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Please cite this paper as:

Benz, S. and L. Johannesson (2019), "Job characteristics, job transitions and services trade: Evidence from the EU labour force survey", *OECD Trade Policy Papers*, No. 225, OECD Publishing, Paris.
http://dx.doi.org/10.1787/bb21f81a-en

OECD Trade Policy Papers No. 225

Job characteristics, job transitions and services trade

EVIDENCE FROM THE EU LABOUR FORCE SURVEY

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JEL Classification: F14, F16, F61, J21, J63

OECD TRADE POLICY PAPER

This document has been declassified on the responsibility of the Working Party of the Trade Committee under the OECD reference number TAD/TC/WP(2018)16.

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JOB CHARACTERISTICS, JOB TRANSITIONS AND SERVICES TRADE: EVIDENCE FROM THE EU LABOUR FORCE SURVEY

Sebastian Benz and Louise Johannesson (OECD)

This report presents new cross-country evidence on labour market transitions in sectors exposed to growing volumes of international trade, and the job characteristics of workers employed in these sectors. It shows that export growth is significantly associated with lower job loss risk. In commercial services sectors, exports offer over-proportional employment opportunities to those currently outside the workforce. Men and women are not always impacted identically. For example, involuntary part time employment amongst women falls with growing export volumes, while there is no such effect for men. These results show that the distributional effects of international trade are not limited to wage effects or net changes in employment numbers and highlight the need for a comprehensive assessment of trade implications for individual workers.

Keywords: Trade, services, worker heterogeneity, labour market transitions, fixed-term contracts, part-time work, non-standard employment

JEL Codes: F14, F16, F61, J21, J63

Acknowledgements

This paper was written by Sebastian Benz and Louise Johannesson from the OECD Trade and Agriculture Directorate. The authors are grateful to Oliver Denk for very helpful comments and advice during the course of this project. In addition, they thank Ken Ash, Holger Breinlich, John Drummond, Peter Horvát, Alexander Hijzen, Alexander Jaax, Andrea Lassmann, Hildegunn Kyvik Nordås, Dorothée Rouzet and Jehan Sauvage for their insightful comments and suggestions. This paper also benefitted from discussions in the OECD Working Party of the Trade Committee, which agreed to make it more widely available through declassification. Finally, the authors thank Laëtitia Christophe and Michèle Patterson for preparing the document for publication.

Table of contents

Tables

Figures

Executive summary

This report is part of the project on *Services trade policy, structural transformation and labour market adjustments*, the objective of which is to support policy makers in designing service sector reforms that produce economy-wide gains and ensure that the benefits are widely shared. It uses OECD Trade in Value Added (TiVA) data and microdata from the European Union Labour Force Survey (EU LFS) in order to analyse patterns of job characteristics and job transitions. It highlights significant differences across sectors and countries and assesses the impact of international trade on European labour markets.

The report explores the relationship between trade exposure and certain labour market outcomes such as part-time employment, fixed term contracts, hiring decisions and job loss risk. Measures of trade exposure include export performance, import competition and offshoring. The difference between imports and offshoring is that imports compete directly with local firms in the end user market, while offshoring refers to imports of intermediate inputs, which may enhance the competitiveness of the importing sector. To the extent possible, the analysis differentiates between male and female workers, highlighting that they are not always identically affected by changes in trade exposure. The main objective is to shed light on the distribution effects of trade integration, while the methodology does not allow to analyse economy-wide effects of trade.

The following findings emerge.

- Working in sectors with strong export performance brings an extra benefit to female workers. A 10% export growth is associated with a reduction in the share of women in involuntary part-time work of almost 1%. By contrast, trade exposure is unrelated to the share of men in part-time work.
- Export growth is linked to a higher share of fixed-term contracts in a sector. Overall, export growth of 10% corresponds to a 1% increase in fixed-term employment. However, there exist strong differences in the composition of this effect along the gender dimension. For men, such growth in fixed-term employment is entirely due to rising shares of apprenticeships, while involuntary fixed-term employment is unaffected by trade exposure. By contrast, growth of female fixed-term employment in export-oriented sectors is mostly due to an increase in involuntary fixed-term contracts.
- Growth of commercial services exports is associated with increased hiring rates for workers in unemployment or inactivity, thereby offering new opportunities to those currently without employment. Hiring rates for these workers could increase by 1.6% after an export growth of 10%. This effect cannot be identified for other sectors, including manufacturing.
- Export growth is also a key factor for reducing workers' job loss risk, defined as the risk of losing a job without finding employment in the subsequent year. Job security of workers in sectors with dynamic export performance is 0.7% higher than that of workers in other sectors. When only considering services, the increase amounts to 1%. The beneficial effect on job security associated with exports exists in similar magnitudes for both, men and women.

- Hiring rates remain unaffected when imports or offshoring grow in parallel with domestic production. Unsurprisingly, workers are less likely to be hired in sectors where the ratio of imports relative to domestic output increases. This effect reflects the transition of workers towards more productive sectors, allowing for gains from trade to materialise.
- There is no evidence of a relationship between a sector's trade exposure and the rate at which workers quit jobs in order to take up other employment. However, the probability of losing a job without finding employment in the subsequent year is relatively higher for workers in sectors with rising imports of intermediate inputs. This correlation is more pronounced for men than it is for women.

1. Introduction

In the last decades, advanced economies have experienced significant structural change. Today, services account for more than 70% of employment in OECD countries and in the European Union. This development has been supported by growing international trade in services. In 20 years, the European Union increased its share of cross-border services exports in GDP from less than 5% (1995) to around 13% (2016).

To date, however, there is only little evidence on employment effects of increasing international trade in services. Among the few exceptions, Crinò (2010[1]) finds that services offshoring increases employment in more skilled occupations relative to less skilled occupations.[1] In line with recent findings for manufacturing, OECD (2017[2]) provides evidence that it is not the low-skilled but rather middle-skilled workers who are most affected. Offshoring in non-manufacturing sectors is correlated with increasing demand for low-skilled workers relative to middle-skilled workers. Ornaghi, Beveren and Vanormelingen (2017[3]) argue that services offshoring has a negative effect on employment growth among highly educated workers, whereas the impact of goods offshoring is positive.

This report contributes to understanding the distribution of economic benefits across different groups within each country's population by looking at non-standard forms of employment and labour market transitions. First, the study explores how trade exposure is related to the prevalence of part-time employment and fixed-term work contracts. These specifications are especially interesting from a gender perspective, as there is a persistent difference between part-time employment shares of men and women of around 23 percentage points. In addition, the study considers how trade integration affects firms' willingness to train and hire workers, measured by the incidence of fixed-term contracts related to apprenticeships and probationary periods.

A second focus of this study is on labour market transitions. In this context, a labour market transition means either a job change, a switch from employment to unemployment or inactivity, or a switch from unemployment or inactivity to employment. Such labour market transitions are of utmost relevance for workers' well-being. For example, exposure to job loss risk may deter workers' from daily consumption spending, major life decisions (Lozza, Castiglioni and Bonanomi, 2017[4]) such as having children (Golsch, 2003[5]; Bernardi, Klärner and von der Lippe, 2007[6]; Hofmann and Hohmeyer, 2013[7]) and increased stress levels, even though their present income remains unaffected. At the same time, voluntary job changes are an important source of individual-level wage growth and allocative efficiency in times of trade liberalisation or structural change. The impact of trade on gross job turnover can, thus, give a more precise picture of its employment impact than focusing exclusively on net changes in employment numbers.

The relationship between trade exposure, labour market transitions and non-standard employment is likely to vary significantly between male and female workers. For example, it is well-know that women are over-represented in part-time jobs. For this reason, an important objective of this study is to identify the differential effect of trade integration by gender. Distinguishing between men and women in this analysis can inform policy makers

[1] In subsequent work Crinò (2012[28]) analyses the channels of this effect, showing that services offshoring is skill-based due to a complementarity between imported services and domestic skills, while material offshoring is skill-biased due to a substitution of low-skilled labour.

about specific requirements for labour market adjustment policies in order to ensure that all workers can benefit from globalisation.

Some authors have already identified effects of international trade on job loss risk. Kletzer (2004[8]) shows that re-employment rates are significantly lower for displaced workers from industries with high import penetration. Munch (2010[9]) finds that international outsourcing slightly increases the risk of becoming unemployed, especially for low-skilled workers. Stone, Sourdin and Legendre (2013[10]) establish that exports can reduce the probability of unemployment, while imports increase unemployment risk and there is mixed evidence for offshoring. Görg and Görlich (2015[11]) identify lower job loss risk in sectors with high offshoring rates. However, since exports are positively correlated with offshoring, it could be exports rather than offshoring driving the results.

For Mexico's maquiladora industry, there is evidence that this production structure may help to mitigate employment volatility in the United States but increase employment volatility in Mexico (Bergin, Feenstra and Hanson, 2009[12]). Moreover, there is evidence that the switching of sectors in reaction to a trade shock is not costless. Estimates for Brazil suggest that the aggregate switching costs range from 1.4 to 2.7 times annual wages, with higher costs falling on female, less-educated, and older workers (Dix-Carneiro, 2014[13]). High-wage workers are more likely to move out of the manufacturing sector in the face of import competition (Autor et al., 2014[14]).

2. Data and measurement

The analysis in this study mainly uses individual-level survey data from the European Labour Force Survey (EU LFS), combined with export and import data from the OECD Trade in Value Added (TiVA) database. The TiVA database measures the flows of goods and services in 63 economies and 34 unique industrial sectors. TiVA now-cast estimates reports data until 2014.[2] The rest of this section will present the EU LFS and describe the construction of relevant labour market indicators.

The EU LFS is a large household sample survey providing annual results on labour participation and persons outside the labour force. Data used in this study include all 28 members of the European Union (EU), and three members of the European Free Trade Association (EFTA) and cover the period 2008–2016.[3] Each participating country is

[2] One advantage of TiVA is the availability of data on the use of imported intermediate inputs by sector, which can be used as a proxy for offshoring. More details are provided in Annex A.

[3] The European Union includes: Austria, Belgium, Bulgaria, Croatia, Cyprus[*] [**], Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom. EFTA includes: Norway, Iceland, Switzerland.

[*]Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

[**]Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of

responsible for the data collection, but the final EU LFS is harmonised so as to ensure comparability across all participating countries.[4] The sample is a yearly cross-section, thus individuals are not followed over years. In 2016 the quarterly sample size was around 1.5 million.[5] Representativeness is achieved by using sampling weights.

Individuals are identified as *employed*, *unemployed* or *inactive* persons, where a person has to work at least one hour per week for pay or profit to be regarded as employed. The purpose of such a broad definition is to include all types of jobs, apart from full-time employment, such as part-time, temporary, odd jobs, seasonal, as well as self-employment. The *labour force* consists of employed and unemployed persons. Unemployed persons are defined as persons not employed but looking for a job. For this analysis, the sample is limited to persons between 15–74 years old living in private households.[6] Using this definition, the sample represents nearly all (99.8 %) of the people in the labour force in 2016, see Annex B for more details.

If a person is not included in the labour force, they count as economically *inactive persons*, which are either in retirement, permanently disabled, other inactive (person), fulfilling domestic tasks, or students. Throughout this report, the sum of unemployed and inactive persons will also be called persons without employment.

Sectors are classified into three broad sector categories: all sectors, all services sectors and commercial services sectors (see Table 1 for further details). Within NACE divisions, public utilities (D and E) as well as professional and administrative services (M and N) were treated as one sector to allow for the merge of the EU LFS data with TiVA. Arts and recreation was merged with other services (R+S).

Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

[4] Further details can be found in EUROSTAT (2016[26]).

[5] https://ec.europa.eu/eurostat/statistics-explained.

[6] An individual's age is provided as 5-year interval age groups and individuals whose subsistence and shelter is provided for by an institution, such as those in military services, are excluded.

Table 1. Broad sector classification

Commercial services	Services	Division	NACE descriptions
		A	Agriculture, forestry and fishing
		B	Mining and quarrying
		C	Manufacturing
		D+E	Electricity, gas, steam and air conditioning supply; Water supply; sewerage, waste management and remediation activities
✓	✓	F	Construction
✓	✓	G	Wholesale and retail trade; repair of motor vehicles and motorcycles
✓	✓	H	Transportation and storage
✓	✓	I	Accommodation and food service activities
✓	✓	J	Information and communication
✓	✓	K	Financial and insurance activities
✓	✓	L	Real estate activities
✓	✓	M+N	Professional, scientific and technical activities; Administrative and support service activities
	✓	O	Public administration and defence; compulsory social security
	✓	P	Education
	✓	Q	Human health and social work activities
	✓	R+S	Other service activities, incl. arts, entertainment and recreation
	✓	T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

Note: NACE division U, Activities of extraterritorial organisations and bodies, is excluded.

2.1. Labour market transitions

Following the methodology of Haltiwanger and Vodopivec (2002[15]) and Davis and Haltiwanger (1998[16]),[7] labour market transitions are defined as changes over time in the activity status of individuals (employed, unemployed and inactive) and of job changes of employed persons. These different types of transitions between a year *t-1* and a year *t* are summarised in Table 2.

Frequencies for all types of transitions can be calculated from the employee-level data in the EU LFS. For example, job accession between two years corresponds to the number of persons who report being in employment in one year but have been unemployed in the previous year.[8] One focus of this report is on the distinction between hiring workers from within an existing employment relationship (churning) and workers who have previously not been employed (accession or entry). Likewise, there is an important distinction between workers leaving employment but able to find other employment elsewhere and workers tumbling into unemployment or inactivity by losing their jobs (separation and exit).

[7] Davis and Haltiwanger (1998[16]) calculate labour market transition rates for several western economies. Haltiwanger and Vodopivec (2002[15]) study labour market dynamics in Estonia during the transition period of the early 1990s. Using data from the EU LFS, patterns of labour market dynamics have been shown in Ward-Warmedinger and Macchiarelli (2014[27]). None of these studies relates labour market dynamics to trade exposure.

[8] Using this definition, all workers can only experience a single transition in each year. It is not possible to distinguish workers who first access the labour force and subsequently switch employers in the same year, from those workers who access the labour force and work for one employer continuously. Thus, this measure of labour market churning is a lower bound. Likewise, the number of separations per year is a lower bound.

Table 2. Types of job transitions

		t			
		Employed at x	Employed at y	Unemployed	Out of the labour force
$t-1$	Employed at x	$e^x e_t^x$	$e^x e_t^y$ (Churning)	s_t (Separation)	eo_t (Exit)
	Employed at y	$e^y e_t^x$ (Churning)	$e^y e_t^y = e^x e_t^x$	s_t (Separation)	eo_t (Exit)
	Unemployed	a_t (Accession)	a_t (Accession)	uu_t	uo_t (Exit from unemployment)
	Out of the labour force	oe_t (Entry)	oe_t (Entry)	ou_t (Entry to unemployment)	oo_t

Source: Own elaboration based on Haltiwanger and Vodopivec (2002[15]).

Following the literature, transition numbers are normalised with the number of employed persons in the previous year (e_{t-1}) to calculate transition rates between two years. Emphasising the distinction made in the previous paragraph, the number of accessions and entries relative to employment is called job take-up rate (*jtr*), while the number of churning relative to employment is called job change rate. Similarly, the number of separations and exits relative to employment is called job loss rate (*jlr*). It is also possible to calculate transition rates conditional on certain worker characteristics, such as gender, education or occupation.[9] Summarising, it means, that the job take up rate in country *i* and sector *k* at time *t* and the job loss rate in country *i* and sector *k* at time *t* can be written as:

$$jtr_{ikt} = \frac{a_{ikt} + oe_{ikt}}{e_{ikt-1}},$$
$$jlr_{ikt} = \frac{s_{ikt} + eo_{ikt}}{e_{ikt-1}}.$$

Table 3 presents descriptive statistics on job transition rates. More than 85% of all employed in the period 2008 to 2016 stay with their employer for at least two consecutive years. Around 6% of currently employed workers have changed their employer during the last 12 months, 3.2% have found a job coming from unemployment and 4% recently entered the labour force. The majority of the last group (almost 85%) are former students and individuals who completed military service or fulfilled domestic duties.

Persistent unemployment is high, corresponding to around 7% of the labour force and almost 60% of all unemployed. Around 25% of the currently unemployed have been separated from employment during the last 12 months, 14% entered the labour force without being able to find a job. Again, the vast majority (over 80%) are former students or individuals having stayed at home fulfilling domestic duties.

[9] The analysis in Section 4 exploits this possibility, analysing how trade exposure influences labour market outcomes by gender.

Table 3. Job transitions, all sectors, 2008-2016

Current status	Previous status	Transition	Weighted total observations (in thousands)	Share of current status	Share of labour force	Share of 15-74 in private households
Employed	Employed at the same employer	No transition	1,511,228	85.7%	75.4%	47.9%
Employed	Employed at different employer	Churning	122,893	7.0%	6.1%	3.9%
Employed	Unemployed	Accession	57,473	3.3%	2.9%	1.8%
Employed	Inactive	Entry	72,138	4.1%	3.6%	2.3%
Unemployed	Employed	Separation	61,819	25.7%	3.1%	2.0%
Unemployed	Unemployed	No transition	143,656	59.6%	7.2%	4.6%
Unemployed	Inactive	Entry to Unemployment	35,489	14.7%	1.8%	1.1%

Note: All numbers are based on individuals in the EU LFS adjusted with yearly weighting factors. They refer to the sum over the period 2008-2016. Share of current status refers to the group in the first column; share of labour force refers to the sum of employed and unemployed; share of 15-74 in private households refers to the sum of employed, unemployed and inactive.
Source: Own calculations based on EU LFS.

2.2. Job characteristics

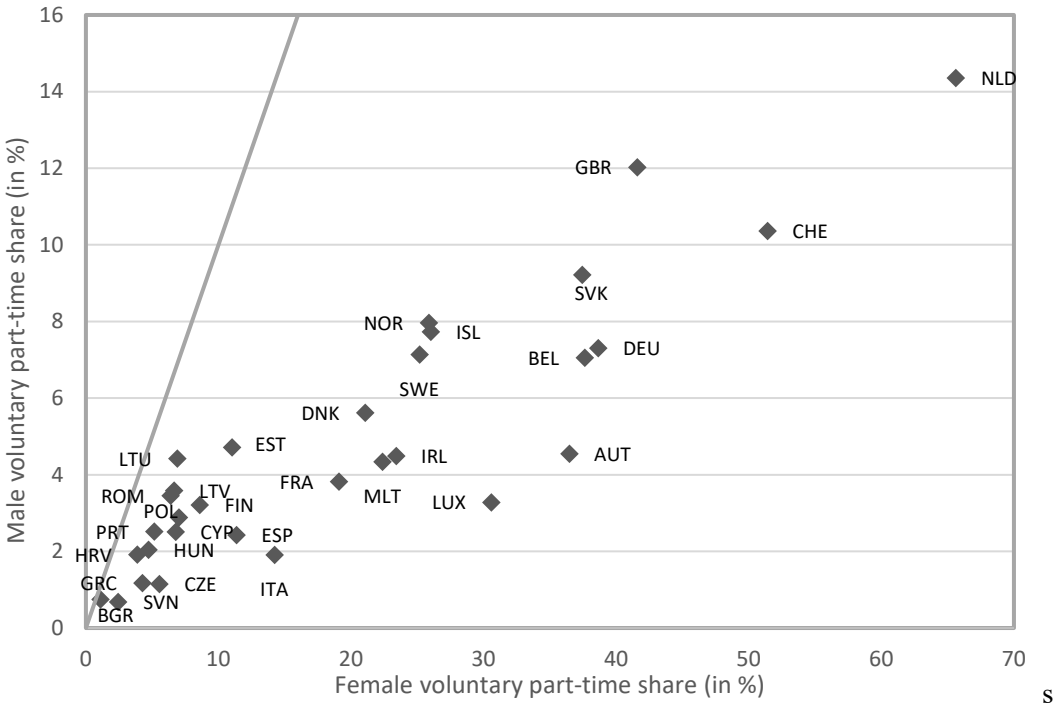
Several types of job characteristics are of interest in this report. Specifically, voluntary and involuntary part-time employment, where the former is defined as part-time employment related to the personal situation of a worker. In the EU LFS, this is indicated by the answers (i)"Person is undergoing school education or training", (ii) "Of own illness or disability", (iii) "Looki ng after children or incapacitated adults", (iv) "Other family or personal reasons". Involuntary part-time employment, on the other hand, is characterised by the fact that the respondent was not able to find full-time work. Additional job characteristics of interest include the prevalence of fixed-term employment, distinguishing whether such employment is involuntary ("person could not find a permanent job") or whether the fixed-term contract covers a period of apprenticeship. Further details on the measurement of these characteristics can be found in Annex B.

3. Descriptive analysis

Figure 1 shows that countries in the EU LFS differ substantially with respect to the prevalence of voluntary part-time employment in their respective economies. The lowest share of voluntary part-time work over the period 2008–2016 can be found in Bulgaria with around 1%. By contrast, 65% of women and 15% of men are in voluntary part-time arrangements in the Netherlands. In general, part-time work seems to be less common in Eastern Europe than in Western Europe. Moreover, the ratio of men and women in voluntary part-time work is more balanced in Eastern European countries, shown by their proximity to the line that indicates equal ratios of male and female part-time work. Countries with the largest gender gap in voluntary part-time employment are Austria and Luxembourg. The overall share of part-time workers has risen from 16.5% to 17.2% between 2008 and 2016.

Figure 1. Voluntary part-time work, by gender

Averages 2008-2016

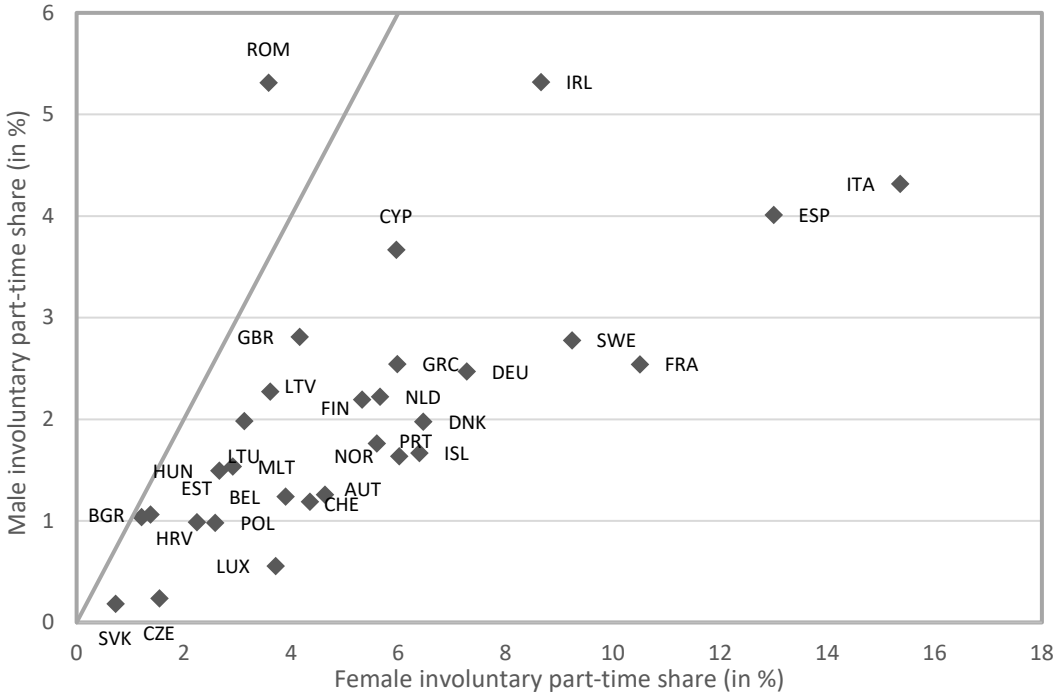


Note: Numbers show voluntary part-time employment as a share of total employment by gender. The grey line indicates equal shares of men and women in part-time work.
Source: Own calculations based on EU LFS.

Involuntary part-time employment is substantially less frequent than voluntary part-time work (Figure 2). It is most prevalent in Italy and Spain, where roughly 8% of the workforce is in involuntary part-time arrangements. Gender differences are less pronounced with respect to involuntary part-time work than they are with respect to voluntary part-time employment. Nonetheless, Romania is the only country where men are more affected by involuntary part-time employment than women, shown by its location to the left of the line that indicates equal ratios of male and female part-time work. Recent evidence shows an upsurge of involuntary part-time work in many countries (OECD, 2018[17]).

Figure 2. Involuntary part-time work, by gender

Averages 2008-2016



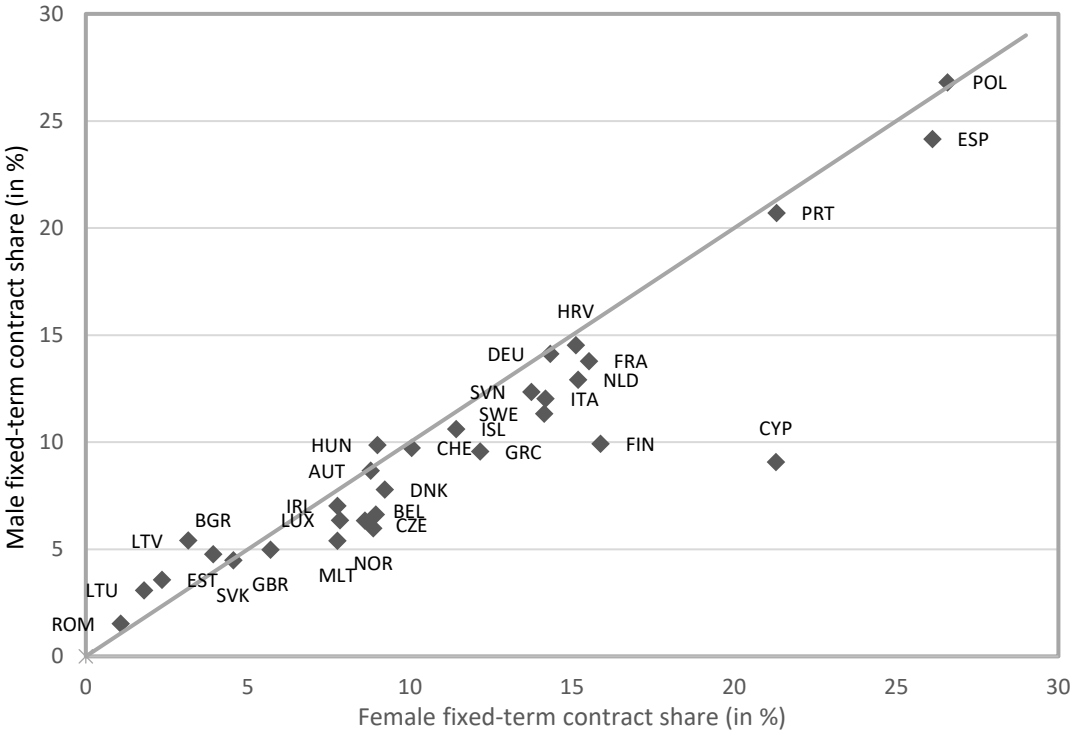
Note: Numbers show involuntary part-time employment as a share of total employment by gender. The grey line indicates equal shares of men and women in part-time work.
Source: Own calculations based on EU LFS.

Shares of fixed-term employment are relatively similar for men and women, as shown in Figure 3. Nonetheless, differences across countries are substantial. The share of workers on fixed-term contracts varies between only 1.3% in Romania and 27% in Poland. In this figure, fixed-term employment includes all types of fixed-term contracts, including apprenticeships and probationary periods.

An important explanation of these differences in job characteristics are structural differences across countries, such as sector composition of the economy, age and gender structure of workers, employment law, but also workers' preferences for part-time jobs. Since these aspects account for the dominant share of variation across countries, it is important to control for such factors when trying to identify the trade impact on job characteristics. However, this does not rule out that trade exposure plays a role in the determination of job characteristics across countries.

Figure 3. Fixed-term employment, by gender

Averages 2008-2016.

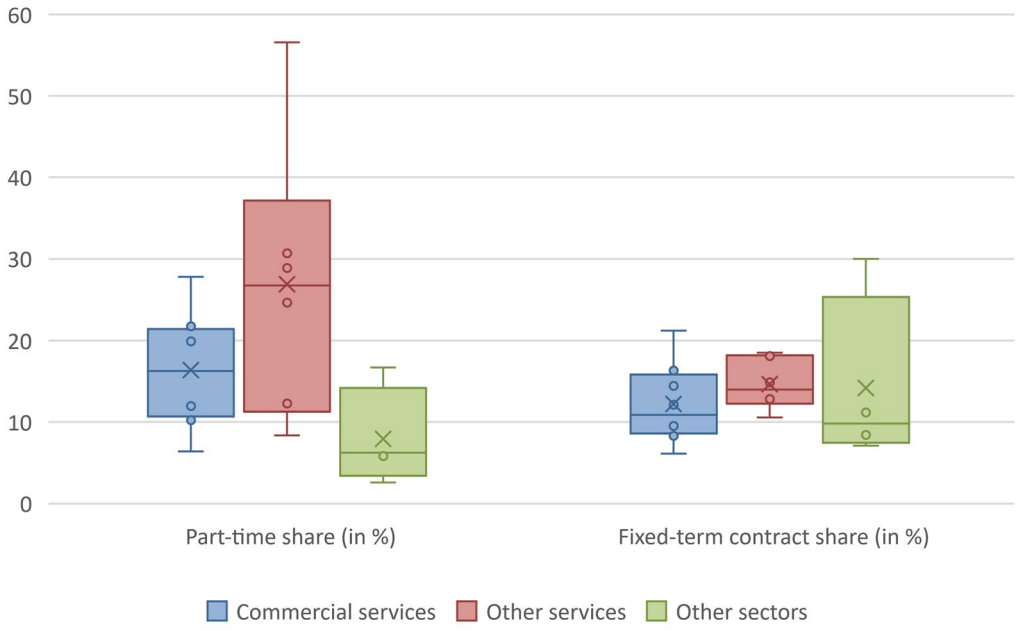


Note: Numbers show employment on fixed-term contracts as a share of total employment by gender. The grey line indicates equal shares of men and women in fixed-term contracts.
Source: Own calculations based on EU LFS.

When looking at differences across sectors (Figure 4), it becomes clear that part-time work is significantly more prevalent in services than in other sectors. Within services, part-time employment is particularly frequent in those that are not classified as commercial services, with a spike in *Activities of households as employers*. Also *Health*, as well as *Arts, recreation and entertainment* are characterised by high part-time shares. Part-time employment is least frequent in manufacturing and other non-services sectors. In contrast, the prevalence of fixed-term contracts seems to be relatively similar in commercial services, other services and all other sectors, even though the variance is larger in non-services sectors.

Figure 4. Job characteristics, by sector

Averages 2008-2016 over all countries in the EU LFS.

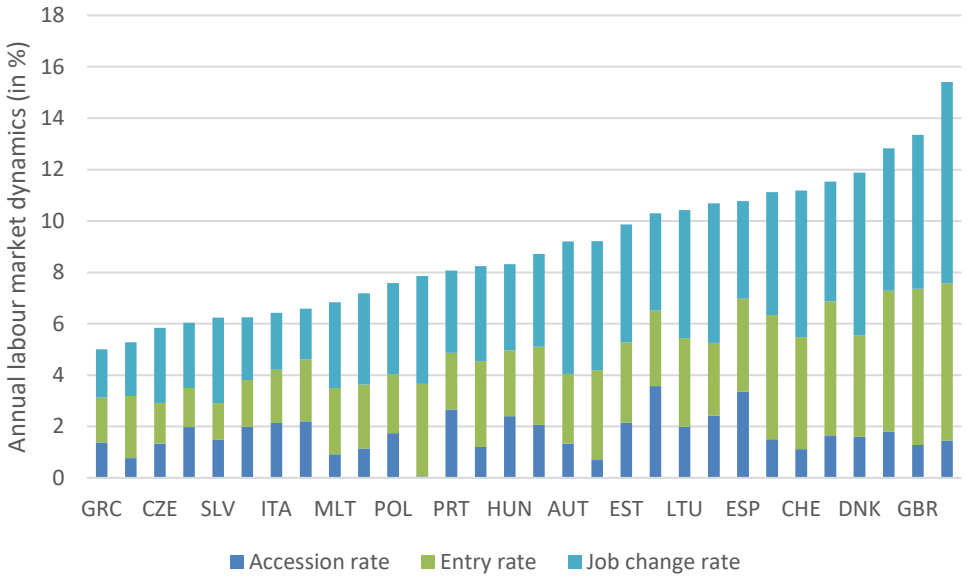


Note: Commercial services include NACE Rev. 2 Sections F-N; other services include NACE Rev. 2 Sections O-T; other sectors include NACE Rev. 2 Sections A-E.
Source: Own calculations based on EU LFS.

Countries do not only differ with respect to the prevalence of part-time work and fixed-term contracts. There are substantial differences with respect to labour market dynamics across countries. Figure 5 shows that labour markets in Nordic countries and the United Kingdom are the most dynamic of all countries in the EU LFS. For example, in Iceland, at any point in time, 8% of all workers changed their employer within the last 12 months, 6% of all workers used to be outside the labour force (entry rate) and 1.5% of all workers used to be without employment in the previous year (accession rate). In contrast, labour market dynamics in South-East European countries such as Greece and Romania are much lower.

Figure 5. Annual hiring dynamics

Averages 2008-2016



Source: Own calculations based on EU LFS.

Figure 6 shows annual job loss rates and job change rates by sector and over time for all major services and the manufacturing sector. Data are shown for all years from 2008 to 2016. There are striking differences across sectors, but dynamics over time in all sectors are relatively similar. More specifically, job loss risk and job change rates are highest in the *Accommodation and food services* sector. Also the labour markets in other services sectors, such as *Construction*, are more dynamic than the labour market for manufacturing workers, which serves as a benchmark.[10] Unsurprisingly, the labour market in the *Public administration* is least dynamic. Also *Health*, *Education* and *Finance* are characterised by low labour market dynamics.[11]

Moreover, the graph shows that some sectors are characterised by relatively high job security, given their level of labour market dynamics. For example, the *ICT* sector seems to be relatively dynamic in terms of job churning. Each year, the share of workers changing employers in the *ICT* sector is around 20% higher than this share in the *Distribution* sector. Nonetheless, job loss risk in the *Distribution* sector is almost 50% higher than it is for *ICT* workers.[12]

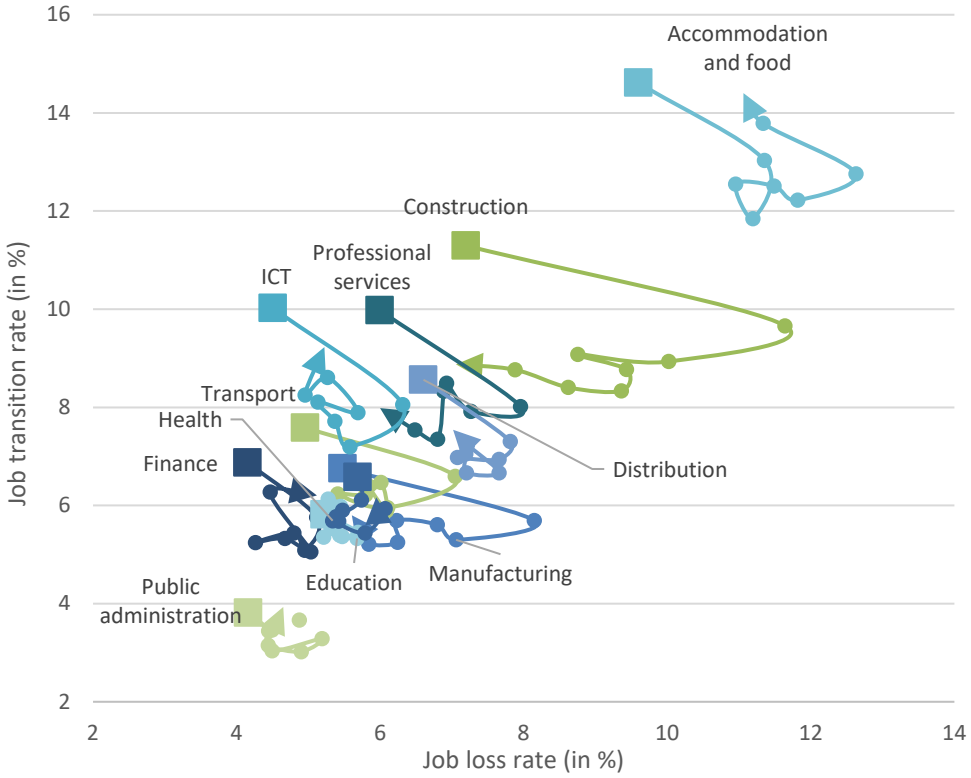
[10] As discussed above, job loss and job change are calculated over 12-month periods. Intermittent job losses during a 12-month period are not captured. For this reason, seasonality of sectors should not be a main factor for these results.

[11] Low rates of job losses in *Finance* during the time of the global financial crisis may seem surprising at first view. One possible explanation is the relatively higher number of employees in classical brick-and-mortar banks which got through the crisis fairly well.

[12] The difference in labour market dynamics between sectors such as *Distribution* and *ICT* might also be due to differences in the market concentration in these sectors.

Figure 6. Job loss and job change dynamics

By sector and over time, 2008–2016, averages over all countries



Source: Own calculations based on EU LFS.

In addition to structural differences across sectors, Figure 6 shows trends over time. In all sectors, labour markets in 2008 exhibited relatively low job loss risk and high job change rates. For each sector, a large square indicates the year 2007. Job loss risk increased during the global financial crisis, while the rate of job changes declined at the same time, making job loss more likely than a successful move from one job to another. The increase in job loss risk was especially pronounced in the construction sector. Obviously, the increase in job loss risk is also reflected in higher unemployment rates during those years.

Recovery has accelerated after 2013 and job loss risk in 2016 is already back to 2008-levels in almost all sectors. However, it is noteworthy that the rate of job changes has not yet recovered to pre-crisis levels in most sectors. In fact, almost all sectors are characterised by a lower rate of job changes than they were in 2008. This observation is consistent with a reduction in the number of business start-ups during the same time period, documented by (Calvino, Criscuolo and Menon, 2015[18]). Unfortunately, data for more recent years are not available yet. Thus, it remains unclear whether lower dynamics is a characterising feature of current labour markets or whether the recovery to pre-crisis levels will continue.

4. Regression results

This section summarises the main findings of the report, identified from regression analysis on labour market outcomes and trade exposure. In all specifications, labour market outcomes are left-hand side variables of a regression, while trade exposure is on the right-hand side. Several control variables and fixed effects are used to take into account observable and unobservable differences across countries and sectors. Detailed information on the estimation strategy can be found in Annex A.

4.1. Part-time employment

There is no evidence that offshoring or imports affect involuntary part-time employment, but they do seem to play a role for the prevalence of voluntary part-time work.

A growing share of imported intermediate inputs is associated with lower rates of voluntary part-time work. This definition includes all cases where the initiative for part-time work comes from the employee, not the employer.[13] As can be seen in Table 4, the effect is particularly strong for commercial services. Assuming a 10% increase of offshoring in one commercial services sector, the share of part-time workers in this sector should fall by 5.7%, relative to other commercial services sectors.[14] Considering not only commercial services but the entire economy, the corresponding decline of voluntary part-time work is around half as large.

At the same time, there is evidence that voluntary part-time work becomes more likely with growing import competition makes. If import shares in a sector grow by 10% it could raise the share of part-time workers by 1.7% relative to sectors where imports remain constant. Because the reasons for this type of part-time work lie exclusively outside the firm, is does not seem plausible that employee requests for part-time work are affected by trade exposure. A more convincing explanation is that firms in offshoring sectors are less likely to grant part-time work to workers asking for it, while those in sectors with larger import competition are more tolerant in that regard. Nevertheless, the reasons for this change in employer behaviour remain unclear. It could reflect an attempt to cut cost or the need for increasing flexibility, but might also be related to organisational restructuring in sectors competing more intensively with foreign providers or to changes in the occupation structure of workers in a sector.

Among the group of control variables, a growing share of male workers in a sector implies a significant reduction of voluntary part-time employment, confirming that men are less likely to work part-time than women are, as shown in Figure 1. However, there is no significant effect of the gender composition on involuntary part-time work, in line with the more balanced gender composition of involuntary part-time employment in Figure 2. Also trade exposure does not seem to affect involuntary part-time work.

[13] Voluntary part-time work is defined as reasons given for part-time work being "Person is undergoing school education or training", "Of own illness or disability", "Looking after children or incapacitated adults", "Other family or personal reasons". More details can be found in Annex B.

[14] The numbers in this hypothetical experiment are based on the regression coefficient for offshoring in column (1), panel (c) of Table 3.

Table 4. Regression results: part-time employment

	(1)	(2)	(3)	(4)	(5)	(6)
(a) All sectors	**voluntary**	**involuntary**	**voluntary**	**involuntary**	**voluntary**	**involuntary**
	Value		Value per worker		Value per output	
Δ Exports	0.030	-0.016	0.050	-0.014	0.034	-0.007
	(0.052)	(0.038)	(0.051)	(0.039)	(0.051)	(0.038)
Δ Imports	0.120	-0.011	0.169**	-0.006	0.170**	0.012
	(0.075)	(0.098)	(0.074)	(0.098)	(0.083)	(0.104)
Δ Offshoring	-0.307**	0.013	-0.194*	0.024	-0.288*	-0.007
	(0.128)	(0.109)	(0.114)	(0.102)	(0.169)	(0.160)
Observations	1 381	1 385	1 381	1 385	1 381	1 385
R-squared	0.336	0.453	0.331	0.453	0.334	0.453
(b) Services	**voluntary**	**involuntary**	**voluntary**	**involuntary**	**voluntary**	**involuntary**
	Value		Value per worker		Value per output	
Δ Exports	0.027	-0.015	0.047	-0.010	0.036	0.002
	(0.055)	(0.039)	(0.055)	(0.040)	(0.055)	(0.039)
Δ Imports	0.110	-0.078	0.195*	-0.064	0.201*	-0.029
	(0.112)	(0.116)	(0.108)	(0.113)	(0.115)	(0.117)
Δ Offshoring	-0.324**	0.018	-0.205	0.047	-0.238	0.127
	(0.146)	(0.101)	(0.130)	(0.100)	(0.196)	(0.141)
Observations	1 087	1 088	1 087	1 088	1 087	1 088
R-squared	0.325	0.442	0.318	0.442	0.322	0.442
(c) Commercial services	**voluntary**	**involuntary**	**voluntary**	**involuntary**	**voluntary**	**involuntary**
	Value		Value per worker		Value per output	
Δ Exports	-0.047	0.001	-0.016	-0.000	-0.045	0.019
	(0.060)	(0.066)	(0.055)	(0.066)	(0.057)	(0.069)
Δ Imports	0.078	-0.033	0.169	-0.035	0.225	-0.016
	(0.140)	(0.150)	(0.140)	(0.149)	(0.153)	(0.162)
Δ Offshoring	-0.567***	0.103	-0.387**	0.094	-0.687***	0.321
	(0.178)	(0.167)	(0.161)	(0.161)	(0.244)	(0.257)
Observations	792	785	792	785	792	785
R-squared	0.393	0.500	0.383	0.500	0.388	0.502

Note: Model is estimated in first differences. Country-year FE, sector-year FE and country-sector FE included in all specifications. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: natural logarithm of voluntary and involuntary part-time employment. All trade variables in natural logarithms. Control variables: log total employment, log share of male workers, log fixed-term share, log fixed-term share (involuntary), shares of high, medium and lower education workers; employment shares in six firm size categories.

Exports support full-time employment for women

Based on the observation that changes in part-time employment are associated with changes in trade patterns and knowing that rates of part-time work are higher among women than among men, it seems crucial to ask whether the link between trade exposure and part-time work is equally strong for men and women. For voluntary part-time work, the analysis shows that this is indeed the case.

However, things are different when looking at involuntary part-time employment. While there was no significant relationship between trade exposure and involuntary part-time work, a strong export performance can contribute to a reduction of involuntary part-time employment amongst women. This effect holds for the entire economy and also when only considering services, but is not significant when only looking at the group of commercial services sectors. A 10% increase in export shares would reduce the number of women in

involuntary part-time work by almost 1%. By contrast, export expansion has no significant effect on the number of men in part-time work.

Table 5. Regression results: part-time employment by gender

	(1)	(2)	(3)	(4)	(5)	(6)
Involuntary part-time employment	Men	Women	Men	Women	Men	Women
	All sectors		Services		Commercial services	
Δ Exports	-0.022	-0.094*	-0.001	-0.093*	-0.038	-0.020
	(0.062)	(0.052)	(0.068)	(0.054)	(0.090)	(0.086)
Δ Imports	-0.148	0.060	-0.270	-0.126	-0.173	-0.219
	(0.152)	(0.148)	(0.180)	(0.164)	(0.245)	(0.332)
Δ Offshoring	-0.064	-0.126	0.129	-0.188	-0.011	-0.172
	(0.348)	(0.181)	(0.391)	(0.183)	(0.390)	(0.382)
Observations	1,240	1,253	957	1,012	707	694
R-squared	0.399	0.376	0.401	0.420	0.444	0.458

Note: Model is estimated in first differences. Country-year FE, sector-year FE and country-sector FE included in all specifications. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: natural logarithm of involuntary part-time employment. All trade variables in natural logarithms. Control variables: log total employment, log fixed-term share, log fixed-term share (involuntary), shares of high, medium and lower education workers; employment shares in six firm size categories.

4.2. Fixed-term contracts

Export growth is linked to a higher share of fixed-term contracts

Firms in sectors with growing export shares are increasingly likely to offer fixed-term employment contracts. The magnitude of the coefficient in column (1) of panel (a) of Table 6 suggests that a sector's export growth of 10% could lead to an increase in fixed-term employment in this sector of 0.8%, relative to sectors where exports remain constant. The effect seems to be strongest when considering the entire economy. Within the group of commercial services sectors, there is no statistically robust evidence even though coefficients have a similar magnitude, probably due to the lower number of observations in these specifications. Table 6 shows results for trade exposure measured by value and by value per output, but results are basically identical when trade exposure is measured by value per worker.

Both total fixed-term employment and involuntary fixed-term employment[15] are positively correlated with export performance. One explanation for this finding is that temporary foreign demand spikes are covered with temporary workers, resulting in a positive correlation between export growth and changes in the shares of fixed-term employment.

Men tend to take-up apprenticeships in exporting sectors

In addition to involuntary fixed-term contracts, apprenticeships are included in this analysis as a special form of fixed-term contract. Involuntary fixed-term contracts and apprenticeships in exporting sectors are not distributed evenly across men and women. Looking at both genders individually reveals that young men benefit disproportionately from an expansion in the number of apprenticeships in exporting sectors. The coefficients

[15] The definition of involuntary fixed-term employment includes cases where the question on the reason of fixed-term work was answered with "person could not find a permanent job".

in Table 7 indicate that growing rates of fixed-term employment among men in sectors with strong export performance can be explained entirely by an inflow of male apprentices into these sectors.

By contrast, women do not seem to discriminate between sectors with strong export performance and domestically oriented sectors when seeking apprenticeships. Instead, the rate of women in fixed-term employment grows with export performance because involuntary fixed-term contracts become more prevalent. This analysis can be seen as evidence that in cases where temporary demand spikes from abroad require additional fixed-term workers, it is mostly women who step up. This pattern is shown for the services sectors based on one single specification in Table 7 but it holds for all groups of sectors and all specifications.

Table 6. Regression results: fixed-term contracts

	(1)	(2)	(3)	(4)	(5)	(6)
(a) All sectors	Total	Involuntary	Apprentice	Total	Involuntary	Apprentice
		Value			Value per output	
Δ Exports	0.081**	0.105**	0.145	0.094***	0.114**	0.149
	(0.033)	(0.052)	(0.147)	(0.036)	(0.053)	(0.147)
Δ Imports	0.085	0.091	-0.056	0.128	0.141	-0.109
	(0.066)	(0.085)	(0.211)	(0.078)	(0.094)	(0.214)
Δ Offshoring	-0.108	0.087	-0.089	0.120	0.230	-0.056
	(0.121)	(0.115)	(0.274)	(0.119)	(0.159)	(0.352)
Observations	1 514	1 494	1 114	1 514	1 494	1 114
R-squared	0.392	0.337	0.316	0.395	0.341	0.316
(b) Services	Total	Involuntary	Apprentice	Total	Involuntary	Apprentice
		Value			Value per output	
Δ Exports	0.066**	0.100*	0.135	0.072**	0.102*	0.144
	(0.031)	(0.054)	(0.145)	(0.033)	(0.054)	(0.144)
Δ Imports	0.001	0.018	-0.129	0.026	0.037	-0.107
	(0.072)	(0.102)	(0.224)	(0.081)	(0.106)	(0.230)
Δ Offshoring	-0.074	0.120	-0.110	0.060	0.203	-0.087
	(0.115)	(0.110)	(0.264)	(0.120)	(0.163)	(0.353)
Observations	1 186	1 167	894	1 186	1 167	894
R-squared	0.425	0.361	0.339	0.426	0.361	0.339
(c) Commercial services	Total	Involuntary	Apprentice	Total	Involuntary	Apprentice
		Value			Value per output	
Δ Exports	0.049	0.097	0.146	0.060	0.075	0.165
	(0.045)	(0.093)	(0.180)	(0.054)	(0.093)	(0.182)
Δ Imports	0.098	0.179	-0.279	0.168	0.264**	-0.233
	(0.099)	(0.123)	(0.307)	(0.108)	(0.132)	(0.349)
Δ Offshoring	-0.179	0.069	0.020	0.084	0.236	-0.221
	(0.152)	(0.179)	(0.419)	(0.202)	(0.285)	(0.630)
Observations	862	843	626	862	843	626
R-squared	0.462	0.394	0.444	0.464	0.398	0.445

Note: Model is estimated in first differences. Country-year FE, sector-year FE and country-sector FE included in all specifications. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: natural logarithm of share of total fixed-term contracts, natural logarithm of share of involuntary fixed-term contracts and natural logarithm of share of apprenticeships. All trade variables in natural logarithms. Additional control variables: log total employment, log share of male workers, log part-time share, log part-time share (involuntary), shares of high, medium and lower education among workers; employment shares in six firm size categories.

Table 7. Regression results: fixed-term contracts by gender

	(1)	(2)	(3)	(4)	(5)	(6)
	Total		Involuntary		Apprentice	
Services	Men	Women	Men	Women	Men	Women
Δ Exports	0.025	0.044	0.003	0.111*	0.234**	-0.002
	(0.050)	(0.046)	(0.049)	(0.058)	(0.112)	(0.132)
Δ Imports	0.115	-0.105	-0.083	-0.265	-0.021	-0.156
	(0.150)	(0.109)	(0.173)	(0.161)	(0.258)	(0.279)
Δ Offshoring	-0.022	0.154	0.049	0.106	0.231	-0.420
	(0.149)	(0.096)	(0.138)	(0.157)	(0.297)	(0.316)
Observations	976	1 031	957	1,012	699	665
R-squared	0.431	0.405	0.424	0.378	0.439	0.431

Note: Trade exposure measured as trade value per worker. Model is estimated in first differences. Country-year FE, sector-year FE and country-sector FE included in all specifications. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: natural logarithm of share of total fixed-term contracts, natural logarithm of share of involuntary fixed-term contracts and natural logarithm of share of apprenticeships. All trade variables in natural logarithms. Additional control variables: log total employment, log part-time share, log part-time share (involuntary), shares of high, medium and lower education among workers; employment shares in six firm size categories.

4.3. Hiring decisions

Growth of commercial services exports offers opportunities to those without employment

Growing focus of commercial services towards export markets represents opportunities of persons who are currently not in employment. Panel (c) in Table 8 shows that such individuals have disproportionally high chances of finding jobs in commercial services sectors with strong export performance. While there is a positive correlation of export growth and the hiring of recruits coming out of unemployment or inactivity, there is no significant effect on the hiring of workers with existing employment relationships. In other words, commercial services exports tend to create jobs for workers with interrupted employment trajectories or for those taking up their very first job.

The coefficients indicate a certain importance of export performance to hiring rates. If export shares in a commercial services sector grow by 10% the hiring rate of workers without current employment could increase by 1.6% relative to sectors with constant export shares. Such a positive and significant effect can only be identified for commercial services exports. When considering the entire economy, all coefficients are insignificant and close to zero. When studying all services there is a tendency in favour of hiring workers currently not in employment. However, it results from a negative effect of export growth on the hiring rates of workers in existing employment relationships, while those currently without employment remain unaffected.

Table 8. Regression results: hiring rates

	(1)	(2)	(3)	(4)	(5)	(6)
(a) All sectors	Job take-up	Job change	Job take-up	Job change	Job take-up	Job change
	Value		Value per worker		Value per output	
Δ Exports	0.012	-0.008	-0.001	-0.006	0.010	-0.026
	(0.022)	(0.026)	(0.023)	(0.026)	(0.022)	(0.025)
Δ Imports	-0.040	-0.069	-0.067	-0.063	-0.051	-0.196***
	(0.051)	(0.064)	(0.049)	(0.063)	(0.049)	(0.055)
Δ Offshoring	0.022	0.023	-0.039	0.036	-0.050	-0.094
	(0.058)	(0.064)	(0.052)	(0.057)	(0.078)	(0.086)
Observations	1 389	1 389	1 389	1 389	1 389	1 389
R-squared	0.618	0.452	0.615	0.452	0.618	0.464
(b) Services	Job take-up	Job change	Job take-up	Job change	Job take-up	Job change
	Value		Value per worker		Value per output	
Δ Exports	0.025	-0.026	0.020	-0.029	0.018	-0.059*
	(0.031)	(0.033)	(0.031)	(0.033)	(0.032)	(0.032)
Δ Imports	-0.066	-0.047	-0.074	-0.051	-0.082	-0.222***
	(0.062)	(0.093)	(0.060)	(0.090)	(0.058)	(0.064)
Δ Offshoring	-0.061	-0.028	-0.078	-0.036	-0.165*	-0.195**
	(0.067)	(0.072)	(0.063)	(0.068)	(0.084)	(0.098)
Observations	970	970	970	970	970	970
R-squared	0.630	0.464	0.630	0.464	0.632	0.482
(c) Commercial services	Job take-up	Job change	Job take-up	Job change	Job take-up	Job change
	Value		Value per worker		Value per output	
Δ Exports	0.160**	-0.034	0.130*	-0.029	0.159**	-0.090
	(0.066)	(0.064)	(0.067)	(0.063)	(0.073)	(0.066)
Δ Imports	-0.104	0.043	-0.113	0.044	-0.146*	-0.188**
	(0.082)	(0.123)	(0.081)	(0.122)	(0.082)	(0.081)
Δ Offshoring	-0.026	-0.114	-0.097	-0.101	-0.222	-0.381**
	(0.126)	(0.128)	(0.115)	(0.116)	(0.161)	(0.177)
Observations	667	667	667	667	667	667
R-squared	0.669	0.516	0.667	0.516	0.672	0.534

Note: Model is estimated in first differences. Country-year FE, sector-year FE and country-sector FE included in all specifications. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: natural logarithm of job change rate and natural logarithm of entry + accession rate. All trade variables in natural logarithms. Additional control variables: log total employment, log share of male workers, log part-time share, log part-time share (involuntary), log fixed-term share, log fixed-term share (involuntary), shares of high, medium and lower education among workers; employment shares in six firm size categories.

By contrast, there is weak evidence that growing rates of import competition and offshoring are associated with lower hiring rates in a sector. Correlations are only significantly negative when both are measured by the value of imports relative to domestic output in a sector. In other words, if import competition or imports of intermediate inputs rise faster than output in a sector, hiring rates are likely to fall. If domestic output grows at the same speed as imports or imported intermediate inputs, hiring rates remain unaffected. A 10% increase in the ratio of imports relative to domestic output could suppress hiring rates in a commercial services sector by somewhat more than 1% relative to commercial services sectors where import shares remain constant. The effect is slightly stronger for workers currently employed elsewhere (1.9%) than workers currently without employment (1.5%).

Also when considering the entire economy or all services sectors, rates of incoming job changers and hiring of workers without current employment fall with rising import competition. In all specifications, the effect is stronger for workers with existing employment relationships. However, it is not necessarily the labour demand side driving this phenomenon. An alternative explanation is that workers in employment are little fond of moving to sectors with growing import competition or offshoring in the anticipation of future negative effects on wages or employment prospects.

These results reflect the transition of workers across sectors. A reduction of hiring rates in shrinking sectors allows for employment growth in more competitive sectors where workers can be more productive. This reallocation is necessary for the expansion of output and materialisation of gains from trade on the production side. It complements gains from trade through the availability of cheaper and better products and services (Breinlich, Dhingra and Ottaviano, 2016[19]; De Loecker et al., 2016[20]; Amiti et al., 2017[21]; Berlingieri, Breinlich and Dhingra, 2018[22]).

Import competition affects hiring prospects of women currently out of the workforce

The relationship between import competition and hiring rates of workers who are currently employed elsewhere is very similar for men and women. Depending on the specification, the probability of being hired in a sector following a 10% increase in the ratio of imports relative to domestic output is between 1% and 3% lower than in sectors where import competition remains constant. However, this relationship is not statistically significant in all specifications.

When considering only unemployed or inactive individuals, women are more affected by import competition than men. In fact, there is no significant correlation between import exposure and the rates at which men find their first employment after at least one year in unemployment or inactivity. By contrast, import competition is associated with fading prospects of women to find new employment. The relevant coefficient is significantly negative in all specifications when looking at the entire economy but also when focusing on services and indicates a reduction in hiring rates between 1.3% and 1.9%, assuming an import growth of 10%.

Table 9. Regression results: job take-up rates by gender

	(1)	(2)	(3)	(4)	(5)	(6)
(a) All sectors	Men	Women	Men	Women	Men	Women
	Value		Value per worker		Value per output	
Δ Exports	-0.010	-0.017	-0.023	-0.002	-0.006	-0.006
	(0.037)	(0.031)	(0.037)	(0.033)	(0.038)	(0.032)
Δ Imports	-0.059	-0.170**	-0.099	-0.133*	-0.053	-0.151*
	(0.073)	(0.076)	(0.073)	(0.071)	(0.077)	(0.082)
Δ Offshoring	0.065	-0.014	-0.019	0.048	0.052	-0.103
	(0.092)	(0.086)	(0.083)	(0.084)	(0.135)	(0.116)
Observations	1 248	1 264	1 248	1 264	1 248	1 264
R-squared	0.587	0.544	0.585	0.543	0.587	0.544
(b) Services	Men	Women	Men	Women	Men	Women
	Value		Value per worker		Value per output	
Δ Exports	0.003	-0.011	0.011	-0.003	-0.004	-0.004
	(0.051)	(0.047)	(0.050)	(0.048)	(0.054)	(0.047)
Δ Imports	-0.116	-0.191**	-0.094	-0.169**	-0.126	-0.160*
	(0.094)	(0.086)	(0.094)	(0.076)	(0.090)	(0.086)
Δ Offshoring	-0.079	-0.076	-0.041	-0.050	-0.199	-0.149
	(0.109)	(0.091)	(0.095)	(0.086)	(0.157)	(0.126)
Observations	855	905	855	905	855	905
R-squared	0.604	0.578	0.604	0.577	0.551	0.606

Note: Model is estimated in first differences. Country-year FE, sector-year FE and country-sector FE included in all specifications. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: natural logarithm of job change rate and natural logarithm of entry + accession rate. All trade variables in natural logarithms. Additional control variables: log total employment, log part-time share, log part-time share (involuntary), log fixed-term share, log fixed-term share (involuntary), shares of high, medium and lower education among workers; employment shares in six firm size categories.

4.4. Job loss risk

Export growth is associated with lower job loss risk, while offshoring has the opposite effect

Strong export performance is negatively correlated with job loss risk. Workers in sectors with faster export growth are less likely to end up in unemployment or inactivity in the next year. This effect holds when considering the entire economy or when only looking at services sectors. In the former case, a sector with an export growth of 10% could exhibit a job loss risk that is 0.7% lower than in other sectors, while for services sectors the difference is even 1%. Regression coefficients are insignificant when only considering the group of commercial services sectors.

Growing use of imported intermediate inputs in a sector is associated with higher risk that workers from this sector end up in unemployment or inactivity in the subsequent year. This pattern holds for the entire economy and all services sectors but it is most pronounced when only considering commercial services. The numbers in Table 10 indicate that the risk of job loss without finding subsequent employment is 3.2% higher in commercial services sectors, 2.2% higher for all services together and 1.6% higher when considering the entire economy after a 10% increase in the share of imported intermediates.

Table 10. Regression results: job loss risk

	(1)	(2)	(3)	(4)	(5)	(6)
(a) All sectors	Job loss	Job change	Job loss	Job change	Job loss	Job change
	Value		Value per worker		Value per output	
Δ Exports	-0.074**	0.007	-0.057**	0.018	-0.058**	0.010
	(0.029)	(0.027)	(0.028)	(0.027)	(0.027)	(0.028)
Δ Imports	-0.021	0.044	0.041	0.088	-0.011	0.116*
	(0.052)	(0.068)	(0.054)	(0.066)	(0.060)	(0.066)
Δ Offshoring	0.136*	-0.134	0.230***	-0.067	0.162*	0.004
	(0.070)	(0.083)	(0.066)	(0.075)	(0.092)	(0.103)
Observations	1 147	1 147	1 147	1 147	1 147	1 147
R-squared	0.696	0.449	0.689	0.444	0.695	0.450
(b) Services	Job loss	Job change	Job loss	Job change	Job loss	Job change
	Value		Value per worker		Value per output	
Δ Exports	-0.099***	0.019	-0.081**	0.031	-0.077**	0.025
	(0.032)	(0.041)	(0.033)	(0.039)	(0.031)	(0.041)
Δ Imports	-0.007	0.034	0.057	0.079	0.023	0.110
	(0.060)	(0.094)	(0.058)	(0.089)	(0.072)	(0.085)
Δ Offshoring	0.152*	-0.036	0.230***	0.018	0.216**	0.115
	(0.082)	(0.092)	(0.073)	(0.084)	(0.100)	(0.120)
Observations	804	804	804	804	804	804
R-squared	0.745	0.455	0.740	0.451	0.744	0.458
(c) Commercial services	Job loss	Job change	Job loss	Job change	Job loss	Job change
	Value		Value per worker		Value per output	
Δ Exports	0.016	-0.015	0.056	0.056	0.083	0.010
	(0.062)	(0.073)	(0.059)	(0.077)	(0.059)	(0.079)
Δ Imports	-0.094	-0.071	-0.062	-0.015	-0.130	0.043
	(0.083)	(0.125)	(0.081)	(0.121)	(0.086)	(0.120)
Δ Offshoring	0.211	-0.052	0.317**	0.135	0.319*	0.233
	(0.135)	(0.142)	(0.123)	(0.133)	(0.164)	(0.216)
Observations	555	555	555	555	555	555
R-squared	0.793	0.522	0.790	0.510	0.794	0.523

Note: Model is estimated in first differences. Country-year FE, sector-year FE and country-sector FE included in all specifications. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: natural logarithm of job change rate and natural logarithm of separation + exit rate. All trade variables in natural logarithms. Additional control variables: log total employment, log share of male workers, log part-time share, log part-time share (involuntary), log fixed-term share, log fixed-term share (involuntary), shares of high, medium and lower education among workers; employment shares in six firm size categories.

Offshoring is linked to higher unemployment risk in a sector even when imports of intermediate inputs lead to proportional output growth in the domestic economy. In this case, there is evidence of a higher risk of falling into unemployment or inactivity when losing employment. By contrast, the number of those quitting a job with the prospect of new employment is lower.[16] Hence, while the total number of people losing their jobs remains fairly constant, a significantly higher share of those laid off do not find employment in the subsequent year.

[16] The coefficient has a p-value of 0.107. In other words, it is almost significant at the 10% level.

Table 11. Regression results: job loss risk by gender

	(1)	(2)	(3)	(4)	(5)	(6)
(a) All sectors	Men	Women	Men	Women	Men	Women
	Value		Value per worker		Value per output	
Δ Exports	-0.086*	-0.073**	-0.053	-0.039	-0.072	-0.064*
	(0.047)	(0.037)	(0.049)	(0.036)	(0.047)	(0.036)
Δ Imports	-0.056	-0.009	0.067	0.140	-0.029	0.039
	(0.070)	(0.074)	(0.075)	(0.088)	(0.077)	(0.077)
Δ Offshoring	0.204**	0.024	0.407***	0.231***	0.274**	-0.150
	(0.097)	(0.097)	(0.103)	(0.087)	(0.129)	(0.122)
Observations	1 018	1 034	1 018	1 034	1 018	1 034
R-squared	0.646	0.612	0.630	0.592	0.645	0.612
(b) Services	Men	Women	Men	Women	Men	Women
	Value		Value per worker		Value per output	
Δ Exports	-0.117**	-0.119***	-0.073	-0.093**	-0.095*	-0.109**
	(0.051)	(0.044)	(0.058)	(0.045)	(0.052)	(0.043)
Δ Imports	-0.071	0.052	0.111	0.211**	-0.014	0.066
	(0.096)	(0.089)	(0.100)	(0.083)	(0.096)	(0.088)
Δ Offshoring	0.221*	0.099	0.442***	0.238**	0.373**	-0.052
	(0.116)	(0.114)	(0.111)	(0.095)	(0.154)	(0.135)
Observations	697	740	697	740	697	740
R-squared	0.693	0.656	0.674	0.646	0.694	0.655

Note: Model is estimated in first differences. Country-year FE, sector-year FE and country-sector FE included in all specifications. Robust standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1. Dependent variables: natural logarithm of job change rate and natural logarithm of separation + exit rate. All trade variables in natural logarithms. Additional control variables: log total employment, log part-time share, log part-time share (involuntary), log fixed-term share, log fixed-term share (involuntary), shares of high, medium and lower education among workers; employment shares in six firm size categories.

Jobs of men are more likely to be substituted by offshore workers than those of women. When being exposed to identical changes in offshoring exposure, job loss risk for men increases much more than that of women. In fact, several specifications do not capture any significant effect of offshoring on women's job loss risk.

Offshoring is linked to higher unemployment risk in a sector even when imports of intermediate inputs lead to proportional output growth in the domestic economy. In this case, there is evidence of a higher risk of falling into unemployment or inactivity when losing employment. By contrast, the number of those quitting a job with the prospect of new employment is lower. Hence, while the total number of people losing their jobs remains fairly constant, it means that a significantly higher share of those laid off do not find employment in the subsequent year.

Table 11 shows that the effect holds for the entire economy but also when only considering services sectors. For example, a 10% increase in the value of imported intermediate inputs relative to domestic output would increase job loss risk of male workers by almost 4%, while there is no significant effect on the job loss risk of female workers.

By contrast, the reduction of job loss risk in sectors with strong export performance is very similar for male and female workers. Depending on the specification, a 10% increase would reduce job loss risk by between 0.5% and 1.2% for men and between 0.4% and 1.2% for women, in line with the effects identified when considering all employees jointly.

As mentioned above, the resulting patterns of hiring and job loss reflect a re- allocation of workers from shrinking to expanding sectors within an economy. Reacting to import competition and export opportunities, adjustment takes place in order to employ resources most efficiently. However, this adjustment may be hindered by a variety of factors, including the lack of necessary skills (Ashournia, 2018[23]; Autor et al., 2014[14]), geographic mobility or start-up funding for entrepreneurial activities (Dix-Carneiro and Kovak, 2017[24]). Facing one or several of these challenges, workers may be left behind unable to reap the gains from trade. The analysis in this report can help to identify vulnerable workers in order to implement appropriate policies that may help to facilitate their adjustment process.

4.5. Summary

Table 12 summarises the most important findings from the regressions discussed in this section. These findings represent the results of a counterfactual simulation, assuming that exports in a sector grow by 10%. Based on the stocks and flows of workers, it is possible to quantify the number of employees who benefit from export growth in each sector.

Table 12. Summary of regression results: Counterfactual 10% export growth

NACE Section	Sector	Female involuntary part-time work 2016 (in thousands)	Change after 10% export growth (in thousands)	Job loss with subsequent unemployment or inactivity (in thousands)	Change after 10% export growth (in thousands)	Hiring from previous unemployment or inactivity (in thousands)	Change after 10% export growth (in thousands)	Male apprentice-ships (in thousands)	Change after 10% export growth (in thousands)
A	Agriculture, forestry and fishing	200	-1.9	844	-6.2				
B	Mining and quarrying	2	0.0	54	-0.4				
C	Manufacturing	236	-2.2	1486	-11.0				
D+E	Electricity, gas, steam and air conditioning supply; Water supply; sewerage, waste management and remediation activities	16	-0.1	129	-1.0				
F	Construction	51	-0.5	864	-6.4	843	13.5	55	1.3
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	1146	-10.8	1720	-12.7	2050	32.8	46	1.1
H	Transportation and storage	109	-1.0	539	-4.0	537	8.6	11	0.3
I	Accommodation and food service activities	719	-6.8	938	-6.9	1273	20.4	11	0.2
J	Information and communication	57	-0.5	281	-2.1	344	5.5	7	0.2
K	Financial and insurance activities	48	-0.4	269	-2.0	232	3.7	5	0.1
L	Real estate activities	52	-0.5	92	-0.7	97	1.6	0	0.0
M+N	Professional, scientific and technical activities; Administrative and support service activities	924	-8.7	1004	-7.4	1329	21.3	19	0.4
O	Public administration and defence; compulsory social security	282	-2.7	579	-4.3			7	0.2
P	Education	709	-6.7	727	-5.4			13	0.3
Q	Human health and social work activities	1233	-11.6	1118	-8.3			13	0.3
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	757	-7.1	202	-1.5				
	SUM	6541	-61.5	10845	-80.3	6705	107.3	186	4.3

Source: Own calculations based on EU LFS.

5. Conclusion

This report draws on detailed individual-level data to analyse the importance of trade exposure for job characteristics and job transition probabilities. It shows that export growth is a key factor for workers' job loss risk. An additional 10% export growth is associated with a reduction of job insecurity by 0.7%. When only considering services, the magnitude of the effect rises to 1%. This correlation between exports on job security exists in similar magnitudes for both, men and women.

In commercial services sectors, export growth offers employment opportunities to those outside the workforce. Hiring rates for workers in unemployment or inactivity are 1.6% higher following a 10% increase in commercial services exports. This effect cannot be identified for other sectors, including manufacturing.

While export growth is associated with lower job loss risk and better hiring opportunities, it is also linked to a rising share of fixed-term contracts in a sector. Overall, sectors with export growth of 10% could experience an increase in the number of fixed-term employment by 1%, relative to other sectors. However, there exist strong differences in the composition of this effect along the gender dimension. For men, growth in fixed-term employment in export sectors is entirely due to rising shares of apprenticeships, indicating that export growth provides opportunities specifically to recent male high school graduates. In contrast, the growth of female fixed-term employment in export-oriented sectors seems to be mostly due to an increase in the prevalence of involuntary fixed-term work.

While women do not seem to find apprenticeships in exporting sectors, they do obtain an extra benefit from working in sectors with a strong export performance. A 10% export growth is associated with a reduction in the number of women in involuntary part-time work by almost 1%. Export expansion has no significant effect on the number of men in part-time work.

By contrast, in sectors with strong growth of imported intermediate inputs (offshoring) it is less likely to observe voluntary part-time employment. Part-time shares in sectors with offshoring growth of 10% fall by 5.7%, relative to other sectors where the volume of imported intermediate inputs remains constant.

Workers are less likely to be hired in sectors with offshoring growth and rising import competition. The effect is stronger for workers currently employed elsewhere than for those currently in unemployment or inactivity. This could reflect that those without employment are more likely to accept job offers in all sectors. By contrast, workers in existing employment relationship might have a preference of moving towards sectors with lower growth of offshoring or import competition, in the anticipation of future negative effects on wages or employment prospects. Among those who are currently without employment, women tend to be particularly affected. Female workers are between 1.3% and 1.9% less likely to find employment in sectors where imports grow by 10% compared to sectors where imports remain constant.

At the same time, sectors with rising imports of intermediate inputs exhibit higher job loss rates than other sectors. Working in a commercial services sector with an offshoring growth of 10% can raise job loss risk by 3% relative to other commercial services sectors. This mechanism tends to work against male workers, who are 4% more likely to lose their jobs when working in sectors with offshoring growth than when working in other sectors, whereas the effect for women is in the range of 2% or even insignificant.

These findings provide new cross-country evidence on hiring and firing patterns in sectors exposed to growing volumes of international trade, and the job characteristics of workers employed in these sectors. They highlight that the distributional effects of international trade are not limited to wage effects or net changes in employment numbers. Changes in objective levels of job loss risk or changes in the ability to work part-time can have substantial impact on workers well-being and life satisfaction. Taking into account these aspects could imply substantial progress towards a more comprehensive way of assessing the impacts of international trade on individual workers and would be an important step in order to ensure that the benefits of globalisation can be more widely shared.

Subsequent studies could extend this analysis in several directions. First, trade exposure could have a differential impact on workers with different characteristics. In addition to the gender dimension analysed in this study, these characteristics include their age, education and occupation. It seems likely that exposure to trade would affect job characteristics and job transition probabilities in some of these groups more severely than in others. Second, emphasis could be put on cross-country heterogeneity. It is possible that different labour market institutions could mitigate the negative effects of trade exposure on job characteristics and job flows, or reinforce its positive impact. Taking into account heterogeneous effects across countries could shed light on this question. Third, the analysis of part-time work could be refined by taking into account information on the number of hours actually worked.

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Annex A. Estimation strategy

The estimation strategy employed in this paper relates labour market outcomes with measures of export performance, import competition and the use of imported intermediate inputs. While results for the entire economy are presented as well, there is a specific focus on services sectors. This Annex discusses the most important aspects related to this estimation strategy.

Level of analysis

Employee-level data come from the EU Labour Force Survey. The EU LFS is a large household sample survey providing annual results on labour participation and persons outside the labour force. Data used in this study include all 28 members of the European Union (EU), and three members of the European Free Trade Association (EFTA) and cover the period 2008–2016. Each participating country is responsible for the data collection, but the final EU LFS is harmonised so as to ensure comparability across all participating countries.[17] The sample is a yearly cross-section, thus individuals are not followed over years. In 2016 the quarterly sample size was around 1.5 million,[18] with an average sampling fraction of 0.74%. Representativeness is achieved by using sampling weights. Although half of the countries have made the survey voluntary, the average response rate was relatively high at around 75.7%, ranging from 48% to 97.4%.

All individual-level variables are aggregated to the country-sector-year level for regression analysis using sampling weights. There is a simple explanation for this choice: Several key variables of interest, such as measures of trade exposure but also information on capital stocks used in robustness checks, are only available at that level of aggregation.[19] Available data for the baseline regression model cover 31 countries[20], 15 sectors[21] and 7 years from 2008 to 2014.[22]

[17] Further details can be found in EUROSTAT (2016[26]).

[18] https://ec.europa.eu/eurostat/statistics-explained.

[19] An alternative approach would use a binary model on the worker level, using certain worker-level control variables and main variables of interest on the sector level. Such a specification could be added as a robustness check for the final version of this report.

[20] Data only cover 29 countries for the analysis of transition rate because no sufficient data are available for Ireland and data for Norway are only available from 2014 onwards.

[21] Few NACE 1-digit sectors have to be merged to achieve a correspondence with TiVA. Hence, the analysis covers NACE 1-digit sectors A, B, C, D+E, F, G, H, I, J, K, L, M+N, O, P and Q. Sectors F to Q are classified as services while sectors F to M+N are classified as commercial services. See Table C.1 for a correspondence between NACE 1-digit sectors and sectors used in the TiVA database.

[22] More recent data are not available for TiVA.

Labour market outcomes

Different types of labour market outcomes are extracted from the EU LFS. As mentioned above, indicators on the country-sector-year level are derived from micro-data on the employee level. An important distinction exists between job characteristics and job transitions. Job characteristics are stock variables, which characterise average employment at a particular point in time. Important job characteristics at least partly determined by exposure to international trade include the share of part-time employment, the share of involuntary part-time employment, the share of fixed-term contracts and the share of fixed-term contracts excluding those related to probationary period or apprenticeships.

Job transition rates indicate flow variables, including those presented above. For all variables related to transitions out of the labour market, country and sector indicate the sector of last employment, observed one year before the time of participation in the EU LFS. Transitions from one employment to another can be broken down either by the sector of contemporary employment or previous employment. Obviously, for transitions into the labour market, such as entry rates and accession rates, the sector-dimension indicates the sector of contemporary employment.

Trade exposure

Measures of trade exposure are available on the country-sector-year level and come from the OECD/WTO TiVA database. The measures distinguish different channels of interaction between international trade and labour markets. In all regressions, the three different measures of trade exposure are included jointly in the regression.

- Export performance
- Import competition
- Offshoring (imports of intermediate inputs) [23]

Importantly, offshoring is assumed to affect workers in the sector where intermediate inputs are used for production. In many cases, this sector does not coincide with the foreign sector that produces intermediate inputs. In contrast, import competition is assumed to affect workers in the sector from which imports originate. To give an example, imports of trucks represent import competition for the automobiles manufacturing sector, but they may reflect imports of intermediate inputs in the transportation sector.

For each of the three measures, three different specifications are used in separate regressions. The first specification relies on the values of exports, imports, and imported intermediate inputs in each sector. The second specification uses the values of these trade flows relative to the number of workers in each country-sector-year combination. In the third specification, trade intensities are measured as trade values relative to domestic output.

For exports and imports, there exist few reasons to expect strong differences between the three specifications. However, this is not true for offshoring. On the one hand, offshoring implies a reduction in the range of activities performed domestically. If the value of

[23] There exist different definitions of offshoring in the literature. According to the definition of offshoring applied in this report, offshoring includes all imported intermediate inputs used in a specific sector, irrespective of the sector where the intermediate inputs are produced.

offshoring relative to output increases, there is increasing pressure on domestic employment. However, offshoring of certain activities can make domestic production more efficient, allowing a sector to expand its overall output by remaining competitive in the domestic market and to thrive in export markets. Hence, if the volume of offshoring or the volume of offshoring per worker increases, but offshoring relative to domestic output remains constant, it might be an indicator for more efficient production and rising competitiveness.

Estimation in first differences

Due to the variation in job characteristics and job transition rates across countries, the approach used in this study does not try to explain the levels of these variables. Instead, the regression is estimated in first differences. This means that changes in labour market outcome variables correlate with changes in trade flows. This approach promises higher robustness and is often used in this strand of the literature.[24]

Fixed effects and control variables

A wide range of different factors affect changes in labour market outcomes. These factors do not only pertain to labour demand but also to labour supply. Identifying the relationship between labour market outcomes and trade exposure requires controlling for these factors in a regression analysis. When some of these factors are unobservable, different sets of fixed effects can be used instead of explicit control variables.

All regressions reported in this report include three types of fixed-effects: country-year fixed effects, controlling for country-specific but time-varying shocks, such as policy reforms; sector-year fixed effects, controlling for sector-specific but time-varying shocks, such as technological developments; country-sector fixed effects, controlling for country-sector-specific trends.[25]

Consequently, only control variables with variation on the country-sector-year level need to be included explicitly in the regressions. Many of these variables stem from the EU LFS, including the gender composition of workers, the share of high-skilled, medium-skilled and low-skilled workers and the share of workers in firms of different size groups. Moreover, in regressions for one specific labour market outcomes, other labour market outcomes are included as control variables.

Estimation equation

The dependent variable in the estimation equation corresponds to first differences of the natural logarithm of a particular labour market outcome in a country i, sector k and year t combination. Right-hand side variables of interest are the natural logarithm of the export, import and offshoring measures.[26] Several control variables are included in each regression,

[24] See for example Autor, Dorn and Hanson (2013[30]) or Dauth, Findeisen and Suedekum (2014[29]).

[25] The importance of unobserved heterogeneity at the country-sector level is also highlighted in Crinó (2012[28]).

[26] Transformation with the natural logarithm is also applied when trade relative to domestic output because the distribution of these shares is extremely skewed to the right. This means that the distribution is characterised by a large number of small values and a small number of very large

summarised in the vector $\boldsymbol{L}$. As mentioned above, these control variables indicate characteristics of the labour force in a country-sector-year combination, such as education shares, gender or the share of workers in firms of different size categories. All regressions include fixed effects on the country-year level, the sector-year level and the country-sector level. All models are estimated with linear ordinary least square regressions. The corresponding estimation equation is shown below.

$$\Delta \ln LMO_{ikt} = \beta_1 \Delta \ln X_{ikt} + \beta_2 \Delta \ln M_{ikt} + \beta_3 \Delta \ln O_{ikt} + \gamma_1 \Delta \boldsymbol{L}_{ikt} + \theta_{it} + \vartheta_{kt} + \mu_{ik} + \varepsilon_{ikt}$$

The use of such contemporary trade flows is not possible for the analysis of job loss rates. Since these workers are currently unemployed or inactive, they are not exposed to trade at all in the current period *t*. Hence, when job loss rates are used as relevant labour market outcome, lagged first differences in trade flows are used, focusing on the sector where workers have been employed in the previous year. The same approach is used for the analysis of determinants driving workers to quit employment in a certain sector but being able to find other employment. In these cases, the estimation equation can be written as follows.

$$\Delta \ln LMO_{ikt} = \beta_1 \Delta \ln X_{ik,t-1} + \beta_2 \Delta \ln M_{ik,t-1} + \beta_3 \Delta \ln O_{ik,t-1} + \gamma_1 \Delta \boldsymbol{L}_{ikt} + \theta_{it} + \vartheta_{kt} + \mu_{ik} + \varepsilon_{ikt}$$

Due to the structure of fixed effects used in the regression, results cannot inform about aggregate changes in a country. It is not possible to state whether export growth, import growth or growth in the share of intermediate inputs can reduce the economy-wide share of fixed-term contracts or whether they can reduce job loss risk for a whole economy. Instead, all results must be interpreted as specific effects in one sector relative to other sectors. For example, a positive correlation between exports and the share of part-time workers means that this share grows faster in sectors that open up more rapidly than other sectors.

However, it is not possible to make a similar statement on the country-level. The growth of part-time employment in countries is not necessarily faster in countries with strong export performance than in other countries. The reason is that aggregate trends towards part-time work are driven by a huge variety of factors, many of which are unobservable, such as changes in workers' preferences. Using fixed effects to control for these factors ensures that all results are unbiased estimates.

Correlation vs. causality

The estimation strategy used in this report can only identify a correlation of variables. The effects cannot be interpreted as a causal effect of trade exposure on labour markets, due to the absence of exogenous variation in the explanatory variables. A frequent solution to this problem in the literature is the used of an instrumental variable (IV) strategy, in which world trade shocks are used as instrument for actual trade exposure (Hummels et al., 2014[25]). The idea is that world trade shocks are not affected by labour market conditions in one specific country, so that they can be considered exogenous.

However, this approach is incompatible with the set of fixed effects used in this report. The variation of world trade shocks is mostly on the sector-year level, making these shocks

outliers. After transformation with the natural logarithm, these shares roughly follow a normal distribution.

highly collinear with sector-year fixed effects. Hence, additional control variables should be added to avoid biased from missing variables. Nonetheless, it would be possible to include such an IV strategy as robustness check in a future version of this report.

Robustness checks

All results reported in this document are robust to the introduction of additional control variables measuring types of capital from the EU KLEMS database, including computing equipment, communications equipment, as well as computer software and databases. Since these data are not available for all countries in the EU LFS, using data from EU KLEMS reduces the size of the sample by around 50% in all specifications. However, including or excluding these control variables does not have a significant impact on coefficients of trade exposure variables when comparing over identical samples of data. Therefore, the main specifications do not include control variables for capital stocks.

Moreover, all results are robust across different econometric specifications. In addition to the estimation in first differences, regressions have been run in levels. Also these specifications include country-year FE, sector-year FE and country-sector FE. Further robustness checks included regressions in first differences without country-sector fixed effects and regressions in first differences over long time intervals, including only two years of data, 2008 and 2014. With only two points in time, no year fixed effects are necessary for regressions in first differences. Instead, country fixed effects and sectors fixed effects are used in these regressions.

Annex B. Definitions of variables in the EU LFS

Labour market status

Two variables from the EU LFS are used in order to analyse labour market dynamics: [27]

i. main labour status (MAINSTAT), and

ii. an individual's situation with regard to activity one year before survey (WSTAT1Y).

From these two labour market status indicators, the labour force is coded using answers 1 and 2, thus, individuals out of the labour force are students, retirees, disabled, and those fulfilling domestic duties (answers 3–8). Since the sample is limited to those aged 15 to 74, answer 9 is automatically eliminated.

Table B.1. Main status

	MAINSTAT
1	Carries out a job or profession, including unpaid work for a family business or holding, including an apprenticeship or paid traineeship, etc.
2	Unemployed
3	Pupil, student, further training, unpaid work experience
4	In retirement or early retirement or has given up business
5	Permanently disabled
6	In compulsory military service
7	Fulfilling domestic tasks
8	Other inactive person
9	Not applicable (child less than 15 years)
blank	No answer

Source: EU Labour Force Survey Database User Guide

[27] Note that there is an alternative variable in LFS that also assign an individual's labour status during the reference week: WSTATOR. One advantage of this variable is that WSTATOR provides quarterly data, while MAINSTAT is included on annual basis. However, only MAINSTAT is conceptually compatible with WSTAT1Y. For this reason it is used as primary source for the quantification of labour market transitions. Since the MAINSTAT is missing for the United Kingdom, WSTATOR is used for this country. Additional explanations on these variables can be found in the "EU Labour Force Survey Database, User Guide".

Table B.2. Situation with regard to activity one year before survey

	WSTAT1Y
1	Carries out a job or profession, including unpaid work for a family business or holding, including an apprenticeship or paid traineeship, etc.
2	Unemployed
3	Pupil, student, further training, unpaid work experience
4	In retirement or early retirement or has given up business
5	Permanently disabled
6	In compulsory military service
7	Fulfilling domestic tasks
8	Other inactive person
9	Not applicable (child less than 15 years)
blank	No answer

Source: EU Labour Force Survey Database User Guide

Reasons for part-time work

Workers are assumed to be in involuntary part-time work if the person states that he/she could not find a full-time job. This answer is coded with the numerical answer 5 in the EU-LFS microdata. Other possible answers to this question are given in Table B.3 below.

Table B.3. Reasons for the part-time work

	FTPTREAS
	Part-time job is taken because:
1	Person is undergoing school education or training
2	Of own illness or disability
3	Looking after children or incapacitated adults
4	Other family or personal reasons
5	Person could not find a full-time job
6	Of other reasons
9	Not applicable
blank	No answer

Source: EU Labour Force Survey Database User Guide

Permanency of jobs and reasons for temporary work contracts

Workers are assumed to be in an involuntary temporary job or work contract of limited duration if the persons states that he/she could not find a permanent job. This answer is coded with the numerical answer 2 in the EU-LFS microdata. Other possible answers to this question are given in Table B.5.

Table B.4. Permanency of the job

	TEMP
1	Person has a permanent job or work contract of unlimited duration
2	Person has temporary job/work contract of limited duration
9	Not applicable
blank	No answer

Source: EU Labour Force Survey Database User Guide

Table B.5. Person has temporary job/work contract of limited duration because

	TEMPREAS
	Person has temporary job/work contract of limited duration because:
1	it is a contract covering a period of training (apprentices, trainees, research assistants, etc.)
2	person could not find a permanent job
3	person did not want a permanent job
4	it is a contract for a probationary period
5	it is a contract covering a period of apprenticeship
6	it is a contract covering a period of training other than apprenticeship (trainees, internships, research assistants, etc.
9	Not applicable
blank	No answer

Source: EU Labour Force Survey Database User Guide.

Annex C. TiVA and NACE (Rev. 2) correspondence

Table C.1. TiVA – NACE (Rev. 2) correspondence

TiVA	NACE Rev. 2	Description
C01T05	A	Agriculture, forestry and fishing
C10T14	B	Mining and quarrying
C15T16	C	Manufacturing
C17T19	C	Manufacturing
C20	C	Manufacturing
C21T22	C	Manufacturing
C23	C	Manufacturing
C24	C	Manufacturing
C25	C	Manufacturing
C26	C	Manufacturing
C27	C	Manufacturing
C28	C	Manufacturing
C303233	C	Manufacturing
C31	C	Manufacturing
C29	C	Manufacturing
C34	C	Manufacturing
C35	C	Manufacturing
C36T37	C	Manufacturing
C40T41	D+E	Electricity, gas, steam and air conditioning supply; Water supply; sewerage, waste management and remediation activities
C90T93	D+E	Electricity, gas, steam and air conditioning supply; Water supply; sewerage, waste management and remediation activities
C45	F	Construction
C50T52	G	Wholesale and retail trade; repair of motor vehicles and motorcycles
C60T63	H	Transportation and storage
C64	H	Transportation and storage
C55	I	Accommodation and food service activities
C22	J	Information and communication
C72	J	Information and communication
C65T67	K	Financial and insurance activities
C70	L	Real estate activities
C73T74	M+N	Professional, scientific and technical activities; Administrative and support service activities
C75	O	Public administration and defence; compulsory social security
C80	P	Education
C85	Q	Human health and social work activities
C95	T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use

Note: NACE Rev. 2 Section T is not used for analysis in this report.