FISCAL CONSOLIDATION IN REFORMED AND UNREFORMED LABOUR MARKETS

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This paper estimates the impact of fiscal consolidation on unemployment and job market flows across EU countries using a recent database of consolidation episodes built on the basis of a "narrative" approach (Devries et al.*, 2011). Results show that fiscal consolidation does have a significant impact on cyclical unemployment, although not large. As expected, the impact of fiscal policy shocks on job separation rates is much stronger in low-EPL countries, while high-EPL countries suffer from a stronger reduction in the rate at which new jobs are created. Since a reduced job-finding rate corresponds to a longer average duration of unemployment spells, fiscal policy shocks also tend to raise the share of long-term unemployment in high-EPL countries. Results are broadly confirmed when using "top-down" fiscal consolidation measures based on adjusting budgetary data for the cycle.*

1 Introduction

Since the outburst of the of the 2008 financial crisis, Europe is witnessing a worrying upsurge in unemployment and an unprecedented degree of dispersion of unemployment rates. The implementation of major and protracted fiscal consolidation strategies in such a context, and without prospects of a stable worldwide recovery, has stimulated debate on the growth and employment impact of consolidation measures, with implications for the coordination of timing and modalities of budgetary adjustment across EU countries (e.g., Corsetti, 2012).

Despite these concerns, a number of EU countries not only have recently put in place ambitious fiscal consolidation plans, but have also at the same time carried out major labour market reforms. In particular, the notoriously rigid and hard-to-reform Employment Protection legislation (EPL) systems of Southern European countries have been profoundly shaken with a view to stimulate job creation and tackle the problem of labour market segmentation at a juncture where severe budgetary cuts to reassure markets and put public finances on a sustainable footing where necessary.

Against this background, this paper aims at addressing a number of questions: to what extent continued fiscal consolidation across Europe would impact on unemployment? Which type of consolidation, expenditure or revenue-based, would be most employment-friendly? Does the impact of fiscal consolidation on unemployment come mostly from the job destruction side or does job creation play a relevant role as well? How do employment protection reforms interact with fiscal consolidation in determining unemployment and labour market flows? Are budgetary cuts more harmful when dismissals are less costly?

The analysis presented in this paper builds on various streams of existing literature. The literature on large episodes of fiscal consolidation focuses on the possible expansionary effects linked to the forward-looking behaviour of agents (e.g., Giavazzi and Pagano, 1990; Alesina *et al.*, 2002) and on the effectiveness of these episodes in durably improving the state of public finances (e.g., Alesina and Ardagna, 1998). Another stream of literature focuses on the estimation of fiscal

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I would like to thank David Leigh for guidance on the data and Alfonso Arpaia, Marco Buti and Lucio Pench for helpful discussions and suggestions.

The views expressed in this paper are those of the author and do not correspond necessarily with those of the European Commission.

multipliers. Most of the empirical literature based on structural VARs identifies fiscal shocks from a-priori information on the impact of the cycle on revenues and expenditures and generally find significantly positive multipliers, but seldom larger than one (e.g., Blanchard and Perotti, 2002; Perotti, 2005).

Analyses based on a "narrative", "action-based" approach to the identification of fiscal shocks, which requires a bottom-up computation of discretionary fiscal measures reported in official documents, also estimate significantly positive multipliers, but values are often large, well above unity (e.g., Romer and Romer, 2010; Guajardo *et al.*, 2011). Most empirical analyses on the impact of fiscal policy focus on output.

A few analyses look at the unemployment and labour market impact. Monacelli *et al.* (2010) develop a structural VAR for the US and estimate a negative and significant impact of government spending on unemployment and job creation, while job destruction falls.

The aim of this paper is to fill gaps in the existing literature in two main respects. First, it presents estimates of the impact of fiscal policy on unemployment and job market flows on EU countries: evidence is scarce for these countries. Second, it aims at shedding light on the interaction between fiscal consolidation and labour market regulation in driving labour market developments.

The baseline measure of fiscal consolidation used in the analysis is the action-based fiscal consolidation variable constructed in Devries *et al.* (2011), which present the double advantage of not including cyclical elements and being largely exogenous. As a countercheck, a "top-down" fiscal consolidation variable based on the cyclical adjustment of budgetary data is also used. The impact of fiscal consolidation is assessed on cyclical unemployment, on job separation and finding rates (hazard rates), and on the share of long-term unemployment. In light of limited sample size, econometric analysis spans the whole available panel of data for EU countries, but separate analysis is carried out for countries with a high vs. low degree of employment regulation.

Results confirm the finding that fiscal consolidation, notably government expenditure cuts have a significant impact on unemployment, although not large, and that this impact comes both from an increase in job destruction and a reduction in job creation. Interestingly, this unemployment impact does not differ much between high or low-EPL countries. There are considerable differences instead for what concerns job market flows, with fiscal consolidation in high-EPL countries having a less strong impact on job destruction but also leading to a more pronounced reduction in job finding rates.

The remainder of the paper is organised as follows. In the next section the data and the empirical strategy are illustrated. Section 3 presents results. The last section concludes with remarks on policy implications and suggestions for further analysis.

2 Data and empirical strategy

2.1 Data

The analysis focuses on EU countries and spans the 1980-2010 period, although lack of data availability for some countries and variables restricts the sample.

The baseline measure of fiscal consolidation is the "action-based" variable constructed in Devries *et al.* (2011). Data are collected over the period 1978-2009 for 17 OECD countries, 13 of which are EU countries (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden, the UK). This action-based consolidation variable contains bottom-up estimates of the amount of measures taken by the government during years where the overall objective of fiscal policy, as reported in official statements and documents, was that of

reducing the deficit and improving the state of public finances. If in a given year, in a given country, fiscal policy resulted in a reduction of the budget deficit and the reduction of the deficit, the variable reports the estimated amount of discretionary measures, separately for revenues and expenditures. In all other cases, the variable is set to zero, *i.e.*, there is no consolidation, either because the fiscal stance was expansionary or because fiscal contraction was mainly aimed at keeping under control domestic demand or at other purposes different than budgetary correction.

These "action-based" measures have a double advantage. First, they are not affected by the economic cycle, the reason being that their construction follows a bottom-up approach, *i.e.*, the amount of measures is computed by summing up estimates contained in official documents, so that cyclical movements in the budget are kept out from the start. Second, these consolidation measures are unlikely to imply risks of reverse causation because only the fiscal adjustment episodes ex-ante driven by the objective to adjust the budget are considered.

The analysis is complemented with the use of "top-down" fiscal consolidation measures. To this purpose, data on the change in the primary structural balance, structural revenues, primary structural expenditures from the DG ECFIN AMECO database are used, which are available for all EU countries (starting from 1995 only for countries having acceded the EU in 2004 or afterwards). Budgetary data are purged from the impact of the cycle and, for years after 2002, from one-off measures.

To address the issue of reverse causation, these top-down fiscal policy measures are instrumented using the variables normally used in the estimation of fiscal policy determinants by means of "fiscal reaction functions" (e.g., Bohn, 1998; Galí and Perotti, 2003). These variables are the own lag of the dependent variable, the lagged output gap, the lagged government/GDP ratio (the source for all instruments is the DG ECFIN AMECO database).

With a view to limit the analysis only to consolidation episodes all observations where the change in the instrumented fiscal balance is less than 0.5 per cent of GDP are set to zero. Hence, as in the case of the action-based fiscal variable measure, also this variable reports measures only in periods of fiscal consolidation that are unlikely to be related to the reaction of fiscal authorities to unemployment. The 0.5 per cent cut-off value for the instrumented change in the structural balance nets out minor consolidation episodes and permits to isolate a roughly equal number of consolidation episodes as those identified with the action-based approach over the sample period for the 13 EU countries for which data are available for both measures (120 action-based consolidation period, 117 top-down consolidation periods). The action-based and the top-down consolidation measures also exhibit a roughly similar average (respectively, 1.2 per cent of GDP and 0.8 per cent of GDP, respectively) and a rather high (0.38), statistically significantly rank correlation.

As for unemployment, the baseline variable used is the cyclical unemployment, as obtained from the difference between the overall unemployment rate and the NAWRU (source: AMECO database). The data are available for all EU27, but only starting from 1995 for countries that acceded the EU in 2004 or after. By dealing with cyclical unemployment, the risk of panel non stationarity is reduced, so that the complications linked to panel cointegration analysis are avoided. The underlying assumption is that, any impact of consolidation on unemployment is mostly arising from variations in cyclical unemployment.

Regarding data on job separation and job finding rates (hazard rates), the have been constructed as described in Arpaia and Curci (2010), following the methodology proposed by Shimer (2007). Data on job flows are available for all EU27 countries but for shorter time series compared with cyclical unemployment (going back to 1997 at the earliest). Data on the share of long-term unemployment on overall unemployment are taken from Eurostat, are available for all EU27 countries, and are available starting from 1992 at the earliest.

Figure 1 displays *prima facie* evidence of the link between cyclical unemployment and fiscal consolidation. Figure 1a reports for each country the action-based fiscal variable and cyclical unemployment figures. It appears that cyclical unemployment was quite often relatively high during the periods where fiscal consolidations took place. Figure 1b confirms this finding in a scatterplot that exhibits a positive, although weak relation between consolidation and cyclical unemployment across the panel. Of course, this prima-facie evidence does not imply causation but is suggestive of a possible link running from fiscal policy to unemployment outcomes.

2.2 Empirical strategy

The baseline regression framework used in the analysis of cyclical unemployment is as follows:

$$u_{i,t} = \alpha u_{i,t-1} + \beta u_{i,t-2} + \gamma FC_{i,t} + \theta_i + \eta_t + \varepsilon_{i,t} \quad (1)$$

where i, t denote country and year respectively, u is cyclical unemployment, FC is a consolidation variable, θ and η are, respectively, country and year fixed effects, while ε is a standard white noise error.

The specification amounts to an augmented AR2 model, which is motivated in light of broadly regular oscillations of cyclical unemployment around the mean (zero) over large samples.

In (1), the use of the simultaneous fiscal policy variable is justified in the case of action-based variables due to low risk of endogeneity and associated reverse causation problems. The top-down fiscal policy variables are instead instrumented to address the simultaneity issue.

The modelling of the impact of fiscal policy on other labour market variables is analogous to (1) except that, for the case of job market flows (hazard rates) and share of long-term unemployment, the second autoregressive term is dropped (being largely insignificant).

Equation (1) is estimated by means of panel fixed effect estimation (least square dummy variables) with robust standard errors for the case of action-based consolidation measures. For top-down measures, estimation is performed in two stages: first, the instrumenting regressions are run and the prediction obtained is "trimmed" in such a way to set to zero all observations corresponding to improvement in the instrumented primary structural balance below 0.5 per cent of GDP; second, panel regressions are run using the instrumented and trimmed consolidation variable.

With a view to shed light on the interaction between fiscal policy and labour market regulation, regressions are run separately for high and low EPL countries. The break down of countries is perfomed in the most straightforward way: countries with high (low) EPL are assumed to be those with an average value over the sample period of the OECD overall EPL indicator above the median of such averages across the whole panel of EU27 countries.

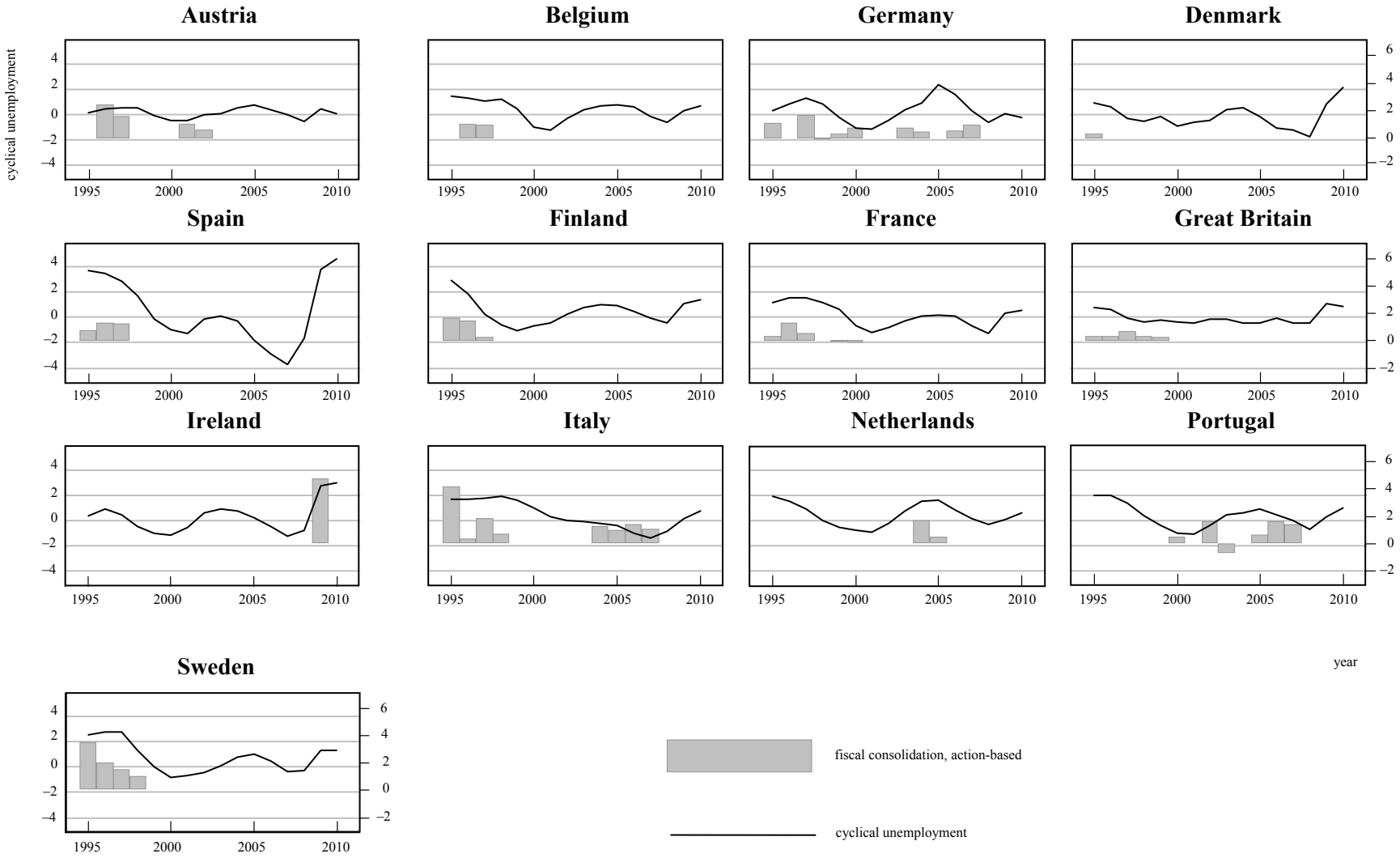
3 Results

3.1 Fiscal consolidation and unemployment

Table 1 reports results concerning the estimated impact of fiscal policy (action-based) on cyclical unemployment. The unemployment impact multiplier of the overall budgetary consolidation variable is positive but not large, amounting to less than 1/10 of a percentage point of unemployment for each GDP point of consolidation. While the impact of government revenue is non-significant, that of government expenditure is negative and higher in absolute value and of a higher order of significance that that for the overall budget balance.

Figure 1a

Cyclical Unemployment and Fiscal Consolidations (Action-based), 13 EU Countries, 1995-2009



Due to the auto-regressive process of unemployment, the peak multiplier is above the impact multiplier, as the adjustment of unemployment to the fiscal shock takes time. As shown in Figure 2, the peak effect materializes after one year (reaching almost 0.1 per cent for the overall budget and about –0.18 for expenditure cuts) and decays to zero after about 5 years. Afterwards, cyclical unemployment tends gradually to revert to pre-shock levels due to its stationarity properties. The overall impact of fiscal policy on unemployment has to take into account the sum of effects (overall multiplier).

The unemployment impact of fiscal consolidation is similar if measured according to top-down variables and notwithstanding the sample used in this case comprises a larger number of countries (Table 2).

The impact of consolidation takes similar values also if measured on the overall unemployment rate rather than on cyclical unemployment (Table 3), with the exception of revenues, whose coefficient is in this case positive, even if non-significant. This result reassures for what concerns the use of cyclical unemployment as baseline variable, and

Figure 1b

Relation Between Consolidation and Cyclical Unemployment

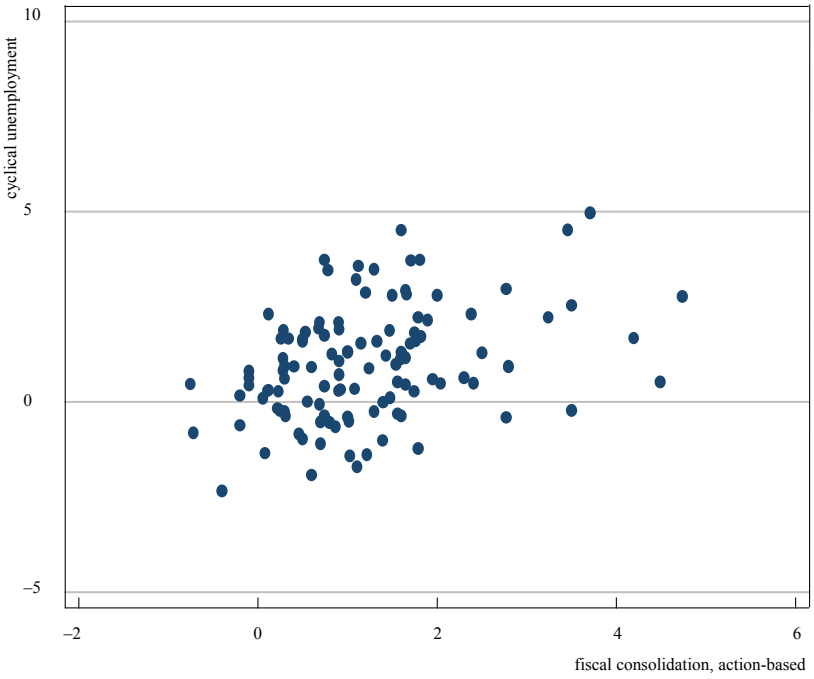


Figure 2

Fiscal Consolidation Impact on Cyclical Unemployment. Impulse Response Function

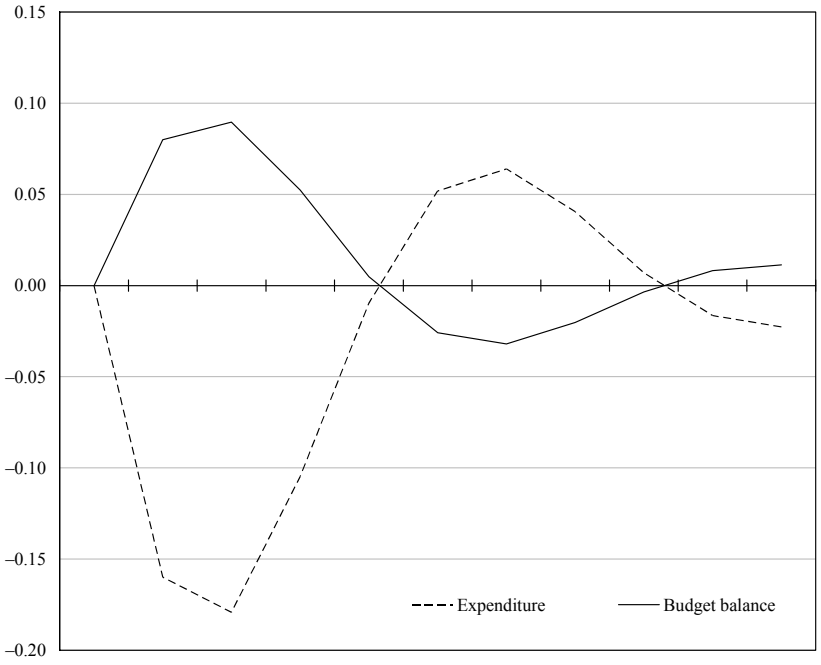


Table 1

**Impact of Consolidation on Cyclical Unemployment,
Action-based Fiscal Policy Variables – 13 Countries EU, 1980-2009**

Dependent Variable: Cyclical Unemployment	**(1)**	**(3)**	**(3)**
	Budget Balance, Action-based	**Revenue, Action-based**	**Expenditure, Action-based**
Explanatory variables:			
Cyclical unemployment (1 lag)	1.206 *(17.87)***	1.22 *(18.09)***	1.194 *(17.57)***
Cyclical unemployment (2 lags)	–0.609 *(7.50)***	–0.611 *(7.46)***	–0.607 *(7.56)***
Fiscal policy variable	0.08 *(1.65)*+	0.018 *(0.20)*	–0.16 *(2.35)**
Constant	0.307 *(1.58)*	–0.236 *(2.30)**	0.303 *(1.58)*
Observations	353	353	353
Number of countries	13	13	13
R^2	0.86	0.86	0.87

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method. fixed effect panel OLS, standard errors robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda:
Budget balance, action-based: year-on-year change in government budget balance associated with fiscal consolidation measures (source: Devries *et al.*, 2011).
Revenue, action-based: year-on-year change in government revenues associated with fiscal consolidation measures on the revenue side (source: Devries *et al.*, 2011).
Expenditure, action-based: year-on-year change in government expenditure associated with fiscal consolidation measures on the expenditure side (source: Devries *et al.*, 2011).

indicates that most of the effect of fiscal policy on unemployment falls on the cyclical component of the unemployment, with relatively minor implications for the NAWRU.[1]

Turning to the impact of fiscal policy on job market flows (Tables 4-7), it turns out that, in line with expectations, fiscal consolidation has a positive and significant impact on separation rates. Action-based consolidation measures have all significant coefficients, while in the case of top-down measures the coefficient of revenues lacks significance. Results are also broadly in line with expectation for what concerns job finding rates. In this case regression coefficients do not reach significance levels but the signs of the coefficients of all variables indicate a negative impact of consolidation on job finding rates, irrespective how consolidation is measured. Moreover, *t*-statistics take all values between 1 and 1.5, not far from cut off values for statistical significance at 10 per cent level.

Results concerning the impact of fiscal consolidation on the share of long-term unemployment do not lend themselves to an obvious interpretation. While the impact appears to be largely insignificant using action-based variables, top-down consolidation variables yield a

[1] These conclusions are, however, to be taken with caution in light of the risk of inconsistent estimates in Table 3 arising from the likely non-stationarity of the unemployment rate, revealed, *inter alia*, by the high first-order auto-regressive coefficient.

Table 2

Impact of Consolidation on Cyclical Unemployment,
"Top-down" Fiscal Policy Variables – EU27, 1980-2010

Dependent Variable: Cyclical Unemployment	(1) Change in Structural Balance	(2) Change in Structural Revenue	(3) Change in Structural Primary Expenditure
Explanatory variables			
Cyclical unemployment (1 lag)	1.098 *(15.41)***	1.094 *(15.47)***	1.063 *(15.01)***
Cyclical unemployment (2 lags)	–0.491 *(6.11)***	–0.485 *(6.11)***	–0.458 *(5.64)***
Fiscal policy variable	0.142 *(1.61)*	–0.037 *(0.88)*	–0.138 *(2.28)**
Constant	–0.355 *(2.96)***	–0.289 *(2.38)**	–0.31 *(2.43)**
Observations	546	547	548
Number of countries	27	27	27
R^2	0.75	0.75	0.74

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel instrumental variables (the fiscal policy variable is instrumented with its own lag, the lagged output gap, and the lagged government debt/GDP ratio). Standard errors are robust with respect to heteroschedasticity and non-independence within country clusters.

Legenda:
Change in structural balance =year-on-year change in cyclically-adjusted government budget balance, information on one-off measures netted out when available (source: ECFIN AMECO database)
Change in structural revenue = year-on-year change in cyclically-adjusted government revenues, information on one-off measures netted out when available (source: ECFIN AMECO database).
Change in structural expenditure= year-on-year change in cyclically-adjusted government primary expenditure, information on one-off measures netted out when available (source: ECFIN AMECO database).
Consolidation episodes: change in instrumented structural balance > 0.5 % GDP.

significant negative impact for revenue increases, while the effect of expenditure cuts is positive. *A priori*, there is no clear expectation on the impact effect of fiscal consolidation on the share of long-term unemployment. On the one hand, since fiscal policy retrenchment implies more job dismissals, the increase of unemployment inflows would lead to a reduction of the share of long-term unemployment. On the other hand, the reduction of job finding rates linked to fiscal consolidation would play in the opposite sense: longer spells into unemployment for those already jobless, and a consequent in crease the long-term unemployment share. In light of these opposite effects, I find no surprising that results are non-significant or ambiguous in this case.

3.2 The role of employment regulations

The next step in the analysis aims at estimating separately the impact of consolidation on unemployment for high and low EPL countries, with a view to assess the interplay between the unemployment effects of fiscal policy and the role of labour market regulations.

Table 3

Impact of Consolidation on Unemployment, Action-based Fiscal Policy Variables – 13 Countries EU, 1980-2009

Dependent Variable: Unemployment Rate	(1) Budget Balance, Action-based	(3) Revenue, Action-based	(3) Expenditure, Action-based
Explanatory variables:			
Unemployment (1 lag)	1.459 *(19.94)***	1.481 *(20.14)***	1.457 *(20.27)***
Unemployment (2 lags)	–0.589 *(7.80)***	–0.603 *(7.90)***	–0.589 *(7.92)***
Fiscal policy variable	0.129 *(1.87)*+	0.145 *(1.20)*	–0.179 *(1.65)*+
Constant	0.97 *(5.05)***	0.928 *(4.73)***	0.987 *(5.11)***
Observations	353	353	353
Number of countries	13	13	13
R^2	0.93	0.93	0.93

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method. fixed effect panel OLS, standard errors robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda:
Budget balance, action-based: year-on-year change in government budget balance associated with fiscal consolidation measures (source: Devries *et al.*, 2011).
Revenue, action-based: year-on-year change in government revenues associated with fiscal consolidation measures on the revenue side (source: Devries *et al.*, 2011).
Expenditure, action-based: year-on-year change in government expenditure associated with fiscal consolidation measures on the expenditure side (source: Devries *et al.*, 2011).

Table 4

Impact of Consolidations on Job Separation Rates, Action-based Fiscal Policy Variables – 13 EU, 1997-2009

Dependent Variable: Job Separation Rates	(1) Budget Balance Action-based	(2) Revenue Action-based	(3) Expenditure Action-based
Explanatory variables:			
Job separation rate (1 lag)	0.778 *(8.24)***	0.783 *(8.31)***	0.776 *(8.16)***
Fiscal policy variable	0.03 *(2.54)**	0.054 *(2.39)**	–0.046 *(1.81)*+
Constant	–0.141 *(0.57)*	–0.145 *(0.59)*	–0.14 *(0.57)*
Observations	115	115	115
Number of countries	13	13	13
R^2	0.72	0.72	0.72

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel OLS, standard errors robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: See footnotes to Table 1.

Table 5

Impact of Discretionary Fiscal Policy on Job Separation Rates,
"Top-down" Fiscal Policy Variables – EU27, 1997-2010

Dependent Variable: Job Separation Rates	(1) Change in Structural Balance	(2) Change in Structural Revenue	(3) Change in Structural Primary Expenditure
Explanatory variables:			
Job separation rate (1 lag)	0.78 *(11.27)***	0.782 *(11.23)***	0.783 *(11.34)***
Fiscal policy variable	0.041 *(2.44)**	–0.021 *(0.80)*	–0.014 *(0.94)*
Constant	0.119 *(1.19)*	0.152 *(1.54)*	0.139 *(1.46)*
Observations Number of countries R^2	225 27 0.68	225 27 0.67	225 27 0.67

+, **, *** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel instrumental variables (the fiscal policy variable is instrumented with its own lag, the lagged output gap, and the lagged government debt/GDP ratio). Standard errors are robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: See footnotes to Table 2.

Table 6

Impact of Consolidations on Job Finding Rates
Action-based Fiscal Policy Variables – 13 EU, 1997-2009

Dependent Variable: Job Finding Rates	(1) Budget Balance Action-based	(2) Revenue Action-based	(3) Expenditure Action-based
Explanatory variables:			
Job finding rate (1 lag)	0.718 *(5.80)***	0.718 *(5.79)***	0.72 *(5.85)***
Fiscal policy variable	–0.305 *(1.45)*	–0.516 *(1.57)*	0.523 *(1.46)*
Constant	3.645 *(1.30)*	3.646 *(1.30)*	3.631 *(1.30)*
Observations Number of countries R^2	115 13 0.59	115 13 0.59	115 13 0.59

+, **, *** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel OLS, standard errors robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: See footnotes to Table 1.

Table 7

Impact of Consolidations on Job Finding Rates
"Top-down" Fiscal Policy Variables – EU27, 1997-2010

Dependent Variable: Job Finding Rates	(1) Change in Structural Balance	(2) Change in Structural Revenue	(3) Change in Structural Primary Expenditure
Explanatory variables:			
Job finding rate (1 lag)	0.665 *(6.31)***	0.666 *(6.24)***	0.661 *(6.22)***
Fiscal policy variable	–0.243 *(1.26)*	–0.262 *(1.00)*	0.148 *(1.13)*
Constant	3.271 *(3.80)***	3.382 *(4.04)***	3.142 *(3.64)***
Observations	229	229	229
Number of countries	27	27	27
R^2	0.52	0.52	0.52

+, **, *** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method. Columns: fixed effect panel instrumental variables (the fiscal policy variable is instrumented with its own lag, the lagged output gap, and the lagged government debt/GDP ratio). Standard errors are robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: See footnotes to Table 2.

Table 8

Impact of Consolidations on the Share of Long-term Unemployment,
Action-based Fiscal Policy Variables – 13 EU Countries, 1992-2009

Dependent Variable: Long-term Unemployment Share	(1) Budget Balance Action-based	(2) Revenue Action-based	(3) Expenditure Action-based
Explanatory variables:			
Long-term unemployment share (1 lag)	0.798 *(20.56)***	0.798 *(20.58)***	0.798 *(20.63)***
Fiscal policy variable	0.037 *(0.10)*	–0.001 *(0.00)*	0.107 *(0.18)*
Constant	10.193 *(5.10)***	10.247 *(5.12)***	10.175 *(5.20)***
Observations	206	206	206
Number of countries	13	13	13
R^2	0.86	0.86	0.86

+, **, *** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel OLS, standard errors robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: See footnotes to Table 1.

Table 9

Impact of Consolidations on the Share of Long-term Unemployment, "Top-down" Fiscal Policy Variables – EU27, 1992-2010

Dependent Variable: Long-term Unemployment Share	(1) Change in Structural Balance	(2) Change in Structural Revenue	(3) Change in Structural Primary Expenditure
Explanatory variables:			
Long-term unemployment share (1 lag)	0.686 *(16.50)***	0.689 *(16.38)***	0.684 *(16.37)***
Fiscal policy variable	–0.707 *(1.34)*	–0.783 *(1.95)*+	–0.382 *(1.06)*
Constant	15.485 *(6.85)***	16.558 *(7.95)***	16.333 *(7.71)***
Observations	368	368	368
Number of countries	27	27	27
R^2	0.7	0.7	0.7

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method. Columns: fixed effect panel instrumental variables (the fiscal policy variable is instrumented with its own lag, the lagged output gap, and the lagged government debt/GDP ratio). Standard errors are robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: See footnotes to Table 2.

Tables 10 and 11 report results for the impact on cyclical unemployment. When running the analysis separately for high-EPL and low-EPL countries, it is found that fiscal consolidations have a somehow larger effect in regulated labour markets, even though, most probably in light of the reduction in sample size, the estimated fiscal policy effect is not anymore significant when the sample is split according to EPL.

The result that fiscal consolidation is not less harmful in more regulated labour markets runs against the intuition. The explanation could lie in the different behaviour of job creation and job destruction. It is well-known from existing theory and evidence that strict EPL is associated with lower exit rates from unemployment but also with a lower probability for the unemployed to find a new job (Mortensen and Pissarides, 1994; Gomez-Salvador *et al.*, 2004). It could be the case that in high-EPL countries fiscal policy shocks destroy less jobs but also lead to a stronger reduction in the rate at which new jobs are created, with a possibly overall strong effect on cyclical unemployment.

The estimation of the impact of fiscal consolidation on job market flows separately for high and low-EPL countries supports the above hypothesis. As shown in Tables 12 and 13, job separation rates rise significantly with fiscal retrenchments only in low-EPL countries. The result is particularly neat using action-based consolidation measures: discretionary changes in the overall budget balance, government revenue, government expenditure are all insignificant in high-EPL countries while they are largely significant and with the expected sign in low-EPL countries. Conversely, job separation rates appear to react mostly in high-EPL countries (Tables 14 and 15). The change in the overall balance leads to a significant reduction in job finding rates only in high-EPL countries, irrespective of the measurement of fiscal policy. The estimates using the action-based variable reveal that this is mostly the outcome of a different reaction of job finding rates to expenditure cuts: only in high-EPL countries the reduction of government expenditure and the associated fall in aggregate demand leads to a significant impact on hiring and job finding rates.

Table 10

Impact of Consolidations on Cyclical Unemployment by EPL Strictness, Action-based Fiscal Policy Variables – 13 EU Countries, 1980-2009

Dependent Variable: Cyclical Unemployment	(1)	(2)	(3)	(4)	(5)	(6)
	Budget Balance, Action-based		Revenue, Action-based		Expenditure, Action-based	
	Low EPL	High EPL	Low EPL	High EPL	Low EPL	High EPL
Explanatory variables:						
Cyclical unemployment (1 lag)	1.206 *(19.70)***	1.216 *(14.40)***	1.224 *(20.16)***	1.22 *(14.27)***	1.19 *(19.39)***	1.198 *(14.27)***
Cyclical unemployment (2 lags)	–0.62 *(10.27)***	–0.614 *(7.26)***	–0.628 *(10.33)***	–0.601 *(6.98)***	–0.619 *(10.37)***	–0.603 *(7.24)***
Fiscal policy variable	0.069 *(1.61)*	0.127 *(1.53)*	0.008 *(0.10)*	–0.014 *(0.09)*	–0.148 *(2.34)**	–0.273 *(2.31)**
Constant	0.427 *(2.13)**	–0.072 *(0.28)*	0.475 *(2.35)**	–0.049 *(0.19)*	0.427 *(2.17)**	–0.276 *(1.08)*
Observations	196	157	196	157	196	157
Number of countries	7	6	7	6	7	6
R^2	0.86	0.89	0.86	0.89	0.87	0.89

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel OLS, standard errors robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: Fiscal variables: see footnote to Table 1. The grouping of countries with respect to the OECD overall EPL indicator is built on the basis of the median country-specific average value of the indicator over the sample period.

Table 11

Impact of Consolidations on Cyclical Unemployment by EPL Strictness, "Top-down" Fiscal Policy Variables – 21 EU Countries, 1980-2010

Dependent Variable: Cyclical Unemployment	(7)	(8)	(9)	(10)	(11)	(12)
	Change in Structural Balance		Change in Structural Revenues		Change in Structural Primary Expenditures	
	Low EPL	High EPL	Low EPL	High EPL	Low EPL	High EPL
Explanatory variables:						
Cyclical unemployment (1 lag)	1.168 *(18.32)***	1.211 *(10.17)***	1.163 *(18.42)***	1.193 *(10.28)***	1.162 *(18.34)***	1.199 *(10.38)***
Cyclical unemployment (2 lags)	–0.595 *(9.53)***	–0.59 *(4.21)***	–0.596 *(9.60)***	–0.576 *(4.21)***	–0.598 *(9.77)***	–0.591 *(4.31)***
Fiscal policy variable	0.04 *(0.59)*	0.076 *(0.88)*	–0.077 *(1.17)*	–0.081 *(1.44)*	–0.116 *(2.26)**	–0.133 *(2.07)**
Constant	0.518 *(3.37)***	–0.28 *(2.11)**	0.541 *(3.43)***	–0.223 *(1.56)*	0.61 *(2.98)***	–0.216 *(1.53)*
Observations	243	233	243	233	243	233
Number of countries	11	10	11	10	11	10
R^2	0.83	0.82	0.83	0.82	0.83	0.82

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method. Columns: fixed effect panel instrumental variables (the fiscal policy variable is instrumented with its own lag, the lagged output gap, and the lagged government debt/GDP ratio). Standard errors are robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: Fiscal variables: see footnote to Table 2. The grouping of countries with respect to the OECD overall EPL indicator is built on the basis of the median country-specific average value of the indicator over the sample period.

Table 12

Impact of Consolidations on Job Separation Rates, Distinguishing by EPL Strictness, Action-based Fiscal Policy Variables – 13 EU Countries, 1997-2009

Dependent Variable: Job Separation Rates	(1)	(2)	(3)	(4)	(5)	(6)
	Budget Balance Action-based		Revenue Action-based		Expenditure Action-based	
	Low EPL	High EPL	Low EPL	High EPL	Low EPL	High EPL
Explanatory variables:						
Separation rate (1 lag)	0.233	0.825	0.268	0.827	0.262	0.825
	(1.07)	*(6.65)***	*(1.28)*	*(6.66)***	*(1.20)*	*(6.81)***
Fiscal policy variable	0.065	–0.027	0.12	–0.023	–0.105	0.088
	*(3.75)***	*(0.48)*	*(3.82)***	*(0.27)*	*(3.17)***	*(0.80)*
Constant	0.641	0.058	0.62	0.059	0.618	0.057
	*(3.97)***	*(0.65)*	*(3.96)***	*(0.64)*	*(3.78)***	*(0.65)*
Observations	63	52	63	52	63	52
Number of countries	7	6	7	6	7	6
R^2	0.61	0.83	0.6	0.83	0.59	0.83

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel OLS, standard errors robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: Fiscal variables: see footnote to Table 1. The grouping of countries with respect to the OECD overall EPL indicator is built on the basis of the median country-specific average value of the indicator over the sample period.

Table 13

Impact of Consolidations on Job Separation Rates, Distinguishing by EPL Strictness, "Top-down" Fiscal Policy Variables – 21 EU Countries, 1997-2009

Dependent Variable: Job Separation Rates	(1)	(2)	(3)	(4)	(5)	(6)
	Change in Structural Balance		Change in Structural Revenue		Change in Structural Expenditure	
	Low EPL	High EPL	Low EPL	High EPL	Low EPL	High EPL
Explanatory variables:						
Separation rate (1 lag)	0.652	0.776	0.705	0.761	0.694	0.78
	*(6.51)***	*(7.56)***	*(6.84)***	*(7.64)***	*(6.82)***	*(8.08)***
Fiscal policy variable	0.06	–0.026	0.013	–0.064	–0.02	–0.011
	*(3.54)***	*(0.48)*	*(0.43)*	*(1.27)*	*(0.92)*	*(0.48)*
Constant	0.15	–0.142	0.123	0.145	0.123	–0.157
	(1.68)+	*(0.56)*	*(1.31)*	*(1.25)*	*(1.36)*	*(0.63)*
Observations	102	83	102	83	102	83
Number of countries	11	10	11	10	11	10
R^2	0.67	0.75	0.65	0.76	0.65	0.75

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel instrumental variables (the fiscal policy variable is instrumented with its own lag, the lagged output gap, and the lagged government debt/GDP ratio). Standard errors are robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: Fiscal variables: see footnote to Table 2. The grouping of countries with respect to the OECD overall EPL indicator is built on the basis of the median country-specific average value of the indicator over the sample period.

Table 14

Impact of Consolidations on Job Finding Rates, Distinguishing by EPL Strictness, Action-based Fiscal Policy Variables – 13 EU Countries, 1997-2009

Dependent Variable: Job Finding Rates	(1)	(2)	(3)	(4)	(5)	(6)
	Budget Balance Action-based		Revenue Action-based		Expenditure Action-based	
	Low EPL	High EPL	Low EPL	High EPL	Low EPL	High EPL
Explanatory variables:						
Finding rate (1 lag)	0.837 *(4.61)***	0.659 *(4.34)***	0.841 *(4.69)***	0.671 *(4.36)***	0.835 *(4.61)***	0.655 *(4.40)***
Fiscal policy variable	–0.146 *(0.67)*	–1.663 *(1.96)*$^{+}$	–0.173 *(0.44)*	–1.761 *(1.52)*	0.338 *(0.82)*	4.292 *(2.26)**
Constant	0.189 *(0.07)*	3.315 *(2.45)**	0.088 *(0.03)*	3.285 *(2.36)**	0.231 *(0.09)*	3.73 *(1.35)*
Observations	63	52	63	52	63	52
Number of countries	7	6	7	6	7	6
R^2	0.58	0.68	0.58	0.67	0.58	0.68

$^{+}$, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel OLS, standard errors robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: Fiscal variables: see footnote to Table 1. The grouping of countries with respect to the OECD overall EPL indicator is built on the basis of the median country-specific average value of the indicator over the sample period.

Table 15

Impact of Consolidations on Job Finding Rates, Distinguishing by EPL Strictness, "Top-down" Fiscal Policy Variables – 21 EU Countries, 1997-2010

Dependent Variable: Job Finding Rates	(1)	(2)	(3)	(4)	(5)	(6)
	Change in Structural Balance		Change in Structural Revenue		Change in Structural Expenditure	
	Low EPL	High EPL	Low EPL	High EPL	Low EPL	High EPL
Explanatory variables:						
Finding rate (1 lag)	0.825 *(5.86)***	0.618 *(3.94)***	0.83 *(5.93)***	0.639 *(4.01)***	0.829 *(5.95)***	0.636 *(4.04)***
Fiscal policy variable	0.112 *(0.56)*	–1.286 *(1.86)*$^{+}$	–0.095 *(0.22)*	–0.257 *(0.48)*	0.135 *(0.59)*	0.419 *(1.28)*
Constant	0.123 *(0.08)*	4.473 *(1.57)*	0.064 *(0.04)*	3.512 *(2.38)**	1.636 *(1.21)*	2.908 *(2.24)**
Observations	102	85	102	85	102	85
Number of countries	11	10	11	10	11	10
R^2	0.59	0.58	0.59	0.56	0.59	0.56

$^{+}$, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel instrumental variables (the fiscal policy variable is instrumented with its own lag, the lagged output gap, and the lagged government debt/GDP ratio). Standard errors are robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: Fiscal variables: see footnote to Table 2. The grouping of countries with respect to the OECD overall EPL indicator is built on the basis of the median country-specific average value of the indicator over the sample period.

Table 16

Impact of Consolidations on the Share of Long-term Unemployment, Distinguishing by EPL Strictness EU27, Action-based Fiscal Policy Variables – 13 EU Countries, 1992-2009

Dependent Variable: Long-term Unemployment Share	(1)	(2)	(3)	(4)	(5)	(6)
	Budget Balance Action-based		Revenue Action-based		Expenditure Action-based	
	Low EPL	High EPL	Low EPL	High EPL	Low EPL	High EPL
Explanatory variables:						
Long-term unemployment share (1 lag)	0.758 *(12.08)***	0.789 *(13.94)***	0.779 *(13.28)***	0.811 *(14.56)***	0.746 *(11.47)***	0.78 *(13.46)***
Fiscal policy variable	–0.512 *(1.14)*	1.422 *(1.80)*+	–0.528 *(0.69)*	1.249 *(1.01)*	1.098 *(1.35)*	–2.262 *(1.81)*+
Constant	8.839 *(4.23)***	6.978 *(2.28)**	3.59 *(1.78)*+	12.345 *(4.30)***	9.189 *(4.29)***	7.451 *(2.38)**
Observations	110	96	110	96	110	96
Number of countries	7	6	7	6	7	6
R^2	0.89	0.86	0.89	0.85	0.89	0.86

+, **, *** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel OLS, standard errors robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: Fiscal variables: see footnote to Table 1. The grouping of countries with respect to the OECD overall EPL indicator is built on the basis of the median country-specific average value of the indicator over the sample period.

The fact that job market flows react differently to fiscal consolidation according to the EPL regime helps disentangling the impact of fiscal retrenchment on the share of long-term unemployment. Since a reduced job finding rate corresponds to a longer average duration of unemployment spells, one would expect that fiscal policy shocks also tend to raise the share of long-term unemployment in high-EPL countries. The evidence reported in Tables 16 and 17 supports this expectation. While, as discussed above, over the whole available sample fiscal consolidation does not exhibit a significant relation with the share of long-term unemployment, when separating countries according to EPL, a pattern emerges: the effect is more strongly positive in high-EPL countries.

4 Concluding remarks

Overall, the evidence confirms that fiscal consolidation does have a significant impact on cyclical unemployment, which peaks after one year and gradually fades away. Results indicate however that the impact of budgetary consolidation is rather moderate (less than 0.1 per cent of additional cyclical unemployment at peak for each GDP point of budgetary cuts) and significant only for measures on the expenditure side.

Results also show that while fiscal consolidation in regulated labour markets is not necessarily less harmful in terms of unemployment, there are well-grounded reasons to expect it to be more worrying in terms of unemployment composition, being high EPL associated with a stronger reduction in job creation and a higher incidence of long-term unemployment. In these

Table 17

Impact of Consolidations on the Share of Long-term Unemployment, Distinguishing by EPL Strictness, "Top-down" Fiscal Policy Variables – 21 EU Countries, 1992-2010

Dependent Variable: Long-term Unemployment Share	(1)	(2)	(3)	(4)	(5)	(6)
	Change in Structural Balance		Change in Structural Revenue		Change in Structural Expenditure	
	Low EPL	High EPL	Low EPL	High EPL	Low EPL	High EPL
Explanatory variables:						
Long-term unemployment share (1 lag)	0.71 *(14.30)***	0.695 *(9.13)***	0.723 *(14.06)***	0.707 *(9.31)***	0.721 *(13.85)***	0.691 *(9.31)***
Fiscal policy variable	–1.365 *(1.93)*+	–0.307 *(0.38)*	–0.262 *(0.44)*	–0.945 *(1.93)*+	0.096 *(0.21)*	–0.412 *(0.65)*
Constant	17.036 *(5.20)***	15.756 *(4.17)***	16.046 *(5.01)***	15.132 *(4.02)***	15.966 *(4.78)***	16.167 *(5.02)***
Observations	155	153	155	153	155	153
Number of countries	11	10	11	10	11	10
R^2	0.82	0.68	0.81	0.68	0.81	0.68

+, **, ** denote statistical significance at the 10, 5, 1 per cent level respectively. *T*-tests are reported in square brackets.
Specification. All regressions include country and year fixed effects.
Estimation method: fixed effect panel instrumental variables (the fiscal policy variable is instrumented with its own lag, the lagged output gap, and the lagged government debt/GDP ratio). Standard errors are robust with respect to heteroschedasticity and non-independence within country clusters.
Legenda: Fiscal variables: see footnote to Table 2. The grouping of countries with respect to the OECD overall EPL indicator is built on the basis of the median country-specific average value of the indicator over the sample period.

respects, the findings bode well for the strategy recently followed by some EU countries and support the view that in the current juncture tackling the challenges facing the euro area requires a multi-pillar approach comprising both fiscal consolidation and courageous structural reforms (Buti and Padoan, 2012).

The findings in this paper have also implications for the feasibility of structural reforms during austerity periods. Although it is well-known that certain labour market reforms may be hard to square with fiscal consolidation because of their electoral (e.g., Buti *et al.*, 2010) or budgetary costs (e.g., Deroose and Turrini, 2005), governments with a strong mandate to bring public finances on a sustainable footing while taking courageous measures to improve to capacity of the economy to create jobs may be able to carry out austerity measures and reform employment protection at the same time.

Further analysis on this topic seems deserved, not only to further check robustness of results with respect to the measurement of fiscal policy, the specification of empirical equations, and the definition of the sample, but also to better qualify results in terms of which EPL policy settings matter most in driving results.

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