Gross Job Flows and Institutions in European Countries

Ramón Gómez-Salvador
DG-Economics
European Central Bank

Julián Messina[§]
DG-Research
European Central Bank

Giovanna Vallanti[*]
Centre for Economic Performance
London School of Economics

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Abstract

We examine job flows in the 1990s for a sample of 12 European countries. By using a dataset of continuing firms that covers all sectors, we find firm characteristics to be important determinants of job flows, with smaller and younger firms within services typically having a larger degree of job turnover. Once controlled for firm and sectoral effects, the role of institutions in the dynamics of job creation and destruction is examined. As expected, employment protection is found to reduce job flows. Similarly, countries with higher unemployment benefits, labour taxes and more coordinated wage bargaining systems are characterised by lower job flows.

Keywords: Gross Job Flows, Labour market institutions.
JEL-Codes: J23, J60

[§] Correspondence author: Julián Messina. European Central Bank, Kaiserstrasse 29, D-60311 Frankfurt am Main. Fax: +496913446000. Tel: +491613448826. Email: julian.messina@ecb.int.

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1 Introduction

Recent literature has stressed the importance of job flows when firms and workers are heterogeneous and the matching process between vacancies and workers is costly. When a shock hits the economy, the desired allocation of jobs among firms and sectors changes, leading to simultaneous job creation and destruction. Because of heterogeneity and other labour market frictions, new vacancies and unemployed workers do not match instantaneously, implying spells of unemployment and vacant positions in the economy (Pissarides, 2000). Studies estimating job creation and destruction from plant or firm level data show that a high number of jobs are simultaneously created and destroyed even when the employment growth is close to zero. This provides evidence on the complexity of the dynamics underlying the adjustment process in the labour market.

The main limitation of the existing studies on job flows is the lack of internationally comparable job flows statistics (OECD 1994). A number of problems arise when using firm level data, which become of particular concern when doing international comparisons. Differences in definitions, sampling intervals and sectoral coverage may lead to misleading interpretations of the cross-country differences in estimated job flows

We examine time series and cross-sectional patterns of job flows for 12 European countries in the 1990s using a unique homogeneous firm dataset that covers all sectors. We provide comparable estimates of job flows of continuing firms, i.e. excluding start-ups and shutdowns, and examine cross-country differences and regularities.

We find important regularities across countries, where smaller and younger firms in service sectors exhibit higher job turnover. After controlling for firm characteristics, we find persistent cross-country differences in job flows that can be explained by

institutional features. As expected, we find a negative effect of policies aiming to protect jobs on the dynamics of job reallocation. These effects are reinforced by a higher tax wedge, generous unemployment benefits and institutions that increase co-ordination in the bargaining process. We also find some indication that countries with stringent employment protection like Spain seem to be making an extensive use of temporary contracts in order to gain flexibility at the margin, resulting in larger aggregate job flows.

The remainder of the paper is organized as follows. In section 2, we present the theoretical motivations of our study and the most relevant empirical evidence. Section 3 describes the data used in the analysis and defines concepts and measures of gross job flows. Section 4 analyses the effects of firm characteristics and Section 5 assesses the role of institutional features in explaining gross job flow. Section 6 concludes.

2 Theoretical motivations and empirical evidence

2.1 Job flows: some stylized facts

There is a large literature studying job reallocation and its components.[1] The key findings can be summarised as follows:

1. A high number of jobs are simultaneously created and destroyed in all countries and sectors regardless of the cycle phase;
2. Job creation and destruction are negatively correlated but not perfectly. This implies that, although job creation is pro-cyclical and job destruction is counter-cyclical, the volatility of the two flows over the business cycle may differ;

[1] For a thorough discussion of the results in this literature, see the excellent survey of Davis and Haltiwanger (1999).

3. Job reallocation is inversely correlated with capital intensity, more jobs being created and destroyed in services than in manufacturing;
4. The intensity of job reallocation depends on various firm-specific characteristics, with job creation being negatively associated with firms' age and size;
5. Job reallocation is a persistent phenomenon. This implies that the observed job flows cannot be accounted for by temporary layoff and recall policies.

2.2 Job flows and labour market institutions: theory and empirical evidence

Cross-country comparisons of job flows provide the basis for a formal investigation of the link between job turnover and labour market institutions and policies. The focus on gross job flows instead of net employment changes allows testing sharper theoretical predictions of the effects of some institutions. A typical example is employment protection legislation (EPL). Barriers to the layoff of workers are expected to hinder both job creation and destruction, having ambiguous effects on the average level of labour demand (Bertola, 1990).

Pissarides (2000) studies the effects of unemployment benefits, employment taxes and job subsidies in a fairly general search-equilibrium framework. Both unemployment benefits and employment taxes decrease job creation and increase job destruction through an increase in labour costs. Job subsidies reduce the cost of matching inducing higher job creation. But job destruction increases as well because of the increase in market tightness, which improves the worker's options in the labour market. In contrast, Leonard and Audenrode (1993) argue that subsidies to declining firms must be supported by taxes on growing firms, which overall reduce job creation and destruction and therefore job reallocation.

Regarding wage-setting institutions, Salvanes (1997) argues that more co-ordinated wage negotiations combined with wage drift policies might impose an additional restriction to plants when negotiating wages, reducing job creation. However, more co-ordinated wage bargaining systems will result in higher job reallocation if they compress the wage structure (Bertola and Rogerson, 1997).

From an empirical point of view, a preliminary attempt to relate facts with theory within a cross-country framework is due to Garibaldi, Koenings and Pissarides (1997). By pooling summary job turnover measures from previous studies, they present cross-country bivariate relationships with some labour market institutions and policies and find a negative correlation between job reallocation and the strictness of EPL and the duration of unemployment benefits. On the contrary, similar correlations in OECD (1999) show a very weak negative association between different indicators of the strictness of EPL and job turnover rates.

Regarding wage-setting institutions, Lucifora (1998) for Italy and Blanchflower and Burgess (1996) for the UK find lower turnover rates in unionised sectors, while Heyman (2001) finds a positive association between job reallocation and the degree of wage compression in a panel of Swedish manufacturing establishments.

To the best of our knowledge, Salvanes (1997) is the only study that presents multivariate analysis on the effect of product and labour institutions on cross-country labour market dynamics. Pooling cross-sectional sectoral data from previous studies for seven OECD countries, he assesses the role of EPL, wage bargaining centralisation and industrial subsidies on job flows. He finds that stricter dismissal costs have a negative impact on job creation and destruction rates. Interestingly, the degree of centralisation also has a negative effect on labour market dynamics by reducing job creation. With regards to industrial subsidies, there is a positive impact on job reallocation that contrasts with the negative effect found by Leonard and Van Audennrode (1993) when comparing the US and Belgium labour markets.

Therefore, despite the growing number of studies on this area, there is still little consensus on the effects of institutions on job flows and no clear pattern emerges by looking at the cross-country job flow developments. The difficulties in international comparisons partly reflect the lack of homogeneous data, which may have affected the empirical results presented so far.

3 Data and measurement issues

3.1 Data source

Annual firm-level observations over the period 1992-2001 are available from *Amadeus* produced by Bureau van Dijk (BvD). Amadeus contains comparable firm-level data for European countries and covers all sectors with the exception of the financial sector. Information on balance sheets, sector of operation and number of employees is collected by BvD local providers from the national Chambers of Commerce. Uniform formats have been applied to the balance sheet data to allow accurate cross-country comparisons and analysis. In order to be included in Amadeus, a firm must satisfy at least one of the following criteria: operating revenues equal to at least 1.5 (1) million euro, total assets equal to at least 3 (2) million euro, number of employees equal to at least 15 (10) for the UK, Germany, France and Italy (for all the other European countries).

The data has several advantages, which make it especially well suited for international comparisons. First, the data collection method is reasonably homogeneous across countries. This overcomes the problem of previous studies where available country data differed on the sources (administrative vs. survey) and unit of study (firm vs. establishments). Second, information is provided on narrowly defined sectors (2-digit NACE classification) and data on both manufacturing and non-manufacturing

sectors are reasonably representative. The availability of services data is an important advantage with respect to previous studies, where cross-country comparisons relied on information obtained from the whole economy in some countries and the manufacturing sector in others.

There are some limitations in our data. First, it is not possible to distinguish between newly created firms and firms that simply enter the sample at a given period t but were already operating in the period before. Similarly, it is not possible to identify firms' closures from firms that exit the sample for other reasons. 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 quite standard in the literature, it introduces a downward bias in the estimates of job flows. Moreover, differences across countries in job turnover rates implied by entry and exit have been found to be quantitatively relevant (Bartelsman *et al.*, 2003) and this may further hamper the cross-country comparability of estimated job flows. However, the exclusion of entry and exit should be less of a problem because it is precisely job turnover of continuing firms the component that is more likely to be affected by some of the labour market institutions considered in this paper (OECD, 1999).

Second, the data are available at the firm rather than the establishment level. Measuring job flows at firm level understates the actual magnitude of total gross flows among plants and may lead to longitudinal linkage problems if ownership and organisational changes (i.e. mergers, acquisitions, etc) are not accounted for. This may be less of a problem with plant-level data, plant being defined in terms of physical location of production. However, cross-country comparisons of establishment data pose serious difficulties since there is important heterogeneity in the definition of establishment across datasets (OECD, 1994). This is less of a problem with firm data. Finally, the inclusion criteria in Amadeus introduces a bias against very small firms.

We assess how representative the data is in Section 3.3. Although the results yield clear positive signs, these characteristics of the data should be kept in mind when comparing our results with previous studies.

3.2 Measuring job flows

The conventions of Davis and Haltiwanger (1999) are followed in defining job flows statistics.

Denote the level of employment at firm level in period t with n_{ft}, and the change in employment between period t and t-1 with Δn_{ft}. Let S^+ be the set of firms in sector S with $\Delta n_{ft}>0$ and S^- the set of firms in sector S with $\Delta n_{ft}<0$. We calculate job creation (JC) by summing employment changes in S^+ and job destruction (JD) by summing (absolute) changes in S^-. JC and JD are obtained by dividing by the size of sector. Firm size at time t is calculated as the average employment between period t and t-1, i.e. $x_{ft}=0.5(n_{ft} + n_{ft-1})$. Accordingly, the sector size is defined as $X_{st} = \sum_{f \in S} x_{ft}$.

Job flow rates can equivalently be expressed as the size-weighted average over firms' growth rates as follows

$$JC_{st} = \sum_{f \in S_t^+} g_{ft} \frac{x_{ft}}{X_{st}} \qquad (1)$$

$$JD_{st} = \sum_{f \in S_t^-} \left| g_{ft} \right| \frac{x_{ft}}{X_{st}} \qquad (2)$$

where $g_{ft} = \frac{\Delta n_{ft}}{x_{ft}}$ is the growth rate of employment in sector f and period t. The sum of the JC and JD is the job reallocation rate (JR). This gives the total number of employment positions reallocated in the economy. The difference between JC and JD is the net employment growth (NET).

3.3 Sample description

Figure 1 compares the evolution of employment growth from our sample with the growth in the number of employees measured by OECD statistics. Although there are some minor inconsistencies, the employment figures in our sample follow quite closely the official statistics (the average correlation excluding Italy is 0.8). The only exception is Italy, which consistently overstates employment growth. This inconsistency is not related to specific outliers, since tabulations show that Italian employment growth in Amadeus is always above the mean values of the rest of the sample for all breakdowns of firm characteristics. We therefore exclude Italy from the analysis.[2]

Table 1 shows the final sample composition and the sample period for each country, after filtering the observations from outliers.[3] The period of observation varies across countries but information is available in most cases at least during 1995-2000. The number of average valid observations per year ranges from almost 90,000 firms in Germany to some 500 firms in Ireland. This implies annual average employment coverage of 25 per cent when compared to figures in the Labour Force Survey (LFS). Comparing the sectoral coverage with the LFS shows a small bias towards employment in manufacturing, but the sample is well representative of both manufacturing and non-manufacturing sectors. Moreover the sectoral coverage is rather homogeneous across countries and stable over time.

[2] The final sample covers the EU countries with the exception of Italy, Luxembourg and Greece. Greece and Luxembourg are excluded from the analysis due to lack of institutional data. The main findings of the paper are largely unaffected by the inclusion of Italy in the sample. These results are available upon request.

[3] A detailed discussion of the data selection and cleaning can be found in Gomez-Salvador et al. (2004).

4 Job Turnover and Firm Characteristics

Table 2 reports summary statistics of JC, JD and JR in each country, averaged within the sample period. JC rates ranged between 4.4% in Germany and 8.6% in Spain, and JD rates from 3.0% in Finland and 4.4% in the UK. These developments led to an average JR rate close to 10%, Austria being the country with the lowest rate (7.9%) and Spain that with the highest (12.1%).

The rest of Table 2 presents summary statistics of flow rates by sector and firm's size, age and capital intensity pooling the information across countries and years. On average, service industries exhibit larger job flows, with Business services being the sector with largest job flows in the sample. Similarly, JR is clearly stronger among smaller and younger firms.

Some of the firm characteristics discussed above are highly correlated among each other (e.g. firm's age and size), suggesting the need of moving to a multivariate framework in order to disentangle the main determinants of job flows. For this purpose, we calculate JC, JD and JR rates for narrower sectors, defined as the crossing of 4 age groups, 7 sectors of activity, 4 size groups, 12 countries, 10 years (between 1992 and 2001) and 4 capital intensity groups. Then, we regress the sectoral flows on dummy variables defined for each of these groups and the aggregate employment growth rate in each country-year to control for the business cycle.

We will consider two different specifications, depending on whether we include or not capital intensity in the definition of the cells. The reason is that *Amadeus* has very limited information on value added for firms in Austria, Germany and the Netherlands. Thus, considering capital intensity classes might affect significantly the estimates of these countries.

Table 3 summarises the results of the OLS regressions for JR, JC and JD on the class dummies. Columns (A) to (C) exclude capital intensity groups, which are

reported in columns (D) to (F). According to the goodness of fit in the regressions, the proposed models do a much better job in explaining the patterns of JR and JC than in explaining the sources of JD, suggesting a more important role of idiosyncratic factors in the determination of the latter. There is a negative relationship between JR and JC and the age of the firms, especially when firms are more than 5 years old. According to columns (A) and (B), JR and JC are 4 percentage points lower in firms above 10 years old than in those which have been operating for less than a year. Interestingly, there is some indication of a reversed pattern in JD, with older firms significantly destroying more jobs than younger ones. The sectoral dummies confirm higher JR and JC rates in construction and services than in industry, while the latter presents higher JD. For instance, JR and JC rates in Business services are more than 5 percentage points higher than in industry, while the difference in JD non-significant.

The negative relationship between the size of the firm and JR is confirmed by the multivariate analysis. Indeed, both JC and JD rates are lower the larger the firm is. As a result, a firm with more than 1,000 employees presents a JR rate 6.8 percentage points lower than a firm with less than 50 workers.

Differences across countries in job flow statistics are statistically significant even after controlling for a wide range of firm characteristics. According to the estimates of JR, only Spain shows a higher rate than the UK, while all the other countries show significantly lower rates. The highest difference compared with the UK is observed in Austria, which has a 5.2 percentage points lower JR rate.[4]

[4] Interestingly, the UK presented relatively low job flow patterns when compared to many Continental European countries in previous international comparisons (e.g. OECD, 1994; Garibaldi et al, 1997 and OECD, 1999). This apparently puzzling result, reversed in our study, might be due to the lack of homogeneous data in previous analysis.

When ranges of capital intensity are taken into account, all previous results remain broadly unchanged (see Columns D to F in Table 3). In addition, we do not find a systematic role of capital intensity in the determination of job flows.

Finally, we focus on the effects of the business cycle on job turnover. Previous country estimates suggest clear pro-cyclical patterns of JR in the US (Davis and Haltiwanger, 1999) but either a-cyclical or slightly pro-cyclical movements in European countries. Our estimates suggest a pro-cyclical character of JR in Europe, although the effect is only statistically significant when capital intensity classes are considered.

5 Job Flows and Institutions

The aim of our next set of regressions is to uncover the determinants of country idiosyncratic factors in the patterns of job turnover. According to our previous discussion, we concentrate on several institutional and regulatory aspects of the labour market:

- Tax and benefits systems: including an index of the duration of unemployment benefits and the tax wedge between the real (monetary) labour cost faced by the firms and the consumption wage received by the employees. The latter is normalized by GDP, while the former ranges from 0 (if benefit provision stops after 1 year) to 1 (for a constant benefit after 5 years).

- Wage-setting institutions: including an index of co-ordination in the wage bargaining process which ranges from 1 to 3 according to the increasing degree of co-ordination.[5] Within our sample, this indicator is time-invariant.

[5] Wage-setting co-ordination, unemployment benefits duration, and the tax wedge are taken from an updated series from Nickell et al. (2001). The information is annual till 1998. When

- Restrictions to hiring and firing: we consider an updated version of the time-varying index of EPL reported in Nickell et al. (2001) and a time-invariant index as described by OECD (1999). Both increase with the relative stringency of EPL.

- Sectoral employment subsidies: we include an indicator of the share of sectoral and ad hoc state aid as a percentage of GDP.[6]

Additionally, we include in the regressions the share of workers holding temporary contracts in the total number of employees.[7] The use of temporary contracts is expected to increase the volatility of jobs, raising JC and JD.

The results presented above suggest that failing to control for differences across countries in the size, age and sectoral distribution of firms might blur cross-country comparisons. Hence, we repeat the cell regressions presented in Columns (A) to (C) of Table 3 including the institutional indicators.

We consider several specifications. First we present pooled OLS regressions where the country dummies are substituted by the institutional variables. A second set of regressions includes country fixed effects. The main advantage of this specification is that it allows to control for unobserved time-invariant country heterogeneity. However, together with the limitation of not allowing for the inclusion of time-invariant covariates (one of the indicators of EPL and wage-setting co-ordination) a fixed effect specification disregards the cross-country information in the data. The latter might severely affect the efficiency of the estimates of institutional variables given the slow moving nature of institutions and the short sample period (see Table 1) of our panel. A final set of regressions treats country unobserved heterogeneity as random. The

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necessary, we extrapolated the variables for the period 1999-2001.

[6] Source: NewCronos Database.

[7] Source: Labour Force Survey.

advantage of this approach in terms of efficiency comes with the cost of imposing the assumption of orthogonality between the individual effects and the covariates.

The effects of institutions on JR, JC and JD are reported on Table 4. As expected, the strictness of EPL has a negative and statistically significant impact on JR. This result is similar for both indicators of EPL and robust to the inclusion of fixed or random effects in the regression. It responds to a reduction of both JC and JD in countries with more stringent EPL, although in general only the coefficients on JD are statistically significant.

The duration of unemployment benefits and the degree of wage-setting co-ordination have similar effects, reducing JR by dampening JC and JD. All these effects are statistically significant across the different specifications, with the exception of the role of benefits on JD when fixed effects are present (Column M). Results for wage-setting co-ordination are in line with those of Salvanes (1997), while the reduction of JC in countries with more generous unemployment benefits supports the predictions of matching models discussed by Pissarides (2000).

Regarding the tax wedge, countries with higher tax burdens experience lower JC and JR. According to the estimates in Columns (A) to (E), a 10 percentage points increase of the tax burden reduces JR in the range of 0.7-1.1 percentage points. These estimates are always significant except in Column (E). In this case the coefficient has still the expected sign and a magnitude very similar to the other specifications. These results are also in line with Pissarides (2000), but we do not find statistically significant effects on JD.

Temporary contracts and employment subsidies present opposite effects on JD, the former increasing and the latter obstructing the destruction of jobs. While the effect of subsidies is significant in all specifications, that of temporary contracts becomes non-significant (though correctly signed) when fixed effects are included. The effects of employment subsidies suggest that these policies are successful in alleviating job losses.

In the case of temporary employment, the result in JD is the expected, but we do not find a positive impact on JC. Interestingly, the positive effect of temporary contracts on JR becomes non-significant when country unobserved heterogeneity is taken into account. Further investigation showed that the OLS results were mainly driven by the inclusion of Spain in the sample, a country with the highest share of temporary contracts in the sample and highest JR rate. Thus, even if temporary contracts are not significant when country effects are included, its inclusion greatly reduces the prediction error of this country within the OLS regressions.

Table 5 presents sensitivity analysis with respect to the number of countries included in the regressions. It repeats each specification dropping one country at a time and pools the information of OLS and random effect regressions where the set of covariates is the same. The results presented above are very robust to the set of countries included in the case of EPL, co-ordination, the duration of unemployment benefits and the tax wedge. In all cases the signs are the expected ones. Moreover, in more than 95 per cent of the JR and JC regressions the coefficient is statistically significant different from zero, with the exception of EPL whose significance is reduced to some 85% of the cases in the JR regressions.

6 Conclusions

This paper presents an analysis of job flows for a panel of 12 European countries in the 1990s using a dataset of continuing firms that covers the whole spectrum of productive sectors and, given homogeneity in the definitions and sectoral coverage, permits cross-country comparisons.

We estimate the joint effect of different firm characteristics on job flow rates. We find that both the size and age of the firm have a negative impact on job reallocation.

Similarly, firms located in services typically exhibit stronger patterns of job flows than firms operating in manufacturing.

Even after controlling for a number of firm characteristics we find significant cross-country differences in labour market dynamics. Thus, we investigate the role of institutional aspects of labour markets in the determination of job turnover. Once controlled for sectoral and firm characteristics, we find that the strictness of employment protection legislation have a negative effect on job creation and destruction. Similarly, the extent of wage bargaining co-ordination and the generosity of unemployment benefits reduce both measures, and consequently job reallocation. All these results are robust to different specifications, although those concerning employment protection depend more on the sample of countries included in the regressions. The effect of other institutions such as the tax wedge, the use of temporary contracts and employment subsidies on job dynamics are less clear-cut, suggesting the need of further empirical and theoretical work.

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Tables and Figures

Table 1
Sample Composition

	Sample period	Average number of firm observations per year	Coverage[1] (%)
Austria	1995-2000	9487	18.9
Belgium	1992-2000	27182	47.4
Denmark	1996-2001	13077	29.9
Finland	1997-2000	7471	27.5
France	1993-2000	50447	23.3
Germany	1994-2000	89459	36.6
Ireland	1994-2000	484	5.9
Netherlands	1994-2000	15384	9.8
Norway	1996-2000	17117	30.3
Portugal	1995-2000	1262	5.3
Spain	1994-2000	44153	24.5
Sweden	1998-2001	29316	33.2
UK	1992-2000	31401	27.3

[1]Coverage: Number of employees covered in the sample as a percentage of total number of employees in the Labour Force Survey.
Sources: Amadeus (2002) and Labour Force Survey.

Table 2

Average job flow rates

	JC	JD	JR
By country			
Austria	4.6	3.4	7.9
Belgium	5.2	3.8	9.0
Denmark	6.2	3.3	9.5
Finland	7.0	3.0	9.9
France	5.1	3.2	8.3
Germany	4.4	3.7	8.1
Ireland	8.5	3.1	11.5
Netherlands	6.5	4.3	10.8
Portugal	4.9	3.5	8.4
Spain	8.6	3.4	12.1
Sweden	8.1	3.6	11.7
UK	6.6	4.4	11.0
Euro area	5.2	3.6	8.8
Nordic countries	7.3	3.4	10.7
By Sector of Operation			
Agriculture	5.5	4.2	9.7
Mining	3.1	5.9	9.0
Manufacturing	4.1	3.8	7.9
Energy	1.8	4.2	5.9
Construction	6.5	4.4	10.9
Trade, restaurants and hotels	6.5	3.0	9.5
Transport and communication	4.9	4.0	8.9
Business services	8.3	4.3	12.6
Community, social and personal serv.	7.4	2.9	10.3
By size			
1-19 employees	10.4	3.8	14.2
20-49 employees	7.5	3.7	11.3
50-99 employees	7.1	3.8	10.9
100-249 employees	6.7	4	10.7
250-499 employees	5.6	3.4	9
500-999 employees	5.4	3.6	9
1000-2499 employees	4.6	3.7	8.3
2500 and more employees	3.6	3.7	7.3
By age			
1 year old	8.8	3.6	12.5
2-5 years old	9.2	3.7	13
6-10 years old	7.4	3.9	11.3
More than 10	4.7	3.6	8.3
By capital intensity			
20% or less	6.3	4.0	10.3
20-30%	5.3	3.6	8.9
30-40%	5.5	3.2	8.6
More than 40%	5.3	3.8	9.2

Note: Average values over the sample period.

Figure 1

Growth in the Number of Employees.

Comparing Amadeus with OECD Statistics

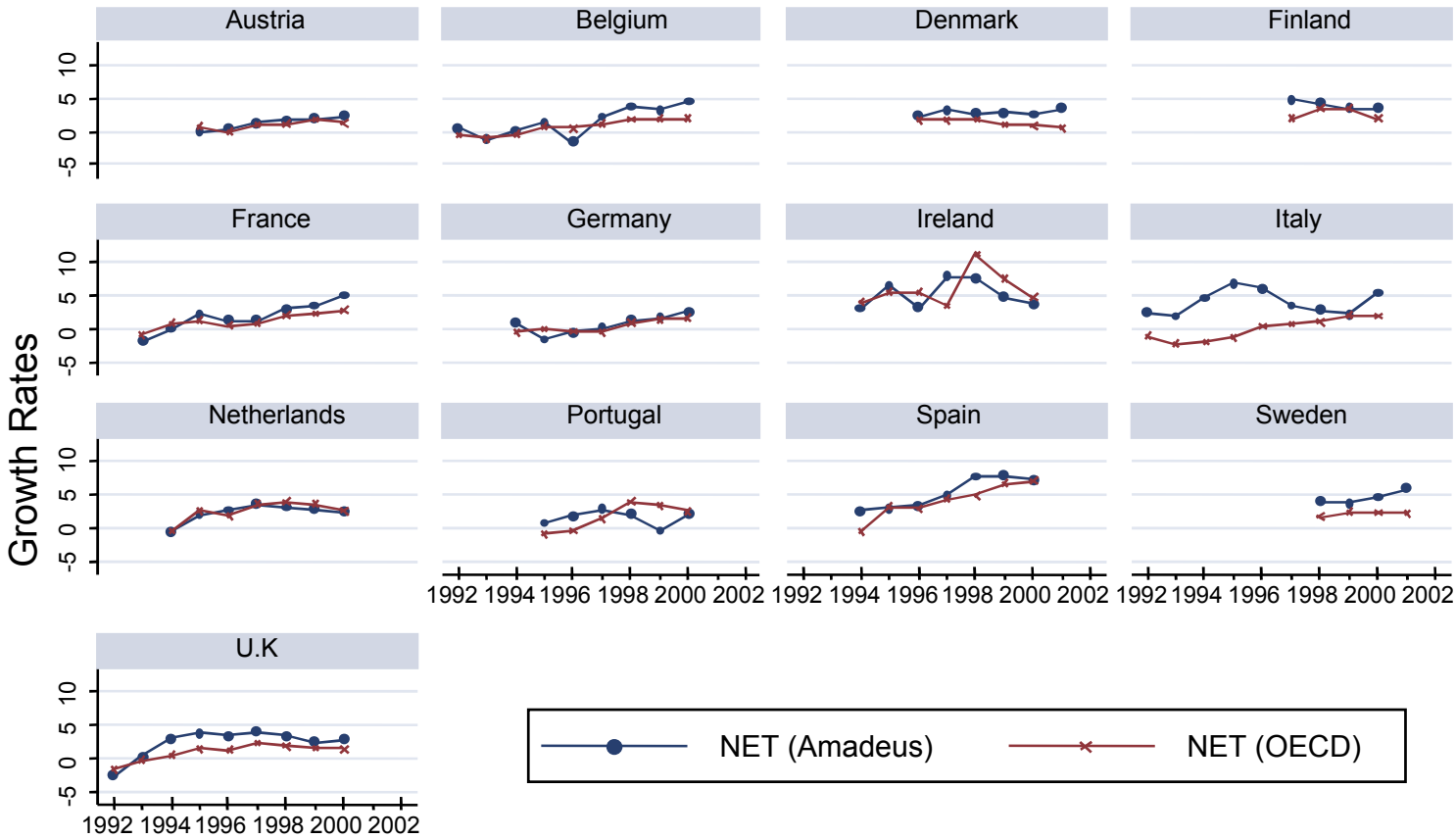

Table 3

Job Flows and Firm characteristics. OLS

Model	(A)	(B)	(C)	(D)	(E)	(F)
Depvar:	JR	JC	JD	JR	JC	JD
Intercept	16.335	10.513	5.871	15.315	10.077	4.999
	(20.31)	(25.60)	(10.46)	(20.25)	(19.84)	(12.11)
NET	0.164	0.613	-0.348	0.300	0.646	-0.282
	(1.16)	(6.91)	(3.66)	(2.63)	(9.07)	(4.07)
Age: 2-5 years	0.510	0.508	0.080	-0.071	-0.144	0.148
	(1.20)	(1.56)	(0.74)	(0.30)	(0.59)	(1.78)
6-10 years	-1.530	-1.435	0.140	-1.554	-1.607	0.241
	(4.74)	(5.00)	(1.57)	(8.09)	(7.58)	(3.41)
More than 10 years	-3.994	-3.974	0.481	-4.076	-4.205	0.655
	(8.28)	(8.15)	(5.06)	(8.75)	(8.95)	(11.60)
Sector: Agriculture	0.169	-0.080	-0.754	0.281	0.080	-0.622
	(0.17)	(0.10)	(3.60)	(0.44)	(0.14)	(2.41)
Construction	1.970	1.556	0.128	3.462	2.830	0.219
	(2.41)	(2.35)	(0.52)	(4.13)	(3.91)	(0.94)
Trade	1.323	1.805	-0.687	1.541	1.997	-0.599
	(3.14)	(4.11)	(4.57)	(5.50)	(5.77)	(3.87)
Transport	2.621	3.189	-0.855	2.506	3.111	-0.758
	(6.92)	(9.19)	(6.51)	(4.66)	(7.06)	(7.69)
Business services	5.892	5.461	0.107	5.260	5.142	-0.196
	(10.07)	(10.44)	(0.80)	(12.48)	(12.93)	(1.69)
Other services	1.887	2.618	-0.984	2.057	2.876	-1.165
	(4.08)	(6.08)	(5.95)	(4.05)	(6.94)	(7.09)
Size: 50-249	-1.439	-1.629	-0.016	-1.625	-1.532	-0.274
	(4.14)	(5.00)	(0.11)	(7.67)	(6.89)	(2.77)
250-999	-4.837	-4.223	-1.132	-4.275	-3.592	-0.833
	(8.22)	(8.56)	(4.47)	(9.83)	(10.73)	(3.94)
1,000 and over	-6.827	-6.209	-1.310	-5.169	-4.608	-0.925
	(12.10)	(14.33)	(5.01)	(14.72)	(10.49)	(4.66)
K-intensity: 20-30%				-0.235	0.183	-0.430
				(1.59)	(1.16)	(4.79)
30-40%				-0.171	0.328	-0.664
				(0.99)	(1.43)	(7.78)
More than 40%				0.531	0.477	-0.119
				(2.78)	(1.72)	(1.01)
Country: France	-3.455	-2.167	-1.287	-3.177	-2.166	-0.819
	(25.98)	(24.48)	(10.75)	(27.60)	(39.79)	(8.44)
Sweden	-1.051	-1.463	-0.263	-1.780	-1.824	-0.195
	(4.03)	(7.12)	(5.31)	(10.99)	(15.29)	(2.61)
Spain	0.791	0.255	0.109	0.415	-0.249	0.446
	(2.93)	(1.22)	(0.59)	(1.78)	(1.36)	(3.18)
Portugal	-2.926	-1.272	-1.900	-2.469	-1.624	-1.361
	(9.33)	(6.00)	(8.09)	(9.34)	(8.99)	(7.25)
Netherlands	-1.383	-1.865	-0.351	-4.081	-3.170	-1.605
	(7.97)	(18.49)	(2.76)	(22.80)	(22.39)	(15.45)
Ireland	-1.697	-1.345	-1.366	-2.676	-2.491	-1.405
	(4.85)	(5.09)	(6.91)	(8.65)	(9.38)	(9.23)
Germany	-3.868	-2.331	-1.415	-3.706	-3.970	-0.198
	(10.00)	(11.23)	(5.46)	(10.65)	(16.50)	(0.97)
Finland	-3.456	-2.514	-1.128	-3.278	-2.821	-0.719
	(27.04)	(34.92)	(25.46)	(30.28)	(31.12)	(8.87)
Denmark	-4.656	-3.560	-1.137	-5.505	-4.205	-1.344
	(15.09)	(19.99)	(7.87)	(24.84)	(40.73)	(9.37)
Belgium	-2.248	-1.119	-1.213	-2.700	-2.039	-0.709
	(16.77)	(12.02)	(12.42)	(23.40)	(27.46)	(10.14)
Austria	-5.252	-3.779	-1.878	-5.156	-4.542	-0.990
	(14.64)	(17.42)	(7.41)	(17.07)	(19.68)	(5.27)
Time dummies	yes	yes	yes	yes	yes	Yes
Observations	7110	7101	7066	17833	17828	17749
R-squared	0.32	0.33	0.15	0.22	0.23	0.08

Base case: Age (<1); Sector (Manufacturing); Size (1-49); Country (UK); Capital intensity (<20%). Calculated standard errors are robust to country clustering. t-statistics in parenthesis

Table 4

Institutional Determinants of Job Flows.

OLS, Fixed- and Random-effects estimates (t-statistics in parenthesis)

Model :	(A) OLS[1]	(B) OLS[1]	(C) Random effects[2]	(D) Random effects[2]	(E) Fixed-effects	(F) OLS[1]	(G) OLS[1]	(H) Random effects[2]	(I) Fixed-effects	(J) OLS[1]	(K) OLS[1]	(L) Random effects[2]	(M) Fixed-effects
Dependent Variable:	JR	JR	JR	JR	JR	JC	JC	JC	JC	JD	JD	JD	JD
Intercept	21.854	22.170	24.319	24.258	24.056	14.589	14.747	15.636	14.824	6.657	6.801	7.148	7.674
	(20.52)	(21.00)	(14.02)	(14.45)	(6.99)	(15.89)	(16.75)	(13.04)	(4.65)	(10.01)	(9.80)	(10.90)	(5.45)
Cycle indicator	0.260	0.227	0.142	0.142	0.136	0.672	0.654	0.609	0.581	-0.366	-0.380	-0.353	-0.349
	(2.91)	(2.36)	(2.06)	(2.04)	(1.88)	(7.09)	(6.96)	(9.77)	(8.70)	(6.53)	(6.30)	(12.67)	(11.76)
Union Co-ordination	-1.161	-1.113	-1.118	-1.104		-1.003	-0.978	-0.932		-0.422	-0.400	-0.486	
	(3.09)	(3.07)	(2.37)	(2.43)		(3.46)	(3.43)	(3.13)		(3.14)	(3.11)	(2.81)	
Benefit Duration	-3.587	-3.949	-4.636	-4.494	-4.003	-2.055	-2.243	-2.635	-3.979	-0.746	-0.908	-0.786	0.207
	(5.18)	(5.99)	(4.67)	(4.58)	(2.38)	(3.44)	(3.97)	(3.55)	(2.56)	(3.05)	(3.32)	(2.06)	(0.30)
Tax Wedge	-0.073	-0.072	-0.103	-0.107	-0.112	-0.078	-0.077	-0.086	-0.058	0.008	0.009	-0.003	-0.061
	(2.65)	(2.76)	(3.52)	(3.76)	(1.17)	(3.89)	(4.02)	(4.43)	(0.65)	(0.78)	(0.90)	(0.26)	(1.56)
Temp. Contracts	0.060	0.068	0.033	0.038	-0.045	0.010	0.015	0.013	-0.011	0.057	0.060	0.032	0.009
	(2.26)	(2.62)	(0.95)	(1.07)	(0.61)	(0.41)	(0.61)	(0.51)	(0.17)	(7.23)	(6.99)	(2.17)	(0.31)
Subsidies	0.543	0.581	0.622	0.348	0.622	1.345	1.282	0.884	0.922	-0.767	-0.527	-0.472	-0.799
	(0.56)	(0.62)	(1.19)	(0.71)	(0.83)	(1.61)	(1.71)	(2.01)	(1.32)	(2.53)	(2.42)	(2.26)	(2.59)
EPL- time-variant	-0.783		-0.959		-1.433	-0.341		-0.416	-0.899	-0.541		-0.230	0.105
	(1.79)		(2.64)		(1.97)	(1.14)		(1.56)	(1.33)	(2.29)		(1.54)	(0.35)
EPL- time-invariant		-0.965		-0.852			-0.442				-0.444		
		(2.08)		(2.12)			(1.51)				(2.65)		
Observations :	7110	7110	7110	7110	7110	7101	7101	7101	7101	7066	7066	7066	7066
R squared	0.31	0.31			0.28	0.33	0.33		0.32	0.14	0.14		0.10

Note: The regressions include age, sector, year and firm size dummies as defined in Columns A to C of Table 3. Range values: Co-ordination(1-3); Unemployment Benefit Duration(0-1); Tax Wedge(18.61-53.33); Share of Temporary Contracts (4.33-34.99); Employment Subsidies(0.23-1.93); EPL time invariant (0.50-3.70); EPL time variant (0.5-3.88). The indicator for the cycle is the aggregate net employment change.

[1]Calculated standard errors are robust to country clustering.

[2]Maximum likelihood estimation.

Table 5

Sensitivity Analysis. The effects of institutions dropping one country at a time

Dependent Variable:	JR			JC			JD		
	(A) Min.	(B) Max.	(C) p>.9	(D) Min.	(E) Max.	(F) p>.9	(G) Min.	(H) Max.	(I) p>.9
Time-variant EPL Specifications									
EPL	-1.346	-0.285	79.2	-0.787	-0.009	29.2	-0.483	-0.047	41.7
Union co-ordination	-1.892	-0.708	95.8	-1.261	-0.565	100	-0.595	-0.308	87.5
Benefit duration	-5.301	-2.694	95.8	-3.197	-1.522	91.7	-0.993	-0.306	83.3
Tax wedge	-0.126	-0.049	95.8	-0.105	-0.059	100	-0.014	0.016	4.2
Temporary Contracts	-0.077	0.091	41.7	-0.085	0.054	12.5	0.001	0.064	83.3
Subsidies	-0.569	1.735	4.2	0.131	2.230	54.2	-0.748	-0.043	83.3
Time-invariant EPL Specifications									
EPL	-1.503	-0.307	87.5	-0.847	-0.052	29.2	-0.573	-0.112	79.2
Union co-ordination	-1.943	-0.706	95.8	-1.289	-0.571	100	-0.585	-0.242	87.5
Benefit duration	-5.163	-3.098	100	-3.177	-1.742	95.8	-1.357	-0.325	87.5
Tax wedge	-0.130	-0.049	95.8	-0.105	-0.059	100	-0.013	0.016	8.3
Temporary Contracts	-0.057	0.092	37.5	-0.076	0.053	12.5	0.011	0.067	91.7
Subsidies	-0.537	1.653	4.2	0.120	2.143	58.3	-0.714	-0.064	83.3
Number of Regressions	24	24	24	24	24	24	24	24	24

Note: Min.: Minimum value; Max: Maximum value; p>.9: Percentage in which the probability of rejection of the parameter is below 10 %. Each column pools the results of the random effects and OLS regressions presented in Table 4.