Job Flow Dynamics and Firing Restrictions: Evidence from Europe

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Abstract

We exploit unique firm level data to study the impact of firing restrictions on job flow dynamics across 14 European countries during the 1990s. We find that more stringent firing laws make job turnover more pro-cyclical by both reducing the responsiveness of job destruction and increasing the responsiveness of job creation to the cycle. Moreover, the effect of firing costs on job flows depends on the sector-specific trend growth, such costs being more important in contracting than in growing sectors.

Keywords: *Gross Job Flows, Europe, Business Cycle, Firing Costs*

JEL Classification: *J23, J63, J68.*

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1 Introduction

Following Davis and Haltiwanger's (1990, 1992) seminal work, a large empirical literature has looked at the stylized facts of job creation and job destruction using firm or establishment level data for different OECD countries. A fraction of this literature has focused on the relationship between job turnover and the business cycle. A pro-cyclical movement of job creation and counter-cyclical movement of job destruction is observed in all studies, but the volatility of these two flows over the business cycle differs across countries. Estimates for the US, Canada and the UK show that the increase in job destruction during economic downturns tends to be stronger than the increase in job creation during upturns, resulting in counter-cyclical movements of job reallocation (the sum of job creation and job destruction).[1] By contrast, estimates for continental European countries present a less clear picture, with job reallocation tending to be a-cyclical or slightly pro-cyclical.[2]

Relying on reallocation frictions such as search or adjustment costs, a number of models have been developed to explain the cyclical patterns of job reallocation. Caballero and Hammour (1994) show, within a vintage model of process and product innovation, that declines in demand are only partly accommodated by a reduction of job creation when fast creation of jobs in an industry is costly due to adjustment costs. As a consequence, job creation will tend to be smoothed over the business cycle and job destruction will be concentrated in recessionary periods, implying a counter-cyclical pattern in job reallocation. In Mortensen and Pissarides (1994), counter-cyclical movements of job reallocation are generated by the time required to establish a profitable job-worker match. Intuitively, during upturns it takes time to fill in vacancies while during downturns job destruction occurs immediately. Hence job turnover is counter-cyclical. Garibaldi (1998) shows that extending this framework to allow for the presence of fixed adjustment costs associated with dismissals can capture the observed job flow dynamics in continental Europe. In

[1] See Davis and Haltiwanger (1992) and Davis et al. (1996) for the US manufacturing sector, Baldwin at al. (1998) for Canada and Konings (1995) for the UK.

[2] In particular, an a-cyclical pattern has been found in Austria (Stiglbauer et al., 2002), Italy (Contini et al., 1995), Spain (Dolado and Gomez-Salvador, 1995) and Germany (Boeri and Cramer, 1992) while a slightly pro-cyclical pattern has been documented for France (Lagarde et al., 1994) and Sweden (OECD, 1994).

this setting, when firing is costly and time-consuming the asymmetry in the cyclical behaviour of job creation and job destruction disappears, as job destruction becomes less responsive to the cycle. Thus, Garibaldi (1998) concludes that cross-country differences in job flow dynamics can be accounted for by differences in the relative stringency of employment protection legislation (EPL).

A competing explanation of the observed cross-country differences in job flow dynamics relies on differences in data coverage and sampling frame across studies. While evidence for the US, Canada and the UK is mostly based on establishment data for the manufacturing sector, studies for continental European countries typically rely on firm level data including manufacturing and service industries. Boeri (1996) and Foote (1998) show that the asymmetric behaviour of job creation and job destruction appears to be a peculiarity of the manufacturing sector, while the positive trend of employment growth in the service sector implies a higher variability of job creation over the business cycle resulting in a pro-cyclical movement of labour turnover.[3]

This paper contributes to the understanding of the role of EPL in labour market dynamics. It overcomes previous problems of cross-country comparability of job flow dynamics by using a unique homogenous firm-level data set that covers the whole spectrum of productive sectors for 14 European countries during the 1990s. Our characterization of the cyclical behaviour of job flows reveals that although different sectoral patterns are apparent, cross-country differences cannot be disregarded. Thus, we search for empirical support for the hypothesis put forward by Garibaldi (1998) by examining the role of EPL on the cyclicality of job flows. Our findings indicate that firing restrictions play a significant role in shaping the response of job flows to shocks while sectoral characteristics are less important. We show that countries where EPL is more stringent present more pro-cyclical job turnover in all productive sectors. Interestingly, we find that firing restrictions affect both margins of adjustment. In countries with more stringent EPL firms strongly respond to business cycle fluctuations via their creation margin (thus overall job creation is highly pro-cyclical) while restraining fluctuations in job destruction (thus

[3]Since net job creation is typically concentreted in small and young units in business sectors (Gomez-Salvador et al., 2004; OECD, 1994), focusing on manufacturing sectors tends to reduce the magnitude and then the variance of job creation relative to job destruction.

overall job destruction is less counter-cyclical).

A closely related result is that the negative impact of EPL on job turnover is stronger in sectors characterized by a declining employment trend. From a theoretical perspective, EPL should reduce both job creation and job destruction and therefore labour turnover.[4] In spite of this unambiguous theoretical prediction, the empirical cross-country evidence on the effects of EPL on aggregate job flows presents mixed results.[5] This apparent discrepancy can be due to counter-balancing effects of other institutions (Bertola and Rogerson, 1997) or the frequency of the data (Wolfers, 2005), but might also be related to the availability of data as highlighted by the OECD (1994), which does not allow to control for aggregate trends. While aggregate and idiosyncratic shocks have been identified as crucial elements in shaping the expected impact of EPL on labour market outcomes (Bentolila and Bertola, 1990), the former have typically been ignored in empirical applications. Moreover, in the rare cases when comparable data on job flows is at hand it is only available for a handful of years and countries, resulting in imprecise and unstable estimates of the effects of EPL. Our approach overcomes these shortcomings by exploiting the differential impact of EPL across sectors, phases of the business cycle and countries.

The rest of the paper is organized as follows. Next section presents the main characteristics of the data. Section 3 spells out the empirical strategy, and the main results of the paper are presented in Section 4. Section 5 draws some concluding remarks.

2 The data

Our main data source is Amadeus, a firm-level database collected by the Bureau van Dijk (BvD) from balance sheet data in European countries.[6] The information is collected by the national Chambers of Commerce and homogenized by BvD applying uniform formats to allow accurate cross-country comparisons. The period of analysis used for this study spans from 1992 to 2001 depending on the country, and the sample includes all EU-15

[4] See Bertola (1999) and the references therein.

[5] See OECD (2004) for a recent survey of the empirical literature.

[6] There are several versions of Amadeus, depending basically on the number of firms covered. Our version is the most extensive one, including information for more than 7,000,000 European firms.

countries with the exception of Luxemburg and Ireland plus Norway. When compared to previous data used for cross-country comparisons of job flow statistics, Amadeus has several important advantages. Previous studies usually suffer from differences across countries in the source of the data (administrative versus survey), unit of observation (firms versus establishments), sectoral coverage (manufacturing versus services), and period of observation (expansion versus recessions), which may have led to misleading interpretations of the cross-country cyclical patterns of job flows (OECD, 1994). Instead, in Amadeus the data collection is relatively homogeneous across countries. Moreover, information is provided on narrowly defined sectors (2-digit NACE classification) and data on both manufacturing and non-manufacturing sectors are reasonably representative. Gómez-Salvador el al (2004) show that the sectoral distribution of employment in Amadeus is very similar to the actual distribution of employment as measured by the national labour force surveys (LFS). Perhaps most convincingly, employment growth rates from Amadeus follow quite closely the growth rate of employment in the LFS, suggesting that the sample in Amadeus is representative of the total firm's population.

One limitation of Amadeus is that it does not allow one to accurately identify birth and death of firms. Therefore we restrict our analysis to continuing firms, e.g. firms that are in the sample for at least two consecutive periods. Although this is an important limitation when comparing job turnover rates in Amadeus with those in other sources, the exclusion of entry and exit should be less problematic at the time of evaluating the effects of EPL on labour dynamics, because it is precisely job turnover of continuing firms the component of total job turnover that is more likely to be affected by firing restrictions (OECD, 1999). A second limitation relates to the sampling of Amadeus, which introduces a bias against very small firms. This is common in firm level data sets, but is potentially important when measuring job flows since a relevant fraction of job turnover occurs in this segment of the size distribution. Moreover, in some countries firms below a certain size-threshold are exempted from firing restrictions.[7] It could well be the case that firms more prone to labour turnover limit their size to slightly below

[7] For a rationale for such differential legislation see Dolado and Jimeno (2005).

the threshold in order to avoid legislation.[8] Since our empirical strategy mostly relies on within country comparisons by exploiting the differential impact of EPL across sectors and phases of the business cycle this sampling bias is unlikely to affect our results, as long as it is similarly distributed across sectors and remains constant over time.

There are several indices of employment protection in the literature. For this study we use the most recent index developed by the OECD (2004), which attributes values from zero to six according to the increasing strictness of EPL and covers several aspects of employment protection, including regulation for individual and collective dismissals and differences across regular and temporary contracts.[9] Since this EPL index is time-invariant in the 1990s for most of the countries in our sample, we take its average value over the sample period for the analysis. Job flows statistics from Amadeus are merged with employment and output data from the OECD Structural Analysis (STAN) database. To this purpose, we construct annual job flow statistics from Amadeus for 24 sectors, which are those covered in STAN. The advantage of STAN is that it contains long time series of annual value added at the sectoral level, which we use to construct a sectoral output gap indicator as a measure of the cycle. Thus, we consider two alternative measures of the cycle: the employment growth rate as measured by STAN and an output gap indicator measured by detrending sectoral value added using a standard Hodrick-Prescott filter.

3 Empirical model

We calculate yearly job creation (JC), job destruction (JD) and job reallocation (JR) rates at the sectoral level for a total of 24 sectors. We follow the standard definitions of job flow measures as described in Davis and Haltiwanger (1990). JC_{ijt} in period t, country j and sector i equals the weighted sum of employment gains over all growing firms in sector i and country j between $t-1$ and t. Similarly JD_{ijt} equals the sum of

[8] Evidence suggests that threshold effects are present, although are quantitatively small. See Borgello et al. (2002) and Schivardi and Torrini (2004) for a discussion of the Italian case.

[9] It should be noted however that similar results are obtained with alternative indices such as the time-variant index developed by Blanchard and Wolfers (2000) and used in the context of cross-country regressions of job flows by Gómez-Salvador et al. (2004).

employment losses (in absolute value) over all contracting firms between $t-1$ and t. It follows that net employment can be obtained as $NET_{ijt} = JC_{ijt} - JD_{ijt}$ and the job reallocation rate is defined as $JR_{ijt} = JC_{ijt} + JD_{ijt}$.

Our basic empirical strategy is based on the following reduced-form specification

$$\begin{aligned} JF_{ijt} &= \alpha + N_{ijt}\gamma\left(1 + F_j\beta + G_{ij}\phi\right) + G_{ij}\theta + D\beta + \mu_j + \varepsilon_{ijt} \\ \text{for } i &= 1, ..., 24 \text{ and } j = 1, ..., 14 \end{aligned} \quad (1)$$

, where JF_{ijt} denotes job flows (job reallocation, job creation or job destruction), N_{ijt} is a business cycle indicator, D is a set of sectoral and year dummies and their interactions, F_j denotes for the index of employment protection legislation, G_{ij} is the sectoral trend employment growth (measured as the average net employment growth in each sector over the sample period) and μ_j stands for country unobserved heterogeneity. The coefficients of interest are $\gamma\beta$ and $\gamma\phi$, which correspond to the interaction terms between the business cycle indicator and the EPL index and sectoral trend growth, respectively. When the dependent variable is JR, a positive sign on $\gamma\beta$ would support Garibaldi (1998) empirical hypothesis suggesting that more stringent EPL increases the cyclicality of job turnover. Similarly, Foote (1998) result for the US would be confirmed by our sample of European countries if in the same regression $\gamma\phi > 0$, suggesting more pro-cyclical turnover in sectors experiencing higher trend growth.

In a second specification we add an interaction term between the employment protection legislation index and trend employment growth. Thus, we assess whether firing costs may have a different impact (both on the level and cyclicality of job flows) in sectors experiencing different growth patterns. The equation we estimate then takes the following form:

$$\begin{aligned} JF_{ijt} &= \alpha + N_{ijt}\gamma\left(1 + F_j\beta + G_{ij}\phi + \left(F_j \times G_{ij}\right)\delta\right) + \\ &\quad + \left(F_j \times G_{ij}\right)\varphi + G_{ij}\theta + D\beta + \mu_j + \varepsilon_{ijt} \\ \text{for } i &= 1, ..., 24 \text{ and } j = 1, ..., 14 \end{aligned} \quad (2)$$

Table 1: Spearman Correlations between job reallocation and cycle

	All sectors	Services	Manufacturing	Growing	Contracting
Austria	0.018	0.186	-0.064	0.061	-0.136
Belgium	-0.059	-0.101	-0.067	-0.031	-0.099
Denmark	0.003	0.117	-0.054	0.071	-0.177
Finland	0.001	0.000	0.127	0.019	-0.415*
France	0.115	0.014	0.042	0.059	0.223
Germany	0.165*	0.197	-0.010	0.281*	-0.048
Greece	0.192*	0.365*	0.073	0.235*	-0.297
Italy	-0102	0.038	-0.063	-0.100	0.067
Netherlands	-0.049	0.278*	-0.112	-0.012	-0.077
Norway	-0.109	0.175	-0.148	-0.132	-0.261
Portugal	0.129	0.155	0.232	0.064	0.089
Spain	-0.136*	-0.317*	0.061	-0.160*	-0.326*
Sweden	-0.110	0.137	-0.092	-0.106	-0.255
UK	-0.225*	0.081	-0.286*	-0.123	-0.418*

Note: * denotes significant at the 5 percent level. The table shows the response of job reallocation to the output gap across different groups, pooling the data from all sectors belonging to each group. The data are yearly observations for a total of 24 sectors, for the period (depends on the country) 1992-2001. For a definition of the sectors see Footnote 11. Growing sectors BLA BLA

It is well known that in the presence of measurement error the bias incurred in a standard OLS regression might actually be exacerbated by the inclusion of fixed effects. One advantage of our synthetic panel is that we know the number of firms from which we draw the summary measures of job flows in each country, sector and year. This allows us to construct weights as the share of the number of firms in each sector in the total number of firms. The weights are country-specific, such that each country has an equal weight in the final regression. Weighting the fixed effects regressions should mitigate the impact of measurement error.[10]

4 Empirical results

We start the analysis by illustrating the cyclical patterns of job turnover. Following most of the literature, Table 1 shows Spearman correlations between job turnover and

[10] In order to avoid spurious job flows, we also drop from the sample sectors with less than 10 firms in a given year. However, results are not substantially affected by the inclusion of these observations.

the output gap indicator. The pooled correlations are reported for five different groups: all sectors, services, manufacturing, growing sectors (those whose average growth rate is above the country average) and contracting sectors (those whose average growth rate is below the country average).[11] Overall job reallocation is in most cases a-cyclical with the clear exception of the United Kingdom and (perhaps more surprisingly) Spain, where the correlation between job reallocation and the indicator of the cycle is negative and statistically significant.[12] These correlations are in line with previous studies, suggesting a-cyclical labour flows in continental Europe in contrast with counter-cyclical patterns in the Anglo-Saxon countries. The cross-country differences are even more apparent when comparing country averages within manufacturing and services industries, or expanding and contracting sectors. With the sole exception of Spain, job reallocation is a-cyclical or pro-cyclical in growing sectors, but either a-cyclical or counter-cyclical in sectors with an average growth below the country mean. A somewhat similar pattern arises if the distinction is made between service and manufacturing sectors, the former group tending to present more pro-cyclical correlations. It should be noted that although differences across sectors are apparent, the ranking of countries is relatively stable across sub-samples. Spearman pairwise correlations across the groups in the different columns are always positive and significant, suggesting the importance of country effects.

4.1 Job dynamics and firing restrictions

Can firing restrictions account for the cross-country differences in the cyclicality of job turnover? Table 2 presents estimates of the coefficients of the baseline model (equation 1)

[11] The sectors are: Agriculture, forestry and fishing; Mining and quarrying; Food, beverages and tobacco; Textiles; Wood products; Paper products, publishing and printing; Refined petroleum, nuclear fuel and chemical products; Rubber and plastic products; Other non-metallic products; Basic metals and fabricated metal products; Machinery and equipment; Electrical and optical equipment; Transport equipment; Other manufacturing sectors; Electricity, gas and water supply; Construction; Wholesale and retail trade, Repairs; Hotels and restaurants; Transport and communications; Financial intermediation and insurance; Real estate and renting, Computer and related activities, Research and development; Public Administration, defense and education; Health and social work; Other community, social and personal services

[12] Spain is characterized by a relatively stringent EPL. However, there is evidence suggesting that this legislation is to a large extent bypassed by the use of temporary employment contracts, whose incidence is the highest in Europe (Dolado et al., 2002) In Gomez-Salvador et al. (2004) we find that Spain presents the highest rate of job turnover in a similar sample of countries. Cross-country regressions show that this is to a great extent due to the presence of temporary jobs.

for the two measures of the cycle. After controlling for sectoral, time, sectoral*time and country effects, we find that job reallocation (JR) is significantly less counter-cyclical in countries with more stringent employment protection laws. Interestingly, the effect of firing costs on the cyclical behaviour of JR occurs through both job destruction (JD) and job creation (JC). In line with Garibaldi (1998) theoretical predictions, the sign of the interaction term $cycle \times EPL$ is positive and significant in the JD regressions, implying that the rate at which firms destroy obsolete jobs is less responsive to the cycle in countries with more stringent employment protection legislation.

Interestingly, our findings point out that higher firing costs are associated with a more pro-cyclical pattern of JC. This result suggests an "insulating" effect of job creation to business cycle fluctuations in countries with stringent dismissal restrictions. As noted by Caballero and Hammour (1994), during recessions industries may accommodate declines of demand in two ways, either by reducing the pace at which new jobs are created or by increasing the rate at which old jobs are destroyed. Making job destruction more costly, higher dismissal costs may lead to so-called "creation–driven recessions": firms respond more strongly to negative demand shocks on their creation side (JC becomes more responsive to negative shocks) than on their destruction side. This makes JC more cyclically responsive than JD and consequently JR more pro-cyclical.

Finally, note that these estimates cast some doubts on the differences in the cyclical behaviour of job flows between growing and contracting sectors. The coefficient on the interaction term $cycle \times trendG$ is positive, in line with Foote's hypothesis, but is never statistically significant at conventional levels.

In order to illustrate the magnitudes in the response of labour market flows to the cycle for varying degrees of employment protection Figures 1 and 2 simulate the estimates presented in the first column of Table 2 for a sector with the sample average growth. The thick lines represent the actual responses and the dotted lines stand for 95 % confidence intervals. According to these estimates, in a country like the UK (e.g. $EPL = 0.5$) JC would be virtually a-cyclical while JD highly counter-cyclical, resulting in a counter-cyclical pattern of JR. At the other extreme, JC would be highly pro-cyclical and JD a-cyclical in the country with the most stringent EPL laws (e.g. in Portugal where

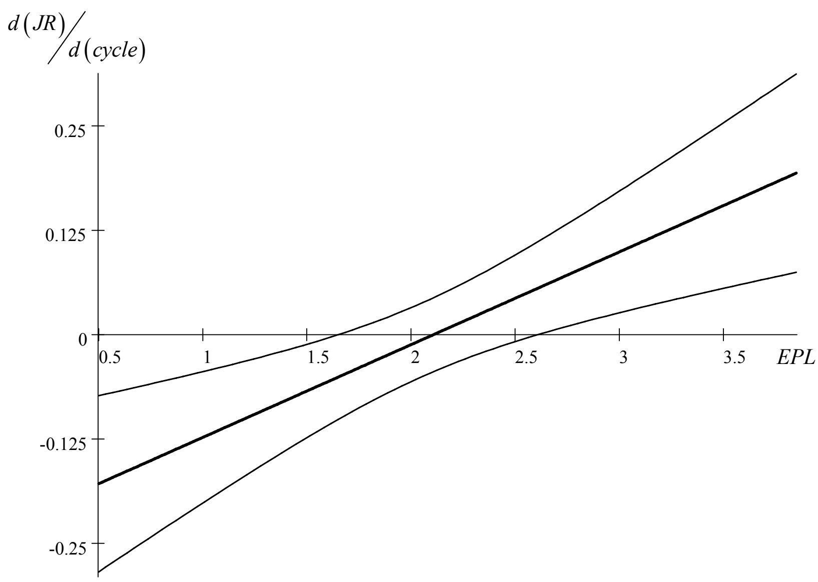

Figure 1: The cyclicality of Job Reallocation and EPL

$EPL = 3.7$), resulting in a pro-cyclical movement of JR.

The next set of regressions extends the benchmark specification to account for differences across sectors in the impact of EPL on labour market flows. Following equation (2), Table 3 reports the results for JR, JC and JD regressions including among the covariates an interaction term between the employment protection legislation index and sectoral trend growth as well as their triple interaction with the indicators of the cycle. We consider two specifications. In columns (1), (3) and (5) we exclude the effect of the employment protection legislation on the *level* of job flows, which is instead captured by the country fixed effects. Columns (2), (4) and (6) replicate specifications (1), (3) and (5) respectively, including as a regressor the direct impact of EPL instead of country dummies. It is interesting to note that replacing the country fixed effects by the EPL index does not significantly alter the estimated coefficient of the other covariates included in the regression. In line with the predictions of the theory, we find that EPL has a negative effect on both JC and JD, which translates into a lower JR rate. The effect is statistically significant (at the 10 per cent level in the case of JD regressions) both when

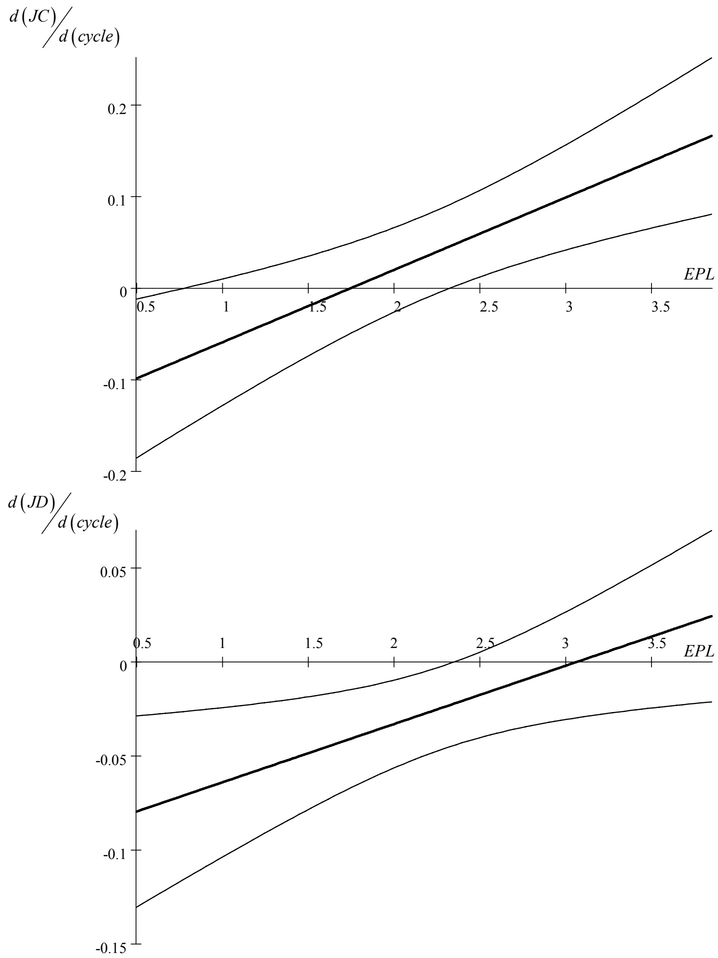

Figure 2: The Cyclicality of JC and JD and EPL

the indicator of the cycle is the output gap (first part of the table) and when the cycle is captured by employment growth. Note also that the previous results are retained in these extended specifications, as the interaction term $cycle \times EPL$ is positive and statistically significant in all cases but the JC regressions with the employment growth as an indicator of the cycle.

Column (1) in Table 3 presents an apparently puzzling result, as the interaction term $EPL * TrendG$ is positive and statistically significant, suggesting that more stringent EPL increases JR and more so as the sector experiences higher trend growth. This effect

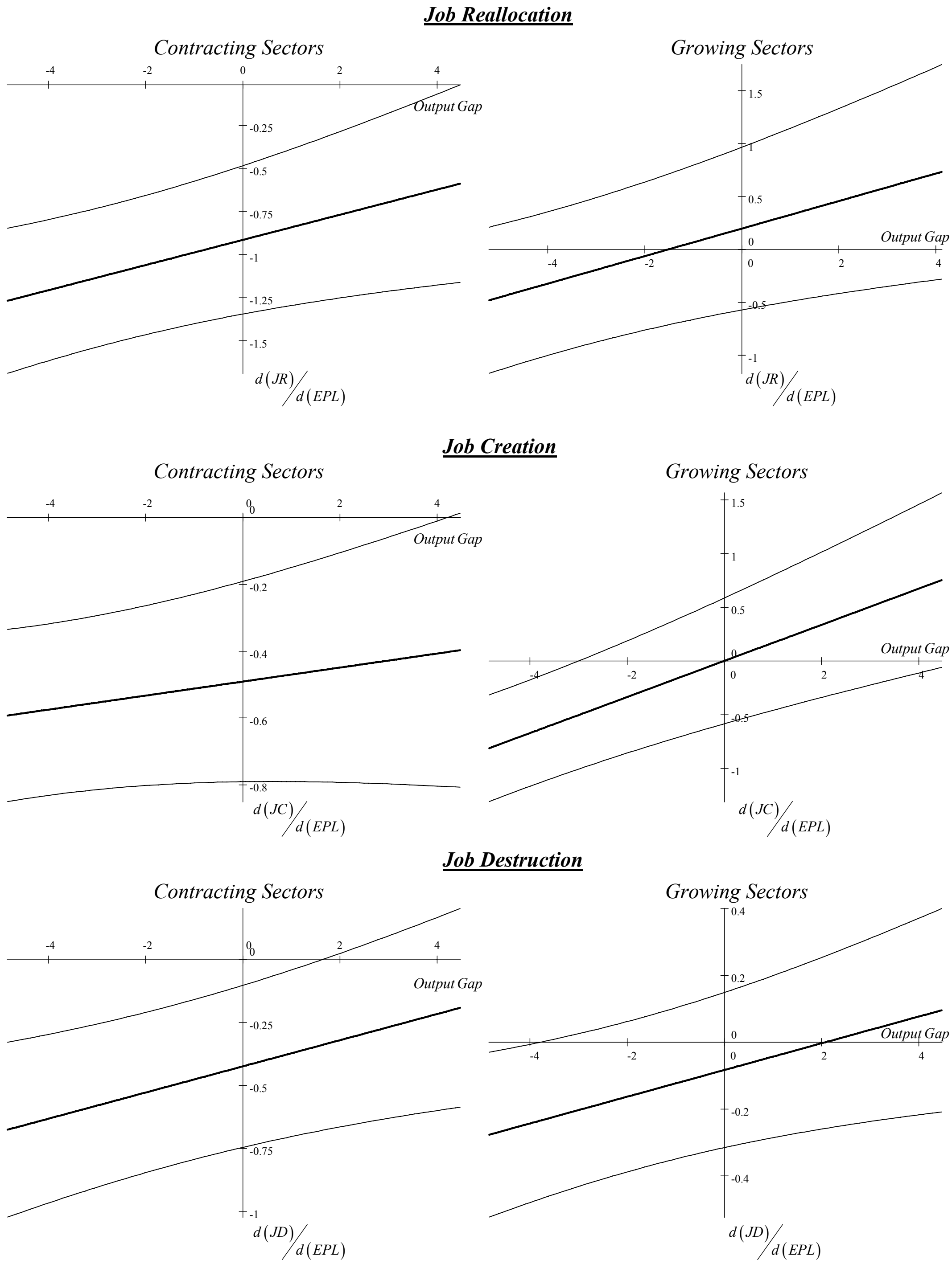

Figure 3: EPL, business cycle and labour market flows

Table 2: Employment protection and the cyclical behavior of job flows

Cycle variable:	*Value added*			*Employment growth*		
Dependent variable:	JR	JC	JD	JR	JC	JD
cycle	-0.273	-0.170	-0.103	-0.438	-0.159	-0.279
	(3.01)	(2.50)	(2.60)	(3.55)	(1.66)	(4.88)
$cycle \times EPL$	0.111	0.079	0.032	0.189	0.108	0.081
	(2.96)	(2.88)	(2.01)	(3.21)	(2.41)	(3.13)
$cycle \times trendG$	0.017	0.014	0.003	0.025	0.014	0.010
	(1.49)	(1.50)	(0.74)	(1.15)	(0.87)	(1.41)
trendG	0.324	0.617	-0.293	0.265	0.567	-0.302
	(3.15)	(7.08)	(8.30)	(2.63)	(6.62)	(8.05)
R^2	0.46	0.57	0.34	0.47	0.57	0.35
Country dummies	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	2119	2119	2119	2137	2137	2137

Note: Robust standard errors. t-statistics in parenthesis. All the specifications include time dummies, industry dummies and the interactions between time and industry dummies.

remains statistically significant after country dummies are replaced by the EPL indicator in column (2). However, the specification in column (2) allows one to evaluate the total impact of EPL on JR, whereby the positive coefficient of the $EPL * TrendG$ term has to be weighted against the negative direct effect captured by the coefficient of EPL. Figure 3 presents simulations of the effects of EPL on JR, JC and JD as a function of the business cycle according to the estimates in columns (2), (4) and (6) in Table 3. A distinction is made between growing (right hand side graphs) and contracting sectors (in the left hand side).[13] As expected, in contracting sectors EPL reduces job turnover, more significantly when the sector experiences a recession than when the sector experiences an expansion. In contrast, the impact of EPL on JR for expanding sectors is never significantly different from zero. A similar pattern is observed regarding JC and JD. The impact of EPL on these two flows is negative during recessions and more so for contracting than for expanding sectors. Our estimates thus suggest that the negative association between EPL and job flows is stronger in sectors experiencing negative trend growth,

[13] In the two simulations the effect of EPL on job flows has been evaluated at the mean employment growth rate of contracting ($trendG \leq 0$) and expanding sectors ($trendG > 0$).

Table 3: Employment protection and the cyclical behavior of job flows

Cycle Variable: *Value added*						
Dependent Variable:	*JR*		*JC*		*JD*	
cycle	-0.242	-0.256	-0.097	-0.100	-0.145	-0.156
	(3.34)	(3.09)	(2.01)	(2.19)	(3.27)	(2.70)
$cycle \times EPL$	0.093	0.087	0.049	0.039	0.044	0.048
	(2.74)	(2.68)	(2.09)	(2.30)	(2.49)	(2.12)
$cycle \times trendG$	-0.003	-0.019	-0.023	-0.032	0.019	0.012
	(0.09)	(0.62)	(0.84)	(1.19)	(1.51)	(0.99)
$cycle \times (EPL \times trendG)$	0.009	0.012	0.014	0.016	-0.006	-0.003
	(0.59)	(0.93)	(1.15)	(1.28)	(1.08)	(0.75)
$EPL \times trendG$	0.181	0.244	0.088	0.144	0.093	-0.398
	(2.35)	(2.89)	(1.34)	(1.64)	(3.67)	(5.36)
$trendG$	-0.162	-0.036	0.383	0.362	-0.545	0.100
	(1.07)	(0.16)	(3.14)	(1.67)	(8.20)	(3.81)
EPL		-0.652		-0.336		-0.316
		(2.36)		(2.06)		(1.81)
Country dummies	yes	no	yes	no	yes	no
R^2	0.47	0.41	0.57	0.53	0.35	0.27
Observations	2119	2119	2119	2119	2119	2119
Cycle Variable: *Employment growth*						
Dependent Variable:	*JR*		*JC*		*JD*	
cycle	-0.301	-0.241	0.006	0.050	-0.307	-0.291
	(2.52)	(1.68)	(0.06)	(0.50)	(5.02)	(3.50)
$cycle \times EPL$	0.136	0.126	0.043	0.034	0.093	0.092
	(2.32)	(1.78)	(0.99)	(0.67)	(3.30)	(2.12)
$cycle \times trendG$	-0.014	-0.027	-0.060	-0.081	0.046	0.054
	(0.27)	(0.47)	(1.40)	(1.70)	(2.08)	(2.32)
$cycle \times EPL \times trendG$	0.014	0.016	0.028	0.034	-0.014	-0.017
	(0.71)	(0.75)	(1.68)	(1.76)	(1.82)	(2.39)
$EPL \times trendG$	0.059	0.132	-0.001	0.050	0.060	0.083
	(0.68)	(1.56)	(0.01)	(0.59)	(2.00)	(2.68)
$trendG$	0.104	0.200	0.565	0.554	-0.462	-0.354
	(0.56)	(0.88)	(3.81)	(1.76)	(2.08)	(4.36)
EPL		-0.674		-0.413		-0.261
		(2.69)		(2.61)		(1.71)
Country dummies	yes	no	yes	no	yes	no
R^2	0.47	0.41	0.58	0.55	0.35	0.28
Observations	2137	2137	2137	2137	2137	2137

Note: Robust standard errors. t-statistics in parenthesis. All the specifications include time dummies, industry dummies and the interactions between time and industry dummies but might not be visible in expanding sectors or during expansionary periods. This finding provides empirical support for models of adjustment costs featuring aggregate as well as idiosyncratic shocks such as Bentolila and Bertola (1990), suggesting that higher aggregate growth dampens the impact of firing cost on firm's hiring and firing decisions.

5 Conclusions

This paper evaluates the impact of employment protection legislation (EPL) on job turnover using unique sectoral firm level data for 14 European countries. Our data set overcomes previous problems of comparability of job flow statistics and allows to extend the analysis of labour market dynamics to manufacturing and non-manufacturing sectors. Our novel empirical strategy does not suffer from the small sample problems typically encountered in cross-country studies since we focus on the impact EPL has on the employment adjustment in different sectors and phases of the business cycle.

We find that EPL induces a positive co-movement of job turnover with different indicators of the cycle, both due to more pro-cyclical responses of job creation and to less counter-cyclical movements of job destruction. These results are statistically significant and robust to different specifications including country, sectoral and time effects. Further, our estimates suggest that the negative impact of EPL on job turnover is closely related to trend growth in the sector, being more relevant in contracting than in expanding industries.

Our results have potentially important policy implications. Understanding the behaviour of gross job flows over the cycle is fundamental for our knowledge about the forces driving employment fluctuations and for the assessment of the extent and scope for stabilization policies. In line with an abundant theoretical literature, our findings strongly suggest a positive role of EPL in stabilizing employment fluctuations in Continental Europe. In the absence of other insurance mechanisms against labour income risk (Bertola, 2004), this effect of EPL should be taken into account when evaluating alternative structural reforms.

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