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## **Education and labour market outcomes for vocational education and training graduates in different types of VET systems in Europe**

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Cedefop project 'Changing nature and role of vocational education and training in Europe'. Working paper 4.1

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# Foreword

This research paper forms part of the Cedefop project *The changing nature and role of vocational education and training (VET) in Europe*.

The purpose of the project is to improve our understanding of how VET is changing in the EU countries (as well as Iceland and Norway). Over a three-year period (2016-18) the project will analyse how vocationally oriented education and training has changed in the past two decades (1995-2015) and based on these results the main challenges and opportunities facing the sector today and in the future will be investigated. The work is divided into six separate but interlinked themes:

- (1) the changing definition and conceptualisation of VET;
- (2) the external drivers influencing VET developments;
- (3) the role of traditional VET at upper secondary level;
- (4) VET from a lifelong learning perspective;
- (5) the role of VET at higher education levels;
- (6) scenarios outlining alternative development paths for European VET in the 21st century.

The study takes as its starting point that vocationally oriented education and training is something more than the traditional VET delivered at upper secondary level (in the form of school-based education or training, apprenticeships, or combinations of these). Due to the requirements of lifelong learning, we are able to observe the diversification of VET, with new institutions and stakeholders involved. We also see an expansion of VET to higher education areas, partly through the reform of the existing institutions, partly through the emergence of new institutions. This has been caused by factors internal to the education and training system as well as by external pressures linked to demographic, technological and economic changes.

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# Executive Summary

This paper analyses how the choice of a general or vocational path at the level of upper secondary education affects future education and employment careers and prospects. It presents a comparative analysis across European countries using the 2014 Labour Force Survey. Vocational education has mainly been promoted as a way of improving the transition from school to work, but it also appears to have an impact on subsequent education paths, as well as on the adaptability of workers to technological and structural change in the economy. The key question is whether any advantages conferred by vocational qualifications early in someone's career are off-set by disadvantages later in life.

In this analysis, the vocational effect is defined as the effect on labour market and educational outcomes of taking vocational programmes in upper-secondary education (ISCED 3). This effect is calculated in comparison to both lower-secondary education and general upper-secondary education. Previous research seems to indicate that vocational education can protect people against unemployment and unskilled work (the safety net effect) but can also restrict the range of occupational opportunities available (the diversion effect).

The findings demonstrate cross-national differences in the early-career advantages of vocational qualifications in line with previous analyses. The results indicate that the vocational effect varies according to the outcome. In comparison to lower-secondary education the findings demonstrate that the early-career advantages of vocational qualifications are generally positive, although this might be because any type of education or training at upper secondary level is more valuable than lower secondary programmes. Nonetheless, it is feasible that the availability of the vocational option at upper secondary level might reduce early school leaving by keeping more practically oriented young people in school and improving their labour market opportunities. When general upper-secondary education is the comparator the results are more mixed: in general there are negative effects from taking a vocational path on participation in further formal and non-formal education and on occupational status, consistent with earlier research. The safety net function of vocational education (that it is beneficial in terms of unemployment and low-skilled employment) is only observable in some countries and this effect seems to decrease in later work careers, perhaps because skills become outdated.

If this shapes the overall attractiveness of vocational education, such labour market outcomes are unlikely to be attractive for career-oriented young people (usually with more advantageous social backgrounds). However, for people with higher risk aversion (usually of less advantageous social origin and having fewer resources at their disposal) vocational upper-secondary might seem to be a viable option for prolonging the educational path beyond lower to upper-secondary education.

The impact of vocational education varies considerably with the specific institutional structure of schooling and work-based training. Furthermore, differences are not only notable in countries belonging to different types, but also within supposedly similar types.

In **apprenticeship countries** (CH, DE, DK) vocational upper-secondary education is still used primarily as a route into work rather than further study. The analysis confirms

previous results about the positive role of dual systems for young people in the short run, and also indicates that the long-term effect of vocational education seems to be less positive. Vocational education still seems to 'divert' young people from formal (tertiary) education even though more and more opportunities for progression have been developing for some time.

The pattern in **countries with combined work- and school-based vocational education (AT, NL)** is quite similar to that in apprenticeship countries but the safety net effect is not so strong.

In countries with **school-based vocational education (BE, BG, CZ, FI, IT, HR, LU, PL, RO, SK, SL)**, vocational education graduates have a higher risk of unemployment and unskilled employment than general education graduates. In these countries general academic and vocational provision is provided in different types of dedicated upper-secondary institutions, with apprenticeships representing separate systems but accounting for few students. Unlike apprenticeship systems, school-based vocational education does not seem to hold any advantages compared to general secondary education. However, there is large variation in the direction and strength of the vocational effect on labour market outcomes between countries in this group. This is likely to indicate differences in the strength of the collaboration between the key actors: employers, unions and the educational institutions.

In **countries where general upper-secondary education dominates (EE; EL, FR, ES, PT, SE, LI, LV)** vocational education does not have a strong negative effect on educational and labour market outcomes. Although vocational upper-secondary education may have a lower status compared to general education in these countries, vocational education functions quite well, especially from a long-term perspective in terms of sheltering their graduates from low-skilled jobs and unemployment and ensuring entry to positions in the middle of the social hierarchy.

In summary, the results highlight unexpected differences between apprenticeship and school-based systems, especially in those countries where general upper-secondary education dominates. This is an important issue in the light of the increased prominence of apprenticeships in Europe in the last 20 years, since the latter is often perceived as the 'poor relation' of the former.

Two single-country 'groups' were also included in the analysis. In **Hungary** vocational education appears not to have a safety net function and the diversion effect is strong, as in apprenticeship countries. The vocational effect in Hungary seems to be quite similar to countries with school-based vocational education but is much stronger.

In the **UK** vocational upper-secondary education has weak links with employment and is less sharply differentiated from academic upper-secondary education. As a result there are quite good opportunities for access to further education and training but there is no safety net function.

Overall, the results support the move towards apprenticeships and work-based learning in terms of labour market outcomes. However, in countries where general upper-secondary education is dominant, vocational tracks are more successful in terms of labour market outcomes than in countries where school-based systems exist. This highlights the need to

examine the wider context within which vocational education is embedded and especially the links between education systems and labour market systems on a country-by-country basis.

The results also show that VET graduates are potentially sacrificing the longer-term gains associated with further education in favour of the short-term benefits. For this reason, vocational education should provide strong basic skills and competences alongside technical ones to ameliorate any later life disadvantages. Transition to further education should also be facilitated in order to avoid negative perceptions of vocational education as a dead-end option. This needs to involve not only the opening up of progression routes between different types and levels of education and training, and more flexible transitions between education and training and work, but also the provision of measures to support such transitions.

## CHAPTER 1.

# Introduction

The paper analyses how the choice of upper secondary education and training specialisation, general or vocational, opens up to future education and employment careers and prospects. The main aim is to present a descriptive overview from the perspective of graduates of vocational upper-secondary education and training, looking at both their participation in further learning and labour market outcomes.

The European Commission's communication *A new impetus for European cooperation in Vocational Education and Training to support the Europe 2020 strategy* (European Commission, 2010) responds to the call of the Europe 2020 Strategy to reinforce the attractiveness of vocational education and training (VET). This communication indicates that attractiveness depends on multiple factors, such as short- and long-term outcomes in terms of easy school-to-work transitions, wage levels, career prospects, as well as the pathways it opens to further education and training without dead-ends, including at the tertiary level. A Cedefop study (2017b) stated that changes have happened in respect of the parity of esteem between VET and general education in many countries and those countries where general education has dominated have tried to raise the low esteem of VET.

Evidence about positive outcomes achieved by VET participants is important in encouraging others to participate in the future. Positive outcomes also encourage people to return to VET to upgrade their skills and competences, to develop new ones and to develop lifelong learning participation. The social status of VET is determined by its position not only in the education system but also in the labour market (Bosch and Charest, 2015).

The upper secondary education system in most European countries is characterized by the duality between general and vocational education. In some countries vocational certificates might signal competence to perform complex tasks in a broad occupational field and open up access to good career opportunities; in other countries they might signal that the vocational education graduate is a low achiever in the school system and possesses narrowly based skills for jobs (Bosch and Charest, 2015). VET enjoys higher esteem in countries in which it opens up access to well-paid jobs and career opportunities than it does in countries with high shares of low-skill jobs.

In the past, in most countries, there were very clear distinctions at secondary level between general and vocational education. While the former aims to provide youth with general, often academically oriented, knowledge as the basis for further (higher) education, initial vocational education (IVET) provides young learners with practice-oriented knowledge and skills directly relevant to evolving labour markets.

Countries have adopted very different policies and structures that differ fundamentally in their focus on work and education. Some stress IVET, while others emphasize general education. Countries also generally differ with respect national VET systems and their institutional arrangements (Bosch and Charest, 2008). In order to characterise these differences, typologies of education and training systems have been developed.

Country differences suggest a possible trade-off between short-term and long-term benefits. The skills generated by IVET may facilitate the transition into the labour market but may later become obsolete at a faster rate due to limited adaptability to structural and technological changes (Hanushek et al., 2017). Developing VET as part of lifelong learning requires examination of the provision structure, including the links between working life, schools and further education. Significant changes in the labour market, such as globalization, technological change, reforms of social security systems etc., are increasing the importance of revisiting the potential efficacy of IVET in today's economic environment. The expansion of upper secondary and higher education has led to a blurring of the traditionally clear borders between VET and general education, and between IVET and further education. These changes are accompanied by new demands to strengthen the linkages and establish parity of esteem between VET and general education (Bosch and Charest, 2015).

The existing empirical analysis of the impact of the type of secondary education on individual outcomes is fairly limited and provides mixed information about both the existence and the magnitude of short- and long-term effects. The general-vocational education debate has centred mainly on whether vocational education is effective in facilitating youth school-to-work transition (see for example Arum and Shavit, 1995; Ryan, 2001; Müller and Gangl, 2003; Iannelli and Raffe, 2007; Cedefop, 2012; Cedefop, 2013). Even at job entry level, existing studies have not found a universal advantage in vocational or general education for youth's labour market outcomes. However, the labour market outcomes of IVET should be complemented by the assessment of the educational career that follows IVET. The extent to which VET provides access to further education is seen as an important indicator for its attractiveness (European Commission, 2004).

### *The vocational effect*

This paper investigates the short- and long-term 'vocational effect' on education and labour market outcomes in EU member states. Countries are classified into different types based on two indicators: the size of the vocational education system in a country (vocational enrolment) and the percentage of vocational enrolment in programmes in which work and school are combined. The approach is modest in terms of country details but extensive in terms of countries covered. The 'vocational effect' is defined as the effect on these outcomes of taking vocational programmes in upper-secondary education using the International Standard Classification of Education (ISCED) 2011 classification. This effect is calculated in comparison with both lower-secondary education and with general upper-secondary education. The major battle fought in terms of VET attractiveness and labour market outcomes<sup>(1)</sup> is between VET and general education at the upper secondary level. However, the

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<sup>(1)</sup> The perception of individuals of value of VET (in terms of skills the VET gives them) is another important part of VET attractiveness. When we speak about VET outcomes from the individuals' viewpoint (and in comparison with general education), it is important to capture their perception concerning skills the VET gave to them (see Cedefop, 2017a).

comparison between VET and lower secondary level is also important if the attainment of vocational upper-secondary education provides better labour market opportunities compared to lower secondary education.

The labour market outcomes analysed include: the employment rate, the unemployment rate and the occupational position (as identified by the first digit of the International Standard Classification of Occupations (ISCO) 08 and the International Socio-Economic Index of Occupational Status (ISEI)). Education outcomes include the percentage of people with general and vocational upper-secondary education who engage in further education. Labour market and education outcomes for two age groups are compared, 20-24 year olds and 30-34 year olds, in order to differentiate short- and long-term vocational effects. However, the important question is whether the changing returns to vocational qualifications over the life cycle should be explained as an age effect or a cohort effect. The education and training outcomes analysed provide evidence about the extent to which they make further use of higher and non-formal education. This evidence is especially informative for policies to promote lifelong learning.

#### *Analytical challenges*

The analysis is based on the EU Labour Force Survey (LFS) 2014. Implementation of ISCED 2011 and the new section on orientation of study in the EU LFS 2014 offers possibilities to distinguish programme orientations at upper-secondary level and to compare the education and employment outcomes of graduates of vocational and general programmes. However, the absence of longitudinal data is a limitation. It is not currently possible to follow individual educational trajectories, usefulness and outcomes of IVET. Exploitation of the EU LFS waves approach could be a way forward, but these possibilities are currently limited for as long as the study orientation is not fully distinguished and as it will take time for longitudinal data to become available.

The analysis presented in this paper thus has some restrictions. First, the analysis focuses on country types rather than the full range of countries. Although confirming the variety within Europe, the results only show a descriptive picture as regards the diversity between countries and do not analyse thoroughly the drivers of this diversity. Second, the paper classifies countries according to the setup of the upper-secondary education system. However, differences between countries have their origins in different social, historical and political backgrounds, summing up to more complex differences at the system level. Third, employment, unemployment and occupational status are not the only factors needed to assess the labour market outcomes of VET graduates. The analysis presented in this paper does not include labour market outcomes such as over- and underqualification, job satisfaction, skills development opportunities etc. In the absence of specific outcome measures for VET other indicators of outcomes could be discussed, for different levels of society (individuals, enterprises, society) and for different aims. For example, monetary returns, economic growth etc. Fourth, the paper presents a snapshot based on the current situation rather than a general finding about the outcomes of VET across countries and time. Fifth, people entering vocational upper-secondary differ systematically from those entering general upper-secondary education. Research shows that students from privileged

backgrounds more likely attend general (rather than vocational) secondary education compared to students from less privileged backgrounds (e.g. Kerckhoff, 1993; Buchmann and Park, 2009). There is also achievement and ability gap between students in different secondary school tracks (Blossfeld et al., 2016). The preferences, abilities and other characteristics (for example, social origin) determine the choice of the programme but also have a direct and autonomous effect on the outcomes (see Meer, 2007; Noelke and Horn 2014; Brunello and Rocco, 2015). This makes difficult to separate vocational effect from that of unobservable ability, preferences, attitudes and other characteristics.

### *Outline of the paper*

Chapter 2 gives an overview of related literature and previous research. Chapter 3 provides some details on the methodological approach. Chapter 4 analyses the VET incidence in Europe and gives the basis for the typology of countries used. Chapter 5 compares the continuation of further studies of vocational and general upper-secondary school graduates in different types of countries. Chapter 6 concentrates on the labour market. Finally, Chapter 7 summarises the key findings.

## CHAPTER 2.

# Related literature and previous research

### 2.1. The vocational effect on employment and education outcomes

While there is a substantial literature on the effect of education on individual labour market performance, the opportunities to investigate the role of vocational versus general education are more limited (especially in terms of comparative analysis between countries), mostly due to the lack of data.

Different theories yield contrasting predictions for the vocational effect. Human capital theory assumes that that vocational education equips students with skills required in the workplace, enhances the human capital of young people and improves their employment chances (Becker, 1975). Employers may economise in firm-specific training when hiring vocationally trained job entrants.

Signalling theory suggests that schools are simply sorters and signallers (Spence, 1974; Wolf, 2002), and any form of education works mainly as a 'positional good' (Triventi et al., 2016; Di Stasio et al., 2016). 'Positional good' refers to the idea that the value of educational credentials is attributable, in part, to their relative scarcity in the population (Shavit and Park, 2016). The absolute level of education does not matter for access to jobs, it is the educational attainment relative to that of other job seekers. This means that school performance is an indicator of various characteristics of job applicants, determining their (relative) position within the 'job queue' (Thurow, 1975). This theory suggests that many vocational qualifications may be less demanding and selective compared to general programmes and may therefore signal to employers that the job applicant is less motivated than academic graduates. The vocational effect is therefore negative. However, as shown in the literature on 'horizontal stratification' in education, some VET programmes might be highly selective and therefore valued by the employer (Baethge, 2010; Gerber and Cheung, 2008; Hefler et al., 2012). A country's composition of VET programmes, combining both demanding and selective, and non-selective ones, is therefore crucial for signalling theory's predicted outcomes.

Network theories predict that the vocational effect may be positive if vocational programmes give young people access to the networks through which employers recruit job applicants (Rosenbaum et al., 1990).

Theories of social reproduction (Bowles and Gintis, 1976) argue that differentiation of secondary education into vocational and academic tracks is a mechanism for the reproduction of social inequality across generations. Students with a lower social origin are typically placed in the vocational track, which reduces their chances of attending university and entering professional work (Shavit, 1984; Müller and Karle, 1993; Lucas, 2001; Breen et al., 2009).

Related approaches study changes in the role of VET in overall social stratification over time, focussing on the relative scarcity or abundance of VET credentials in general or of a particular type. Changing societal expectations for acquiring any type of upper secondary education may lead to a higher 'vocational effect' when comparing VET graduates to adults with no upper secondary credential, as the latter become strongly discriminated against in the labour market (Solga, 2005; Solga, 2008).

Different theories are not mutually exclusive. As VET programmes differ in requirements and selectivity, the vocational effect may also differ considerably between types of programmes or fields of learning, requiring educators to consider the effects of the changing composition of VET across place and time. However, as Shavit and Müller (2000) indicate, the critique of vocational education evaluates VET from the point of view of its effect on university attendance and on the chances of attaining a higher occupational position when entering the labour market. However, vocational education may also provide a 'safety net' to protect young people against unemployment and unskilled work. Vocational education might have motivational and cognitive benefits, particularly for low achievers, many of whom would otherwise drop out. Shavit and Müller (2000) declare vocational education to be a 'diversion' if its graduates attain significantly less desirable occupations than general secondary education graduates.

Empirical studies of the vocational effect do not reach consistent conclusions about the size, or even the direction, of the vocational effect (see Van de Werfhorst, 2011; Ryan, 2001; Müller and Gangl, 2003; Breen, 2005; Wolbers, 2007). However, we will mention some of the main conclusions of these studies. The effect of vocational upper-secondary education is more likely to be positive if it is compared to lower-secondary education than if it is compared to general upper-secondary education. Fewer graduates from vocational than from general upper-secondary programmes enter higher education, which means that VET graduates are potentially sacrificing longer-term gains associated with further education in favour of the short-term benefits (Cedefop, 2012).

Existing studies clearly find that young people with vocational education have a smoother transition to the labour market: they find a job faster, have a lower probability of being unemployed at the start of their career, establish a more stable employment relationship, their cumulative spells in work are longer, and they get access to permanent full-time jobs early in their careers (Müller and Gangl, 2003; Cedefop, 2012). Researchers explain these positive vocational effects by the occupation-specific skills that students obtain in vocational programmes which make them productive in the labour market and attractive to employers (Arum and Shavit, 1995). The vocational effect for labour market entrants seems to be negative when the criterion is occupational level (Müller and Gangl, 2003). Shavit and Müller (2000) have found that vocational education can provide a safety net and diversion effect (restrict the range of occupational opportunities) at the same time.

However, it has been found that the returns to vocational education depend on institutional context (Kerckhoff, 2000; Bills, 2003; Müller and Gangl, 2003). Vocational secondary education appears to be more effective when it is occupationally specific: it reduces unemployment risks and the probabilities of young people entering the labour market as unskilled workers, and increases their chances of finding a job (Shavit and Müller,

2000). In highly vocationally oriented countries (for example, Germany), with higher vocational specificity, vocational education is a viable alternative to higher education. Vocational qualifications reflect the needs of stakeholders and lead to relatively good job prospects. The safety net effect of vocational education seems to be strong in these countries. At the same time, the strong position of vocational education diverts young people from the academic track that leads to higher education and more prestigious occupational positions (Hillmert and Jacob, 2003). In these countries there are strong links between education and the labour market. Employers have a major role in the design, delivery and assessment of vocational programmes. They tend to sort job seekers based on specific skills. Besides this, vocational programmes are less likely to be stigmatized and to signal low ability or low motivation to employers. Ianelli and Raffe (2007) consider that the employment logic dominates in these countries, meaning that vocational education has close links with the labour market and weak links with higher education.

In less vocationally oriented countries (for example, France) job-relevant skills have to be learned in the workplace. Vocational education has weak links with the labour market. Employers select applicants with the greatest potential and trainability rather than for their vocational skills. Vocational qualifications signal a low educational level and are largely viewed as a remedial option for underachievers (Solga, 2002). As a result, vocational secondary education graduates have poorer employment chances than general education graduates. However, vocational education functions more straightforwardly as a part of the education system. Its position compared to general secondary education is defined by its lower status and not by its stronger orientation to employment (Ianelli and Raffe, 2007). Vocational education in these countries lacks the institutional foundations that make it successful for skill formation in German-speaking countries (Hall and Soskice, 2001).

The main shortcoming of previous empirical studies is their exclusive focus on the short-term labour market and education outcomes. More recently, several researchers have investigated the relationship between VET and long-term employment outcomes using the Programme for the International Assessment of Adult Competencies (PIAAC) data (Brunello and Rocco, 2015; Forster et al., 2016; Hanushek et al., 2017). Hanushek et al. (2017) argue that having vocational education might be a benefit at the start of a work career but turns into a disadvantage later in life. Specific job-related skills are likely to become obsolete quickly in modern economies with rapid technological change. Individuals engaged in general programmes are also more likely to continue to study, compared with graduates of vocational programmes, thus improving their long-term outcomes. Hanushek et al. (2011), studying employment patterns of different cohorts of graduates with general and vocational education, find support for this hypothesis. There is a trade-off between the short- and long-term benefits of vocational education: it may help when entering the labour market but general education contributes to a higher probability of being employed at older ages (compared to individuals with vocational training) and individuals with general education are more likely to receive lifelong training. Besides this, returns to vocational education (throughout the whole lifespan) vary widely among countries, even among countries with well-established apprenticeship systems (Denmark, Germany and Switzerland). An important question is whether the changing returns to vocational education over the life course should be

explained as an age effect or a cohort effect. Previous explanations have ignored the fact that at a later age skills become outdated, but this depends on technological changes affecting the skills that are demanded from different cohorts (Forster et al., 2016).

However, the main conclusion from these studies is that neither general nor vocational education is consistently associated with better labour market outcomes, with the implication that other factors and institutions are influential. Countries differ with respect to how vocational education is operated. However, lack of comparability across institutions and the operation of other factors makes it difficult to identify 'successful' VET systems. Cross-country comparisons have attempted to list some systematic elements of success (see (Ianelli and Raffe, 2007; Woessmann, 2008; Cedefop, 2008)). Eichorst et al. (2012) reviewing these comparisons mention six important elements: (1) to ensure the relevance of curricula; (2) to maintain close contact with the labour market; (3) to ensure high-quality schooling; (4) to incentivize training providers and create competition amongst training providers; (5) to maintain a high level of training quality; (6) to limit the risk of establishing a dead-end vocational schooling track. The benefits of vocational qualifications seem to be highest when vocational education takes a prominent position and stronger traditions in the educational system of a country, most clearly in the form of a dual system (Ryan, 2001; Wolbers, 2007; Ianelli and Raffe, 2007; Cedefop, 2013)). Most recent studies indicate that a trade-off over the life-cycle seems to be strongest in the countries with extensive apprenticeship systems (Germany, Austria, Denmark and Switzerland) (Hampf and Woessmann, 2016). These systems are, by definition, built on employer-apprentice contracts, so it would be surprising if this were not the case. That said, it is important not to ignore school-based VET which is still very common across Europe. Indeed, the findings presented in this report have some interesting light to shed in this regard, whilst confirming the positive initial labour market outcomes of apprenticeship systems.

The shift in employment to services has also influenced the returns to vocational education (see Estevez-Abe, 2006; Wren, 2012). The service sector thrives on general rather than specific skills. As Anderson and Hassel (2012) point out, school-based training systems might fit more easily with the skill requirements of the service sector because they provide general skills that are central to the service economy. General secondary education may in some ways be better equipped than traditional apprenticeships to generate the social and communication skills that employers in the service sector seek (Thelen, 2014). Anderson and Hassel (2012) conclude that "school-based systems have a distinct advantage over firm-based systems in the provision of general skills that are so central to the service sector" (p. 191). Recent research has established a strong link between rising educational attainment and employment in the service sector (see Wren, 2012).

## 2.2. Definitions

Definitions used are based on the ones from Cedefop (2014). **VET** aims to equip people with knowledge, know-how, skills and competences required in particular occupations or more

broadly in the labour market. It normally combines practical training with more theoretical learning.

It is customary to distinguish between initial vocational education and training (IVET) and continuing vocational education and training (CVET). **IVET** is defined as vocational education and training carried out in the initial education system, usually before entering working life (Cedefop, 2014). It concerns mainly young people at the beginning of their careers and before labour market entry. In this report we concentrate on IVET at upper-secondary level (ISCED11 3). Cedefop (2014) defines **CVET** as education or training after entry into working life <sup>(2)</sup>. However, this definition of CVET is too broad and not clear. Instead of CVET the term **further education and training** was used in this paper. Further education and training is defined as further formal or non-formal education and training (at any level).

**Further education and training** is here understood as studies in formal or non-formal programmes after upper-secondary education, to be distinguished as:

- formal education (all ISCED levels);
- higher education: ISCED 5, ISCED 6, ISCED 7;
- non-formal education and training <sup>(3)</sup>.

The paper concentrates on upper-secondary education (ISCED11 3) graduates. The Operational Manual of ISCED 2011 (OECD, 2015) indicates that programmes at ISCED level 3 – upper secondary education – are typically designed to either or both complete secondary education in preparation for tertiary education and provide skills relevant to employment. Programmes at this level offer students more varied, specialised and in-depth instruction than programmes at ISCED11 level 2. They are more differentiated, with an increased range of options and streams available.

Data should be collected, especially when producing statistics on labour market and education outcomes, not only on the level of educational attainment but also on the orientation (general or vocational) of the highest level of education completed. This information is particularly important for the analysis of:

- the responsiveness of education systems to labour market needs for skills and competencies;
- the transition from education to work;
- the matching of skills with jobs;
- access to and inequalities in education; and
- patterns of people returning to education.

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<sup>(2)</sup> CVET is aimed at helping individuals to:

- improve or update their knowledge and/or skills;
- acquire new skills for a career move or retraining;
- continue their personal or professional development.

CVET is part of lifelong learning and may encompass any kind of education (general, specialised or vocational, formal or non-formal, etc.).

<sup>(3)</sup> About definitions of formal and non-formal education see Annex 1.

Programmes which form upper-secondary education may be either general or vocational programmes. Some of these programmes allow direct access to ISCED level 4, and level 5, 6 or 7.

One of the limitations of previous EU LFS as a data source about initial VET is related to the difficulties to fully distinguish (general or vocational) programme orientation. Implementation of ISCED 2011 and the new section on orientation of study in the EU LFS 2014 offers possibilities to distinguish programme orientations at upper-secondary level and to compare the education and employment outcomes of graduates of vocational and general programmes. This distinction is available from 2014 onwards.

As explained in the ISCED 2011 glossary (UNESCO-UIS, 2012), there are two categories of orientation, i.e. general and vocational education:

**Vocational education** is defined as education programmes that are designed for learners to acquire the knowledge, skills and competencies specific to a particular occupation, trade, or class of occupations or trades. Such programmes may have work-based components (e.g. apprenticeships, dual system education programmes). Successful completion of such programmes leads to labour market-relevant, vocational qualifications acknowledged as occupationally-oriented by either or both of the relevant national authorities and the labour market.

**General education** is defined as education programmes that are designed to develop learners' general knowledge, skills and competencies, as well as literacy and numeracy skills, often to prepare participants for more advanced education programmes at the same or a higher ISCED level and to lay the foundation for lifelong learning. These programmes are typically school- or college-based. General education includes education programmes that are designed to prepare participants for entry into vocational education but do not prepare for employment in a particular occupation, trade or class of occupations or trades, nor lead directly to a labour market-relevant qualification.

The EU Labour Force Survey 2014 includes the issue about orientation of the programme completed at the highest education level (HATVOC) (general or vocational). We are using this issue to separate ISCED 3 level programmes. In regression analyses vocational effect is calculated in comparison with both lower-secondary education (ISCED 2) and with general upper-secondary education (general ISCED 3).

## CHAPTER 3.

# Data and methods

### 3.1. Data set (EU LFS) and definition of variables

Individual-level anonymised data from the 2014 European Union Labour Force Survey (EU LFS) are used for this report. EU LFS provides information about socio-demographic background, the level and orientation of education and labour market outcomes. The sample consists of 31 countries with reliable information on programme orientation at ISCED 3 level <sup>(4)</sup>. Two age groups (20-24 year-olds and 30-34 year-olds) are analysed to study the short- and long-term vocational effects on labour market and education outcomes. EU LFS 2014 is among the first comparative data sets to provide good grounds for the analysis that is of interest here. Unfortunately data from EU LFS 2014 does not allow the inclusion of older age groups in the analysis and hence the comparison of outcomes across widely different age groups. On the one hand, this is an important restriction because it is not possible to analyse longer-term vocational effects across the life-course or over longer periods of time. For obvious reasons we cannot be sure if it would be reasonable to generalise these results on other cohorts, given the rather different labour market situation and the general social context, including the architecture of educational system. There is also no clarity if this would be good indication of age-related and life-course-related aspects, since not only might this cohort have been too specific, but we have not followed other cohorts in this age, nor this cohort in different historical time. Furthermore, the variety in life-course choices available and patterns differ across countries, whereby what is considered a general social requirement for 30-34-year olds in one country may be unique. On the other hand, our focus on these specific cohorts could be well justified for two reasons. First, their experience reflects the most recent developments within the IVET systems across the countries considered, since 2000 to 2014. Second, the experiences of these cohorts is very relevant in understanding, predicting and shaping the future developments in CVET, as the currently youngest cohorts will spend the longest time in professional positions. Sample sizes are presented in Annex 3.

In EU LFS 2014 only the highest degree of education is reported, with no information being provided on intermediate levels. In EU LFS 2014 we are using two different variables: highest level of education successfully completed (ISCED 2011) (HATLEVEL) and orientation of the programme completed at the highest education level (HATVOC).

The question about programme orientation concerns only persons aged 15-34 years, or older persons who have completed their highest educational level at most 15 years before the date of the interview. In addition, it only concerns people with an educational attainment level of ISCED 3 or 4 (upper-secondary or post-secondary non-tertiary).

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<sup>(4)</sup> About limitations of the data set see Annex 2.

By combining programme type and ISCED categories, three different educational types are defined: lower-secondary education (ISCED 2), vocational upper-secondary education and general upper-secondary education. These three groups of people are compared.

The analysis concentrates on three types of labour market outcomes: employment, unemployment and occupational group.

**An unemployed person** in EU LFS is defined as:

- someone without work during the reference week;
- available to start work within the next two weeks (or has already found a job to start within the next three months);
- actively having sought employment at some time during the last four weeks.

The unemployment rate is the number of people unemployed as a percentage of the labour force.

**Occupational group** is measured according to ISCO-08 classification (ISCO1D) (four groups: professionals, associate professionals and managers (ISCO 1-3); skilled non-manual workers (ISCO 4-5); skilled manual workers (ISCO 6-8); unskilled workers (ISCO 9)). Occupational status is also measured according to the International Socio-Economic Index of Occupational Status (ISEI) (Ganzeboom et al., 1992).

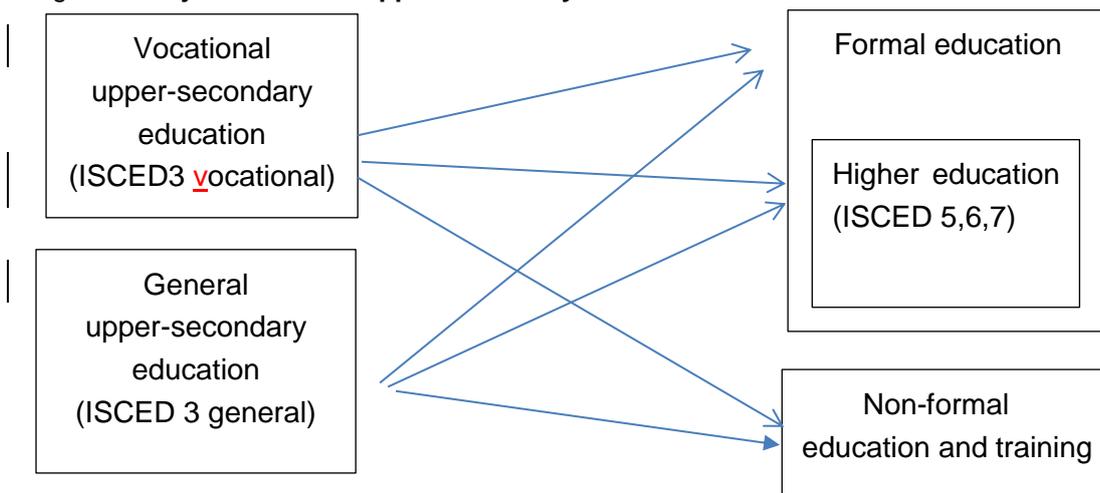
Education outcomes include **participation in any formal education activities** <sup>(5)</sup> during the last 4 weeks period ending with the reference week (EDUCSTAT), **participation in higher education** during the last 4 weeks period (EDUCLEVL) and attendance at any courses, seminars, conferences or private lessons or instructions outside the regular education system within the last four weeks (COURATT). This variable covers all taught organised learning activities **outside the regular education system** which the respondent has attended during the last four weeks ending with the reference week. Clearly, the indicator is not an ideal measure due to the short reference period. It underestimates the absolute level of participation, but it is suitable for displaying differences between VET and general education graduates.

Figure 1 depicts studied education trajectories from upper-secondary education.

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<sup>(5)</sup> This variable only covers the regular education system (formal education, including schools, colleges and universities) which the respondent has attended during the last 4 week period ending with the reference week.

Figure 1. Trajectories from upper-secondary education



Source: Authors.

Overall, the cross-country analysis of differences among VET graduates participating in further education and training shows how countries differ in the level of inequality of access. Combining this with analysis of adults continuing educational careers in formal education, will enable us to establish the track record of national VET systems in promoting lifelong learning.

### 3.2. Empirical methodology

The empirical analysis adopted in this paper is based on regression analyses. The analyses include several individual controls, such as gender, time since person started to work (proxy for work experience) and educational level.

The analysis is conducted for every country and country groups separately. The direction and relative magnitude of vocational effects is systematically reported in the tables in terms of regression coefficients (see Annexes 5-8). Assessing the vocational effect on outcomes requires the definition of a benchmark. For the most part of this paper two benchmarks are used, upper-secondary general education and lower-secondary education.

The study uses two important concepts: the safety net and the diversion functions of VET. The safety net function is operationalised as the impact of VET on risks of unemployment and low skilled jobs (ISCO 9) compared to general upper-secondary education. The diversion function is operationalised as the effect of VET on participation in formal and higher education and on occupational status. As well as these two functions the study also analyses the effect of VET on employment in medium skilled jobs (ISCO 4-8) and participation in non-formal learning, because, according to previous analyses, there should be quite big differences between countries. For example, in Germany the VET system is producing the intermediate skills needed by the economy. In Germany all vocational qualifications can be supplemented after some years of work experience by promotional

training, which equips VET graduates for advancement to middle-management positions (Bosch, 2015). In countries with school-based VET systems VET tends to lead mainly to semi-skilled jobs with low potential for development (Bosch and Charest, 2015).

As mentioned above, it is difficult to study the direct causal vocational effect on different outcomes because preferences, abilities and other characteristics (for example, social origin) determine the choice of the programme but also have a direct and autonomous effect on the outcomes. As Brunello and Rocco (2015) mentioned, ideally the causal vocational effect on outcomes could be identified if the individuals were randomly assigned to general and vocational education. This assumption is most likely violated as at least some individual characteristics that are predictors of both programme choice and labour market outcomes are typically unobserved or poorly measured. Literature has adopted several empirical strategies to identify causal vocational effect. In this paper a selection-on-observables strategy is used. There is one very important limitation of this strategy (as well as propensity-score matching strategy<sup>6</sup>) due to the restricted list of individual characteristics in the EU LFS. This data set does not include very important variables (skills, social origin etc.). This restriction should be taken into account when interpreting the results.

Investigating short- and long-term outcomes requires a comparison of individuals of different ages, but the important question is whether the changing returns to vocational qualifications over the life cycle should be explained as an age effect or a cohort effect. Since cross-sectional data (such as EU LFS 2014) does not allow to distinction to be made between age and cohort effects, it is assumed that today's older age group in each educational category is a good proxy for today's younger age cohort when persons belonging to this age group will become older.

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<sup>6</sup>) Propensity-score matching compares individuals with a vocational education only to observationally similar individuals with a general education.

## CHAPTER 4.

# Typology of countries

### 4.1. Previous typologies

In order to characterise country differences, typologies of education and training systems have been developed. Lynch (1994) groups countries according to the institutional principles around which the VET system is organised. Busemeyer and Trampusch (2012) distinguish VET systems according to the degree of public commitment to vocational training and the involvement of firms in IVET. Other typologies are based on an approach of varieties of capitalism, in which national economies are described as liberal market or coordinate market economies (Hall and Soskice, 2001; Estevez-Abe et al., 2001; Iversen and Stephens, 2008).

Previous analyses have indicated that there is substantial variation across countries in the relative size of the general and vocational upper-secondary programmes and in the specific organization of the vocational programmes. There are different types of vocational systems, some of which provide vocational training in fully school-based programmes, whereas others offer a combination of school and work, e.g. in a dual system (Ryan, 2001; Ianelli and Raffe, 2007; Van de Werfhorst, 2011; Forster et al., 2016; Hampf and Woessman, 2016). Previous empirical analyses have shown that the specificity of the vocational education and the extent to which there are direct links between the education system and employers have an impact on the labour market entry of young people as well as on their return to vocational education (Breen, 2005; Andersen and van de Werfhorst, 2010; Bol and van de Werfhorst, 2013). Especially when vocational education takes place in a dual form <sup>(7)</sup> (school-based and work-based), specific skills are provided and a close link between job seekers and employers are ensured.

Hanushek et al. (2017) argue that the setup of upper-secondary education and the organisation of vocational education are also important for studying short- and long-term vocational effects. Students who have attained vocational education in a dual system will have a smooth labour market entry because they have obtained highly occupation-specific skills, more than in vocational systems that do not have dual training. However, their analyses indicate that students in these systems are more vulnerable in their later careers. They (Hanushek et al., 2017) state that in vocationally oriented countries the process of skill out-dating is especially strong. At the same time, the level of adult training is lower for vocational than for general education graduates. This absence of adult training is especially strong in systems that offer highly occupation-specific skills.

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<sup>(7)</sup> Education or training combining periods in an educational institution or training centre and in the workplace.

For these reasons in this paper the classification of countries based on two traditional indicators: that between vocational and general upper-secondary education and, within vocational education, that between apprenticeship <sup>(8)</sup> and school-based vocational education has been used. Hanushek et al. (2011) have classified countries into different types based on the percentage of upper-secondary education students studying in vocational programmes and the percentage of students in combined school and work-based vocational programmes. The country groupings emerging from this bear a close resemblance to the classifications proposed by Green and Pansiero (2016).

#### 4.2. Defining country groups by variation of upper-secondary education

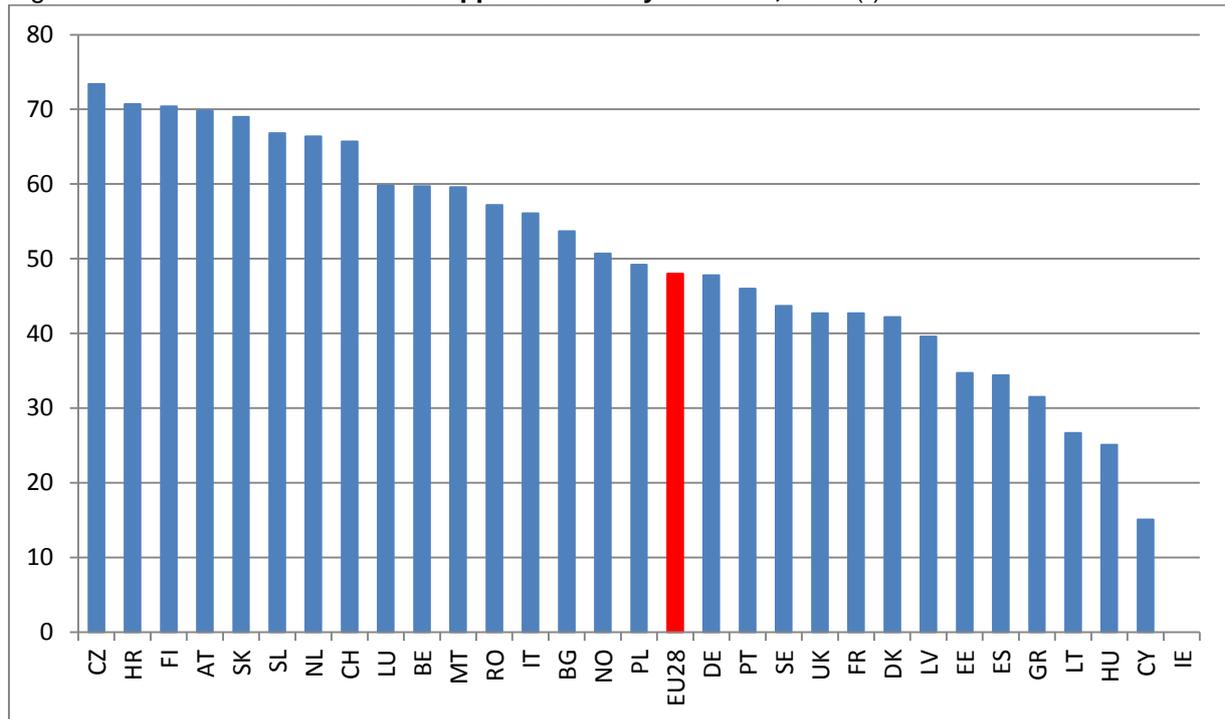
As noted above, a classification of countries based on two indicators is used. The first indicator measures the proportion of vocational enrolment in upper-secondary education. The second indicator measures the size of the dual system as a percentage of vocational enrolment in programmes in which work and school are combined.

Figure 2 shows that the percentage of those in upper secondary level education taking the VET pathway is different between member states. This percentage is the highest in the Czech Republic, Croatia, Finland, Austria, Slovakia, Slovenia and the Netherlands (above 60%). Malta (13%), Cyprus (15%), Hungary (25%) and Lithuania (27%) have the lowest shares (all below 30% in 2014).

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<sup>(8)</sup> Apprenticeship is defined as systematic, long-term training alternating periods at the workplace and in an educational institution or training centre.

Figure 2. **IVET students as % of all upper-secondary students, 2014** <sup>(9)</sup>



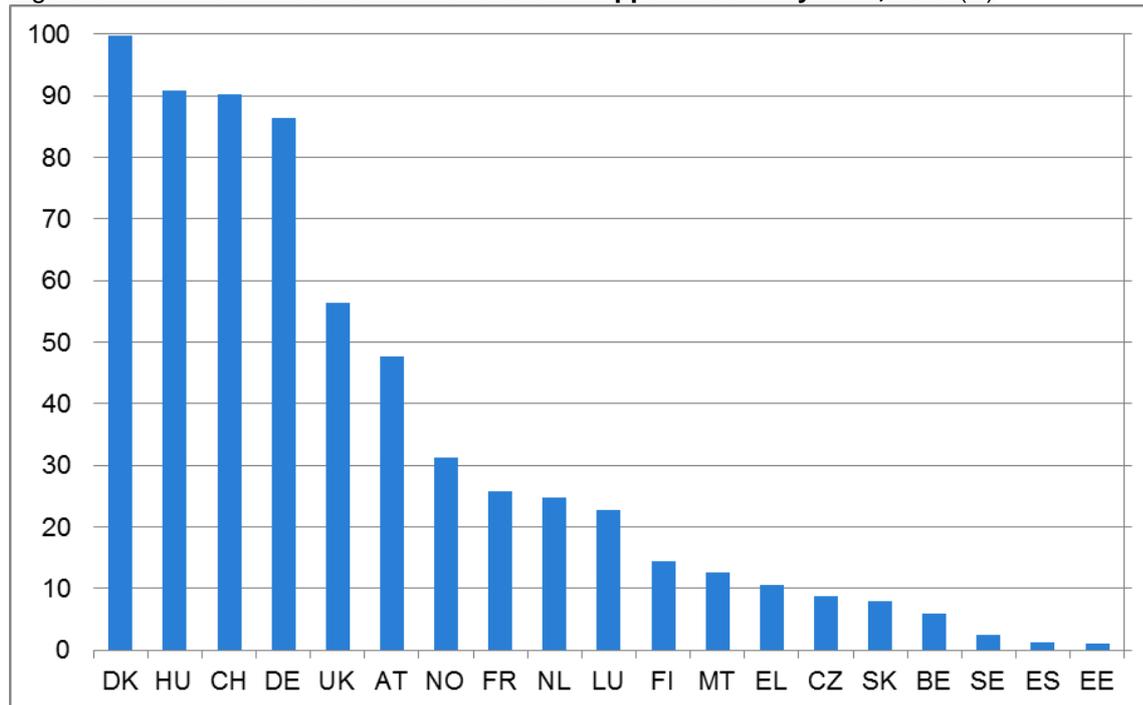
Source: Eurostat.

The percentage of work-based students <sup>(10)</sup> is the highest in Denmark (98%) (see Figure 3). This proportion is also high in Hungary and Germany. Combined work- and school-based programmes accounted for more than 50% of students in upper-secondary VET in the UK and in Austria. This proportion was low in Greece, Malta, Finland, Luxembourg, the Netherlands and France and very low in the Czech Republic, Slovakia, Belgium, Sweden, Spain and Estonia .

<sup>(9)</sup> According data of EU LFS 2014 there were no students in VET at upper-secondary level in Ireland. It is not a case of no students but of how types/levels of education are classified.

<sup>(10)</sup> The indicator is defined as the percentage of upper secondary VET students that are enrolled in combined work- and school-based programmes.

Figure 3. **IVET work-based students as % of all upper-secondary IVET, 2015** <sup>(11)</sup>



Source: Eurostat.

In Figure 4 countries are plotted according to the percentage of IVET students of all upper-secondary students and the percentage of IVET work-based students. It reveals no linear relationship between the percentage of IVET students and the percentage of work-based IVET students. However, Figure 4 shows that there are some distinct clusters of countries <sup>(12)</sup>:

- Countries where the percentage of IVET students as well as the percentage of IVET work-based students are high – in Switzerland, Germany and Denmark;
- Countries where the percentage of IVET students is high but the percentage of work-based students is at a medium level - Austria and the Netherlands;
- Countries where the percentage of IVET students is high but the percentage of IVET work-based students is low – in Slovakia, the Czech Republic, Finland, Luxembourg and Belgium <sup>(13)</sup>;
- Countries where the percentage of IVET students is low or at a medium level and the percentage of IVET work-based students is low – in Sweden, France, Malta, Estonia and Greece <sup>(14)</sup>.

<sup>(11)</sup> Data are missing for Bulgaria, Croatia, Cyprus, Italy, Latvia, Lithuania, Poland, Portugal, Romania, and Slovenia.

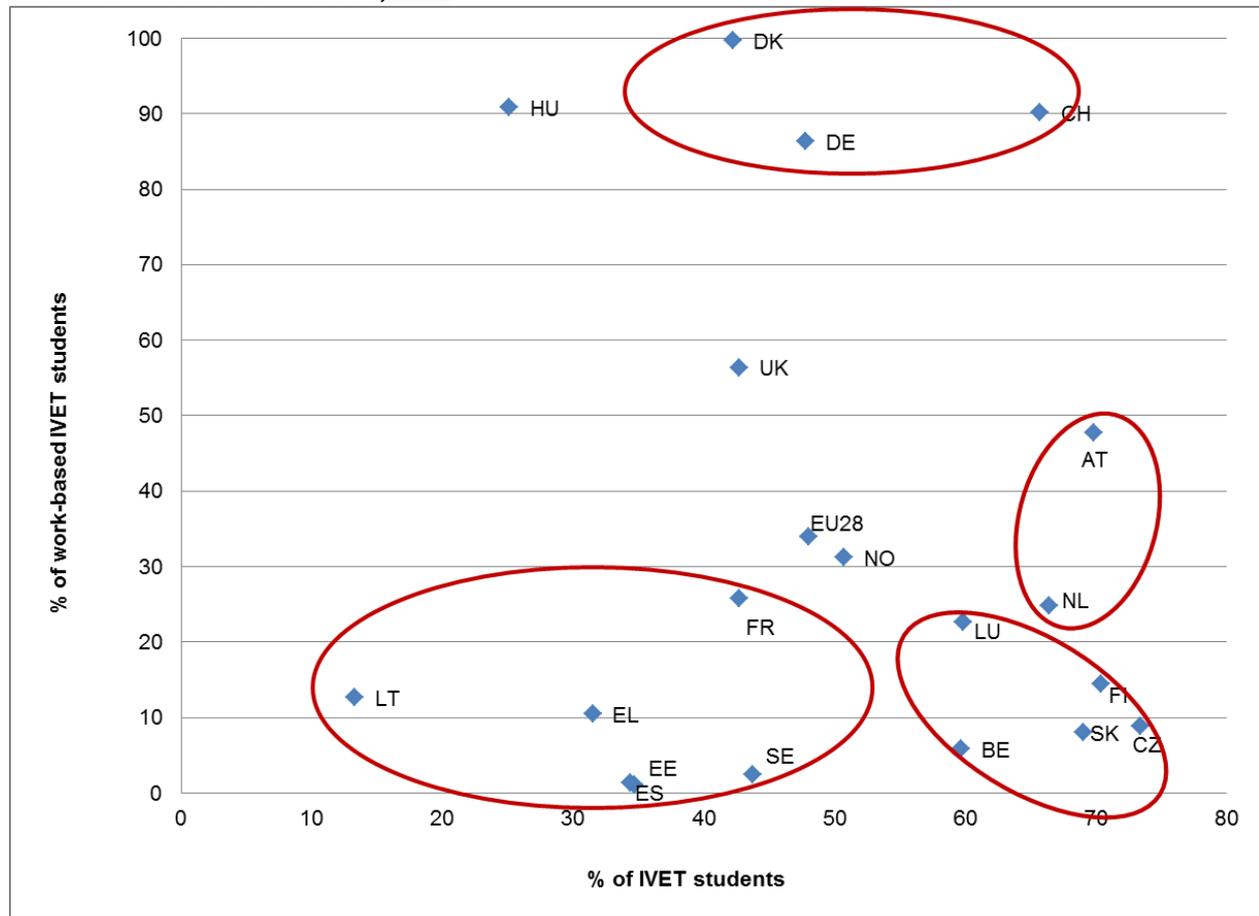
<sup>(12)</sup> Ireland is excluded from the following analyses because according data of EU LFS 2014 there were no students in VET at upper-secondary level.

<sup>(13)</sup> Some countries where data were not available (Bulgaria, Croatia, Italy, Poland, Romania and Slovenia) could be added to this type.

<sup>(14)</sup> Cyprus, Spain, Portugal, Latvia and Lithuania also belong to this type.

Two countries do not fit to this classification. In Hungary the percentage of IVET students is low but the percentage of work-based students is very high. In the UK the percentage of IVET students as well as work-based students are at a medium level.

Figure 4. % of upper secondary students who are in IVET versus % of upper secondary IVET students who are work-based, 2015



Source: Eurostat.

Based on this clustering different types of countries could be differentiated.

**Type 1 (CH, DE, DK)** These are countries with **dual systems of apprenticeship**. Apprenticeship systems are closely integrated with labour market institutions and the world of work, and this has important effects on the labour market value of the qualifications they offer and the consequent incentives this provides for apprentices (Busemeyer and Iversen, 2011). A number of countries have traditional dual systems of apprenticeship, where provision is regulated by the social partners, and apprentices are recruited by firms and placed on employment contracts (Denmark, Germany, Switzerland).

**Type 2. (AT, NL)** These are systems with **participation distributed relatively equally between school-based education and employment-based dual systems of apprenticeship**. Austria and the Netherlands belong to this type.

**Type 3. Hungary** represents an exceptional type because the percentage of IVET students is low but the percentage of work-based students is very high. Noelke and Horn (2014) mention that liberalization in Hungary has made the transition from vocational

education to work more difficult because linkages between schools and employers have been broken.

**Type 4.** We classified also the **United Kingdom** to separate type because the percentage of IVET students and work-based students are at a medium level in this country. Hodgson and Spours (2014) argue that the UK can be viewed as 'exceptionalist' because of a unique combination of system factors and the degree to which it is influenced by the market and the concept of choice.

**Type 5 (BE, BG, CZ, FI, IT, HR, LU, MT, PL, RO, SK, SI).** These are predominantly **school-based systems** with general academic and vocational provision in different types of dedicated upper-secondary institutions and with apprenticeships representing separate systems but accounting for few students. Most Central and Eastern European (CEE) countries (the Czech Republic, Slovakia, Croatia, Romania, Bulgaria, Poland and Slovenia) as well as Finland, Luxembourg, Belgium, Malta and Italy belong to this type.

**Type 6 (CY, EE, EL, ES, FR, LT, LV, PT, SE).** These are general education countries with **limited vocational systems** and with vocational education being school-based. This is the modal type in most southern European countries (Spain, Portugal, Greece, Cyprus) and in France. but also in the Baltic countries (Estonia, Latvia and Lithuania) and in Sweden. This typology is quite similar to all previous typologies <sup>(15)</sup>. Hanushek et al. (2017) have defined the first five types as 'vocational' countries. It becomes evident from our analysis that the important differences within this group of 'work-based vocational education oriented countries' (our first four types) makes it reasonable to suggest differences in educational and labour market outcomes.

A comparison of the classification of countries according to the setup of upper-secondary education used in this paper and the often used territorial or regional grouping is presented in Table A2 (see Annex 4). A comparison of the classification used in this paper and classification of countries based on prevalent VET conceptions is presented in Table A3 (see Annex 4).

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<sup>(15)</sup> As was noticed above, the results for Norway should be interpreted with caution, although the data collection process does not reveal significant divergencies. We decided to exclude Norway from this paper.

## CHAPTER 5.

# Effect of VET on participation in further education in different types of countries

Table 1 shows the effect of VET on participation in further education by country types <sup>(16)</sup>. As with previous studies the analysis indicates that graduates from vocational programmes have a lower chance to continue their studies in **formal education** than graduates from general upper-secondary programmes. However, the propensity of VET graduates to continue studying varies considerably from country to country and seems to depend on factors such as the type of vocational education offered, as well as the ease of progression and openness of the education system. The pattern is most pronounced in the group of apprenticeship countries, but also in countries with combined school- and work-based learning (Types 1 and 2) and in Hungary. The difference is smallest in the UK and in countries with school-based vocational education (Type 5). However, there is some variation in the effect of VET between countries in Type 5. As Table A6 in Annex 4 (analysis by countries) indicates, the negative vocational effect on participation in formal education is strong in some countries belonging to this type (in the Czech Republic, Finland, Croatia, Italy, Slovenia and Slovakia). The same pattern is observable for participation in **higher education**: the general education premium (the advantages of general education graduates compared to vocational education graduates) is more substantial in apprenticeship countries, in countries with work- and school-based vocational education and in Hungary. The effect of VET on participation in higher education is quite weak in countries with school-based vocational education.

### Box 1: Participation in higher education and citizens' perceptions of VET

There are very loose connections between participation of VET graduates in higher education and the views of the respondents on the vertical permeability of the education system in the countries. For example, in Estonia 84% of respondents agree that 'it is easy to continue into higher education such as university after vocational education at upper secondary education', followed by respondents in Poland (75%), Bulgaria and Cyprus (both 71%). The analysis of EU LFS 2014 data indicates that the participation of VET graduates in higher education is low or below average in these countries. An exception is the 20-24 age group in Bulgaria. Their participation is above the EU average. The level of agreement about vertical permeability in Belgium is much lower than in other member states (26% agree). There are five other countries where disagreement outweighs agreement: Sweden, Luxembourg, Slovenia, France and Denmark. In Slovenia the participation rate of VET graduates in higher education is high, in Belgium average, in France and Luxembourg low, in Denmark and Sweden low for age group 20-24 but above average for age group 30-34.

Source: Based on Cedefop, 2017a.

<sup>(16)</sup> Table 1 is based on results of regression analyses. Regression analyses are presented in Tables A4 and A5 in Annex 5, analyses were performed by each country type.

In the long term the negative effect of vocational education appears to decrease as the differences between the two educational groups are smaller among people in their early thirties. The pattern is similar for the two analysed age groups: the negative effect of VET on participation in formal education is strongest in apprenticeship countries (especially in Germany, see Table A6) as well as in countries with work- and school-based VET. This effect is insignificant in the UK, as well as in some countries with school-based vocational education (Bulgaria, the Czech Republic, Luxembourg and Malta). Therefore, in these countries, in the long term the negative effect of vocational education on participation in formal education is decreasing, i.e. vocational education graduates do not have lower chances of participation in formal education in their early thirties. The vocational effect on participation in higher education is also significant but has also weakened somewhat for the 30-34 age group

Table 1. **The effect of VET on participation in formal and non-formal education in different types of countries, 2014** <sup>(a)</sup>

Country type	Vocational upper-secondary education in reference to general upper-secondary education					
	Participation in formal education		Participation in higher education		Participation in non-formal education	
	20-24	30-34	20-24	30-34	20-24	30-34
<b>Type 1</b>	Very strong negative effect	Strong negative effect	Strong negative effect	Strong negative effect	Average negative effect	Average negative effect
<b>Type 2</b>	Very strong negative effect	Strong negative effect	Strong negative effect	Strong negative effect	Average negative effect	Average negative effect
<b>Type 3 (HU)</b>	Very strong negative effect	Average negative effect	Very strong negative effect	Average negative effect	No effect	Average negative effect
<b>Type 4 (UK)</b>	Weak negative effect	No effect	Average negative effect	Weak negative effect	Weak negative effect	No effect
<b>Type 5</b>	Weak negative effect	Average negative effect	Weak negative effect	Weak negative effect	Weak negative effect	Weak negative effect
<b>Type 6</b>	Average negative effect	Weak negative effect	Average negative effect	Weak negative effect	Weak positive effect	Weak positive effect

Source: Own calculations based on EU LFS 2014.

The scale used is based on regression coefficients presented in Table A4 (Annex 5). The estimations are based on comparison of the vocational effect in the country type with this average effect. Effects are presented on the relative scale from *weak positive* to *average positive* to *no effect* to *average negative* to *weak negative*.

In addition to opportunities to continue studies in formal settings (at any level or in higher education, in particular), from the lifelong learning perspective it is also important to have easy access to non-formal training. It has been argued that job-related skills provided by vocational education are more likely to become obsolete (Hanushek et al., 2017). Thus, further education and training could enable people to continuously to adapt to changing labour market requirements or to make changes in their occupations and careers, which in turn would increase the probability of employment at an older age.

#### Box 2: VET conception and participation in further education in France

The analysis of conception of VET (see Cedefop, 2017) indicated that in France VET is understood as (part of) lifelong learning. A national system of validation of prior learning and the qualification framework has helped to develop this concept. Initial VET and continuing VET for adults are now more often presented together. However, this changed conception of VET is now not completely reflected in high participation of VET graduates in further education. The participation rate of VET graduates in formal education is quite low compared to other European countries but VET seems to facilitate participation in non-formal learning. Differences between general upper-secondary and VET graduates have remained high.

*Source:* Based of Cedefop, 2017b and own calculations.

The results show that there is no single trend emerging in the probability of vocational upper-secondary education graduates continuing to participate in **non-formal training**. First, when compared to lower secondary education, those with vocational upper-secondary education are more likely to participate in training in most types of countries (except in Type 1 countries among 20-24 year-olds, in Type 2 countries among 30-34 year-olds and in Hungary among both age groups, see Table A5). Second, in four types of countries, compared to general upper secondary education, those with vocational certificates are less likely to train: in apprenticeship, combined school- and work-based and school-based vocational countries, as well as in Hungary. However, there are some exceptional cases: for example, in Denmark and the Netherlands VET graduates are more likely to participate in non-formal education and training than general education graduates (see Table A6 in Annex 5). In school-based VET systems one reason might be that different actors are responsible for setting standards in initial and further education. Another reason might be that IVET mainly leads to semi-skilled jobs with low potential for promotion and development (see also Bosch and Charest, 2015). In countries with predominantly general upper-secondary education vocational education relative to general education significantly increases participation in non-formal training. In the UK the respective relationships are not statistically significant.

### Box 3: Further education for VET graduates in Germany and Denmark

Germany and Denmark are both countries with dual VET systems. Nevertheless, there are big differences in the participation of VET graduates in further education (especially in non-formal education and training). In Germany the training system is organised around a very significant front-end investment but with very little adult continuing training. Training goes to those workers who are already employed and highly valued. Crouch et al. (1999) argue that Germany's high quality system for IVET may have contributed to the underdevelopment of training for adults. Unlike Germany, in Denmark a well-institutionalised system for adult education provides opportunities for skill development over the life course. There are courses building on IVET in nearly all occupational fields. All vocational qualifications can be supplemented after some years of work experience by promotional training. The standards of these courses are laid down by the social partners and the certificates are generally recognised. These courses open prospects for career advancements and promotions to middle management positions.

*Source:* Bosch and Charest, 2015; Thelen, 2014.

In summary, the results presented here indicate that school-based vocational education functions more straightforwardly as a part of the education system facilitating participation in further education. Surprisingly, in countries where general programmes dominate in upper-secondary education, vocational education graduates have a higher probability to continue their studies in non-formal education and the positive vocational effect is even stronger among 30-34 year-olds. This result might indicate that in this type of country VET graduates have better opportunities to get further training or they lack the skills required in the labour market and need additional training.

A limitation of the analysis is that it is not possible to know why people engage in lifelong learning, in particular whether they do so to fill skills gaps (perhaps compensating for a poor fit between initial VET and job needs) or to acquire new skills related to future employment, including enabling career progression (see also Cedefop, 2015).

## CHAPTER 6.

# Effect of VET on labour market outcomes in different types of countries

The observed effect of vocational upper secondary education is generally positive in comparison to lower-secondary education for both 20-24 and 30-34 year-olds (see Tables A7 and A8). Higher chances of skilled employment are secured by vocational upper-secondary education in all types of countries, indicating a rather uniform pattern which hardly depends on context. Three countries presenting exceptions to this positive pattern have mainly general educational systems (Cyprus, Greece and France, see Annex 9, Table A9). Moreover, the occupational status of people with vocational upper-secondary education is significantly higher compared to that of people with lower-secondary education. These findings suggest that the labour market outcomes of holders of vocational upper-secondary credentials are likely to signal the value of vocational education.

### *Age group 20-24*

Comparison of vocational upper-secondary education with general upper-secondary education provides more diverse picture. **In age group 20-24**, only one vocational effect is similar in all types of examined countries: the employment rate of people with vocational upper-secondary education is higher than that for people with general upper secondary education. At the same time, our results show that, with regard to quality of employment (risks of having an unskilled job or level of occupational status), the advantage of vocational upper-secondary education compared to general secondary education depends on country context (i.e. type of VET, but there is some variety within types as well). All countries with dual VET systems (Type 1), and also with work and school-based VET systems (Type 2) give their employed graduates higher chances of escaping unskilled jobs. Outside these VET systems only Finland guarantees a higher chance of having a skilled job for people with upper-secondary vocational education compared to those with general secondary education. VET decreases the unemployment risk compared to general education in countries with predominantly general upper-secondary education, but increases this risk in countries with school-based vocational education. The effect of education orientation is not significant in all other types of countries.

The analysis indicates that vocational secondary education seems to have a **safety net function** (measured as avoiding the risk of unemployment and low skilled employment) only in apprenticeship countries and in countries with combined work- and school-based vocational education. In countries with school-based vocational education vocational education actually increases both risks compared to general education.

Vocational upper-secondary education compared to general upper-secondary education has a stronger (and more negative) effect on the occupational position (**diversion effect**) in

countries where general upper-secondary education dominates, as well as in Hungary. Apparently in these countries the esteem of vocational education is low. However, our analysis does not support the previous results that vocational education can provide a safety net and restrict the range of occupational opportunities at the same time (Shavit and Müller, 2000) because the vocational effect on occupational status is smallest in apprenticeship countries and in countries with combined work- and school-based vocational education.

As previous analysis indicated another expression of the **diversion effect** - lower levels of participation in formal education (and respectively higher levels of inactivity) among persons with vocational upper-secondary education compared to holders of general upper-secondary education - are characteristic for all types of VET systems and this has an impact on long-term labour market outcomes.

Additional analysis shows that the vocational effect on entry into occupational groups in the middle of the social hierarchy (skilled white and blue collar workers) is positive in apprenticeship countries and countries with combined work- and school-based studies, and also in countries where general secondary education dominates (the effect is substantially weaker compared to Type 1 and Type 2 countries). Therefore, vocational upper-secondary education ensures the entry to skilled workers in these countries. This effect is non-significant in Hungary and the UK, and negative in countries with school-based vocational education. However, the variation between countries in Type 5 (school-based upper-secondary education) is substantial. As the analysis by countries shows the vocational effect is positive in Belgium, Bulgaria and Finland, but negative and very strong in Slovenia and Poland. This evidence in some countries with school-based VET highlights the importance of supportive policies and institutions beyond the school system.

Country types could be ordered according to the magnitude and the direction of the vocational effect on labour market outcomes and the safety net and diversion functions of VET (see Table 2 <sup>(17)</sup>). The vocational effect is the most positive on labour market outcomes in apprenticeship countries and in countries with combined work- and school-based vocational education. Vocational education has a safety net function but also quite a strong diversion effect in countries where general upper-secondary education dominates. However, there are quite big country differences in this type of countries. There are some countries, where there is no diversion effect, signalling that there are some mechanisms that might decrease this effect. Vocational education does not have a safety net effect in France or Greece. The vocational effect is low in the UK. In Hungary and in countries with school-based vocational education vocational education does not have a safety net effect but its diversion effect is strong. Once again country differences are substantial. In two countries belonging to this type (Finland and Bulgaria) vocational education does decrease the risk of unemployment.

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<sup>(17)</sup> Table 2 is based on Tables A4, A5, A7 and A8.

## Box 4: Changes in Finnish VET system

The Finnish VET system is hybrid: it produces skills for the labour market and enables graduates to enter higher education. Creation of higher and further education opportunities for VET graduates has allowed for the removal its dead-end character and has increased the prestige of VET. The major outcome of these reforms is that participation in IVET has been increasing in Finland since the early 2000s. The reforms have been aimed at increasing employability of VET graduates. As the result the position of VET in the Finnish school system has changed and increased its interest among applicants.

Source: Stenström and Virolainen, 2016.

Table 2. **Safety net and diversion functions of VET in different types of countries among 20-24 year-olds**

Country type	Safety net function		Diversion function		Employment in medium skilled jobs
	unemployment	low-skilled employment	occupational position	participation in formal education	
Type 1	No	Yes	Quite low	Very strong	Strong
Type 2	No	Yes	Quite low	Very strong	Strong
Type 3	No	No (higher risk for VET)	Very strong	Very strong	No
Type 4	No	No	Medium	Medium	No
Type 5	No (higher risk for VET)	No (higher risk for VET)	Strong	Medium	No
Type 6	Yes	No	Strong	Medium	Medium

Source: Own calculations based on EU LFS 2014.

The scale used is based on regression coefficients presented in Table A4 (Annex 5) and A7 (Annex 6). The estimations are based on comparison of the vocational effect in the country type with this average effect. Estimations are presented on the scale of *yes*, *no (higher risk for VET)* and *no* for safety net function; on the relative scale ranging from *quite low* to *low* to *medium* to *strong* to *very strong* for diversion function; and on the scale ranging from *no* to *medium* to *strong* for securing employment in medium skilled jobs.

### Age group 30-34

For **30-34 year-olds**, the comparison of employment rates among people with vocational upper-secondary and general upper-secondary education is favourable for the former group in most types of countries (see Table A9). This effect is negative in Hungary, i.e. the employment rate of individuals with vocational education is lower than individuals with general education. The safety net function of vocational education among 30-34 year-olds (as among 20-24 year-olds) is more pronounced in apprenticeship countries and in countries where general programmes dominate in upper-secondary education. There is a positive and

significant VET premium for skilled jobs (VET graduates are less likely to perform unskilled jobs) in apprenticeship countries (Type 1). The analysis indicates that the probability of having a low-skilled job is significantly lower for individuals with general secondary education in countries with school-based vocational education, and especially in Hungary and the UK.

Among 30-34 year-olds the two roles of vocational education mentioned by Shavit and Müller (2000) (diversification and safety net) tend to coincide. In apprenticeship countries, and in countries with combined work- and school-based education, vocational education helps to avoid unemployment and unskilled jobs but also restricts occupational opportunities<sup>(18)</sup>. However, vocational education ensures positions in the middle positions of the occupational scale in these countries, as well as in countries with predominantly general upper-secondary education. There is quite big variation in countries belonging to Type 6: the effect is positive in Sweden, Spain and Latvia and negative in Greece, Cyprus and Portugal. The positive vocational effect is even more pronounced among 30-34 year-olds than in the younger age group (20-24 year olds). This effect is non-significant in the UK but negative in countries with school-based vocational education, and in Hungary, where the effect is strong.

**The general patterns for age group 30-34** are somewhat different compared to age group 20-24 (Table 3). The vocational effect on labour market outcomes seems to be quite positive in countries where enrolment in general upper-secondary education is high. Vocational education shelters individuals from unemployment and, to a lesser extent, from low-skilled employment. The diversion effect is quite low compared to other types of countries. The pattern in apprenticeship countries and in countries with combined work- and school-based vocational education is quite similar: vocational education has a safety net function (shelters from unemployment) but a very strong diversion effect. There is no safety net effect in countries with school-based vocational education: there are no differences in unemployment risks between people with vocational and general upper-secondary education, but vocational education graduates have a higher risk of being in a low-skilled job. An exception seems to be Romania where vocational education decreases the risk of unemployment and being in a low-skilled job. The diversion effect has remained at a medium level. Quite surprisingly the vocational effect is quite similar in the UK and Hungary. Vocational education does not have a safety net effect as in previous types of countries but the effect on low-skilled jobs is strong. This means that vocational education graduates have a much higher probability of working in low-skilled jobs compared to general education graduates. Vocational education also diverts people from higher occupational positions. In addition, in Hungary VET does not guarantee employment in medium skilled jobs.

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<sup>(18)</sup> It should be noted that this analysis excludes those vocational education graduates who have continued their studies in tertiary education. Previous analysis presented indicates that the percentage of vocational education graduates continuing their studies in higher education is quite high in Denmark (a country with an apprenticeship system).

## Box 5: Bulgaria and Romania as exceptional cases

The participation rate of upper-secondary students in VET is above the EU average in both countries. Other reports also indicate that the labour market outcomes of VET graduates are better than those of general upper-secondary graduates. However, the quality and attractiveness of VET, and the provision of relevant skills for further training and employment, remain inadequate. VET schools have high drop-out rates. The Romanian report also indicates insufficient systematic links with the labour market.

Source: European Commission, 2016; European Commission, 2017.

Table 3. **Safety net and diversions functions of VET in different types of countries among 30-34 year-olds**

Country type	Safety net effect		Diversion function		Employment in medium skilled jobs
	Unemployment	low-skilled employment	occupational position	participation in formal education	
Type 1	Yes	Yes	Very strong	Very strong	Strong
Type 2	Yes	No	Very strong	Strong	Strong
Type 3 (HU)	No	No (higher risk for VET)	Strong	Medium	Medium (neg. effect for VET)
Type 4 (UK)	No	No (higher risk for VET)	Strong	No	No
Type 5	No	No (higher risk for VET)	Medium	Medium	No
Type 6	Yes	Yes	Quite low	Low	Medium

Source: Own calculations based on EU LFS 2014.

The scale used is based on regression coefficients presented in Table A4 (Annex 5) and A8 (Annex 7). The estimations are based on comparison of the vocational effect in the country type with this average effect. Estimations are presented on the scale of *yes*, *no (higher risk for VET)* and *no* for safety net function; on the relative scale ranging from *quite low* to *low* to *medium* to *strong* to *very strong* for diversion function; and on the scale ranging from *no* to *medium* to *strong* for securing employment in medium skilled jobs.

## CHAPTER 7.

# Concluding remarks and key findings

This paper presents a comparative analysis of the effect of different educational orientations at upper-secondary level on education and labour market outcomes across European countries. The analysis has been made possible by the availability of the 2014 Labour Force Survey, which has allowed comparison of these outcomes for general and vocational upper-secondary programmes.

Vocational education has mainly been promoted as a way of improving the transition from school to work <sup>(19)</sup>, but it also appears to have an impact on subsequent education paths, as well as on the adaptability of workers to technological and structural change in the economy. The advantages of vocational education in smoothing entry into the labour market have to be set against later labour market opportunities.

The vocational effect is defined as the effect on labour market and educational outcomes of taking vocational programmes in upper-secondary education (ISCED 3). This effect is calculated in comparison to both lower-secondary education and general upper-secondary education. Following Shavit and Müller (2000) the safety net effect (protecting people against unemployment and unskilled work) and the diversion effect (restricting the range of occupational opportunities) of vocational education have been separated.

Countries have been grouped into different types based on the percentage of upper-secondary education students studying in vocational programmes and the percentage of students in combined school and work-based vocational programmes. These two indicators have been used because previous analyses have indicated that the setup of upper-secondary education and the organisation of vocational education have an impact on the labour market entry of young people as well as on long-term vocational effects.

The analysis indicates that many of the previous discussions about the programme orientation have been too narrow. As Hanushek et al. (2017) show vocational education has been promoted largely as a way of improving the transition from school to work, but it also appears to have a long-term impact on labour market outcomes. The question is whether a potential advantage of vocational qualifications early in someone's career is off-set by disadvantages later in the life. This question is very important for policy debates because it helps to understand how institutional context influences the adaptability of workers with vocational education backgrounds to technological and structural change in European societies.

The findings demonstrate cross-national differences in the early-career advantages of vocational qualifications in line with previous analyses. The results indicate that the vocational effect varies according to the outcome. It is generally positive in comparison to lower-secondary education, although since vocational upper-secondary education produces

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<sup>(19)</sup> Although other objectives include helping to tackle early school leaving.

more favourable labour market outcomes than lower secondary education, this might indicate greater demand for qualifications at this level in the labour market <sup>(20)</sup>. This would be in line with the trend for higher-level qualifications to be in demand in occupations that once would have called for lower-level qualifications and the changing role of VET. The availability of the vocational option might reduce early school leaving by keeping more practically oriented young people in school and improving their labour market opportunities.

When general upper-secondary education is the comparator, the results are more mixed: in general there are negative effects on further formal and non-formal education and on occupational status, consistent with earlier research. The safety net function of vocational education (negative vocational effect on unemployment and low-skilled employment) is only observable in a few countries and this effect seems to decrease later on in individuals' work careers, perhaps because of a reduction in the labour market relevance of the skills obtained through initial vocational education and training.

If this could be taken as evidence of shaping the general level of attraction of vocational education, one could assume that such labour market outcomes are hardly attractive for career-oriented young people (usually with more advantageous social backgrounds). However, for people with higher risk aversion (usually of less advantageous social origin and having fewer resources at their disposal) vocational upper-secondary might seem to be a viable option for prolonging the educational path **beyond lower to upper-secondary education**. There is a significant problem with many students ending at lower secondary level in many European countries. The intention should be to improve the access of those students to the upper secondary level.

### **Country-type observations**

The impact of vocational education varies considerably with the specific institutional structure of schooling and work-based training. However, differences are not only remarkable in countries belonging to different types, but also within supposedly similar types.

In **apprenticeship countries** (CH, DE, DK) the safety net effects of vocational upper-secondary education are strongest among 20-24 year-olds and weaker among 30-34 year-olds. The negative vocational effect on occupational status at the beginning of a career is even more pronounced (weaker) compared to other types of countries. Dual systems have positive impacts on the labour market entry of vocational school graduates, sheltering them from unemployment and unskilled jobs and ensuring their entry to skilled positions on the occupational ladder. The findings do not support previous findings about the coexistence of safety net and diversion effects of vocational education on labour market entrants.

However, the results for 30-34 year-olds are broadly consistent with earlier research and confirm that the safety net and diversion roles of vocational education seem to coincide. In

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<sup>(20)</sup> However, there is a risk that the direct implication for value of vocational education may be exaggerated, as there may be a simple reason that upper secondary is more valued than lower secondary, no matter whether it is vocational or general.

countries with dual systems fewer vocational education graduates enter formal and non-formal education. Vocational upper-secondary education does not automatically provide its graduates with the opportunity to continue their studies in formal or in non-formal education (often further 'bridging' courses are required). It is still used primarily as a route into work rather than further study. Vocational upper-secondary education functions according to the employment logic, especially for labour market entrants. Thus, while the analysis confirms previous results about the positive role of dual systems for young people in the short run, the long-term effect of vocational education seems to be less positive (see also Hanushek et al., 2017). Vocational education still seems to 'divert' young people from formal (tertiary) education even though more and more opportunities for progression have been developing for some time. The reasons for this phenomenon need further investigation but are likely to include dispositional factors on the part of people who choose to do an apprenticeship (e.g. a disinterest in continuing in formal education) but also supply side factors, such as the promotion and accessibility of programmes. Also of interest is the fact that there is less take-up of *non-formal* learning opportunities. This may reflect a lack of supply of such opportunities on the part of employers and other actors, dispositional factors on the part of individuals, and 'structural' factors such as the nature of professions and vocations (the German 'Beruf' concept) which leads to labour market rigidities and lack of flow between occupations with sorting into professions being a key function of apprenticeships.

However, international experiences show that attempts towards such a system often fail. As indicated by several authors, dual VET systems only work sustainably if there is significant support and acceptance by major actors and the apprenticeship system is complemented by strong labour market institutions (Estevez-Abe et al., 2001; Dustmann and Schoeneberg, 2008).

The pattern in **countries with combined work- and school-based vocational education (AT, NL)** is quite similar to that in apprenticeship countries. The vocational effect on participation in non-formal learning is positive for the 20-24 age group but turns negative later in life. The safety net effect is not so strong as in apprenticeship countries. Vocational education does somewhat restrict occupational opportunities at the beginning of a career but the negative vocational effect is substantially larger for the 30-34 age group.

In countries with **school-based vocational education (BE, BG, CZ, FI, IT, HR, LU, PL, RO, SK, SL)**, with general academic and vocational provision in different types of dedicated upper-secondary institutions and with apprenticeships representing separate systems but accounting for few students, vocational education graduates have a higher risk of unemployment and unskilled employment than general education graduates. School-based vocational education functions in a more straightforward way as a part of the education system. Its effect seems to have quite a negative effect on initial labour market entry, in terms of occupational positions, but this negative effect somewhat weakens for the 30-34 age group. This finding is consistent with the notion that there is a much greater degree of fluidity between professions (sorting of individuals) after labour market entry into and once in the labour market in these systems. However, unlike apprenticeship systems, school-based vocational education does not seem to hold any advantages compared to general secondary education. The success of school-based vocational education depends on the adequacy of

skills taught in vocational schools compared to labour market needs (see also Eishhorts et al., 2012). It requires the close collaboration of employers, unions and the educational institutions. The big variation in the direction and strength of the vocational effect on labour market outcomes in these countries is likely to indicate differences in the strength of the collaboration between different actors. The vocational effect is more positive in Finland and weaker in Bulgaria and Romania.

In **countries where general upper-secondary education** dominates (EE; EL, FR, ES, PT, SE, LI, LV) vocational education graduates are less likely to continue their studies in formal education than general upper-secondary education graduates, but the vocational effect is positive on participation in non-formal education and training, which may indicate a 'compensation' effect, i.e. individuals have a strong need to 'back fill' gaps in their skills that were not filled through formal vocational education in the upper-secondary phase. Surprisingly, vocational education does not have a strong negative effect on educational and labour market outcomes in this type of country group. Differences in most studied outcomes between individuals with vocational and general upper-secondary education are smaller in these countries compared to other types of countries, especially for the 30-34 age group. Although vocational upper-secondary education may have a lower status compared to general education in these countries, vocational education functions quite well, especially from a long-term perspective in terms of sheltering their graduates from low-skilled jobs and unemployment and ensuring entry to positions in the middle of the social hierarchy. It is possible that there is a generally weak connection between education and training and the labour market, suggesting that the labour market is less determined by qualifications possessed, e.g. family ties in Mediterranean countries. Once again, the variation between countries belonging to this type is quite large, probably reflecting significant differences in the institutions that underpin both education and training and the labour market. The vocational effect on labour market outcomes seems to be quite negative in Greece and France.

In summary, the results highlight interesting differences between apprenticeship and school-based systems especially in those countries where general upper-secondary education dominates. The effect of vocational upper-secondary education on educational and labour market outcomes is quite positive in the following countries with school-based vocational education: for the 20-24 year-old age group in Finland, Bulgaria and Romania, for the 30-34 year-old age group in Sweden, Spain and Romania. This is an important issue in the light of the increased prominence of apprenticeships in Europe in the last 20 years and since the latter is often perceived as the 'poor relation' of the former.

All in all the mere evidence of exceptions from the general tendencies revealed at the level of VET system types highlights the context-sensitivity of labour market and educational outcomes of VET, and the importance of further investigation of institutions and policies contributing to such 'atypical' outcomes. VET systems are deeply embedded in the various national production, labour market, industrial relations and status systems. The demand side (labour market structure) should also have a strong impact on the labour market outcomes of VET graduates.

With regard to the two single-country groups, in **Hungary** vocational education does not have a safety net function. Vocational education also restricts occupational opportunities as

in apprenticeship countries. Vocational education graduates have lower participation rates in formal and non-formal education compared to general education graduates. The diversion effect of vocational education is also strong. The vocational effect in Hungary seems to be quite similar to countries with school-based vocational education. The results indicate the negative vocational effect on educational and labour market outcomes and confirm conclusions made by Noelke and Horn (2014), who argue that the substitution of employer-with school-provided vocational education has substantially increased the unemployment rate of VET graduates.

In the **UK** vocational education seems to have relatively strong linkages with tertiary education giving access to further education. Using the terminology of Ianelli and Raffe (2007) it could be concluded that in the UK education logic dominates: vocational upper-secondary education has weak links with employment, is less sharply differentiated from academic upper-secondary education and as a result ensures quite good opportunities for further education and training. The quite positive vocational effect on educational outcomes does not coincide with this effect on labour market outcomes. Vocational education does not have a safety net function in the UK. The vocational effect on occupational position is quite strong and it is stronger among 30-34 year-olds.

### **General observations**

The results support the move towards apprenticeships and work-based learning in terms of labour market outcomes. However, in countries where general upper-secondary education is dominant, vocational tracks are more successful in terms of labour market outcomes than in countries where school-based systems exist. This highlights the need to examine the links between education systems and labour market systems.

Besides the positive role of vocational education in labour market entry processes (especially in apprenticeship countries) more attention should be paid to its long-term effect, to the adaptability of vocational education graduates to technological and structural changes in society. The results show that VET graduates are potentially sacrificing the longer-term gains associated with further education in favour of the short-term benefits. It is no longer sufficient to facilitate the smooth transition into work: vocational education should also provide strong basic skills to ameliorate any later life disadvantages. In order to avoid a negative perception of vocational education as a dead-end option, transition to further education should be facilitated. This opportunity should be provided not only formally, by creating the necessary means of transition, but also by actively supporting such transitions. The European Commission (2010) communique stresses the need to strengthen vocational programmes, to deal with high youth unemployment in Europe, but also to enhance investment to lifelong learning. The increased attention on lifelong learning will require policies allowing progression between different types and levels of education and training, and more flexible transitions between education and training and work.

The analyses presented in this paper have some restrictions. First, it is difficult to draw convincing conclusions about long-term vocational effects based on the comparison of different cohorts. The question is whether cohort differences indicate short- and long-term effects or depreciation of skills with age. However, the consistency of the short- and long-

term vocational effect across country groupings seems to confirm previous findings. Second, very few independent variables have been included in the analysis. It was not possible to control factors such as social background as well as abilities. As noted in the Introduction, participation in vocational programmes is selective and the selection is inversely related to ability.

The approach taken in this paper was not to aim for a comprehensive comparison of VET systems. The classification of countries used in the paper is based on two indicators of national VET systems on upper-secondary level independent of its socio-economic context, disregarding simple comparative indicators (participation in further education and labour market outcomes). The approach has been selective because the full diversity of VET at the national level was intentionally not taken into account.

Despite these limitations the analyses presented in this paper have produced original research about labour market and educational outcomes of VET graduates in countries with different types of education system at upper-secondary level. One of the strengths of this research is the use of the best comparable data on IVET graduates available so far for the countries across Europe. One of the limitations of previous EU LFS as a data source about initial VET was related to the difficulties of fully distinguishing (general or vocational) study orientation. From 2014 the EU LFS offers possibilities to distinguish programme orientations at upper-secondary level and to compare education and labour market outcomes of graduates of vocational and general programmes. The paper prepares the ground for the development of VET scenarios for the future. In particular, the social status of VET, determined by its position in the education system and in the labour market, is expected to be among the most relevant outputs defining future developments. The country typology used in this paper will contribute to revealing, and predicting, the changes at a more systematic level.

## List of abbreviations

EU LFS	European Union Labour Force Survey
FET	Further education and training
IVET	Initial vocational and training
VET	Vocational education and training
AT	Austria
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom

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# ANNEXES

## ANNEX 1.

### Formal and non-formal education

**Formal education** is defined as 'education that is institutionalised, intentional and planned through public organisations and recognised private bodies, and — in their totality — constitute the formal education system of a country. Formal education programmes are thus recognised as such by the relevant national education or equivalent authorities, e.g. any institution in cooperation with the national or sub-national education authorities. Formal education consists mostly of initial education. Vocational education, special needs education and some parts of adult education are often recognised as being part of the formal education system. Qualifications from formal education are by definition recognised and, therefore, are within the scope of ISCED. Institutionalised education occurs when an organisation provides structured educational arrangements, such as student-teacher relationships and/or interactions, that are specially designed for education and learning (Eurostat, 2016).

**Non-formal education** is defined as 'education that is institutionalised, intentional and planned by an education provider. The defining characteristic of non-formal education is that it is an addition, alternative and/or complement to formal education within the process of lifelong learning of individuals. Non-formal education is often provided in order to guarantee the right of access to education for all, as it caters to people of all ages but does not necessarily apply a continuous pathway structure; it may be short in duration and/or low-intensity; and it is typically provided in the form of short courses, workshops or seminars. Non-formal education mostly leads to qualifications that are not recognised as formal or equivalent to formal qualifications by the relevant national or sub-national education authorities or to no qualifications at all. Nevertheless, formal, recognised qualifications may be obtained through exclusive participation in specific non-formal education programmes; this often happens when the non-formal programme completes the competencies obtained in another context (Eurostat, 2016, p.15).

## ANNEX 2.

### Limitations of the data set

Despite providing an opportunity for comparing the education and labour market outcomes of vocational and general upper-secondary education internationally, the **EU LFS data set** has significant limitations.

- It assumes a four-week reference period for measuring participation in CVET (i.e. it measures participation in the last four weeks prior to the interview),
- it does not systematically cover guided on the job training;
- it allows proxy interviews (i.e. it allows proxy respondents to answer the questionnaire in case the sampled individuals are not available);
- it provides no or very little information on aspects other than participation in education and training (such as for instance purpose, content, forms, source of financing, time invested in it and obstacles to it);
- it provides only cross-sectional information.

It is currently not possible to follow individual educational trajectories. Exploitation of the EU LFS waves approach could be a way forward, but these possibilities are currently limited. So long as study orientation is not fully distinguished, it will take time for longitudinal data to become available.

Additional data limitations refer to specific countries and variables, as detailed below:

- The 'Hatvoc' variable was missing for Iceland;
- It was not possible distinguish vocational education using the 'Hatvoc' variable for Ireland;
- Continuing studies in higher education data was missing for Switzerland.

Analysing and comparing data of different countries presents a number of challenges. First, the definition of a VET degree in practice varies widely among European countries, depending on the country-specific structure of the educational system. It is therefore important to be aware that the term VET can identify very heterogeneous situations: some countries may have vocational degrees systematically alternating school and workplace practice, while some other may call 'vocational' degrees that are only vaguely job-oriented, often low-ranked compared to the academic track and possibly stigmatized (see Hanuschek et al., 2011). In this case, two qualifications falling under the same umbrella of VET may lead to very different outcomes, suggesting that a more comprehensive analysis of the internal differentiation of VET education (i.e. the extent of school-work alternation, the degree of transition from one track to the other, the type of curricula, etc.) would help understanding better the extent to which cross-national variation can be associated to the characteristics of the vocational system.

Second, people entering vocational upper-secondary education may differ systematically from those entering general upper-secondary education. Vocational education is usually correlated with unobserved ability because selection into different tracks is based on a competitive examination or because individuals with higher ability choose to enter general rather than vocational schools. More able individuals are more likely to have better labour market and education outcomes and are also more likely to enter to general programmes (Meer, 2007). This makes difficult to separate vocational effect from that of unobservable ability, preferences, attitudes and other characteristics. There has been adopted several strategies to deal with this problem, ranging from instrumental variable estimation to matching techniques (see Hanuschek et al., 2011). Brunello and Rosso (2015) have adopted a selection-on-observables strategy. Their analysis is based on PIAAC data set which includes useful information (skills, social background etc.) to model selection into different types of programmes.

## ANNEX 3.

## Samples

Table A1. Sample sizes, EU LFS 2014

Country	20-24 year-olds			30-34 year-olds		
	Vocational upper-secondary education	General upper-secondary education	Total	Vocational upper-secondary education	General upper-secondary education	Total
Austria	4212	1637	5849	4464	674	5138
Belgium	1776	1815	3591	1611	652	2263
Bulgaria	459	801	1260	582	343	925
Switzerland	1312	962	2274	1518	435	1953
Czech Republic	1380	420	1800	1489	91	1580
Cyprus	274	1006	1280	316	554	870
Germany	6673	9512	16185	10767	1025	11792
Denmark	1069	4769	5838	1296	289	1585
Estonia	332	770	1102	299	273	572
Spain	762	1983	2745	679	641	1320
Finland	1117	1117	2234	985	233	1218
France	8213	7465	15678	9184	2720	11904
Greece	970	6476	7446	1111	3317	4428
Croatia	1297	395	1692	1223	77	1300
Hungary	2910	5656	8566	4863	1306	6169
Ireland	-	6292	6292	-	2965	2965
Iceland	-	-	-	-	-	-
Italy	10902	8792	19694	9648	3119	12767
Lithuania	416	1753	2169	416	393	809
Luxembourg	40	392	432	72	187	259
Latvia	425	1153	1578	415	542	957
Netherlands	1520	1360	2880	1329	209	1538
Norway	585	323	908	141	266	407
Poland	8769	7291	16060	10223	2270	12493
Portugal	1482	2967	4449	868	1686	2554
Romania	6396	2250	8646	4617	954	5571
Sweden	7220	3355	10575	4310	1614	5924
Slovenia	1913	1207	3120	1940	265	2205
Slovakia	2634	1496	4130	2723	239	2962
United Kingdom	970	1419	2389	1306	707	2013
Malta	172	624	796	64	265	329

## ANNEX 4.

### Comparison of the classifications of countries

The following table compares the classification of countries according to the setup of upper-secondary education used in this Working Paper and often used in territorial/regional grouping.

Table A2. Territorial grouping of countries and typology of countries by setup of upper-secondary education

Territorial/regional grouping	Types by setup of upper-secondary education system					
	Type 1: Dual system VET	Type 2: work- and school-based VET high	Type 3: work-based high, school-based VET low (HU)	Type 4: work- and school-based VET medium (UK)	Type 5: school-based VET dominant	Type 6: General education focused
Western European countries				UK		
Visegrad countries			HU		CZ, SK, PL	
South East European countries					BG, RO, HR	
Central European countries	DE, CH	AT, NL			BE, LU, SL	
Nordic countries	DK				FI	SE
South Mediterranean countries					MT	EL, CY
West Mediterranean countries						ES, PT, FR
Baltic countries						EE, LV, LT

The table indicates that there are some similarities between territorial grouping and typology used in this Working Paper. However, there is substantial variation across Central European and Nordic countries in the relative size of the general and vocational programs and in the specific organization of the vocational programs. All West Mediterranean and Baltic countries belong to Type 6. But this type also includes Sweden, as well as two South Mediterranean countries. All three South East European countries belong to Type 5 with several countries from other regions.

Table A3. Comparison of the classification of countries according to the setup of upper-secondary education and the concept of VET

Grouping based on the concept of VET	Types by setup of upper-secondary education system					
	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
VET understood as dual initial training	DE, DK	AT	HU		SK (appr.)	
VET understood as initial vocational education		NL			BE, BG, CZ; HR, IT, PL, RO, SK(school), LU, MT, SI	CY, EE, EL, ES, LV, LT, PT, SE
VET understood as further training				UK		CY
VET understood as (part of) life-long learning					FI	FR

Source: Own table based on Cedefop, 2017.

## ANNEX 5.

### The effect of VET on participation in further education: results of logistic regression analyses

Table A4. Types of upper-secondary education and participation in formal education among 20-24 and 30-34 year-olds, logistic regression coefficients by country type, 2014

Country type	Vocational upper secondary education in reference to general upper- secondary education			
	Participation in formal education		Participation in higher education	
	20-24 year-olds	30-34 year-olds	20-24 year-olds	30-34 year-olds
Type 1	-3.208***	-2.858***	-2.742***	-2.684***
Type 2	-3.146***	-.2.302***	-2.887	-2.199***
Type 3 (HU)	-3.024***	-1.282***	-5.064***	-1.986***
Type 4 (UK)	-1.402***	-.222	-1.929***	-.535*
Type 5	-1.795***	-1.451***	-1.164***	-1.329***
Type 6	-2.061***	-.556***	-2.173***	-.984***

\*\*\* significant at level 0.001;

\*\* significant at level 0.01

Source: EULFS 2014 microdata, own calculations.

Table A5. Types of upper-secondary education and participation in non-formal education among 20-24 and 30-34 year-olds, logistic regression coefficients by country type, 2014

Country type	Vocational upper-secondary education in reference to lower- secondary education		Vocational upper-secondary education in reference to general upper-secondary education	
	20-24 year-olds	30-34 year-olds	20-24 year-olds	30-34 year-olds
Type 1	-.020	.322***	-.353***	-.781***
Type 2	.227***	.154	-.309***	-.517***
Type 3 (HU)	.286	-.730***	-.172	-.833***
Type 4 (UK)	.630***	.529***	-.227***	-.162
Type 5	.323***	.606***	-.173***	-.287***
Type 6	.475***	.630***	.216***	.411***

\*\*\* significant at level 0.001

Source: EULFS 2014 microdata, own calculations.

## ANNEX 6.

## The effect of VET on participation in further education, summary of country analyses

Table A6. Effect of VET on educational outcomes, summary <sup>(21)</sup>

Type	Country	20-24 year-olds		30-34 year-olds		20-34 year-olds
		Participation in formal education	Participation in higher education	Participation in formal education	Participation in higher education	Participation in non-formal education
Type 1: Dual	DE	--	--	--	-	--
	DK	-	-	-	-	+
	CH	-	n.a.	-	n.a.	-
Type 2: Work- and school-based	AT	--	--	--	--	-
	NL	--	--	-	-	+
Type 3	HU	--	--	-	--	-
Type 4	UK	-	-	0	-	0
Type 5: School-based	BE	-	-	-	-	0
	BG	-	-	0	0	0
	CZ	--	-	0	0	0
	FI	--	-	-	-	0
	HR	--	-	--	0	0
	IT	--	-	-	-	0
	LU	-	--	0	0	0
	MT	-	-	0	0	0
	PL	-	-	-	-	-
	RO	-	-	-	-	0
	SI	--	-	-	-	-
SK	--	-	--	--	0	
Type 6: Mainly general	CY	-	-	--	--	0
	EE	--	--	-	-	0
	EL	--	--	--	--	0
	ES	--	--	-	-	0
	FR	--	--	-	-	-
	LT	--	--	-	-	0
	LV	-	-	-	--	0
	PT	--	--	-	-	-
SE	-	-	-	0	0	

**vocational upper-secondary education** (ref. general upper-secondary education)

+ probability is higher for those with vocational upper-secondary education;

- probability is lower for those with vocational upper-secondary education;

-- probability is much lower for those with vocational upper-secondary education

n.a. not applicable

<sup>(21)</sup> Table is based on Working paper 4.2.

## ANNEX 7.

## The effect of VET on labour market outcomes among 20-24 year-olds

Table A7. Types of upper-secondary education and labour market outcomes among 20-24 year-olds, regression coefficients by country types, 2014

Country type	Vocational upper-secondary education in reference to lower-secondary education	Vocational upper-secondary education in reference to general upper-secondary education
<b>Employment</b>		
Type 1	1.277***	1.575***
Type 2	1.016***	1.375***
Type 3 (HU)	1.247***	1.970***
Type 4 (UK)	.918***	.781***
Type 5	.430***	1.089***
Type 6	1.010***	1.452***
<b>Unemployment</b>		
Type 1	-.681***	.113
Type 2	-.954***	-.113
Type 3 (HU)	-.739***	.095
Type 4 (UK)	-.834***	.033
Type 5	-.411***	.153***
Type 6	-.885***	-.202***
<b>Low-skilled employment</b>		
Type 1	-1.067***	-.904***
Type 2	-1.184***	-.779***
Type 3 (HU)	-1.666***	.426***
Type 4 (UK)	-1.047***	.123
Type 5	-1.054***	.172***
Type 6	-.819***	.080
<b>Employment in ISCO 1-8 versus unemployment and ISCO 9 (low-skilled employment)</b>		
Type 1	.904***	.447***
Type 2	1.149***	.516***
Type 3 (HU)	1.510***	-.214***
Type 4 (UK)	1.049***	-.083
Type 5	.691***	-.138***
Type 6	.971***	.141***
<b>Socio-Economic Index of Occupational Status (ISEI)</b>		
Type 1	2.218***	-3.414***
Type 2	5.360***	-1.756***
Type 3 (HU)	5.550***	-8.116***
Type 4 (UK)	4.808***	-4.153***
Type 5	5.811***	-4.597***
Type 6	3.220***	-5.552***
<b>Employment in ISCO 1-3 versus unemployment and ISCO 9 (low-skilled employment)</b>		
Type 1	.978***	.040
Type 2	1.578***	.298***
Type 3 (HU)	2.412***	-1.935***
Type 4 (UK)	1.488***	-.0440***
Type 5	1.840***	-.548***
Type 6	1.369***	-.415***
<b>Employment in ISCO 4-8 versus unemployment and ISCO 9 (low-skilled employment)</b>		
Type 1	.879***	.569***

Type 2	1.051***	.588***
Type 3 (HU)	.149***	-.001
Type 4 (UK)	.958***	.028
Type 5	.601***	-.066*
Type 6	.926***	.253***

\*\*\* significant at level 0.001; \* significant at level 0.05

Source: EULFS 2014 microdata, own calculations.

## ANNEX 8.

## The effect of VET on labour market outcomes among 30-34 year-olds

Table A8. Types of upper-secondary education and labour market outcomes among 30-34 year-olds, regression coefficients by country types, 2014

Country type	Vocational upper-secondary education in reference to lower-secondary education	Vocational upper-secondary education in reference to general upper-secondary education
<b>Employment</b>		
Type 1	1.279***	.912***
Type 2	1.125***	.394***
Type 3 (HU)	1.077***	-.284***
Type 4 (UK)	1.126***	-.124
Type 5	.846***	.152***
Type 6	.770***	.160***
<b>Unemployment</b>		
Type 1	-1.204***	-.336***
Type 2	-1.090***	-.261
Type 3 (HU)	-.995***	.087
Type 4 (UK)	-1.006***	.016
Type 5	-.718***	-.031
Type 6	-.699***	-.206***
<b>Low-skilled employment</b>		
Type 1	-1.592***	-.266*
Type 2	-1.559***	-.038
Type 3 (HU)	-1.718***	.938***
Type 4 (UK)	-.776***	.619***
Type 5	-1.209***	.175***
Type 6	-.952***	-.094*
<b>Employment in ISCO 1-8 versus unemployment and ISCO 9 (low-skilled employment)</b>		
Type 1	1.564***	.393***
Type 2	1.496***	.199
Type 3 (HU)	1.719***	-.533***
Type 4 (UK)	.893***	-.414***
Type 5	1.001***	-.030
Type 6	.876***	.183***
<b>Socio-Economic Index of Occupational Status (ISEI)</b>		
Type 1	7.403***	-9.365***
Type 2	7.598***	-10.553***
Type 3 (HU)	6.870***	-8.067***
Type 4 (UK)	3.342***	-9.232***
Type 5	7.944***	-4.981***
Type 6	4.316***	-3.997***
<b>Employment in ISCO 1-3 versus unemployment and ISCO 9 (low-skilled employment)</b>		
Type 1	2.021***	-.188***
Type 2	2.063***	-.512***
Type 3 (HU)	2.248***	-1.443***
Type 4 (UK)	.998***	-.960***
Type 5	2.071***	-.379***

Type 6	1.359***	-.037
<b>Employment in ISCO 4-8 versus unemployment and ISCO 9 (low-skilled employment)</b>		
Type 1	1.420***	.752***
Type 2	1.345***	.704***
Type 3 (HU)	1.674***	-.364***
Type 4 (UK)	.855***	-.103
Type 5	.857***	-.072*
Type 6	.782***	.248***

\*\*\* significant at level 0.001; \* significant at level 0.05.

Source: EULFS 2014 microdata, own calculations

ANNEX 9.

The effect of VET on labour market outcomes, summary of country analyses

Table A9. Effect of VET on labour market outcomes, summary <sup>(22)</sup>

Type	Country	20-24 years-old					30-34 years-old				
		Employment	Un-employment	Low-skilled jobs	ISEI	ISCO versus ISCO 9 and unemployment	Employment	Un-employment	Low-skilled jobs	ISEI	ISCO versus ISCO 9 and unemployment
Type 1: Dual	DE	+	+	-	-	+	+		-	-	+
	DK	+	+	-	-	+	+			-	+
	CH	+	-	-	-	+	+			-	+
Type 2: Work- and school-based	AT	+		-	-	+	+			-	+
	NL	+		-			+			-	
Type 3	HU	+		+	-		-		+	-	-
Type 4	UK	+			-				+	-	
Type 5: School-based	BE	+			-	+	+		+	-	
	BG	+	-			+					
	CZ	+			-		-			-	-
	FI	+	-	-	-	+				-	
	HR	+								-	
	IT	+		+	-		+		-	-	
	LU	+								-	

<sup>(22)</sup> Table is based on Working paper 4.3.

	MT	+			+							
	PL	+	+	+	-	-			+		-	
	RO	+		-	-	+			-		-	+
	SI	+	+		-	-			+		-	
	SK	+		+	-				+		-	
Type 6: Mainly general	CY	+						-	+	+		-
	EE	+			-	+						-
	EL	+		+			-	-	+		-	-
	ES	+			-	+	+		-	-	-	+
	FR	+	+	+	-			-	+		-	
	LT	+			-							-
	LV	+										+
	PT	+			-				+			
	SE	+			-	+	+				-	-

**vocational upper-secondary education** (ref. general upper- secondary education)

+ probability is higher for those with vocational upper-secondary education;

- probability is lower for those with vocational upper-secondary education.

|