DEMAND FOR LOW- AND MEDIUM-SKILLED WORKERS ACROSS EUROPE: BETWEEN FORMAL QUALIFICATIONS AND NON-COGNITIVE SKILLS

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Abstract

This paper analyses job advertisements posted on the public EU portal EURES to identify the specific skills and characteristics that are demanded in the European labour market in selected low- and medium-skilled occupations and in different sectors. This research is innovative in exploring online job advertisement data from the EURES website and quantifying different skills, personal attributes and characteristics requested by employers in three countries: the Czech Republic, Denmark and Ireland. While we find that the service sector demands non-cognitive skills more than other types of occupations, the skill-demanded mix is very diverse across the countries analysed, implying that there is no universal demand and that domestic institutions and structures affect how demand is formulated. We point to potential limits of 'European occupational labour markets' as we find that employers' preferences across the three countries seem rather distinct for similar types of jobs. Our work shows that online portals can become a useful source for gathering information about the content and specificities of demand at the micro-level.

Keywords: Labour market demand, low-skilled workers, qualifications, non-cognitive skills, job ads, EURES

1. Introduction

The concern for effective skill matching and skill needs anticipation has been at the forefront of the EU's policy agenda for some time. This is a response to both rising unemployment levels and longer-term concerns about negative demographic trends across the EU and a global skills shortage (CEDEFOP, 2008; Cohen & Zaidi, 2002). Given the prominence that the issue has gained, it is surprising to note that relatively little systematic data and knowledge are available about the demand for skills at the micro-level. Most labour market research concentrates on analysing the supply side of labour market, and measures skills and knowledge by levels of education and formal qualifications attained (Kureková, Haita, & Beblavý, 2012; Teichler, 1999). Such a focus is partly due to the greater availability of individual data that enables the study of labour market processes from the point of view of workers. Much less is known about how the preferences of firms are framed, and how they might differ across different sectors, occupations or labour markets with characteristics shaped by skills training institutions, labour market performance or employment legislation. The researchers who focus on labour market demand typically rely on vacancy data. The quality of vacancy data is often insufficient, however, and provides only a general view of the level of occupation rather than a detailed picture of the skills demanded. In sum, although rising in number, only a few studies to date investigate the character, trends and changes in labour market demand at the micro-level and cover which skills, competences and attributes are demanded by employers. Cross-country research in this area also seems to be lacking.

We seek to address some of these gaps in this paper by studying the content of job advertisements for low- and medium-skilled occupations published on the public EU portal EURES, between March and July 2012.[1] EURES – the European Job Mobility Portal – is an EU platform that aims at supporting jobseekers and labour mobility by collecting vacancies in the EU countries and assisting in the cross-national search for jobs. Our focus on the low- and medium-skilled labour market segment is driven by the fact that unemployment and 'low-skillness' are positively correlated across the EU countries, while it is not rare that unemployment and labour force shortages coexist, which signals an inadequate skill-match between demand and supply (Allen & De Weert, 2007; Obadic, 2006; Padoa-Schioppa, 1991; Zimmermann, Bonin, Fahr, & Hinte, 2007). This issue is of general economic and social concern, also in light of the fact that low-skilled workers especially represent a pool of labour that could and should be integrated into the labour market. It is therefore important to understand **which types of skills are demanded in the low- and medium- skilled occupations in different European labour markets**. With the expansion of formal education at the secondary and tertiary levels across EU countries and the increasing importance given to 'new' skills or non-cognitive skills, related in particular to the rise of the service sector, we also investigate **what might be the combination of cognitive and non-cognitive skills and abilities demanded by employers and the importance given to formal qualifications across Europe**.

[1] Based on the ILO classification, we consider occupations in ISCO88 category 9 as low-skilled (skill level 1) and ISCO88 categories 4-8 as medium-skilled (skill level 2). For more information, see the ILO website (http://www.ilo.org/public/english/bureau/stat/isco/isco88/index.htm).

We conduct a three-country analysis that looks at small open European economies that differ in a number of aspects: the Czech Republic, Denmark and Ireland. These countries are comparable in labour market size but differ in economic structure, the design of education and skill formation systems, and the degree to which they have been affected by the recent economic crisis.[2] The Czech Republic is still characterised by a larger share of industrial production output, while Ireland and Denmark are service-oriented economies. Employers and social partners are intensively involved in skills formation in Denmark and in the Czech Republic, while in Ireland the system is much less institutionalised and there is a limited participation of firms in training. Ireland was hit hard by the economic crisis, which resulted in increased unemployment, while Danish and Czech labour markets suffered less in the downturn. The Czech Republic, a former socialist and transition economy, it is now highly transnational and marked by processes of rampant job creation and destruction, which allows comparison with more established market economies. In sum, the selected countries differ in a number of aspects, enabling us to explore varied sets of hypotheses about how structural factors might affect labour demand at the micro-level with respect to specific skills, competences, abilities and qualities.

The above questions are key to understanding which competences are required from workers across the EU labour markets and to providing insight into possible adjustments in skill formation systems or life-long learning programmes. From the point of view of workers, it is important to understand which skills are considered (more) important by employers: formal qualifications or other non-cognitive or soft skills (and which ones). We therefore seek to offer a deeper understanding of the types of qualifications and skills demanded and rewarded in different low- and medium-skilled occupations. Focusing on medium and low-skilled jobs enables us to narrow down our interest to vocational training provision, which is the key institutional segment leading to skills and qualification generation for these types of jobs.

Implications will be drawn for policies aimed at the labour market integration of low-skilled workers and their skill development, as well as for the facilitation of labour mobility in the EU. The results of our work, however, need to be considered with caution, as their direct usage is conditioned on an in-depth investigation of degree of representativeness and reliability of online vacancies, which we are unable to conduct in this paper (but see this as the area for future work).

Our work is distinctive in its empirical focus on the content of job vacancies, the use of online data, analysis of a range of skills and abilities, and a systematic comparative approach. Section 2 reviews three sets of literature relevant for our study: formal qualifications and merit selection literature; works about skill regimes and forms of education affecting the formulation and understanding of skill requirements in the labour market; and studies analysing job advertisements. Section 3 explains the categorisation of skills into cognitive and non-cognitive spheres. Section 4 describes the data source and data processing steps, and touches upon the limitations of the data we investigate. The empirical analysis is presented and discussed in section 5. The last section concludes and summarises the implications of our work.

[2] The whole project studies a range of small countries (Austria, the Czech Republic, Denmark and Ireland) as well as large economies (Germany, Italy and the UK).

2. Literature review

2.1 Formal qualifications versus other skills

On a theoretical level, our research speaks to several streams of literature. In particular, we join the debate about the relative importance of qualifications and their use as a proxy by employers for the level of skills and capabilities. With the rise of interactive service jobs, there is a growing interest in understanding the extent to which the decision of employer based on the applicant having formal qualification versus other skills or attitudes (Keep & James, 2010; Nickson, Warhurst, & Dutton, 2005; Warhurst & Nickson, 2007).

The notion that formal qualifications can be equalised with merit and are the main determinants of mobility in the labour market has been advanced and tested, especially by the economics literature. These works typically utilise large survey data and suggest that people holding qualifications are more likely to be employed than those without (for a review see Keep & James 2010, p.9). This premise is theoretically underpinned by the liberal theory of industrialism, also referred to as the modernisation theory, which argues for a shift from ascription to achievement (education) in the social mobility patterns in modern societies (Dörfler & Van de Werfhorst, 2009; Jackson, Goldthorpe, & Mills, 2005; Jackson, 2001). It argues that it is no longer effective to recruit on the basis of social background characteristics and employers increasingly select on the basis of individual achievements (increased merit selection hypothesis). This strand of literature can be critiqued for concentrating primarily on formal qualifications while overlooking other relevant components of skills (for more see Dörfler & van de Werfhorst (2009, pp.697–698). In light of the universalisation of access to education at secondary and increasingly at tertiary levels across Europe, the social stratification and social mobility discourse embedded in access to education might be becoming less relevant.

Importantly, the discourse about skills has in recent years shifted towards the debate about the importance of cognitive versus non-cognitive skills in the education and labour market outcomes of individuals. The studies have initially concentrated more on estimating the effect of non-cognitive skills on education outcomes (Borghans, Meijers, & Ter Weel, 2008; Leininger & Kalil, 2008), but recently increasingly also on labour market outcomes (Brunello & Schlotter, 2010; Glewwe, Huang, & Park, 2011; Heckman & Rubinstein, 2001; Heineck & Anger, 2010). The literature generally proposes that non-cognitive skills and other personal characteristics are likely to matter more in interactive service work. Given the general shifts in economic structures and a growing share of services in employment (Jackson, 2001, 2007; Keep & James, 2010; Nickson et al., 2005; Warhurst & Nickson, 2007), it is crucial to understand what types of skills are needed in this segment, and whether, indeed, a large difference exists between industry and service occupations. Contributing to this debate, Maxwell (2006) studies the job tasks of low-skilled occupations specifically, and has demonstrated a great heterogeneity of required skills generally, but also across different low-skilled sectoral segments and occupations. A wide range of these skills and their mix include what he calls "new basic skills" such as problem solving, communication and computer software, which are required in different low-skilled occupations (cf. Levy & Murnane, 2004).

2.2 Skill demand: Types of education regimes and other determinants

The institutionalist literature on the variety of welfare regimes and the varieties of capitalism extends some of its propositions towards the typology of education regimes and skill differentiation (Atzmüller, 2012; Estevez-Abe, Iverson, & Soskice, 2001; Hall & Soskice, 2001; Streeck, 2011). Education and skill formation systems are among defining the elements of a country's institutional configuration and influence the prevalence of different types of skills within an economy. Indirectly this should also affect the way in which skill requirements are formulated, screened and expressed in job advertisements. Scholars typically identify three 'regimes', defined according to the type of skills that dominate the respective regime: general, occupational or industry-specific, and firm-specific skills (Atzmüller, 2012). General skills are easily transferable across companies and even industries, and are predominantly produced in public education systems (schools, universities). Industry-specific skills are produced in a system that combines on-the-job training with education in a public institution ('dual system') providing skills typically transferable across firms within an industry/occupation, but no further. Firm-specific skills are mainly provided within companies and are the least portable. Each skill type requires a different type of training and assumes a particular type of product market strategy (Lauder et al., 2008). The types of skills are also broadly linked to distinct educational pathways in initial vocational education and training. Specifically, in educational systems that are vocationally specific and are more strongly tracked, stronger effects of education are typically found on labour market outcomes (Shavit, Müller, & Tame, 1998; van de Werfhorst, 2011).

An important dimension on which the differentiation in skill regimes is based is the extent of institutionalisation and, related to this, the degree of involvement (financial, educational, political, etc.) of stakeholders in a given education and skill production regime. An important outcome of the greater involvement of social partners and employers in the education system is their greater 'trust' and understanding of a given system, and in turn a greater reliance on formal qualifications in the screening and recruitment process. From the three skill regimes, employers in dual systems are the most likely to rely on formal qualifications and certification, while degrees will be the least important in firm-based skill formation systems and in general skill regimes. Among the countries considered in this paper, Denmark and the Czech Republic approximate the dual system (similar to Germany and Austria), while Ireland is a general skill economy (similar to the UK) (Atzmüller, 2012; Thelen, 2004; Trampusch, 2010; van de Werfhorst, 2011). Denmark, in particular, is characterised by cooperative industrial relations and coordinated wage bargaining system, which is also reflected in the involvement of social partners – unions, employers' associations and guilds, in the processes of training and certification. The Czech Republic inherited elements of the dual system from the socialist regime. While the close link between schools and companies was weakened during regime transition, the Czech system continues to have elements of a strong involvement of selected sectors in skill formation (Hancke & Kureková, 2008). Therefore, in the Czech Republic and Denmark, formal qualifications and vocational streams are likely to be more important than in Ireland. An interesting difference between Denmark and Czech Republic lies in the structure of their economies (agriculture and services versus a comparatively strong industrial basis) and industrial relations type and coverage.

In contrast to the institutionalist literature, Teichler (2009) studying recruitment processes of graduates in Germany and the UK found that rather than being affected

by the logic of economy or technology, which determines qualification requirements, firms develop distinct and individualised styles and strategies of recruitment, screening and criteria formulation independent of structural macro-factors (p. 134). Institutional hierarchy and prestige might be other factors affecting the search and recruitment processes of firms. For example, hierarchy in the quality and prestige among British higher education institutions is affecting selection of graduates in the UK. Such preferences might not be framed explicitly in a job vacancy but would be applied in the screening of the job applications and candidate profiles received.

Labour market 'tightness' has been proposed as an additional factor affecting the way employers might search for candidates and specify job requirements generally, but also in the low-skilled sector (Maxwell, 2006). Labour market performance establishes limits on what employers can expect to recruit (Keep & James, 2010). In tight labour markets, or in instances when the job on offer is less attractive (due to pay or status) relative to other jobs, employers are likely to face a problem of recruitment rather than of selection. They would therefore be less demanding in the expected skills and qualities during the boom period, but more demanding in times of recession. This should in principle also be true for job ads recruiting in areas of low unemployment versus in localities with high unemployment and labour abundance. We will be able to test this aspect empirically as the countries analysed in 2012 represent two poles of labour market performance: with low unemployment rates in the Czech Republic and Denmark (around 7%) and a higher rate in Ireland (over 14%) (Eurostat, 2011).

Employers are not a homogenous group and their recruitment practices can vary based on factors such as firm size. Large firms have more resources to internally train and relocate labour force and to some extent rely less on external hiring. On the other hand, they might be also more likely to outsource recruitment to an external provider. Smaller firms are less likely to rely on internal labour reallocation and training and therefore recruit in an open labour market. They are also less likely to outsource the process. An interesting recruitment phenomenon process is the increasing share of recruitment agencies, i.e. outsourcing recruitment to specialised firms. These have been found to dominate low-skilled segment in the UK (Keep & James, 2010). In our own work about Slovakia we found variation across sectors and saw that the agencies recruit more to fill in industrial occupations, while in service occupations it is individual firms that post the ads and carry out the recruitment process (Kureková, Beblavý, & Haita, 2012). Unfortunately, in the EURES data we are not able to identify the background of the advertising firms and therefore are not able to test firm size directly. We now turn to review how job advertisements have been used to inform the debate on skills and the importance of formal qualifications.

2.3 Job advertisements as a source of data on labour market demand

Job advertisements are the first step in a screening process that communicates an employer's views about an *ideal* candidate. While in the actual recruitment process only a subset of specified requirements might come into play in an employer's decision, they are nevertheless highly suggestive in identifying the desired skills and qualifications for a particular position. Most existing studies of job ads analyse the content of demand across different skill levels and engage with printed media, which has affected the number of ads they were able to analyse. .

Jackson (2007) analysed approximately 5,000 British newspaper ads to understand how social stratification maps onto the labour market and to discern differences in the valuation of merit (qualifications, cognitive abilities, effort and technical skills) *vis-à-vis* non-merit (social skills and personal characteristics) characteristics among different classes and occupational groups. The author took advertisements from national and local newspapers with a high circulation. The sample was chosen to be *representative of the range of occupations* in the occupational sectors. The author found evidence of higher and more specified demand for merit characteristics as one moved up through the class structure. In her earlier study, Jackson (2001) analysed 322 newspaper job ads chosen from national, regional and local newspapers. She found that only 40% of all ads contained a requirement for qualifications of any kind. From these, educational qualifications were very important for managerial and professional class, while vocational qualifications were more important for the remaining classes. Jackson et al (2005) study the importance of education in mediating mobility and find a declining impact of education on mobility, linking it to the fact that with expanding access to education, employers may use educational qualifications less as a tool for determining relevant competences or as a signal of desired but unobservable attributes. However, the signalling and certifying role of education should be judged differently across different occupations, and also in the context of the high-tech, knowledge-based economy or 'high-touch' occupations. Similar to the findings reported above, qualifications appeared as a requirement in only 26% of all advertised jobs, but were required in as many as 64% of the ads in the professional occupational category and only in around 10% of the ads in the technical and operative and sales and personal service occupational categories.

The study conducted on the Austrian labour market by Dörfler & van de Werfhorst (2009) brings in the time aspect and analyses trends. Covering a time span of 20 years (1985, 1990 and 2005), the authors evaluate the merit selection hypothesis over time. They conduct an analysis of nearly a thousand newspaper ads and expand the operationalisation of education to include the field of study in addition to educational level. They note a growing diversity of required skills, across as well as within occupations and over time, which cannot be attributed to compositional change alone (a change in the structure of the economy and jobs). They find that formal qualifications were demanded in about two-thirds of all advertisements. Social skills were sought among but not solely in service occupations. Among the most recent studies that have analysed job ads is the work of (Kuhn & Shen, 2012), who studied gender discrimination in the recruitment process in the Chinese labour market from online job ads. Analysing over a million job ads from the late 2000s, merged with firm data, the authors found high levels of gender preference, although highly skilled vacancies were less discriminatory.

A few recent works have analysed job ads also in the former transition economies. Štefánik (2010, 2012a, 2012b) studied online data from a private job portal in Slovakia and analysed both vacancies and CV data. His study concentrated on the labour market segment of the highly skilled and analysed the matching of demand and supply of university graduates, concentrating on a small number of narrowly defined high-skilled professions. In our own earlier work we used data from the same job portal and studied demand for formal qualifications and other skills in a wide range of selected low- and medium-skilled occupations (Kureková, Beblavý, et al., 2012). We found that Slovak employers are quite demanding in the low- and medium-skilled

occupations with respect to skill set and skill intensity, but also as far as formal educational level is concerned. From the skills analysed, non-cognitive skills and cognitive specific skills were demanded more than cognitive general skills or appearance. Experience was the single most requested qualification.

Our work differs from the above studies in a number of ways. First, while most of the above studies analysed high-skilled occupations or a full range of skill levels, we concentrate on analysing labour demand at the lower end of the occupational hierarchy by selecting low- and medium-skilled occupational categories. Our motivation is to better understand the recruitment process in the labour market segment where it is the most problematic in most EU economies. Second, our work is fairly innovative in relying on online vacancy data, which have not been extensively utilised in the past but represent a valuable source of information about labour market trends. By developing a custom-made data grabber, we have been able to analyse a population of vacancies in a given broader occupational group and country at the time of download. To the best of our knowledge, the use of the EURES portal for such purpose is also a novelty. A third distinct characteristic of our work is its attempt to produce a comparative study. While this endeavour is challenging, we view it as a good exercise in understanding future possibilities in the use of similar data for the purposes of analysis that is focused on a single country as well as comparative labour market analysis. We touch upon some limitations ensuing from our data and methodology in the data section.

3. Categorisation of skills and abilities

The growing literature about skills is characterised by the lack of a clear definition or taxonomy of what cognitive versus non-cognitive skills are. For the purpose of our study, we formulated a categorisation of different skills, abilities and other characteristics likely to be sought by employers. The categorisation is based mainly on a detailed review and approaches of the available literature, namely Jackson (2007), (Brunello & Schlotter, 2010; Dörfler & van de Werfhorst, 2009; Heckman, 2008)runello & Schlotter (2010); Dörfler & van de Werfhorst (2009); Heckman (2008) runello & Schlotter (2010); Dörfler & van de Werfhorst (2009); Heckman (2008) runello & Schlotter (2010); Dörfler & van de Werfhorst (2009); Heckman (2008) runello & Schlotter (2010); Dörfler & van de Werfhorst (2009); Heckman (2008) . It groups individual skills, competences and abilities into cognitive skills and cognitively acquired abilities (specific and generic), and non-cognitive skills, which we further divided into personal characteristics and social skills.

Cognitive skills are typically identified with intelligence and the ability to solve abstract problems. They are proxied with an IQ test or standardised tests on reading, science and maths (e.g. PISA). For the purposes of our project, cognitive skills are proxied in two ways, whereby formal education and specialised (but formalised) training represent one category of cognitive skills. In addition, there are sets of other kinds of knowledge often sought by employers that are cognitively based or related to learning efforts in a formalised learning process. These can be specific and generic. Knowledge of foreign languages, a driving license, ICT skills and technical knowledge (the ability to read technical papers/materials) are cognitively acquired and also specific. Analytical skills, problem-solving skills, the ability to see things in context, quick perceptive faculties and the ability to learn quickly are also cognitively based but

generic skills. We hence treat these requirements as 'cognitive and cognitively acquired abilities' and group both *specific* and *generic* skills into a joint group of cognitive abilities. A substantive difference between them is that generic abilities are unlikely to feature in the job ads for low-skilled workers, while specific ones are more likely to appear.

(Brunello & Schlotter, 2010) define non-cognitive skills as personality traits that are weakly correlated with measures of intelligence. Non-cognitive skills are often termed "soft skills" and can shade into personal characteristics and attitudes ("fudging" of skills with behaviour) (Anderson & Ruhs, 2008). A broadly accepted taxonomy of non-cognitive skills is the five factor model, which includes the following factors: agreeableness, conscientiousness, emotional stability, autonomy and extraversion.[3] We classify the non-cognitive skills and qualities as a set of *social skills and personal skills*. They are weakly correlated with cognitive ability but differ in the inter-relational aspect – social skills are those typically applied in relation to the need to cooperate and communicate with other people. Personal characteristics refer to personal predispositions that characterise how one approaches work tasks.

The specific taxonomy of skills that we analysed in our data is summarised in Table 1. We did not include every possible skill or attribute, but selected a few from each category, based on the initial analysis of randomly selected ads to identify skills that appeared the most often across the countries. In addition to formal education, cognitive and non-cognitive skills, we also considered requirements for references and (clean) criminal record as not directly skill-related requirements that might nevertheless appear in job ads and could characterise how skills are 'tested' through indirect means. We also checked whether the ads made explicit mention of physical appearance and how important previous experience was. The job ads posted in EURES also have a predefined 'experience field', which we coded as well and added to the mention of experience in the ad description itself.

Table 1. Categorisation of skills, abilities and other characteristics

Education and formal qualifications		o Formal degrees gained through full-time study (can be measured by ISCED) o Specialised training
Cognitive skills and abilities		o ICT skills o Language skills o Driving skills o Ability to learn

[3] *Agreeableness* is the willingness to help other people, to act in accordance with other people's interests and the degree to which an individual is cooperative, warm and agreeable versus cold, disagreeable and antagonistic. *Conscientiousness* is the preference for following rules and schedules, for keeping engagements and the attitude of being hardworking, organised and dependable, as opposed to lazy, disorganised and unreliable. *Emotional stability* encompasses such dimensions as nervous versus relaxed and dependent versus independent, and addresses the degree to which the individual is insecure, anxious, depressed and emotional rather than calm, self-confident and cool. *Autonomy* indicates the individual propensity to decide and the degree of initiative and control. *Extraversion* is the preference for human contacts, empathy, gregariousness, assertiveness and the wish to inspire people.

Non-cognitive skills	Social skills	o Communication skills o Service skills, customer approach o Team-working skills
	Personal skills	o Timeliness, punctuality o Independence o Reliability o Creativity o Flexibility o Resistance to stress
Personal characteristics		o Pleasant physical appearance
Experience		o Experience
Other		o Criminal record o References

Source: Authors.

4. Data source, data processing and descriptive statistics

Given the innovative nature of data that we use, we find it important to explain in detail data characteristics and data processing steps, before we move on to present descriptive statistics.

4.1 EURES as a source of data

The data were downloaded from the English version of the EU-wide EURES website.[4] EURES was founded in 1993. Its aim is to provide information, advice and recruitment/placement services for workers and employers, as well as for any citizen wanting to take advantage of the free movement of persons. In 2012, the EURES placement network consisted of 31 European employment services based in EU member states, the European Economic Area (EEA – Norway, Iceland and Lichtenstein) and in Switzerland.[5]

The portal is run by the European Commission (DG EMPL) and is free of charge for jobseekers and employers. National public employment services (PES) link their own vacancy databases to the portal, where the openings are collected and posted in a semi-structured way and in pre-designed categories, creating a large 'standardised' collection of job openings across the participant countries. Employers cannot post vacancies on EURES independently, but need to contact national PES or EURES personnel to administer the upload. The portal is estimated to cover 30-40% of the overall European market for job vacancies (Ackers, 2012).[6] In 2012, on average 750,000 CVs were live in the system at any time in a given month. Jobseekers create and store their search profiles and receive email alerts when jobs matching their profiles become available. About 26,000 employers had accounts that allow them to search for CVs,

[4] See the EURES website at http://ec.europa.eu/eures/home.jsp?lang=en.

[5] See S. Petitjean, "EURES portal to be revamped", *Europolitics*, 26 November 2012 (http://www.europolitics.info/social/eures-portal-to-be-revamped-artb345570-23.html).

[6] Unfortunately, at the time of study we did not have data that would estimate the portal coverage at the national level.

create and store search profiles, and receive email alerts. The number of monthly visits averaged at about 3.6 million, but has been rising every year (Ackers, 2012; GHK Consulting & EPEC, 2009). About 150,000 contacts are established per month between jobseekers and employers, leading to approximately 50,000 placements per year (Ackers, 2012).

The website is based on a partnership principle among the PES offices, with the aim of increasing the transparency of the labour market in Europe. All jobs that are advertised by national PES offices should be made visible on the EURES website as well.[7] In practice, a 2009 evaluation of EURES revealed that there have been implementation set-backs in the technical interlinking of national job vacancy databases to the EURES website (GHK Consulting & EPEC, 2009), but efforts have been made to improve this over time. Currently, plans exist to upscale the portal and its resources to better contribute to the goal of freedom of movement across Europe.[8]

The structure of the portal ensures a good degree of comparability of job vacancies across the countries, as it unifies them by standardised ISCO codes and groups them into broad occupational categories. We consider this the main advantage of the EURES portal, which makes EURES a good source of micro-data on labour market demand for comparative analysis (better than any other we were able to identify). The overall number of vacancies and their distribution across occupational groups within countries reflects the country-level intensity and character of the labour demand, which is reflected in the structure of our download (see Table 3 in section 4.3). A further factor affecting the composition of vacancies is the national legislation related to the systems of vacancy collection – in some countries, firms are obliged to report vacancies, while in others it is a voluntary practice.

The way data are collected leads to possible biases of the results. Public employment services, unless vacancy registration is mandatory, are known to serve the labour market segment of the lower-skilled (Larsen & Vesan, 2012).[9] Yet a recent study by the European Commission revealed that personal initiative and networking dominate job-searching methods. Internet access and usage has enabled greater independence in job search activities by jobseekers (European Commission & ECORYS, 2012). With respect to personal initiative, looking for advertisements in newspapers or online and sending off speculative applications is a dominant strategy, used by 85% of jobseekers (European Commission & ECORYS, 2012)(European Commission & ECORYS, 2012)(EC and ECORYS 2012)(EC & ECORYS 2012)(EC and ECORYS 2012). From this perspective, while the EURES portal displays PES vacancies, it is an online tool available to a wide range of people, not just PES clients. This is reflected in the profile of EURES portal users, who tend to have tertiary education and are not necessarily unemployed (i.e. job changers, rather than jobseekers) (2008–09 data) (GHK Consulting & EPEC, 2009). While the scope for improvement was identified on many accounts, the

[7] See the article "About EURES Job-search" on the EURES website (http://ec.europa.eu/eures/main.jsp?acro=job&lang=en&catId=481&parentCategory=481).

[8] S. Petitjean, "EURES portal to be revamped", *Europolitics*, 26 November 2012 http://www.europolitics.info/social/eures-portal-to-be-revamped-artb345570-23.html

[9] For overview of the use of public versus private employment service providers, see (European Commission & ECORYS, 2012, p. 97).

evaluation of EURES found satisfactory levels of client satisfaction expressed by both employees and employers (GHK Consulting & EPEC, 2009).

This leads us to view the EURES portal as a suitable source of data for comparative study of the nature of demand across the EU. A representativeness analysis of PES data in national labour markets would be desirable before policy recommendations are made based on EURES data alone. Such an analysis is not a trivial exercise, as the population of job openings in any labour market is practically unidentifiable, as much recruitment happens informally.[10]

At the same time, given that we are not using EURES vacancies for the quantitative estimation of demand, but rather to study the content of job advertisements, we believe that the danger of making conclusions on the basis of unrepresentative data is limited. The skill profile of vacancies would be biased only if we could assume that just certain firms within a given sector tend to post vacancies on PES and these firms differ significantly in their expectations. We do not think that such a scenario is very likely. As a word of caution, we nevertheless recommend using similar types of analyses as complementary inputs to other labour market data, such as vacancies from private portals or surveys of employers' skill requirements.

4.2 Data description and data processing

The vacancy format is predefined, whereby a range of subfields with information detailing the required qualifications, proposed type of contract, location of vacancy, languages, experience and other information are specified. We found the actual content and degree of detail of the vacancies to differ across countries, which as we have discussed, most likely reflects the way vacancies are collected at the national level. Hence, while vacancy structure and content are predefined, national differences appear, as some fields are only filled in job ads from some countries and are missing in others. An example is the 'educational requirement' field, which appears extensively in the Czech data but is completely missing in the Irish job ads, and does not contain much information in the Danish vacancies. It is for this reason that we do not consider the predefined education field and rather search within the job notice for a specific reference to the required type or level of education. At the same time, we decided to consider the predefined 'experience' field and add this information to the references on desired experience expressed in the text of the job vacancy itself.

While most details about jobs (such as type of contract, required experience and level of education) are translated into all EU languages, this is not the case for the title and the text of the job notice. These were the key fields for our analysis, which required the involvement of native speakers in the preparation and translation of the skill taxonomy. The key fields for our work – job description, position title and ISCO codes – appeared across all countries. Each vacancy also has a unique identifier (by means of a national reference number), enabling us to exclude duplicate vacancies that might have been collected through repeated downloads. Data were downloaded by selecting a country and a wide occupational group predefined on the website, with the aim of gathering at least 500 vacancies per given cell (i.e. for country and occupational group). The period when data collection took place lasted from March to August 2012. Repeated downloads were carried out for smaller countries and smaller occupational

[10] The authors welcome suggestions on how data representativeness could be conducted.

groups in order to gain the planned number of vacancies. The total number of job openings per country and cell is presented in Table 3. It shows that we were not able to gather the planned number of job ads in every cell during the download period, which is a result of the labour demand in the first half of 2012 in these countries. We do not consider this a major problem, as we are not trying to capture the rate of vacancies, but rather use the available ones to understand the skill content and skill requirements.

We downloaded the data by using self-developed custom-made software, which we dubbed 'grabber'. The grabber was programmed to download the selected and identified fields from vacancies posted in a particular occupational group. Vacancies typically appear in national languages, but foreign language ads also exist (e.g. in the English language for Czech or Danish vacancies). The foreign language vacancies were excluded from the current analysis, as they were not numerous. We used a series of steps and multiple techniques to process and code the data. Native speaker translators/coders were instructed in the usage of text analysis software to be able to work with a random sample of ads from a given country in the preparation of a list of general word frequencies from a given country. Frequency lists summarising skill and competence-related vocabulary were then used by the lead researchers in preparing the selection of skills for the actual analysis – i.e. the development of a 'skill taxonomy' (in Table 1 above). The skill taxonomy was prepared in English and coders were then used again to provide translation into relevant languages (Czech and Danish). A binary code for the job description field was then created to mark those ads where a particular skill or capability was mentioned. We then proceeded with the analysis of data to calculate frequencies and simple statistics across occupations and across countries.

4.3 Descriptive statistics

In the selection of occupational groups, we worked with the list of predefined ones on the EURES website.[11] We selected a range of medium- and low-skilled occupational groups from the service sector and industry to also see the possible variation in the skills required among these sectors. These are summarised in Table 2, which additionally shows the relevant ISCO 1-digit classifications. The ISCO codes were checked across the countries to ensure cross-country comparability. Medium-skilled occupations in the service sector include hotel, catering and sales staff (ISCO 5) and office staff (ISCO 4). Medium-skilled occupations in industry include metal and machinery workers (ISCO 7) and machine operators and assemblers (ISCO 8). Low-skilled service occupations include elementary occupations in sales, services, cleaning and various types of labourers in industry, all of which belong to ISCO 9. Our focus on low- and medium-skilled occupations is due to our interest in this more disadvantaged segment of the labour market, but analysis in the future could be extended to all skill levels and in principle to all occupational groups.

Table 2. Selection of occupations

	Sector	Occupational group	ISCO
Medium-skilled	Service sector	Hotel, catering and personal services staff	5

[11] A list of all occupational groups can be seen on the EURES website (http://ec.europa.eu/eures/main.jsp?lang=en&acro=job&catId=482&parentCategory=482).

		Sales staff and fashion work	5
		Office staff	4
	Industry	Metal, machinery and electronic equipment workers	7
		Machine operators and assemblers	8
Low-skilled	Service sector	Sales, services and cleaning elementary occupations	9
	Industry	Labourers in mining, construction, manufacturing and transport	9

Source: Authors, based on EURES data.

Table 3 displays the number of job ads downloaded in each country and for each occupational group, which have been specified also by the two-digit ISCO code. Overall, we analysed more than 6,000 Czech vacancies, while only roughly half and a third of this number in Denmark and Ireland, respectively. Comparing these figures with the inflow of vacancies registered by PES in Q3 in 2011,[12] we essentially analysed 15% of Czech, 10% of Danish and 13% of Irish PES-collected vacancies. The shares of vacancies across the occupational groups reveal structural differences among these economies. In Ireland and Denmark, service sector jobs clearly prevail in medium- and low-skilled segments of the labour market, while the Czech economy is still more industrial. Over a quarter of the Czech vacancies belong to the hotel and catering category, with a similar share for metal and machinery workers. Compared with the other two countries, the share of openings at the elementary level is lower.

Table 3. Number of job ads by occupation and country

	Occupational group	**ISCO** (2 digit)	**Czech Republic** (Count/%)		**Denmark** (Count/%)		**Ireland** (Count/%)	
Medium-skilled								
Service sector	Hotel, catering and personal services staff	**51**	1,582	26%	606	22%	902	42%
	Sales staff and fashion work	**52**	876	14%	563	21%	-	-
	Office staff	**41**	597	10%	378	14%	416	19%
Industry	Metal, machinery and electronic equipment workers	**72**	1,718	28%	318	12%	223	10%
	Machine operators and assemblers	**82**	228	4%	28	1%	-	-
Low-skilled								
Service sector	Sales, services and cleaning elementary occupations	**91**	621	10%	659	24%	480	22%
Industry	Labourers in mining, construction, manufacturing and transport	**93**	460	8%	196	7%	114	5%

[12] These are the latest available, source: (European Commission & ECORYS, 2012, p. 123)

	Total		**6,082**	100%	**2,748**	100%	**2,135**	100%

Source: Authors, based on EURES data.

In the Irish data, two occupational categories are missing as shown in Table 3, which is a combination of low labour demand for these types of jobs and the different occupational classification system that Ireland uses.[13] Even though repeated downloads were carried out where necessary, we did not manage to obtain the target number of about 500 vacancies in each given cell. We do not consider this a major problem, however, as we are not trying to capture the rate of vacancies, but rather use the available ones to understand skill content and skill requirements. From this perspective, we consider the numbers of gathered vacancies per cell and occupational category sufficient, with the exception of machine operators and assemblers in Denmark, which are analysed with caution.

In Table 1A in the appendix, we provide examples of job titles falling within each occupational group. Job titles are not standardised and appear in national languages, and therefore are subject to variations in how they are expressed. Yet generally, they are similar across the countries, although the range and specificity of the job titles might vary. Because the job titles are not standardised, we rely on the ISCO code as the main characteristic that determines the appropriate occupational group, relying on the national employment services to have a good knowledge of the classification system and to have classified job vacancies appropriately. In practice this means that although job vacancies might have the same job title in different occupational categories, we do not re-group them, and only consider the assigned ISCO code.

5. Empirical analysis

5.1 Hypotheses and expectations

Our study can be empirically streamlined in three directions. Our first concern is of a more descriptive nature and seeks to explore which skills (and in what combination) are demanded in the occupational groups and countries analysed. We find it particularly insightful to acquire a better understanding about how demanding employers are in the low- and medium-skilled segment of the labour market and to gain a general overview of the content of labour demand across different EU economies. Several more analytical hypotheses can be framed as well. The first relates to the variation in the skills demanded in occupational groups belonging to different sectors – i.e. services versus industry. In interactive service work in particular, non-cognitive skills and personal characteristics are likely to matter more than in industry, where formal qualifications and certification should prevail (Jackson, 2001, 2007; Nickson et al., 2005; Warhurst & Nickson, 2007). Our hypothesis is therefore the following one:

[13] When enquiring about the reason for no or extremely few vacancies in these categories in Ireland with EURES web design staff, we were told that the countries are asked to transpose their national classification systems to ISCO88, which in the case of Ireland is in some occupational areas more problematic due to greater differences between the international classification and the Irish system. A similar problem exists with respect to the UK data, and is even of greater magnitude.

H1. Non-cognitive skills are likely to be more important in interactive service occupations than in manufacturing occupations and non-interactive service work.

The second set of expectations can be framed with respect to the cross-country variation in the importance of formal qualifications. The degree of institutionalisation of skill formation and the education system is reflected in employers' reliance on and belief in the validity, reliability and value of qualifications. As explained in the section reviewing the relevant literature, the countries analysed belong to different skill-formation regimes. We expect these institutional factors to affect labour recruitment practices and employers' expressions of desired competences and skills. This leads us to anticipate our next hypothesis:

H2. In the Czech Republic and Denmark, where industry-specific skills that are generated through dual systems of skill formation prevail, formal qualifications will be more important than in Ireland.

Third, firm size and labour market tightness have been proposed as additional factors affecting the way employers might be searching for candidates and specifying the job requirements generally, but also in the low-skilled sector (Maxwell, 2006). The labour market performance of the countries analysed during data collection varies, which is partly a function of how much they were affected by the late economic downturn. In 2011, the unemployment rates in the Czech Republic (6.7%) and Denmark (7.6%) were about half that of Ireland (14.4%). Therefore, our last hypothesis is as follows:

H3. Given the more depressed labour market in Ireland, we expect Irish employers to be more demanding, detailed and specific in the job requirements expressed in their ads than the Czech and Danish employers.

5.2 Analysis of content of job advertisements

We analyse the job description field to understand which skills and competences are desired by the employers. Ads written in a foreign language were excluded from the analysis. In all three countries, this meant only a few job advertisements typically written in English or German. Tables 4-6 show how many job advertisements within a particular occupational group requested *at least one* skill or competence within a particular skill group as defined earlier in Table 1. The results reveal interesting variations among occupational groups within countries and also point to some important differences across the three countries analysed, generally confirming the first hypothesis, partly confirming the second one and disconfirming the last one.

An initial general finding is that country-level formulation of demand is rather unique and the combination of skills required is very distinct in each country. Some general trends can nonetheless be identified on the basis of the more aggregated skill-group analysis. First, physical appearance is marginal across the three countries, although it appears to be more important for the Danish employers. Second, experience is among the most important qualities in all three countries, but it appears much less important in Denmark. Third, within the countries, the content of job demand is very different across the occupational groups – a feature that is also confirmed by the Chi-Square statistics of difference, which show statistically robust differences among the occupational groups in the countries (not displayed).

Interestingly, formal qualifications are demanded the least often in Denmark, where we expected them to matter a lot, and are at the aggregate level the most salient in the Czech Republic (see the 'total' column). Still, there is significant variation among the

occupational groups in how important formal qualifications are. In general, the importance of a formal qualification rises with the skill level – job ads pertaining to elementary occupations request formal education less frequently. Additionally, cognitive skills appear to be very important in all three countries and particularly in Ireland.

In the Czech Republic, at the aggregate level, after experience, formal qualifications and cognitive skills are the most important. Formal qualifications are particularly sought for 'metal worker' jobs, while cognitive skills are sought in nearly three-quarters of the job ads looking for office staff. Only a few job ads were advertised as suitable for graduates. While non-cognitive social skills are less sought in 'industrial occupations' (ISCO 7 and 8), they are also infrequently sought for the hotel and catering group, which is perhaps surprising. Overall, low-skilled job ads are less demanding than job ads searching for workers to fill vacancies belonging to medium-skilled occupations.

In Ireland, experience strongly dominates, followed by cognitive skills and formal qualifications, which are especially sought when hiring workers for hotel and catering occupations and in metal and machinery work. The differences among occupational groups are not statistically significant for cognitive skills in particular, which are sought relatively equally for different types or levels of jobs. The Danish formulation of the labour demand in the occupations analysed differs from the other two countries in a number of aspects. The employers seek non-cognitive personal characteristics more than experience. All these as well as non-cognitive social skills and cognitive skills appear to be more important than formal qualifications.

The results for each skill, competence or capability are presented separately in Tables 7-9. In addition to skill frequencies (the share of job ads where a specific skill was explicitly demanded), we provide the total for each skill subcategory. At the end of each table we present indices showing the 'sum of skills', which add up individual skill frequencies into a composite sum and imply occupational 'skill intensity' (without and with experience). Comparatively, the sum of the skills indices enables us to compare skill intensity across occupational groups and to determine which groups are associated with the most skills sought in the labour market. In addition to skills, we also review whether employers ask for a (clean) criminal record or references. These are not added to the sum of skill indices, nor are requirements related to physical appearance.

Table 4. Czech Republic: Share of job ads requesting at least one particular skill (%)

	Hotel, catering and personal services staff	Sales staff and fashion work	Office staff	Metal, machinery and electronic equipment workers	Machine operators and assemblers	Sales, services and cleaning elementary occupations	Labourers in mining, construction manufacturing and transport	Total
Formal degrees	29.5	19.2	27.8	46.4	21.1	7.6	10.9	28.7
Cognitive skills	22.3	39.3	76.2	17.3	18.9	17.2	19.6	27.8
Non-cognitive social	5.2	23.6	27.0	2.4	3.1	7.2	3.0	9.2
Non-cognitive personal	22.3	29.1	40.5	22.0	23.7	21.4	19.8	24.7
Appearance	0.6	1.6	0.5	0.0	0.0	0.2	0.0	0.5
Experience total	64.9	60.8	68.7	75.1	54.8	24.5	33.5	60.7
Other *	12.3	10.3	8.5	3.2	11.4	17.6	7.4	9.2
N	1581	875	593	1717	227	621	459	6,077

* Refers to criminal record and references

Note: Chi-square test was used to determine significance of the differences. The differences between categories are statistically significant at 99%.

Source: Authors, based on EURES data.

Table 5. Ireland: Share of job ads requesting at least one particular skill (%)

	Hotel, catering and personal services staff	Sales staff and fashion work	Office staff	Metal, machinery and electronic equipment workers	Machine operators and assemblers	Sales, services and cleaning elementary occupations	Labourers in mining, construction manufacturing and transport	Total
Formal degrees	38.4	-	6.3	27.4	-	7.5	0.9	22.0
Cognitive skills	31.5	-	37.2	30.5	-	32.7	34.2	32.9
Non-cognitive social	10.8	-	15.0	6.3	-	10.6	3.5	10.7
Non-cognitive personal	19.2	-	15.2	8.5	-	11.5	11.4	15.2
Appearance	0.3	-	0.5	0.0	-	0.2	0.0	0.3
Experience	96.8	-	94.4	95.1	-	88.1	91.2	93.9
Other *	22.5	-	1.9	8.1	-	5.6	10.5	12.6
N	901		414	223		480	114	2,132

* Refers to criminal record and references

Note: Chi-square test was used to determine significance of the differences. The differences between categories are statistically significant at 99%, with the exception of cognitive skills and physical appearance within which the differences between occupational groups are not significant.

Source: Authors, based on EURES data.

Table 6. Denmark: Share of job ads requesting at least one particular skill (%)

	Hotel, catering and personal services staff	Sales staff and fashion work	Office staff	Metal, machinery and electronic equipment workers	Machine operators and assemblers	Sales, services and cleaning elementary occupations	Labourers in mining, construction manufacturing and transport	Total
Formal degrees	30.5	3.9	24.7	14.1	25.0	2.0	9.4	13.5
Cognitive skills	25.5	19.8	44.4	25.0	75.0	36.3	45.3	30.9
Non-cognitive social	22.0	48.2	52.7	26.1	25.0	25.5	13.0	31.5
Non-cognitive personal	55.7	48.6	67.2	57.7	0.0	47.7	54.2	52.2
Appearance	1.8	20.2	0.8	0.4	0.0	1.6	0.0	5.0
Experience	14.9	3.8	10.5	10.2	0.0	26.9	12.0	33.1
Other *	22.5	36.6	38.2	50.7	50.0	27.7	47.9	13.6
N	596	560	372	284	16	639	192	2,741

* Refers to criminal record and references

Notes: Chi-square test was used to determine significance of the differences. The differences between categories are statistically significant at 99%.

Source: Authors, based on EURES data.

*Table 7. Overview of skills and competences sought in the **Czech Republic**: Share of jobs for which a particular skill was demanded (%)*

		Hotel, catering and personal services staff	Sales staff and fashion work	Office staff	Metal, machinery and electronic equipment workers	Machine operators and assemblers	Sales, services and cleaning elementary occupations	Labourers in mining, construction manufacturing and transport	Total
A. Formal education and certification		29.5	19.2	27.8	46.4	21.1	7.6	10.9	28.7
B. Cognitive abilities and skills	ICT	5.4	31.5	62.1	7.4	9.6	9.5	9.3	16.2
	Czech language	0.90	0.80	3.40	0.30	0.00	2.10	1.30	1.10
	Foreign language	14.0	8.7	38.7	5.9	6.6	3.5	3.3	11.2
	English	7.6	9.1	28.3	3.3	4.4	2.3	0.9	7.50
	Driving license	2.7	5.8	12.4	5.8	4.8	2.4	5.2	5.2
	Ability to learn	2.9	3.9	4.0	1.8	3.1	3.1	2.2	2.8
	Total	**33.4**	**59.8**	**149.0**	**24.4**	**28.5**	**22.9**	**22.2**	**44.0**
C. Non-cognitive social	Communication	4.8	23.3	25.5	1.9	1.8	6.6	2.2	8.5
	Service-oriented	0.2	1.3	0.3	0.0	0.0	0.6	0.0	0.3
	Team skills	0.3	0.5	2.8	0.9	1.8	1.3	0.9	1.0
	Total	**5.3**	**25.0**	**28.6**	**2.8**	**3.5**	**8.5**	**3.0**	**9.8**

Table 7. Cont'd

D. Non-cognitive personal	Timeliness	0.3	0.0	0.0	0.0	0.0	0.2	0.2	0.1
	Independence	10.1	11.4	21.1	13.7	10.1	6.3	5.2	11.6
	Reliability	9.5	13.0	17.1	9.5	12.7	12.1	12.4	11.4
	Creativity	1.6	1.3	1.0	0.2	0.4	0.2	0.9	0.9
	Flexibility	9.4	13.1	20.6	7.0	11.4	8.9	6.5	10.2
	Stress-resistant	1.0	0.7	4.7	0.4	0.9	1.3	0.2	1.1
	Total	**31.9**	**39.5**	**64.5**	**30.8**	**35.5**	**28.8**	**25.4**	**35.2**
E. Experience total		**64.9**	**60.8**	**68.7**	**75.1**	**54.8**	**24.5**	**33.5**	**60.7**
Experience in job ads		63.0	52.9	53.4	68.0	49.1	21.6	31.1	54.8
F. Appearance		0.6	1.6	0.5	0.0	0.0	0.2	0.0	0.5
G. Other	Criminal record	11.4	10.2	8.2	3.0	11.0	17.6	7.2	8.8
	References	0.8	0.1	0.7	0.3	0.4	0.3	0.2	0.4
H. Total sum of skills and competences (A – D)		**92.5**	**134.4**	**241.6**	**101.1**	**84.2**	**65.5**	**60.6**	**110.1**
F. Total including experience total (H + E)		**157.3**	**195.2**	**310.3**	**176.2**	**139.0**	**90.0**	**94.1**	**170.8**

Source: Authors, based on EURES data.

*Table 8. Overview of skills and competences sought in **Ireland**: Share of jobs for which a particular skill was demanded (%)*

		Hotel, catering and personal services staff	Office staff	Metal, machinery & electronic equipment workers	Sales, services, cleaning elementary occupations	Labourers in mining, construction, manufacturing and transport	Total
A. Formal education and certification		38.4	6.3	27.4	7.5	.9	22.0
B. Cognitive abilities and skills	ICT	0.3	27.1	4.9	2.9	5.3	6.8
	English	25.9	12.8	17.0	23.8	16.7	21.4
	Driving license	6.9	4.1	12.6	6.5	23.7	7.7
	Ability to learn	1.7	1.2	0.9	0.8	0.0	1.2
	Total	**34.7**	**45.2**	**35.4**	**34.0**	**45.6**	**37.2**
C. Non-cognitive social	Communication	4.8	13.0	4.5	8.1	0.0	6.8
	Service-oriented	1.2	0.7	0.0	0.4	0.9	.8
	Team skills	5.3	2.9	2.2	2.9	2.6	3.8
	Total	**11.3**	**16.7**	**6.7**	**11.5**	**3.5**	**11.5**
D. Non-cognitive personal	Timeliness	0.9	4.8	0.9	1.0	3.5	1.8
	Independence	0.1	0.0	0.4	0.2	0.0	.1
	Reliability	5.7	1.4	3.1	1.9	5.3	3.7
	Creativity	1.9	0.5	0.0	0.0	0.0	0.9
	Flexibility	13.2	8.7	4.9	8.5	7.0	10.1
	Stress-resistant	1.4	1.2	0.9	0.6	0.0	1.1
	Total	**23.2**	**16.7**	**10.3**	**12.3**	**15.8**	**17.7**
E. Experience total		**96.8**	**94.4**	**95.1**	**88.1**	**91.2**	**93.9**
	Experience in job ads	67.6	44.0	69.1	64.8	54.4	61.8
F. Appearance		0.3	0.5	0.0	0.2	0.0	0.3
G. Other	Criminal record	21.1	1.7	5.4	3.1	9.6	11.0
	References	2.6	0.2	3.6	2.9	0.9	2.2
H. Total sum of skills and competences (A – D)		**107.7**	**84.8**	**79.8**	**65.2**	**65.8**	**88.5**
F. Total including experience total (H + E)		**204.4**	**179.2**	**174.9**	**153.3**	**157.0**	**182.4**

Source: Authors, based on EURES data.

*Table 9. Overview of skills and competences sought in **Denmark**: Share of jobs for which a particular skill was demanded (%)*

		Hotel, catering and personal services staff	Sales staff and fashion work	Office staff	Metal, machinery and electronic equipment workers	Machine operators and assemblers	Sales, services and cleaning elementary occupations	Labourers in mining, construction manufacturing and transport	Total
A. Formal education and certification		30.5	3.9	24.7	14.1	25.0	2.0	9.4	14.0
B. Cognitive abilities and skills	ICT	3.9	10.4	25.8	6.7	25.0	2.5	4.2	8.4
	Danish	4.4	4.3	3.2	4.2	0.0	21.6	18.8	9.3
	Foreign language	2.9	7.7	18.5	8.8	50.0	5.8	4.7	7.8
	Driving license	12.8	6.3	2.7	9.5	0.0	13.1	24.5	10.5
	Ability to learn	5.0	.7	6.7	2.5	0.0	0.6	2.6	2.8
	Total	**28.9**	**29.3**	**57.0**	**31.7**	**75.0**	**43.7**	**54.7**	**38.9**
C. Non-cognitive social	Communication	1.7	1.6	9.9	1.8	0.0	2.2	0.5	2.9
	Service-oriented	9.4	42.1	36.0	11.6	0.0	19.4	1.6	22.0
	Team skills	13.1	21.3	27.4	14.4	25.0	5.6	11.5	15.1
	Total	**24.2**	**65.0**	**73.4**	**27.8**	**25.0**	**27.2**	**13.5**	**40.0**

Table 9. Cont'd

D. Non-cognitive personal	Timeliness	0.5	0.2	2.7	1.1	0.0	4.5	0.0	1.7
	Independence	20.0	19.3	36.0	34.2	0.0	22.1	27.1	24.5
	Reliability	7.4	8.2	3.0	12.0	0.0	6.6	27.1	8.6
	Creativity	12.1	10.9	2.7	1.8	0.0	1.3	0.5	5.9
	Flexibility	37.4	32.0	43.5	31.0	0.0	24.3	20.8	31.9
	Stress-resistant	4.5	6.3	16.4	3.5	0.0	2.2	1.0	5.6
	Total	**81.9**	**76.8**	**104.3**	**83.5**	**0.0**	**60.9**	**76.6**	**78.2**
E. Experience total		**22.5**	**36.6**	**38.2**	**50.7**	**50.0**	**27.7**	**47.9**	**33.9**
	Experience in job ads	0	0	0	0	0	0	0	0
F. Appearance		1.8	20.2	0.8	0.4	0.0	1.6	0.0	5.2
G. Other	Criminal record	13.8	3.6	8.3	8.1	0.0	25.4	9.4	12.6
	References	2.2	0.5	3.2	2.8	0.0	2.2	2.6	2.1
H. Total sum of skills and competences (A – D)		**165.4**	**175.0**	**259.4**	**157.0**	**125.0**	**133.8**	**154.2**	**171.0**
F. Total including experience (H + E)		**187.9**	**211.6**	**297.6**	**207.7**	**175.0**	**161.5**	**202.1**	**205.0**

Source: Authors, based on EURES data.

The Czech labour market is a varied one across the occupational groups analysed with respect to the extent of the skills and other qualities demanded. Low-skilled occupational groups are much less demanding than the medium-skilled occupations, for office staff in particular. This is the case with respect to formal education as well as experience, but also as far as skill demand for non-cognitive personal skills is concerned. In the Czech Republic, low-skilled jobs seem to be those for which – compared with medium-skilled jobs – relatively less education and experience is necessary, but where basic credibility (a clean criminal record), reliability, flexibility and ICT knowledge might be desired. A much wider and more intense skill set is needed at the medium-skill level. Particularly the category of 'office staff' stands out in the occupational groups analysed as the one demanding the most skills. A set of cognitive skills, such as ICT skills and foreign language knowledge, are widely requested. Non-cognitive social skills and personal characteristics are relatively more important for sales and fashion staff, and for office staff. Metal and machinery workers are the most formalised occupational group, as in addition to formal education, training is also widely requested (not displayed). Previous experience is an important factor in the Czech labour market. Service occupations (both medium- and low-skilled) on average request more non-cognitive skills. In the Czech labour market, mainly communication skills, independence and reliability dominate. Non-cognitive skills are requested *in addition* to formal qualifications *rather than instead of them*, as in the Czech labour market formal qualifications remain important.

The Irish data reveal several differences compared with the Czech Republic. Although medium-skilled occupations are more demanding in terms of requirements than low-skilled ones, the spread in skill intensity across them is smaller than in the Czech data. The occupation that is the most demanding in this regard is the hotel, catering and personal services category, which in addition to formal education and the proof of a clean criminal record, seeks a good command of English and flexibility. The immigrant character of the Irish labour market seems to radiate through a high share of low-skilled manual jobs requesting a (good) command of English as a requirement. English language skills are more often sought in interactive service jobs. Importantly, cognitive skills seem to be generally more frequently sought than other skill types, while experience remains a key aspect designated in the ads. There is no clear-cut difference between service and industry sector occupations with respect to non-cognitive skills.

Danish labour demand is again very specific and different from the other two countries. Formal education appears less important than in the other two countries. Low-skilled service jobs appear to be the least demanding in relation to requirements, while office staff is the most demanding occupational group, but no clear hierarchy between low- and medium-skilled jobs exists. While cognitive specific skills seem to matter, it is especially non-cognitive skills that are requested. Being service-oriented, having team skills, being independent and especially flexible are widely sought attributes. As predicted by the theory, non-cognitive skills are more widely requested in service-related occupations. Overall, the Danish employers construct their demand in ways that are quite different to the Czech and Irish employers.

Following this analysis, Table 10 provides an overall summary of the type of national labour market and its degree of formalisation, i.e. reliance on formal qualifications and cognitive competences (last column).

Table 10. Summary of the 'skill mix' and type of labour market: The three most requested skills and competences

	Hotel, catering and personal services staff	**Sales staff and fashion work**	**Office staff**	**Metal, machinery and electronic equipment workers**	**Machine operators and assemblers**	**Sales, services and cleaning elementary occupations**	**Labourers in mining, construction manufacturing and transport**	Summary: **Type of labour market at the country level**
Czech Republic	Experience Formal education Foreign language	Experience ICT Communication skills	Experience ICT Foreign language	Formal education Experience Independence	Experience Formal education Reliability	Experience Clean CR* Reliability	Experience Reliability Formal education	Formalised and hierarchical labour market with experience being the most important across occupational types and levels. Formal education is demanded more in skill-specific occupational groups. In low-skilled segments, non-cognitive personal skills (reliability, flexibility) are important. In the medium-skilled segment, cognitive skills (especially ICT and language skills) matter; these prevail in service occupations too.
Ireland	Experience Formal education English	X	Experience ICT Communication skills	Experience Formal education English	X	Experience English Flexibility	Experience Driving license English	Formalised and non-hierarchical labour market with small differences in skill intensity across the analysed occupations. Experience strongly dominates, together with a range of cognitive skills, knowledge of English in particular. Formal education is more demanded in skill-specific occupational groups.
Denmark	Flexibility Formal education Experience	Service-oriented Experience Flexibility	Flexibility Experience Service-oriented Independence	Experience Independence Flexibility	Foreign language Experience ICT Formal education Team skills	Experience Clean CR Flexibility	Experience Independence Reliability Driving license	Non-formalised and non-hierarchical labour market where non-cognitive skills attain importance especially in service occupations. Among these, flexibility, a service-oriented approach and independence dominate.

* CR = criminal record

Source: Authors, based on EURES data.

Among the countries analysed, the Czech labour market appears to be the most formalised, as formal education is requested widely with the exception of selected service occupations. More than non-cognitive skills, cognitive abilities prevail and this is the case also in the service-related occupations. In the least skilled segment, reliability and flexibility are sought. A strong hierarchy of skill intensity appears to exist between low- and medium-skilled occupations. In the Irish labour market, experience and a range of cognitive skills (including knowledge of English) prevail over non-cognitive skills and characteristics, while the labour market appears less hierarchical as far as skill intensity across occupational groups is concerned. Similar to the Czech Republic, cognitive skills are more often explicitly phrased in the job ads than non-cognitive skills. Compared with the Czech Republic and Ireland, employers in the Danish labour market demand much less formal education and cognitive abilities, and from this perspective labour demand is less formalised. It is strongly focused on non-cognitive skills and abilities across occupational types, with flexibility, good customer skills and team skills considered an asset. The low level of importance given to formal qualifications is surprising in light of theoretical expectations and suggests that a more detailed institutional analysis of the functioning of education systems and their role as screening tools is needed.

It is also interesting to note that the character of occupational labour demand appears quite dissimilar across the countries. A common feature cutting across occupations and countries is the requirement of previous experience in a given job. Yet, when this criterion is taken as constant, the required skills or abilities that follow as the most requested for a particular occupational group tend to differ across the countries. This can be interpreted as suggesting that the employers' expectations focus on different mixes of skills and competences when hiring the workers. While this does not necessarily imply worse cross-country opportunities for labour migration (as what matters is whether a given worker possesses a given skill set or not), it is important from the point of an individual's job search strategy. It also suggests that the views, behavioural models and understanding pertaining to the functioning of particular occupational labour markets might not be directly transferable across the EU borders.

This raises questions with respect to the skill endowments provided through national labour markets, which appear to be reflected in the formulation of labour demand at the micro-level. Our analysis disconfirmed the third hypothesis, which expected to discover more demanding or more detailed formulation of demand in a more depressed labour market, i.e. Ireland. The skill intensity formulated in Irish ads generally appears to be roughly at the level of the other two countries. We find a smaller degree of hierarchy across the skill levels, however, which could reflect that at a time of labour market slackness, expectations across skill levels equalise as more skilled workers might be ready to take less skilled jobs and employers are therefore bolder in expressing their expectations.

6. Conclusions and implications

This paper has analysed labour demand at the micro-level by studying the content of job advertisements to identify specific skills and characteristics that are demanded in selected low- and medium-skilled occupations in three small, European labour markets: the Czech Republic, Ireland and Denmark. We have connected our empirical analysis to various strands of literature and considered the importance of the shift

towards a service economy, the institutional characteristics of education and skill formation systems and labour market tightness as possible factors affecting the formulation of labour demand and the recruitment process at its initial point. Our general finding is that the skill-mix demand is very diverse across the countries analysed, implying that there is no universal 'European' demand and that domestic institutions and structures affect how demand for workers in the low- and medium-skilled segments of the labour market is formulated.

We find confirmation of the hypothesis that the specific skill set demanded in service occupations differs from other, mainly industrial-sector (manual) jobs, in that there is greater focus on non-cognitive social skills and personal characteristics. At the same time, there is great variation in the content of skill demand across the labour markets analysed, and while on average non-cognitive skills might be more desired in interactive service jobs, these requirements might appear in addition to formal education, not instead of it. The Czech and Irish labour markets are much more formalised, and formal education and cognitive skills matter to a large extent. Formal degrees are explicitly sought much less by Danish employers, who voice a strong preference for a range of non-cognitive skills. This finding is surprising, as we expected formal education and certification to play an important role in employers' demand in 'dual' skill formation regimes (Denmark and the Czech Republic) and to matter marginally in general skill economies (Ireland). An important specific characteristic of the Danish labour demand is the emphasis on flexibility, which crosses occupations and skill levels. This is not surprising, however, given the 'flexicurity' economy that Denmark embodies. The last hypothesis, which anticipated more demanding employers in Ireland, where the labour market is currently more relaxed, was not confirmed by the data. Our findings suggest that more analysis is needed to better understand the factors influencing the formulation of labour demand and recruitment processes in different institutional contexts.

Our work is innovative in exploring data taken from online job ads and quantifying different skills, personal attributes and characteristics, especially in a comparative approach. It shows that online job portals can potentially become a very useful source for gathering information about the content of labour demand and in improving the generally weak statistics of vacancies generated through other sources. Although we consider the EURES portal a uniquely suitable source of data for comparative study of the nature of demand across the EU, a representativeness analysis of PES data in national labour markets would be desirable before policy recommendations are made based on EURES data alone. For reasons of potential biases, at this point, we recommend using similar types of analyses as complementary rather than independent data inputs.

Thus, we contribute to works that emphasise the need to analyse labour market demand at the micro-level and use job advertisements as a source of information about the details of employers' requirements. So far, these works are scarce but essential to fully understanding recruitment processes and labour matching (Keep & James, 2010), and they bring deeper insights into the issues of intra-EU mobility and limits on a 'skills union'. Our work highlights the potential limits of 'European occupational labour markets', as we find that the preferences of employers across the three countries seem rather distinct for similar types of jobs. Learning more about the demand for competences is a fundamental question that needs to be considered in order to reveal

the complex relationship between employee selection, different strands of education and training policy, and labour market regulation. It can also facilitate understanding of the link between formal education and other skill requirements sought for different types of occupations in a particular institutional context. Furthermore, reducing mismatches – an issue that has been placed high on the EU's agenda – requires consideration of broader labour market processes and circumstances, including recruitment processes, job structures and employer demand more generally (Anderson & Ruhs, 2008). The analysis we have conducted in this paper can be considered an initial feasibility test for further, comparative cross-country projects that would apply a similar methodology to understanding labour demand in different EU countries.

From the perspective of applied labour market policy, analyses such as this one could also be used more directly as a partial input in designing labour market policy and life-long learning programmes to integrate the especially hard-to-place jobless or the inactive. Existing active labour market policies have been criticised for being too oriented towards individuals and lacking a closer relationship with demand (Gore, 2005). Systematic investigation of job ads could be a way towards a more demand-led approach to labour market policy-making. If further improved from a methodological standpoint, it might provide a tool to match disadvantaged workers to jobs for which they possess greater capabilities or to help them develop skills that might be key to a given occupation and might not be easily transferable through the formal education system.

Bibliography

Ackers, D. (2012, November 6). *The experience of EURES. Improving Access to Labour Market Information for Migrants and Employers*. High Level Conference, European Commission DG Employment Social Affairs and Inclusion Unit C4. Retrieved from www.labourmigration.eu/events/document/163?format=raw

Allen, J., & De Weert, E. (2007). What Do Educational Mismatches Tell Us About Skill Mismatches? A Cross-country Analysis. *European Journal of Education,*, *42*(1), 59–73.

Anderson, B., & Ruhs, M. (2008). *A Need for Migrant Labour? The Micro-level Determinants of Staff Shortages and Implications for a Skills Based Immigration Policy.* COMPAS: Oxford University.

Atzmüller, R. (2012). Dynamics of Educational Regimes and Capability-Oriented Research. *Social Work & Society*, *10*(1). Retrieved from https://www.socwork.net/sws/article/view/298

Borghans, L., Meijers, H., & Ter Weel, B. (2008). The role of noncognitive skills in explaining cognitive test scores. *Economic Inquiry*, *46*(1), 2–12.

Brunello, G., & Schlotter, M. (2010). *The Effect of Non Cognitive Skills and Personality Traits on Labour Market Outcomes*. Working paper.

CEDEFOP. (2008). *Skill needs in Europe. Focus on 2020*. Retrieved from http://www.cedefop.europa.eu/EN/Files/5191_en.pdf

Cohen, M. S., & Zaidi, M. A. (2002). *Global skill shortages*. Cheltenham, UK; Northampton, MA, USA: E. Elgar.

Dörfler, L., & Van de Werfhorst, H. G. (2009). Employers' demand for qualifications and skills. *European Societies*, *11*(5), 697–721. doi:10.1080/14616690802474374

Estevez-Abe, M., Iverson, T., & Soskice, D. W. (2001). Social Protection and the Formation of Skills: A Reinterpretation of the Welfare State. In P. A. Hall & D. W. Soskice (Eds.), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage* (pp. 154–183). Oxford: Oxford University Press. Retrieved from http://onlinelibrary.wiley.com/doi/10.1111/1468-2338.00267/abstract

European Commission, & ECORYS. (2012). *European Vacancy and Recruitment Report 2012*. Luxembourg: Pulblications Office of the EU.

GHK Consulting, & EPEC. (2009). *Ex-post evaluation of the EURES programme covering the period 2006-2008. Final Report*.

Glewwe, P. W., Huang, Q., & Park, A. (2011). *Cognitive Skills, Non-Cognitive Skills, and the Employment and Wages of Young Adults in Rural China* (2011 Annual Meeting, July 24-26, Pittsburgh, Pennsylvania No. 103407). Agricultural and Applied Economics Association. Retrieved from http://econpapers.repec.org/paper/agsaaea11/103407.htm

Gore, T. (2005). Extending Employability or Solving Employers' Recruitment Problems? Demand-led Approaches as an Instrument of Labour Market Policy. *Urban Studies (Routledge)*, *42*(2), 341–353. doi:10.1080/0042098042000316182

Hall, P. A., & Soskice, D. W. (Eds.). (2001). *Varieties of capitalism: The institutional foundations of comparative advantage*. Oxford University Press.

Hancke, B., & Kureková, L. (2008). *Varieties of capitalism and economic governance in Central Europe* (NewGov/STACEE Report). London: LSE.

Heckman, J. J. (2008). Schools, skills, and synapses. *Economic Inquiry*, *46*(3), 289–324.

Heckman, J. J., & Rubinstein, Y. (2001). The importance of noncognitive skills: Lessons from the GED testing program. *The American Economic Review*, *91*(2), 145–149.
Heineck, G., & Anger, S. (2010). The returns to cognitive abilities and personality traits in Germany. *Labour Economics*, *17*(3), 535–546.
Jackson, M. (2001). Non-Meritocratic Job Requirements and the Reproduction of Class Inequality: An Investigation. *Work, Employment & Society*, *15*(3), 619 –630. doi:10.1177/09500170122119020
Jackson, M. (2007). How far merit selection? Social stratification and the labour market. *The British Journal of Sociology*, *58*, 367–390. doi:10.1111/j.1468-4446.2007.00156.x
Jackson, M., Goldthorpe, J., & Mills, C. (2005). Education, Employers and Class Mobility. *Research in Social Stratification and Mobility*, *23*, 3–33. doi:10.1016/S0276-5624(05)23001-9
Keep, E., & James, S. (2010). *Recruitment and Selection – the Great Neglected Topic*. Retrieved from http://www.cf.ac.uk/socsi/research/researchcentres/skope/publications/researchpapers/SKOPEWP88.pdf
Kuhn, P., & Shen, K. (2012). Gender Discrimination in Job Ads: Evidence from China. *The Quarterly Journal of Economics*. doi:10.1093/qje/qjs046
Kureková, L., Beblavý, M., & Haita, C. (2012). Qualifications or soft skills? Studying demand for low-skilled from job advertisements. NEUJOBS Working Paper no. 4.3.3.
Kureková, L., Haita, C., & Beblavý, M. (2012). *Being and becoming low-skilled: A comprehensive approach to studying low-skillness* (NEUJOBS Working Paper no. 4.3.1.). CEPS.
Larsen, C. A., & Vesan, P. (2012). Why Public Employment Services Always Fail. Double-sided Asymetric Information and the Placement of Low-skilled Workers in Six European Countries. *Public Administration*, *90*(2), 466–479.
Lauder, H., Brown, P., & Ashton, D. (2008). Globalisation, Skill Formation and the Varieties of Capitalism Approach. *New Political Economy*, *13*(1), 19–35. doi:10.1080/13563460701859678
Leininger, L. J., & Kalil, A. (2008). Cognitive and non-cognitive predictors of success in adult education programs: Evidence from experimental data with low-income welfare recipients. *Journal of Policy Analysis and Management*, *27*(3), 521–535.
Levy, F., & Murnane, R. J. (2004). *The New Division of Labor: How Computers are Creating the Next Job Market*. United States of America: Russell Sage Foundation.
Maxwell, N. L. (2006). *The working life: The labor market for workers in low-skilled jobs*. WE Upjohn Institute. Retrieved from http://www.google.com/books?hl=en&lr=&id=3cZO0cTOOTMC&oi=fnd&pg=PR9&dq=the+working+life,+maxwell&ots=uS9l7g2Fpk&sig=KOG0NPHh0TfdJvfqc8XU70NijeQ
Nickson, D., Warhurst, C., & Dutton, E. (2005). The importance of attitude and appearance in the service encounter in retail and hospitality. *Managing Service Quality*, *15*, 195–208. doi:10.1108/09604520510585370
Obadic, A. (2006). Theoretical and empirical framework of measuring mismatch on a labour market. *Zb. rad. Ekon. fak. Rij*, *24*(1), 55–80.
Padoa-Schioppa, F. (Ed.). (1991). *Mismatch and labour mobility*. Cambridge University Press.
Shavit, Y., Müller, W., & Tame, C. (1998). *From school to work*. Clarendon Press Oxford. Retrieved from http://soc.haifa.ac.il/~yaish/papers/fromschooltowork.pdf

Streeck, W. (2011). Skills and Politics: General and Specific. *MPIfG Discussion Paper*, *2011*(1). Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1781042

Štefánik, M. (2010). *ZMENY V PONUKE VYSOKOŠKOLSKY VZDELANÝCH PRACOVNÍKOV NA TRHU PRÁCE Z POHĽADU POTRIEB ZNALOSTNEJ EKONOMIKY V SLOVENSKEJ REPUBLIKE (Changes in supply of university educated workers on labor market from the point of view of needs of knowledge economy).* (Dissertation). Slovak Academy of Sciences, Bratislava. Retrieved from http://www.ekonom.sav.sk/doc/Stefandp.pdf

Štefánik, M. (2012a). Internet job search data as a possible source of information on skills demand (with results for Slovak university graduates). In CEDEFOP (Ed.), *Building on Skills Forecasts – Comparing Methods and Applications*. Luxembourg: Publications Office of the European Union. Retrieved from http://www.cedefop.europa.eu/EN/Files/5518_en.pdf

Štefánik, M. (2012b). Focused information on skills demand using internet job search data (with results for Slovak university graduates). Institute of Economic Research, Slovak Academy of Sciences. Retrieved from http://doku.iab.de/fdz/events/2012/Stefanik.pdf

Teichler, U. (1999). Research on the relationships between higher education and the world of work: Past achievements, problems and new challenges. *Higher Education*, *38*(2), 169–190. doi:10.1023/A:1003761214250

Teichler, U. (2009). *Higher education and the world of work*. Rotterdam: Sense Publishers.

Thelen, K. A. (2004). *How institutions evolve: The political economy of skills in Germany, Britain, the United States, and Japan*. Cambridge Univ Pr. Retrieved from http://books.google.com/books?hl=en&lr=&id=I0afDJGPczwC&oi=fnd&pg=PR11&dq=thelen+2004&ots=qESuxI0T9O&sig=YHA4TiNqzLYmaXHTBmFI4Wd4Q_U

Trampusch, C. (2010). Co-evolution of skills and welfare in coordinated market economies? A comparative historical analysis of Denmark, the Netherlands and Switzerland. *European Journal of Industrial Relations*, *16*(3), 197–220.

Van de Werfhorst, H. G. (2011). Skill and education effects on earnings in 18 Countries: The role of national educational institutions. *Social Science Research*, *40*(4), 1078–1090. doi:10.1016/j.ssresearch.2011.03.004

Warhurst, C., & Nickson, D. (2007). Employee experience of aesthetic labour in retail and hospitality. *Work, Employment & Society*, *21*(1), 103 –120. doi:10.1177/0950017007073622

Zimmermann, K. F., Bonin, H., Fahr, R., & Hinte, H. (2007). *Immigration policy and the labor market: the German experience and lessons for Europe*. Berlin: Springer.

Appendix

Table A1. Examples of job titles by country and occupation

	Hotel, catering and personal services staff	**Sales staff and fashion work**	**Office staff**	**Metal, machinery and electronic equipment workers**	**Machine operators and assemblers**	**Sales, services and cleaning elementary occupations**	**Labourers in mining, construction manufacturing and transport**
Czech Republic	Cook, security worker, waiter/tress, guard/security worker, chef, masseur, bartender, hairdresser, manicurist, cosmetician, housekeeper, social worker	Sales assistant, sales manager, gas station attendant, cashier, mobile phones consultant	Assistant, administrative worker, accountant, traffic dispatcher, Call centre employer, delivery man, warehouse worker, secretary, logistician	Electrician, welder, mechanic, technician, technical machine operator, locksmith, metal worker, mechanic, plumber, turner	Miller, plastic-products machine operator, service technician, machine tool operators, electronic equipment assembler	Cleaner, assistant cook, security worker, operator, porter, housekeeper, maintenance worker, assistant cleaner	Construction worker, helper, manipulation worker, warehouse worker, packer, wood processor, gardener, installer
Ireland	Chef, chef de partie, commis chef, waiting staff, barber, cook,		Sales developer, office administrator, accounts assistant, administrator, accounts clerk, bookkeeper, receptionist	Motor mechanic, general operative, panel beater, service manager, tool maker, welder, fabricator		Kitchen porter, deli assistant, cleaner, night porter, accommodation assistant, catering assistant, cleaner	Delivery driver., flooring installer, freight labourer, truck./van driver, traffic controller, general operative – guttering
Denmark	Cook, barber, waiter, social and health assistant, bartender, assistant cook, assistant to teacher, serving employee	Shop assistant, sales assistant, deputy manager,	Clerk, secretary, office employee, bookkeeper, office assistant	Locksmith, car mechanic, bicycle mechanic, industry technician, welder	Lifting specialist, industrial engineer, machine operator, electrical worker, worker with plastic materials	Cleaner, window cleaner, kitchen assistant, café worker, telemarketing staff, hotel cleaner, service assistant	Warehouse and logistics personnel, factory worker, construction worker, helper

Source: Authors, based on EURES data.

ABOUT NEUJOBS

"Creating and adapting jobs in Europe in the context of a socio-ecological transition"

NEUJOBS is a research project financed by the European Commission under the 7th Framework Programme. Its objective is to analyse likely future developments in the European labour market(s), in view of four major transitions that will impact employment - particularly certain sectors of the labour force and the economy - and European societies in general. What are these transitions? The first is the **socio-ecological transition:** a comprehensive change in the patterns of social organisation and culture, production and consumption that will drive humanity beyond the current industrial model towards a more sustainable future. The second is the **societal transition,** produced by a combination of population ageing, low fertility rates, changing family structures, urbanisation and growing female employment. The third transition concerns **new territorial dynamics** and the balance between agglomeration and dispersion forces. The fourth is **a skills (upgrading)** transition and and its likely consequences for employment and (in)equality.

Research Areas

NEUJOBS consists of 23 work packages organised in six groups:

- **Group 1** provides a conceptualisation of the **socio-ecological transition** that constitutes the basis for the other work-packages.
- **Group 2** considers in detail the main drivers for change and the resulting relevant policies. Regarding the drivers we analyse the discourse on **job quality**, **educationa**l needs, changes in the organisation of production and in the employment structure. Regarding relevant policies, research in this group assesses the impact of changes in **family composition**, the effect of **labour relations** and the issue of financing transition in an era of budget constraints. The regional dimension is taken into account, also in relation to **migration** flows.
- **Group 3** models economic and employment development on the basis of the inputs provided in the previous work packages.
- **Group 4** examines possible employment trends in key sectors of the economy in the light of the transition processes: energy, health care and goods/services for the **ageing** population, **care services**, housing and transport.
- **Group 5** focuses on impact groups, namely those vital for employment growth in the EU: **women**, the **elderly**, immigrants and **Roma**.
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