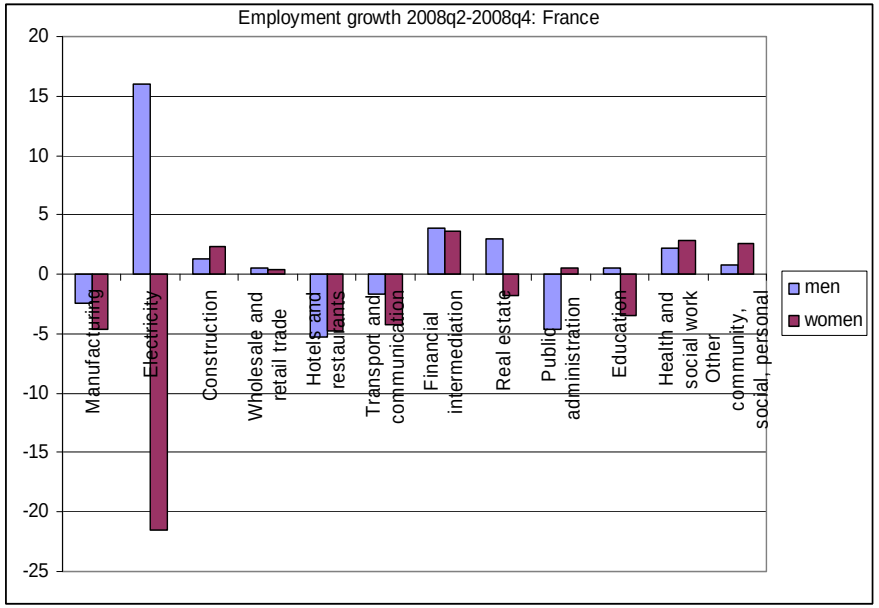












Source: Labour Force Survey, Eurostat.

3. Evidence from previous recessions

Looking at previous recessions can help detect to what extent the current labour market adjustment is congruent with past episodes. Table 4 reports the average intensity and duration of the past and the last recession for the largest EU countries (Germany, Italy, France and the UK) and the US, while Graph 4 shows the changes in the total, male and female unemployment rates during the recession and the 12 month following the end of the recession.

During the recessions of the past 40 years, output contracted on average for about 3 quarters by 0.5% each quarter. In response to this contraction, unemployment increased consecutively for about 6 quarters by 0.03 pp. each quarter. Men and young workers were much harder hit than women. Thus, despite men have lost jobs in disproportionate numbers during the current recession, the relative effects of the recession on men and women are not particularly unusual - a conclusion also valid for the US (Wall 2009). Unemployment spiked quickly and did not fall back to its pre-recession level for several years. For example, in the aftermath of the recession of the early 1990s, GDP contracted for about five quarters in Italy and the UK and two quarters in Germany and France. However, the unemployment rate returned to its pre-recession levels only after more than 30 months following the start of the recession in Italy and the UK and after about 20 months in France and Germany. During the recovery of the early 2000s, the behaviour of the labour market differed from that of the average cycle. ([2]) For example, the increase in output in Spain and Italy between 2003 and 2004 translated almost entirely into higher employment. In France, where one year after the trough the recovery was jobless, the increase in productivity was higher and the participation rate less responsive than in the average recovery. In the UK, employment continued to increase up to two quarters ahead of the trough of GDP and stagnated thereafter. In Germany, the recovery was less atypical as the weak recovery was accompanied by only modest employment growth.

Compared to the past recessions, the output loss during the last recession (about 1.2% each quarter) was particularly large, yet less short-lived than the average recession - 5 consecutive quarters of negative growth against an average of 3 quarters. Thus, notwithstanding the initial labour hoarding, the size of this loss implied an increase in unemployment and decline in employment larger than that observed in past recessions. Even so, in Europe the apparent elasticity of employment (unemployment) is lower than in previous episodes; conversely, the US experience a much stronger labour market adjustment during the current recession. Compared to a small decline of the past recessions, the participation rate increased slightly in the 2008-2009 recession. The burden of the recession is spread unevenly across demographic groups. Graph 5 compares for the largest EU countries the evolution of unemployment rate during the recession and the following year. The unemployment of the young is always more reactive to the business cycle than the total unemployment rate. Yet, the increase in the young unemployment rate is almost twice as much as the increase experienced during the previous deep recession of the early 1990s. Moreover, compared to past recessions, men have accounted in the recession that started in 2008 for the largest increase in unemployment rate,

[2] DG ECFIN (2004), "Labour Market and Wage Developments. Special focus on the risks of jobless growth ", European Economy, No 3.

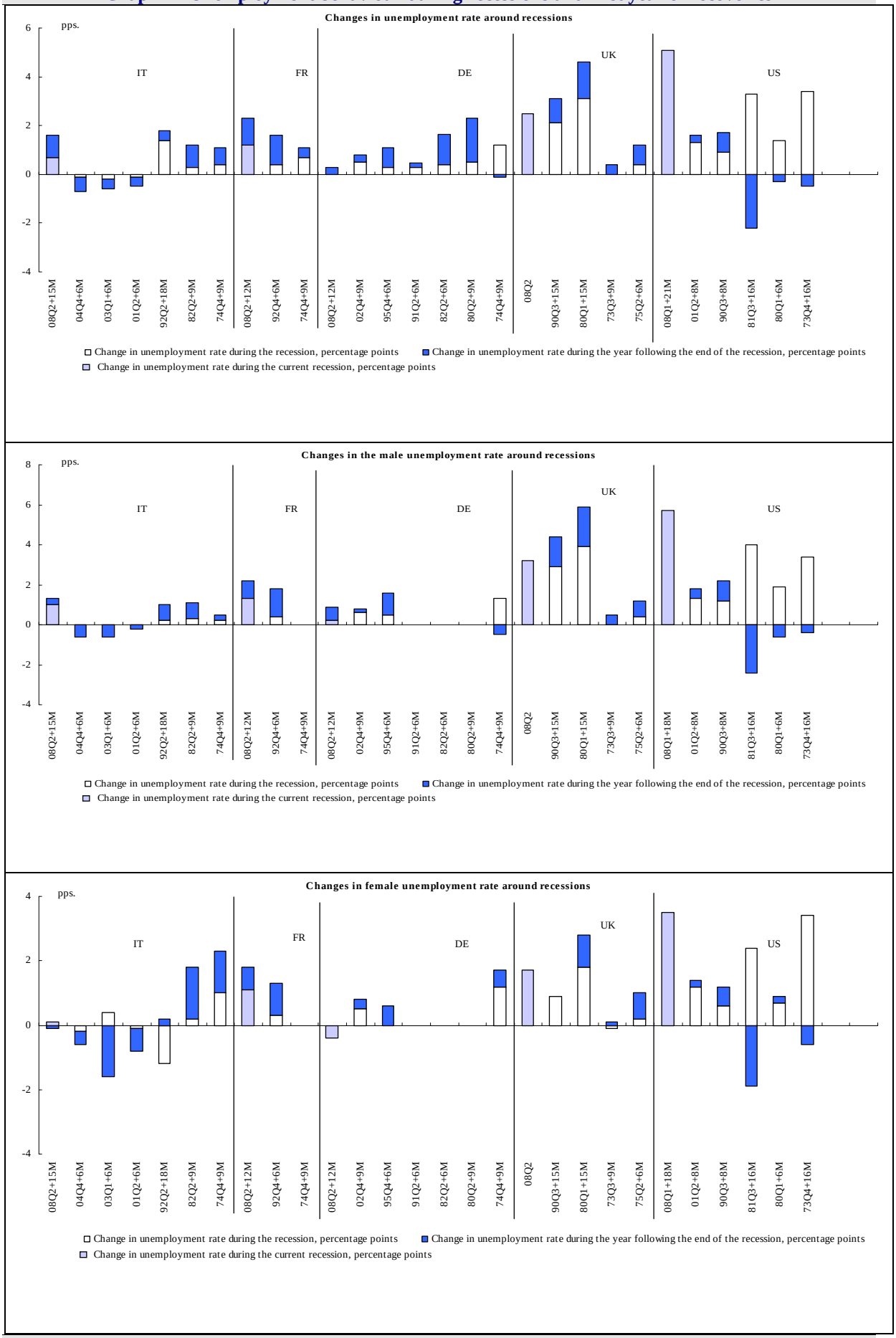
in particular in Italy and Germany. Finally, there is a striking contrast between the behaviour of unemployment in the US in the aftermath of the severe recessions of the early 1980s and 1981 and that that followed the two most recent recessions in 1990-1991 and 2001, which has made many observers to qualify the last two recoveries as jobless.

Table 4 - Average intensity and duration of past recessions in the largest EU countries and the US

	Decline of GDP /increase of unemployment				Duration of contraction/increase in quarters				Quarters needed to recover to pre-crisis levels	
	Largest EU countries		United States		Largest EU countries		United States		Largest EU countries	United States
	average recession	last recession	average recession	last recession	average recession	last recession	average recession	last recession	average recession	average recession
GDP	-0.5%	-1.2%	-0.9%	-1.0%	3	5	2	4	3.6	3.25
Unemployment	0.18 pp.	0.30 pp.	0.70 pp.	0.90 pp.	5	5	2	4	:	:
Activity rate	-0..02 pp.	0.02 pp.	-0.035 pp.		6	5	2	4		
Employment	-0.18%	-0.31%	-0.21%	-1.0%	6	5	3	4	:	:
Apparent elasticity										
Unemployment	-0.34	-0.24	-0.72	-0.93	:	:	:	:	:	:
Employment	0.34	0.25	0.24	1.05						

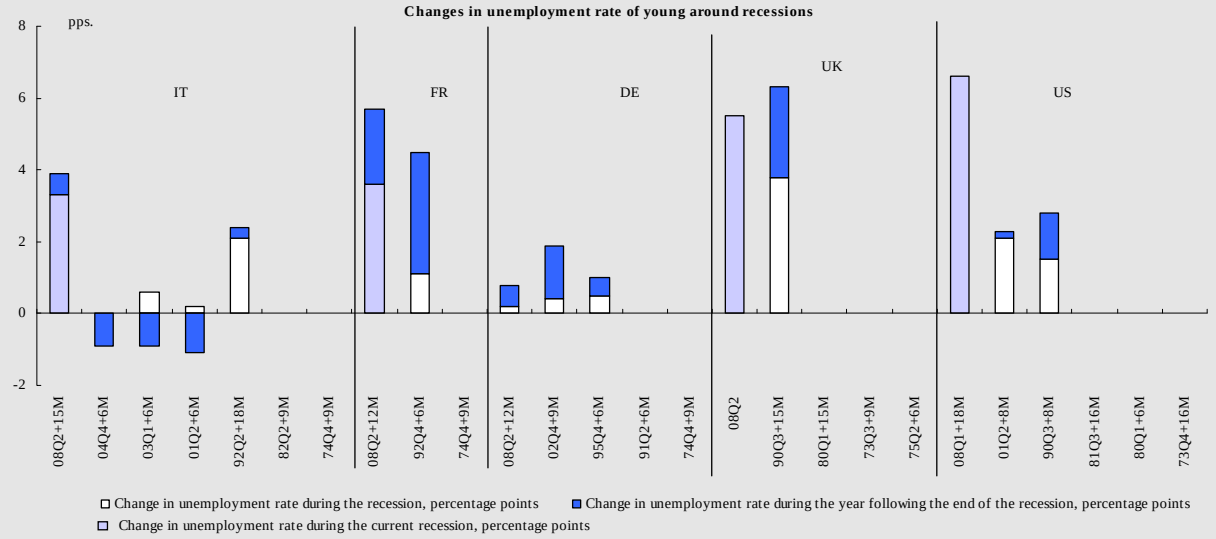
Source: Authors' calculations. Largest countries include, Germany France, Italy and the UK. The reference periods for the calculations are the following: for GDP we consider the decline during the recession period; for unemployment and activity rates, the increases are calculated from the beginning of the recession until the last positive change in unemployment; for employment growth we measure the loss occurred since the recession until employment starts to grow again.

Graph 4 - Unemployment behaviour during recessions and first year of recoveries



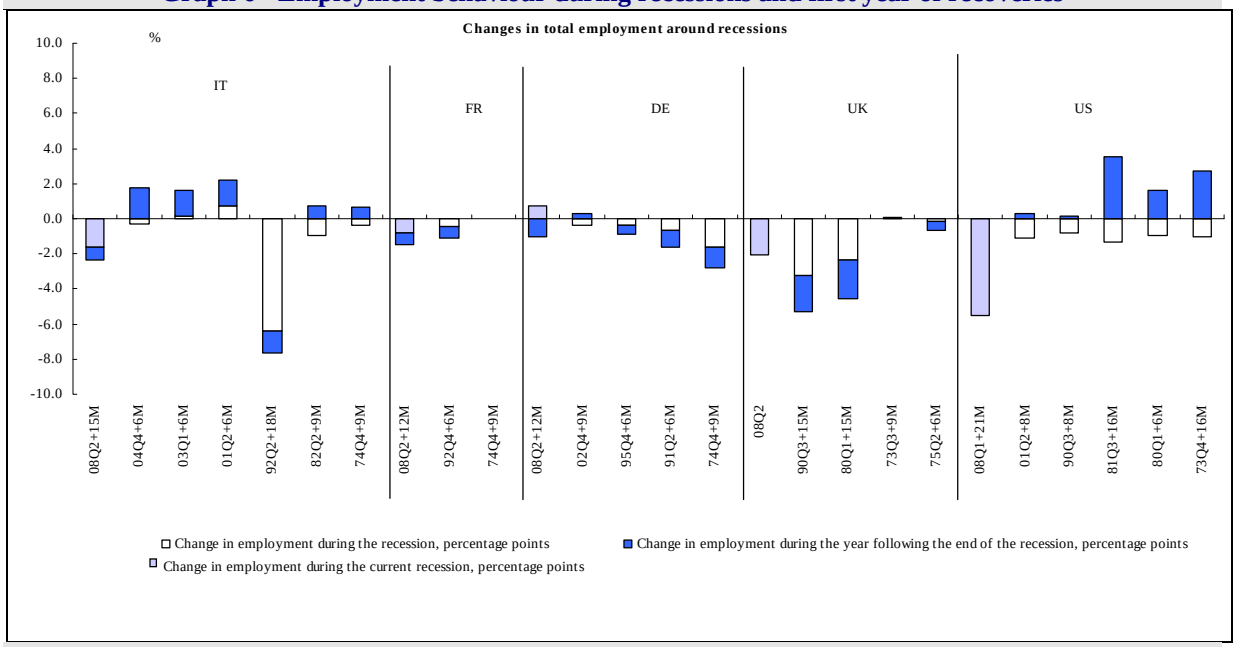
Source: Authors' calculations based on Labour Force Survey. Recessions are identified as two consecutive quarters of negative growth. On the horizontal axis, the starting quarter and the duration of the recessions in months are reported. US recession dates are taken form NBER; all countries. For the last recession, the chart shows the change in unemployment from the end of recession until November 2009; for the UK the last figure is August 2009.

Graph 5 - Unemployment behaviour during recessions and first year of recoveries



Source: Authors' calculations based on Labour Force Survey.

Graph 6 - Employment behaviour during recessions and first year of recoveries



Source: Authors' calculations based on Labour Force Survey. Recessions are identified as two consecutive quarters of negative growth. On the horizontal axis, the starting quarter and the duration of the recessions in months are reported. US recession dates are taken form NBER.

4. Evidence from inflows and outflows

Upward and downward movements in the unemployment rate are usually taken as a signal of a cyclical expansion or contraction. Yet, they provide only a sign of the state of the economy at one point in time, usually the week before the survey. In practice, fluctuations of unemployment are driven by a continuous process of job creation and job destruction.

According to the standard theory of business cycles, these fluctuations are the outcomes of aggregate shocks which influence all firms similarly and are generated by policy shocks (e.g. changes in the stance of monetary and/or fiscal policies). This implies that job creation and job destruction rates mirror each other and their correlation coefficient is -1. Moreover, the predicted correlation between job reallocation rates and employment growth is very small. In this theoretical context, job flows are not of much interest. But, contrary to these predictions, the evidence provided by Davis et al (1996) for the US showed that job destruction and job reallocation rise sharply during recession, suggesting that there is an asymmetry in the cyclical response of job creation and job destruction.

This asymmetry has spurred a rich literature, which cannot be summarised here. Yet, a premise of many studies is that differences in the behaviour of job creation and destruction rates are mainly due to idiosyncratic shocks (reallocation shocks /sector specific shocks) that impinge differently upon heterogonous workers. When search and matching frictions prevail, these shocks may become the major drivers of aggregate business fluctuations. Thus, a standard analysis of the business cycle would downplay the role of reallocation shocks and miss the mechanisms through which labour market institutions influence the size and the shape of their impact on job creation and job destruction.

Notwithstanding their utility for policy purposes, labour market flows are not easy to measure. The European Labour Force Survey asks respondents their labour market status one year before the survey, providing an annual estimate of movements from and into unemployment. This measure presents some drawbacks. Firstly, it is subject to misreporting errors due to the long horizon respondents are asked about. Secondly, it is not useful for cyclical analysis as this information is available only annually. Thirdly, it underestimates the gross job destruction when the job finding rate is high, which introduces a bias in the measured cyclicality of the job separation rate[3].

In recent years, many have developed indirect measures of the inflows and outflows based on the information available from the LFS. We adapt the method developed by Shimer (2007) who used monthly data on unemployment duration to compute inflows and outflows from the relation describing the dynamics of unemployment rate. This method relies upon a series of assumptions, two of which are particularly important. First, workers neither enter nor exit from the labour force but simply transit between employment and unemployment. Second, all workers are *ex ante* identical and, in particular, in each period all unemployed workers have the same job finding probability and all employed the same exit probability. As for the first assumption, the evidence for the US shows that discarding flows into and out of the labour market does not affect the cyclical pattern of unemployment inflows and outflows, although it

[3] This is what Shimer (2007) calls the time aggregation bias.

changes their level[4]. As for the second assumption, unemployment inflows and outflows rates can be referred to the average representative worker if workers are heterogeneous.
The approach by Shimer cannot be applied to European countries as unemployment duration is not available at monthly frequencies in the European LFS. To overcome this limitation, Elsby, Hobijn and Sahin (2009) proposed a methodology that exploits annual and quarterly data to measure annual averages of monthly unemployment flows for the OECD countries. We apply the same methodology to estimate for all European countries quarterly averages of monthly job finding and job separation rates.

Under these assumptions, and given the assumption of fixed labour force, the evolution of aggregate unemployment[5], u_t, can be written as:

$$\dot{u}_t = s_t(1-u_t) - f_t u_t \qquad [1]$$

where s_t is the monthly rate of inflows into unemployment; f_t is the monthly rate of unemployment outflows; t indexes months[6]. Thus, unemployment decreases when unemployed workers find a job, at the instantaneous rate f_t and increases when workers exit employment at the instantaneous rate s_t. As in Elsby et al, we compute f_t and s_t by relating this continuous time evolution of unemployment rate to the unemployment rate observed at discrete quarterly frequencies. To do this, we assume that the monthly flow hazards rates f_t and s_t are constant within quarters.[7] In this case, solving eq. [1] forward one quarter allows us to write:

$$u_t = u_{t-3}(1-\lambda_t) + u_t^* \lambda_t, \qquad [2]$$

where $\lambda_t = 1 - e^{-3(s_t + f_t)}$ denotes the quarterly rate of convergence to the steady state and

$$u_t^* = \frac{s_t}{s_t + f_t} \qquad [3]$$

is the flow steady-state unemployment rate, i.e. the level of unemployment consistent with balanced inflows and outflows; u_{t-3} is the unemployment rate three months earlier, i.e. a quarter before (recall that t denotes months). According to equation [2], the actual unemployment is a weighted average of the previous unemployment rate and of the flow steady state. The weight of the latter (λ) is the convergence rate while that of the former (1-λ) measures the persistence of unemployment rate; both are function of the inflow rate into and outflow rates out of unemployment.

When the sum of these rates (i.e. the job reallocation rate) is high, the persistence of unemployment is low and unemployment converges to the steady-state quickly, eventually

[4] In practice, the flows calculated by Shimer (2007) are total inflows into and outflows out of unemployment. Total inflows into unemployment are the sum of job separations (or job destruction) and movements from out-of-the-labour force to unemployment. Total outflows from unemployment are the sum of job findings and movements from unemployment to inactivity. As emphasized by many authors, movements from and into inactivity over the business cycles are dominated by movements between employment and unemployment.
[5] Notice that u_t can be interpreted as total unemployed once one normalizes the labour force to 1. Alternatively, under our assumption of fixed labour force, u_t can be interpreted as the unemployment rate at time t and, consequently, the employment rate is 1- u_t.
[6] As in Elsby et al. (2009), we prefer to call s the inflow rate (instead of job separation rate) and f the outflow rate (instead of job finding rate) for the reason exposed in footnote 3.
[7] The hazard rate is the rate at which jobs are created or destroyed at time t conditional on survival in one of the two states until time t or later.

within the quarter. In such a case, equation [2] reduces to $u_t \cong u_t^*$. In this case, the dynamics of unemployment is irrelevant as unemployment does not deviate from its steady state. On the contrary, for small flow rates, the dynamic behaviour of unemployment depends on evolution of both the flow steady-state and the convergence parameter λ. Thus, an increase in the inflow rate (or in the outflow rate) exerts two effects on current unemployment rate: 1) it increases (decreases) the steady state unemployment rate u_t^*, towards which the current unemployment rate converges; 2) it changes the weight of the new steady state (λ) or, equivalently, the persistency of the observed unemployment rate, 1-λ. Clearly, when the turnover $(s_t + f_t)$ rises the convergence rate increases and the persistency of unemployment decreases (see definition of λ).

To measure f_t, we follow Shimer (2007). The monthly change in the unemployment rate equals the number of unemployed workers at the end of the period who were employed at some point during the period (i.e. the short-term unemployment rate $u_t^{<1}$) minus the number of unemployed workers at time t-1 who found a job (with probability F_t)

$$u_t - u_{t-1} = u_t^{<1} - F_t u_{t-1} \qquad \text{[4a] or}$$

$$u_t = u_t^{<1} + (1 - F_t) u_{t-1} \qquad \text{[4b]}$$

Here $u_t^{<1}$ denotes the short-term unemployment rate, the unemployment rate for a duration less than one month and hence reflects the inflows into unemployment; $F_t u_{t-1}$ represents the outflows from unemployment. Solving for the monthly outflow probability, one obtains

$$F_t = 1 - \frac{u_t - u_t^{<1}}{u_{t-1}} \qquad \text{[5]}$$

Thus the probability that an unemployed worker finds a job during a period (the 'outflow probability') is a function of the number of unemployed workers at the start of the period, u_{t-1}, the number of unemployed workers at the end of the period, u_t, and the number of unemployed workers at the end of the period who were employed at some point during the period (i.e. short-term unemployment). The monthly outflow hazard rate $f_t^{<1}$ is related to the monthly outflow probability F_t vie the following relation,

$$f_t^{<1} = -\ln(1 - F_t) \qquad \text{[6]}$$

As Elsby et al. (2009) emphasized, when the persistence in unemployment rate is low (i.e. the unemployment rate is not far from its flow steady state on average), equation [5] gives a reliable estimates of the outflow probability (i.e. the job finding probability) and of the corresponding monthly hazard rate, $f_t^{<1}$. Once this rate is known, the inflow rate (i.e. the job separation rate) s_t and the associated monthly inflow probability, i.e. the probability of becoming unemployed, can be found out from equation [2].

For European countries our prior is that the actual unemployment does not necessarily follow strictly the flow steady state unemployment rate, because of hysteresis in the unemployment rate (i.e. the job finding rate is low). In this case, estimates of F_t based only on the short-term unemployment rate can be noisy as the stock of newly unemployed each quarter is small, which increases the sampling variance of the LFS estimate of $u_t^{<1}$ and leads to unreliable estimates of $f_t^{<1}$. Following Elsby et al (2009), we use the information available from the LFS

on the unemployment rates by duration of spells to increase the precision of the estimate of the outflow rate (see box 1 for details). Given the estimated value of the outflow rate, we compute the inflow rate s_t by solving the non-linear equation [2] for s_t as proposed originally by Shimer (2007).[8]

Box 1: ***Estimation of the monthly outflow hazard rate***

As done for [5], one can write the probability that an unemployed worker exits unemployment within d months as

$$F_t^{<d} = 1 - \frac{u_t - u_t^{<d}}{u_{t-d}} \qquad [7]$$

Thus, the probability that an unemployed person exits unemployment within the next d months equals one minus the probability of remaining unemployed after d months ($\frac{u_t - u_t^{<d}}{u_{t-d}}$*). As done for [6], this can be mapped into an outflow hazard rate:*

$$f_t^{<d} = -\frac{\ln(1 - F_t^{<d})}{d} \qquad [8]$$

$f_t^{<d}$ *is the hazard rate associated with the probability that an unemployed worker at time t completes her spell within the subsequent d months. From LFS data, we can estimate* $f_t^{<d}$ *for d=1, 3, 6, 12 months. The hazard rate may change with the spell of unemployment. For example, if there is negative duration dependence the outflow hazard rate declines with duration (i.e.* $f_t^{<1} > f_t^{<3} > f_t^{<6} > f_t^{<12}$*), as the probability of remaining unemployed after 3 months of unemployment is higher than the probability of remaining unemployed after 1 month of unemployment. Indeed* $F_t^{<1} > F_t^{<3}$ *implies* $f_t^{<1} > f_t^{<3}$*. The same reasoning applies to the estimates on longer horizons.*

If the outflow rates do not depend on the unemployment duration (i.e. $f_t^{<1} = f_t^{<3} = f_t^{<6} = f_t^{<12}$*), each of the four rates is a consistent estimates of the job finding rate (i.e. the outflow rate from unemployment). Averaging over f is an unbiased estimate of the outflows rate, as it reduces stochastic volatility. On the contrary, if the hypothesis of duration dependence is supported by the data,* $f_t^{<3}$*,* $f_t^{<6}$ *and* $f_t^{<12}$ *will not give consistent estimates of the average outflow rate among the unemployed. In this case, an estimate of the short-term flows relies on* $f_t^{<1}$ *alone.*

Elsby et al. (2009) propose a test for duration dependence, i.e. for the hypothesis $f_t^{<1} = f_t^{<3} = f_t^{<6} = f_t^{<12}$ [9]*. If this hypothesis is rejected (i.e. there is duration dependence), the monthly outflow rate can be estimated using* $f_t^{<1}$ *. On the contrary, if it is accepted, all information contained in* $f_t^{<3}$*,* $f_t^{<6}$ *and* $f_t^{<12}$ *is exploited to get an unbiased estimate of the monthly outflow rate.*

[8] The non-linear equation is solved with the Golden Section method, Kiefer, J. (1953).

[9] For details, see Elsby et al. (2009)

Box 1 continued

A second version of the test has a less stringent null hypothesis $f_t^{<3} = f_t^{<6} = f_t^{<12}$. *We apply this method to EU27 countries based on Eurostat LFS data. We prefer the second version of the test, as for our prior is that the incidence of short-term unemployment in European countries is relatively low. In any case, using the first version would have led to the same conclusion for all countries but Belgium and Estonia.*

Table 5 reports the finding of the test of duration dependence. Evidence of duration dependence is found in Germany, Spain, Finland, France, Sweden, the UK, in EU27 and EUR16. This implies that the outflow probability (i.e. the job finding probability) varies with the duration of unemployment spells. Table 5 reports also the monthly average flow rates and the average actual and flow steady state unemployment rates [eq.2] for the period before the recession and for 2009q2, the last available quarter. Focussing on the implication for a) the unemployment rate; b) the persistence of unemployment and the steady state; c) the dynamics of unemployment rate, the following facts stand out of this table:

- Unemployment rate. Before the crisis the unemployment rate had reached in many countries its lowest level since more than two decades; yet in several it was in 2009q2 well above pre-crisis levels.

- Steady state and persistence. As a consequence of a falling outflow rate (i.e. job finding) and increasing inflow rate (i.e. job separation rate), the flow steady-state unemployment increased almost everywhere. In some countries (the Czech Republic, Slovakia, Denmark the Netherlands, Slovenia, Romania, Finland), it is the rapid pick up in the inflow rate that drives the increase in the steady state, as the outflow rate even improves. In the remaining countries but France and Germany, the flow steady state unemployment rate increases as the inflow rate into unemployment increases and the outflow rate decreases. In France and Germany, both rates decline slightly which leads to respectively a small and no increase in steady state. In the Baltics, Spain, Ireland, and UK, the persistence of unemployment (1-λ, not shown for brevity) increases. In such cases, the increase in steady-state unemployment is driven not only by the higher inflow rate but also by the higher unemployment duration caused by the lower outflow rate. For other countries the persistence remained mainly unchanged.

- Deviation of actual unemployment from flow steady state. How much higher or lower the actual unemployment rate is relative to the steady state is informative of the expected changes in the next quarters in the unemployment rate [see eq. 2]. When the steady-state unemployment is higher than the actual unemployment, the unemployment is increasing. The unemployment rate before the crisis was above the steady; after the crisis, it turned out to be lower than the (new) steady state. In terms of unemployment dynamics, this implies that in many countries the increase in unemployment is not over.

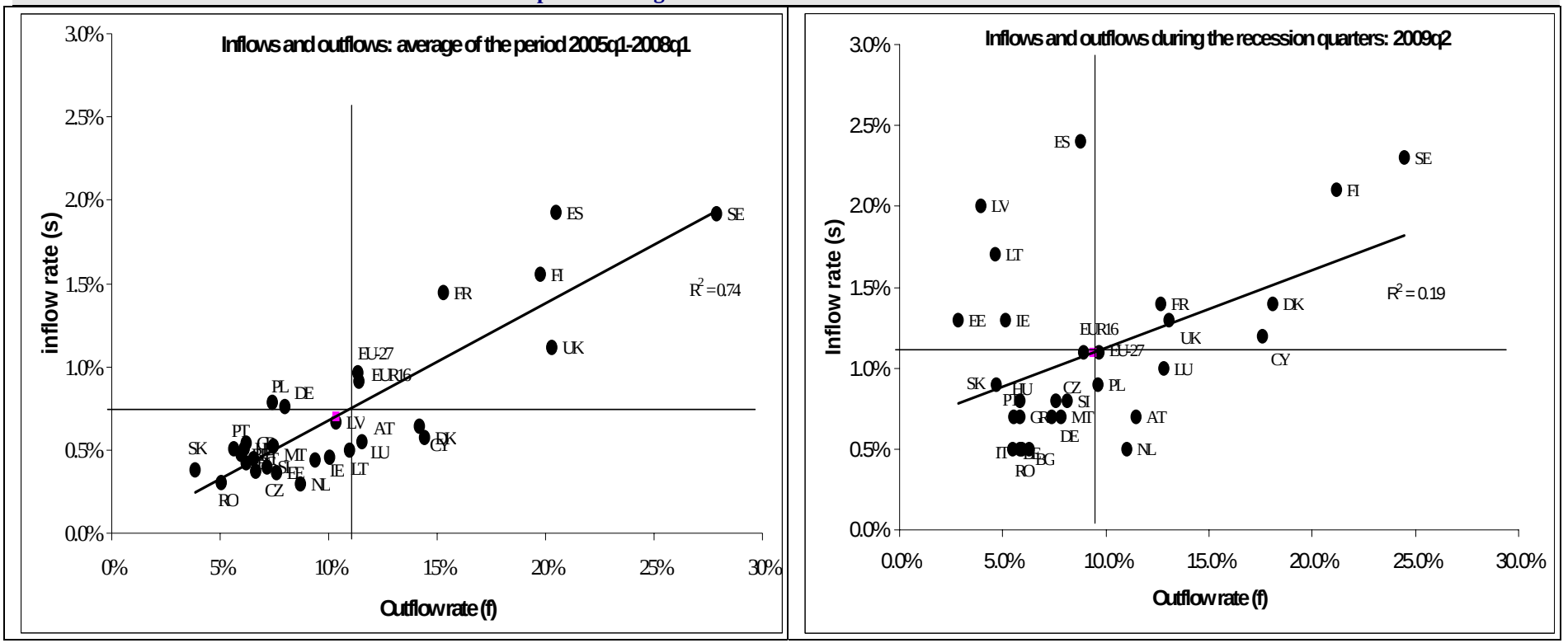
In cross countries comparisons, there is a positive correlation between inflow and outflow rates (Graph 7). UK, Sweden, Spain, Finland and France do have a turnover larger than the average (over the all countries - the horizontal and the vertical lines represent the average flow rates). On the opposite side, there is a large majority of countries (for example, Italy, Portugal, Romania, the Netherlands, Slovenia, the Czech Republic) with smaller flows. During the crisis this positive relation becomes weaker, in particular owing to the above mentioned in the Baltic countries, Ireland and Spain.

According to graph 7, movements from pre-crisis to the crisis quarter of inflow and outflow rates could be interpreted as an indication of the dynamism of the labour market. Countries that moved along the regression line may have a better adjustment dynamics, because during the recession higher inflows into unemployment are accompanied by higher outflows from unemployment. It is worthwhile noting that among countries with this pattern, one can find the "flexicurity" models of Denmark, Finland and the Netherlands. Despite an increase in the jobless rate, the employment chances do not worsen in the recession in these countries. One potential explanation of this finding is that during recessions the cost of opening a vacancy raises (e.g. Hall, 2005). However, this cost is somewhat reduced by effective activation policies and by job search and assistance activities by public employment services that put pressure on unemployed and enhance the probability of a successful match. On the other hand, countries like the Baltics, Spain, and Ireland moved off the line and coupled an increased inflow rate with a decreased outflow rate, thus experiencing a massive rise in unemployment.

So far we have focused on the flow hazard rates for worker transitions in and out of unemployment. These rates in turn generate actual worker flows into and out of unemployment. Graph 8 reports annual worker flows (as % of the labour force) and the annual change in the unemployment rate. A broadly accepted view about the behaviour of total flows in the business cycle is that gross flows increase when unemployment increases and changes in inflows tend to lead changes in outflows, as well as changes in the unemployment rate. Putting differently, the increase in inflows causes a rise in the stock of unemployed which leads to a rise in total outflows too, because the negative effect on outflows related to the lower outflow rate is dominated by the positive effect of the larger unemployment pool. This is exactly what has happened during the crisis in Denmark, Finland and the Netherlands and, to a lesser extent, in some other smaller countries.

On the other side, it is clear that annual changes in unemployment in the Baltic countries, Spain and Ireland have been driven mainly by huge inflows into unemployment. In particular, in the case of Spain, the spectacular increase in the unemployment was led by a rise in inflows accompanied by a decrease in total outflows from unemployment. Thus, the decrease in the outflow rate (see Table 5) was so high that it worsened the employment perspective of an increase pool of unemployed, which raise concerns about long-term unemployment and risks of labour market detachment in this country. To a less extent, a similar patter can be identified in France and the UK. Moreover, during the recession quarters, the inflows into unemployment were relatively small in Italy and Germany while their outflows declined. It is tempting to relate this development to the intense recourse to short-time employment scheme in these countries. We leave for future work to investigate how the interaction between shocks and institutions account for the observed patterns in the dynamics of total flows.

Graph 7 - Average inflows and outflows rate across countries



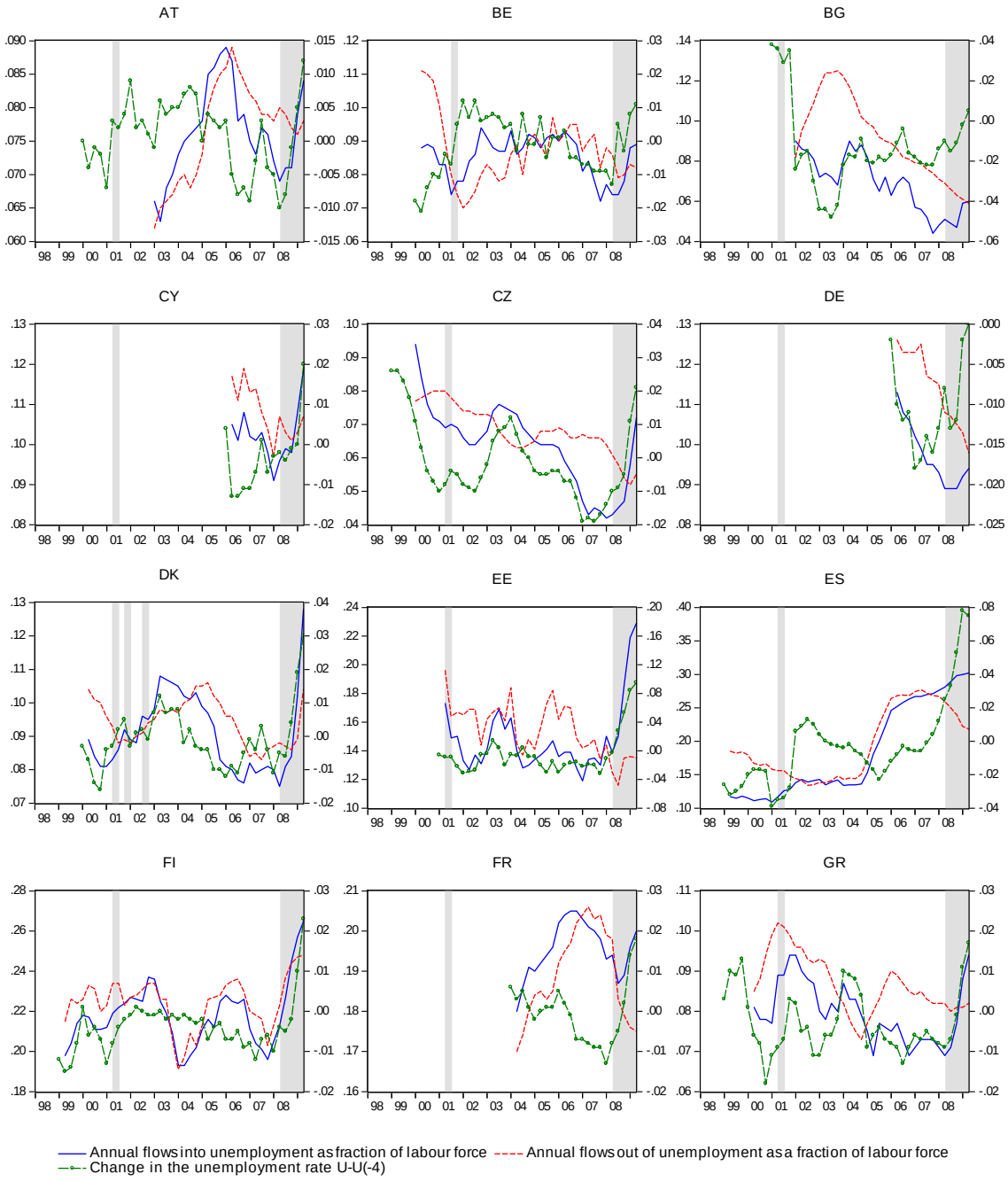
Source: Authors' calculations based on Labour Force Survey.

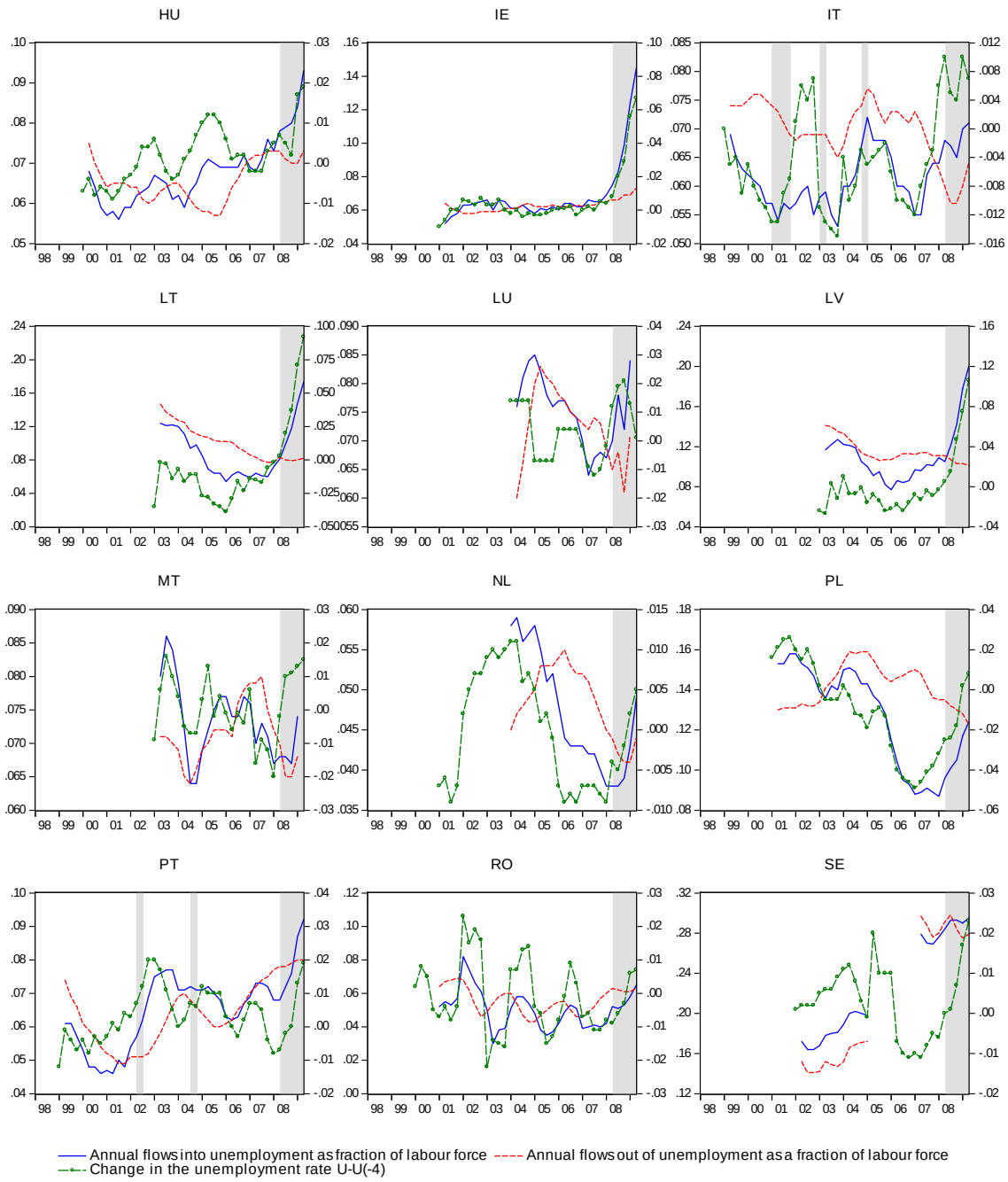
Table 5 - Test for no duration dependence and summary statistics on unemployment and flow rates

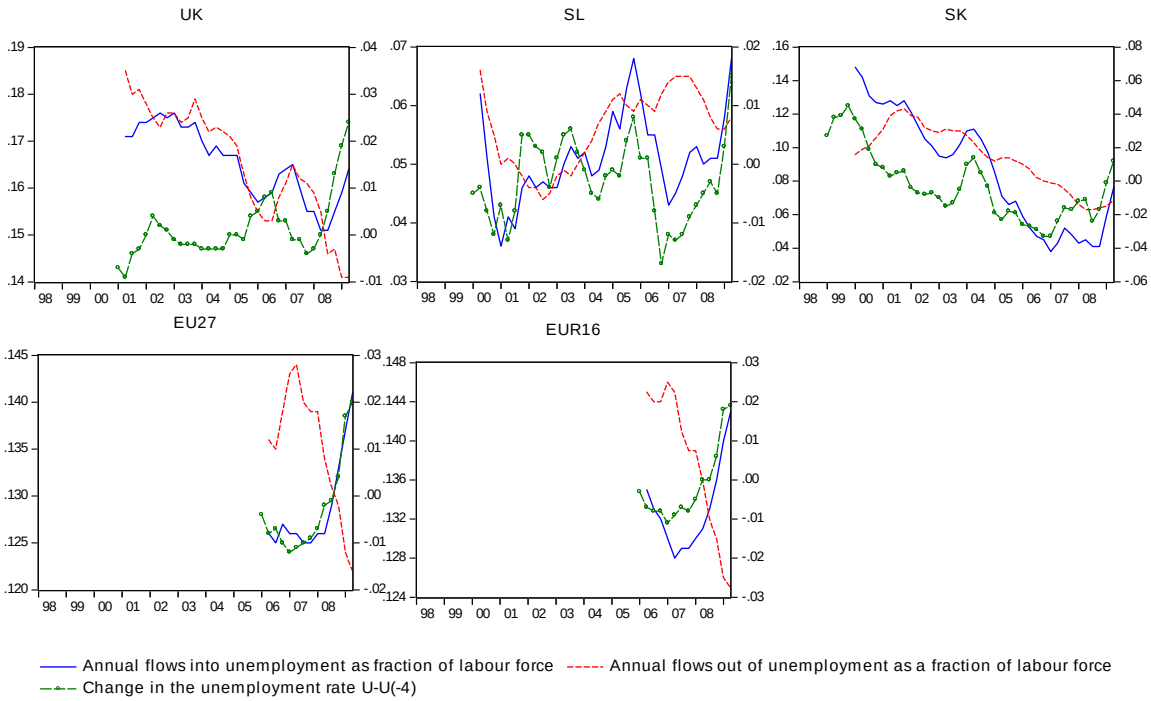
	Test for no duration			Averages 2005q1-2008q1				2009q2			
Country	Start of sample	P -value	H0 rejected?	unemployment rate (u)	outflow rate (f)	inflow rate (s)	steady state unemp.	unemployment rate	outflow rate (f)	inflow rate (s)	steady state unemp.
AT	2002	4%	FALSE	4.8%	11.6%	0.5%	4.5%	4.7%	11.4%	0.7%	5.8%
BE	1999	3%	FALSE	8.0%	6.0%	0.5%	7.3%	7.5%	5.5%	0.5%	8.4%
BG	2000	12%	FALSE	8.6%	6.2%	0.4%	6.4%	6.4%	5.8%	0.5%	7.9%
CY	2005	18%	FALSE	4.7%	14.2%	0.6%	4.4%	5.3%	17.6%	1.2%	6.4%
CZ	1998	46%	FALSE	6.7%	6.6%	0.4%	5.3%	6.4%	7.6%	0.8%	9.5%
DE	2005	0%	TRUE	10.0%	8.0%	0.8%	8.7%	7.8%	7.4%	0.7%	8.7%
DK	1999	2%	FALSE	4.2%	14.4%	0.6%	3.8%	6.1%	18.1%	1.4%	7.2%
EE	2000	16%	FALSE	5.7%	7.6%	0.4%	4.5%	13.6%	2.8%	1.3%	31.3%
ES	1998	0%	TRUE	8.8%	20.5%	1.9%	8.6%	18.0%	8.8%	2.4%	21.5%
EU-27	2005	0%	TRUE	8.1%	11.4%	0.9%	7.4%	8.9%	9.6%	1.1%	10.2%
EUR16	2005	0%	TRUE	8.3%	11.4%	1.0%	7.8%	9.3%	8.9%	1.1%	11.0%
FI	1998	0%	TRUE	7.7%	19.7%	1.6%	7.3%	9.7%	21.2%	2.1%	9.0%
FR	2003	0%	TRUE	8.5%	15.3%	1.4%	8.6%	8.8%	12.7%	1.4%	9.9%
GR	1998	15%	FALSE	9.1%	6.2%	0.5%	8.0%	9.0%	5.8%	0.7%	10.7%
HU	1999	29%	FALSE	7.4%	6.1%	0.5%	7.7%	9.6%	5.8%	0.8%	12.1%
IE	2000	4%	FALSE	4.5%	9.4%	0.4%	4.5%	12.1%	5.2%	1.3%	20.1%
IT	1998	2%	FALSE	7.0%	6.6%	0.4%	6.4%	7.5%	6.3%	0.5%	7.4%
LT	2002	19%	FALSE	6.1%	10.0%	0.5%	4.3%	13.7%	4.6%	1.7%	26.8%
LU	2003	57%	FALSE	4.4%	11.0%	0.5%	4.4%	5.2%	12.8%	1.0%	7.2%
LV	2002	19%	FALSE	7.3%	10.3%	0.7%	6.1%	17.2%	4.0%	2.0%	33.6%
MT	2002	27%	FALSE	6.5%	7.4%	0.5%	6.6%	7.0%	7.8%	0.7%	8.2%
NL	2003	2%	FALSE	3.9%	8.7%	0.3%	3.3%	3.3%	11.0%	0.5%	4.3%
PL	2000	25%	FALSE	13.5%	7.4%	0.8%	9.6%	8.0%	9.6%	0.9%	8.6%
PT	1998	17%	FALSE	8.2%	5.6%	0.5%	8.3%	9.6%	5.5%	0.7%	11.2%
RO	1999	5%	FALSE	7.2%	5.0%	0.3%	5.8%	6.6%	5.9%	0.5%	7.8%
SE	2001	0%	TRUE	6.9%	--	--	--	9.3%	24.5%	2.3%	8.6%
SI	1999	35%	FALSE	5.8%	7.1%	0.4%	5.3%	5.7%	8.1%	0.8%	8.9%
SK	1998	41%	FALSE	13.4%	3.8%	0.4%	9.0%	11.3%	4.7%	0.9%	16.1%
UK	2000	0%	TRUE	5.2%	20.3%	1.1%	5.2%	7.7%	13.1%	1.3%	9.1%
average				7.3%	10.4%	0.7%	6.3%	8.8%	9.4%	1.1%	10.5%

Source: Authors' calculations based on Labour Force Survey. The rejection of the null is based on a significance level of 1%; the reported P-values are sample averages for the test for no duration dependence over the sample period, based on the application of the sample size reported by Eurostat for the national LFS.

Graph 8 – Workers flows (left scale) and unemployment rate (right scale) (as % of the labour force)




HU
IE
IT
LT
LU
LV
MT
NL
PL
PT
RO
SE
98 99 00 01 02 03 04 05 06 07 08
Annual flows into unemployment as fraction of labour force
Annual flows out of unemployment as a fraction of labour force
Change in the unemployment rate U-U(-4)

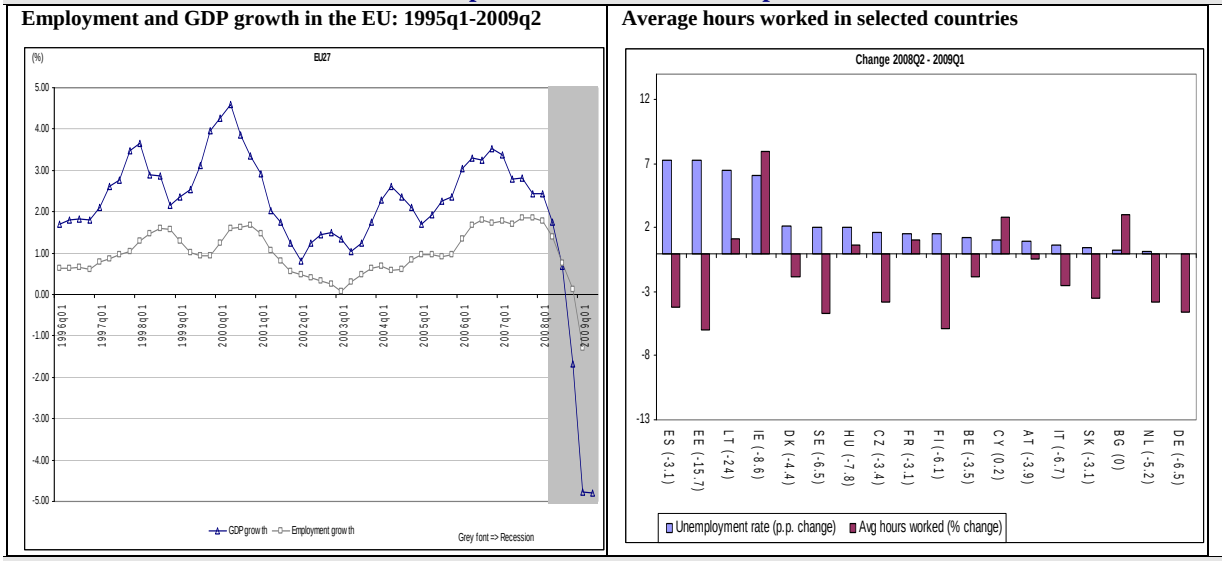


Source: Authors' calculations.

5. The role of labour hoarding in moderating the rise in unemployment

During slowdowns firms hoard labour while cutting production, which implies a falling productivity growth. As the economy turns up, the increasing demand for output is met by firms with an increase in the hours worked before they start hiring again. Firms may usually decide not to adjust employment in line with transitory fluctuations in the demand of their products for different reasons. Firstly, adjusting the labour force can be costly because of hiring and firing costs associated to search and training costs and to the regulation of labour contracts. Secondly, firms may prefer to adjust the labour input at the intensive (i.e. hours worked) rather than at the extensive margin (i.e. workforce) to be able to increase its utilisation with no major recruiting, especially of scarce and expensive skilled-labour, when the recovery comes. A major feature during the early quarters of the last recession was the fall in output growth, accompanied only by a limited fall in employment growth for the EU as a whole (Graph 9). However, by the summer of 2009, the overall adjustment in unemployment rates had caught up with the average during past recessions.

Graph 9 – GDP and labour input



Source: Authors' calculations.

The presence of labour hoarding during the current recession can be illustrated by the fall in the average hours worked in countries where the increase in unemployment is relatively small while the fall in GDP is big (Graph 9)[10]. For example, among countries with an output loss higher than the EU-27 average, the increase in unemployment is lower than average in Germany and Italy, while hours worked declined proportionally more than employment growth. [11] Conversely, the average number of hours worked increased slightly in France and declined in Spain, despite similar output losses in both countries - about 3% from the first quarter of 2008 to the first quarter of 2009. The increase in the average hours worked in France may be due to the effect of the TEPA law, implemented in 2007, which introduced a tax break on overtime work and increased overtime premiums in firms with less than 20 employees. This reform might have led to an increase in the number of hours worked declared previously not reported in the statistics. Yet, most of the increase in overtime in 2006 was in sectors where the cyclical response of employment is relatively high (e.g. construction, trade,

[10] DG ECFIN (2009) "Economic crisis in Europe: Causes, consequences and responses", Chapter 2, "Impact on labour market and employment". European Economy, No 7.

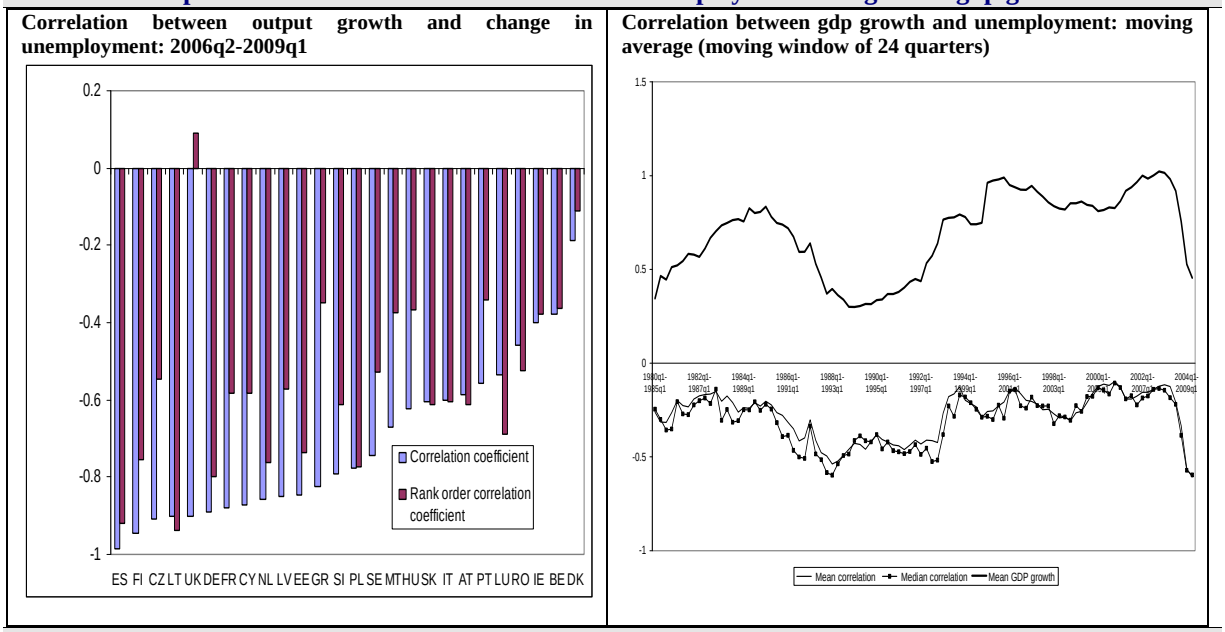
[11] During the current recession the average hours worked fell in Italy and Germany more than during past recent recessions. The opposite is observed for France. DG ECFIN (2009), "Labour Market and Wage Developments in 2008", European Economy, No 8.

transports and business services). Thus, had the distribution of overtime remained unchanged during recent periods, this would imply an adjustment more at the extensive than that at the intensive margin in these sectors, which may explain the increase in the average hours worked.[12]

A closer look at the correlation between output growth and changes in unemployment reveals a stronger link during the latest recession than during the recessions of the early 1980s, which is suggestive of a more flexible labour market nowadays, although it could also be driven by the sheer size of the contraction in GDP. For the period 1980q1-1983q4, the correlation equals to -0.25. It increased to -0.43 during the period 1990q3-1993q4. During the 2001 "near" recession, the correlation fell to about the same level as in the early 1980s and picked up again to -0.64 during the period 2006q2-2009q2; this increase in correlation is mainly due to the inclusion of the current recession quarters (i.e. 2008q2-2009q2). If these quarters are excluded, the correlation (over the period 2006q2-2008q2) falls to -0.2. Over the period 2008q2-2009q2 the correlation coefficient is -0.6. [13]

One important element to consider when assessing the employment response to the cycle on the basis of its correlation with GDP growth is the stability over time of this correlation. To assess this stability, the correlation coefficient between GDP growth and unemployment changes has been computed for each period of 5 years starting from the beginning of the sample (so the first correlation coefficient is 1980q1-1985q1). Graph 10 displays the mean and median of the distribution of the 5 years moving correlation between employment and GDP growth by country and the mean GDP growth.[14] Clearly the correlation is not constant over time as the link between GDP and unemployment is weaker during expansions than during contractions. A simple correlation is only informative about the potential link and not about the causality. Thus, we turn to a multivariate framework.

Graph 10 - Correlation coefficient between unemployment changes and gdp growth



Source: Authors' calculations.

[12] Dares, 2008; Premiére Syntèhses Informations *Évaluation du volume d'heures supplémentaires rémunérées des salaries des secteurs concurrentiels en 2006*). Moreover, the July 2008 reform giving to companies the possibility to negotiate the amount of overtime might have stimulated also stronger adjustment in the hours worked through bilateral negotiation. More details about recent reform of the working time organisation can be found in the Country fiche of France of the report "Labour Market and wage developments in 2008".

[13] The correlation is for a sample of countries for which data are available in each period.

[14] The mean is therefore a mean group estimator of the rolling correlation coefficient.

Over short-time, a change in output is accompanied by a less than proportional change in unemployment because firms may prefer to keep workers rather than lay-off them when output falls. Thus, the average productivity of labour rises with employment and output, and falls when they decline. In order to identify the effective impact of growth on unemployment over the cycle, the standard practice is to estimate the Okuns' law, which relates changes in unemployment to output growth. [15] The evidence in Knotek (2007), suggests that the Okun relationship varies over time and that a dynamic specification in first difference perform better than a specification in terms of deviation from potential output and trend unemployment.

To get hindsight on the extent of labour hoarding, the change in unemployment observed during the recession quarters is compared with the change implied by the historical relations between output growth and unemployment changes.

A dynamic version of the Okun's law is estimated for each country over the period 1985q1-2007q4. In addition to the usual contemporaneous GDP growth, three lags of GDP growth and two lags of changes in unemployment are included in the regression to capture the delayed response of unemployment to economic developments and the persistency of changes in unemployment. For each country, an out-of sample forecast of unemployment has been generated from this estimate based on the pattern of observed GDP growth. The actual values of the change in unemployment are then compared with those generated by the out-of-sample forecast. Graph 11 on the left side reports for the period 2008H1-2009H2 the gap between the actual employment growth and the employment growth that one would have expected based on the historical relationship between employment and GDP growth. A positive value implies an under-adjustment of employment to the current fall in output growth - i.e. that the actual employment growth was above the value one would have expected from the observed fall in GDP growth.

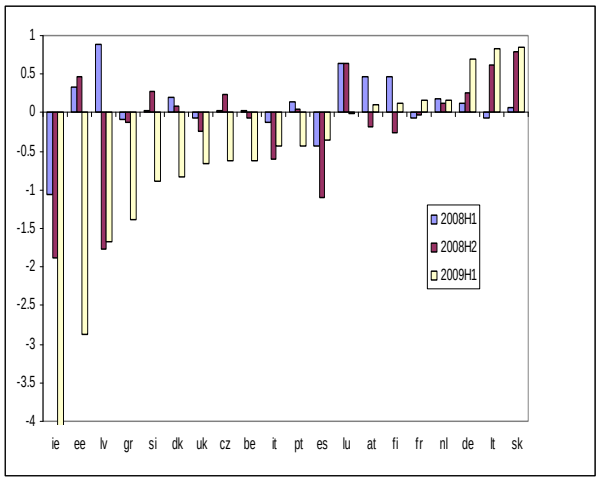
At the onset of the crisis, in Ireland and Spain employment growth was much lower than expected given the size of decline of output. In contrast, labour shedding in Latvia and Estonia appears more consistent with their sizeable output loss until the end of 2008, but became higher than one would have foreseen in the first half of 2009. Only Germany, Finland, Lithuania, and Slovakia had in the first half of 2009 a growth of employment higher that expected on the basis of the fall in output growth. Graph 11 on the right side does the same analysis for the change in the unemployment rate. The rise in unemployment rate is below what predicted by an *Okun's* type relationship in Finland, Austria, the Netherlands and Germany.[16]

[15] In his original work (1962), Okun estimated two versions of what has since then become the "Okun's law" using U.S. quarterly data from 1948q2 to 1960q1. Both are simple relationships between the change in the unemployment rate and a measure of economic activity, which is the real output growth in the first version and the output gap in the second version.

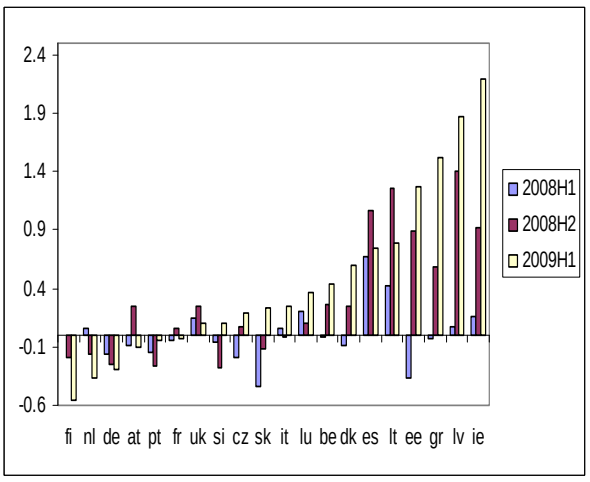
[16] The gap between actual and predicted unemployment is significantly different from zero for Austria and Germany in 2008q2; for Slovakia in 2008q3; for Belgium, Germany, Finland, the Netherlands, Portugal, Slovenia in 2008q4; for Germany, Finland and Netherlands in 2009q1; for Belgium, Germany, Finland, and the Netherlands in 2009q2. In all other cases the gap is not significantly different zero, implying that the change in unemployment is consistent with the change in output according to an Okun's type relation estimated over the period 1980-2007.

Graph 11 – Under-prediction and over prediction of Okun's relationships

Gap between actual employment growth and employment predicted by GDP growth



Gap between actual unemployment changes and unemployment changes predicted by GDP growth



Source: Authors' calculations. Each bar represents the gap between the actual employment growth (unemployment change) and the employment growth (unemployment change) expected from a country specific relationship linking employment growth (unemployment change) to GDP growth; this relationship has been estimated on quarterly data over the period 1995q1-2007q4**;** the specification used includes the current GDP growth and 3 of its lags and two lags of employment growth (unemployment change). The gaps for the first semester of 2008 and 2009 and for the second semester of 2008 are average of the corresponding quarters of semester.

To sum up, the labour market response to the global slowdown has been quite heterogeneous across countries. This is partly due to the need for reallocating resources away from specific industries characterised by low productivity growth and/or overcapacity. In addition, the use of flexible working time arrangements (bilaterally agreed or government sponsored) to avoid wasteful labour shedding and preserve firm-specific human capital has varied across countries, which explains some of the differences in the labour market responses.

A temporary reduction of the hours worked could be an effective tool to stabilise employment only if it is not accompanied by a full compensation of hourly wages that keeps the monthly labour income unchanged. Thus, reduced hours should come alongside wage or labour costs cuts, the main difference being that the latter are attained through schemes that subsidise wages of workers accepting to work fewer hours, while wage cuts are reached usually with the mutual consent of the parties (e.g. recession sabbatical). The latter are more efficient as they involve bilateral negotiations and their usage should go down as the recovery steps in.

In many European countries, government sponsored schemes are available to employers to supplement wages of workers working at reduced hours. The *Cassa Integrazione Guadagni* in Italy, the *Chômage technique* in France, or the *Kurzarbeitergeld* in Germany, to mention a few. In Italy, the number of hours of wage supplementation (CIG) was around 20 per thousands of hours worked between January 2002 and July 2008. It rapidly picked up in November of 2008 to reach in April 2009 the highest ever ratio since 2000 (110 per thousands of hours worked in industry). In the 2009q2 about 10% of full-time equivalents workers were on wage supplementation schemes. Similarly, in Germany the use of short-time employment picked-up swiftly, reaching in March 2009 the highest level since the 1992-1993 recessions. In France, the proportion of workers in *chômage partiel* increased from 0.1% in 2008q1 to 0.7% in 2009q1, but remained below the 1995-2005 average of about 2% (Calavrezo et al., 2009). Short-time schemes may be an effective instrument to contain wasteful labour shedding vis-à-vis a temporary demand shocks in the short-term. This is less obvious if the recovery takes more time to materialise and/or companies face the need to restructure. In this situation adjustments in the workforce are required which could be hampered if schemes "freeze" employment patterns in the affected sectors and companies; there can be a trade-off between unemployment today and more redundancies at later stage.

To address this, stricter conditionalities to access government support are imposed on firms, but it is too early to say if in some countries the increase in the short-time workers for economic reasons would anticipate an increase in unemployment when the schemes expire. Yet, a concern remains that the limited adjustment observed so far in some countries would imply less hiring during the recovery. The risk of jobless or job-low growth is potentially high.

6. Potential risks to the labour market outlook

The severity of the recession raises concerns about the labour market adjustment and its persistency. Job losses may translate in longer spells of unemployment, which will lead to a deterioration of skills, contribute to the persistency of unemployment (hysteresis) and increase the likelihood of a falling labour supply, ultimately translating in higher natural rate of unemployment. This section discusses the potential risks to the labour market outlook. It reviews the explanations given for a delayed labour market recovery and looks at the risks of jobless growth in Europe. The matching of vacant posts with unemployed and the risk that high unemployment translates in high equilibrium unemployment (hysteresis) is discussed subsequently. The final section examines the impact of the recession on wages and labour costs.

6.1 The risks of jobless recovery

At the early stages of a recovery, when they have limited information about their demand, firms adjust productivity more than employment, which implies that employment responds with a time lag to changes in output. When these lags are substantial, until a sustained and consolidated economic growth takes old, job creation remains insufficient to bring unemployment down for a prolonged period of time after the upturn, and the recovery turns out to be jobless.[17] Economists have given a number of explanations for the jobless recoveries

- Employment lags the pickup in the economic growth due to labour hoarding during recession. As output falls firms do not fire their workers but hold on them for a time even if they are not fully utilised. Thus, when GDP increases, new workers are not hired until the existing ones are fully employed. Given the depth of the present recession and the massive recourse to short-time employment, this effect could be significant.

- Macroeconomic uncertainty can be considered as a stand-alone reason for low employment growth at the early stages of economic recovery. As the signals of the recovery consolidate, labour demand increases follow the initial increase in productivity and profits. Yet, heightened uncertainty may lead firms to postpone hiring, thus delaying the time at which employment starts growing again (Bloom, 2008 and Bloom et al, 2009).

- Another view contends that a reduction in the utilisation of labour occurs during the period required to move workers out of restructuring sectors into new occupations. The extent of this adjustment and its distribution between different adjustment margins (i.e. hours worked against employment) depends on how deep the slump is and the

[17] In the US, during the recovery from the 2001 recession, employment grew more slowly than could have been explained by sluggish output growth alone. The gains in employment during the recovery were less than what observed for the average cycle and made the recovery jobless. Despite the employment growth of the second half of 2003, it was only in January 2004 that employment increased above the level recorded at the trough of the cycle. The total numbers of hours worked also resumed very slowly compared to previous recoveries.

existence of over-manning before the recession. Thus, a long boom followed by a shallow recession will be associated with an adjustment mainly at the intensive margin (hours worked) while a persistent and deep decline will bring about an adjustment at the extensive margin (job destruction). Assuming that jobs are permanently destroyed in some sectors, the aggregate employment growth depends on new positions being opened in different industries (the *sectoral-shift* hypothesis), in particular in expanding industries, something very unlikely to happen either without a substantial real wages cut and/or when there is high uncertainty about the depth and duration of the slump[18]. Among displaced workers, especially in labour intensive sectors, those who have to find jobs in sectors different from the ones where they have acquired their skills experience longer spells of unemployment than workers who can search for jobs in the same sector. Displaced workers are not necessarily suitable to fill new jobs and exert little pressure on wages. As a consequence, both the duration of unemployment and the NAIRU increase. According to this interpretation, unemployment is expected to start decreasing and employment increasing only when the recovery is set on a steady path.[19]

- A fourth view holds that "just-in-time" employment practices allow firms to wait before opening new vacancies and hiring full-time workers until the signs of a robust recovery materialise in strong demand for their goods and services (Aaronson et al. (2004), Schreft and Singh (2003)).

- According to a fifth explanation, a weak labour market may prevail after periods of long expansion during which firms delay internal restructuring until the recession arrives; high aggregate job destruction would occur as many firms go through a period of internal re-organisation (Koenders and Jorgenson, 2005).

- Finally, the intensity of the recession influences the degree of deterioration in unemployment during the recovery. Deep recessions are followed by relatively bigger declines in unemployment and vice versa (Knotek and Therry, 2009).

A further consideration concerning the current recession relates to the presence of an impaired financial sector. The empirical evidence on international banking crises shows that output losses that follow financial crises are highly persistent (Cerra and Saxena, 2008 and IMF, 2009) and accompanied by a persistent increase in unemployment (Knotek and Terry, 2009)[20] owing to: output losses; the disruption of the credit flows, which creates difficulty in funding operating expenses; hiring freezes and delay in the sectoral reallocation (Bloom, 2007). In addition, since the self-employed are more likely to be liquidity constrained, the financial crisis might reduce access to bank credit for potential new self-employed workers, which may

[18] The evidence on the structural shift hypothesis is mixed. See DG ECFIN, "*Labour market and wage developments in 2004, with special focus on the risk of jobless growth*", European Commission - European Economy- Special report, No.3/2005. For the US Valletta and Cleary (2008) find as of 2008q3 a low degree of sectoral reallocation relative to past economic downturns.

[19] In addition, the employment losses would be only temporary if part of the increase in productivity growth is permanent and not simply transitory. In reality, one should distinguish the effects on employment of increases in trend productivity due to the introduction of labour saving innovation and technologies and those made possible by the introduction of new products at higher value added (i.e. product innovations). In the case of product innovations, the effects on labour demand are direct and positive. In the case of process innovations, they depend on productivity increases being transferred in lower producer's and consumer's prices, which boost demand for goods produced. Of course the process is smoother the more competitive are the product markets (including retail trade and distribution).

[20] For a panel of 33 high income countries, Knotek and Terry (2009) show that a banking crisis is accompanied over four years by an increase in unemployment of about 2.5 pps., and that a banking crisis combined with a recession to an increase in unemployment by 3.5 pps. after 4 years into the recovery.

make move from self-employment into unemployment or inactivity more prevalent than entries in the labour market.

Implications for the European labour markets

During the current recession, the EU and the euro-area unemployment rate increased in the 2008q2-2009q2 period by more than 2 pps., while GDP declined by about 5 per cent. This means that each percentage point of decline in GDP has implied an increase in unemployment of about ½ percentage point. One issue worth investigating is how this change compares with the past experience and to what extent the actual increase in unemployment fully reflects the decline in output observed so far. The Okun's relationship can be a useful tool to address these issues.[21] The following specification of the Okun's Law is estimated with GLS and countries specific fixed effects.

$$du=a+b*dlog(GDP)+c*dlog(GDP(-1))+d*dlog(GDP(-2))+e*dlog(GDP(-3))+f*du(-1)+ g*du(-2)+e_{it}$$

where b, c, d and e captures the impact of GDP growth at various lags on the change in unemployment. In particular, in the case of jobless recoveries, unemployment would respond more to past than to current changes in GDP. Graph 12 reports for different periods the coefficients of this relationship, based on the assumption that current changes in unemployment are affected by current output growth, past output growth (up to three lags) and past changes in unemployment (up to two lags). The main results are the following:

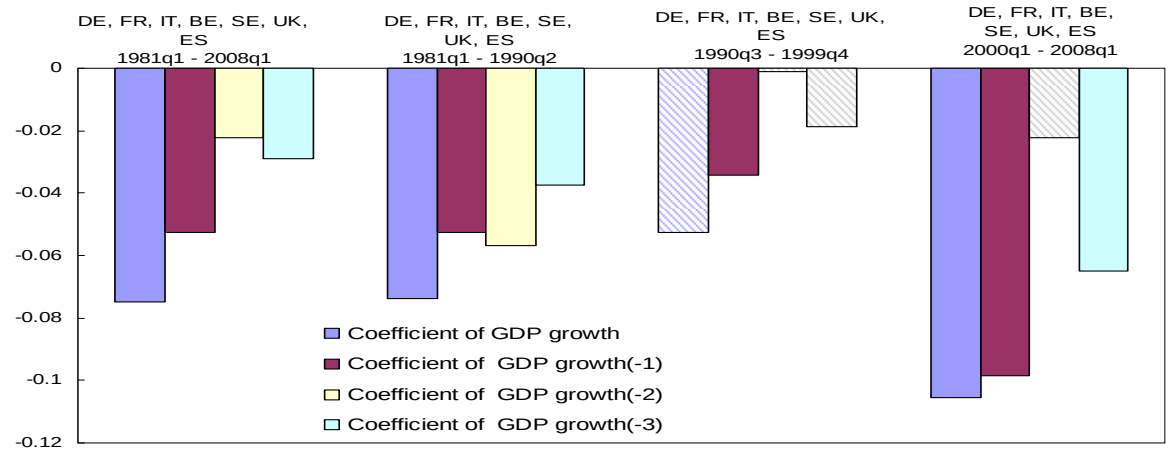
- The coefficients of current output growth are higher than the coefficient of past output growth, but both are now larger than in the 1980s or the 1990s.

- Over time, the exact quantitative form of this relationship has changed somewhat. The effect on unemployment of output growth at various lags follows an inverted U-shape pattern. The effect is high in the 1980s, decline in the 1990s and pick up again in the 2000s, but only for the effect of the contemporaneous and lagged output growth. In the 1990s, the largest statistically significant impact of output growth is attained after one quarter, which is suggestive of jobless growth (e.g. Caballero and Hammour, 1999).

- In addition to the direct effect of GDP growth, the persistency of unemployment changes (as captured by the lagged effect) falls. This implies that for a given change in output growth, past unemployment changes weight less.

[21] Because of data availability, this relationship has been estimated on two groups of countries. The first is a balanced panel which includes BE, DE, ES, FR, IT, SE and UK, and covers the period 1980q1-2008q1; the second group pool all EU Member States but Bulgaria. Output growth has its maximum effect on unemployment for the coefficient that is the highest in absolute value.

Graph 12 – Okun's coefficients over different periods



Source: Authors' calculations. Stripped bars display coefficients non-statistically significant.

Thus, there is a change in the relationship between unemployment and output, which implies that the contemporaneous developments have a greater weight in determining the change of the unemployment rate in the short-term.[22] More generally, as documented for the US, the relationship may vary considerably over time. In particular, the contemporaneous estimated impact of GDP growth rises in samples that include recessions. This result is confirmed by the estimation of an Okun's relationship on a sample including all EU countries. Graph 13 reports the Okun's coefficients estimated with the technique of the rolling regressions. With this procedure the sample length is fixed in each estimation round while the beginning and ending dates are increased by one quarter at the time.

In practice, we have fixed a window of 10 years starting from 1981q1-1991q1 and made as many regressions are needed to recover the entire period; thus the final sample is 1999q3-2009q2. The moving sample obviously incorporates different numbers of recessionary periods; the shadow bars represent the number of recessions on the total number of observations within each sample. By looking at the change in the estimates over time, one can infer how the relationship has changed over time and over the business cycle.

Graph 13 suggests that there is an increasing effect on unemployment of GDP growth (at various lags) in the recent years. However, during the last quarters this effect diminishes which could be caused by the use of reduced working time during the crisis. Moreover, the effect of the contemporaneous GDP growth prevails on that of its lags and increases during recessions. The same rolling estimation on a smaller window of 5 years (i.e. 20 quarters), confirm these findings. A possible explanation of this asymmetry might related to recessions being an opportunity for firms to adjust the workforce, as for them the value of foregone production associated with unemployment is pro-cyclical and, consequently, the incentive to shed labour is stronger during recessions (Davis 1987). Worrying for the short-term outlook is the fact that in the past the response of changes in unemployment gets smaller as the economy recovers – as it is evident from the estimation ending in mid 1990s. This implies that the unemployment rate could react only sluggishly to the recovery. The extent to which recent labour market reforms have affected the relationship during the recession is unknown.

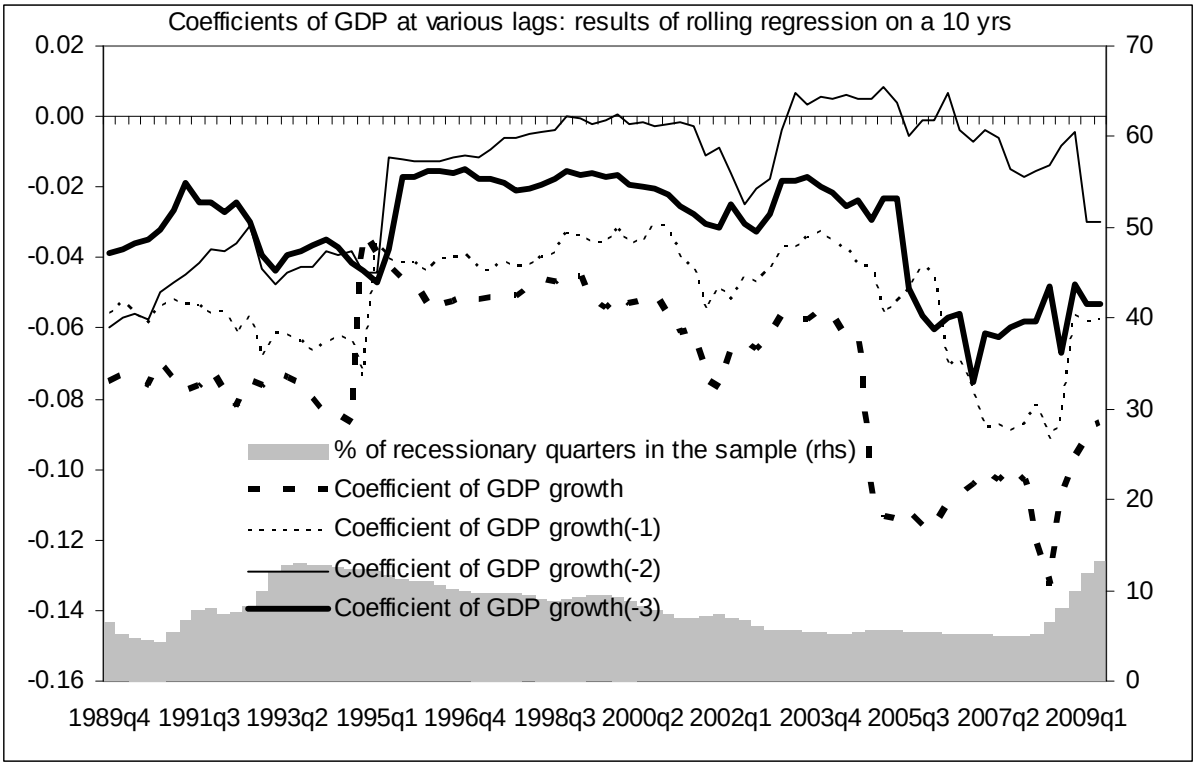
[22] These findings differ from what found for the United States, which give more support to the possibility of jobless recovery in this country in the more recent period (Knotek 2007).

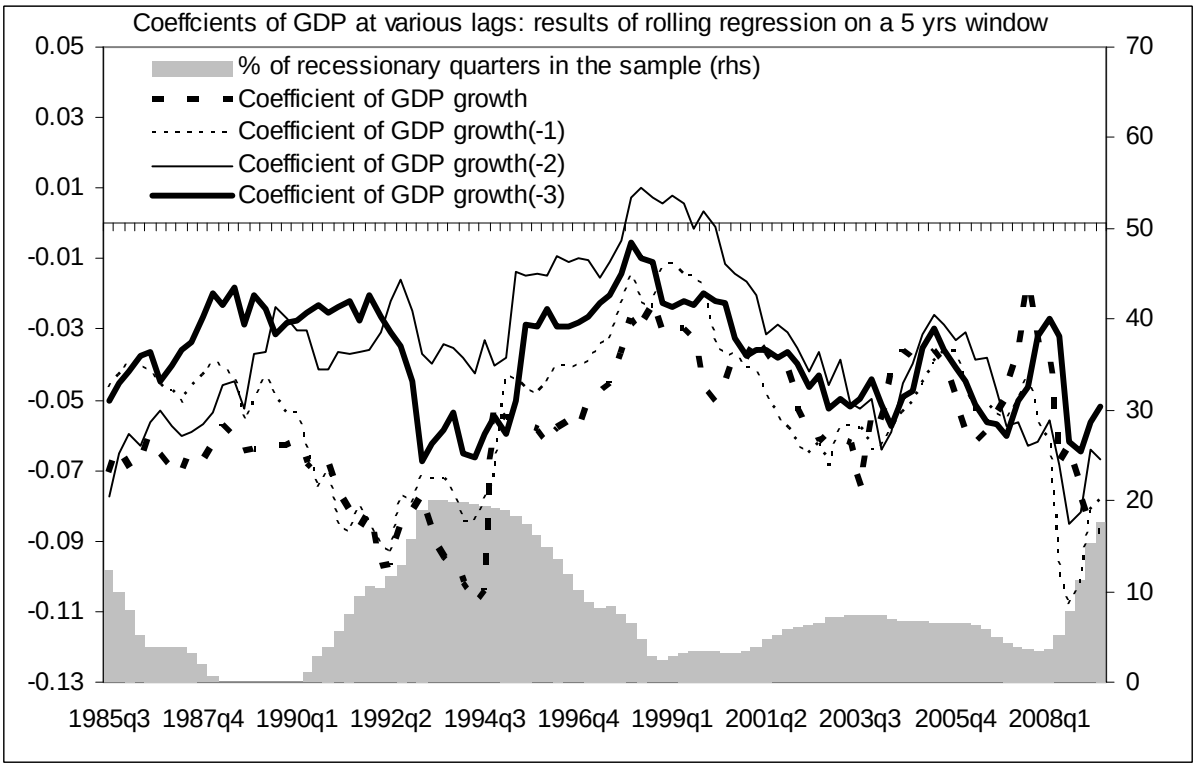
However, the overall dynamic adjustment of unemployment to a shock depends on output growth and on the persistency of unemployment. For the recession of the early 1990s and the last recession, Graph 14 reports the dynamic response of unemployment to a change in output growth of 1 pp.

It is based on the estimate of an Okun's law in levels. Estimating the equation in first differences imposes a unit root in the level of unemployment rate, which implies that fluctuations in the level unemployment are driven by permanent shocks and there is no short-term dynamics in the level of unemployment rate. To avoid this strong assumption, we estimate the Okun's low in levels and study the dynamics of the level of the unemployment rate. One problem with macro panel is that the error term for different observations can be correlated. This happens, for example, when shocks to GDP are correlated across countries. In this case the estimates of the parameters are biased and inconsistent. Moreover, there can be country specific factors that account for cross-countries differences in the unemployment rates. Therefore, in modelling the relation between unemployment rate and GDP we assume that unobserved factors that influence GDP are of two types: those constant across countries and fixed over time and those that are fixed over countries but vary over time. This allows identifying the dynamic response of unemployment to a country specific shock to GDP.

It turns out that the response expected for the current recession is for the first year following the decline in output growth similar to that estimated for the recession of the early 1990s, but less persistent over time. Thus, without further significant improvements in output growth in the coming quarters a substantial effect on unemployment may be expected. Yet, the lower persistency of unemployment of the more recent period may suggest that a faster adjustment as the economy rebounds. This suggests that past labour market reforms have made unemployment more responsive to the cycle. During the present recession, this has partly been offset by the use of short-time schemes, which could mean that a recovery would lead to a somewhat delayed fall in unemployment; yet, over the medium term, the fall in unemployment could be stronger than what has been observed in the past.

Graph 13 - Okun's coefficients and dynamic response of unemployment





Source: Authors' calculations. On the horizontal axis, final year of the sample used for the estimates of rolling coefficients are reported. The shares (in %) of recessionary quarters of the total quarters in each estimation window are reported on the vertical axis (right-hand side).

Graph 14 - Okun's coefficients and dynamic response of unemployment

Source: Authors' calculations.

6.2 How a W- or V-shaped recovery influences unemployment and participation rates

The reaction of the labour market during a recession influences also its response during the recovery. In addition, the response of the labour market is also influenced by the timing and the shape of the recovery. If the initial recovery is tentative and lacks sustainability, employers will be reluctant to open new vacancies and hire workers. The shape of the cycle depends very much on the types of shock that caused the recession. In particular, recessions that take place together with financial crisis, often caused by overoptimistic expectations of income growth, are followed by prolonged and uncertain recoveries (IMF, 2009, Knotek, 2009).

In order to assess the evolution of labour market aggregates in the aftermath of a recession, it can be of interest looking at their evolution in the quarters following past recessions. Since recessions are not all alike, a distinction is made between W-shaped and V-shaped recoveries. W-shaped recovery are defined as episodes in which output growth resumes after a sharp contraction, but for few quarters only, and falls back into recession before the recovery takes hold. During V-shaped recoveries, output growth is steadily positive over the quarters that follow the trough. In the sample of EU27 countries it is possible to identify 25 recessions[23], excluding the current recession, 15 of which are W-shaped (Table 6). Graph 15 reports the average evolution of GDP growth, employment, unemployment rate and the labour force for the 8 quarters that follow the first quarter after which the average W- or V-shaped recovery consolidates – i.e. after the trough of the V-shaped recovery and the second dip of a W-shaped recovery.

[23] Recessions are identified as at least two consecutive quarters in which output growth has been negative. Due to data limitation, the number of identified recessions underestimates the effective number. Only few countries have long time series for quarterly data starting from 1980q1.

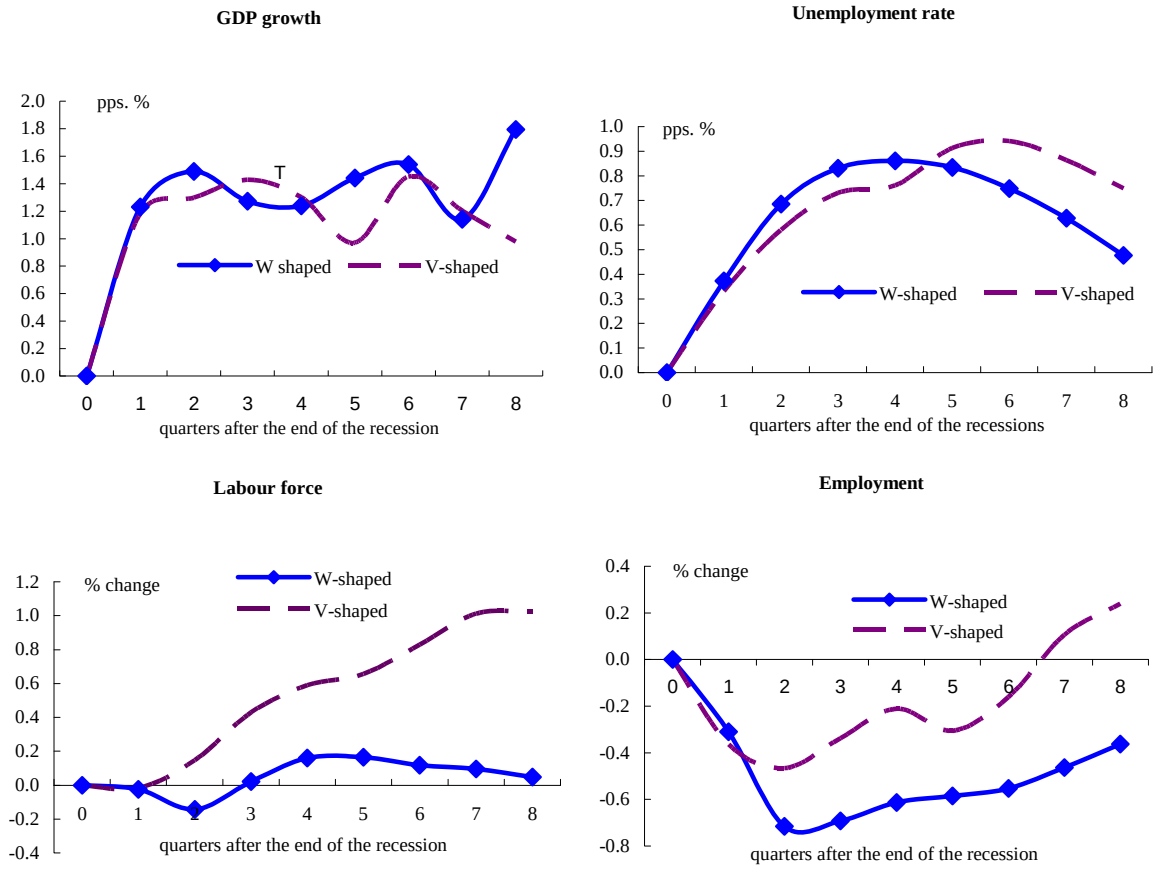
Table 6 - Recessions followed by W- and V-shaped recoveries

	Recessions followed by	
Country	**W-shaped recoveries**	**V-shaped recoveries**
Austria		01q2-01q3
Belgium	80q2-80q4 92q4-93q1	01q3-01q4
Germany	80q2-80q4 91q2-91q3 02q4-03q2	95q4-96q1
Denmark	97q3-97q4 01q4-02q1	92q4-93q2
Estonia		98q4-99q2
Spain		92q2-93q1
Finland	90q2-91q4	
France		80q2-80q4 92q2-93q1
Italy	82q1-82q4 01q2-01q4	92q3-93q3
Lithuania	98q4-99q1	
Portugal	02q3-02q4	
Sweden	90q2-93q1	
Slovak Republic		99q1-99q4
United Kingdom	80q2-81q1 90q3-91q3	

***Source*:** Authors' calculations.

When the recovery is on a stable path, output growth follows a pattern which does not differ across the two types of recoveries – but of course it takes more time for W-shaped recoveries to reach this path. As expected, employment continue to contract more, and more persistently, during W-shaped recoveries. In the V-shaped case, employment returns to the level that prevailed before the recession after about 2 years from the upswing, while it remains steadily below this level during W-shaped recoveries. The unemployment rate behaves consistently with the evolution of employment in both types of recessions. Unemployment rates keep growing during the first year after both W-shape and V-shaped recoveries. Yet, unemployment continues to rise for a further two quarters in the case of the relatively more solid and fast V-shaped recovery. This finding suggests that during a solid recovery the perception of finding a job improves and more people enter into the labour market. Indeed, the fourth panel shows clearly that the labour force rises during V-shaped recoveries while it mainly hovers around the level which prevails at the early stage of a W-shaped recovery. W-shaped recessions are, therefore, characterised by significant discouraged workers effects and run a high risk of a shrinking labour supply.

Graph 15 – GDP, unemployment and employment in the quarters following W- and V- shaped recessions



Source: Authors' calculations. Change compared to the end of the recession.

6.3 Matching process and sectoral reallocation: the risk of hysteresis

Structural imbalances should be dealt with substantial mobility of workers across different industries. In the current situation, the main sectors with structural imbalances are construction and finance. As housing subside to a level consistent with the replacement of the old housing stock and the growth in the population (i.e. the housing boom comes to an end), employment in construction and related financial services needs to come down (Phelps, 2008). A decline in the price-rental ratio triggers an additional decline in the demand for labour which could intensify the initial contraction of employment in these sectors. The time needed for reallocating workers from these sectors into other sectors may raise the NAIRU.

Graph 16 displays a measure of the sectoral reallocation for selected countries, the so called Lillien index. [24] For the largest euro area countries, this measure suggests only an occasional and mild sectoral reallocation during slowdowns/recessions, which contrasts with the more regular pattern observed in the US. In Italy and France, the dispersion of employment growth across sectors increases sharply during the recession of the early 1990s. During the shallow recession of 2003, it increased in Italy as employment growth in manufacturing sector turned out negative while employment expanded strongly in services. The index of sectoral reallocation capture the intense period of restructuring that followed the German reunification. Finally, in 2008 and 2009, the degree of sectoral reallocation increased in all countries but Italy. Other countries (not shown for brevity) where the degree of sectoral

[24] The index of reallocation is calculated as in Lilien (1982) as the weighted standard deviation of cross-sectoral employment growth rates using an industry breakdown in 6 Industries.

reallocation rises substantially include the Czech Republic, Denmark, Ireland, Lithuania, Netherlands, Slovenia, and Slovakia.

Of course, the dispersion can increase as a result of shifts caused by normal business cycles (i.e. aggregate demand shocks) having differentiated impact across sectors. This implies that the positive correlation between the dispersion and the unemployment rate would be determined by aggregate demand shock rather than by structural change. Indirect evidence of the effect of the sectoral reallocation on the structural unemployment rate can be gained by comparing the result of a regression of respectively the unemployment rate and the NAIRU on the measure of sectoral reallocation (Lillien index). In the first case, an increase by 1 pp. in the dispersion of employment growth across sectors is accompanied by an increase in the unemployment rate of 0.6 pp. The same regression, with the NAIRU as a measure of the natural rate of unemployment gives a response of 0.1 pp. The estimate is done on an unbalanced panel of 19 EU countries with data starting from 1981. The specification includes the NAIRU and a measure of dispersion (both contemporaneous and lagged). Fixed effects and country specific time trends are included to control for factors not captured by the reallocation index and that may affect the unemployment rate or the NAIRU. The following equations are estimated with fixed effects and country specific trends with feasible GLS; variances are robust to cross equation and contemporaneous correlation and heteroschedastic error disturbances in each cross section:

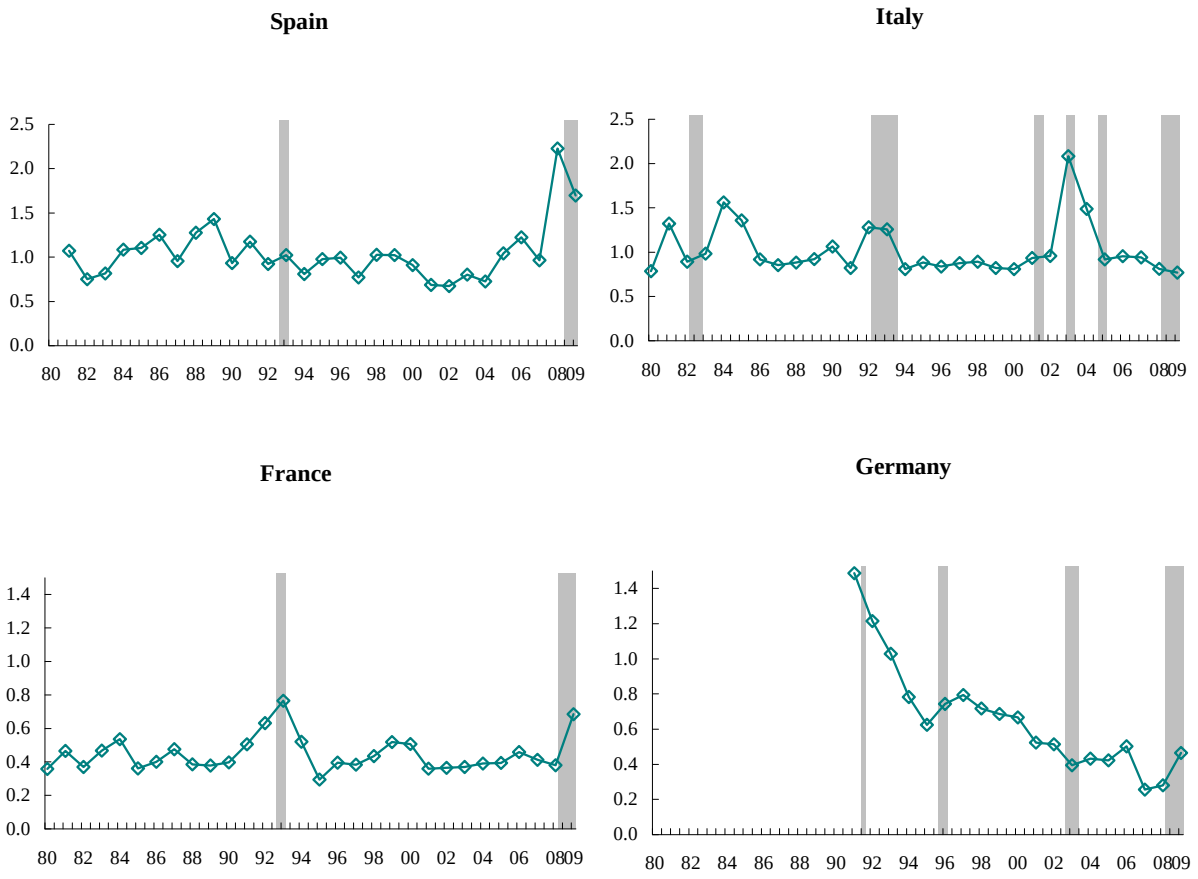
$$u_{it} = \underset{(0.05)}{0.80} u_{it}(-1) + \underset{(0.30)}{0.60} dis_{it}$$

$$nairu_{it} = \underset{(0.02)}{0.92} nairu_{it}(-1) + \underset{(0.005)}{0.11} dis_{it}$$

where *dis* is the measure of dispersion; standard error in parentheses; cross-sections observations included: 21. Total pooled observations: 328.

It is worth noticing that the impact of the dispersion on unemployment is higher but less persistent than the impact on the NAIRU. This suggests that part of the increase in unemployment reflects an heterogeneous response across sectors to a aggregate demand shocks. However, the slightly higher high persistency of the NAIRU implies that a pure sectoral reallocation shock may imply a persistently high structural unemployment rate. Thus, looking ahead, the structural unemployment rate may increase in those countries where structural reallocation was already occurring in 2008 and 2009.

Graph 16 – Lillien index of sectoral reallocation



Source: Authors' calculations.. The Lillien index is the standard deviation of the growth rate of employment across 7 industries for the average quarter of each year. The standard deviation is weighted with the share of employment in each industry. Grey bars represent recessions.

One problem with the measure of sectoral reallocation is that the employment dispersion may reflect both reallocation shocks and differences in industries' cyclical sensitivity and growth trends. In this case, it is difficult to distinguish true reallocations from differences across industries in the cyclical response of employment to aggregate fluctuations (Abraham and Katz, 1986). During a deep recession, the degree of sectoral reallocation can be very high. At the same time, the distribution of skills in the labour force is fixed in the very short run. As a result, the mismatch worsens significantly and the effectiveness of the matching process deteriorates.

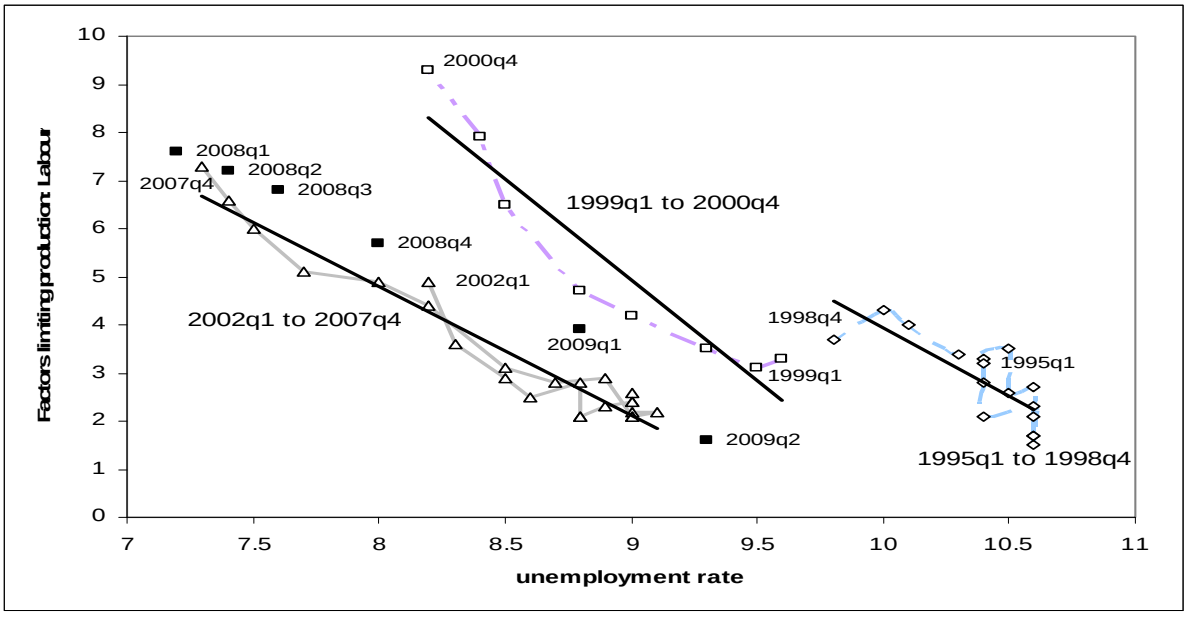
The Beveridge curve provides a way to distinguish sectoral shifts from cyclical developments. It depicts the relationship between job vacancies and unemployment rates. Over the cycle this relationship exhibits negative co-movement, with high vacancies and low unemployment when the economy is growing and vice versa when it is contracting. This leads to shifts along the curve. Shifts in the curve - i.e. positive co-movements between vacancies and unemployment - reflect changes in the effectiveness of the matching process, possibly related to skill mismatches or sectoral imbalances. Thus, shift leftward are suggestive of an improvement in the matching process.

Graph 17 shows the Beveridge curve for the euro area measured at quarterly frequencies over the period 1995q1-2009q2. A graphical inspection of data reveals two shifts of the curve leftward from the curve of the late 1990s. The first one coincides with the dot-com bubble of the late 90s; the second can be identified after the 2001 downturn. Both shifts are likely to have been caused by reforms that have made the functioning of the labour market more efficient. The improvements have been significant: unemployment rates are about 2-3 pps.

lower for a given level of vacancies than in the mid 1990s. These results are consistent with analysis carried out by the OECD which suggests that actual unemployment now has a smaller impact on structural unemployment than in the mid 1990s. ([25])

The behaviour of the data in the latest six quarters up to 2009q2, which include the current recession, should be interpreted with caution given the small number of observations available. However, so far, it seems that we are observing changes along the curve rather than changes of the curve. Yet, it cannot be excluded that protracted sectoral shifts[26] may render the skills of some workers – particularly those formerly employed in industries with non-transferable skills – obsolete leading to skill mismatches. When job destruction is high and unemployment remains high, due to the process of sectoral reallocation described above, the human capital of the labour force deteriorates, which reinforces the skills' mismatch. An ensuing deterioration of the matching process would lead to shift rightward of the curve and to the risk of unemployment hysteresis. In the current environment, policies aimed at keeping people in employment and support the labour market attachment may have contributed to avoid wasteful labour shedding and a deterioration of skills.

Graph 17 - The Beveridge curve for the euro-area



Source: Survey of Business Statistics. Since data on vacancies are not available on a long time series, the variable from the Employers' survey "*Factors limiting production: Labour*" is used as proxy. The square symbols in black mark the quarters from 2008q1 to 2009q2.

[25] OECD (2009).

[26] The sectoral shift hypothesis of unemployment rate suggested by Lilien (1982) can be explained by different factors including labour and capital market imperfections that limit the possibility of moving resources between sectors and imperfect matching due to the lack of the skills of displaced workers who have to fill positions in new expanding sectors.

7. Labour supply: the risk of shrinking workforce

The massive unemployment inflows, which a recession usually brings about, can be harmful for the strength of the following recovery. If the large stock of new unemployed workers is not absorbed very quickly when the recovery becomes sustainably anchored, labour supply may be negatively affected, which may result in an obstacle to future growth. New unemployed workers may become long-term unemployed for many reasons. As a result of a recession, unemployed people become less effective in their search for a job, leading to more persistent unemployment. This may occur because the recession may influence either the efficiency with which information about vacancies is transmitted or the time and effort the unemployed devote to the job search. In particular, a prolonged period of weak labour demand may reduce the search effort of unemployed as discouragement arises after many not successful attempts of finding a job (the so-called "discouraged" worker effect). Unconditional and extremely generous unemployment benefits may create a moral hazard problem which reinforces the propensity of job-searcher to be highly selective with regard to a job offer and increase their reservation wage, that is the wage level at which they are willing to take up job offers.

At the same time, during recessions households' income can be heavily weakened by the risks of unemployment of the bread-winner (typically the man). This creates a negative wealth effect that induces other components of the household to put more effort in the job search to compensate for the expected loss in household income and smooth consumption. The "added" worker effect implies that in periods of high unemployment the labour supply of women increases, as the consumption smoothing motive prevails on factors, such as the low substitution of leisure time between the husband and the wife (for cultural reasons or lack of childcare services), that keeps women out of the labour market. Whether the 'discouraged worker' or the 'added worker' effect prevails in the recessions is an empirical question. Eichengreen and Hatton (1987) studied unemployment pattern in the US during the Great Depression and found that a married woman was more likely to work if her husband was an unemployed than if he was employed.

In the current recession, some signals of discouraged worker effects prevailing over added worker effects have started to emerge, albeit on a small scale. The increase in unemployment so far has been limited by a fall in the labour force for two consecutive quarters (-0.3% in the fourth quarter of 2008 and -0.5% in the first quarter of 2009).

While these findings could raise some concerns about the effects of the crisis on total labour supply, it must be kept in mind that reforms in many countries have strengthened the labour market attachment of most vulnerable groups. As a consequence, big reduction in the overall activity rate should not occur, implying that job losses are likely to be largely reflected in a higher unemployment rate. In addition, there is evidence that governments are not repeating the mistakes of past recessions in which early retirement schemes were introduced to reduce unemployment by shrinking the size of the labour supply.[27]

8. Wage developments

A slack labour market is generally accompanied by reduced wage pressures. In the face of prolonged period of weak demand, firms start to reduce their workforce. The resulting increase in the jobless rate, if not accompanied by a shrinking labour supply, will put

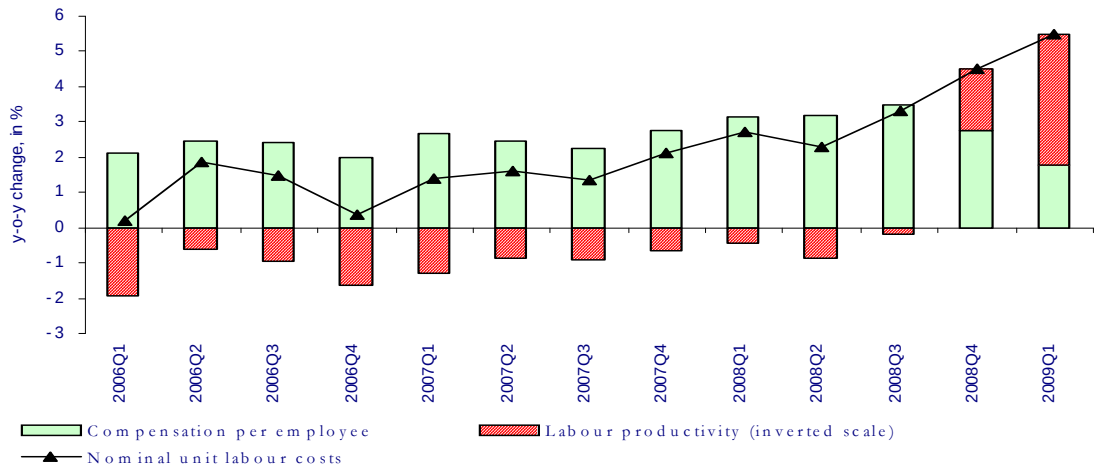
[27] See "The EU's response to support the real economy during the economic crisis", European Economy, Occasional Paper No. 51, 2009.

downward pressure on wages, especially where increase in unemployment is sizeable. Even so, unit labour costs may increase as firms hoard labour during the recession (i.e. the productivity growth declines) while wages are slow to react as they are not continuously negotiated. New negotiated wages incorporate the effects of the common aggregate demand shock as expired contracts are renegotiated. At this juncture, the capacity of wages to reflect changes in demand at the local and sectoral level will probably influence the shape of the recovery, in particular in countries where competitiveness is a constraint for economic growth. Public wages can play an important role in signalling appropriate wage developments for the private sector.

Graph 18 shows the growth of the nominal unit labour costs and of its components, compensation per employees and changes in labour productivity. Even though the compensation per employee slowed down since the end of 2008, the growth in the nominal unit labour costs rose as labour productivity was negatively affected by the labour hoarding. Graph 19 shows the growth of compensation per employee and of the negotiated wages for the euro area. After having achieved a growth rate of 3.5% in 2008q3, the compensation per employee slowed down considerably in the first half of 2009. Even so, nominal unit labour costs rose significantly to some 5.8%, a rate never seen since more than a decade, as labour productivity was negatively affected by labour hoarding.

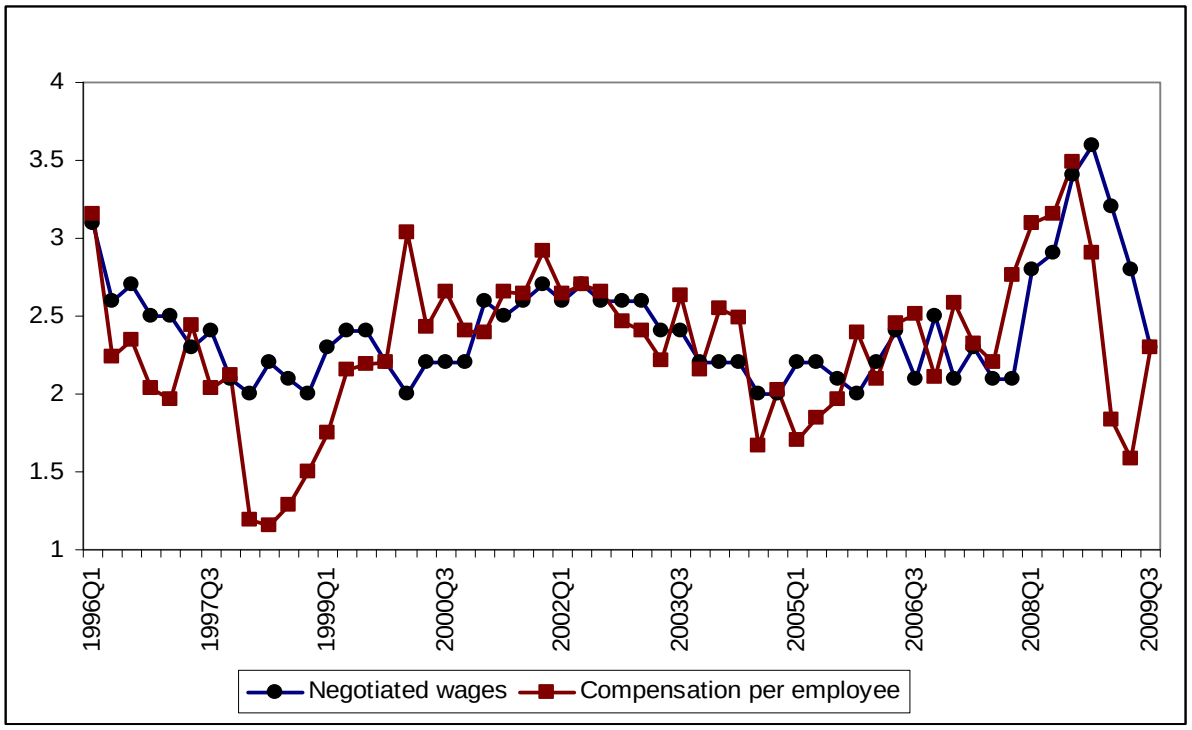
As suggested by Graph 19, the decline in compensation per employee has been almost entirely led by the fall in the variable component, which over-shooted to compensate for the relative invariance of negotiated wages. In fact, negotiated wages responded with a lag of one quarter, and only by the end of the year, as the weaknesses in the labour market started to become evident, the gap between the two wages started to close. Looking forward, the growth in unit labour costs in the EU and the Euro area is projected to be negative in 2009 and consistent with price stability in 2010.

Graph 18 – Nominal unit labour costs



Source: Authors' calculations.

Graph 19 - Negotiated wages and Compensation per employee



Source: Authors' calculations.

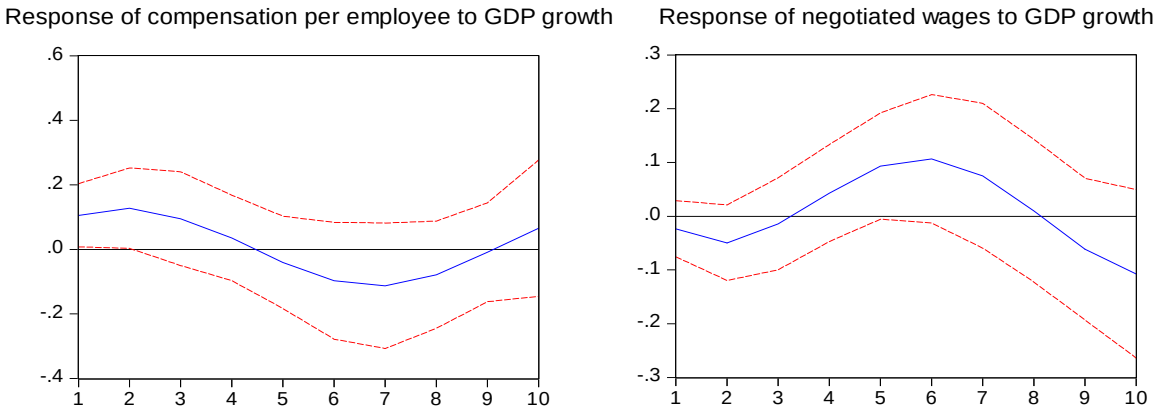
The relatively fast response of compensation per employee in the euro area during the current crisis is confirmed by an econometric exercise investigating how the compensation per employee and the negotiated wages fluctuate in response to an unexpected shock to GDP growth. The analysis is developed in a VAR framework, which allows taking into account the interdependencies between the variables (growth in compensation per employee, in negotiated wages and of GDP). We identify the response of wages assuming a contemporaneous causal structure, which implies that unexpected shock to GDP growth in one quarter influences only the variable component of compensation in the same quarter, while the negotiated wages changes only in the following quarters. Graph 21 gives, respectively, the response of compensation per employee and negotiated wages to an unexpected shock to GDP growth.

An unexpected positive shock to GDP growth triggers an adjustment mechanism where the variable component of wages adjusts in the same quarter, while negotiated wages respond with a lag of one quarter. The growth of compensation per employee rises by 0.1 pp. in the case of an unexpected increase in GDP growth by one standard deviation. The maximum effect is achieved after 2 quarters and dies out by the end of the year. After 4 quarters labour costs increase by about 0.4 pp. Conversely, the second graph shows that negotiated wages reacts with a lag of almost 4 quarters but its effect is not statistically significant. These findings are based on the period 1996q1-2009q4. Yet if 2008 and 2009 are excluded from the sample, it turns out that nominal wages do not change in response to unexpected GDP shock, which is consistent with the presence of nominal wage rigidities in the euro-area. Thus, although there has been a response of wages during the current crisis, this has been particularly exceptional if judged with the metric of the past historical experience.

Looking forward, the growth in the unit labour costs is expected to be more moderate as new negotiated wages start to incorporate the effect of the recession and productivity growth recovers as labour hoarding falls. Indeed, the decline in compensation per employee has been almost entirely led by the fall in the wage drift. As the economy recovers, it will be important that relative wages adjust to respond to productivity differentials and demand patterns at the local level. This is of particular importance for those Member States that need to improve their competitive position. Given the considerable downward wage rigidity recorded in the

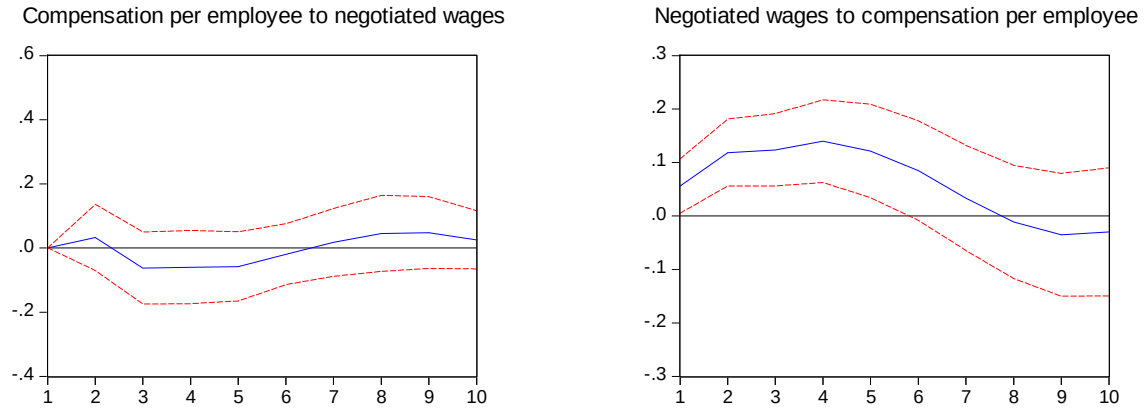
past crises, reforms of the wage bargaining system in this respect will be essential in a number of cases.

Graph 20 - Response of compensation per employee and negotiated wages to a shock to GDP growth in the Euro area



Source: Authors' calculations. Identification based on Cholesky decomposition with the order GDP growth, compensation per employee growth and negotiated wages growth; dotted line: one sd innovations ± 2se.

Graph 21 - Response of compensation per employee and negotiated wages to a shock hitting one of the two variables, assuming that negotiated wages respond to shock to GDP growth with a lag of one quarter



Source: Authors' calculations. Identification based on Cholesky decomposition with the order GDP growth, compensation per employee growth and negotiated wages growth; dotted line: one sd innovations ± 2se.

9. Conclusions

The global downturn has strongly affected the EU labour markets. Yet the increase in unemployment has been slow to materialise. The situation differs considerably across Member States, both in terms of labour market institutions and constraints on account of the fiscal situation and external competitiveness.

The effects on unemployment persistency and human capital can be important, especially where the adjustment requires a sectoral reallocation away from traditional declining sectors. Restructuring will be necessary in some cases and an increase in unemployment unavoidable. There might be a trade-off between less unemployment today and more redundancies at later stage, particularly if, as seen in past recessions, the recovery is uncertain and slow to materialise. To avoid negative effects on the quality of the labour input and of output potential, it is imperative to minimise the deterioration of skills.

At this juncture, the major risks concern the possibility that unemployed people become disenfranchised from the labour market and, thus, that high unemployment does not curb the

growth of real wages (i.e. becomes structural unemployment). Apart from being a constraint to the recovery in the short term, a decline in the labour supply may heavily affect the potential output. However, reforms in many countries have strengthened the labour market attachment of most vulnerable groups and a large reduction in the overall activity rate is less likely now than in the past. In addition, stricter eligibility conditions, uncertain labour market prospects for the main earner and considerable wealth losses created by the burst of various bubbles lead to negative wealth effects that induce other members of the household to put more effort into finding a job to compensate for the expected loss in household income and to smooth consumption. This 'added' worker effect means that, in periods of high unemployment, the labour supply of non-working spouses increases, as the consumption smoothing motive prevails over other factors, such as the low substitution of leisure time between husband and wife (for cultural reasons or lack of childcare services), that keeps women out of the labour market. There is evidence of added worker effects for the Great Depression (Eichengreen and Hatton 1987).

There are extensions to this analysis, which, we believe, of further interest. First, we provided evidence of heterogeneous impact of the crisis on different socioeconomic groups and countries. Further work should attempt to quantify in a multivariate framework the determinants of this differentiated performance. In doing so, one could take into account the role played by initial institutional and macroeconomic conditions, in particular as far as the configuration of labour market institutions and various imbalances prevailing before the crisis are concerned, and of workers' socio-demographic characteristics. Second, further work should try to identify the role played by crisis-related measures in the stabilisation of employment and unemployment. Third, further exploration of inflows and outflows rates would provide some insight on how labour market institutions have influenced the job creation and job destruction process during the crisis compared to the normal times. By identifying policies that are more needed for specific purposes (i.e. to enhance job finding or reduce job destruction), this analysis would help to devise a framework for the appropriate policy response to cyclical fluctuations.
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